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Public Utility Commissions and Energy Efficiency

A Handbook of Legal & Regulatory Tools for Commissioners and Advocates

August 2012

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Contents

Acronyms and Abbreviations

AMI	Advanced metering infrastructure
CO_2	Carbon dioxide
CPP	Critical Peak Pricing
EERS	Energy Efficiency Resource Standard
EEU	Energy Efficiency Utility
EPS	Emissions Performance Standard
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse gas
IEA	International Energy Agency
IOU	Investor-owned utility
kWh	kilowatt-hour
MWh	Megawatt-hour
PUC	Public Utilities Commission
REC	Renewable energy credit
RGGI	Regional Greenhouse Gas Initiative
RIM	Ratepayer Impact Measure
ROR	Rate of Return
RPS	Renewable Portfolio Standard
RTP	Real-time Pricing
SBC	System Benefits Charge
TOU	Time-of-use
TRC	Total Resource Cost

Introduction

Energy efficiency is one of the most economical and effective tools we have to improve environmental quality while at the same time helping to ensure the provision of reliable electricity service. The goal of energy efficiency is decades old, but progress lags behind potential due to the many practical and regulatory hurdles it faces. Encouragingly, however, state policy efforts have been dramatically ramping up in the past several years. A confluence of many factors is driving this renewed attention to energy efficiency: fuel price volatility, new air pollution regulations on traditional power plants, concerns about electric grid reliability, a continued quest for energy security, increasing efforts to craft state-level solutions to the problem of climate change in the continued absence of comprehensive federal legislation, and the development of new technologies that allow greater efficiency. A number of states have set impressively ambitious new energy efficiency savings targets, generally overseen by state public utility commissions (PUCs). How these commissions can craft effective regulatory rules and incentives to meet these targets is a pressing question that has received much attention in recent literature on state utility-sector energy efficiency policies. But even where ambitious state goals are not in place, PUCs and energy efficiency advocates have many regulatory tools at their disposal to help encourage greater consideration of and penetration of energy efficiency.

This handbook examines the range of legal and regulatory tools that state PUCs have to promote energy efficiency. It draws from a broad and deep body of literature on the topic, an examination of relevant state laws and regulations, and interviews with experts in the private and public sectors. The handbook may prove useful in those states that are more advanced in their energy efficiency policies by illuminating potential refinements or alternative design options in areas that prove to be sticking points. It is intended primarily, however, as a resource for those in states that are not yet as advanced in energy efficiency policy. By highlighting the breadth of strategies that PUCs have at their disposal, this handbook aims to be useful to PUC commissioners and staff, and to energy efficiency advocates, no matter what political or practical constraints they might be facing in their states.

The remainder of this introduction focuses on why increasing energy efficiency should be a first-order goal in all states, and why PUCs have such an integral role in advancing this goal. Following sections detail the myriad ways that commissions, and advocates appearing in front of commissions, can tackle the issue of increasing energy efficiency's role in meeting future electricity demand. The first portion of the handbook focuses on policies directly aimed at promoting energy efficiency. The handbook then turns its attention to strategies for helping energy efficiency considerations permeate other, more traditional areas of PUC decision-making. When certain policies have proven particularly effective, this fact is noted, and the same is true where certain strategies have fallen out of favor. But the goal of this handbook is less to prescribe a particular pathway to a successful state energy efficiency strategy, and more to provide to interested parties a collection of the range of options available. The report closes with a brief section written specifically for advocates, which explains how to intervene in relevant PUC proceedings and provides resources on effective PUC intervention.

The Benefits of Energy Efficiency

It is worth stepping back for a moment, at the beginning of any somewhat technical document on energy efficiency policy, to take stock of the many reasons that energy efficiency will be a critical resource in the coming decades.

First and foremost, energy efficiency offers the cheapest way to help meet future demand for electricity. Any form of electricity generation necessarily comes at a cost, whereas energy efficiency often saves consumers money. Residential, commercial, and industrial consumers of electricity have seen a steady rise in prices over the last decade: between 1998 and 2011, residential prices rose from 8.26 cents/kWh to 11.54 cents/kWh; commercial prices rose from 7.41 cents/kWh to 10.19 cents/kWh; and industrial prices rose from 4.48 cents/kWh to 6.77 cents/kWh.[1] Although many complex variables factor into electricity prices, one of the reasons for this upward trend is that as a country, we are massively under-investing in energy efficiency. Energy efficiency saves money: one of the most comprehensive studies of energy efficiency's savings potential, produced by McKinsey and Company in 2009, found that by 2020, the U.S. could consume 23 percent less energy per year by investing $520 billion in energy efficiency, and that this investment would yield present-value savings of roughly $1,200 billion.[2] These potential savings provide a compelling reason for regulators to pay careful attention to energy efficiency opportunities.

Energy efficiency offers a range of other benefits that add to its appeal. By reducing the amount of electricity necessary to meet demand, including demand at peak times, it improves the reliability of the

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[1] *See* U.S. Energy Info. Admin, Table 5.3. Average Retail Price of Electricity to Ultimate Customers: Total by End-Use Sector, 1998 through April 2012, *available at* http://205.254.135.7/electricity/data.cfm. Record lows in natural gas prices may cause this price trend to slow or reverse as gas replaces coal in electricity generation, at least in the near term, although there is much uncertainty over whether these low prices will persist. *See* Henry D. Jacoby, Francis M. O'Sullivan & Sergey Paltsev, *The Influence of Shale Gas on U.S. Energy and Environmental Policy*, ECON. OF ENERGY & ENVTL. POL'Y 37, 38, 42 (2012).

[2] *See* HANNAH CHOI GRANADE ET AL., UNLOCKING ENERGY EFFICIENCY IN THE U.S. ECONOMY 7-8 (McKinsey & Co. July 2009); *see also Efficiency and Climate Policy: Hearing Before the Select Committee on Energy Independence and Global Warming,* 110th Cong. 3 (2008) (statement of Richard Cowart, Director, Regulatory Assistance Project: studies show that "the cost-effective reservoir of efficiency opportunities is large enough to meet 50% to 100% or more of all new electric demand" in the country) (May 8, 2008). Even looking only at existing programs and best practices, the Electric Power Research Institute (EPRI) estimates that energy efficiency programs have the potential to "realistically" reduce the growth rate of electrical consumption by 22% (to 0.83%) per year, from 2008-2030. But under a more vigorous approach, the growth rate could be reduced by 36% (to 0.68%) per year. In 2030, this would represent an achievable reduction in electricity consumption of between 236 billion and 382 billion kWh (5-8% reduction in projected consumption). EPRI, ASSESSMENT OF ACHIEVABLE POTENTIAL FROM ENERGY EFFICIENCY AND DEMAND RESPONSE PROGRAMS IN THE U.S. (2010-2030), EXECUTIVE SUMMARY 7 (2009); McKinsey & Co., *EPRI and McKinsey Reports on Energy Efficiency: A Comparison* (2009), *available at* http://www.mckinsey.com/Client_Service/Electric_Power_and_Natural_Gas/Latest_thinking/Unlocking_energy_efficiency_in_the_US_economy. Of course, the fact that energy efficiency investments overall save money does not mean that those who stand to lose from reduced energy consumption—traditional utilities whose revenue increases with sales volumes—might not initially oppose such policies. Strategies to reduce such opposition by incentivizing utilities to be full collaborators in implementing energy efficiency policy are discussed *infra* section 3.

electric grid.[3] Avoiding brownouts and blackouts is a paramount concern for grid operators, utilities, and state and federal regulators alike. In the face of historically high summer temperatures and considerable controversy over how coal plant retirements can be expected to impact reliability,[4] energy efficiency's ability to ease worries over electric grid reliability is another major reason it should be promoted.

Energy efficiency also allows utilities and states to avoid building as much new transmission and generation, thereby not only saving money but also improving environmental quality. Transmission and generation have huge environmental footprints, both in terms of the land and resources required for construction, and in terms of the air and water pollution that most electricity generation emits as a byproduct. As federal air quality standards increase in stringency, one of energy efficiency's important roles may be in helping states to cost-effectively meet new standards by acting as a substitute for dirtier electricity sources.[5] In fact, states are able to receive direct credit for improvements in energy efficiency made as part of their Clean Air Act State Implementation Plans. Recent Environmental Protection Agency guidance clarifies how states can use energy efficiency to help meet air quality regulations.[6] Moreover, turning to energy efficiency instead of new transmission and generation can help state regulators avoid the protracted and costly siting battles that often accompany proposals to build these new facilities.

Finally, energy efficiency has a significant potential role in addressing what has come to be the dominant environmental crisis of our time: climate change. Improved energy efficiency is one of the most effective and lowest cost methods of reducing greenhouse gas emissions.

Several recent studies show just how important energy efficiency will be in securing a sustainable energy future. In examining how the world might feasibly halve its energy use by 2050, the International Energy Agency (IEA) found that end-use fuel and electricity efficiency would need to account for *38 percent* of reduced CO_2 emissions (Figure 1).[7] That number amounts to the same

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[3] *See* Ned Raynolds & Richard Cowart, *The Contribution of Energy Efficiency to the Reliability of the U.S. Electric System* (Alliance to Save Energy & Regulatory Assistance Project 2000), *available at* http://ase.org/resources/electricity-reliability-white-paper.

[4] *See, e.g.*, U.S. DEP'T OF ENERGY, RESOURCE ADEQUACY IMPLICATIONS OF FORTHCOMING EPA AIR QUALITY REGULATIONS (Dec. 2011), available at http://energy.gov/sites/prod/files/2011%20Air%20Quality%20Regulations%20Report_120111.pdf; N. AM. ELEC. RELIABILITY CORP., 2011 LONG-TERM RELIABILITY ASSESSMENT (Nov. 2011), *available at* http://www.nerc.com/files/2011LTRA_Final.pdf.

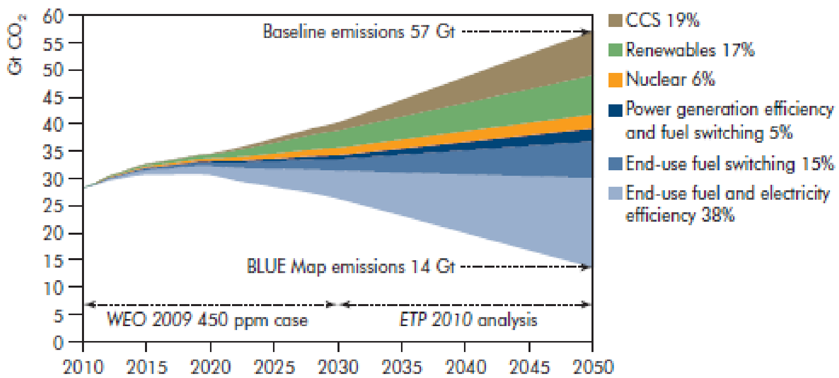
[5] *See generally* SARAH HAYES & RACHEL YOUNG, ENERGY EFFICIENCY: THE SLIP SWITCH TO A NEW TRACK TOWARD COMPLIANCE WITH FEDERAL AIR REGULATIONS (ACEEE Rep. No. E122, Jan. 2012) (exploring how energy efficiency may prove to be a cost-effective method for complying with new federal air regulations).

[6] *See* U.S. ENVTL. PROT. AGENCY, ROADMAP FOR INCORPORATING ENERGY EFFICIENCY/RENEWABLE ENERGY POLICIES AND PROGRAMS INTO STATE AND TRIBAL IMPLEMENTATION PLANS (July 2012), *available at* http://www.epa.gov/airquality/eere/pdfs/EEREmanual.pdf.

[7] INTERNATIONAL ENERGY AGENCY, ENERGY TECHNOLOGY PERSPECTIVES: SCENARIOS & STRATEGIES TO 2050, at 3 (2010).

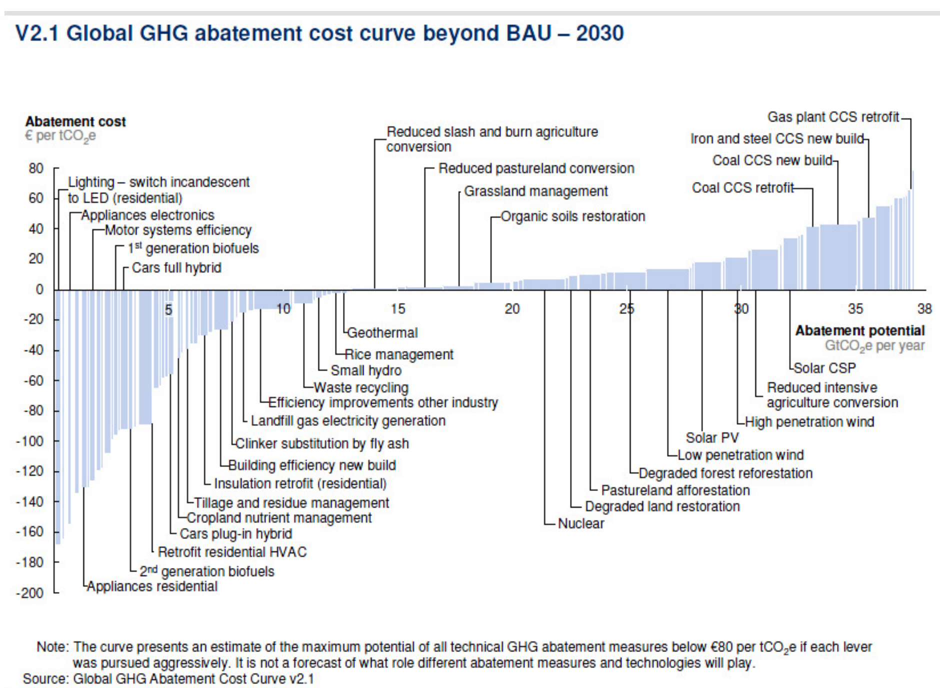
contribution as nuclear, renewable, and end-use fuel switching *combined*, causing the IEA to conclude that "increasing energy efficiency . . . should be the highest priority in the short term."[8]

Figure 1: Role of Various Policy Options in Driving Carbon Emissions Reductions[9]



Energy efficiency is also one of the least expensive solutions for reducing carbon emissions, with investments often netting a return rather than a cost. This fact is illustrated by the now-famous McKinsey & Company "cost curve" (Figure 2).

Figure 2: Costs of Various Greenhouse Gas Abatement Technologies[10]



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[8] *Id.* at 5.

[9] This figure is reprinted from *id.* at 3.

[10] This figure is reprinted with permission from © McKinsey & Co., Impact of the Financial Crisis on Carbon Economics: Version 2.1 of the Global Greenhouse Gas Abatement Curve 8 (2010).

As this curve illustrates, many of the most cost-effective energy efficiency measures will *more than pay for themselves*: for example, residential appliances, lighting, and electronics, residential HVAC retrofits, insulation retrofits, new build building efficiency, and industrial energy efficiency improvements all have *negative* abatement costs, making them rare win-win solutions that save consumers money and cut carbon emissions at the same time. These negative costs stand in contrast to the majority of new electricity sources, including renewable and nuclear power, as well as fossil fuel power, especially with carbon capture and storage technology. Moreover, energy efficiency avoids many of the regulatory and technical hurdles currently plaguing renewable energy, including concerns over renewables' ability to compete with natural gas given historically low gas prices, worries about renewables' impacts on grid reliability, and difficulties siting and financing the major transmission lines necessary to connect areas with great renewable energy potential to areas with large energy demand.[11]

The Need for Regulation

Given the host of benefits just catalogued, it is fair to ask why energy efficiency needs regulating at all. Why won't the market simply capture all of the cost-saving opportunities available?

Markets fail with respect to energy efficiency for a number of reasons. First, energy efficiency is plagued by a host of well-catalogued structural and market barriers that make consumers unlikely to seek out optimum levels of energy efficiency investment.[12] In some cases, misaligned incentives mean that the person responsible for making an energy efficiency investment would not be the same person who would reap the savings and increased comfort of that investment, as in the case of the landlord-tenant or the homebuilder-homeowner relationship.[13] Similarly, long pay-back periods for some efficiency investments, coupled with the frequency with which people move in the United States, can make homeowners skeptical of receiving the full value of their efficiency investments.[14] Others may simply not have the up-front capital to devote even to efficiency investments that are sure to net them a return over the years, and securing energy efficiency financing can be difficult.[15] And finally, a lack of

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[11] *See* Steven Ferrey, *Efficiency in the Regulatory Crucible: Navigating 21st Century 'Smart' Technology and Power*, J. ENERGY & ENVTL. L. 1, 11-16 (Winter 2012).

[12] Brandon Hofmeister, *Bridging the Gap: Using Social Psychology to Design Market Interventions to Overcome the Energy Efficiency Gap in Residential Energy Markets*, 19 SOUTHEASTERN ENVTL. L. J. 1 (2011), collects many of the long-standing arguments about market failures that contribute to the "energy efficiency gap." The barriers being discussed today are, by and large, the same ones identified twenty years ago, suggesting that we still have a long way to go in creating an efficient energy efficiency marketplace, and that the problem is more one of lack of action than lack of understanding. *See* WILLIAM H. GOLOVE & JOSEPH H. ETO, MARKET BARRIERS TO ENERGY EFFICIENCY: A CRITICAL REAPPRAISAL OF THE RATIONALE FOR PUBLIC POLICIES TO PROMOTE ENERGY EFFICIENCY (Lawrence Berkeley Nat'l Lab., March 1996); *see also* Marilyn A. Brown, *Market failures and barriers as a basis for clean energy policies*, 29 ENERGY POL'Y 1197 (2001).

[13] Hofmeister, *supra* note 12, at 14-15.

[14] *Id.*; *see also* CHOI GRANADE ET AL., *supra* note 2, at 8.

[15] Hofmeister, *supra* note 12, at 16-17; Brown, *supra* note 12, at 1202-03.

information about the many cost-saving opportunities available, or a lack of time to devote to the task, may be prime hurdles stopping many would-be investors.[16]

Another contributing impediment to energy efficiency is that we have a highly regulated electric utility sector that remains, in most states, insulated from competition as a presumed natural monopoly.[17] Electric utilities are the primary interface between the electric wholesale market and electricity consumers, and are therefore in the best practical position to promote energy efficiency measures to consumers. However, under a traditional regulatory model, they have little incentive to encourage consumers to invest in energy efficiency, given that such measures would lower their electricity sales and, thereby, revenues. Intelligent policies to help better align utilities' business models with the goal of energy efficiency are therefore a crucial piece of solving the energy efficiency puzzle.[18]

Finally, many of energy efficiency's benefits are classic "public goods" that the market is prone to under-provide. "Public goods" offer overall societal benefits that the market under-supplies because profits cannot be earned on them.[19] As discussed above, energy efficiency provides public goods in many forms, including increased grid reliability, decreased air and water pollution, and increased public health. These public good attributes are another classic reason that market intervention is necessary for energy efficiency.

For all of these reasons, regulation to promote energy efficiency is necessary and justified. We have known of the barriers discussed above for a long time, but still have a long way to go in eliminating them. The central challenge for regulators today remains continuing to experiment with policy solutions that can overcome these barriers that keep us from saving money and energy. With its catalogue of potential regulatory solutions, this handbook hopes to move this effort forward.

Progress to Date

State-level action on energy efficiency is not a new idea; it has been pursued with waxing and waning degrees of enthusiasm since the 1970s. Policies to date have had a demonstrable payoff: in 2010, for example, energy efficiency programs saved a reported 112 Terawatt-hours of energy—enough to power 9.7 million U.S. homes for one year.[20] And in the most recent several years, progress by many states has been rapid: electric energy efficiency program budgets rose from $2.7 billion in 2007 to $5.4 billion in 2010, and further rose to over $6.8 billion in 2011.[21]

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[16] Hofmeister also catalogues a range of "cognitive" barriers that further explain why people under-invest in energy efficiency. *See supra note* 12 at 18-31.
[17] *See generally* Edan Rotenberg, *Energy Efficiency in Regulated and Deregulated Markets*, 24 UCLA J. ENVTL. L. & POL'Y 259 (2006).
[18] *See id.* at 298.
[19] *See* DAVID J. BJORNSTAD & MARILYN A. BROWN, A MARKET FAILURES FRAMEWORK FOR DEFINING THE GOVERNMENT'S ROLE IN ENERGY EFFICIENCY (Joint Institute for Energy & Envt. Rep. No. JIEE 2004-02, June 2004).
[20] THE EDISON FOUNDATION INSTITUTE FOR ELECTRIC EFFICIENCY, SUMMARY OF RATEPAYER-FUNDED ELECTRIC EFFICIENCY IMPACTS, EXPENDITURES, AND BUDGETS 2 (2012).
[21] *Id.* at 4.

Progress nevertheless varies drastically from state to state, and even in leading states, a tremendous amount of potential remains unachieved.[22] A recent American Council for an Energy-Efficient Economy (ACEEE) study estimates that with penetration of known advanced technologies, the United States could reduce its energy consumption by a further 42% by 2050.[23]

Encouragingly, and perhaps unsurprisingly given energy efficiency's myriad benefits described above, energy efficiency appears to be a bipartisan issue, at least at the state level. The National Governors Association reports that in 2011, forty-eight states took some measures to expand their energy efficiency programs.[24] Accordingly, although large divergences exist in the efficacy of various state programs, all states have at least some political will to tackle the issue of improving energy efficiency. This fact makes energy efficiency particularly appealing during these politically polarized times, since it stands out as one of the few issues able to bridge the partisan divide and reach implementation in the short term.[25]

The Scope of this Handbook

Achieving the kind of massive energy efficiency gains discussed above will take significant efforts at multiple scales. This handbook collects strategies being pursued by one of the most important regulators in the utility-sector energy efficiency field: state public utilities commissions (referred to in this report as "PUCs" but also known in various states as public service commissions, regulatory authorities, corporation commissions, or other names[26]).

For unfamiliar readers, PUCs are the state regulatory entities charged with overseeing utilities and other entities operating within the state. In this handbook, we are primarily concerned with their oversight of electric utilities—those utilities with the critical mission of delivering electricity to the homes and businesses of the state.[27] PUCs' traditional, long-standing goal has been to ensure "just and

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[22] "In the U.S., as in most countries, analyses have shown that the efficiency potential has been tapped only in small measure." Cowart, *supra* note 2, at 2. A 2009 McKinsey & Company study estimated that we can further reduce residential energy consumption by approximately 28% as compared to a business-as-usual baseline through 2020. *See* CHOI GRANADE ET AL., *supra* note 2, at 8.
[23] *See* AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY *[hereinafter* ACEEE"*]*, THE LONG-TERM ENERGY EFFICIENCY POTENTIAL: WHAT THE EVIDENCE SUGGESTS v-vi (Jan. 2012).
[24] *See* Nat'l Governors Assoc., Clean: 2011 Update, State Energy Actions, at 9 (Jan. 2010), *available at* http://www.nga.org/files/live/sites/NGA/files/pdf/1201CLEANENERGYEXECSUMMARIES.PDF.
[25] *See* MICHAEL SCIORTINO ET AL., THE 2011 STATE ENERGY EFFICIENCY SCORECARD iii (ACEEE Oct. 2011) ("Energy efficiency [] is a pragmatic, bipartisan solution that political leaders from both sides of the aisle have supported over the past year.").
[26] *See* Jeremy Knee, *Rational Electricity Regulation: Environmental Impacts and the "Public Interest"*, W. VA. L. REV. 739, 753 n.88 (2011).
[27] Although some PUCs have authority over municipally owned utilities as well as investor-owned utilities, most PUCs have oversight only over investor-owned utilities, which are private companies owned by shareholders. DAN YORK & MARTIN KUSHLER, THE OLD MODEL ISN'T WORKING: CREATING THE ENERGY UTILITY FOR THE 21ST CENTURY 1 (ACEEE Sept. 2011). Investor-owned utilities are responsible for 66% of retail electricity sales across the United States. MIT INTERDISCIPLINARY STUDY, THE FUTURE OF THE ELECTRIC GRID 6 (2011).

reasonable rates" and reliable service for electricity consumers.[28] This mission is still central, but there is growing recognition that this duty demands a broader conceptualization of the PUC's role.[29] More specifically, many legislators and regulators are coming to realize that it should be within the PUC's sphere of responsibility to ensure that energy efficiency—as a clean, cheap, reliability-enhancing resource—is taken seriously and implemented to the greatest extent feasible by regulated utilities.

It should be noted that enhancing the efficiency of natural gas delivery, as well as electricity, is another important and complementary policy goal. This handbook, however, limits itself to electric utility energy efficiency, both for the sake of manageability and also because natural gas programs are newer and less developed, meaning that it is more difficult to draw comprehensive strategies and design options from them at this point.[30]

This handbook focuses on PUCs for several reasons: first, PUCs have primary jurisdiction over the end-use electricity sector, where the most opportunities for energy efficiency improvements exist.[31] And PUC buy-in matters a lot; experts recently ranked PUC support for energy efficiency as one of the key drivers of its success.[32] Particularly as we exhaust the "low-hanging fruit" of energy efficiency achievements, more robust PUC policies will be imperative to drive the "broader and deeper" cuts necessary to wring the next generation of cost-effective energy efficiency out of our electric system.[33]

Second, there has been considerable recent advancement by PUCs in the range and depth of policies being used to promote energy efficiency, but there is a great disparity among the PUCs of various states in the extent to which energy efficiency policies are being pursued. For example, in 2009, "[t]he top twenty states in terms of their [ratepayer-funded energy efficiency] spending per capita account[ed] for 85 percent of nationwide spending on energy efficiency programs."[34] This disparity points to a particularly large opportunity for those state PUCs just entering the field of energy efficiency, or looking to become more active in the field, to learn from more experienced PUCs.

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[28] *See* York & Kushler, *supra* note 27, at 1. For a historical account of the creation and role of PUCs, *see* Timothy P. Duane, *Regulation's Rationale: Learning from the California Energy Crisis*, 19 YALE. J. ON REG. 471 (2002).

[29] *See, e.g.*, Michael Dworkin et al., *The Environmental Duties of Public Utility Commissions*, 18 PACE ENVTL. L. REV. 325, 327 (2001).

[30] *See* MARTIN KUSHLER ET AL., MEETING AGGRESSIVE NEW STATE GOALS FOR UTILITY-SECTOR ENERGY EFFICIENCY: EXAMINING KEY FACTORS ASSOCIATED WITH HIGH SAVINGS 2 (ACEEE Report No. U091, 2009). Increasing the efficiency of natural gas delivery systems is certainly, however, a rich area of policy that could benefit from future attention.

[31] *See Climate Change: Emissions*, Envtl. Protection Agency, http://www.epa.gov/climatechange/fq/emissions.html (last visited April 17, 2012).

[32] KUSHLER ET AL., *supra* note 30, at 14. A recent report benchmarking the performance of several dozen utilities' energy efficiency programs also found that "[s]tate policies and political support for energy efficiency are major drivers of utility spending . . . ." M.J. BRADLEY & ASSOCS., LLC, BENCHMARKING ELECTRIC UTILITY ENERGY EFFICIENCY PORTFOLIOS IN THE U.S. 7 (Ceres Nov. 2011).

[33] *See* SETH NOWAK ET AL., ENERGY EFFICIENCY RESOURCE STANDARDS: STATE AND UTILITY STRATEGIES FOR HIGHER ENERGY SAVINGS 11 (ACEEE June 2011).

[34] Michael Dworkin et al., *A Driving Need, a Vital Tool: The Rebirth of Efficiency Programs for Electric Consumers*, in CAPTURING THE POWER OF ELECTRIC RESTRUCTURING 226 (Joey Lee Miranda, ed. 2009).

Finally, there is a dearth in the abundant and generally excellent literature surrounding state energy efficiency policy of papers detailing exactly what PUCs' roles—as opposed to other state actors' roles—should and can be. There are many detailed reports covering the policies and strategies we discuss below, and we provide bibliographies, organized by topic, of these reports. There are also more exhaustive surveys and reports available on what each state as a whole is doing to promote energy efficiency. But there are multiple agencies involved in energy efficiency policy in each state, as well as multiple private actors and multiple sectors. This handbook differs from many other reports in that it focuses on the PUC's particularized role, disaggregating its work from the work being done by other state agencies and private actors. In doing so, it necessarily leaves out many of the groundbreaking initiatives coming out of a variety of other state agencies.[35] This handbook also takes a wide view of how PUCs might promote energy efficiency, covering not only those critically important policy solutions that PUCs can adopt to drive energy efficiency improvements, but also the various ways that PUCs might encourage energy efficiency to permeate their broader decision-making authority. It is therefore both narrower and more comprehensive in scope than previous reports.

This handbook focuses on PUC-level policies that drive end-user energy efficiency in the electricity sector. By energy efficiency, we mean reductions in the amount of energy it takes to accomplish a particular function, e.g., heating or lighting, without a reduction in end-user benefits. We do not examine here the issue of energy conservation, whereby energy users take steps to alter their lifestyles to become less electricity consumptive. The range of policies explored in the handbook includes mandates, incentives, information-forcing policies, planning policies, rate design, environmental review policies, and several additional tools.

The handbook does not discuss in detail the energy efficiency programs that utilities or third-party administrators are implementing in order to *comply* with PUC-driven policies, e.g., lighting swap-outs, efficiency audits, weatherization, etc., though these are obviously integrally related to achieving PUC-established (or statutorily established) energy efficiency goals and mandates. PUCs have, for the most part, chosen to leave the design and implementation details of such programs to specialized boards and/or program administrators (either utilities, a designated state agency, or third-party administrators), who are better equipped to select and tailor particular strategies to their locations and markets.[36] For interested readers, a description of the main categories of energy efficiency programs appears in Appendix A. Similarly, it does not discuss means to increase the efficiency of electricity *generation*—a separate important topic.[37]

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[35] For example, this handbook does not address state-level appliance efficiency standards or state building codes, even though these are two additional critical strategies for driving state-level energy efficiency gains, because these policies are administered by other state agencies.
[36] *See* MIT, *supra* note 27, at 177.
[37] Efficiency in generation is often thought to require less regulatory intervention than end-use efficiency, given that generators will themselves often have significant economic incentives to make their generation as efficient as possible.

Intended Audience

This handbook is intended for two primary audiences: first, it hopes to assist those PUC commissioners and staff who wish to know more about PUC-level policy options to advance energy efficiency. Second, it aims to serve as a valuable resource for those advocates and their elected representatives who want to encourage their state PUCs to devote greater attention to energy efficiency. For this latter group, the handbook includes a section outlining the basics of PUCs proceedings and how the public can participate in them.

PUCs are not uniform entities such that lessons can be transferred seamlessly from one state to another. States find themselves at different points in the process of deregulating the electricity sector (or, in some cases, re-regulating it), and these different stages of restructuring translate into different roles for PUCs. In particular, some PUCs still find themselves with considerable control over electric generation and long-term utility planning, whereas PUCs in areas with competitive wholesale markets have largely ceded these functions to the market and have control only over the retail side of electricity.[38] Commissioners and advocates should keep in mind their particular state context when considering whether a policy successful in another state could be transferred. Sensitive to these differences, this handbook notes in its policy descriptions whether any particular policy tends to work best in deregulated or regulated markets, as the case may be. But the differences among state electric industry regulatory structures do not preclude drawing transferable lessons—to the contrary, many states with highly divergent levels of deregulation have found success with similar policies, and whether or not a state is restructured does not appear to play a major role in its success in adopting energy efficiency policies.[39]

The Legal Authority of PUCs

A final preliminary point bears treatment up front: the legal authority of PUCs to implement the various policies and strategies detailed below. PUCs are creatures of statute. Their authority is established by state legislatures.[40] Accordingly, their power only extends as far as their statutory authorization (as this authorization is interpreted in subsequent legal decisions). The power that PUCs have to implement energy efficiency policy therefore varies state to state, but perhaps to a lesser extent than some might perceive.

In some states, PUCs have explicit statutory mandates to consider environmental issues or energy efficiency in certain areas of their energy decision-making.[41] And some legislatures have mandated a particular energy efficiency savings target that the PUC is instructed to work to achieve. However, it is not always necessary for an energy efficiency policy mandate to flow directly from the state legislature in order for a PUC to take action on encouraging energy efficiency. Several state PUCs

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[38] *See id.* at 178.
[39] *See* KUSHLER ET AL., *supra* note 30, at v.
[40] *See* John A. Sautter, *State Environmental Law and Carbon Emissions: Do Public Utility Commissions Use Environmental Statutes to Fight Global Warming?*, 23:8 ELEC. J. 37 (Oct. 2010).
[41] *Id.* at 39.

have declared that their basic authority over ensuring "just and reasonable rates" provides all the statutory authorization needed for implementing efficiency policies.[42] Of course, the extent to which any particular state PUC can pursue specific energy efficiency policies based on a general, broad statutory mandate will be tempered by relevant administrative and judicial decisions. Regardless, there is at least precedent—and a persuasive case to be made, based on the benefits energy efficiency policies bring to ratepayers—for PUCs pursuing aggressive energy efficiency goals directly. Strong support from a state governor's office can help encourage PUC action even in the absence of a particular legislative mandate. And for advocates and program participants, there may be a distinct advantage to pursuing programs directly to the PUC: adopting programs administratively has the potential advantage of offering more flexibility, as commissions are able to modify programs without the need for additional legislation.[43]

PUCs in some states may be limited in their ability to craft binding energy efficiency mandates, either by jurisdiction or by political feasibility. Nevertheless, as this handbook explains, much can still be done to cultivate an institutional culture in which energy efficiency is considered an important future resource, rather than an unrelated side project.[44] Furthermore, PUCs can and should take a role in leading the charge for energy efficiency policies in front of the state legislature, in those situations where legislation is needed to accomplish a particular policy goal.[45] Similarly, there are multiple avenues through which advocates can attempt to secure robust end-use energy efficiency mandates and supporting policies: the state legislature, the governor's office, *and* the state PUC.

With this background established, the following sections turn to an examination of the methods that PUCs have to promote energy efficiency. Sections one through six look at specific policy options that PUCs are using to promote energy efficiency as well as demand response. Sections seven through nine examine ways that energy efficiency considerations can enter into other areas of PUC decision-making. The final several sections lay out some of the newest experiments in energy efficiency policy, discuss the interplay between energy efficiency and greenhouse gas policies, and provide an overview for advocates of how to intervene in PUC proceedings.

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[42] *See* STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK *[hereinafter "SEE ACTION"]*, SETTING ENERGY SAVINGS TARGETS FOR UTILITIES 2 (Sept. 2011). For example, Arizona's Corporation Commission concluded that its state constitutional authority to ensure just and reasonable rates gave it the authority to adopt a major energy efficiency mandate of its own accord. *See* Ariz. Corp. Comm'n, In the Matter of the Notice of Proposed Rulemaking on Electric Energy Efficiency, Decision No. 71819, Docket No. RE-00000C-09-0427, at 8 (March 5, 2010).

[43] Of course, to the extent advocates are worried about the potential weakening of a program through modification, this flexibility might in some situations prove a disadvantage.

[44] *Cf.* APPLIED PUBLIC POLICY RESEARCH INSTITUTE FOR STUDY AND EVALUATION, RATEPAYER-FUNDED LOW-INCOME ENERGY PROGRAMS: PERFORMANCE AND POSSIBILITIES 22 (2007) (describing that state PUCs have differed in the degree to which they were willing to use their general authority over rates to justify the creation of low-income programs).

[45] The Department of Energy reports that State Utility Commissions often lead successful calls for energy efficiency legislation. *See* SANDY GLATT, STATE ENERGY EFFICIENCY RESOURCE STANDARDS ANALYSIS 6 (Dep't of Energy 2010).

1. Setting Energy Efficiency Targets

One critical first step in a state achieving its energy efficiency potential is the establishment of an energy efficiency mandate or target. Study after study has confirmed that these announced goals are important drivers in pushing private actors to pursue the socially optimal level of energy efficiency improvements.[46] Recognizing this fact, states and PUCs have pursued a few different major strategies in setting energy efficiency targets, each of which is addressed below.

1.1 *Energy Efficiency Resource Standards*

The most popular method of setting energy efficiency targets is through Energy Efficiency Resource Standards ("EERS"). As of fall 2011, 24 states had adopted some version of EERS.[47] An EERS is a performance-based mechanism that requires the program administrator to take measures so that a certain percentage of energy savings is achieved over a specific timeframe (relative to some baseline, usually a previous year's total electricity sales).[48]

In the most common version of an EERS, either state legislation or a PUC order calls for all covered utilities to achieve a set level of electricity savings over a given period of time. This simple description of an EERS policy, however, masks several design issues that must be considered, including:

Stringency of the targets: The stringency of the selected targets is probably the single most important determination in setting an EERS. Targets should be challenging but feasible. Experts recommend that, where possible, targets should be based on an energy efficiency market potential study—a study that analyzes in detail a state's particular situation to determine how much energy efficiency can be cost-effectively implemented.[49] The most ambitious state EERS policies are calling for average annual savings of 1.5% per year and greater, but targets vary greatly from state to state.[50]

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[46] *See, e.g.*, Nicole Hopper et al., *Energy Efficiency as a Preferred Resource: Evidence from Utility Resource Plans in the Western United States and Canada*, at 18 (Lawrence Berkeley Nat'l Lab Pub. No. LBNL-1023E, Sept. 2008) ("The adoption of multiple, aggressive policies targeting energy efficiency and climate change does appear to produce sizeable energy efficiency commitments."); Michael Sciortino et al., Energy Efficiency Resource Standards: A Progress Report on State Experience 18 (ACEEE June 2011); Kushler et al., *supra* note 30, at 5.

[47] Michael Sciortino et al., *supra* note 46, at 18. This ACEEE report counts as "EERS policies" those state policies that mandate "all cost-effective" energy efficiency investments, as well as those that include energy efficiency within a Renewable Portfolio Standard. This handbook discusses these two policy variations *infra* in separate subsections.

[48] Sciortino et al., *supra* note 46; Nowak et al., *supra* note 33, at 4.

[49] See Action, *supra* note 42, at 4.

[50] *See id.* at iii; Sciortino et al., *supra* note 46. The least ambitious states call for annual savings around .25%. See Action, *supra* note 42, at iii.

***Whom the target applies to*:** in most states, utilities are responsible for meeting EERS targets.[51] Other states have created "energy efficiency utilities"—independent organizations responsible for administering the state's energy efficiency programs.[52] And in some states, a state agency maintains responsibility for overseeing and achieving energy efficiency targets.[53] There is no consensus as to which of these administrators is most effective; much depends on a particular state's regulatory context.[54]

***What counts towards the target*:** An EERS classically targets end-use efficiency measures at utility customers' homes or facilities.[55] However, some states are trending towards greater flexibility in the types of policies and programs that can contribute towards EERS savings targets. In particular, some PUCs are allowing utilities to receive credit for their role in developing, implementing, and advancing state building codes and appliance standards.[56] Others allow a portion of targets to be met through efficiency enhancements to a utility's generation, transmission, and distribution infrastructure.[57] Allowing more flexibility in the types of programs utilities can utilize to

For example: Arizona

In August 2010, the Arizona Corporation Commission (ACC) adopted an EERS under its state constitutional authority to ensure "just and reasonable rates." The EERS requires investor-owned utilities to achieve increasing levels of annual savings—beginning at 1.25%, ramping up to 2% in 2014—that will result in 22% cumulative savings by 2020—an impressively aggressive target. The program requires utilities to file plans every other year with the ACC indicating how they will meet their targets, and to file annual updates apprising the ACC of their progress. Utilities can recover the costs of approved cost-effective energy efficiency investments, and the ACC works with individual utilities to develop performance incentives. The state is also reportedly considering decoupling and allowing building code improvements to count towards EERS targets.

One early study suggests that if successfully implemented, Arizona's program will save its ratepayers $9 billion, and may defer the need for new baseload power plants by ten years. 2011 was the first year of compliance.

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[51] SEE ACTION, *supra* note 42, at 2.
[52] For details on this program option, see the "For example" box detailing Vermont's program structure at page 19.
[53] New York illustrates yet another administrative option: it has implemented a combination of two models by splitting administration authority between a state agency (the New York State Energy Research & Development Authority) and utilities. *See* N.Y. Public Serv. Comm'n, Order Establishing Energy Efficiency Portfolio Standard, Case No. 07-M-0548, at 44-51 (June 23, 2008).
[54] However, designating a separate energy efficiency utility reportedly does not work as well in states with more limited energy efficiency budgets. *See* Glatt, *supra* note 45, at 9.
[55] *See* NOWAK ET AL., *supra* note 33, at 9. For example, utilities most successful programs have been aimed at changing customers' lighting choices. Customer rebates for the purchase of more efficient appliances are also a popular utility program. *Id.* at 11-12.
[56] *See* Adam Cooper & Lisa Wood, *Making Building Energy Codes and Appliance/Equipment Standards Part of Utility Energy Efficiency Portfolios* (Institute for Electric Efficiency Aug. 2011). For example, California allows utilities to receive credit towards their efficiency goals for their work advancing codes and standards, and utilities met about 9% of their EERS targets through codes and standards savings between 2006 and 2008. *Id.* at 5.
[57] NOWAK ET AL., *supra* note 33, at 9. Minnesota has adopted this model, allowing improvements to generation, transmission, and distribution infrastructure to account for a specified portion of the overall efficiency target. *Id.* But some suggest that utilities already have adequate business incentives to make these infrastructure investments, such that it is inappropriate to credit them under an EEPS.

meet their targets may become increasingly important as states adopt more aggressive targets.

Flexibility: States have built varying levels of flexibility into their EERS. Some have chosen to make their EERS voluntary—a choice unlikely to drive the same sort of savings as in states with mandatory policies.[58] Others have adopted various forms of cost controls, which typically cap the overall impact that energy efficiency policies can have on rates and adjust targets downward if necessary. Similarly, some states allow for adjustments to targets based on extenuating circumstances. All of these policies may help make an EERS more politically feasible, but may impede achievement of aggressive savings targets.[59]

Measurement and verification: PUCs typically require covered utilities to file periodic program reports documenting how they achieved their required savings. To ensure that savings are real and verifiable, PUCs must establish measurement, quantification, and verification requirements. Measurement and verification are vital to confirm the efficacy of energy efficiency programs and avoid wasting ratepayer funding. Robust measurement and verification also serves an additional important role: to the extent that energy efficiency can be relied upon and accurately measured, regional grid planners can better factor estimated energy efficiency reductions into their calculations of future projected load growth, helping regions to avoid overbuilding new generation or transmission lines.

Setting protocols for how to validate efficiency savings is a highly complex endeavor, and implementation of these rules can amount to a significant percentage of budget expenditures. For these reasons, PUCs and advocates should carefully select and monitor measurement and verification rules. However, there is currently no standard methodology required by PUCs across different states, and there is some disagreement as to whether a standardized system would even be appropriate for states with very different goals.[60] For the time being, the best solution for states adopting new EERS might be to adopt a protocol from an established state with similar energy-saving goals.[61]

Two other major policy issues contribute greatly to the success of any EERS: program funding and utility sector buy-in.[62] If a program is inadequately funded, or if utilities are not incentivized to be collaborative partners in achieving EERS targets rather than fighting against them, success is more

[58] SEE ACTION, *supra* note 42, at 12.
[59] *Id.*
[60] Steven R. Schiller et al., *National Energy Efficiency Evaluation, Measurement and Verification (EM&V) Standard: Scoping Study of Issues and Implementation Requirements*, at 1-2 (Lawrence Berkeley National Laboratory, April 2011).
[61] *See, e.g.*, Cal. PUC, California Energy Efficiency Evaluation Protocols: Technical, Methodological, and Reporting Requirements for Evaluation Professionals (April 2006), *available at* http://www.calmac.org/publications/EvaluatorsProtocols_Final_AdoptedviaRuling_06-19-2006ES.pdf. PUCs might also look to the requirements that are established by various Independent System Operators and Regional Transmission Organizations, some of which have established measurement and verification protocols for energy efficiency's participation in regional capacity markets. *See, e.g.*, ISO New England, Manual for Measurement and Verification of Demand Reduction Value from Demand Resources (revised June 1, 2012), *available at* http://www.iso-ne.com/rules_proceds/isone_mnls/index.html.
[62] *See* NOWAK ET AL., *supra* note 33, at 20-21.

difficult. These two policy issues are important and complex enough that they merit their own separate sections and are discussed *infra* sections 2 and 3.

Recent studies show that most states are meeting or exceeding their EERS targets; a few are lagging slightly behind their targets and attribute this gap primarily to the effects of the recession and sluggish state economies.[63] Some PUCs in states that are struggling to meet their goals are taking an active role in ensuring progress: for example, the Maryland Public Service Commission recently ordered that its utilities "form work groups to develop additional programs designed to reach those goals, and to file a report with the group's recommendations" by a set date.[64] Overall, EERSs appear to be effective in driving increased energy efficiency investment due to their establishment of concrete goals and timelines.[65]

1.2 *"All Cost-Effective Energy Efficiency" Policies*

A second way for states and PUCs to mandate energy efficiency—which is perhaps best considered a "variation on a theme" given its similarity to an EERS—is to adopt a law or regulation that requires utilities to pursue "all cost effective energy efficiency." This policy differs from an EERS in that rather than setting a statewide numerical target (based perhaps on a feasibility study), the policy requires utilities or administrators—with PUC oversight—to take the lead in determining how much energy efficiency can cost-effectively be implemented.[66] The general mandate to pursue all energy efficiency that is cost-effective is translated into numerical goals through

> ***For example: Vermont***
>
> Vermont has one of the oldest efficiency mandates in the country. In 2000, its Public Service Board (PSB) created **"Efficiency Vermont,"** a utility devoted exclusively to energy efficiency, and adopted a requirement that it implement all cost-effective energy efficiency. This general requirement is translated into specific contractual goals, which are set by the PSB, are expressed in absolute kWh, and amounted to approximately a 6.75% savings target between 2009 and 2011. Efficiency Vermont is run by the Vermont Energy Investment Corporation (VEIC), which receives incentive payments for meeting its goals, and is responsible for submitting an annual report to the PSB for monitoring and verification. Efficiency Vermont has consistently achieved impressive levels of savings, though whether it will meet its very ambitious current almost 7% 3-year goal remains to be seen. The state has recently switched to a 12-year appointment model that will give VEIC the ability to engage in longer-term and more comprehensive program planning.

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63 *See id.* at 27-32.
64 Md. Public Serv. Comm'n, Order No. 84569, at 2 (Dec. 22, 2011).
65 *See* Matthew Brown, *The Energy Efficiency Resource Standard: Observations on an Emerging State Policy* (Harcourt Brown 2010); MICHAEL SCIORTINO ET AL., *supra* note 46, at 1; Glatt, *supra* note 45, at 9.
66 *See* Nicole Hopper et al., *supra* note 46, at 9.

an annual process involving the PUC, individual utilities, and stakeholders.[67] A number of states, including Massachusetts, Rhode Island, Washington, California, and Vermont have adopted this model.[68]

One particular version of this model—first adopted by California—is a "loading order" policy, which requires utilities to consider cost-effective efficiency before all other resources in their supply planning.[69] California's PUC recently strengthened its loading order policy by clarifying that utilities must do more than simply meet the energy efficiency and renewable energy targets set by the PUC. As a recent decision from the California PUC explained, "[w]hile hitting a target for energy efficiency or demand response may satisfy other obligations of the utility, that does not constitute a ceiling on those resources for purposes of procurement."[70] This decision demonstrates how a strict loading order policy can lead to both the setting of numerical targets *and* a continuing utility obligation to pursue energy efficiency above and beyond these targets—a critical combination in ensuring that truly *all* cost-effective energy efficiency gets implemented.[71] Intervenors in front of the California PUC were instrumental in getting the PUC to adopt this stricter interpretation of its loading order policy, demonstrating the power that energy efficiency advocates have to shape PUC policies.[72]

1.3 *Including Energy Efficiency in Renewable Portfolio Standards*

Some states, instead of setting separate energy efficiency targets, have opted to include energy efficiency as an eligible resource in their state renewable portfolio standards ("RPS"), which set targets for the amount of electricity that utilities must procure from renewable (or in some states, "clean") resources each year. Generally, states allow energy efficiency investments to go some way towards meeting RPS targets, but impose a cap on how much of the target a utility can meet with energy efficiency investments. For example, Nevada allows energy efficiency to meet up to 6.25% of a utility's responsibility to procure 25% renewable resources by 2025.[73] The theory behind adopting this type of restriction on the percentage of an RPS that energy efficiency can satisfy is that an RPS is intended to spur market innovations in energy supply, and if energy efficiency is allowed too great a role, an RPS may fail in its aim to promote clean energy technologies.[74] However, given that energy efficiency is the lowest-cost, cleanest resource available, it may be advisable for states choosing to incorporate energy

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[67] *See, e.g.*, MICHAEL SCIORTINO ET AL., *supra* note 46, at 1, 18. Because this policy is driven by a mandate to pursue only "cost-effective" solutions, the success of a policy is shaped to a large extent by how this term is defined. Methods and best practices for evaluating cost-effectiveness are summarized *infra* section 2.1.

[68] *Id.* at 1-2.

[69] *See* CAL. PUB. UTIL. CODE § 454.5(b)(9)(C).

[70] Cal. PUC, Decision Approving Modified Bundled Procurement Plans 21, Rulemaking 10-05-2010 (Jan. 12, 2012).

[71] There are reports that in some states, all cost-effective energy efficiency may be on the books for years before being fully implemented. For example, Northeast Energy Efficiency Partnerships (NEEP) reports that Connecticut's all cost-effective efficiency policy is just finally being ramped up, due to a reorganization of the states' agencies (see *infra* section 10.2) and an ambitious new Commissioner, despite having been on the books for years. NEEP, A REGIONAL ROUNDUP OF ENERGY EFFICIENCY POLICY IN THE NORTHEAST & MID-ATLANTIC STATES (Fall 2011).

[72] Section 12 of this handbook discusses how to intervene in PUC proceedings.

[73] Nev. Rev. Stat. § 704.7821(b).

[74] See REGULATORY ASSISTANCE PROJECT & THE CENTER FOR CLIMATE AND ENERGY SOLUTIONS *[hereinafter "RAP & C2ES"]*, CLEAN ENERGY STANDARDS: STATE AND FEDERAL POLICY OPTIONS AND IMPLICATIONS 27 (Nov. 2011).

efficiency into their RPSs to place generous limits on energy efficiency's role coupled with aggressive targets expected to result in significant investment in new technologies as well as all cost-effective energy efficiency.

Early reports on energy efficiency's inclusion in RPS suggest that this version of an EERS has resulted in less aggressive energy efficiency savings than others, although in theory this policy option could—if targets are adequately stringent and energy efficiency plays a great enough role—produce the same kind of results as a traditional EERS.[75]

SETTING ENERGY EFFICIENCY TARGETS: BIBLIOGRAPHY

Those who want to know more about EERS policies may find the following more detailed resources helpful:

Reports

ACEEE, *Energy Efficiency Resource Standard: In Practice* (2009), http://aceee.org/fact-sheet/eers-practice-detailed-april-2009

ACEEE, *Energy Efficiency and Resource Standards: Experience and Recommendations* (2006), http://www.aceee.org/pubs/e063.htm

ACEEE, Energy Efficiency Resource Standards: A State Model (November 2009), http://www.aceee.org/files/pdf/white-paper/eers_statemodel.pdf

Timothy J. Brennan & Karen Palmer, *Energy Efficiency Resource Standards: Economics and Policy* (Resources for the Future Discussion Paper 12-10, Feb. 2012).

Matthew Brown, *The Energy Efficiency Resource Standard: Observations on an Emerging State Policy* (Harcourt Brown 2010), http://harcourtbrown.com/wp-content/uploads/The-Energy-Efficiency-Resource-Standard_Observations-on-an-Emerging-State-Policy.pdf

Adam Cooper & Lisa Wood, *Making Building Energy Codes and Appliance/Equipment Standards Part of Utility Energy Efficiency Portfolios* (Institute for Electric Efficiency Aug. 2011), http://www.edisonfoundation.net/iee/reports/IEE_IntegratingC&SintoEEPortfolios_final.pdf

Sandy Glatt, *State Energy Efficiency Resource Standards Analysis*, 9 (Dep't of Energy 2010), http://www1.eere.energy.gov/industry/states/pdfs/eers_web_final.pdf

Institute for Electric Efficiency, *Implementing Energy Efficiency: Program Delivery Comparison Study* (March 2010), http://www.edisonfoundation.net/IEE/Documents/IEE_EEProgDeliveryComparison.pdf.

Seth Nowak et al., Energy Efficiency Resource Standards: State and Utility Strategies for Higher Energy Savings (ACEEE June 2011), http://aceee.org/research-report/u113

Karen Palmer et al., *Putting a Floor on Energy Savings: Comparing State Energy Efficiency Resource Standards* (Resources for the Future Discussion Paper 12-11, Feb. 2012).

Michael Sciortino et al., Energy Efficiency Resource Standards: A Progress Report on State Experience 1 (ACEEE June 2011), http://aceee.org/research-report/u112

Michael Sciortino et al., The 2011 State Energy Efficiency Scorecard (ACEEE October 2011), http://aceee.org/research-report/e115

NEEP, *A Regional Roundup of Energy Efficiency Policy in the Northeast & Mid-Atlantic States* (Fall 2011), http://neep.org/uploads/policy/2011%20Regional%20Roundup_FINAL.pdf

State & Local Energy Efficiency Action Network ("See Action"), Setting Energy Savings Targets for Utilities iii (Sept. 2011), http://www1.eere.energy.gov/seeaction/pdfs/utilitymotivation_targets.pdf

Websites

ACEEE Website on EERS, http://www.aceee.org/topics/eers

Center for Climate and Energy Solutions Website on EERS, http://www.c2es.org/what_s_being_done/in_the_states/efficiency_resource.cfm

Database of State Incentives for Renewables & Efficiency, http://www.dsireusa.org/summarymaps/index.cfm?ee=1&RE=1

[75] *See* SCIORTINO ET AL., *supra* note 46, at 1.

2. FUNDING ENERGY EFFICIENCY PROGRAMS

[I]f a state wants to "talk the talk" of setting high energy savings goals, they will need to "walk the walk" in terms of providing sufficiently high levels of funding for energy efficiency programs.[76]

States are unlikely to reach their energy efficiency targets unless they also put mechanisms in place to fund energy efficiency programs. Energy efficiency programs have significant costs to implementing utilities.[77] Although energy efficiency measures may result in net gains to consumers when electricity bill savings and non-energy benefits are taken into consideration, utilities do not themselves reap all of these benefits. A 2009 survey of fourteen states[78] found that, on average, energy efficiency had a utility cost of saved energy of about 2.5 cents per kilowatt-hour (kWh).[79] Importantly, this number is still considerably lower than utilities' supply-side options for meeting demand, which cost at least three times as much.[80]

Energy efficiency initiatives are typically funded by money collected from ratepayers. Ratepayer funding is accepted as fair practice given that it is electricity customers who ultimately benefit from energy efficiency investments in the form of lower electricity bills, more reliable electricity, and improved health and environment.[81]

There are two key areas in which PUCs make determinations about energy efficiency program financing. The first question is *what and how much*: what kinds of energy efficiency investments will the PUC allow utilities or third-party administrators to recover from ratepayers? How much total funding will be allocated to this endeavor? The second is *how*: what mechanism will PUCs utilize in order to authorize these costs to be recouped? This section addresses possible answers to these questions in turn.

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[76] KUSHLER ET AL., *supra* note 30, at 7.

[77] STEVEN NADEL & JOHN SHENOT, STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK, SETTING ENERGY SAVINGS TARGETS FOR UTILITIES: UTILITY MOTIVATION AND ENERGY EFFICIENCY WORKING GROUP 3 (2011).

[78] California, Connecticut, Iowa, Massachusetts, Minnesota, Nevada, New Mexico, New Jersey, New York, Oregon, Rhode Island, Texas, Vermont, and Wisconsin.

[79] KATHERINE FRIEDRICH ET AL., SAVING ENERGY COST-EFFECTIVELY: A NATIONAL REVIEW OF THE COST OF ENERGY SAVED THROUGH UTILITY-SECTOR ENERGY EFFICIENCY PROGRAMS 15 (ACEEE REPORT NO. U091, 2009); *see also* NADAL & SHENOT, *supra* note 77, at 3. The "utility cost of saved energy" measures the cost to utilities of implementing an energy efficiency program, factoring in the discount rate, the estimated measure life in years, the total program cost in millions of dollars, and the incremental annual MWh saved that year by the energy efficiency program. It does not include customer costs and/or non-energy benefits of energy efficiency. *See* Friedrich, *supra*, at 2. Measuring the utility cost of saved energy allows energy efficiency investments to be compared directly to supply-side investments. *Id.* at 15.

[80] *Id.*; *see also* LAZARD, LTD., LEVELIZED COST OF ENERGY ANALYSIS: VERSION 3.0 (2009).

[81] There are, however, numerous debates about whether certain ratepayers bear more than the fair share of the costs of these programs without reaping adequate benefits. The details of these debates are beyond the scope of this report.

2.1 *Funding Levels & Cost-Effectiveness*

The first critical threshold issue confronting PUCs is how much and what kinds of spending to authorize. Deciding how much funding to authorize is of critical importance—in one recent survey of industry experts, "the relative size of the [energy efficiency] program budget" ranked as the number one factor determining the success of a state's electric utility energy efficiency policies.[82] As might be expected, energy efficiency expenditures vary greatly among different states, depending on the ambition of targets and the size of the state, among other factors. Ideally, funding levels should be set based on energy efficiency potential and estimated costs of the programs necessary to reach that potential (rather than the opposite case, where a predetermined level of funding dictates what the energy efficiency goals of a state will be). Ensuring that overall program budgets are in line with announced energy efficiency goals is one key role for energy efficiency advocates to play.

To best measure how states' energy efficiency spending compares, experts recommend using "budget as a percent of utility revenues," a measure which approximates the *magnitude* of energy efficiency spending in a state.[83] In 2010, Vermont led the country in electric energy efficiency budget as a percent of revenue, spending 4.57% of utility revenues on energy efficiency (with an actual budget of $34.0 million). Massachusetts and California ranked second and third, with budgets as percents of revenues at 3.69% and 3.42%, respectively (and budgets of $301.9 million and $1,158.1 million, respectively). In contrast, 28 states spent less than 1% of utility revenues on energy efficiency, and 16 of these spent less than 0.5% of utility revenues on energy efficiency.[84]

Of primary concern for regulators, of course, is what these high levels of spending do to electricity bills. Importantly, higher spending on energy efficiency does *not* correlate with higher electricity bills: the American Council for an Energy Efficiency Economy recently found that many of the states with the lowest spending on energy efficiency have some of the highest average monthly bills.[85] Rates may increase modestly in those states that are investing significantly in energy efficiency—for example, a 2010 Massachusetts analysis found that its aggressive level of efficiency spending would increase electricity rates between 0.5% and almost 4% through 2012, depending on the customer class. However, the same analysis predicted a significant negative impact on overall electricity *bills* over the long term, leading to significant net benefits.[86] A longer-term analysis of Massachusetts' energy efficiency potential through 2030 found that if its full energy efficiency portfolio is implemented, customer bills over the lifetime of the installed measures would be lowered by $5.6 billion dollars, or

[82] *See* KUSHLER ET AL., *supra* note 30, at 14.
[83] *Id.* at 6-7; *see also* MICHAEL SCIORTINO ET AL., *supra* note 25, at 10.
[84] *Id.* at 11-12. For a detailed chart showing state levels of energy efficiency spending and a figure comparing spending across states, *see id.* at 11-13.
[85] *See* Michael Sciortino et al., *Opportunity Knocks: Examining Low-Ranking States in the State Energy Efficiency Scorecard* 9-11 (ACEEE Rep. No. E126, May 2012). Although rates are in some instances higher in high energy efficiency states, these higher rates are counterbalanced by lowered electricity consumption. *See id.*
[86] *See* Tim Woolf, *Bill Impacts of Energy Efficiency Programs*, Presentation of the Mass. Dep't of Pub. Uts. to NARUC Winter Meetings Energy Resources and Environment Committee (Feb. 15, 2010), *available at* http://www.narucmeetings.org/Presentations/Woolf-efficiency-bill-impacts.pdf.

about 5.5% (with bill savings accounting for and net of any rate increases).[87] These early numbers on the impacts of even very aggressive programs should give some comfort that energy efficiency does indeed pay out for consumers. Commissioners and advocates should, however, be sensitive to how these overall benefits are distributed among customer classes and participants versus non-participants (though, practically, in states with very aggressive energy efficiency targets, there are likely to be few non-participants).[88]

Once overall spending levels are determined, there is the further question of how to ensure that dollars are wisely invested. PUCs generally maintain significant oversight of how ratepayer money is spent. This oversight is particularly important in states that have "all cost-effective energy efficiency" policies. Most PUCs impose a requirement that utilities or administrators demonstrate that the energy efficiency investments they make are "cost-effective" before ratepayer recovery is allowed.[89] Much depends, then, on how a PUC chooses to define and measure cost-effectiveness.

There are four predominant cost-effectiveness tests: the Participant Test, the Ratepayer Impact Measure Test, the Program Administrator Cost Test, and the Total Resource Cost Test.[90] These tests, officially promulgated by the California PUC and the California Energy Commission in the 1983 California Standard Practice Manual, have been used by states and PUCs for nearly thirty years.[91] Although different in application, each test compares the net present value of a stream of benefits over the life of an investment with the net present value of a corresponding stream of costs.[92] However, the selection of one or another of these tests has a significant bearing on the types of energy efficiency programs that utilities will be permitted to pursue.

Participant Test: The Participant Test measures cost-effectiveness from the perspective of the energy efficiency program participant. By comparing bill savings (using retail rates) that the customer will realize over the life of an efficiency upgrade to the cost incurred by the customer to make the upgrade, PUCs can determine the cost-effectiveness of an energy efficiency program through the eyes of the consumer.[93] Of the forty-four states with formally approved ratepayer-funded energy efficiency programs, no state claimed to use the Participant Test as its primary means of cost-benefit analysis.[94]

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[87] *See* Peter Cappers et al., *Benefits and Costs of Aggressive Energy Efficiency Programs and the Impacts of Alternative Sources of Funding: Case Study of Massachusetts*, at 8-76 – 8-77. (ACEEE Summer Study on Energy Efficiency in Buildings 2010). This study compared an "aggressive" scenario to a "business as usual" scenario with *some* energy efficiency still being implemented, but on a smaller scale. *See id.*

[88] *See* Woolf, *supra* note 86.

[89] CHRIS NEME & MARTY KUSHLER, IS IT TIME TO DITCH THE TRC? EXAMINING CONCERNS WITH CURRENT PRACTICE IN BENEFIT-COST ANALYSIS 5-299 (2010); MARTIN KUSHLER ET AL., A NATIONAL SURVEY OF STATE POLICIES AND PRACTICES FOR THE EVALUATION OF RATEPAYER-FUNDED ENERGY EFFICIENCY PROGRAMS 30 (ACEEE REPORT NO. U122, 2012).

[90] NEME & KUSHLER, *supra* note 89, at 5-299.

[91] *Id.* at 5-300. Commentators note that the universal acceptance of a single common source for cost-effective practice standards is striking in a field where inconsistency and diversity among states is the norm. KUSHLER ET AL., *supra* note 89, at 31.

[92] NEME & KUSHLER, *supra* note 89, at 5-300.

[93] *Id.*

[94] KUSHLER ET AL., *supra* note 30, at 59–60.

Ratepayer Impact Measure (RIM) Test: The RIM Test analyzes savings from the perspective of the customer who does not participate in the energy efficiency program. It compares the value of avoided supply investments by the utility, which includes avoided generation, transmission, and distribution costs, to the sum of the program costs and the utility's lost revenue from reduced sales.[95] Of the forty-four states with formally approved ratepayer-funded energy efficiency programs, Virginia is the only state that uses the RIM Test as the primary means of cost-benefit analysis.[96] This test largely has been abandoned by states upon a determination that it does not capture all desirable energy efficiency opportunities.[97] Because the RIM Test focuses only on the impact on nonparticipants, its application often results in the rejection of programs that could produce large energy savings and significant reductions to customers' bills.[98]

Total Resources Cost (TRC) Test: The TRC Test combines the viewpoints of the customers in the Participant and RIM tests. It differs from the other tests because at least in theory, it is capable of incorporating environmental and other non-energy benefits into the calculation, such as improved comfort, building durability, and health and safety.[99] In doing so, it considers the avoided costs of secondary fuel, water, or other resources instead of the actual retail price for such resources (unlike the Participant Test, which focuses on actual retail prices).[100] The TRC Test compares the value of avoided energy and other resources from all sources with the full cost of the efficiency measures, plus all non-measure program costs.[101] Of the forty-four states with formally approved ratepayer funded energy efficiency programs, twenty-nine identify the TRC Test as their primary means of cost-benefit analysis.[102]

Many praise the TRC test as the most comprehensive of the available mechanisms for measuring cost effectiveness, but it has also been criticized for significant shortcomings.[103] For example, under the TRC Test all participant costs for an energy efficiency upgrade are counted as costs, but most or all of the customer benefits outside of utility savings are not considered.[104] Full incorporation of environmental benefits, including the value of avoided carbon emissions, has also proven challenging.[105] Commentators have suggested numerous improvements that could strengthen the TRC Test;[106] PUCs

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[95] NEME & KUSHLER, *supra* note 89, at 5-301.
[96] KUSHLER ET AL., *supra* note 30, at 59–60.
[97] BRUCE BIEWALD ET AL., SYNAPSE ENERGY ECON., PORTFOLIO MANAGEMENT: HOW TO PROCURE ELECTRICITY RESOURCES TO PROVIDE RELIABLE, LOW-COST, AND EFFICIENT ELECTRICITY SERVICES TO ALL RETAIL CUSTOMERS, at B-3 (2003).
[98] *Id.*
[99] NEME & KUSHLER, *supra* note 89, at 5-301.
[100] *Id.* at 5-301.
[101] *Id.*
[102] KUSHLER ET AL., *supra* note 30, at 59–60. Six states still adhere to the "Societal Test," a test that the California Manual previously espoused but that is now rolled into the TRC test in the manual. *See* NEME & KUSHLER, *supra* note 89, at 5-301 n.3.
[103] *E.g.*, ROBIN LEBARON, NAT'L HOME PERFORMANCE COUNCIL, GETTING TO FAIR COST EFFECTIVENESS TESTING: USING THE PAC TEST, BEST PRACTICES FOR THE TRC TEST, AND BEYOND 5–11 (Draft 2011); NEME & KUSHLER, *supra* note 89, at 5-303 to 5-304.
[104] KUSHLER ET AL., *supra* note 30, at 36.
[105] LEBARON, *supra* note 103, at 6–11.
[106] These suggested best practices include: (1) applying the TRC Test at the broad portfolio level instead of at the individual project level; (2) evaluating the costs and benefits over a multi-year time frame instead of a single year;

and advocates using or considering the TRC Test may want to look carefully at ways in which the test in its current applications might disserve or under-serve their goals.

Program Administrator Cost (PAC) Test: The PAC Test measures cost-effectiveness from the perspective of the utility by comparing the value of the utility's avoided costs with the cost to the utility of acquiring the efficiency resources that produce the avoided costs.[107] It does not consider energy benefits of fuels not provided by the utility, any other resource benefits such as water savings, or any customer contributions to the cost of an efficiency investment.[108] Of the forty-four states with formally approved rate-payer funded energy efficiency programs, five states reported using the PAC Test as their primary means of cost-benefit analysis: Connecticut, Delaware, Michigan, Texas, and Utah.[109]

These tests share an important component that bears additional mention: they rely on a calculation of **avoided costs.** Avoided costs are the "costs that would have been spent if the energy efficiency savings measure had not been put into place." [110] The method through which avoided costs are measured can significantly affect the results of any cost-effectiveness test.[111] There are a large number of factors that can be included in avoided costs. Generally, most methodologies include an "energy-related" component and a "capacity-related" component.[112] Energy-related savings might include "market purchases or fuel and operation and maintenance losses, system losses, ancillary services, energy market price reductions, co-benefits in water, natural gas, fuel oil, etc. , air emissions, [and] hedging costs."[113] Capacity savings in the avoided cost calculation may include "capacity purchases or generator construction, system losses (peak load), transmission facilities, distribution facilities, ancillary services related to capacity, capacity market price reductions, [and] land use."[114] Most states choose to analyze some subset of these considerations in their avoided cost calculations.[115] As if these factors did not create enough complexity, there are additional decisions to be made about how to develop forecasts of future electricity and capacity costs, how to factor in area- and time-specific marginal costs, how to

(3) addressing only the incremental costs of a program instead of the entire cost of the program; (4) using a societal discount rate to measure the net present value of costs and benefits, as opposed to a weighted average cost of capital for utilities; (5) including the values of non-energy savings and avoided externalities in TRC testing; (6) reducing participant costs based on whether the projects are whole-house or single-measure; (7) instituting thoughtful, well-reasoned caps on the effective useful life of an energy efficiency measure; (8) incorporating the value of avoided carbon emissions as a benefit in the TRC Test; (9) recognizing spillover and market transformation effects in net-to-gross calculations; and (10) considering all energy savings, not just those obtained by the participating utility. *See id.*

[107] NEME & KUSHLER, *supra* note 89, at 5-301.

[108] *Id.*

[109] KUSHLER ET AL., *supra* note 30, at 59–60.

[110] U.S. DEP'T OF ENERGY & U.S. ENVTL. PROT. AGENCY, NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY 4-1 (2006).

[111] *Id.*

[112] *Id.* at 4-2; *see also, e.g.*, Rick Hornby et al., *Avoided Energy Supply Costs in New England: 2009 Report*, at 1-3 (Synapse Energy Economics Oct. 2009), *available at* http://www.synapse-energy.com/Downloads/SynapseReport.2009-10.AESC.AESC-Study-2009.09-020.pdf

[113] U.S. DEP'T OF ENERGY & U.S. ENVTL. PROT. AGENCY, *supra* note 110, at 4-2.

[114] *Id.*

[115] *Id.* at 4-3.

select a discount rate, and how to value the program's effect on GHG emissions.[116] Ultimately, each PUC must decide how best to balance accuracy and simplicity in determining what measure(s) of avoided cost are appropriate (some avoided costs may be calculated at a utility level, and utilities within a state may vary in their methodologies).[117] But given the importance of avoided cost calculations in determining cost-effectiveness and therefore in determining the level of energy efficiency a state will pursue, avoided cost calculations are one area where commissioners, staff, and advocates should pay careful attention to the policy decisions being made. Moreover, avoided cost calculations deserve particularly careful attention as a result of the recent natural gas boom and resultant declining natural gas prices, as fuel costs are one major component of avoided costs. Declining natural gas prices, to the extent they persist, may change the calculus significantly on what energy efficiency policies are deemed cost-effective, and advocates of energy efficiency would be wise to make sure the very real, but often economically undervalued, benefits of energy efficiency are taken fully into consideration.[118]

2.2 *Funding Mechanisms*

A second financing decision that a PUC must make is *how* to ensure that utilities or program administrators recover the costs of implementing energy efficiency programs. Generally, there are two types of funding mechanisms used to generate revenue for cost recovery: (1) a system benefits charge (SBC), which is a per-kilowatt-hour charge that typically is applied statewide, or (2) a specifically determined rate charge that is usually applied on a utility-by-utility basis.[119] Specifically determined rate charges can take the form of tariff riders or rate case recovery. Capitalization is an alternative, but uncommon, approach to funding energy efficiency programs.

System Benefits Charges: SBCs, also called public benefits charges, are surcharges imposed on electric ratepayers to collect funds for energy efficiency programs.[120] Sixteen states and the District of Columbia use SBCs for various environmental programs.[121] SBC funds typically flow to the selected energy efficiency program administrator. In California, Connecticut, Nevada, and Rhode Island, SBCs fund utility-run energy efficiency programs.[122] In Massachusetts and New York, the utilities and PUCs work in tandem to use SBC funds for programs.[123] In Oregon and Vermont, an independent nonprofit third party

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[116] *Id.* at 4-1–4-12.
[117] *Id.*; *see also* Synapse Energy Economics, *Review of Avoided Costs Used in Minnesota Electric Utility Conservation Improvement Programs* (Nov. 2004).
[118] *See, e.g.*, RICK HORNBY ET AL., AVOIDED ENERGY SUPPLY COSTS IN NEW ENGLAND: 2011 REPORT 1-1 (JULY 2011), *available at* http://psb.vermont.gov/sites/psb/files/projects/EEU/2011AvoidedCosts/AESC%202011%20Complete%202011%2007%2021%20FINAL.pdf (noting that compared to 2009, "[d]ramatic increases in the quantity of technically recoverable shale gas resources—coupled with decreases in the expected costs of finding, developing, and producing gas from those resources—lead[] to lower projections of avoided costs for natural gas and gas-fired electric energy").
[119] *Id.* In those states that participate in the Regional Greenhouse Gas Initiative (RGGI), *see infra* section 11.1, RGGI auctions provide an additional source of revenue that is often spent on energy efficiency.
[120] U.S. DEP'T OF ENERGY & U.S. ENVTL. PROT. AGENCY, NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY 2-8 (2006).
[121] Michael Dworkin et al., *Revisiting the Environmental Duties of Public Utility Commissions*, 7 VT. J. ENVTL. L. 1, 7 (2006).
[122] KUSHLER ET AL., *supra* note 30, at 16–20.
[123] *Id.* at 16, 18.

oversees the use of SBC funds.[124] New Jersey is the only state in which the PUC directly administers SBCs and uses the funds for energy efficiency programs.[125] SBCs are mostly established by statute,[126] except in New York, where the Public Service Commission instituted the SBC and named the New York State Energy Research and Development Authority (NYSERDA) as the third-party administrator of the charge.[127]

Some states combine the SBCs with other funding mechanisms. Connecticut utilities, for example, fund energy efficiency programs through a statewide SBC as well as through the ISO New England Forward Capacity Market and auction proceeds from the Regional Greenhouse Gas Initiative.[128]

System benefits charges can have at least one disadvantage that has hindered energy efficiency spending in some states recently: if the funds enter the realm of general state revenues, the money may be devoted to other state spending needs and may not find its way to the utilities.[129]

For example: Massachusetts

In Massachusetts, the state legislature has mandated that the Department of Public Utilities (DPU) require utilities to levy a $0.0025 per kWh monthly charge on all customer bills to fund energy efficiency programs. This money goes into a trust fund that is used to pay a portion of program costs anticipated by each utility. The DPU supplements program funding by using amounts generated by the Regional Greenhouse Gas Initiative, by the NOx Allowance Trading Program, and by distribution companies and municipal aggregators under the ISO New England Forward Capacity market. This funding allows Massachusetts to provide one of the most aggressive set of energy efficiency programs in the United States, established by its 2008 Green Communities Act. Massachusetts' energy efficiency programs are expected to yield electric savings of 2.4 percent, amounting to the most aggressive EERS target in the country.

Rate Case Recovery: Some state energy efficiency programs are funded through general rate cases. Arizona, Minnesota, and Wisconsin use this mechanism.[130] Rate case recovery can be beneficial for utilities because it is consistent with existing regulatory rules and procedures. Ideally, this process assures utilities of timely cost recovery, although some utilities may object to having a time lag between

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[124] *Id.* at 17–18.
[125] *Id.* at 19.
[126] *See, e.g.*, CAL. PUB. UTIL. CODE § 399.8 (West 2012); CONN. GEN. STAT. § 16-245*l* (2012); MASS. GEN. LAWS ch. 25, § 19 (West 2012); N.J. STAT. ANN. § 48:3-60 (West 2012); NEV. REV. STAT. §§ 702.100, 702.600 (2012); OR. REV. STAT. § 757.612 (2012); R.I. GEN. LAWS §§ 39-2-1.2, 39-26-8 (2012); VT. STAT. ANN. tit. 30, § 209 (2012).
[127] N.Y. Public Serv. Comm'n, In the Matter of Competitive Opportunities Regarding Electric Service, Case No. 94-E-0952, Opinion and Order Regarding Competitive Opportunities for Electric Service, Opinion No. 96-12 (May 20, 1996), *available at* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={076F3B08-917D-47FE-83C0-8B2B32822A67}.
[128] KUSHLER ET AL., *supra* note 30, at 20. Many of the other states participating in RGGI also dedicate some portion of RGGI auction proceeds to energy efficiency.
[129] U.S. DEP'T OF ENERGY & U.S. ENVTL. PROT. AGENCY, *supra* note 120, at 2-8.
[130] KUSHLER ET AL., *supra* note 30, at 17–18; *Incentivizing Utility-Led Efficiency Programs: Program Cost Recovery*, ACEEE, http://aceee.org/sector/state-policy/toolkit/utility-programs/program-cost-recovery (last visited Mar. 18, 2012).

when energy efficiency expenditures are made and when those costs are recovered through the next rate case.[131]

Tariff Riders: A tariff rider for energy efficiency allows for a periodic rate adjustment to account for the difference between planned costs, which are included in rates, and actual costs.[132] Tariff riders are designed to prevent utilities from over- or under-recovering costs.[133] They are used less frequently than SBCs. Idaho, Iowa, Texas, and Washington all use this mechanism to allow for cost recovery of energy efficiency investments.[134] In each state, the utilities administer and implement energy efficiency programs.[135]

Capitalization: This approach treats energy efficiency costs like an investment in physical capacity (as opposed to rate case recovery, which treats efficiency costs as an expense). Capitalization adds the amortized cost and an approved return on capital to the revenue requirement, which is then passed on to customers as an increase in per-kWh or per-therm rates.[136] Although once used by Idaho, Nevada, Oregon, and Washington, this method of cost recovery is no longer preferred because it spreads out the recovery over a long period of time, raises the total cost of efficiency programs, and allows for a return on capitalized program costs not tied to program performance.[137]

As this discussion suggests, there is no agreed solution on the best way to finance utility-sector energy efficiency programs, and most mechanisms have their benefits and drawbacks. What does appear clear, however, is that making the commitment to finance energy efficiency through PUC-

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[131] *Id.* For an example of utility objection to this practice, *see* Pub. Serv. Comm'n of Md., *In the Matter of the Application of Baltimore Gas and Electric Co. For Authorization to Deploy a Smart Grid Initiative and to Establish a Surcharge For the Recovery of Cost,* Case No. 9208 (Aug. 13, 2010), at 32-41, *available at* http://webapp.psc.state.md.us/Intranet/casenum/CaseAction_new.cfm?CaseNumber=9208. These objections can be alleviated to some extent by implementing a "frequent balancing mechanism" between rate cases. *See Incentivizing Utility-Led Efficiency Programs*, *supra* note 130. Another issue that may arise when using traditional rates to fund energy efficiency programs is the potential for cross-subsidization among and across customer classes. Although rates affect all customers equally within a customer class, not every customer will take equal advantage of and benefit from energy efficiency programs. One easy solution is to ensure that the offered programs are advertised and marketed in such a way that the maximum number of customers has the opportunity to benefit. This issue occurs between customer classes as well (for example, industrial customers versus residential customers). This problem is typically solved by either requiring each class to pay for its own programs, or by requiring utilities to have robust programs for all customers, giving everyone an opportunity to participate. *See* STEVEN NADAL ET AL., SEE ACTION, SETTING ENERGY SAVINGS TARGETS FOR UTILITIES 13 (2011).

[132] U.S. DEP'T OF ENERGY & U.S. ENVTL. PROT. AGENCY, *supra* note 120, at 2-8.

[133] KUSHLER ET AL., *supra* note 30, at 20.

[134] *Id.* at 18–20.

[135] *Id.*; *see also Customer Energy Efficiency Programs: Idaho*, ACEEE, http://aceee.org/sector/state-policy/idaho/customer-energy-efficiency-programs (last visited Mar. 18, 2012).

[136] *Incentivizing Utility-Led Efficiency Programs*, *supra* note 130.

[137] *Id.; see also* United States Environmental Protection Agency *[hereinafter U.S. EPA]*, Aligning Utility Incentives with Investment in Energy Efficiency 4-10 n.12 (2007), *available at* http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf.

administered, system-wide mechanisms is a fundamental step in achieving robust energy efficiency savings.

FUNDING ENERGY EFFICIENCY: BIBLIOGRAPHY

Those who want to know more about funding utility or third-party run energy efficiency programs may find the following resources helpful:

BRUCE BIEWALD ET AL., SYNAPSE ENERGY ECON., PORTFOLIO MANAGEMENT: HOW TO PROCURE ELECTRICITY RESOURCES TO PROVIDE RELIABLE, LOW-COST, AND EFFICIENT ELECTRICITY SERVICES TO ALL RETAIL CUSTOMERS (2003).

Environmental Protection Agency, Chapter 4: Program Cost Recovery, *in* ALIGNING UTILITY INCENTIVES WITH INVESTMENT IN ENERGY EFFICIENCY (Nov. 2007), http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf.

KATHERINE FRIEDRICH ET AL., ACEEE REPORT NO. U091, SAVING ENERGY COST-EFFECTIVELY: A NATIONAL REVIEW OF THE COST OF ENERGY SAVED THROUGH UTILITY-SECTOR ENERGY EFFICIENCY PROGRAMS (2009).

MARTIN KUSHLER ET AL., ACEEE REPORT NO. U122, A NATIONAL SURVEY OF STATE POLICIES AND PRACTICES FOR THE EVALUATION OF RATEPAYER-FUNDED ENERGY EFFICIENCY PROGRAMS 30 (2012).

MARTIN KUSHLER ET AL., ACEEE REPORT NO. U091, MEETING AGGRESSIVE NEW STATE GOALS FOR UTILITY-SECTOR ENERGY EFFICIENCY: EXAMINING KEY FACTORS ASSOCIATED WITH HIGH SAVINGS (2009).

STEVEN NADEL & JOHN SHENOT, STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK, SETTING ENERGY SAVINGS TARGETS FOR UTILITIES: UTILITY MOTIVATION AND ENERGY EFFICIENCY WORKING GROUP (2011).

NATURAL RESOURCES DEFENSE COUNCIL, DOING MORE AND USING LESS: REGULATORY REFORMS FOR ELECTRICITY AND NATURAL GAS UTLITIES CAN SPUR ENERGY EFFICENCY (2011).

CHRIS NEME & MARTY KUSHLER, IS IT TIME TO DITCH THE TRC? EXAMINING CONCERNS WITH CURRENT PRACTICE IN BENEFIT-COST ANALYSIS (2010).

DAN YORK & MARTIN KUSHLER, ACEEE, THE OLD MODEL ISN'T WORKING: CREATING THE ENERGY UTILITY FOR THE 21ST CENTURY 3 (2011).

3. Aligning Utility Incentives with Policy Goals

Mandating and funding robust energy efficiency programs are key first steps in significantly increasing energy efficiency, but these policies inevitably butt up against the fact that they cut against the traditional utility business model. Many states -- particularly those that have chosen for utilities to administer their energy efficiency programs -- have elected to work with utilities to incentivize their investments in energy efficiency so that they are proactive partners in, rather than opponents of, aggressive energy efficiency policies.[138] Studies comparing state energy efficiency programs have found that "[i]n the U.S., utility energy efficiency programs have been most successful in those states that utilize a 'sticks-and-carrots' approach, combining a mandated savings goal or target with a comprehensive business model."[139] The sections below explore two areas where PUCs are taking action to better align utility incentives with state policy goals.

3.1 *Decoupling & Lost Revenue Adjustment*

One method of aligning utility incentives and energy efficiency objectives is to remove utilities' incentive to sell ever more power as a method of increasing profit. The traditional rate formula that PUCs use to establish utility earnings encourages utilities to increase revenues through increased electricity sales.[140] Revenue regulation and decoupling attempt to address this misalignment by capping revenue and putting in place a price mechanism that "breaks the link between the amount of energy sold and the actual (allowed) revenue collected by the utility."[141] However, it is worth noting that decoupling has been a controversial area of PUC decision-making and it is unclear the extent to which decoupling drives successful energy efficiency policies.[142] Nevertheless, many states and experts in the field believe that decoupling—or a similar sort of policy—will be a necessary component of future efforts to achieve wider and deeper energy savings.[143] Decoupling may be more important in deregulated than regulated states, as utilities in deregulated states "appear to be more vulnerable to revenue losses incurred by decreased sales from efficiency than utilities in vertically-integrated markets."[144] But decoupling can be applied in both market structures.

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[138] In states that have chosen a government administrator or a third-party administrator, realigning utility incentives is less of a concern. However, those states might still encounter strong opposition from utilities if no reevaluation of utility revenue is undertaken, as irrespective of who administers the programs, energy efficiency programs will affect utilities' bottom lines. *See* National Association of Regulatory Utility Commissioners, Third Party Provision of Energy Efficiency Programs 8-9 (2011), *available at* http://www.naruc.org/Publications/SERCAT_Colorado_2010.pdf.

[139] Andrew Satchwell et al., *Carrots and Sticks: A Comprehensive Business Model for the Successful Achievement of Energy Efficiency Resource Standards*, at 1 (Lawrence Berkeley Nat'l Laboratory, March 2011).

[140] The Regulatory Assistance Project, Revenue Regulation and Decoupling: A Guide to Theory and Application 3 (2011), *available at* http://www.raponline.org/document/download/id/902 *[hereinafter RAP].*

[141] *See id.* at 2.

[142] Martin Kushler et al., *supra* note 30, at 21.

[143] *Id.*

[144] Nat'l Assoc. of Regulatory Utility Commissioners (NARUC), *Decoupling for Electric & Gas Utilities: Frequently Asked Questions*, at 10 (Sept. 2007). As NARUC explains, this may be because "once divested of a generation plant, the distribution utility is a smaller company (in terms of total rate base and capitalization), and fluctuations in

Decoupling Basics

Decoupling changes the way that PUCs establish utility rates. Traditionally, rates are fixed between rate cases. During a rate case, rates are set, broadly speaking, by dividing the sum of expenses, the allowable return, and taxes during the test period (the revenue requirement) by the units sold during the test period.[145] Since the rate is fixed between rate cases, utilities can increase revenue by lowering expenses or increasing sales of electricity. However, since "there is a floor below which expenses simply cannot be reduced without adversely affecting the level of service," utilities generally rely in large measure on increasing units of electricity sold.[146] The resulting profit is often enough to discourage utilities from becoming "competent vendors of energy efficiency and load reduction services."[147]

Decoupling addresses this problem by fixing revenue during a rate case and allowing for price adjustments between rate cases to try to best approximate that level of revenue. As revenue becomes "decoupled" from sales, it remains tied only to expenses so that utilities have no incentive to increase customer demand.[148]

For example: California

California, a pioneer in energy efficiency, has one of the oldest decoupling programs in the nation, with electricity decoupling beginning in 1982. Under California's decoupling policy, utilities submit their revenue requirements and estimated sales to regulators at the beginning of a rate case. California's PUC sets each utility's rates and then adjusts them regularly to ensure that the approved revenue requirement is met. Any excess revenue is credited back to customers; conversely, any shortfall in revenue gets recovered later from customers. Decoupling in California has been heralded as a component of its success in getting energy usage per person to flatline during a period in which the rest of the nation has experienced a 50% increase in per capita energy usage. California has combined its decoupling efforts with shareholder incentives for utilities that meet or exceed their energy efficiency targets.

Implementation of Decoupling

As of July 2012, fourteen states had electricity decoupling programs.[149] There are a variety of ways to implement decoupling. One of the major issues that a regulator must resolve is whether to

throughput and earnings have a relatively larger impact on return." *Id.* (quoting US EPA, NATIONAL ACTION PLAN ON ENERGY EFFICIENCY, Chapter 2 (July 2006)).

[145] *See* RAP, *supra* note 140. Revenue Requirement = (Expenses + Return + Taxes). Rate = Revenue Requirement / Units Sold. Certain fixed costs, notably the amortized costs of generation, transmission, and distribution facilities, may be recovered through charges that do not vary with the amount of energy actually used by the customer.

[146] *See id.* at 8.

[147] *See* The Electricity Consumers Resource Council, Revenue Decoupling: A Policy Brief of the Electricity Consumers Resource Council 1 (2007), *available at* http://www.elcon.org/Documents/Publications/3-1RevenueDecoupling.PDF.

[148] *See* RAP, *supra* note 140 at 33-40. Decoupling can also be designed to insulate utility revenue from shocks in weather and economic downturns, decrease volatility, and potentially decrease the cost of capital for the utility. *Id.*

[149] *See* INSTITUTE FOR ELECTRIC EFFICIENCY, STATE ELECTRIC EFFICIENCY REGULATORY FRAMEWORKS 2-3 (July 2012).

implement full decoupling[150], partial decoupling[151], or limited decoupling.[152] From an energy efficiency standpoint, full decoupling is preferred as it completely insulates utility revenue from any deviation in sales, including any investment in energy efficiency.[153] Another major decision needs to be made whether to adjust the revenue requirement between rate cases to account for changes in cost structure.[154]

Concerns and Alternatives

Decoupling is not without its concerns. Opponents of decoupling claim that it may lead to annual rate increases without the careful scrutiny of a rate case.[155] They also claim that utilities are using decoupling as an excuse to add to rate base, that efficiency is already incentivized without the need for such a scheme, that decoupling is not appropriate for large-volume users, and that decoupling disincentivizes good service.[156] Proponents of decoupling argue that these concerns can be addressed with proper and careful design.[157]

The most popular alternative to decoupling is the "Lost Revenue Adjustment Mechanism" (LRAM). "This mechanism, unlike decoupling, does not attempt to completely sever the link between revenue and sales, but instead attempts to determine the portion of lost revenue that results only from a successful energy efficiency program. This lost revenue is recovered through a rate adjustment, removing the utility disincentive to invest in efficiency."[158] There has been a resurgence of state interest in LRAMs recently, and thirteen states reportedly have current or pending LRAMs.[159] However, LRAM has been critiqued for failing to completely remove utility's incentive to invest in supply-side resources over energy efficiency and for being susceptible to gaming by utilities.[160]

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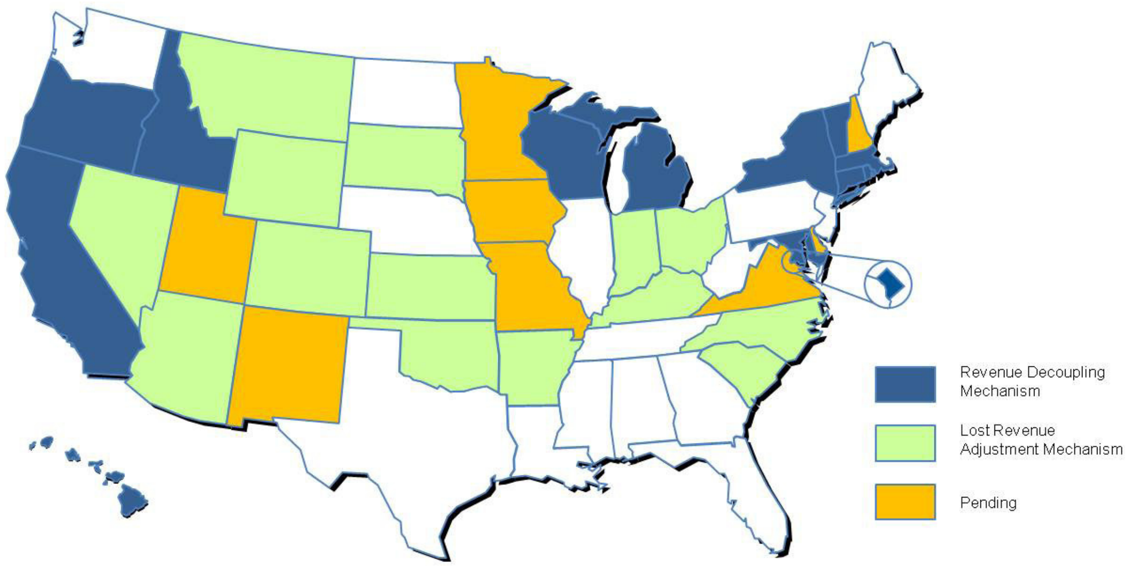
[150] Full decoupling involves completely severing the link between utility revenue and sales. *See* RAP, *supra* note 140, at 11. Truly full decoupling is rare. Often times, industrial users are exempt from decoupling requirements. *See* U.S. Dep't of Energy & U.S. EPA, *supra* note 110, at 5-1; RAP, *supra* note 140, at 48.
[151] As its name indicates, partial decoupling only decouples a portion of a utility's full revenue. *See* RAP, *supra* note 140, at 12.
[152] Limited decoupling refers to decoupling for specified causes of variations in sales, e.g. decoupling only for weather variations or reduced usage by existing customers (as opposed to new customers). *See id.* at 12-13.
[153] Full decoupling thereby fully eliminates the "throughput" incentive, whereas partial and limited decoupling only partially do so. *See id.* at 11.
[154] For example, a utility's customer base may change between rate cases. Decoupling revenue on a per customer basis allows for changes in revenue between rate cases if a utility's customer base changes. *See* U.S. EPA, *supra* note 150, at 5-2. RAP, *supra* note 140, lays out a number of additional important decoupling design considerations.
[155] *See* RAP, *supra* note 140, at 44.
[156] *See id.* at 47-50.
[157] *See id.*
[158] *See* ACEEE, Lost Margin Recovery, http://aceee.org/sector/state-policy/toolkit/utility-programs/lost-margin-recovery.
[159] Sara Hayes et al., *Balancing Interests: A Review of Lost Revenue Adjustment Programs for Utility Energy Efficiency Programs*, at iii (ACEEE Report No. U114, Sept. 2011).
[160] *Id.*

The following figure from the Institute for Electric Efficiency shows those states that have implemented or have implementation pending of decoupling or lost revenue adjustment:

Figure 3: Electric Utilities with Decoupling or Lost Revenue Adjustment Mechanisms[161]



[161] Reprinted with permission from © INSTITUTE FOR ELECTRIC EFFICIENCY, STATE ELECTRIC EFFICIENCY REGULATORY FRAMEWORKS 6 (July 2012), *available at* http://www.edisonfoundation.net/iee/Documents/IEE_StateRegulatoryFrame_0712.pdf.

DECOUPLING & LOST REVENUE RECOVERY: BIBLIOGRAPHY

Those who want to know more about decoupling and its alternatives may find the following more detailed resources helpful:

Timothy J. Brennan, *"Night of the Living Dead" or "Back to the Future?" Electric Utility Decoupling, Reviving Rate-of-Return Regulation, and Energy Efficiency* (Resources for the Future Discussion Paper 08-27, Aug. 2008).

ELCON, Revenue Decoupling (2007), http://www.elcon.org/Documents/Publications/3-1RevenueDecoupling.PDF.

EPA, Aligning Utility Incentives with Investment in Energy Efficiency (2007), http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf.

Sara Hayes et al., *Balancing Interests: A Review of Lost Revenue Adjustment Programs for Utility Energy Efficiency Programs* (ACEEE Report No. U114, Sept. 2011), http://aceee.org/research-report/u114.

IEE, State Energy Efficiency Regulatory Frameworks (2012), http://www.edisonfoundation.net/iee/Documents/IEE_StateRegulatoryFrame_0712.pdf (summarizes decoupling and lost revenue recovery policies in a number of states).

NARUC, Third Party Provision of Energy Efficiency Programs (2011), http://www.naruc.org/Publications/SERCAT_Colorado_2010.pdf (a Colorado discussion of alternatives to utility management of energy efficiency programs).

Nat'l Assoc. of Regulatory Utility Commissioners, *Decoupling for Electric & Gas Utilities: Frequently Asked Questions*, at 10 (Sept. 2007).

RAP, Decoupling vs. Lost Revenues: Regulatory Considerations (1992), http://www.epa.gov/statelocalclimate/documents/pdf/5_19decoupling_lost_revs_compariso_RAP.pdf (Lost Margin Recovery).

RAP, Revenue Regulation and Decoupling (2011), http://www.raponline.org/document/download/id/902.

3.2 *Performance Incentives*

While decoupling attempts to remove the disincentive for utilities to invest in energy efficiency, it does not *incentivize* them to do so.[162] Energy efficiency still may not appear attractive to utilities because "while decoupling may make utilities indifferent to fluctuations in sales, it does not necessarily remove the incentive to make large supply-side investments that benefit shareholders."[163] Even in those states with state agency-administered or third-party administered programs, top performers have "specific economic incentives tied to energy savings performance by the entities responsible for delivering the programs."[164]

As a result, PUCs may wish to devise and implement incentive programs to supplement their decoupling or revenue stabilization programs.[165] Alternatively, some states have eschewed decoupling entirely and have opted to implement performance incentive programs in place of decoupling, sometimes because performance incentive programs are seen as "easier to accomplish" than decoupling

[162] *See supra* section 3.1.

[163] ACEEE, Lost Margin Recovery, http://aceee.org/sector/state-policy/toolkit/utility-programs/lost-margin-recovery (last visited Feb. 21, 2012). These supply-side decisions benefit shareholders because, as noted *supra*, ratemaking typically allows a fixed rate of return on capital investments, giving them an advantage over investments in energy efficiency.

[164] MARTIN KUSHLER ET AL., *supra* note 30, at 21.

[165] *See* RAP, *supra* note 140, at 12.

programs.[166] As of January 2011, at least 18 states have implemented some sort of incentive program.[167]

State PUCs with utility-administered programs have come up with a large variety of individualized incentive programs. Generally though, these programs can be placed into one of three categories: Performance Targets, Shared Benefits, and Rate of Return.[168] Currently, five states have performance target incentive programs[169]; at least twelve states are engaged in a shared benefit incentive program[170]; and at least one state has a rate of return program.[171]

Performance targets are the simplest type of incentive program. Programs in this category seek to incentivize utilities by measuring them against certain energy efficiency metrics and by offering them payment of a percentage of the project budget based on performance.[172] A common metric is a percentage energy savings target.[173] Alternate design options include metrics for "installation of eligible equipment" or "market share achieved for certain products."[174] In addition to a target, a floor and ceiling are often placed on the benefits so that a utility that fails to reach the floor will not receive benefits and a utility that exceeds the ceiling cannot be paid more benefits. Falling below the floor can also result in penalties. A prototypical performance target program can be seen in Rhode Island's performance incentives scheme approved for Narragansett Company.[175] This program included five performance-based metrics and a kWh savings target for each sector.[176] For each performance-based metric, the utility could earn up to $15,000 for achieving the stated goal in full. For meeting an overall kWh savings target, the utility could earn 4.4% of total program expenditures, or approximately $600,000.[177]

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[166] *See* MARTIN KUSHLER ET AL., AMERICAN COUNCIL FOR AN ENERGY EFFICIENT ECONOMY, ALIGNING UTILITY INTERESTS WITH ENERGY EFFICIENCY OBJECTIVES: A REVIEW OF RECENT EFFORTS AT DECOUPLING AND PERFORMANCE INCENTIVES 9 (2006). *See also* STEVE KIHM, ENERGY CENTER OF WISCONSIN, WHEN REVENUE DECOUPLING WILL WORK… AND WHEN IT WON'T (2009) (a more detailed analysis on why a utility might use a performance incentive rather than a decoupling mechanism).
[167] *See* SARA HAYES ET AL., AMERICAN COUNCIL FOR AN ENERGY EFFICIENT ECONOMY, CARROTS FOR UTILITIES: PROVIDING FINANCIAL RETURNS FOR UTILITY INVESTMENTS IN ENERGY EFFICIENCY 5 (2011).
[168] *See id.*
[169] These states include Connecticut, Massachusetts, New Hampshire, Rhode Island, and Washington. *See id.*
[170] These states include Arizona, California, Colorado, Georgia, Hawaii, Idaho, Kentucky, Minnesota, Ohio, Oklahoma, Texas, and Washington. *See id* at 12.
[171] Wisconsin reportedly has a rate of return program in place for one of its electric utilities, which allows the company to earn the same rate-of-return for energy efficiency investments as it earns on other capital investments. *See State Energy Efficiency Policy Database: Wisconsin*, ACEEE, http://www.aceee.org/sector/state-policy/wisconsin (last visited August 28, 2012).
[172] *See* U.S. EPA, *supra* note 150, at ES-4, 6-3 to 4.
[173] *See id.*
[174] *See id.* at 6-12 n.1.
[175] *See* R.I. Public Serv. Comm'n, , *In re: The Narragansett Electric Company, Demand Side Management Programs for 2005,* No. 3635, Report and Order, at 6 (Sept. 20, 2004).
[176] *See id.*
[177] *Id.* at 8.

Shared Benefit programs are designed to allow shareholders to reap some of the net benefits of energy efficiency programs.[178] Like performance targets, these programs often scale up rewards to utilities based on how close to, or far above, an established savings target the utility gets.[179] The key difference between shared benefit and performance target programs, though, is that in shared benefits programs, the amount of money a utility receives is calculated as a percentage of total net benefits to consumers derived from the energy efficiency investments.[180] Typically, net benefits are measured by comparing program spending to the avoided cost of supply-side investments.[181] This design places added incentive on a utility to make sure its programs deliver maximum possible benefits. As an example, Minnesota's PUC allows recovery of certain percentages of net benefits depending on the percentage of a kWh goal achieved: if a utility meets 90% of its kWh goal, it gets 0% of net benefits; at 100%, it receives .84%, and at 150%, it receives 5% of total net benefits.[182] Another design option is to include penalties as well as rewards. California's shared benefit program provides increasing percentages of net benefit awards to utilities that achieve greater than 85% of their goals (including additional incentives for exceeding 100% of the goals), but penalizes utilities that fall below 65% of their goal or whose programs result in any negative net benefits.[183] A recent discussion paper by Resources for the Future suggested that only those schemes that include penalties for failure to comply are truly "policies," as targets set in the other programs are de facto really just "aspirational goal[s]."[184]

Rate of Return (ROR) programs allow utilities to earn an increased rate of return on equity for capitalized energy efficiency costs.[185] This increased rate of return ideally makes investments in energy efficiency look more attractive than investments in other capital projects (e.g., power plants or additional transmission lines). While ROR programs were popular in the 1980s, they have fallen out of favor.[186] The main problem is that they require utilities to capitalize energy efficiency program costs, which is unappealing to utilities for several reasons.[187] Most importantly, capitalization treats energy efficiency costs as capital outlays rather than expenses.[188] This means that utilities may not be able to recover their costs until far in the future, increasing the risk of non-recovery.[189] From the regulator's perspective, capitalization is often not preferred because it does not tie spending to program

[178] *See* U.S. EPA, *supra* note 150, at ES-4, 6-4.
[179] *See id.*
[180] *See id.*
[181] *Id.* at 6-5. The way that avoided costs are calculated is extremely important in determining the cost-effectiveness of energy efficiency, and can be the subject of substantial debate. *Id.* at 6-12; *see also supra* section 2.1.
[182] *See id.* at 6-5, 6-6; *see also* PHYLLIS A. REHA, THE MINNESOTA APPROACH 2, *available at* http://www.epa.gov/statelocalclimate/documents/pdf/5_19MN_DSM_Incentives_Reha.pdf. *See generally*, MINN. STAT. § 216B.16 (2011).
[183] *See* U.S. EPA, *supra* note 150, at 6-7.
[184] TIMOTHY J. BRENNAN & KAREN PALMER, ENERGY EFFICIENCY RESOURCE STANDARDS: ECONOMICS AND POLICY 2 (Resources for the Future Discussion Paper 12-10, Feb. 2012).
[185] *See* U.S. EPA, *supra* note 150, at ES-4, 6-11.
[186] *See id.* at 6-11.
[187] *See id.* at 4-8.
[188] *See id.*
[189] *See id.*

performance; unlike performance targets, utilities are not rewarded if they achieve higher levels of efficiency.[190] It is likely because of these concerns that states have, by and large, moved away from utilizing rate of return programs.[191]

It is somewhat difficult to measure the exact role that incentive programs have had in incentivizing utilities to pursue energy efficiency. Because energy use is dependent on a wide variety of factors, including changing fuel prices, fluctuations in the weather, and changes in economic conditions, it is difficult to attribute energy savings to a particular incentive program.[192] Despite this difficulty, some studies indicate, via survey, that incentive programs do in fact influence utility planning and help level the playing field between energy efficiency and investment in new capacity.[193]

PERFORMANCE INCENTIVES: BIBLIOGRAPHY

Those who want to know more about performance incentives may find the following more detailed resources helpful:

Reports

Jiyong Eom and James Sweeny. Precourt Energy Efficiency Center. *Shareholder Incentives for Utility-Delivered Energy Efficiency Programs in California*. Stanford University (2009), http://www.stanford.edu/group/peec/cgi-bin/docs/modeling/research/Shareholder%20Incentives%20for%20Utility-Delivered%20Energy%20Efficiency%20Programs%20in%20California.pdf.

EPA, Aligning Utility Incentives with Investment in Energy Efficiency (2007), http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf (includes several case studies).

Franks et al, ACEEE. *Seeking Consistency in Performance Incentives for Utility Energy Efficiency Programs.* ACEEE Summer Study on Energy Efficiency in Buildings (2010), http://eec.ucdavis.edu/ACEEE/2010/data/papers/2052.pdf.

Hayes, et al., ACEEE, Carrots for Utilities: Providing Financial Returns for Utility Investments in Energy Efficiency, http://ecorebates.com/wp-content/uploads/2011/09/ACEEE-2011-Report-on-IOU-Spending-on-Energy-Eff7.pdf.

IEE, Performance Incentives for Energy Efficiency Programs by State (May 2009), http://www.edisonfoundation.net/iee/issueBriefs/IncentiveMechanisms_0509.pdf.

Martin Kushler, ACEEE, Aligning Utility Interests with Energy Efficiency Objectives: A Review of Recent Efforts at Decoupling and Performance Incentives (includes a survey of 18 state performance incentive programs).

Steve Kihm, Energy Center of Wisconsin, When Revenue Decoupling Will Work . . . and When It Won't (2009), http://www.ecw.org/ecwresults/kihmdecouplingarticle2009.pdf (a somewhat technical analysis of when decoupling may not work and thus when it may be wise to use a performance incentive instead).

Websites

ACEEE. "Incentivizing Utility-Led Efficiency Programs: Performance Incentives," http://aceee.org/sector/state-policy/toolkit/utility-programs/performance-incentives

DOE, IREC. "Database of State Incentives for Renewables and Efficiency," http://www.dsireusa.org/

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[190] *See id.*

[191] For example, Nevada moved in 2011 from a program allowing its utilities to earn an extra 5% return on equity for approved demand-side management costs, to a lost revenue recovery model, under the authority of a 2009 law. *See* Nev. S.B. No. 358, § 11.3 (2009).

[192] *See* HAYES ET AL., CARROTS FOR UTILITIES, *supra* note 167, at 13.

[193] *See id.*

4. Increasing Consumer Participation: On-Bill Financing

A recurring issue that has plagued the energy efficiency policy community for some time is how to increase consumer participation in energy efficiency programs. Generally, this question is one for utility and third-party administrators, as PUCs typically do not select particular program designs themselves, but rather limit their role to one of approval or disapproval of proposed programs. Outside of the PUC realm, many innovative financing tools are helping to boost participation: energy service companies are providing improvements backed by private financing, community banks and credit unions are offering residential energy efficiency financing, and utility- and government-run programs are helping fill in some of the remaining market gaps.[194] These innovative financing efforts are important but beyond the scope of this handbook, given the focus here on PUCs. There is one area, however, where PUC activity has proven important in helping property owners to easily obtain and see the benefit of energy-efficiency improvements: on-bill financing.

On-bill financing offers a partial solution to the high up-front costs of energy efficiency retrofits by allowing customers to finance energy efficiency improvements through their utility bills.[195] In doing so, the utility leverages its existing relationship with the customer to provide less expensive financing and reduces the time and effort that would otherwise be expended to acquire alternative financing.[196] By linking financing to electricity bills, utilities reduce the risk of lending, as electricity bills are usually paid with priority.[197] Additionally, utilities can use the customer's payment history to accurately measure risk, opening up financing to customers unable to access other forms of credit.[198] While the threat of disconnecting the customer's power for failing to pay for the energy efficiency improvements is unappealing,[199] energy savings from the improvements are often greater than the associated monthly charges.[200] Some programs even cap the monthly charges at the estimated energy savings, attracting more consumer participation, but in doing so increasing the risk to lenders.

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[194] Karen Palmer et al., Borrowing to Save Energy: An Assessment of Energy-Efficiency Financing Programs 1-2 (Resources For the Future April 2012). One particularly promising public model is Property Assessed Clean Energy (PACE), wherein cities or counties establish energy financing districts that loan money to homeowners, who repay the loans through assessment on property tax bills. *See id.* at 15.

[195] Catherine Bell et al., On-Bill Financing for Energy Efficacy Improvements: A Review of Current Program Challenges, Opportunities, and Best Practices (ACEEE Report No. E1118, 2011), *available at* http://www.aceee.org/node/3078?id=4491.

[196] *Id.* at 1.

[197] Byrd D. J. & R.S. Cohen, *A Roadmap to Energy Efficiency Loan Financing*, Memorandum from Progressive Energy Group to U.S. Department of Energy, (Apr. 29, 2011) In a survey of 19 programs, the default rate was less than two percent, except for Southern California Edison's program which carried a 6.8 default rate, primarily attributable to a deterioration in business in the area. Bell, *supra* note 195, at 11.

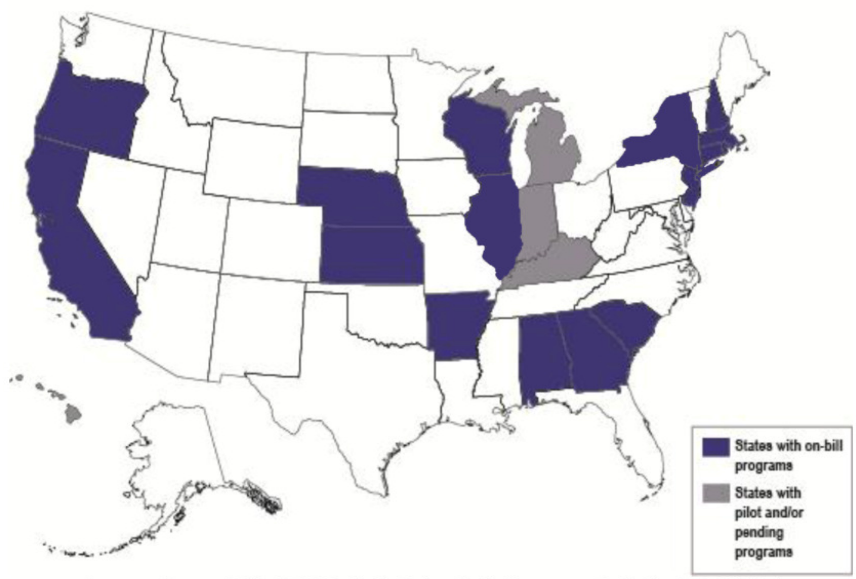
[198] Bell, *supra* note 195, at 1-2.

[199] Midwest Energy's How$mart Program initially confronted such concerns. However, the program required the charge to be less than the energy savings, dispelling these concerns. *Id.* at 14.

[200] *Id.* at 1. Energy savings may not be greater than the associated monthly charge if a short payback period for the loan is selected but the savings accrue over a longer time period.

As shown in Figure 4, at least 20 states now require or encourage their utilities to implement on-bill financing programs.[201] In many of these states (Illinois, Hawaii, Oregon, California, Kentucky, Georgia, South Carolina, Michigan, and New York),[202] the authorization for on-bill financing came from the legislature. However, some PUCs have independently taken action to explore the possibility of on-bill financing. [203]

Figure 4: States with On-bill Financing[204]



PUCs first initiated on-bill financing in 1993 by encouraging partnerships between utilities and third-party energy efficiency administrators.[205] Since then, PUCs have taken a more active role, ranging from mandating the availability of on-bill financing, authorizing the use of ratepayers' funds for lending, and establishing collaborative groups to further develop programs, to granting EERS credits to utilities that implement programs. These various policy options are explained in more detail below. One final point worth making up front: when implementing on-bill financing, it is important to ensure that participants are provided clear and up-front material on the risks and obligations of participating, including, in some states, the existence of a junior mortgage lien.

[201] *Id.* at 2-3.
[202] *Id.*
[203] *Id.* One reason that on-bill financing has grown in popularity is that PACE programs, discussed *supra* note XXX, have encountered some legal difficulties. *See* James M. Van Nostrand, *Legal Issues in Financing Energy Efficiency: Creative Solutions for Funding the Initial Capital Costs of Investments in Energy Efficiency Measures*, WINTER 2011 J. OF ENERGY & ENVTL. L. 2-9. On-bill financing offers an alternative conceptual model to PACE financing that is similarly capable of allowing energy efficiency costs to be tied to a particular property and paid off over time through associated savings. *Id.* at 10.
[204] Reprinted with permission from © 2011 American Council for an Energy Efficient Economy, BELL ET AL., *supra* note 195, at 2.
[205] *Id.* at 2-3; Merrian Fuller et. al., *Driving Demand for Home Energy Improvements*, at 12 (Lawrence Berkeley Nat'l Laboratory 2010), *available at* http://drivingdemand.lbl.gov/reports/lbnl-3960e-nlrp.pdf/.

Mandating or approving on-bill financing: Several PUCs have mandated that utilities offer on-bill financing programs.[206] In most cases, state legislation provides the authorization for these mandates. But even where legislators have yet to take such action, PUCs may approve utility tariffs providing for on-bill financing.[207] Additionally, many PUCs authorize the use of ratepayer funds to capitalize these programs (often funding them from the general energy efficiency funds discussed *infra* section 2). For example, the California PUC approved using $40 million of ratepayer funds to capitalize utilities on-bill financing programs for 2010 through 2012.[208]

Establishing collaborative groups to further develop programs: PUCs are ideally positioned to convene utilities, consumer advocates, and community organizations to facilitate conversations on how to design a balanced on-bill financing program.[209] These discussions can identify barriers and also attract new sources of capital. At least one PUC has created a special task force to congregate financial institutions, building owners and operators, real estate developers, local governments, and utilities to explore partnerships to expand on-bill financing programs.[210]

Granting EERS credits to utilities that implement programs: PUCs can also incentivize utilities to develop on-bill financing programs by extending Energy Efficiency Resource Standard (EERS) Credits to utilities that implement such programs.[211] As discussed *supra* section 1, an EERS sets long-term energy efficiency targets and typically requires a yearly percentage reduction in energy consumption from efficiency measures.

Modifying billing systems: Despite the potential of on-bill financing, many utilities' billing systems are not able to handle the more complex charges that on-bill financing requires. PUCs can alleviate this hurdle by ensuring recovery of the costs of updating utility information and billing systems or even providing seed money for the improvements. PUCs have authorized the use of ratepayer funds for recovery of these expenditures. [212] Other programs have set up funds specifically for this purpose, and

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[206] For example, in 2008, the California PUC directed utilities to create or continue on-bill financing pilot programs for small commercial customers, to propose on-bill financing for institutional customers, and to investigate programs for other sectors such as residential customers. *See* Cal. Pub. Utils. Comm'n, Dec. No. 08-10-032.
[207] For example, the Kentucky Public Service Commission, in Case Number 2010-0089, approved on-bill financing for energy efficiency improvements.
[208] BELL, *supra* note 195. Some states supplement ratepayer funds with funds from other sources: for instance, capital for New York on-bill financing program comes from ratepayer funds as well as proceeds from the Regional Greenhouse Gas Initiative auction. *Id.*
[209] *Id.* at 25.
[210] *See* Cal. PUC, Decision No. 08-09-040, Adopting the California Long-term Energy Efficiency Strategic Plan, Rulemaking No. 08-07-011 (decided Sept. 18, 2008).
[211] BELL, *supra* note 195, at 25. In the New York on-bill financing program, utilities receive credit toward mandated energy efficiency goals, which are tied to incentive payments from New York System Benefit Funds. *Id.* at 12.
[212] The California PUC permitted utilities to use ratepayer funds to cover the overhead costs of the on-bill financing which have already been expended. *See* Cal. PUC, Dec. No. 09-09-047, Approving 2010 to 2012 Energy Efficiency Portfolios and Budgets, A. 08-07-021, at 286-87 (Oct. 1, 2009). However, the PUC opined that future expenditures

some even provide utilities with additional compensation based on a percentage of the value of loans extended.[213] These types of programs defray the costs of updating billing systems and encourage utilities to establish active financing programs.

Effectiveness of On-Bill Financing

Although intended as a method of driving up participation in energy efficiency programs, participation in on-bill financing programs has, to date, remained low. In more than half of the programs, participation was below 0.5% of customers in the targeted market.[214] The low participation rates may be the result of a lack of awareness about the program or the potential benefits of energy efficiency improvements, the inability to find contractors, or a lack of capital necessary to expand the program.[215] Hopefully, rates of participation will rise as word of the programs and their successes spreads.

ON-BILL FINANCING: BIBLIOGRAPHY

Those who want to know more about on-bill financing may find the following more detailed resources helpful:

Reports

Center for Energy and Public Policy, Columbia University SIPA. *"On-Bill Financing" for Energy Efficiency* (2009), http://energy.sipa.columbia.edu/researchprograms/urbanenergy/documents/On%20bill%20Financing%20FINAL.pdf

CATHERINE BELL ET AL., AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, ON-BILL FINANCING FOR ENERGY EFFICACY IMPROVEMENTS: A REVIEW OF CURRENT PROGRAM CHALLENGES, OPPORTUNITIES, AND BEST PRACTICES, REPORT E1118 (2011).

MATTHEW BROWN, ALLIANCE TO SAVE ENERGY, PAYING FOR ENERGY UPGRADES THROUGH UTILITY BILLS: BRIEF #3: STATE ENERGY EFFICIENCY POLICIES: OPTIONS AND LESSONS LEARNED (2010), *available at* http://ase.org/resources.

MATTHEW BROWN, ON-BILL FINANCING: HELPING SMALL BUSINESS REDUCE EMISSIONS AND ENERGY USE WHILE IMPROVING PROFITABILITY, (Nat'l Small Bus. Assoc. 2009). http://www.nsba.biz/docs/09OBFNSBA.pdf

HAYES ET AL., AMERICAN COUNCIL FOR AN ENERGY- EFFICIENT ECONOMY, CARROTS FOR UTILITIES: PROVIDING FINANCIAL RETURNS FOR UTILITY INVESTMENTS IN ENERGY EFFICIENCY (2011).

MERRIAN FULLER ET. AL., ENVIRONMENTAL ENERGY TECHNOLOGIES DIVISION LAWRENCE BERKELEY NATIONAL LABORATORY, DRIVING DEMAND FOR HOME ENERGY IMPROVEMENTS (2010), *available at* http://drivingdemand.lbl.gov/reports/lbnl-3960e-nlrp.pdf/.

State of New York Public Service Commission, *Energy Efficiency Portfolio Standard Working Group VI – On-Bill Financing Final Report* (2008), http://www.nclc.org/images/pdf/energy_utility_telecom/obf/WGVI-On_Bill_Financing_Final_Report.pdf

Websites

U.S. DOE, EERE. "On-Bill Repayment Programs," http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/onbillrepayment.html

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would not be approved, and expected that future system improvements would be amortized over the larger value of future loans. *Id*. at 287.

[213] The administrator of New York's on-bill financing program, New York State Energy Research and Development Authority ("NYSERDA") established a $50,000 fund to enable utilities to update billing systems. NYSERDA also pays utilities $100 per loan and 1% of the loan value. BELL, *supra* note 195, 25.

[214] BELL, *supra* note 195, at 18.

[215] *Id*.

5. Low-Income Energy Efficiency Programs

Many states have long had in place energy efficiency programs devoted to serving low-income residents. Some of these programs are mandated by statute; others are created through a PUC initiative.[216] These programs have the dual aims of improving energy affordability and increasing energy efficiency penetration in the state.[217] Often, a state's low-income energy efficiency program works in tandem with a rate affordability program that focuses exclusively on making energy more affordable for low-income residents, though the degree to which these programs are integrated varies.[218]

Low-income energy efficiency programs are typically targeted towards customers that are below a set income level, often 150% of the poverty level.[219] Targets for programs can be set in a variety of ways: some PUCs set goals for the number of households to be served or the total amount to be spent, while others do not cap the number of potential participants.[220] Similarly, some states set a limit on spending per household, while others do not.[221] Utilities are most often tasked with program administration, but independent third-party administrators or government agencies are also sometimes selected to run low-income energy efficiency programs.[222]

The funding for low-income programs is collected from ratepayers, though not all ratepayers necessarily contribute equally. Some states only collect funding from the residential customer class; others collect low-income program funding across all customer classes.[223] Spending levels vary drastically: at the high end, California spends around $300 million annually.[224] A 2007 survey of state programs found that most spent considerably less, ranging from around $1 million to $16 million.[225] Funding from the federal government under the 2009 American Recovery and Reinvestment Act (ARRA) at least temporarily increased state spending substantially—ARRA provided $5 billion in weatherization funding for states to increase the size and scope of their programs.[226] One other important decision

[216] *See* Applied Public Policy Research Institute for Study and Evaluation, Evaluating Low-Income Energy Efficiency Programs 99 (2011) *[hereinafter APPRISE].*

[217] *See id.* at 49-50. These programs also serve an important role in helping offset what otherwise can be a perverse outcome of energy efficiency policies: although a robust set of energy efficiency programs overall causes electricity bills to drop, the greatest benefits accrue to the people who can afford to take measures to invest in energy efficiency in their own homes and thereby lower their energy consumption (public/utility financing often covers a portion but not the entirety of the cost of energy efficiency measures). *See* Center for American Progress, Efficiency Works 22 (Sept. 2010). Low-income energy efficiency programs help to ensure that the overall net societal benefit of energy efficiency is better distributed so that the poorest do not end up bearing more costs than they reap in home improvements. *Id.*

[218] *See* APPRISE, *supra* note 216, at 51.

[219] *Id.* at 102.

[220] *Id.* at 44, 100.

[221] *Id.* at 100.

[222] *Id*.

[223] *Id.* at 43-44.

[224] Economic Opportunities Studies, California's Low-Income Energy Efficiency Program 7, *available at* http://www.opportunitystudies.org/repository/File/weatherization/CA_LIEE.pdf.

[225] *See* APPRISE, *supra* note 216, at 100.

[226] U.S. Dep't of Energy, Weatherization and Intergovernmental Program, http://www1.eere.energy.gov/wip/wap.html (last visited April 9, 2012).

that must be made in designing a program is whether to target customers with the highest usage. Because these customers provide greater opportunities for savings, programs targeting them typically have more cost-effective service delivery.[227] But targeting only high-use customers may mean that some who most need assistance fail to get it.

State programs also differ in the types of services offered to low-income customers. The most common services are weatherization (including attic insulation, caulking, weather stripping, low-flow showerheads, water heater blankets, and door and building envelope repairs), energy education, and energy-efficient appliance upgrades.[228] These upgrades have important positive impacts first and foremost for participating low-income homeowners and renters who enjoy reduced energy bills and higher levels of home comfort. But the "co-benefits" of these low-income energy efficiency programs reach beyond their participants and include reduced emissions, improved health, job creation, local spending, and higher property values.[229]

LOW-INCOME ENERGY EFFICIENCY PROGRAMS: BIBLIOGRAPHY

Those who want to know more about low-income energy efficiency programs may find the following more detailed resources helpful:

Reports

Applied Public Policy Research Institute for Study and Evaluation, *Evaluating Low-Income Energy Efficiency Programs* (2011), http://www.appriseinc.org/reports/Evaluating%20Low-Income%20Energy%20Efficiency%20Programs.pdf

Merrian Fuller, *Driving Demand for Home Energy Improvements* (Lawrence Berkeley Nat'l Laboratory 2010), http://eetd.lbl.gov/ea/emp/reports/lbnl-3960e-ppt.pdf

Grayson Heffner & Nina Campbell, *Evaluating the co-benefits of low-income energy-efficiency programs* (Int'l Energy Agency 2011), http://www.iea.org/papers/2011/low_income_energy_efficiency.pdf

Dan York, Marty Kushler, and Patti Witte, *Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs* (ACEEE 2005), http://www.aceee.org/research-report/u053

Websites

Low-Income Weatherization, http://www.publicpower.org/utility/utility.cfm?ItemNumber=24643

Weatherization Assistance Program Technical Assistance Center, http://www.waptac.org/

HUD summary of CA low-income energy efficiency program, http://www.hud.gov/local/shared/working/r9/cpd/lowincome.pdf

US DOE Weatherization Assistance Program, http://www1.eere.energy.gov/wip/wap.html

[227] *See* APPRISE, *supra* note 216, at 114.

[228] *See, e.g.*, Economic Opportunities Studies, *supra* note 224, at 6 & n.27.

[229] *See* GRAYSON HEFFNER & NINA CAMPBELL, EVALUATING THE CO-BENEFITS OF LOW-INCOME ENERGY EFFICIENCY PROGRAMS 8 (Int'l Energy Agency June 2011)

6. Demand Response

Although demand response and energy efficiency are often lumped together under the general rubric "demand-side management," they are in fact separate concepts that serve related but distinct goals. Whereas energy efficiency policies seek to lower the overall amount of energy consumed by any given use of electricity, demand response policies aim to reduce consumption specifically during periods of peak demand. More specifically, "demand response is a resource that allows end-use electric customers to reduce their electricity usage in a given time period, or shift that usage to another time period, in response to a price signal, a financial incentive, an environmental condition or a reliability signal."[230]

The precise relationship between demand response and *overall* energy usage is a matter of some debate: although demand response clearly cuts energy usage during peak times, it does not clearly create *net* energy savings. While customers may eliminate some energy-consuming activities altogether, they may alternatively choose to simply shift energy usage to off-peak times or even *increase* energy usage during off-peak times to compensate for decreased electricity consumption during a period of peak demand.[231] Nevertheless, demand response's focus on cutting peak energy has significant system and environmental benefits. By lowering high-priced peak energy usage and offsetting the need for new power plants and associated transmission facilities, demand response lowers electricity rates and increases grid reliability. It also helps markets function more efficiently and moderates the potential for market power abuse.[232] Demand response can reduce carbon emissions by reducing the need for additional peak generation units.[233] And it has tremendous potential to support large-scale integration of renewable generation by giving grid administrators an additional resource that can be called upon to respond to periods of variability in renewables' output.[234] Because of demand response's importance in addressing many of the same environmental and system reliability concerns as energy efficiency, this handbook includes the following section on some of the key policy tools that PUCs have to promote demand response alongside energy efficiency.

The Federal Energy Regulatory Commission (FERC) and PUCs across the country have taken a variety of actions to encourage demand response. Given its focus, this handbook will highlight only PUC actions, but demand response—much more so than energy efficiency—is an area of shared

[230] *See* Cal. PUC, *Demand Response*, at http://www.cpuc.ca.gov/PUC/energy/Demand+Response/ (last visited March 16, 2012).
[231] *See* MIT, *supra* note 27, at 147 ("Some conservation may occur through demand response, as when usage at peak periods is eliminated rather than shifted . . . . But some peak use, such as clothes drying, may simply be rescheduled, and lower off-peak prices associated with many dynamic pricing structures may further increase off-peak usage. Whether the direct net effect of demand response is to reduce or increase overall consumption is ultimately an empirical question, and there is considerable uncertainty in estimates of the likely net impact.")
[232] Int'l Energy Agency, Empowering Customer Choice in Electricity Markets 17 (Oct. 2011).
[233] *Id.* at 18.
[234] *Id.*; *see also* MIT, *supra* note 27, at 67.

responsibility among the Federal Energy Regulatory Commission (FERC), independent system operators and regional transmission organizations (ISOs and RTOs), and state policy-makers.[235]

Regulated utilities have long been players in demand response. As early as the late 1980s, certain utilities implemented "peak shaving" programs, most commonly in the form of residential air conditioning cycling programs that allowed the utility to use "a radio frequency switch to shut off participating consumers' air conditioning units for some portion of each hour during extended peak periods," usually in exchange for a monthly flat fee.[236] Since this time, the range of demand response programs run by utilities has expanded, although most attention has shifted from the residential arena to the industrial and commercial arenas.

As the value of demand response becomes more apparent and new technologies promise to open markets to new participants, PUCs are engaging more on the question of what the next generation of demand response policies should be. In recent years, PUCs in many, if not a majority of states, have implemented proceedings and policies to examine and augment utilities' demand response programs and to determine how to "eliminate regulatory barriers to improved participation in demand response."[237] This recent upsurge in PUC consideration of demand response policies has been driven at least in part by a requirement in the Energy Policy Act of 2005 that PUCs consider whether to adopt dynamic pricing, load management techniques, energy efficiency policies, and demand response.[238] The variety of ways that states have responded to this requirement, and gone beyond it, showcases the potential policy drivers PUCs have to promote demand response.

6.1 *Mandates & Planning Requirements*

One way PUCs can drive demand response participation is to include specific demand response requirements within an EERS, or as a separate mandate imposed on utilities.[239] For example, Pennsylvania's Act 129, passed in 2008, calls for a three percent reduction in overall electricity consumption by 2013 coupled with a 4.5 percent reduction in peak demand, with an additional requirement that 70% of this reduction in peak come from the residential sector.[240] This mandate has reportedly driven a robust market for demand response service providers, who are contracting with utilities to help them meet these goals. As an alternative demand response policy model, many states set utility-by-utility demand response targets (and many combine these two models, setting an overall state target that is then translated into utility-specific targets by the PUC).[241] For example, Colorado's

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[235] *See* Hon. John Wellinghoff & David L. Morenoff, *Recognizing the Importance of Demand Response: The Second Half of the Wholesale Electric Market Equation*, 28 ENERGY L. J. 389, 412 (2007) (discussing the jurisdictional overlap that exists between state regulators and FERC on demand response). ISOs/RTOs have primary jurisdiction over the rules governing demand response's participation in wholesale electricity markets.
[236] *Id.* at 394.
[237] *Id.* at 418 (quoting a Minnesota PUC Commissioner's remarks).
[238] *See* 16 U.S.C. § 2621.
[239] For a description of EEPS policies, see *supra* section 1.
[240] *See* PA Act 129 of 2008, HB 2200 (2008).
[241] For example, the Maryland Commission reportedly translated the statewide goal of a 15% reduction in peak demand by 2015 into individual utility-specific reduction targets. It then initiated separate proceedings to consider

PUC sets peak demand reduction goals for each IOU, which the legislature requires to be "at least five percent of the utility's retail system peak demand measured in megawatts in the base year."[242] Nevada has chosen another inventive method of motivating demand response initiatives as part of its EERS: it awards a "peak-demand multiplier" that "allows savings from efficiency measures that also reduce peak demand to receive twice the number of credits they would otherwise."[243]

Along with increasing mandates for demand response, many PUCs also allow cost recovery for demand response investments.[244] Without cost recovery, utilities are likely to be reluctant to invest heavily in new demand response measures. As with energy efficiency, recovery is generally limited to those investments that are demonstrated to be cost-effective.[245]

Planning requirements can also force utilities to give demand response a hard look as a resource option, alongside both energy efficiency and supply-side options. For example, Maryland requires its IOUs to file long-term procurement plans that examine a variety of scenarios representing a range of potential resources, including demand response (along with "new generation, generation upgrades, . . . PSC-approved residential energy efficiency programs, potential or proposed commercial and industrial energy efficiency programs, [and] implementation of a smart grid system and upgrades to the transmission and distribution system").[246] Similarly, in October 2008, Michigan passed a law requiring its PUC to set standards for integrated resource plans that include consideration of demand response as a resource that could "defer, displace, or partially displace" new generation or power purchase agreements.[247]

6.2 *Rate Design*

Another critical component of demand response policy is the issue of how to structure retail rates to better correspond to wholesale electricity prices—an area where PUCs have considerable control. In

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each utility's demand response plan. *See* U.S. DEMAND RESPONSE COORDINATING COMMITTEE FOR THE NAT'L COUNCIL ON ELECTRICITY POLICY, DEMAND RESPONSE AND SMART METERING POLICY ACTIONS SINCE THE ENERGY POLICY ACT OF 2005: A SUMMARY FOR STATE OFFICIALS 33 (2008), *available at* http://www.demandresponsesmartgrid.org/Resources/Documents/Final_NCEP_Report_on_DR_and_SM_Policy_Actiona_08.12.pdf.

[242] Col. Rev. Stat. § 40-3.2-104(2).

[243] U.S. DEMAND RESPONSE COORDINATING COMMITTEE, DEMAND RESPONSE & SMART GRID—STATE LEGISLATIVE AND REGULATORY POLICY ACTION REVIEW: OCTOBER 2008—MAY 2010 48 (JUNE 2010).

[244] *See, e.g.*, N.H. SB 451 (2008); *see also* Cal. PUC, Demand Response Cost-Effectiveness Protocols, *available at* http://www.cpuc.ca.gov/PUC/energy/Demand+Response/Cost-Effectiveness.htm (2010).

[245] As just one example of the type of new demand response program that might be deemed cost effective, California has been working to develop a cost-effective demand response lighting control technology that would "be capable of receiving a utility demand reduction signal and transmitting, over the building power lines, a load-shed signal to multiple receiver devices, which are installed at light switches that are deemed ideal to shed lighting load." *Lighting California's Future: Cost-Effective Demand Response* vii (March 2011), *available at* http://www.energy.ca.gov/2011publications/CEC-500-2011-014/CEC-500-2011-014.PDF.

[246] *See* Md. Public Serv. Comm'n, Order No. 82195, In the Matter of the Commission's Investigation of Investor-Owned Electric Companies' Standard Offer Service for Residential and Small Commercial Customers in Maryland, Case No. 9117, at 3 (July 2008).

[247] Mich. Public Act No. 286 (Oct. 2008).

the past, demand response has often been targeted towards emergency and reliability events—that is, demand response resources have been called upon primarily when an emergency situation or a predicted spike in electricity demand necessitates short-term action to curb some portion of anticipated peak demand. However, the advent of new advanced metering infrastructure (AMI) that is penetrating greater market segments allows for wider use of price-based demand response (see *infra* section 6.3).[248] The possibilities for growth in this area are tremendous—the International Energy Agency reports that in more competitive markets, demand response has the potential to comprise 15% to 20% of peak demand.[249] Increasing customer exposure to real-time pricing will be a "key precondition" to reaching this potential.[250]

PUCs have a central role to play in encouraging intelligent pricing structures that shift energy consumption and flatten demand. One basic pricing tool that PUCs have at their disposal is the use of strategic block-rate pricing to incentivize reductions in overall electricity consumption. Historically, many utilities had in place declining block rates that incentivized consumption by making, for example, a customer's second 1000 kWh of electricity consumed during a given time period cheaper than its first 1000 kWh. Flipping this incentive structure on its head, through instead creating *inclining* block rates, goes some way towards encouraging efficiency by sending customers price signals that communicate the desirability of moderating electricity usage.[251] Under an inclining block rate, the first "block" of electricity consumed—usually set at some hundreds of kWh—is priced cheaper than the second block, which in turn is cheaper than the third. Studies indicate that such inclining block rates "might encourage significant conservation, with long-run reductions in electricity use nearing 20 percent, and customer bills falling by more than 25 percent."[252] Inclining block rates have the additional advantages of being cheap and easy to administer and not requiring any advanced metering technologies.[253] However, their effectiveness depends heavily on customers understanding the pricing scheme and being able to see, through billing statements, how their consumption stacks up against the block rates.[254]

Inclining block rates may help reduce overall consumption. However, they will not produce true "demand response" that shifts in response to seasonal, daily, or hourly fluctuations in electricity demand.[255] For this, more sophisticated dynamic pricing tools are necessary. Currently, most retail electricity rates do not mirror the variation in wholesale prices in deregulated markets or the cost of production in regulated markets. Rather, retail rates are generally fixed based on an average cost over the year. However, the quantity of electricity demanded varies significantly throughout the day and year, and in most regions, peaks in the late- afternoon and in the summer.[256] The accompanying costs of

[248] *See* INT'L ENERGY AGENCY, *supra* note 232, at 6 (Oct. 2011); MIT, *supra* note 27, at 144.
[249] INT'L ENERGY AGENCY, *supra* note 232, at 6.
[250] *Id.* at 55.
[251] *See* EPA, CUSTOMER INCENTIVES FOR ENERGY EFFICIENCY THROUGH ELECTRIC AND NATURAL GAS RATE DESIGN 13 (Sept. 2009).
[252] Ahmad Faruqui, *Inclining Towards Efficiency*, PUB. UTS. FORTNIGHTLY AUG. 2008 22.
[253] *Id.* at 24.
[254] *Id.*; *see also* EPA, *supra* note 251.
[255] *See* Faruqui, *supra* note 252, at 27.
[256] In some cold climate areas, demand peaks in the winter due to electrical heating.

providing peak power skyrocket, as less efficient generators must be called into service.[257] A fixed rate offers no incentives to alter electricity usage in response to the cost of production at that time, leading to over-consumption during system peaks.

Under a dynamic retail price, customers are incentivized to adjust their consumption of electricity according to the current price, flattening the consumption curve as they respond to pricing signals. By shaving peak demand, PUCs can eliminate the need to keep inefficient generators online, reducing reliability costs and meeting overall power demand at a lower cost. Additionally, dynamic pricing could reduce the costs of managing supply volatility from variable energy resources, such as wind and solar.[258] Although flattening the consumption curve is the principal benefit of dynamic pricing, some reduction in overall consumption has occurred in some pilots and early programs.[259]

Currently twelve states have dynamic pricing requirements.[260] Legislation has spurred much PUC action, but at least three PUCs have independently mandated dynamic pricing. Moreover, eighteen states have taken regulatory action regarding AMI (discussed *infra* section 5.3),[261] and eight states currently have an AMI deployment plan or requirement.[262]

"Dynamic Pricing" Defined

The term "dynamic pricing" actually encompasses a wide array of pricing structures. On the most responsive end of the spectrum, under real-time pricing (RTP) regimes, the price of electricity varies hourly (or more frequently) in response to the system's marginal energy costs.[263] Retail providers can sell the power with little (if any) markup, as they do not have to compensate for the risk that their costs might exceed the price charged. Time-of-use (TOU) tariffs set prices, which change seasonally, for specific time periods to reflect the historical costs of meeting demand for those hours. The pre-established pricing periods alleviate uncertainty for the consumer, but in exchange, providers must bear the risk that the price will not compensate for the cost of power and charge a risk premium. An intermediate pricing structure, critical peak pricing (CPP), utilizes a set price structure but allows providers, on a day's notice, to price power higher for several hours when demand is expected to be extraordinarily high relative to supply.[264] While some PUCs have specifically required utilities to offer

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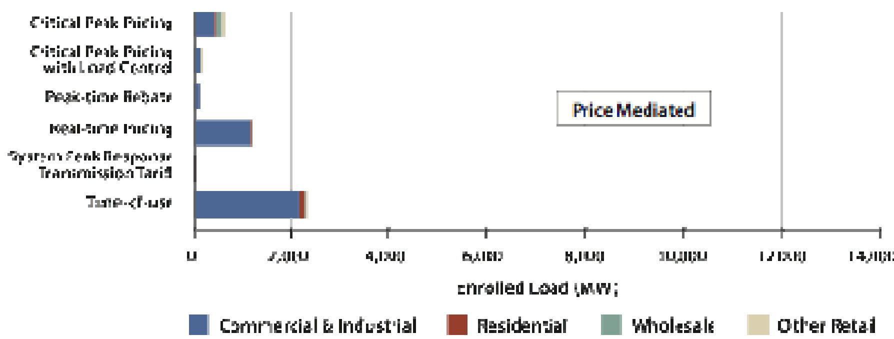
[257] Less than 1% of annual hours account for 10–18% of capacity needs in North America. Ahmad Fariuqui, Ryan Hledlik, & John Tsoukalis, *The Power of Dynamic Pricing*, ELECTRICITY JOURNAL 22:3, 42—56 (2009).
[258] MIT, *supra* note 27, at 143-44.
[259] Customers who face dynamic pricing have reduced their overall consumption by as much as five percent. Chris King & Dan Delurey, *Efficiency and Demand Response: Twins, Sibling, or Cousins?,* PUBLIC UTILITIES FORTNIGHTLY, Mar. 2006.
[260] SCIENCE INT'L APPLICATION CORP., SMART GRID LEGISLATIVE AND REGULATORY PROCEEDINGS 6-7 (2011).
[261] US DEMAND RESPONSE COORDINATING COMMITTEE, *supra* note 241, at 2.
[262] SCIENCE INT'L APPLICATION CORP., *supra* note 260, at 2-3.
[263] MIT, *supra* note 27, at 155.
[264] *Id.* Alternatively, a peak pricing rebate structure operates similarly to CPP, except that customers are given a rebate for reductions in usage during the high demand period rather than charged a premium. However, under the rebate structure, each customer's baseline usage must be determined, which is both expensive and subject to the possibility of customers altering usage to game rebate payouts. *Id.*

RTP, others encourage any dynamic pricing plan, including TOU or CCP. As shown in Figure 6, TOU pricing for commercial and industrial customers makes up by far the largest portion of dynamic pricing in the U.S. right now, with RTP for commercial and industrial customers comprising the second most popular dynamic pricing option. The remainder of this subsection sets forth the methods that PUCs are using to promote dynamic pricing.

Figure 5: National Amount of Energy Enrolled in Dynamic Pricing



Source: Federal Energy Regulatory Commission, *Assessment of Demand Response and Advanced Metering Staff Report* (Washington, DC: 2011).

Ordering Dynamic Pricing: Some PUCs require dynamic price structures for certain customer classes, primarily large commercial and industrial users.[265] For example, the New York Public Service Commission mandated RTP for large commercial and industrial customers, who represent about 15% of total peak demand. Some PUCs hesitate to issue broad orders related to pricing because they have traditionally regulated rates through individualized rate proceedings. But dynamic pricing policies can also proceed through this more traditional channel: some PUCs have explicitly identified rate design proceedings as the appropriate forum to address dynamic pricing while giving broad guidelines to other utilities by notifying utilities of future tariff expectations.[266]

PUCs have also employed the less aggressive tactic of requiring utilities to *consider* dynamic pricing. In this regard, some PUCs have ordered dynamic pricing's potential to help meet future demand to be given comparable consideration to other alternatives for meeting supply needs.[267] Other PUCs

[265] *See* NY Pub. Serv. Comm'n, Order Denying Petitions for Rehearing and Clarification in Part and Adopting Mandatory Hourly Pricing Requirements, Case No. 03-E-0641 (April 24, 2006). Somewhat less stringently, the Arizona Corporation Commission requires each utility to *offer* a time-based rate schedule to appropriate consumer classes, and also mandates that the utilities report any variation in the utility's wholesale generation costs compared to these rates. *See* SCIENCE INT'L APPLICATION CORP., *supra* note 260.
[266] For instance, in a 2008 rate proceeding for Pacific Gas & Electric, the California PUC set a timetable for the implementation of mandatory, default, and voluntary dynamic pricing programs for different customer classes. Although the decision does not directly affect California's other investor owned utilities, the ruling makes clear that similar standards will be employed in other utilities' future rate proceedings. Press Release, Cal. PUC, CPUC gives customers greater control over their electricity bills with dynamic pricing rates for GG&E (July 31, 2008).
[267] *See, e.g.*, Arkansas Public Service Commission, Order on Guidelines on Resource Planning for Electric Utilities, Docket No. 06-028-R (2007).

have required that dynamic pricing be specifically addressed in all utility rate design proceedings.[268] While this approach does not ensure dynamic pricing's implementation, it at least requires utilities to consider such pricing.

Allowing Dynamic Pricing: PUCs have the potential to act as a barrier instead of a catalyst for dynamic pricing: because PUCs regulate private utility tariffs, utilities must seek PUC approval before instituting dynamic pricing. At least nine PUCs in states that do not require dynamic pricing for any customer classes have approved a dynamic pricing tariff for some customers.[269] Approval of such rates is uncontroversial for large commercial and industrial customers, and some PUCs have approved pilot programs for residential and small commercial users.[270] Controversy often surrounds residential dynamic pricing programs due to concern that low-income households may be exposed to higher, more volatile electric bills. For this reason, residential dynamic programs are typically voluntary, opt-in programs. Some residential pilot programs have resulted in significant reductions of peak consumption and high customer satisfaction, but the results among pilots have widely varied.[271]

Ensuring recovery of fixed costs: Because dynamic pricing pilot programs have often resulted in an overall reduction to electricity consumption, they can result in a utility under-recovering its fixed costs.[272] PUCs have responded to this problem by adjusting rates to reflect the expected decrease in customer usage.[273] Additionally, separating charges for transmission and delivery from generation may help alleviate this concern.[274]

6.3 *Advanced Metering Policies*

Integrally related to the topics of demand response and dynamic pricing is advanced metering. Advanced metering infrastructure (AMI) is a two-way communications network and database system that provides real-time usage and pricing data to both power providers and customers. Advanced

[268] The California PUC ordered all utilities to address dynamic pricing options for all customer classes. Cal. Pub. Utils. Comm'n, Decision Closing this Rulemaking and Identifying Future Activities Related to Demand Response, Dec. No. 05-11-009, Rulemaking 02-06-001 (Nov. 18, 2005).
[269] REGULATORY ASSISTANCE PROJECT, STATUS OF SELECTED STATES' INVOLVEMENT IN AMI AND TIME SENSITIVE RATES (2007).
[270] Before the current mandates, California Public Utilities Commission implemented the first comprehensive dynamic pricing test, which involved 2,500 residential and small commercial and industrial customers. Cal. Pub. Utils. Comm'n, Interim Opinion in Phase 1 Adopting Pilot Program for Residential and Small Commercial Customers, Dec. No. 03-03-036, Rulemaking 02-06-002 (March 13, 2003). In Pennsylvania, PECO Energy filed a petition for approval of a dynamic pricing pilot program, and in December 2010 the PAPUC approved the voluntary time-of-use rate program. PA Pub. Util. Comm'n, PPL Electric Utilities Corporation Supplement No. 94 To Tariff Electric – Pa. P.U.C. No. 201 – Time-of-Use Rates, Docket No. R-2010-2201138 (Dec. 2, 2010). Many other PUC have approved similar pilot programs.
[271] MIT, *supra* note 27, at 158-59; Ahmad Faruqui & Jennifer Palmer, Brattle Group, *Dynamic Pricing and its Discontents,* CATO REGULATION, at 16, 21 (Fall 2011).
[272] BRAITHWAIT ET AL., RETAIL ELECTRICITY PRICING AND RATE DESIGN IN EVOLVING MARKETS 26 (Edison Electrical Institute 2007).
[273] 2008 Regulators Forum, Marsha Smith, Commissioner of Idaho Public Utilities Commission, 146 No. 11 Pub. Util. Fort. 32 (discussing Idaho's three-year pilot program initiated in 2007).
[274] PUC activities in encouraging decoupling are discussed *supra* section 3.1.

"smart" meters, which record and transmit real-time energy usage, are one important component of AMI. Potential advantages of these meters include reduced meter reads and associated costs, increased meter accuracy, better tracking of outages and faster restoration of service, and the ability to implement new technologies such as smart thermostats and other appliances that respond to price signals automatically, saving consumers money and electricity.[275]

Aside from those programs that allow utilities to directly control customers' load at certain times via remote technology, most demand response relies on being able to measure an appreciable drop in energy consumption by a consumer during a peak period. For this reason, participation in demand response is mostly limited to those customers who have meters that are capable of measuring and reporting energy use in one-hour intervals or less.[276] Similarly, RTP and CPP require an ability to measure energy usage at various times of day. However, as more advanced meters are installed for residential customers, these customers' ability to participate in demand response programs—including dynamic pricing programs—and reap the attendant energy and cost savings will increase. The most recent FERC survey of advanced meters, from 2009, indicated an advanced meter penetration rate of 8.7 percent, though this number has certainly gone up in the years since.[277] The American Recovery and Reinvestment Act of 2009 provided considerable sums for additional installations, which should result in an additional 15.5 million meters.[278] In total, 65 million advanced meters are expected to be deployed across the U.S. by 2015.[279]

There are several steps that PUCs can take to promote the penetration of advanced metering. However, here more than in energy efficiency there has been considerable consumer pushback against some PUC efforts. Steps that PUCs can take, along with some of the resistance that has been encountered, are described below.

***Planning*:** Several PUCs have developed "smart grid" implementation plans.[280] In doing so, PUCs have established an independent collaborative group to consider the view of all stakeholders.[281] These plans review the full range of implementation issues in an attempt to maximize results at the lowest customer

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[275] *See*, Electric Power Research Institute, Advanced Metering Infrastructure Information Sheet, *available at* http://www.ferc.gov/eventcalendar/Files/20070423091846-EPRI%20-%20Advanced%20Metering.pdf; NAT'L ENERGY TECH. LAB., ADVANCED METERING INFRASTRUCTURE 5 (Feb. 2008), *available at* http://www.netl.doe.gov/smartgrid/referenceshelf/whitepapers/AMI%20White%20paper%20final%20021108%20(2)%20APPROVED_2008_02_12.pdf.
[276] *See* Cal. PUC, *Demand Response*, http://www.cpuc.ca.gov/PUC/energy/Demand+Response/ (last visited March 16, 2012).
[277] FERC, ASSESSMENT OF DEMAND RESPONSE & ADVANCED METERING STAFF REPORT 2 (Nov. 2011).
[278] *Id.* at 3.
[279] *Id.*
[280] *See, e.g.*, CAL. PUB. UTIL. CODE Ch. 4. SB 17 required the California PUC to develop a comprehensive plan. The Illinois Commerce Commission acted on its own initiative in its Order in Docket No. 07-0566 to develop a collaborative group to encourage the deployment of smart meters.
[281] The Illinois Commerce Commission established the Illinois Statewide Smart Grid Collaborative in September 2008 by its Order in Docket No. 07-0566.

costs.[282] Such plans are especially beneficial when they consider and try to ensure the compatibility and longevity of AMI investment decisions, given that such investments run some risk of obsolescence during this time of rapid smart-grid technology development.

AMI mandates: After investigating opportunities to cost effectively install smart meters, some PUCs have mandated that utilities develop plans for deploying smart meters and dynamic pricing.[283] Other PUCs have delegated the investigatory responsibility to the utilities, requiring utilities to examine the feasibility and cost effectiveness of implementing AMI, and depending on the outcome of the study, deploy the technology.[284] Another option is to require utilities to supply AMI to customers that request them.[285] Or, in an effort to incentivize dynamic pricing, utilities can be required to give AMIs specifically to those customers that elect an optional RTP plan. For example, Illinois legislation requires that a utility servicing at least 100,000 customers file a tariff allowing residential customers to elect real-time pricing. Utilities are entitled to recover incurred costs in implementing real-time pricing, but such costs must be recovered against the entire customer base, not just those electing dynamic pricing.[286] At the opposite end of the spectrum, some PUCs are considering an opt-out policy, in which customers must pay a fee to decline installation of a smart meter.[287] Figure 6 shows the distribution of states that have adopted AMI plans and requirements or that had AMI requirements pending as of late 2011.

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[282] CAL. PUB. UTIL. CODE Ch. 4.

[283] *See, e.g.*, Vermont Energy Efficiency and Affordability Act of 2008 (H 520). Although Vermont's PUC did not institute the policy, it serves a critical role in its implementation. Other PUCs could independently set up such a system.

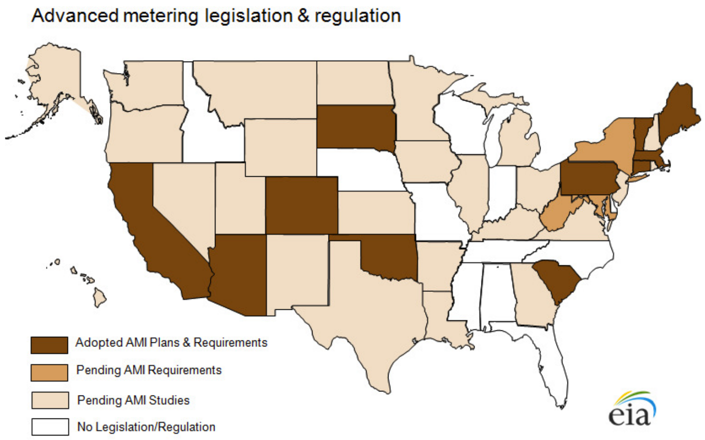
[284] AZ Corp. Comm'n, Decision No. 70696 (2007); US DEMAND RESPONSE COORDINATING COMMITTEE, *supra* note 241. Vermont's Energy Efficiency and Affordability Act of 2008 (H 520) directs Vermont's Public Service Board to "investigate opportunities for Vermont electric utilities cost-effectively to install advanced 'smart' metering equipment capable of sending two-way signals and sufficient to support advanced time-of-use pricing during periods of critical peaks or hourly differentiated time-of-use pricing." *Id.* § 7. After an investigation, the Board must require each utility to file plans for deploying smart meters and TOU pricing, provided that the utility serves a territory where such a deployment is "appropriate and cost-effective." *Id.*

[285] For example, in August 2007, the South Carolina Public Service Commission directed all utilities to make smart meters available to all customers. Order No. 2007-618.

[286] 2005 Ill. Laws 977 (amending 220 Ill. Comp. Stat. Ann. 5/16-101A, 16-102, 16-107).

[287] The Vermont Public Service Board has a schedule for adopting the Vermont Department of Public Service's recommendations for opt-out smart metering. Docket No. 73707 (2012).

Figure 6: Advanced Metering Legislation & Regulation[288]



Rate Recovery: Advance metering deployment costs remain relatively high for small volume commercial and residential customers,[289] deterring utilities from developing smart metering programs. Some PUCs have approved recovery of advanced meter installation expenses connected with the implementation of a dynamic pricing program.[290] California's PUC, in a monumental step towards enabling widespread deployment of AMI, approved the business case for advanced metering, allowing rate recovery independent of dynamic pricing.[291] However, not all PUCs have been as receptive to rate recovery for AMI, even when accompanied by dynamic pricing. The Hawaii and Maryland PUCs have denied such request, due to the lack of information about cost effectiveness.[292]

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[288] U.S. Energy Information Administration, Smart Grid Legislative and Regulatory Policies and Case Studies 2 (2011).

[289] Advanced metering costs for residences averaged $300 per installed meter over the last five year but are expected to fall to the $150—$250 price range. A. Fariuqui et al, *The Costs and benefits of Smart Meters for Residential Customers*, White Paper (Washington, DC: Edison Foundation Institute for Electrical Efficiency, July 2011). Advanced meters and installation costs for large industrial and commercial customers can range up to $5,000.

[290] *See, e.g.*, D.C. Pub. Serv. Comm'n, *In the Matter of the Application of PEPCO for Authority to Establish a Demand Side Management Surcharge and an Advance Metering Infrastructure Surcharge*, 278 P.U.R. 4th 155, 2009 WL 5048995 (Dec. 17, 2009). The Oklahoma Corporate Commission (OCC) permitted rate recovery for AMI expenses up to $366 million, but expenses beyond the floor must be shown to be prudently incurred for recovery. OCC also explicitly provided that certain cost reductions expected to result for the smart Grid deployment were to be passed-through to customers. OCC, Order No. 576595 (2010). Pennsylvania Public Utility Commission has also approved smart metering plans for three utilities and allows for rate recovery for installing and operating the meters and communication technology, educating customers, and implementing a dynamic pricing pilot. Penn. Pub. Util. Comm'n, Order on Docket No. M-2009-2123950. For a brief description, *see* Press Release, Penn. PUC, PUC approves Act 129 Smart Meter Plan for Met-Ed, Penelec, (April 15, 2010), *available at* http://www.puc.state.pa.us/General/press_releases/Press_Releases.aspx?ShowPR=2496.

[291] The California PUC considered advance metering to be cost effective independently of dynamic pricing, because it improves the operating efficiency of utilities. *See, e.g.,* Cal. Pub. Utils. Comm'n, *Decision Adopting Dynamic Pricing Timetable and Rate Design Guidance for Pacific Gas & Electric Company,* D. 08-07-045, Application 06-03-005 (July 31, 2008).

[292] *Hawaii PUC rejects Smart Grid Proposal*, PowerNews, Aug. 4, 2010, *available at* http://www.powermag.com/smart_grid/Hawaii-PUC-Rejects-Smart-Grid-Proposal_2917.html.

Education: In light of consumer backlash against dynamic pricing and advanced meters in some early-moving states,[293] PUCs should be careful not to rush AMI deployment without first educating customers on the substantial benefits. A transition to dynamic pricing requires careful planning and education. Failure to introduce customers to advanced metering and dynamic pricing gradually through education and price comparison may result in strong and continued customer opposition.[294] In approving these rates and meters, PUCs should take steps to ensure that customers are adequately informed about potential AMI benefits. In some cases, PUCs have themselves developed customer education plans.[295] Other PUCs have taken a less active role, and have delegated the education responsibility to utilities proposing dynamic pricing and deployment of smart meters. Generally, PUCs permit rate recovery for expenditures developing and executing such programs.[296]

Overall, the national trend seems to be cautious advancement on AMI deployment, given some of the challenges that aggressive AMI rollout programs have faced. There should be considerable room for transfer of experiences and best practices as states progress further in implementing AMI programs.

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[293] *See, e.g.*, Stop Smart Meters!, http://stopsmartmeters.org/2011/09/15/utility-and-smart-meter-tech-company-executives-get-grilled-by-the-public/ (last visited April 5, 2012).

[294] MIT, *supra* note 27, at 164.

[295] The District of Columbia Public Service Committee formed the AMI Task Force to design a detailed customer education plan to ensure customers are kept informed of how to take advantage of the large scale smart meter rollout underway by PEPCO. *See* D.C. Pub. Serv. Comm'n, *supra* note 290.

[296] In approving a utility smart meter pilot program, the Oklahoma Corporate Commission required the utility to educate customers. OCC, Order No. 576595 (2010). Likewise, Pennsylvania PUC included an education requirement in approving utility pilot programs, and granted rate recovery for the costs of education programs. Pennsylvania Public Utility Commission, Order on Docket No. M-2009-2123950. In 2007, the South Carolina Public Service Commission found a lack of awareness of the "availability and capability" of smart meters. In response, the commission required utilities to propose a campaign to educate consumers. This requirement was not connected with a dynamic pricing pilot program. Order No. 2007-618.

DEMAND RESPONSE, DYNAMIC PRICING, & ADVANCED METERING BIBLIOGRAPHY

Those who want to know more about demand response and related policies may find the following more detailed resources helpful:

M.H. Albadi, IEEE, *Demand Response in Electricity Markets: An Overview* (2007).

BRAITHWAIT ET AL., EDISON ELECTRICAL INSTITUTE, RETAIL ELECTRICITY PRICING AND RATE DESIGN IN EVOLVING MARKETS 26 (2007).

JOHN G. CASSATION ET. AL., MIT, MIT STUDY ON THE FUTURE OF THE ELECTRIC GRID (2011), http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml.

Edison Electric Institute, *EEI Summary of State Regulatory Smart Grid Decisions* (2011), http://www.eei.org/whatwedo/PublicPolicyAdvocacy/StateRegulation/Documents/EEI_State_SG_Matrix_Update_Aug_2011.pdf

Karen Ehrhardt-Martinez et al., ADVANCED METERING INITIATIVES AND RESIDENTIAL FEEDBACK PROGRAMS: A META-REVIEW FOR HOUSEHOLD ELECTRICITY-SAVING OPPORTUNITIES (ACEEE June 2010), http://www.energycollection.us/Energy-Metering/Advanced-Metering-Initiatives.pdf

Ahmad Faruqui and Sanem Sergici, The Brattle Group, *Household Response to Dynamic Pricing of Electricity—A survey of the experimental evidence* (2009), http://www.science.smith.edu/~jcardell/Readings/uGrid/House%20DemandResp%20Experience.pdf

Federal Energy Regulatory Commission, Staff Report, *Assessment of Demand Response & Advanced Metering Staff Report* (Nov. 2011).

BEN FOSTER & SUSAN MAZUR-STOMMEN, RESULTS FROM RECENT REAL-TIME FEEDBACK STUDIES (ACEEE Report No. B122, Feb. 2012).

INSTITUTE FOR ELECTRIC EFFICIENCY, THE COSTS & BENEFITS OF SMART METERS FOR RESIDENTIAL CUSTOMERS (July 2011), http://www.edisonfoundation.net/iee/Documents/IEE_BenefitsofSmartMeters_Final.pdf.

INSTITUTE FOR ELECTRIC EFFICIENCY, MOVING TOWARD UTILITY-SCALE DEPLOYMENT OF DYNAMIC PRICING IN MASS MARKETS (June 2009), http://www.edisonfoundation.net/IEE/Documents/IEE_Utility-ScaleDynamicPricing_0609.pdf.

REGULATORY ASSISTANCE PROJECT, STATUS OF SELECTED STATES' INVOLVEMENT IN AMI AND TIME SENSITIVE RATES (2007).

INGRID ROHMUND ET AL., ASSESSMENT OF ACHIEVABLE POTENTIAL FOR ENERGY EFFICIENCY AND DEMAND RESPONSE IN THE U.S. (2010-2030), http://eec.ucdavis.edu/ACEEE/2008/data/papers/5_297.pdf

Martha Rowley, Edison Electric Institute, *State Regulatory Update: Energy Efficiency* (2008), http://www.eei.org/ourissues/EnergyEfficiency/Documents/state_reg_update_efficiency.pdf

SCIENCE APPLICATIONS IMPLEMENTATION CORPORATION, SMART GRID LEGISLATIVE AND REGULATORY PROCEEDINGS (2011)

US DEMAND RESPONSE COORDINATING COMMITTEE, DEMAND RESPONSE AND SMART METERING POLICY ACTIONS SINCE THE ENERGY POLICY ACT OF 2005: SUMMARY FOR STATE OFFICIALS (2008).

U.S. ENERGY INFORMATION ADMINISTRATION, SMART GRID LEGISLATIVE AND REGULATORY POLICIES AND CASE STUDIES 2 (2011).

7. PLANNING

This handbook so far has focused on PUC policies and practices directed specifically at promoting energy efficiency and demand response. The following several sections move to an examination of the ways that commissions and advocates can push for energy efficiency to receive increased attention within traditional PUC activities.

Introduction to the Importance of Planning

Including energy efficiency during the process of resource planning is crucial to the efficient use of energy resources. Resource planning allows policymakers, PUCs, and utilities to consider long-term issues and solutions, make decisions in advance, and create new directions for energy generation and distribution. Incorporating efficiency into these plans adds another way of meeting energy needs, through reducing energy requirements. Many experts and organizations have therefore recommended that efficiency should be heavily considered in energy planning.[297] Where they exist, methods of planning currently differ widely between states. This section will summarize ways that energy efficiency can be incorporated into planning both in states with regulated energy markets and those with restructured markets.[298] Although legislatures are chiefly responsible for selecting planning options, PUCs generally have an important role in monitoring and enforcement and are crucial to their success.

7.1 *Planning in Regulated Energy Markets*

Integrated Resource Planning

The most common form of planning for electricity is integrated resource planning (IRP), which most regulated states practice in some form.[299] An integrated resource plan is "a long-range utility plan for meeting the forecasted demand for energy within a defined geographic area through a combination of supply side resources and demand side resources."[300] The plans evaluate resources according to specific criteria, which can include minimizing the total resource costs.[301] Typically, states require electric utilities, either public or investor-owned, to practice IRP by regularly filing plans with the state energy or utility commissions.[302] From there, commissions can often regulate the utilities' choices by accepting, disapproving, or modifying plans.[303] States such as Ohio require active involvement by the PUC in planning, by mandating that utilities file long-range forecasts and estimating long-term energy demands

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[297] U.S. DEP'T OF ENERGY & U.S. ENVTL. PROTECTION AGENCY, *supra* note 120, at 3-1 (2006).
[298] As of September 2010, fifteen states and the District of Columbia have restructured markets. *Status of Electricity Restructuring by State*, U.S. ENERGY INFORMATION ADMINISTRATION, http://www.eia.gov/cneaf/electricity/page/restructuring/restructure_elect.html (last visited April 16, 2012).
[299] David Nichols, *The Role of Regulators: Energy Efficiency*, 18 PACE ENVTL. L. REV. 295, 297 (2001).
[300] STATE AND LOCAL ENERGY EFFICIENCY ACTION NETWORK, USING INTEGRATED RESOURCE PLANNING TO ENCOURAGE INVESTMENT IN COST-EFFECTIVE ENERGY EFFICIENCY MEASURES 1 (2011).
[301] Nichols, *supra* note 299, at 297.
[302] Regulatory Assistance Project, *US States with Integrated Resource Planning or Similar Planning Processes* (Dec. 2009), *available at* www.raponline.org/document/download/id/4447.
[303] Sautter, *supra* note 40, at 37, 39.

in order to create efficient energy policies and proposals.[304] Oregon's PUC has gone further, using IRP statutes to deny requests to build coal power plants in those cases where the requesting utility failed to consider alternatives sufficiently.[305] Generally, IRP is considered a "major lever" in developing and implementing demand-side management, with energy efficiency advocates reportedly having great success in getting utilities to adopt plans with robust energy efficiency components.[306] PUCs' role in plan approval or rejection allows them to have a major voice in the contents of such plans, though the degree of control they exercise does vary state to state.

Multiple advocacy groups have identified general best practice standards in the creation of IRPs. Plans should identify a broad range of options on both the energy supply side and the demand side to increase productivity of electricity use.[307] Planners should create credible load forecasts using realistic assumptions, while modeling a broad range of possible load forecasts to account for variations and incorporate uncertainty.[308] Plans should account for generation, transmission, distribution, energy efficiency, and other relevant resources while considering ranges of possible costs.[309] The process should integrate various perspectives through public participation techniques that allow input from general public and other stakeholders.[310] Finally, plans should be properly implemented, continuously monitored and evaluated for their effectiveness, and flexible enough to adapt to new situations and required updates.[311] These broad objectives are adopted in various ways across different states by utilities and regulators.

For example: Minnesota

Minnesota is a state that has a leading role in efficiency and renewable power. Although coal supplies almost 60 percent of its electricity, 9.4 percent of power comes from wind turbines, one of the highest among states. The state has pledged to conserve energy by setting a goal of reducing retail electric and gas sales by 1.5 percent annually and has empowered its PUC to ensure that utilities reach this goal. Statute 216B.2422 requires utilities to file a resource plan, defined as "a set of resource options that a utility could use to meet the service needs . . . over a forecast period, including an explanation of the supply and demand circumstances . . . These resource options include . . . implementing customer energy conservation." The Minnesota Public Utilities Commission then decides whether to approve, modify, or reject the plans.

Minnesota requires a 15-year planning horizon with updates every two years. According to the Regulatory Assistance Project, the planning process often results in utilities procuring efficiency in excess of the amount required. In 2009, Minnesota's efficiency programs saved 637,845 megawatt-hours (MWh).

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[304] *Id.* at 40.
[305] *Id.*
[306] Nichols, *supra* note 299, at 296-97.
[307] USAID, BEST PRACTICES GUIDE: INTEGRATED RESOURCES PLANNING FOR ELECTRICITY 3.
[308] STATE AND LOCAL ENERGY EFFICIENCY ACTION NETWORK, *supra* note 300, at 5.
[309] *Id.* at 6.
[310] TENNESSEE VALLEY AUTHORITY, ENERGY VISION 2020 2.3 (1995), http://www.tva.com/environment/reports/energyvision2020/ev2020_vol1ch02.pdf.
[311] USAID, *supra* note 307, at 39–41.

7.2 *Planning in Restructured Energy Markets*

Alternatives to IRP

Where markets have been restructured and deregulated, state authorities must plan differently, as utilities no longer have direct control over generation. It is possible for PUCs in deregulated states to require IRP for transmission and distribution facilities only, as, for example, Massachusetts has done.[312] For states that want to go further and help influence the generation mix in their state, another suggested form of planning is the strategic energy assessment (SEA), which can be used by either regulated or restructured states. Under such a model, state agencies and utilities create scenarios based on detailed analysis of present and expected energy demands and available supply sources.[313] Unlike with IRP, the authorities conducting the assessment would not select a plan for electric generation and investment, as they lack this authority within a deregulated market.[314] However, states could use their authority over distribution utilities and facility siting to implement efficiency boosting options.[315] Currently only Wisconsin, a state with regulated energy markets, employs strategic energy assessment.[316] However, states with restructured markets could adopt SEA for their energy planning.

For example: Massachusetts

The Bay State is an example of a relatively successful restructured state, well regarded for its efficiency achievements. The state's goals for efficiency savings are ambitious: the 2008 Green Communities Act requires efficiency savings of 2.4 percent per year starting in 2012.

The EPA characterizes the form of energy savings in Massachusetts as a form of portfolio management, as the Green Communities Act attempts to boost alternative and renewable energy as well as energy efficiency measures through clean demand side resources. Section 21 of the Act empowers the Department of Public Utilities (DPU) to ensure that resource needs are met "through all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." Every three years, distribution companies and municipal aggregators must prepare electric efficiency investment plans that "provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." Plans must include lifetime assessments for costs and reliability, amount of demand resources, estimated cost savings, descriptions of programs, budgets and incentives, estimated peak load reductions, and other cost benefit estimates. The plans are then reviewed on an annual basis with opportunities for public hearings. The DPU can then accept, modify, or reject plans based on the adequacy of the resource analyses. This planning process appears to have been successful in promoting efficiency in a deregulated energy market.

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312 STATE AND LOCAL ENERGY EFFICIENCY ACTION NETWORK, *supra* note 300, at 10-11.
313 Nichols, *supra* note 299, at 298-99.
314 *Id.* at 299.
315 *Id.*
316 REGULATORY ASSISTANCE PROJECT, *supra* note 302.

Another alternative method of planning is to require utilities to engage in their own energy portfolio management (PM). Portfolio management requires utilities to formulate resource plans and procurement strategies that consider a range of scenarios, including both supply-side and demand-side options for meeting projected needs and diversifying fuel sources.[317] The use of PM allows utilities to include efficiency and renewable energy in their evaluation and evaluate options based on computer models that account for various scenarios.[318] An ideal portfolio would contain options for a variety of fuel sources, technologies for generation and transmission, programs to encourage customer adoption of efficient measures, and financial incentives to encourage reduced consumption.[319] In addition, the management process should allow interested and affected parties to provide input and information, and provide for assessment for difficulties in the process that requires adjustments before the next forecast.[320] The Portfolio Management strategy can be employed in restructured states, with obligations placed on the default provider in the event that retail choice is present but not prevalent.[321] States that mandate the use of portfolio management include Montana, Massachusetts, and California.[322]

For example: California

California—a state with a long track record of success in promoting energy efficiency—uses both long-term planning and portfolio management for energy planning, and has a partially restructured energy market. California's PUC (CPUC) worked with a number of regulated IOUs to develop a "Long Term Energy Efficiency Strategic Plan" in 2008, with the goal of increasing energy efficiency through 2020 and beyond. The plan outlines a long-term strategy of integrating energy efficiency programs into the marketplace "without ratepayer subsidies or codes and standards" by creating a "more sustained long-term, market transformation strategic focus." Under the plan, California utilities are predicted to produce electricity savings of up to 7,000 GWh between 2010 and 2012.

In addition to its long-term plans, California engages in portfolio management that includes requirements for both renewable energy and energy efficiency. As discussed *supra* section 1.3, California's loading order policy requires utilities to use efficiency resources before turning to other supply options. The CPUC also has broad power to approve, modify, or reject the procurement plans of utilities.

[317] SYNAPSE ENERGY ECONOMICS, A BRIEF SURVEY OF STATE INTEGRATED RESOURCE PLANNING RULES AND REQUIREMENTS 4–6 (2011).
[318] *Id.* at 7.
[319] ENVIRONMENTAL PROTECTION AGENCY, CLEAN ENERGY – ENVIRONMENT GUIDE TO ACTION 6-3 (Apr. 2006), *available at* http://www.epa.gov/statelocalclimate/resources/action-guide.html.
[320] *Id.* at 6-11.
[321] *Id.* at 6-5.
[322] REGULATORY ASSISTANCE PROJECT, *supra* note 302.

PLANNING BIBLIOGRAPHY

Those who want to know more about planning may find the following more detailed resources helpful:

ACEEE, *2011 State Energy Efficiency Scorecard*, http://www.aceee.org/sector/state-policy/scorecard.

Cal. PUC, *California Long Term Energy Efficiency Strategic Plan* (Sep. 2008), http://www.cpuc.ca.gov/NR/rdonlyres/D4321448-208C-48F9-9F62-1BBB14A8D717/0/EEStrategicPlan.pdf.

Environmental Protection Agency, *Clean Energy – Environment Guide to Action* (Apr. 2006), http://www.epa.gov/statelocalclimate/resources/action-guide.html.

Environmental Protection Agency, *State and Local Climate Policy Tracking*, http://www.epa.gov/statelocalclimate/state/tracking/

Great Lakes Wind Collaborative, *Best Practices for Sustainable Wind Energy Development in the Great Lakes Region* (July 2011), http://www.glc.org/energy/wind/pdf/bptoolkit/GLWC-BPToolkit-BP04.pdf.

Institute for Energy Research, http://www.instituteforenergyresearch.org/states/.

Itron, Inc., *National Energy Efficiency Best Practices Study: Volume 1 – Portfolio Best Practices Report* (July 2008), http://www.eebestpractices.com/pdf/portfolio.pdf.

National Action Plan for Energy Efficiency Leadership Group, *Full Report* (July 2006), http://www.epa.gov/cleanenergy/documents/suca/napee_report.pdf.

David Nichols, *The Role of Regulators: Energy Efficiency*, 18 PACE ENVTL. L. REV. 295 (2001).

John A. Sautter, *State Environmental Law and Carbon Emissions: Do Public Utility Commissions Use Environmental Statutes to Fight Global Warming?*, THE ELECTRICITY JOURNAL, Oct. 2010.

John A. Sautter et al., *The Energy Trilemma in the Green Mountain State: An Analysis of Vermont's Energy Challenges and Policy Options*, 10 VT. J. ENVTL. L. 478 (2009), http://www.vjel.org/journal/pdf/VJEL10101.pdf.

State and Local Energy Efficiency Action Network, *Using Integrated Resource Planning to Encourage Investment in Cost-Effective Energy Efficiency Measures* (September 2011), http://www1.eere.energy.gov/seeaction/pdfs/ratepayer_efficiency_irpportfoliomanagement.pdf.

Synapse Energy Economics, *A Brief Survey of State Integrated Resource Planning Rules and Requirements* (Apr. 28, 2011), http://www.cleanskies.org/wp-content/uploads/2011/05/ACSF_IRP-Survey_Final_2011-04-28.pdf.

US Energy Information Administration, *Status of Electricity Restructuring by State*, http://www.eia.gov/cneaf/electricity/page/restructuring/restructure_elect.html.

US States with Integrated Resource Planning or Similar Planning Processes, Regulatory Assistance Project (Dec. 2009), www.raponline.org/document/download/id/4447.

USAID, *Best Practices Guide: Integrated Resources Planning for Electricity*, http://pdf.usaid.gov/pdf_docs/PNACQ960.pdf.

Vermont Department of Public Service, *Comprehensive Energy Plan 2011* (Dec. 2011), http://www.vtenergyplan.vermont.gov/sites/cep/files/2011%20CEP_Volume%201.pdf.

8. Incorporating Energy Efficiency into Other Areas of PUC Jurisdiction

8.1 *Siting of Generation and Transmission; Power Purchase Agreements*

PUCs often—though not always—have some degree of authority over transmission and generation facility siting.[323] Typically, companies planning new facilities are required to apply for and obtain from the PUC a "Certificate of Public Convenience and Necessity," though in some states these certificates are issued by separate siting boards.[324] Commissioners evaluate the project to determine, among other things, whether its proponents have shown a demonstrated need.[325]

Energy efficiency can play an important role in the consideration of the need for a particular generation or transmission project. PUCs differ in the amount of rigor that they apply in determining the need for a project, and some deregulated states now apply a presumption of need on the theory that if an investor is risking its own capital (rather than ratepayers' money) on a project, there is little need for PUC oversight.[326] Within the need assessment, some states explicitly require the consideration of energy efficiency as an alternative to new construction. For example, Florida law requires that in considering the need for new generation, its PUC must "expressly consider the conservation measures taken by or reasonably available to the applicant or its members which might mitigate the need for the proposed plant and other matters within its jurisdiction which it deems relevant."[327] Vermont goes further, requiring those applying for a "Certificate of Public Good" to meet ten statutory criteria, including establishing that the project's demand could not be met more cost effectively by energy efficiency and that the project "will not have an undue adverse effect on esthetics, historic sites, air and water purity, the natural environment and the public health and safety . . . ."[328]

Other states simply instruct the PUC to consider whether the project is in the "public interest" or some such similar phrasing, leaving the details of this phrase to be worked out in subsequent decisions.[329] But whether or not a statute specifically requires energy efficiency or conservation to be considered, a PUC's duty to ensure that a project is necessary or in the public interest provides reason

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[323] *See* Ashley C. Brown & Jim Rossi, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the "Public Interest" in Balancing State and Regional Considerations*, 81 U. Colo. L. Rev. 705, 710 n.15 (2010). Sometimes this authority is vested in a different state agency, or in a body comprised of representatives of multiple state agencies. *Id.*

[324] *Id.*

[325] *Id.* at 721.

[326] *See* David Nichols, *The Role of Regulators: Energy Efficiency*, 18 Pace Envtl. L. Rev. 295 (2001). Applying a presumption of need can result in useful streamlining of the process if state regulations require a thorough "need" evaluation to occur in some other context—resource planning, for example. However, it may be the case that private investors in new generation resources under-consider the possibility that energy efficiency could provide an alternative solution to load growth, such that applying a presumption of need based on a market justification may perpetuate the market failures that plague energy efficiency.

[327] Fl. Stat. Ann. § 403.519.

[328] 30 V.S.A. § 248(b).

[329] Jeremy Knee, *Rational Electricity Regulation: Environmental Impacts and the "Public Interest"*, 113 W. Va. L. Rev. 739, 758-59 (2011).

enough, standing alone, for it to require serious consideration of energy efficiency as an alternative, given that energy efficiency investments may often be cheaper and will always be cleaner than new transmission or generation.[330]

Advocates can use the process of a project developer or utility applying for a Certificate of Public Convenience and Necessity as an opportunity to ensure that the project's proponents and the PUC have adequately considered energy efficiency. For example, several intervenors recently argued to the New Jersey Board of Public Utilities that a transmission line being proposed by the utility PSE&G had been rendered unnecessary by the drop in energy demand caused by the U.S. recession and the ability of energy efficiency and demand response to meet projected new demand.[331] The Board disagreed in that case, but even so, noted in its decision that it too "ha[d] advocated that PJM [the relevant regional transmission operator] give greater recognition to demand response and energy efficiency measures in its system planning."[332] This case is but one example of how PUCs are increasingly attuned to the ways in which energy efficiency permeates all aspects of energy decision-making, and how advocates of energy efficiency can help raise its profile in major system-wide decisions.

PUCs can also consider energy efficiency in a different vein when evaluating project siting: even if energy efficiency may not eliminate the need for a new facility, PUCs can require a facility to undertake efficiency measures to reduce its size or to offset some of the negative impacts that the project may have. For example, in approving a new transmission project in 2009, the Minnesota PUC exacted a number of conditions, including that the Minnesota project owners would offset their in-state carbon emissions by investing in measures to reduce emissions an equal amount, including energy efficiency measures above and beyond those already required by law.[333]

Many PUCs also have some approval authority over utilities' proposed power purchase agreements (PPAs). PPAs are long-term contracts between an electricity supplier and a utility responsible for delivering electricity to its customers, and they are now used by many utilities to meet a large portion of their loads.[334] Like new transmission and generation, PPAs in many states must be

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[330] For example, the Illinois PUC, which is not explicitly required to consider environmental costs in facility siting, has nevertheless "rigorously inquired into the details of environmental externalities." *Id.* at 759.

[331] *See* State of N.J. Board of Public Utilities, *In the Matter of the Petition of Public Service Electric and Gas Company for a Determination Pursuant to the Provisions of N.J.S.A. 40:55D-19 (Susquehanna-Roseland Transmission Line)*, Decision & Order, Docket No. EM09010035 (Feb. 11, 2010). Advocates have petitioned the Board to reopen the case, in light of new analysis that allegedly shows that the line has become unnecessary. *See* Motion to Reopen Proceedings, *In the Matter of the Petition of Public Service Electric and Gas Company for a Determination Pursuant to the Provisions of N.J.S.A. 40:55D-19 (Susquehanna-Roseland Transmission Line)*, Decision & Order, Docket No. EM09010035 (Dec. 20, 2010).

[332] *Id.* This case also illustrates the complicated interrelationship among utilities, regional transmission organizations, and PUCs in deregulated markets, all of whom play a role in making transmission, generation, and siting decisions. This topic is beyond the scope of this handbook, but future work on best practices for coordination among these entities might prove useful.

[333] *See* Minnesota PUC, *In the Matter of the Application of Otter Tail*, Order Granting Certificate of Need With Conditions, Docket No, E-017, ET-6131, ET-6130, ET-6144, ET-6135, ET-10/CN-05-619 (March 17, 2009).

[334] *See* Timothy P. Duane, *Greening the Grid: Implementing Climate Change Policy Through Energy Efficiency, Renewable Portfolio Standards, and Strategic Transmission System Investments*, 34 VT. L. REV. 712, 745 (2010).

deemed in the public interest by the PUC before they are allowed to proceed. This review authority gives PUCs the ability to place certain conditions on these PPAS. For example, California has adopted a policy that prohibits its utilities from entering into a long-term PPA unless "any baseload generation supplied under the long-term financial commitment complies with the greenhouse gases emission performance standard established by the commission."[335] The provision goes on to specify that PPAs cannot contract for generation supply that has a rate of greenhouse gas emissions higher than the rate of emissions for combined-cycle natural gas baseload generation.[336] While this California example does not relate directly to energy efficiency, it stands as an example of the authority that PUCs can be given over PPA agreements. It is conceivable that PUCs could similarly use their PPA approval authority to prioritize energy efficiency through creating certain incentives.[337]

8.2 *Mergers*

Another interesting policy tool that can be used to incentivize energy efficiency is the power that some state PUCs have to approve or disapprove mergers between utilities. For example, in Maryland, the Public Service Commission must approve any acquisition that would give a company "the power to exercise any substantial influence over the policies and actions of an electric company, gas and electric company, or gas company, if the person would become an affiliate of the electric company, gas and electric company, or gas company as a result of the acquisition."[338] Before approving the merger, the Commission must find that the merger is "consistent with the public interest, convenience and necessity, including benefits and no harm to consumers."[339]

In December 2011, Maryland used this approval authority to advance its clean energy agenda. Earlier that year, Exelon Corporation announced a planned takeover of the Baltimore-based Constellation Energy Group. Originally, Exelon pledged to develop 25 megawatts of renewable energy as part of its acquisition plan.[340] After discussions with the state, Exelon and Constellation filed a new merger settlement with the Public Service Commission that pledged development of at least 30 MW of solar generation and an additional 125 MW of other renewable energy, and promised to contribute funding to help the state develop off-shore wind.[341] The merger settlement also proposed that Exelon would contribute $50 million, not recoverable in rates, to help spur energy efficiency and demand-side management.[342]

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[335] Cal. Pub. Util. Code § 8341(a).
[336] *Id.* § 8341(d).
[337] Duane, *supra* note 334, at 745. We did not find any examples of states currently implementing such a practice, though that is not to say there are none.
[338] MD Code, Public Utilities, § 6-105(e).
[339] *Id.* § 6-105(g)(3).
[340] *See* Julie Johnsson & Bradley Olson, *Utilities in Power Squeeze as States Tie Mergers to Clean Energy*, BLOOMBERG, Dec. 16, 2011.
[341] *See* Joint Petition for Approval of Settlement, In the Matter of the Merger of Exelon Corp. and Constellation Energy Group, Inc., Before the Pub. Serv. Comm'n. of Md., Case No. 9271, at 9-15 (Dec. 15, 2011).
[342] *Id.* at 7.

Prioritizing such environmental commitments during merger approvals is a relatively new phenomenon; traditionally, state authority over mergers has been used to secure lower rates and customer rebates.[343] But now that state renewable energy and energy efficiency goals are becoming central components of state energy strategies, it makes sense to ask what effects a major merger will have on accomplishment of these state goals. This Maryland anecdote illustrates the power that state approval of mergers can have to extract energy efficiency (and renewable energy) commitments from acquiring parties. In states with similar merger approval laws, state officials and advocates should pay attention to potential mergers as another avenue for gaining energy efficiency support.[344]

[343] Julie Johnsson & Bradley Olson, *supra* note 340.
[344] Separate from these state processes, FERC also has the authority to approve, or disapprove, most proposed utility mergers.

9. State NEPA Review

For federal agency decisions, environmental review is required pursuant to the National Environmental Policy Act (NEPA). Many states have adopted similar environmental review requirements for state agencies, through statutes that are often referred to as "state NEPAs" or "little NEPAs."[345] In states with little NEPAs, often some of the decisions made by the PUC are subject to little NEPA rules, providing another avenue for considering energy efficiency. (Often, rate-making is exempted from the state NEPA, and some states exempt additional PUC decisions as well.[346]) Moreover, "[t]hese statutes also provide for public participation from the early stages of government decision-making. Thus, state NEPAs can provide a procedural device for early and significant public involvement in a utility commission's decision-making about matters that could affect the environment and the health of the public."[347]

PUC consideration of decisions with significant environmental impacts often necessitates the preparation of an "Environmental Impact Statement" (EIS).[348] Initially, a less-detailed "Environmental Assessment" is prepared. This provides the basis of a determination of whether or not significant impacts are present such that a full EIS is necessary. In the case of proposed new generation and transmission projects, an EIS is often required, because these large-scale projects tend to have significant environmental implications. EISs typically must contain an evaluation of feasible alternatives to a given proposed project,[349] and it is here that advocates and commissioners can ensure that energy efficiency has been adequately examined as a possible alternative to new generation or transmission, or as a method of reducing the size of needed generation or transmission facilities.[350] After a draft EIS is published, state NEPAs typically require a time for the agency to accept and respond to comments. Advocates can use this comment period to attempt to ensure that an EIS gives the fullest review possible of energy efficiency alternatives.

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[345] As of December 2011, the Council on Environmental Quality reported that 19 states have state-level analogs to NEPA. *See State Environmental Planning Information*, COUNCIL ON ENVIRONMENTAL QUALITY, http://ceq.hss.doe.gov/nepa/regs/states/states.cfm (last visited Jan. 30, 2011).

[346] For example, New York exempts PSC decisions regarding siting of generation and transmission facilities over a certain size from its State Environmental Quality Review Act, reasoning that the Certificate of Environmental Compatibility and Public Need process provides analogous environmental safeguards. *See* N.Y. Envtl. Cons. L. § 8-0111(5)(b); N.Y. Pub. Serv. L. Art. 10; N.Y. DEP'T OF ENVTL. CONS., THE SEQR HANDBOOK 10 (3d. ed. 2010).

[347] Michael Dworkin et al., *supra* note 121, at 4.

[348] Like the federal NEPA statute, state NEPAs typically only require EISs for those projects that are expected to have "significant" environmental impacts. *See, e.g.*, 6 N.Y. COMP. CODES R. & REGS. Tit. 6, § 617.7(a) ("To require an EIS for a proposed action, the lead agency must determine that the action may include the potential for at least one significant adverse environmental impact."). The "significance" determination is therefore an important preliminary step to an EIS even being prepared.

[349] *See, e.g.*, 6 N.Y. COMP. CODES R. & REGS. tit. 6, § 617.9(5)(iv) (requiring an EIS to contain a "description and evaluation of the range of reasonable alternatives to the action that are feasible, considering the objectives and capabilities of the project sponsor," including a "no action" alternative).

[350] *See* Adam Riedel, *Encouraging Energy Efficiency through NEPA Comments*, (Columbia Law School Center for Climate Change Law White Paper, July 2012), *available at* https://www.law.columbia.edu/null/download?&exclusive=filemgr.download&file_id=621883.

A good example of the state NEPA process at work can be seen in the Wisconsin PUC's recent consideration of a proposed transmission project. In Wisconsin, the sponsor of a new generation or transmission project must apply to the PSC for a Certificate of Public Convenience and Necessity.[351] Before ruling on the need for a project, the PSC is required to prepare either an EIS or an EA (often in collaboration with the Department of Natural Resources).[352] In November 2011, the Wisconsin PSC released a draft EIS for the proposed 345 kilovolt "Alma-La Cross" transmission project, a 45 to 55 mile long project.[353]

This draft EIS mentioned energy efficiency-relevant considerations in two sections. In its section on "Need for the Proposed Project," the draft EIS critically examined projected future demand. It questioned the developers' assertion that population growth would increase demand for electricity in the communities that would ostensibly benefit from the new line.[354] It noted that the best estimate of projected peak load growth rate in the area was likely far below the figure used by the developers, and concluded that further questioning was needed as to whether future demand growth would really tax the existing electric system.[355]

The draft EIS also examined potential alternative solutions to building the proposed transmission line. It summarized the applicants' contention that demand-side management solutions would not adequately address the needs of the area, and also mentioned the results of a study on energy efficiency that concluded that energy efficiency opportunities exist in Wisconsin that could render the area's peak demand growth negative. The draft EIS noted, however, that "at this time, there is no regulatory authority to ensure energy user compliance with load reduction and energy efficiency goals."[356] Ultimately, the Wisconsin Public Service Commission ended up granting the project a Certificate of Public Convenience and Necessity in May 2012, after concluding that there was not adequate evidence that energy efficiency provided a reasonable alternative to new transmission for the area.[357]

This draft EIS from Wisconsin illustrates two of the key ways that preparation of an EIS can facilitate consideration of energy efficiency: first, planned energy efficiency measures can factor into the projected future electricity demand for an area, ensuring that future estimates of demand are accurate and potentially negating the need for a project. Second, potential energy efficiency policies may be able to serve as a feasible alternative to a transmission or generation project—and often one that might be

[351] These certificates are discussed in more detail *supra* section 8.1.
[352] *See* WIS. STAT. ANN. § 196.025(2) (2011) (subjecting the Commission to the state's general environmental impacts requirements and specifying that the commission shall promulgate standards for determining the necessity of preparing an EIS); *id.* § 1.11 (setting forth the requirements of the state's Environmental Policy Act).
[353] Pub. Serv. Comm'n of Wisconsin & Wisconsin Dep't of Natural Res., *Alma—La Crosse 345 kV Transmission Project Volume I Draft Environmental Impact Statement*, PSCW Docket No. 05-CE-136 (Nov. 2011).
[354] *Id.* at XVI.
[355] *Id.* at XVII.
[356] *Id.* at 21.
[357] Pub. Serv. Comm'n of Wisconsin & Wisconsin Dep't of Natural Res., Final Decision, Joint Application of Dairyland Power Coop. et al. for Authority to Construct and Place in Service 345 kV Electric Transmission Lines and Electric Substation Facilities, PSCW Docket No. 05-CE-136, at 18 (May 30, 2012).

able to deliver the same benefits, at the same or lower costs, but with fewer environmental impacts. In those states where a little NEPA is applicable, commissioners and advocates can and should use the little NEPA process as an opportunity to ensure that energy efficiency is considered in both these veins.

10. Exploring New Models

This section of the handbook documents some newer experiments that PUCs are undertaking in the field of energy efficiency policy. Although the tools described here are not as well-established, they may prove to be key parts of the next generation of energy efficiency policies.

10.1 *Geo-targeting*

Geographic targeting, or "geo-targeting," of energy efficiency involves targeting a state's energy efficiency programs to particular geographic locales. Vermont has been the leader on geo-targeting, and it has chosen to focus its efficiency programs in those areas where greater efficiency investments are most likely to defer the need for new transmission and distribution.

Vermont uses some of its energy efficiency funding to encourage efficiency statewide, and some to focus on particular areas. Vermont's energy efficiency utility,[358] Efficiency Vermont, selects target areas across the state where the transmission and distribution systems have been identified as constrained.[359] It then "focuses on specific energy efficiency efforts for customers within these targeted territories," including "enhanced services or increased incentives to encourage efficiency measures."[360] Although it might be seen as controversial to give some state residents higher incentives or more services than others, Efficiency Vermont explains its decision in this way:

> In addition to lowering the energy costs for participating homes and businesses, the energy savings from Geographic Targeting will reduce the overall peak demand for electricity. These efforts benefit all customers across the state by reducing expensive power supply purchases. If enough homes and businesses improve their electrical energy efficiency within these targeted areas, all Vermont electric ratepayers will benefit by avoiding the need for additional transmission and distribution upgrades.[361]

Efficiency Vermont's geo-targeting efforts are still in their infancy, but early results suggest that there was significantly higher participation in energy efficiency programs in geo-targeted areas than there was in the state as a whole.[362] However, although geo-targeted programs were still required to be cost-effective, programs in geo-targeted areas did end up costing approximately 25% more than programs on average did across the state.[363] But if these costlier programs result in avoiding spending ratepayer money on new transmission and distribution in the future, the additional costs may well be worthwhile.

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[358] *See infra* section 10.3 for more detail on energy efficiency utilities.
[359] *See* Efficiency Vermont, Geographic Targeting, at http://www.efficiencyvermont.com/about_us/energy_initiatives/geographic_targeting.aspx.
[360] *Id.*
[361] *Id.*
[362] *See* T.J. Poor, Geotargeting in Vermont: Using Energy Efficiency to Avoid or Defer Transmission and Distribution Constraints 9, Presentation at the ACEEE Conference on Energy Efficiency as a Resource (Sept. 2011), *available at* http://aceee.org/conferences/2011/eer/program.
[363] *Id.* at 11-13.

10.2 *Combining Energy & Environmental Regulatory Functions*

A recent trend among policymakers at both state and federal levels is the desire to better integrate energy and environmental regulatory functions. This trend stems from a recognition that energy and environmental policy are inherently linked, perhaps more so in the era of climate change than ever before. As early as April 2007, Massachusetts Governor Deval Patrick reorganized his cabinet and added the Department of Public Utilities and Division of Energy Resources to the Executive Office of Environmental Affairs.[364] This created the Executive Office of Energy and Environmental Affairs, a larger office that oversees six departments, including the renamed Department of Energy Resources and the Department of Public Utilities, as well as various other environmental departments and additional offices.[365]

In February 2011, Connecticut Governor Dannel Malloy officially announced similar plans for the creation of the Connecticut Department of Energy and Environmental Protection (DEEP) by merging the Department of Environmental Protection with various energy agencies including the former Department of Public Utility Control.[366] This announcement received media interest, with the Hartford Courant noting potential "sweeping effects on environmental quality and the cost of energy to consumers"[367] and the Connecticut Mirror stating that this is "expected to enhance energy planning efforts while reducing spending across three existing agencies."[368]

The governor's plans became reality in July 2011, as the Connecticut Senate passed Bill No. 1243 (Public Act No. 11-80), establishing the DEEP with the goals of "(1) [r]educing rates and decreasing costs . . . (2) ensuring the reliability and safety of . . . energy supply, (3) increasing use of clean energy and technology . . . and (4) developing . . . energy-related economy."[369] The Act discusses several goals of environmental protection and energy use, and specifically addresses the new Public Utilities Regulatory Authority (PURA). The PURA remains responsible for rate regulation for public utilities and regulated entities and is responsible for promoting policies that lead to just and reasonable utility rates.[370] However, the Act states that "decisions of the [PURA] shall be guided by the goals of the [DEEP] . . . and by the goals of the comprehensive plan and the integrated resource plan . . ."[371] The new Authority

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[364] *About Us,* Mass. Executive Office of Energy and Environmental Affairs, http://www.mass.gov/eea/utility/about-us.html (last accessed April 16, 2012).
[365] *Id.*
[366] Press Release, Connecticut Governor Dannel P. Malloy, Governor Malloy Proposes Consolidated Department of Energy & Environmental Protection (Feb. 8, 2011), *available at* http://www.governor.ct.gov/malloy/cwp/view.asp?A=4010&Q=473626.
[367] Jon Lender, *Malloy Would Merge Environmental, Utility-Control Agencies*, HARTFORD COURANT (Feb. 8, 2011), http://articles.courant.com/2011-02-08/news/hc-consolidating-agencies-malloy-020920110208_1_state-budget-proposal-cost-savings-agency.
[368] Keith Phaneuf and Mark Pazniokas, *Malloy to Consolidate DEP, DPUC*, THE CONNECTICUT MIRROR (Feb. 8, 2011), http://www.ctmirror.org/story/11435/malloy-consolidate-dep-dpuc.
[369] S. 1243, 2011 Gen. Assemb. (Conn. 2011).
[370] *Id.*
[371] *Id.*

therefore has similar functions as the previous Department, though it now operates under the DEEP and is more focused on environmental issues.

Presently it is difficult to determine whether the new Connecticut DEEP will fulfill Governor Malloy's goals "to strengthen our ability to protect the environment; to clean, conserve and lower the cost of energy; and to set the table for rapid and responsible growth."[372] But the model at least shows increased sensitivity to the ways in which state environmental policy priorities should more overtly influence and work in tandem with energy planning.

10.3 *The Energy Efficiency Utility*

Another expanding and evolving model of delivering energy efficiency is the "energy efficiency utility" (EEU). In essence, such an entity formulates, publicizes, and administers energy efficiency programs, such as those described in Appendix A. In 1999, Vermont became the first state to establish an independent non-profit ratepayer-funded EEU responsible for delivering energy efficiency.[373] The purpose was to avoid the disincentives regular utilities faced with energy efficiency and to create an efficiency utility with an effective administration system.[374] After the legislature granted legal authority, the Public Service Board approved a settlement between Vermont's electric utilities, various consumer and environmental groups, and the Department of Public Service (Vermont's PUC).[375] The EEU, Efficiency Vermont, is administered by the Vermont Energy Investment Corporation and funded with a 4.5 percent fee on each customer's energy bill.[376] Between 1999 and 2009, Efficiency Vermont contracted with the Public Service Board to provide energy efficiency to customers, with oversight by a Contract Administrator and a Fiscal Agent.[377] The Department of Public Service (DPS) had an active role in the creation of Efficiency Vermont, proposing that the EEU carry out efficiency programs in commercial and industrial markets, construction, dairy farms, residential constructions, and other areas with potential for energy savings.[378] Additionally, the DPS is "in charge of providing for formal evaluation of . . . programs and program performance . . . [it] will also develop and present avoided cost information, necessary to assess program design and expected benefits . . . [and it] will continue to propose new initiatives . . . for the [EEU to consider]."[379] However, the DPS has no direct authority over

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[372] *Malloy Proposes New Combined Energy, Environment Agency*, NEW HAVEN REGISTER (Feb. 8, 2011), http://nhregister.com/articles/2011/02/08/news/doc4d51da052a393996686495.txt.
[373] Efficiency Vermont, *How Efficiency Vermont Works*, http://www.efficiencyvermont.com/about_us/information_reports/how_we_work.aspx.
[374] *Id.*
[375] Vt. Pub. Serv. Board, *Investigation into the Department of Public Service's Proposed Energy Efficiency Plan Re: Phase II*, 7 – 9 (Sep. 30, 1999), *available at* http://psb.vermont.gov/sites/psb/files/orders/1999/5980eeu.PDF.
[376] Susan Arterian Chang, *The Rise of the Energy Efficiency Utility*, IEEE SPECTRUM (May 2008), http://spectrum.ieee.org/green-tech/conservation/the-rise-of-the-energy-efficiency-utility/0.
[377] *Energy Efficiency Utility Creation and Structure*, VT. PUB. SERV. BOARD, http://psb.vermont.gov/utilityindustries/eeu/generalinfo/creationandstructure.
[378] VERMONT PUBLIC SERVICE BOARD, *supra* note 375, at 14-20.
[379] *Id.* at 33.

the utility, with the exception of the power to request information.[380] This created a unique system for improving energy efficiency in Vermont.

In 2009, Efficiency Vermont saved approximately 85 million kWh of electricity, at an estimated cost of 3.8 cents per kWh, significantly lower than the 13.6 cents per kWh electric utilities would have to spend to generate such an amount of power.[381] The success of Efficiency Vermont prompted the legislature and the Public Service Board to move from 3 year contracts to a longer and more stable 12 year "Order of Appointment" structure with increased responsibility and oversight.[382] The new structure has increased the role of the Department of Public Service, which has the power to certify Efficiency Vermont's performance and evaluate its progress towards satisfying its responsibilities on an annual basis.[383] Based on Vermont's success, several other states have picked up on this model, including Delaware, Hawaii, Maine, and Oregon.[384]

Delaware's "Sustainable Energy Utility" (SEU) represents a second generation of EEUs, with more ambitious plans and scope than Vermont's utility-sector focus, and, consequently, a non-PUC state administrator. The Delaware General Assembly first created the Sustainable Energy Utility Task Force in June 2006 following rising electricity prices.[385] The Task Force noted Delaware's current inefficiency relative to neighboring states and its potential for energy savings, and stated three goals for the SEU: "[1] Provide market development for . . . high-efficiency alternatives in energy-using equipment to enable 30% savings in household and company energy use . . . [2] Provide expanded weatherization services to residences . . . [3] Promote at least 300 MW of customer-sited renewable energy applications [by 2019]."[386]

The SEU model in Delaware seeks to provide a full spectrum of sustainable energy services entirely through a third party, streamlining service delivery to customers while creating a single point of contact for energy users.[387] By acting as "a single statewide clearinghouse" for efficiency services in all end-use markets and fuels, the SEU uses competitive contracts and incentives to go beyond other energy efficiency utilities while minimizing administrative costs.[388] The Delaware Energy Office and a newly created Oversight Board oversee the SEU, whose funding comes from multiple sources that minimize

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[380] *Id.* at 34.
[381] *Efficiency Vermont's Accomplishments*, VT. PUB. SERV. BD., http://psb.vermont.gov/utilityindustries/eeu/generalinfo/evtaccomplishments (last visited April 16, 2012).
[382] VT. PUB. SERV. BD., *supra* note 377.
[383] VT. PUB. SERV. BD., INVESTIGATION INTO PETITION FILED BY VERMONT DEPARTMENT OF PUBLIC SERVICE RE: ENERGY EFFICIENCY UTILITY STRUCTURE, 35 – 36 (Nov. 24, 2009), *available at* http://psb.vermont.gov/sites/psb/files/orders/2009/7466OrderReStructure.pdf.
[384] *Renewable Power & Energy Efficiency: Energy Efficiency Resource Standards and Goals*, FERC, http://www.ferc.gov/market-oversight/othr-mkts/renew/othr-rnw-eers.pdf (updated Sep. 13, 2011).
[385] SUSTAINABLE ENERGY UTILITY TASK FORCE, THE SUSTAINABLE ENERGY UTILITY: A DELAWARE FIRST 1 (2007), *available at* http://www.seu-de.org/docs/SEU_Final_Report.pdf.
[386] *Id.* at 7, 47-49.
[387] JOHN BYRNE ET AL., CENTER FOR ENERGY AND ENVIRONMENTAL POLICY, SUSTAINABLE ENERGY UTILITY DESIGN: OPTIONS FOR THE DISTRICT OF COLUMBIA 19 – 20 (2007), *available at* http://www.ceep.udel.edu/energy/publications/2007_es_Wash%20DC_SEU_report_final.pdf?_encoding=UTF8.
[388] *Id.* at 21.

public liability: Delaware's green energy fund, sales of Renewable Energy Credits, energy shared savings programs (the SEU receives a portion of customer cost savings from efficiency), and tax-exempt bonds.[389] Delaware's PUC has no jurisdictional authority to regulate the SEU and is limited to regulating electricity and gas markets.[390] So far, the SEU has focused mainly on public buildings, issuing bonds to fund retrofits that private contractors are then hired to execute. Although the SEU is still relatively new, it has already attracted pledges of $40 million in private equity.[391]

Independent energy efficiency providers such as those of Vermont and Delaware may have numerous advantages. Third-party administrations are able to focus on energy efficiency as they have no other sales incentives, can implement efficiency measures at low cost because they are not concerned by recovery of lost margins, and can reduce inefficiency by running a single statewide program.[392] However, experts caution that choosing the right administrative model is a state-specific process.[393]

10.4 *Harnessing the Power of Data*

California's AB 1103 and resulting regulations represent another way in which energy efficiency can be encouraged: using the power of consumption data to influence property buying, leasing, and lending decisions. AB 1103 and proposed (but not yet finalized) implementing regulations require that beginning in 2013, nonresidential building owners must maintain and disclose energy usage data to prospective buyers, lessees, and lenders.[394] This data must be managed through the EPA's Energy Star program, which allows for benchmarking that compares the energy performance of various buildings.[395] It also imposes an obligation on utilities in California to maintain their customers' energy use data in a form compatible with the Energy Star program.

Although the AB 1103 program is not strictly a PUC initiative, as it is administered by the California Energy Commission and imposes primary obligations on building owners, it does directly place certain important obligations on utilities to maintain and make available energy consumption data. Similar programs in states without California's unique regulatory structure probably would necessitate PUC

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[389] *Id.* at 21-25.
[390] Jason Houck, Wilson Rickerson, *The Sustainable Energy Utility Model for Energy Service Delivery*, 29 BULLETIN OF SCIENCE, TECHNOLOGY & SOCIETY 95, 102 (2009), *available at* http://www.ceep.udel.edu/publications/2009_es_BSTS_SEU_model_DE_Wash%20DC_Houck_Rickerson.pdf.
[391] John Byrne et al., *Shifting from the Economics of Obesity to Sustainable Energy*, RENEWABLEENERGYWORLD.COM (Feb. 22, 2010), http://www.renewableenergyworld.com/rea/news/article/2010/02/shifting-from-the-economics-of-obesity-to-sustainable-energy#close=1.
[392] DIANE MUNNS, EDISON ELECTRIC INSTITUTE, TREND ANALYSIS: ADMINISTRATION OF ENERGY EFFICIENCY PROGRAMS (Sep. 2008), *available at* http://www.eei.org/ourissues/EnergyEfficiency/Documents/Third_Party_Trend_Analysis_Sep2008.pdf; Chang, *supra* note 376.
[393] *See supra* note 54 and accompanying text.
[394] *See* Cal. AB 1103; Cal. Energy Comm'n, Nonresidential Building Energy Use Disclosure Program, Proposed Regulations, Title 20, Div. 2, Ch. 4, Art. 9, §§ 1680-85 (2012). Information need not be provided, however, to individual lessees—the regulations only apply when the entire building is sold, leased, or financed. *Id.* § 1684.
[395] Cal. Energy Comm'n, *supra* note 394, § 1685.

involvement to oversee utility obligations. The theory behind this program is that building energy efficiency policies need to go beyond merely reaching new construction and major retrofits, which is the role most state building codes now serve. By requiring disclosures during lease, sale, and lending, the law will impact far more buildings. Of course, it does not impose substantive energy efficiency improvement requirements, as many building codes do. Nevertheless, requiring the provision of energy data along with comparisons to the performance of similar buildings should incentivize building owners to make greater efficiency investments, and should raise awareness of the costs of energy and potential financial and performance benefits of energy efficiency investments. Given that reliable information about the payoffs of energy efficiency appears to be one of the main hurdles to increasing participation in energy efficiency programs, California's information-forcing law may also solve one critical piece of the puzzle of increasing demand for energy efficiency programs.[396]

Exploring New Models Bibliography

Those who want to know more about the policies explored in this section may find the following more detailed resources helpful:

John Byrne et al., Center for Energy and Environmental Policy, *Sustainable Energy Utility Design: Options for the District of Columbia* (2007), *available at* http://www.ceep.udel.edu/energy/publications/2007_es_Wash%20DC_SEU_report_final.pdf?_encoding=UTF8.

Cal. Energy Comm'n, Nonresidential Building Energy Use Disclosure Program, Proposed Regulations, Title 20, Div. 2, Ch. 4, Art. 9, §§ 1680-85 (2012).

Connecticut Governor Dannel P. Malloy: *Connecticut FY2012 – FY2013 Biennium Governor's Budget*, http://www.governor.ct.gov/malloy/cwp/view.asp?a=11&Q=473940.

Connecticut Office of Fiscal Analysis: transparency.CT.gov, http://transparency.ct.gov/html/searchExpenditures.asp?LEVEL=AGENCY&ENTITY=DEP&PERIOD=2011.

Efficiency Vermont, http://www.efficiencyvermont.com/Index.aspx.

Efficiency Vermont, Geographic Targeting, http://www.efficiencyvermont.com/about_us/energy_initiatives/geographic_targeting.aspx.

Jason Houck, Wilson Rickerson, *The Sustainable Energy Utility Model for Energy Service Delivery*, 29 BULLETIN OF SCIENCE, TECHNOLOGY & SOCIETY 95 (2009), http://www.ceep.udel.edu/publications/2009_es_BSTS_SEU_model_DE_Wash%20DC_Houck_Rickerson.pdf.

Diane Munns, Edison Electric Institute, *Trend Analysis: Administration of Energy Efficiency Programs* (Sep. 2008), *http://www.eei.org/ourissues/EnergyEfficiency/Documents/Third_Party_Trend_Analysis_Sep2008.pdf*.

T.J. Poor, Geotargeting in Vermont: Using Energy Efficiency to Avoid or Defer Transmission and Distribution Constraint, Presentation at the ACEEE Conference on Energy Efficiency as a Resource (Sept. 2011), http://aceee.org/conferences/2011/eer/program

Sustainable Energy Utility Task Force, *The Sustainable Energy Utility: A Delaware First* (2007), *available at* http://www.seu-de.org/docs/SEU_Final_Report.pdf.

Vermont Public Service Board, *Investigation into the Department of Public Service's Proposed Energy Efficiency Plan Re: Phase II*, (Sep. 30, 1999) http://psb.vermont.gov/sites/psb/files/orders/1999/5980eeu.PDF.

Vermont Public Service Board, *Investigation into Petition Filed by Vermont Department of Public Service Re: Energy Efficiency Utility Structure*, (Nov. 24, 2009) http://psb.vermont.gov/sites/psb/files/orders/2009/7466OrderReStructure.pdf.

[396] *See* PALMER ET AL., *supra* note 194, at 3.

11. GREENHOUSE GAS POLICIES: A TANGENTIAL DRIVER

In response to growing concerns about climate change, many states have taken actions directly aimed at reducing greenhouse gas (GHG) emissions in the electricity sector. These policies include pricing carbon emissions and mandating that a percentage of electricity be provided by non-emitting sources. With respect to PUCs' efforts to encourage energy efficiency, it is important to note two aspects of the interaction between carbon reduction policies and energy efficiency policies. First, PUCs' energy efficiency policies do not appear to conflict with these other policies. Second, these other polices, while important in helping to send the right market signals about the true costs of various energy sources, will not by themselves adequately promote energy efficiency, because they fail to address the incentive problems that have thus far prevented the implementation of cost effective energy efficiency improvements.[397] Unless energy efficiency is promoted in its own right, the costs of reducing carbon emissions will be unnecessarily high. Thus, there is a strong case to be made for PUCs taking steps to encourage energy efficiency in tandem with other climate change policies.

11.1 *Carbon Pricing Policies*

Some states have attempted to control carbon emissions by attaching a price to such emissions. The price can either be levied directly through a tax on electricity generators or indirectly through a cap and trade policy. A cap and trade program sets a limit of the quantity of greenhouse gases to be emitted. Each emitter is either allocated, or must purchase at auction, credits that allow it to emit a certain quantity of GHGs. These credits can also be traded through secondary markets, effectively establishing a price for carbon. The Northeastern and Mid-Atlantic states have had a GHG cap-and-trade system in place since 2009, called the Regional Greenhouse Gas Initiative (RGGI). Since 2010, RGGI allowances have traded at or near their floor price, such that the program has not significantly increased the costs of carbon-intensive generating sources.[398] However, RGGI auctions have been successful in raising significant money—$913 million through November 2011—about half of which has been invested in energy efficiency programs.[399] California recently adopted the second cap-and-trade program in the country for GHGs and finalized its regulations in late 2011.[400] California's first

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[397] As mentioned earlier, many cost-effective energy efficiency improvements are not implemented due to various incentive problems. The foremost of these incentives problems is the relatively small gain accompanying such improvement in comparison to the effort required to make the improvements. Moreover, often the owner of the property does not pay the energy bills. In this situation, neither the renter nor the owner has the proper incentives to undertake energy efficiency improvements.

[398] *See* POTOMAC ECONOMICS, ANNUAL REPORT ON THE MARKET FOR RGGI CO_2 ALLOWANCES: 2010, AT 5 (April 2011).

[399] *See* PAUL J. HIBBARD ET AL., THE ECONOMIC IMPACTS OF THE REGIONAL GREENHOUSE GAS INITIATIVE ON TEN NORTHEAST AND MID-ATLANTIC STATES 20-21 (The Analysis Group, Nov. 2011), *available at* http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf.

[400] For a more robust description of RGGI, see REGIONAL GREENHOUSE GAS INNOVATIVE, OVERVIEW OF THE CO_2 BUDGET TRADING PROGRAM, *available at* http://www.rggi.org/docs/program_summary_10_07.pdf. For a description of California's Cap and Trade Program, see CALIFORNIA AIR RESOURCE BOARD, OVERVIEW OF ARB EMISSIONS TRADING PROGRAM, *available at* http://www.arb.ca.gov/newsrel/2011/cap_trade_overview.pdf.

allowance auction is scheduled for November 2012, and enforceable compliance obligations begin in 2013.[401]

A carbon tax, on the other hand, sets a fixed price on carbon emissions. While no states currently use a direct tax on carbon, a few states utilize a variation thereof that is often referred to as a carbon "adder."[402] A carbon adder requires utilities to account for the future financial risk associated with GHG emissions in evaluating new long-term resource investments by including a carbon "adder" in their resource cost calculations. During the planning stage, the adder increases the imagined price of electricity from carbon emitting sources of electricity, thus encouraging utilities to select cleaner sources of power.[403]

In essence, carbon pricing policies raise the price of electricity to account, at least in part, for the externalities of emitting carbon. To the extent that suppliers' costs of producing conventional energy better approximate the costs to society, carbon pricing will play a more and more important role in driving additional energy efficiency investments. However, although such policies have the potential to play an important role in encouraging energy efficiency, they do not address the incentive and informational problems inhibiting energy efficiency. Simply raising the price of electricity will not properly encourage renters or landlords to invest in substantial energy efficiency improvements, nor will higher prices resolve the financing difficulties confronting such improvements.[404]

Moreover, a well-utilized energy efficiency program can result in emission reductions per dollar spent of five to seven times that of just a carbon pricing program.[405] Efficiency therefore helps lower the compliance costs of a carbon pricing scheme. As one expert explains: "Efficiency studies and two decades of utility Demand Side Management (DSM) experience remind us that it will cost far less to avoid carbon emissions through energy efficiency than by adding or substituting expensive low-emissions generation on the grid."[406] The revenues from cap-and-trade auctions can also be used to directly fund energy efficiency programs—a practice currently used by many RGGI states.[407]

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[401] *See* California Air Resource Board, *California Cap-and-Trade Implementation Frequently Asked Questions* (June 25, 2012), *available at* http://www.arb.ca.gov/cc/capandtrade/implementation/faq.pdf.

[402] *See* Laura H. Kosloff & Mark C. Trexler, *Consideration of Climate Change in Facility Permitting*, *in* GLOBAL CLIMATE CHANGE AND U.S. LAW 259, 264-65 (Michael B. Gerrard ed., 2007). California has had a carbon adder policy since 2004, and Oregon and Colorado have also utilized a carbon adder. *Id.*

[403] Cal. PUC, Opinion Adopting Pacific Gas & Electric Company, Southern California Edison Company and San Diego Gas & Electric Company's Long-term Procurement Plans, Decision No. 04-12-048, Rulemaking 04-04-003 (Dec. 16, 2004).

[404] Richard Cowart, *Carbon Caps and Efficiency Resources: How Climate Legislation Can Mobilize Efficiency and Lower the Cost of Greenhouse Gas Emission Reduction*, 33 VT. L. REV. 201, 209 (2008). These barriers include the relative price inelasticity of demand for electricity, the split incentives between builders and building occupiers and landlords and tenants, confusion and lack of motivation of the part of consumers, the long payback period for some energy efficiency investments compared with the average period of home occupation, and the difficulty obtaining up-front financing for efficiency improvements. *Id.*

[405] Cowart, *supra* note 2.

[406] Cowart, *supra* note 404, at 206.

[407] Cowart, *supra* note 2.

In sum, PUCs that wish to reduce state carbon emissions at lowest cost should consider carbon pricing and energy efficiency as synergistic strategies to be employed alongside one another, rather than as substitutes or competitors.

11.2 *Renewable Portfolio & Emission Performance Standards*

Thirty states currently have a Renewable Portfolio Standard (RPS),[408] mandating that a minimum (and typically increasing) percentage of electricity be provided by renewable generation. An RPS generally creates a market for Renewable Energy Credits (RECs), each of which corresponds to one kilowatt-hour produced by a renewable source. Utilities must obtain RECs to cover the required percentage of their annual electricity sales. To meet their obligations, utilities can choose to invest in renewable generation, enter direct contracts with renewable generating facilities, or purchase excess credits from other utilities or through the spot market.[409]

As with carbon pricing, encouraging energy efficiency does not interfere with an RPS program. Energy efficiency lowers the total amount of power demanded, while an RPS shifts how that amount of power will be provided. In fact, improving energy efficiency will ease compliance with RPS: as the amount of power demanded decreases due to energy efficiency, each additional MW of renewable-generated electricity supplied will constitute a larger percentage of total energy sales. Thus, PUCs can indirectly help utilities comply with RPS targets by also mandating energy efficiency programs. Conversely, an RPS does little to encourage energy efficiency—much like cap-and-trade, it increases electricity prices but does not address the incentive and information problems confronting energy efficiency.

A separate policy to encourage cleaner generation is an Emissions Performance Standard (EPS), which limits the emissions rate of retail electricity suppliers' new supply contracts. For instance, California's EPS program requires that electricity retailers' new long-term generation contracts be with power plants that have emission rates no greater than a combined natural gas turbine plant.[410] This requirement means that in effect, power plants with greater emission rates (namely, coal) will not be allowed to enter into long-term, base-load supply contracts with electricity retailers.

An energy efficiency program will not disrupt EPS programs. Like an RPS, an EPS focuses on changing the generation mix over time. While an effective energy efficiency program will lower the total amount of energy required, such a program will not affect the electricity retail providers' current or

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[408] Ivan Gold & Nidhi Thakar, *A Survey of State Renewable Portfolio Standards: Square Pegs for Round Climate Change Holes?,* 35 WM. & MARY ENVTL. L. & POL'Y REV. 183 (2010).
[409] For a comparison of RPSs in various states, *see id.*
[410] Cal. Pub. Utils. Comm'n Docket No. R.06-04-009; Press Release, California Public Utility Commission, PUC sets GHG Emissions Performance Standard to help mitigate Climate Change, (Jan. 25, 2007) *available at* http://docs.cpuc.ca.gov/Published/NEWS_RELEASE/63997.htm.

future contracts.[411] Moreover, an EPS will do little to encourage energy efficiency, as the only effect on end-users may be a modest increase in price, which will not address the implementation problems mentioned above.

Greenhouse Gas Policies: A Tangential Driver Bibliography

Those who want to know more about state greenhouse gas policies, RPS, and EPS may find the following more detailed resources helpful:

Reports

Richard Cowart, *Carbon Caps and Efficiency Resources: How Climate Legislation Can Mobilize Efficiency and Lower the Cost of Greenhouse Gas Emission Reduction*, 33 Vt. L. Rev. 201 (2008).

Ivan Gold and Nidhi Thakar, *A Survey of State Renewable Portfolio Standards: Square Pegs for Round Climate Change Holes?,* 35 Wm. & Mary Envtl. L. & Pol'y Rev. 183 (2010).

Warren Leon, State-Federal RPS Collaborative. *Designing the Right RPS: A guide to Selecting Goals and Program Options for a Renewable Portfolio Standard,* Clean Energy States Alliance (2012), http://www.cleanenergystates.org/assets/2012-Files/RPS/CESA-RPS-Goals-and-Program-Design-Report-March-2012.pdf.

Charles Kubert and Mark Sinclair, National Renewable Energy Laboratory, *State Support for Clean Energy Deployment: Lessons Learned for Potential Future Policy.* Clean Energy States Alliance (2011), http://www.cleanenergystates.org/assets/2011-Files/Renewable-Energy-Finance/CESA-NREL-State-Support-for-CE-April-2011.pdf.

PEW Center, Climate Change 101: Cap and Trade (2011).

Richard J. Pierce, Jr., *The Past, Present, and Future of Energy Regulation*, 31 Utah Env. L. Rev. 291 (2011).

Jonathan Ramseur, Climate Change: Action by States to Address Greenhouse Gas Emissions, Congressional Research Service (2007), http://fpc.state.gov/documents/organization/80733.pdf.

Edwards Rubin, PEW Center, A Performance Standards Approach to Reducing CO2 Emissions from Electric Power Plants (2009).

Chris Simpson et al. *Emissions Performance Standards in Selected States*, Regulatory Assistance Project Research Brief (2010), http://www.raponline.org/search/site/?q=emissions%20performance%20standards%20in%20selected%20states

Websites

U.S. Department of Energy, "States with Renewable Portfolio Standards," http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm

Environmental Protection Agency, "Renewable Portfolio Standards Fact Sheet," http://www.epa.gov/chp/state-policy/renewable_fs.html

Regional Greenhouse Gas Initiative, "Program Overview and Design," http://www.rggi.org/design/overview

Environmental Protection Agency, "Output-Based Environmental Regulations Fact Sheet," http://www.epa.gov/chp/state-policy/obr_factsheet.html

[411] Cal. Code Regs, tit. 20, § 2902.

12. GUIDE FOR ADVOCATES

It is important for PUCs to hear from the public that energy efficiency is a priority worth pursuing vigorously. All PUCs have a mechanism by which public advocates can intervene in PUC proceedings to voice their opinions on important policy decisions, and as shown in several sections throughout this handbook, intervenors have often (though by no means always) considerably influenced PUC decision-making. Having an understanding of *how* to participate in these proceedings and ratemakings is an important first step in encouraging greater public participation in PUC activities. To this end, this section provides an overview of the typical procedures PUCs follow in making decisions. It first identifies the different types of proceedings (subsection 12.1), and then outlines the various stages of these proceedings and describes the time and resources necessary for effective participation in each type of proceeding (subsections 12.2-12.3). However, it is important to also note up front that rules and practices vary from state to state. Becoming familiar with a particular state PUC's rules of practice and procedure is critical to effective advocacy.

12.1 *Types of Proceedings*

The types of proceedings that commissions handle vary widely from state to state,[412] but there are enough similarities to offer an overview applicable in most situations. Being familiar with each type of proceeding should aid interested persons in advocating before regulators for the implementation of more energy efficient policies.

Informal proceedings: Commissions may establish *de facto* policies on issues in a variety of situations, such as when a commission's general counsel decides to clarify a policy in response to a letter from a company, legislator or consumer.[413] The extent to which commissions use informal proceedings to set policies varies from state to state, so it is important for advocates to know which policies in their state are set through such practices. This is especially true for informal proceedings because the public tends to have little or no involvement in them, even though it is often easier to have a successful impact on informal proceedings than it is to do so in adjudicatory ones.[414]

Rulemaking proceedings: These proceedings are typically initiated by the commission and generate rules which will apply to a class of companies or an entire regulated industry (e.g., gas, electric or water).[415] A rulemaking case typically begins when the commission decides to investigate a new

[412] For example, California's PUC uses five types of formal proceedings to review issues that come before it: application, formal complaint, order instituting investigation, order instituting rulemaking and a petition for rulemaking. CAL. PUB. UTILS. COMM'N, CONSUMER GUIDE TO THE CALIFORNIA PUBLIC UTILITIES COMMISSION*, available at* http://docs.cpuc.ca.gov/word_pdf/REPORT/42839.pdf.

[413] *See* A Consumer's Guide*, supra* note 415.

[414] This is because participating in informal proceedings does not require nearly as much formal legal knowledge, time or money. *See id.*

[415] CHARLIE HARAK, JOHN HOWAT & OLIVIA WEIN, A CONSUMER'S GUIDE TO INTERVENING IN STATE PUBLIC UTILITY PROCEEDINGS *[hereinafter* "A Consumer's Guide"*], available at* http://www.nclc.org/images/pdf/energy_utility_telecom/additional_resources/consumers_guide.pdf. While

problem that affects a whole industry and issues a general notice to the public. Unlike adjudicatory proceedings, any person may file written comments once the initial notice has been issued and there is no need to file a petition to intervene.[416] This type of proceeding is more like a legislative fact-finding process where interested parties are invited to submit written comments, rather than a formal legal proceeding in a court-type setting.[417]

Ratemaking/adjudicatory proceedings: Ratemaking proceedings are typically initiated by a company or by the PUC itself and are conducted similarly to civil cases in court. They therefore require careful conformity to each state commission's rules and practices. In rate cases, utilities typically request to change the rates they charge or the services they offer, or the PUC investigates whether existing rates or services should be changed to meet statutory standards. Often such proceedings involve the review of a specific company's operations, the approval of the construction of new power plants, or the review of rate hike requests.[418] The commission decides such issues only after hearing witnesses, accepting evidence, and reading briefs. For these proceedings, most states require a party to file a "petition to intervene" before participating.

Some states separate out ratemaking and siting cases from other more formal adjudicatory proceedings, such as enforcement actions, where the PUC sits as a court and can enforce its rules and decisions through fines and other penalties.[419] Stricter rules for intervenors and more formal rules of evidence may apply in this latter category, whereas intervenors may be allowed to participate more liberally in ratemaking and siting cases. Consultation of relevant PUC rules is important to understand the particular requirements for any given jurisdiction.

12.2 *Participating in Utility Proceedings*

Informal: Parties should look for opportunities to advance their goals through informal proceedings, but it is important to keep in mind that policies adopted informally can easily be reversed. Winning a victory in an adjudicatory case is much more likely to be long lasting.[420] Informal proceedings are often not publicized; for advocates, maintaining informal contacts with PUC staff may be the best way of knowing when relevant informal proceedings occur.

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rulemaking proceedings may be instituted only by the PUC itself, PUCs typically will entertain petitions by utilities, public advocates, or others proposing the initiation of such proceedings on specific topics. See note 392, *supra.*

[416] For this reason, intervening in rulemakings typically requires fewer resources than intervening in rate cases. *Id.*

[417] The Legal Process *[hereinafter* "The Legal Process—Washington"*]*, WASH. UTILS. & TRANSP. COMM'N, http://www.utc.wa.gov/aboutUs/Pages/theLegalProcess.aspx (last visited Jan. 19, 2010).

[418] *See id.*

[419] *See, e.g.*, Cal. Pub. Uts. Code § 1701.1 (differentiating "adjudication cases," which it defines as "enforcement cases and complaints," from "ratesetting cases"); 5 VA. ADMIN. CODE. § 5-20-80 (distinguishing "regulatory proceedings," including rate cases, from "adjudicatory proceedings").

[420] Informally adopted policies are easily undone because there is no formal process through which they are adopted which means that they can also be changed without any formality. Changes can be a result of newly appointed commissioners, staff or any other reason. *See id.*

Rulemaking: When a rulemaking is taking place, the extent of participation possible will depend on what the commission decides will follow the issuance of the notice to the public. The most common way to participate in rulemaking proceedings is the filing of written comments. In those situations where a commission also decides to hold public hearings, advocates may speak publicly at these events. Also, if informal sessions are held, advocates may participate by attending these sessions and exchanging ideas about the proposed rules.[421]

Adjudicatory/Ratemaking Proceedings: Typically parties may participate in these proceedings by seeking either "full party" status (intervenor) or "limited party" (interested party) status. To gain intervenor status, a party files a motion to intervene showing that the party's substantial interests may be affected by the case. Once approved by the commission, a party with intervenor status has the same rights and obligations as the other formal parties and is similarly bound by the commission's procedural rules.[422] Parties with "limited" status, on the other hand, are not parties to the case and may be prohibited from conducting discovery or cross-examining witnesses. They may however, be allowed to make a written or verbal statement for the record in support or in opposition to a case or to give information to the commission staff that they believe may be useful.[423]

Ex parte restrictions: Once a formal proceeding--whether rulemaking or adjudicatory--has been instituted, the commission's rules may forbid communications with commissioners and members of the commission staff with respect to the subject matter of the proceeding unless they are formally filed with the commission and served on all parties to the proceeding. The scope of ex parte restrictions will vary from state to state, but their underlying purpose is to assure that commission decisions are made on the basis of evidence and arguments that are in the public record.[424]

12.3 *Stages of Adjudicatory/Ratemaking Proceedings*

Initial Filing: A proceeding begins when an individual or a regulated utility files an "application" with the commission.[425] Initial filings, particularly in rate cases, often include, or are shortly followed by, written direct testimony of the applicant's witnesses in support of the relief, *e.g.,* increased rates, requested. It is important to get a copy of this initial filing as early as possible in order to determine which issues of interest will be raised during the case. Most PUCs maintain online dockets through which these filings are publicly available. The commission itself may institute a proceeding to investigate a utility's existing

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[421] For example, interested parties may discuss best ways to implement policies, technical issues, or the positive or negative consequences of a proposed rule.

[422] For example, a full party has the right to submit testimony of its own witnesses, conduct discovery, cross-examine other parties' witnesses, make legal arguments; its witnesses are themselves subject to cross-examination. *See* Pub. Util. Comm'n of Texas, http://www.puc.state.tx.us/agency/rulesnlaws/Participate.aspx (last accessed Jan. 31, 2012).

[423] *Id.*

[424] *See, e.g.,* Article 8 of the CPUC rules.

[425] PUCs conduct adjudicatory hearings on a number of issues including new fees for utility services, rate hike cases, approvals of new power plants, and cases involving cost of fuel or proposed mergers. *See* A Consumer's Guide*, supra* note 415.

rates or terms of service. Moreover, outside parties may file complaints challenging such rates or services and asking the commission to institute a formal ratemaking or legislative proceeding.

Notice: After the commission receives an initial filing or institutes an investigation, it issues a public notice through newspapers, its website, and/or mailing lists of interested persons. Along with other pertinent information, the notice will include a deadline for filing petitions to intervene, which may be strictly enforced.[426] Although different states have varying rules on the contents of the petition, a typically successful petition to intervene will clearly state a party's interest in the proceeding and include a description of how the party will be affected by the outcome.[427]

Conference: Soon after an initial filing has been made and notice has been given of the pending proceeding, a commission will typically hold a prehearing conference in order to identify potential parties, narrow down the issues of the case, and set the schedule for the case.[428] Attendance at these conferences will increase the likelihood of intervenors becoming part of any forthcoming settlement talks between the parties and will, at the very least, put the other parties on notice of intervenors' active involvement and dedication to the issues in the proceeding.[429] Commissions often also assign a hearing officer or an administrative law judge (ALJ) to oversee a particular case. The officer or ALJ hears evidence, considers briefing, and issues a proposed decision for the commission's consideration.

Discovery: Each party to an adjudicatory case has the right to gather information and pose questions to the other parties involved. The process by which parties to a proceeding exchange information is known as "discovery" and it is typically accomplished through data requests, either written or oral.[430] Information in a PUC's files is typically also available through public records laws, though for parties, discovery often proves a better method. The usual means of discovery in utility cases is through written questions (interrogatories) and/or document demands that one party serves upon another party. Oral discovery is called a "deposition" and is generally allowed, although it is uncommon in commission proceedings.[431]

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[426] While some states are strict about this deadline, others do not require a formal petition to intervene as long as the party shows up at the initial pre-hearing conference and there are no objections to the intervention. *See id.*
[427] For example, New Hampshire's rules require a party seeking intervenor status to demonstrate that the party's "rights, duties, privileges, immunities or other interests may be affected by the case." N.H. REV. STAT. ANN. § 541-A:32.
[428] For example, the Vermont Public Service Board's scheduling of a case involving a siting decision includes a visit to the site in question, setting a public hearing date, and determining deadlines for the filing of various motions and briefs. Vermont Public Service Board, *Citizens' Guide to the Vermont PSB's Section 248 Process [hereinafter* "Vermont Citizens Guide"*], available at* http://psb.vermont.gov/sites/psb/files/publications/Citizens_Guide_to_248.pdf.
[429] *See* A Consumer's Guide*, supra* note 415*.*
[430] *See id.* at xxi.
[431] Discovery rules vary from state to state and in some states there may not even be any written rules on discovery. In such cases, discovery procedure is governed by accepted practice in that jurisdiction. *See, e.g.*, Cal. Pub. Utils. Comm'n, Discovery: Custom & Practice Guidelines, *available at* http://docs.cpuc.ca.gov/word_pdf/REPORT/117475.pdf.

Answering Testimony: After an initial round of discovery, intervenors and the PUC staff will normally be allowed to submit testimony of their own, contradicting or supporting the initial testimony filed by the applicant. Such testimony will itself be subject to discovery, and the applicant may then have an opportunity to file rebuttal testimony.

Hearing*:* Following the completion of discovery and submission of the successive rounds of testimony, the commission will typically hold trial-type hearings at which witnesses who have submitted testimony will be subject to cross-examination by other parties. Although most witnesses who take the stand in utility cases are "experts" in the subject matter they are testifying about, it is important to note that parties are nonetheless free to present non-expert witnesses as well. All witnesses, whether experts or not, should be ready to be cross-examined by opposing counsel when they take the stand to give testimony.[432]

Briefs: Once all evidence has been presented and the hearing phase of the case is complete, the parties are given time -- typically a few weeks -- to submit their briefs. There may also be pre-hearing briefing as well. A brief should be a concise summary of the relevant evidence presented at the hearing, arguing why the commission should rule in your favor based on applicable law.[433] Rules governing the brief's format and procedure for submission vary substantially from state to state and should be consulted early on. In cases heard by a hearing examiner or administrative law judge, briefs (and often reply briefs) are submitted to the judge before he or she issues a proposed decision, and, after issuance of the proposed decision, to the commission urging adoption, modification, or reversal, of that decision.

The decision: The final step is the commission issuing its decision. A party that participated in the commission's proceedings and is not satisfied with the commission's ultimate decision will generally have the right to appeal it in front of a court. The instruction for pursuing an appeal will likely be attached to the final decision. However, appellants typically face a high burden when appealing commission decisions.[434]

Strategies for Successful Intervention

Although beyond the scope of this handbook, there are numerous publications available that offer more detailed advice on (1) how and when it might make sense to intervene in PUC proceedings; and (2) how intervenors can maximize their effectiveness. Additionally, a majority of states have utility consumer advocates, appointed to represent consumers in front of the state PUC, who may be of great assistance. For further information, advocates should consult the sources listed in the bibliography below.

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[432] *Id.*
[433] *Id.*
[434] *Id.* In some cases, a party may be required to seek rehearing by the commission before appealing the decision. *See, eg,* Cal. Pub. Util Code Sec 1756.

RESOURCES FOR INTERVENORS: BIBLIOGRAPHY

Citizens' Guides

Cal. Public Utilities Commission, Guide to Public Participation (2010), *available at* http://www.cpuc.ca.gov/NR/rdonlyres/B1C2F5B2-8A22-492B-B695-8751AE7FBA76/0/GuidePblcPrtcptnApr10.pdf

Charlie Harak, John Howat & Olivia Wein, *A Consumer's Guide to Intervening in State Public Utility Proceedings, available at* http://www.nclc.org/images/pdf/energy_utility_telecom/additional_resources/consumers_guide.pdf

Regulatory Assistance Project, *Electricity Regulation in the U.S.: A Guide* (March 2011), *available at* http://www.raponline.org/document/download/id/645

Vermont Public Service Board, *Citizens' Guide to the Vermont PSB's Section 248 Process)*, *available at* http://psb.vermont.gov/sites/psb/files/publications/Citizens_Guide_to_248.pdf

Websites

Nat'l Assoc. of State Utility Consumer Advocates, http://www.nasuca.org/archive/index.php (NASUCA is the national association of utility consumer advocates across states. Contact information for individual state advocates is available in its online member directory).

"Online Bibliography of Consumer Education and Public Information Materials from Public Utilities Commissions," http://www.wutc.wa.gov/PUCPubs.nsf/ebe6b246327a29278825651d0065b867!OpenView

Appendix A: Utility and Third-Party Administered Programs

Although this handbook has focused on the policy and regulatory levers that PUCs utilize to drive energy efficiency improvements, it is utilities and other state and third-party administrators who are responsible for turning state policy goals into concrete, measurable energy efficiency improvements. This appendix provides an overview of the major types of programs employed by utilities and other program administrators to meet state energy efficiency goals, and gives some examples of their use; it is not comprehensive.

Categories of Programs

- **Audits and Consultants –** Audits and consultants help a resident or business assess how much energy their home or office uses and evaluate what improvements could be made to increase efficiency. This generally includes an evaluation of air leakage, insulation, lighting, and appliances. Vermont offers up to $2500 in incentives for energy audits. New York's FlexTech program provides cost-sharing incentives for efficiency studies, analysis, and strategies for increasing efficiency. The budget for FlexTech programs was $41,554,608 in 2011.
- **Lighting –** Incentive programs are available in many states for improvements in both residential and commercial lighting systems. For example, California utilities run residential lighting incentive programs for compact fluorescent lamps (CFLs), light emitting diodes (LEDs), halogen lighting, and other lighting products. The program uses manufacturer and retailer rebates for products typically purchased by contractors. The state spent $75 million on this program from September 2008 to July 2010. New York also has a CFL expansion program, which had a 2011 budget of $5.3 million.
- **Agricultural –** Several states have programs that offer rebates for installing more energy efficient farm equipment. Pump systems account for more than 80 percent of agricultural electric use in California, and California spent $14.7 million on pump tests and repairs between September 2008 and July 2010. As another example, Vermont offers standard rebates for improvements in agricultural lighting, dairy equipment, and refrigeration.
- **Construction –** In many states there is a focus on ensuring that the next generation of buildings will maximize efficiency. For example, Southern California Edison developed the Sustainable Communities Program to support the construction of zero net energy (ZNE) buildings. Pacific Gas & Electric has a Zero Net Energy Pilot Program, and even held a Zero Net Energy Design Competition. Indeed, California's Long Term Energy Efficiency Strategic Plan calls for all new residential construction to be ZNE by 2020, and all new commercial construction be ZNE by 2030.
- **Demand Response and Load Management –** Managing the timing and nature of the demand for power in order to level out demand across time will be an important area of investment that could see growth in the coming years. Currently, Burbank Water & Power (CA), Omaha Public Power District (NE), Austin Energy (TX), and City of Palo Alto Utilities (CA), among many others, offer time-of-use rates to industrial customers. Some (mostly smaller) utilities, such as the City

of Burlington Electric Department (VT), offer time-of-use rates to residential customers as well. Further, both Texas and California have provided customers with smart meters. AEP Texas plans to have smart meters available to all customers by 2013 and Southern California Edison customers will have smart meters installed throughout 2012.

- **Low-income Projects –** California allows low-income customers to enroll in the CARE program, which makes them eligible for participation in the Energy Savings Assistance Program. The Energy Savings Assistance Program provides no-cost attic insulation, energy efficient refrigerators and furnaces, weatherstripping and caulking, and more. Eleven different utilities including Pacific Gas & Electric and Southern California Edison are involved with this program. Vermont has the Low-Income Energy Efficiency Partnership (LEEP), and has guaranteed that at least $7,500,000 will be spent on low-income efficiency projects during the 2012-2014 period.
- **Appliances –** Some states have programs that mimic "cash for clunkers," where old, inefficient appliances can be replaced with newer, more efficient ones at reduced prices. This was a federally funded program that distributed more than $300 million in funding for efficient appliance rebates. A total of 1.7 million rebates were given out. ConEdison is currently paying $50 to customers who recycle their old, working refrigerator or freezer, and $20 to customers who recycle old air conditioners. Pacific Gas & Electric is offering $35 for old, working refrigerators and freezers, and $25 for air conditioners.
- **Financing –** Many states provide special financing structures for the above efficiency projects. In addition to on-bill financing, which is discussed *supra* section 4, utilities and third-party administrators are running many other innovative loan programs. NYSERDA, for example, is working to expand the number of persons eligible for energy efficiency financing loans by moving to a two-tiered underwriting process. Under this process, applicants who would be rejected for a loan based on traditional creditworthiness measures are given a second opportunity to qualify for financing based on their utility bill repayment history in lieu of their credit history. The New Jersey Board of Public Utilities has recently approved an innovative financing scheme as well, the Large Energy Users Pilot program, which will grant low interest loans of up to $1,000,000 for eligible new efficiency projects in some of the state's largest commercial and industrial facilities.
- **Whole-house improvements –** As utilities experience a need to move beyond traditional lighting and appliance solutions to achieve the ambitious targets being set for them in many states, they are increasingly developing programs aimed at improving the efficiency of an entire house, including fixing leaks, reducing plug loads, adding insulation, and replacing heating and cooling systems. These programs, however, typically require substantial owner investments and thus are ideally accompanied by strong financing programs.

The following resources provide more detailed information on specific energy efficiency programs that are being used to meet state-mandated goals:

- American Council for an Energy-Efficient Economy, *Utility Policies*, http://www.aceee.org/sector/state-policy/utility-policies (providing an overview of the efficiency programs in all 50 states).
- American Public Power Association, *Demand Response Programs of Public Power Utilities*, http://www.publicpower.org/files/PDFs/PublicPowerDemandResponseprograms.pdf (compiling utility demand response offerings).
- Benefits.gov, *Energy Assistance*, http://www.benefits.gov/benefits/browse-by-category/category/ENA (providing a state-by-state list of low-income energy assistance projects).
- Cal. Energy Commission, *Energy Efficiency Programs*, http://www.energy.ca.gov/efficiency/
- California Public Utilities Commission, *Statewide Programs and Activities*, http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Statewide+Programs.htm (breaking down California's energy efficiency programs by sector).
- Center for Climate Change Law, State Actions on Clean Energy: A Fifty-State Survey, http://www.law.columbia.edu/centers/climatechange/resources/energy-law
- Database of State Incentives for Renewable Energy, http://www.dsireusa.org/
- Efficiency Vermont, *2012 Annual Plan*, http://www.efficiencyvermont.com/docs/about_efficiency_vermont/annual_plans/EVT_AnnualPlan2012.pdf
- Efficiency Vt., *All Rebates and Ways to Save*, http://www.efficiencyvermont.com/Index/ways-to-save-and-rebates.aspx
- Institute for Electric Efficiency, *Compilation of U.S. Energy Efficiency Program Profiles* (June 2009), http://www.edisonfoundation.net/IEE/Documents/IEE_EEProgSummariesPUBLIC_0609.pdf (describing existing programs across a range of program types)
- Institute for Electric Efficiency, *Jump-Starting Your EE Portfolio: Quick Start, Quick Return Energy Efficiency Programs* (May 2009), http://www.edisonfoundation.net/IEE/Documents/Jump-StartingEEPortfolio_0609.pdf
- Long Island Power Authority, Draft Electric Resource Plan 2009-2018 (2009)
- Massachusetts Executive Office of Energy and Environmental Affairs, *Energy Efficiency*, http://www.mass.gov/eea/energy-utilities-clean-tech/energy-efficiency/ (providing an overview of Massachusetts utility efficiency programs).
- MASS SAVE, http://www.masssave.com/
- New York State Energy Research & Development Authority, *Energy Efficiency and Renewable Programs*, http://www.nyserda.ny.gov/en/Energy-Efficiency-and-Renewable-Programs.aspx (providing an overview of New York's energy efficiency programs).
- NYSERDA, *Energy Audit Program*, http://www.nyserda.ny.gov/Page-Sections/Commercial-and-Industrial/Programs/FlexTech-Program/Energy-Audit-Program.aspx

- KAREN PALMER ET AL., BORROWING TO SAVE ENERGY: AN ASSESSMENT OF ENERGY-EFFICIENCY FINANCING PROGRAMS 1-2 (Resources For the Future April 2012), http://www.rff.org/RFF/Documents/RFF-Rpt-Palmeretal%20EEFinancing.pdf
- SEE ACTION, ROADMAP FOR THE HOME ENERGY UPGRADE MARKET: RESIDENTIAL RETROFIT WORKING GROUP (2011), http://www1.eere.energy.gov/seeaction/pdfs/retrofit_energyupgradesroadmap.pdf
- U.S. Dep't of Energy, *Energy Incentive Programs*, http://www1.eere.energy.gov/femp/financing/energyincentiveprograms.html
- MARK ZIMRING ET AL., ENVTL. ENERGY TECH. DIV., LAWRENCE BERKELEY NAT'L LAB., LBNL-5244E, DELIVERING ENERGY EFFICIENCY TO MIDDLE INCOME SINGLE FAMILY HOUSEHOLDS (2011), http://eetd.lbl.gov/ea/emp/reports/lbnl-5244e.pdf

Appendix B: Full Bibliography

This handbook is organized thematically, with a bibliography included at the end of each major section. A full bibliography is available below.

M.H. Albadi, *Demand Response in Electricity Markets: An Overview* (IEEE 2007).

American Council for an Energy-Efficiency Economy (ACEEE), *Energy Efficiency Resource Standard: In Practice* (2009), http://aceee.org/fact-sheet/eers-practice-detailed-april-2009

ACEEE, *2011 State Energy Efficiency Scorecard*, http://www.aceee.org/sector/state-policy/scorecard.

ACEEE, ENERGY EFFICIENCY AND RESOURCE STANDARDS: EXPERIENCE AND RECOMMENDATIONS (2006), http://www.aceee.org/pubs/e063.htm

ACEEE, Energy Efficiency Resource Standards: A State Model (November 2009), http://www.aceee.org/files/pdf/white- paper/eers statemodel.pdf

ACEEE. "Incentivizing Utility-Led Efficiency Programs: Performance Incentives," http://aceee.org/sector/state- policy/toolkit/utility-programs/performance-incentives

ACEEE Website on EERS, http://www.aceee.org/topics/eers

ACEEE, *Utility Policies*, http://www.aceee.org/sector/state-policy/utility-policies

American Public Power Association, *Demand Response Programs of Public Power Utilities*, http://www.publicpower.org/files/PDFs/PublicPowerDemandResponseprograms.pdf

Applied Public Policy Research Institute for Study and Evaluation, *Evaluating Low-Income Energy Efficiency Programs* (2011), http://www.appriseinc.org/reports/Evaluating%20Low-Income%20Energy%20Efficiency%20Programs.pdf

CATHERINE BELL ET AL., AMERICAN COUNCIL FOR AN ENERGY-EFFICIENT ECONOMY, ON-BILL FINANCING FOR ENERGY EFFICACY IMPROVEMENTS: A REVIEW OF CURRENT PROGRAM CHALLENGES, OPPORTUNITIES, AND BEST PRACTICES, REPORT E1118 (2011).

Benefits.gov, *Energy Assistance*, http://www.benefits.gov/benefits/browse-by-category/category/ENA

BRUCE BIEWALD ET AL., SYNAPSE ENERGY ECON., PORTFOLIO MANAGEMENT: HOW TO PROCURE ELECTRICITY RESOURCES TO PROVIDE RELIABLE, LOW-COST, AND EFFICIENT ELECTRICITY SERVICES TO ALL RETAIL CUSTOMERS (2003).

BRAITHWAIT ET AL., EDISON ELECTRICAL INSTITUTE, RETAIL ELECTRICITY PRICING AND RATE DESIGN IN EVOLVING MARKETS 26 (2007).

Timothy J. Brennan & Karen Palmer, *Energy Efficiency Resource Standards: Economics and Policy* (Resources for the Future Discussion Paper 12-10, Feb. 2012).

Timothy J. Brennan, *"Night of the Living Dead" or "Back to the Future?" Electric Utility Decoupling, Reviving Rate-of-Return Regulation, and Energy Efficiency* (Resources for the Future Discussion Paper 08-27, Aug. 2008).

MATTHEW BROWN, ALLIANCE TO SAVE ENERGY, PAYING FOR ENERGY UPGRADES THROUGH UTILITY BILLS: BRIEF #3: STATE ENERGY EFFICIENCY POLICIES: OPTIONS AND LESSONS LEARNED (2010), http://ase.org/resources.

Matthew Brown. *On-Bill Financing: Helping Small Business Reduce Emissions and Energy Use While Improving Profitability*, National Small Business Association (2009), http://www.nsba.biz/docs/09OBFNSBA.pdf

Matthew Brown, *The Energy Efficiency Resource Standard: Observations on an Emerging State Policy* (Harcourt Brown 2010), http://harcourtbrown.com/wp-content/uploads/The-Energy-Efficiency-Resource-Standard_Observations-on-an-Emerging-State-Policy.pdf

John Byrne et al., Center for Energy and Environmental Policy, *Sustainable Energy Utility Design: Options for the District of Columbia* (2007), *available at* http://www.ceep.udel.edu/energy/publications/2007_es_Wash%20DC_SEU_report_final.pdf?_encoding=UTF8.

Cal. Energy Comm'n, Nonresidential Building Energy Use Disclosure Program, Proposed Regulations, Title 20, Div. 2, Ch. 4, Art. 9, §§ 1680-85 (2012).

Cal. Energy Comm'n, *Energy Efficiency Programs*, http://www.energy.ca.gov/efficiency/

California Pub. Utils. Comm'n, *Statewide Programs and Activities*, http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/Statewide+Programs.htm

Cal. PUC, Guide to Public Participation (2010), *available at* http://www.cpuc.ca.gov/NR/rdonlyres/B1C2F5B2-8A22-492B-B695-8751AE7FBA76/0/GuidePblcPrtcptnApr10.pdf

Cal. PUC, *California Long Term Energy Efficiency Strategic Plan* (Sep. 2008), http://www.cpuc.ca.gov/NR/rdonlyres/D4321448 -208C-48F9-9F62-1BBB14A8D717/0/EEStrategicPlan.pdf.

Center for Climate and Energy Solutions Website on EERS, http://www.c2es.org/what_s_being_done/in_the_states/efficiency_resource.cfm

Center for Climate Change Law, State Actions on Clean Energy: A Fifty-State Survey, http://www.law.columbia.edu/centers/climatechange/resources/energy-law

Center for Energy and Public Policy, Columbia University SIPA. *"On-Bill Financing" for Energy Efficiency* (2009),http://energy.sipa.columbia.edu/researchprograms/urbanenergy/documents/On%20bill%20Fin_ancing%20FINAL.pdf

Connecticut Governor Dannel P. Malloy: *Connecticut FY2012 – FY2013 Biennium Governor's Budget*, http://www.governor.ct.gov/malloy/cwp/view.asp?a=11&Q=473940.

Connecticut Office of Fiscal Analysis: transparency.CT.gov, http://transparency.ct.gov/html/searchExpenditures.asp?LEVEL=AGENCY&ENTITY=DEP&PERIOD=2011.

Adam Cooper & Lisa Wood, *Making Building Energy Codes and Appliance/Equipment Standards Part of Utility Energy Efficiency Portfolios* (Institute for Electric Efficiency Aug. 2011), http://www.edisonfoundation.net/iee/reports/IEE_IntegratingC&SintoEEPortfolios_final.pdf

Richard Cowart, *Carbon Caps and Efficiency Resources: How Climate Legislation Can Mobilize Efficiency and Lower the Cost of Greenhouse Gas Emission Reduction*, 33 VT. L. REV. 201 (2008).

Database of State Incentives for Renewables & Efficiency, http://www.dsireusa.org/

Edison Electric Institute, *Summary of State Regulatory Smart Grid Decisions* (2011), http://www.eei.org/whatwedo/PublicPolicyAdvocacy/StateRegulation/Documents/EEI_State_SG_Matrix_Update_Aug_2 011.pdf

Efficiency Vermont, http://www.efficiencyvermont.com/Index.aspx.

Efficiency Vermont, Geographic Targeting, http://www.efficiencyvermont.com/about_us/energy_initiatives/geographic_targeting.aspx.

Efficiency Vermont, *2012 Annual Plan*, http://www.efficiencyvermont.com/docs/about_efficiency_vermont/annual_plans/EVT_AnnualPlan2012.pdf

Efficiency Vermont, *All Rebates and Ways to Save*, http://www.efficiencyvermont.com/Index/ways-to-save-and-rebates.aspx

KAREN EHRHARDT-MARTINEZ ET AL., ADVANCED METERING INITIATIVES AND RESIDENTIAL FEEDBACK PROGRAMS: A META-REVIEW FOR HOUSEHOLD ELECTRICITY-SAVING OPPORTUNITIES (ACEEE June 2010), http://www.energycollection.us/Energy-Metering/Advanced- Metering-Initiatives.pdf

ELCON, Revenue Decoupling (2007), http://www.elcon.org/Documents/Publications/3-1RevenueDecoupling.PDF.

ENVIRONMENTAL PROTECTION AGENCY (EPA), ALIGNING UTILITY INCENTIVES WITH INVESTMENT IN ENERGY EFFICIENCY (2007), http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf.

EPA, *Clean Energy – Environment Guide to Action* (Apr. 2006), http://www.epa.gov/statelocalclimate/resources/action-guide.html.

EPA, *State and Local Climate Policy Tracking*, http://www.epa.gov/statelocalclimate/state/tracking/

EPA, "Renewable Portfolio Standards Fact Sheet," http://www.epa.gov/chp/state-policy/renewable_fs.html

EPA, "Output-Based Environmental Regulations Fact Sheet," http://www.epa.gov/chp/state-policy/obr_factsheet.html

Jiyong Eom and James Sweeny, *Shareholder Incentives for Utility-Delivered Energy Efficiency Programs in California* (Precourt Energy Efficiency Center, Stanford University 2009), http://www.stanford.edu/group/peec/cgi-bin/docs/modeling/research/Shareholder%20Incentives%20for%20Utility-Delivered%20Energy%20Efficiency%20Programs%20in%20California.pdf.

Ahmad Faruqui and Sanem Sergici, The Brattle Group, *Household Response to Dynamic Pricing of Electricity—A survey of the experimental evidence* (2009), http://www.science.smith.edu/~jcardell/Readings/uGrid/House%20DemandResp%20Experience.pdf

Federal Energy Regulatory Commission (FERC), Staff Report, *Assessment of Demand Response & Advanced Metering Staff Report* (Nov. 2011), http://www.ferc.gov/legal/staff-reports/sep-09-demand-response.pdf

BEN FOSTER & SUSAN MAZUR-STOMMEN, RESULTS FROM RECENT REAL-TIME FEEDBACK STUDIES (ACEEE Report No. B122, Feb. 2012).

Tom Franks et al., *Seeking Consistency in Performance Incentives for Utility Energy Efficiency Programs,* ACEEE Summer Study on Energy Efficiency in Buildings (2010), http://eec.ucdavis.edu/ACEEE/2010/data/papers/2052.pdf.

KATHERINE FRIEDRICH ET AL., ACEEE REPORT NO. U091, SAVING ENERGY COST-EFFECTIVELY: A NATIONAL REVIEW OF THE COST OF ENERGY SAVED THROUGH UTILITY-SECTOR ENERGY EFFICIENCY PROGRAMS (2009).

MERRIAN FULLER ET. AL., DRIVING DEMAND FOR HOME ENERGY IMPROVEMENTS (Lawrence Berkeley Nat'l. Lab. 2010), http://drivingdemand.lbl.gov/reports/lbnl-3960e-nlrp.pdf/.

Michael B. Gerrard, ed., THE LAW OF CLEAN ENERGY: EFFICIENCY AND RENEWABLES (American Bar Association 2011)

Sandy Glatt, *State Energy Efficiency Resource Standards Analysis*, 9 (Dep't of Energy 2010), http://www1.eere.energy.gov/industry/states/pdfs/eers_web_final.pdf

Ivan Gold and Nidhi Thakar, *A Survey of State Renewable Portfolio Standards: Square Pegs for Round Climate Change Holes?,* 35 Wm. & Mary Envtl. L. & Pol'y Rev. 183 (2010).

Great Lakes Wind Collaborative, *Best Practices for Sustainable Wind Energy Development in the Great Lakes Region* (July 2011), http://www.glc.org/energy/wind/pdf/bptoolkit/GLWC-BPToolkit-BP04.pdf.

Charlie Harak, John Howat & Olivia Wein, *A Consumer's Guide to Intervening in State Public Utility Proceedings,* http://www.nclc.org/images/pdf/energy_utility_telecom/additional_resources/consumers_guide.pdf

Sara Hayes et al., *Balancing Interests: A Review of Lost Revenue Adjustment Programs for Utility Energy Efficiency Programs* (ACEEE Report No. U114, Sept. 2011), http://aceee.org/research-report/u114.

Sarah Hayes, et al., Carrots for Utilities: Providing Financial Returns for Utility Investments in Energy Efficiency (ACEEE 2011), http://ecorebates.com/wp-content/uploads/2011/09/ACEEE-2011-Report-on-IOU-Spending-on-Energy-Eff7.pdf.

Grayson Heffner & Nina Campbell, *Evaluating the co-benefits of low-income energy-efficiency programs* (Int'l Energy Agency 2011), http://www.iea.org/papers/2011/low_income_energy_efficiency.pdf

Jason Houck &Wilson Rickerson, *The Sustainable Energy Utility Model for Energy Service Delivery*, 29 BULLETIN OF SCIENCE, TECHNOLOGY & SOCIETY 95 (2009), http://www.ceep.udel.edu/publications/2009_es_BSTS_SEU_model_DE_Wash%20DC_Houck_Rickerson.pdf.

Institute for Electric Efficiency (IEE), *Implementing Energy Efficiency: Program Delivery Comparison Study* (March 2010), http://www.edisonfoundation.net/IEE/Documents/IEE_EEProgDeliveryComparison.pdf.

IEE, State Electric Efficiency Regulatory Frameworks (July 2012), *available at* http://www.edisonfoundation.net/iee/Documents/IEE_StateRegulatoryFrame_0712.pdf

IEE, Performance Incentives for Energy Efficiency Programs by State (May 2009), http://www.edisonfoundation.net/iee/issueBriefs/IncentiveMechanisms_0509.pdf.

IEE, THE COSTS & BENEFITS OF SMART METERS FOR RESIDENTIAL CUSTOMERS (July 2011), http://www.edisonfoundation.net/iee/Documents/IEE_BenefitsofSmartMeters_Final.pdf.

IEE, *Compilation of U.S. Energy Efficiency Program Profiles* (June 2009), http://www.edisonfoundation.net/IEE/Documents/IEE_EEProgSummariesPUBLIC_0609.pdf

IEE, MOVING TOWARD UTILITY-SCALE DEPLOYMENT OF DYNAMIC PRICING IN MASS MARKETS (June 2009), http://www.edisonfoundation.net/IEE/Documents/IEE_Utility-ScaleDynamicPricing_0609.pdf.

Institute for Energy Research, http://www.instituteforenergyresearch.org/states/.

IEE, *Jump-Starting Your EE Portfolio: Quick Start, Quick Return Energy Efficiency Programs* (May 2009), http://www.edisonfoundation.net/IEE/Documents/Jump-StartingEEPortfolio_0609.pdf

Itron, Inc., *National Energy Efficiency Best Practices Study: Volume 1 – Portfolio Best Practices Report* (July 2008), http://www.eebestpractices.com/pdf/portfolio.pdf.

Steve Kihm, Energy Center of Wisconsin, When Revenue Decoupling Will Work . . . and When It Won't (2009), http://www.ecw.org/ecwresults/kihmdecouplingarticle2009.pdf

Charles Kubert and Mark Sinclair, *State Support for Clean Energy Deployment: Lessons Learned for Potential Future Policy.* Clean Energy States Alliance (National Renewable Energy Laboratory 2011), http://www.cleanenergystates.org/assets/2011-Files/Renewable-Energy-Finance/CESA-NREL-State-Support-for-CE-April- 2011.pdf.

MARTIN KUSHLER ET AL., ACEEE REPORT NO. U122, A NATIONAL SURVEY OF STATE POLICIES AND PRACTICES FOR THE EVALUATION OF RATEPAYER-FUNDED ENERGY EFFICIENCY PROGRAMS 30 (2012).

MARTIN KUSHLER ET AL., ACEEE REPORT NO. U091, MEETING AGGRESSIVE NEW STATE GOALS FOR UTILITY-SECTOR ENERGY EFFICIENCY: EXAMINING KEY FACTORS ASSOCIATED WITH HIGH SAVINGS (2009).

MARTIN KUSHLER, ALIGNING UTILITY INTERESTS WITH ENERGY EFFICIENCY OBJECTIVES: A REVIEW OF RECENT EFFORTS AT DECOUPLING AND PERFORMANCE INCENTIVES (ACEEE 2006), http://www.aceee.org/research-report/u061

Warren Leon, State-Federal RPS Collaborative. *Designing the Right RPS: A guide to Selecting Goals and Program Options for a Renewable Portfolio Standard,* Clean Energy States Alliance (2012), http://www.cleanenergystates.org/assets/2012- Files/RPS/CESA-RPS-Goals-and-Program-Design-Report-March-2012.pdf.

Long Island Power Authority, Draft Electric Resource Plan 2009-2018 (2009)

Low-Income Weatherization, http://www.publicpower.org/utility/utility.cfm?ItemNumber=24643

Massachusetts Executive Office of Energy and Environmental Affairs, *Energy Efficiency*, http://www.mass.gov/eea/energy-utilities-clean-tech/energy-efficiency/

MASS. INST. OF TECH., MIT STUDY ON THE FUTURE OF THE ELECTRIC GRID (2011), http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml.

MASS SAVE, http://www.masssave.com/

Diane Munns, Edison Electric Institute, *Trend Analysis: Administration of Energy Efficiency Programs* (Sep. 2008), *http://www.eei.org/ourissues/EnergyEfficiency/Documents/Third_Party_Trend_Analysis_Sep2008.pdf*.

STEVEN NADEL & JOHN SHENOT, STATE & LOCAL ENERGY EFFICIENCY ACTION NETWORK, SETTING ENERGY SAVINGS TARGETS FOR UTILITIES: UTILITY MOTIVATION AND ENERGY EFFICIENCY WORKING GROUP (2011).

Nat'l Assoc. of Regulatory Utility Commissioners (NARUC), Third Party Provision of Energy Efficiency Programs (2011), http://www.naruc.org/Publications/SERCAT_Colorado_2010.pdf

NARUC, *Decoupling for Electric & Gas Utilities: Frequently Asked Questions* (Sep. 2007).

National Action Plan for Energy Efficiency Leadership Group, *Full Report* (July 2006), http://www.epa.gov/cleanenergy/documents/suca/napee_report.pdf.

Nat'l Assoc. of State Utility Consumer Advocates, http://www.nasuca.org/archive/index.php

NATURAL RESOURCES DEFENSE COUNCIL, DOING MORE AND USING LESS: REGULATORY REFORMS FOR ELECTRICITY AND NATURAL GAS UTILITIES CAN SPUR ENERGY EFFICIENCY (2011).

CHRIS NEME & MARTY KUSHLER, IS IT TIME TO DITCH THE TRC? EXAMINING CONCERNS WITH CURRENT PRACTICE IN BENEFIT-COST ANALYSIS (2010).

David Nichols, *The Role of Regulators: Energy Efficiency*, 18 PACE ENVTL. L. REV. 295 (2001).

Northeast Energy Efficiency Partnerships (NEEP), *A Regional Roundup of Energy Efficiency Policy in the Northeast & Mid-Atlantic States* (Fall 2011), http://neep.org/uploads/policy/2011%20Regional%20Roundup_FINAL.pdf

Seth Nowak et al., Energy Efficiency Resource Standards: State and Utility Strategies for Higher Energy Savings (ACEEE June 2011), http://aceee.org/research-report/u113

N.Y. Pub. Serv. Comm'n, *Energy Efficiency Portfolio Standard Working Group VI – On-Bill Financing Final Report* (2008), http://www.nclc.org/images/pdf/energy_utility_telecom/obf/WGVI-On_Bill_Financing_Final_Report.pdf

New York State Energy Research & Development Authority (NYSERDA), *Energy Efficiency and Renewable Programs*, http://www.nyserda.ny.gov/en/Energy-Efficiency-and-Renewable-Programs.aspx

NYSERDA, *Energy Audit Program*, http://www.nyserda.ny.gov/Page-Sections/Commercial-and-Industrial/Programs/FlexTech-Program/Energy-Audit-Program.aspx

KAREN PALMER ET AL., PUTTING A FLOOR ON ENERGY SAVINGS: COMPARING STATE ENERGY EFFICIENCY RESOURCE STANDARDS (Resources for the Future Discussion Paper 12-11, Feb. 2012).

KAREN PALMER ET AL., BORROWING TO SAVE ENERGY: AN ASSESSMENT OF ENERGY-EFFICIENCY FINANCING PROGRAMS (Resources For the Future April 2012), http://www.rff.org/RFF/Documents/RFF-Rpt-Palmeretal%20EEFinancing.pdf

PEW CENTER, CLIMATE CHANGE 101: CAP AND TRADE (2011).

Richard J. Pierce, Jr., *The Past, Present, and Future of Energy Regulation*, 31 UTAH ENV. L. REV. 291 (2011).

T.J. Poor, Geotargeting in Vermont: Using Energy Efficiency to Avoid or Defer Transmission and Distribution Constraint, Presentation at the ACEEE Conference on Energy Efficiency as a Resource (Sept. 2011), http://aceee.org/conferences/2011/eer/program

Jonathan Ramseur, Climate Change: Action by States to Address Greenhouse Gas Emissions, Congressional Research Service (2007), http://fpc.state.gov/documents/organization/80733.pdf.

Regional Greenhouse Gas Initiative, "Program Overview and Design," http://www.rggi.org/design/overview

Regulatory Assistance Project (RAP), Decoupling vs. Lost Revenues: Regulatory Considerations (1992), http://www.epa.gov/statelocalclimate/documents/pdf/5_19decoupling_lost_revs_compariso_RAP.pdf.

RAP, Revenue Regulation and Decoupling (2011), http://www.raponline.org/document/download/id/902.

RAP, STATUS OF SELECTED STATES' INVOLVEMENT IN AMI AND TIME SENSITIVE RATES (2007).

RAP, *US States with Integrated Resource Planning or Similar Planning Processes* (Dec. 2009), www.raponline.org/document/download/id/4447.

RAP, *Electricity Regulation in the U.S.: A Guide* (March 2011), *available at* http://www.raponline.org/document/download/id/645

INGRID ROHMUND ET AL., ASSESSMENT OF ACHIEVABLE POTENTIAL FOR ENERGY EFFICIENCY AND DEMAND RESPONSE IN THE U.S. (2010-2030), http://eec.ucdavis.edu/ACEEE/2008/data/papers/5_297.pdf

Martha Rowley, *State Regulatory Update: Energy Efficiency* (Edison Electric Institute 2008), http://www.eei.org/ourissues/EnergyEfficiency/Documents/state_reg_update_efficiency.pdf

EDWARDS RUBIN, PEW CENTER, A PERFORMANCE STANDARDS APPROACH TO REDUCING CO2 EMISSIONS FROM ELECTRIC POWER PLANTS (2009).

John A. Sautter, *State Environmental Law and Carbon Emissions: Do Public Utility Commissions Use Environmental Statutes toFight Global Warming?*, THE ELECTRICITY JOURNAL, Oct. 2010.

John A. Sautter et al., *The Energy Trilemma in the Green Mountain State: An Analysis of Vermont's Energy Challenges and Policy Options*, 10 VT. J. ENVTL. L. 478 (2009), http://www.vjel.org/journal/pdf/VJEL10101.pdf.

SCIENCE APPLICATIONS IMPLEMENTATION CORPORATION, SMART GRID LEGISLATIVE AND REGULATORY PROCEEDINGS (2011)

Michael Sciortino et al., Energy Efficiency Resource Standards: A Progress Report on State Experience (ACEEE June 2011), http://aceee.org/research-report/u112

Michael Sciortino et al., The 2011 State Energy Efficiency Scorecard (ACEEE October 2011), http://aceee.org/research-report/e115

Chris Simpson et al., *Emissions Performance Standards in Selected States*, Regulatory Assistance Project Research Brief (2010), http://www.raponline.org/search/site/?q=emissions%20performance%20standards%20in%20selected%20states

State & Local Energy Efficiency Action Network (SEE Action), Setting Energy Savings Targets for Utilities iii (Sept. 2011), http://www1.eere.energy.gov/seeaction/pdfs/utilitymotivation_targets.pdf

SEE Action, *Using Integrated Resource Planning to Encourage Investment in Cost-Effective Energy Efficiency Measures* (September 2011).

SEE ACTION, ROADMAP FOR THE HOME ENERGY UPGRADE MARKET: RESIDENTIAL RETROFIT WORKING GROUP (2011), http://www1.eere.energy.gov/seeaction/pdfs/retrofit_energyupgradesroadmap.pdf

Sustainable Energy Utility Task Force, *The Sustainable Energy Utility: A Delaware First* (2007), *available at* http://www.seu-de.org/docs/SEU_Final_Report.pdf.

Synapse Energy Economics, *A Brief Survey of State Integrated Resource Planning Rules and Requirements* (Apr. 28, 2011), http://www.cleanskies.org/wp-content/uploads/2011/05/ACSF_IRP-Survey_Final_2011-04-28.pdf.

USAID, *Best Practices Guide: Integrated Resources Planning for Electricity*, http://pdf.usaid.gov/pdf_docs/PNACQ960.pdf.

U.S. DEMAND RESPONSE COORDINATING COMMITTEE, DEMAND RESPONSE AND SMART METERING POLICY ACTIONS SINCETHE ENERGY POLICY ACT OF 2005: SUMMARY FOR STATE OFFICIALS (2008), *available at* http://www.demandresponsesmartgrid.org/Resources/Documents/Final_NCEP_Report_on_DR_and_SM_Poli__cy_Actiona_08.12.pdf

U.S. Dep't of Energy (DOE), "On-Bill Repayment Programs," http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/onbillrepayment.html

U.S. DOE, Weatherization Assistance Program, http://www1.eere.energy.gov/wip/wap.html

U.S. DOE, "States with Renewable Portfolio Standards," http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm

U.S. DOE, *Energy Incentive Programs*, http://www1.eere.energy.gov/femp/financing/energyincentiveprograms.html

US Energy Information Administration, *Status of Electricity Restructuring by State*, http://www.eia.gov/cneaf/electricity/page/restructuring/restructure_elect.html.

U.S. ENERGY INFORMATION ADMINISTRATION, SMART GRID LEGISLATIVE AND REGULATORY POLICIES AND CASE STUDIES (2011).

U.S. Dep't of Housing & Urban Development, Summary of CA low-income energy efficiency program, http://www.hud.gov/local/shared/working/r9/cpd/lowincome.pdf

Vermont Department of Public Service, *Comprehensive Energy Plan 2011* (Dec. 2011), http://www.vtenergyplan.vermont.gov/sites/cep/files/2011%20CEP_Volume%201.pdf.

Vermont Public Service Board, *Investigation into the Department of Public Service's Proposed Energy Efficiency Plan Re: Phase II* (Sep. 30, 1999) , http://psb.vermont.gov/sites/psb/files/orders/1999/5980eeu.PDF.

Vermont Public Service Board, *Investigation into Petition Filed by Vermont Department of Public Service Re: Energy Efficiency Utility Structure*, (Nov. 24, 2009), http://psb.vermont.gov/sites/psb/files/orders/2009/7466OrderReStructure.pdf.

Vermont Public Service Board, *Citizens' Guide to the Vermont PSB's Section 248 Process), available at* http://psb.vermont.gov/sites/psb/files/publications/Citizens_Guide_to_248.pdf

Wash. Utils. & Transp. Comm'n, Online Bibliography of Consumer Education and Public Information Materials from Public Utilities Commissions, http://www.wutc.wa.gov/PUCPubs.nsf/ebe6b246327a29278825651d0065b867!OpenView

Weatherization Assistance Program Technical Assistance Center, http://www.waptac.org/

DAN YORK & MARTIN KUSHLER, ACEEE, THE OLD MODEL ISN'T WORKING: CREATING THE ENERGY UTILITY FOR THE 21ST CENTURY 3 (2011).

Dan York, Marty Kushler, and Patti Witte, *Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs* (ACEEE 2005), http://www.aceee.org/research-report/u053

MARK ZIMRING ET AL., LBNL-5244E, DELIVERING ENERGY EFFICIENCY TO MIDDLE INCOME SINGLE FAMILY HOUSEHOLDS (ENVTL. ENERGY TECH. DIV., LAWRENCE BERKELEY NAT'L LAB. 2011), http://eetd.lbl.gov/ea/emp/reports/lbnl-5244e.pdf