ARTICLES

"DANCING BACKWARD IN HIGH HEELS": EXAMINING AND ADDRESSING THE DISPARATE REGULATORY TREATMENT OF ENERGY EFFICIENCY AND RENEWABLE RESOURCES

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Both energy efficiency and renewable resources offer significant benefits to utilities, their customers, and society as a whole. Yet energy efficiency programs face formidable barriers to adoption that renewable resources do not. While both renewable and efficiency resources have received significant funding in recent years, government support for renewables continues to dwarf that for efficiency measures, and regulatory policies consistently discourage utilities from investing in efficiency measures even while they incentivize investment in renewables. This Article examines the parallel development of renewable resource and energy efficiency programs within utilities, compares the differing treatment of each, and offers concrete recommendations for enhancing energy efficiency adoption by modifying existing policies to more closely resemble those applied to renewable resources. The Article concludes that the historic disincentives to implementing efficiency policies can be remedied by: 1) updating ratemaking structures to ensure utilities can recover and earn on efficiency investments; 2) streamlining cost effectiveness tests that presently encourage utilities to underestimate and under-invest in efficiency programs; and 3) addressing market barriers by strengthening consumer incentives and market transformation efforts.

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I. INTRODUCTION

When public utilities plan the resources they will use to meet their customers' load requirements, they have a variety of options from which to choose.[1] An electric utility might elect to obtain supplies from a natural gas-

[1] Utility long-range resource planning is generally known as "integrated resource planning." Integrated resource plans (IRPs) compare available resources to determine the optimal mix of resources to reliably meet customer load requirements over an extended period of time, often 20 years. *See* Energy Policy Act of 1992 § 111(d)(19), 16 U.S.C. § 2602(19) (2006) (defining integrated resource planning as "a planning and selection process for new energy resources that evaluates the full range of alternatives, including new generating capacity, power purchases, energy conservation and efficiency, cogeneration and district heating and cooling applications, and renewable energy resources, in order to provide adequate and reliable service to its electric customers at the lowest system cost"); RACHEL WILSON & PAUL PETERSON, A BRIEF SURVEY OF STATE INTEGRATED RESOURCE PLANNING RULES AND REQUIREMENTS 7 (2011), *available at* http://www.cleanskies.org/wp-content/uploads/2011/05/ACSF_IRP-Survey_Final_2011-04-28.pdf (stating that "the most common planning horizon spans a 20 year period"). A thorough IRP includes both supply-side and demand-side resources, and considers costs and risks associated with those resources, including infrastructure requirements, environmental externalities, and long-term regulatory risks, such as those associated with carbon emissions. *See* 16 U.S.C. § 2602(19) (2006). Within the IRP process, utility planning managers compare portfolios of options and select a given portfolio. Regulatory review is typically focused on whether the IRP meets regulatory requirements rather than approving specific resource acquisitions; resource costs still

fired generator, a coal plant, or a wind farm. A natural gas utility in the Pacific Northwest might choose from natural gas supplied by producers in the Rocky Mountains or Canada. These options are known as *supply-side* resources;[2] that is, they are alternatives the utility can use to serve existing load. Utility programs aimed at reducing demand or modifying demand patterns are known as *demand-side management* programs, or DSM.[3] Energy efficiency is a DSM resource.

Energy efficiency lowers consumers' energy bills, reduces environmental impacts from energy use, stabilizes the electrical grid, decreases the need for expensive infrastructure improvements, and often costs less than supply-side alternatives.[4] As energy production is responsible for the vast majority of greenhouse gas emissions in the United States,[5] energy efficiency can play a key role in national efforts to address global warming.[6] New methods of extraction, including hydraulic fracturing

need to be reviewed at the time of a rate case before the utility can include those costs in its rate base. *See* WILSON & PETERSON, *supra*, at 3–13 (providing a brief overview of the IRP process as well as a summary of state regulations); *see also* Scott F. Bertschi, *Integrated Resource Planning and Demand Side Management in Electric Utility Regulation: Public Utility Panacea or a Waste of Energy?*, 43 EMORY L.J. 815, 829–36 (1994) (describing the regulatory requirements of integrated resource planning). For a discussion of utility ratemaking procedures, see discussion *infra* Part II.

2 *See, e.g.*, Bertschi, *supra* note 1, at 830 ("Supply-side measures generally are those measures which meet the increased demand either through construction of new generating facilities or purchasing electricity from other utilities.").

3 Utility DSM includes energy efficiency, load management, and conservation. Load management refers to programs that manage patterns of use to reduce consumption at peak times, or real-time pricing tariffs, which provide customers the opportunity to shape their load based on accurate price signals. *See* Sanya Carley, *Energy Demand-Side Management: New Perspectives for a New Era*, 31 J. POL'Y ANALYSIS MGMT. 6, 7 (2012) (providing a background discussion on DSM).

4 *See infra* 64-68, 76-80 and accompanying text.

5 *See* U.S. ENVTL. PROT. AGENCY, EPA 430-R-12-001, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990 – 2010, at ES-12 (2012), *available at* www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-Main-Text.pdf ("Energy-related activities, primarily fossil fuel combustion, accounted for the vast majority of U.S. CO_2 emissions for the period of 1990 through 2010. . . . Overall, emission sources in the Energy chapter account for a combined 87.0[%] of total U.S. greenhouse gas emissions in 2010."). Electricity generation accounts for 42% of all carbon dioxide emissions in the United States. *Id.* at 3-11.

6 Although a minority of Americans continue to doubt that global warming is real, scientists around the world have reached an increasing consensus that the planet is warming and human activity is to blame. YALE PROJECT ON CLIMATE CHANGE COMMC'N ET AL., CLIMATE CHANGE IN THE AMERICAN MIND 4, 7 (2012), *available at* http://environment.yale.edu/climate/files/Climate-Beliefs-September-2012.pdf. For a straightforward presentation of climate change science, see U.S. Envtl. Prot. Agency, *Climate Change Science*, http://www.epa.gov/climatechange/science/ (last visited Apr. 11, 2013). The Intergovernmental Panel on Climate Change (IPCC) is the international body generally acknowledged to be the leading scientific organization in the field of global warming. Intergovernmental Panel on Climate Change, *Organization*, http://www.ipcc.ch/organization/organization.shtml#.UQxmXmfC5bI (last visited Apr. 11, 2013). For information about the IPCC and copies of publications, see Intergovernmental Panel on Climate Change, *Intergovernmental Panel on Climate Change Home*, http://www.ipcc.ch/index.htm (last visited Apr. 11, 2013). For the IPCC's most recent global assessment and summary of data, research, and policy related to climate change, see INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 26 (2008), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

(fracking), may have extended the available supply of fossil fuels, but they have also created new environmental concerns.[7] Energy efficiency decreases the need for additional fossil fuel resources, without requiring additional resources in its stead. This range of benefits—with little to no downside—may be why politicians, academics, and regulators have lined up to support energy efficiency, often establishing it as a first priority resource.[8]

As a supply-side option, renewable resources are quite different from energy efficiency resources. Rather than decreasing demand, these resources meet demand—they simply do it in an environmentally preferred way. Renewable resources offer benefits similar to energy efficiency. Renewables diversify a utility's portfolio away from fossil fuels, reduce U.S. dependence on foreign imports, mitigate environmental harms, and create new market opportunities for U.S. businesses.[9] Renewable resources are essential to our world's long-term energy future; even with the best technological advancements, a utility's supply-side options cannot *all* be met with energy efficiency. On the other hand, renewable resources may increase the strain on the electric grid, require additional investments in transmission and distribution infrastructure, or create undesired environmental hazards.[10]

Given the balance of costs and benefits offered by the two resources and the importance ascribed to increasing energy efficiency, one might expect that renewable and efficiency resources receive, at a minimum, comparable regulatory treatment. However, this is not the case. In 2009, renewables constituted 76% of all energy tax incentives, while energy

7 *See* Emily C. Powers, Comment, *Fracking and Federalism: Support for an Adaptive Approach that Avoids the Tragedy of the Regulatory Commons*, 19 J.L. & POL'Y 913, 918–19, 924–26 (2011) (describing the process of hydrofracking, its potential harms, and economic benefits).

8 DAN YORK ET AL., THREE DECADES AND COUNTING: A HISTORICAL REVIEW AND CURRENT ASSESSMENT OF ELECTRIC UTILITY ENERGY EFFICIENCY ACTIVITY IN THE STATES 26 (2012), *available at* http://www.aceee.org/research-report/u123. For an example of state policies memorializing this "loading order," see Decision on Evaluation, Measurement, and Verification of California Utility Energy Efficiency Programs, Decision 10-10-033, R.09-11-014, at 5 (Cal. Pub. Util. Comm'n Nov. 2, 2010), *available at* http://www.cpuc.ca.gov/NR/rdonlyres/E5342224-F683-4731-8DCE-166EEBCA54C9/0/D1010033.pdf ("[W]ith the passage of AB 32, energy efficiency became not only the state's energy resource of choice, but also a primary factor in achieving California's GHG reduction targets."). *See also* Ann E. Carlson, Commentary, *Energy Efficiency and Federalism*, 107 MICH. L. REV. FIRST IMPRESSIONS 63, 63 (2008) ("Everyone loves energy efficiency."); President Barack Obama, Remarks by the President in State of the Union Address (Jan. 24, 2012) ("[T]he easiest way to save money is to waste less energy.").

9 *See infra* Part IV.B.1.

10 *See* Thomas M. Lenard, *Renewable Electricity Standards, Energy Efficiency, and Cost-Effective Climate Change Policy*, 22 ELECTRICITY J., Oct. 2009, at 55, 57–58, *available at* http://www.techpolicyinstitute.org/files/renewableej.pdf (describing the increased costs of renewable technologies like updating transmission systems and the construction of additional fossil fuel facilities to provide limited but necessary support for new renewable facilities); *see e.g.*, R. Saidur et al., *Environmental Impact of Wind Energy*, 15 RENEWABLE & SUSTAINABLE ENERGY REV. 2423, 2424, 2426–27 (2011) (discussing bird and bat mortality as negative environmental effects of wind turbines).

efficiency only constituted 3%.[11] Twenty-nine states have now adopted renewable portfolio standards (RPS) requiring utilities to serve a percentage of their load from renewable resources[12]—even when those resources are more expensive than other alternatives—while states mandating efficiency adoption explicitly cap targets to only "cost-effective" energy efficiency.[13] Utility rate structures deter utilities from making cost-effective energy efficiency investments, while incentivizing utilities to invest in large-scale renewable resource projects.[14]

The disparate treatment of energy efficiency operates on many levels, from the utility regulator to the individual customer. Thousands of utility customers choose a "green energy" option that *adds* to their monthly bills,[15] yet they must be offered financial incentives to engage in energy efficiency projects that provide significant long-term energy savings. A variety of sources have identified a significant "efficiency gap"[16] between readily

11 Memorandum from the Cong. Research Serv. to Sen. John Cornyn, on Energy Production by Source and Energy Tax Incentives 8 fig.3 (May 16, 2011), *available at* http://assets.nationaljournal.com/pdf/051411_CRSsubsidies.pdf. Although funding for energy efficiency jumped under the American Recovery and Reinvestment Act (ARRA), the funding differential remains profound. In 2007, prior to ARRA spending, total federal interventions and subsidies in the energy field—including research and development—totaled $4.9 billion for renewables, and only $926 million for energy efficiency. U.S. Energy Info. Admin., SR/CNEAF/2008-01, Federal Financial Interventions and Subsidies in Energy Markets 2007, at xii (2008), *available at* http://www.eia.gov/oiaf/servicerpt/subsidy2/pdf/subsidy08.pdf. The impact of ARRA can be seen in funding numbers from 2010. In that year, energy specific subsidies totaled $14.7 billion for renewables and $6.6 billion for efficiency—$6.3 billion of which was related to ARRA. U.S. Energy Info. Admin., Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2010, at xiii (2011), *available at* http://www.eia.gov/analysis/requests/subsidy/pdf/subsidy.pdf.

12 Twenty-nine states and the District of Columbia have an RPS with hard targets; an additional eight have an RPS with soft targets. U.S. Dep't of Energy, Database of State Incentives for Renewables and Efficiency (2013), *available at* http://www.dsireusa.org/documents/summarymaps/RPS_map.pdf (providing a map listing each state's policy, and noting whether it is a goal or a standard).

13 *See infra* notes 88–89 and accompanying text.

14 *See, e.g.*, U.S. Envtl. Prot. Agency & U.S. Dep't of Energy, National Action Plan for Energy Efficiency 2-17 (2006), *available at* http://www.epa.gov/cleanenergy/documents/suca/napee_report.pdf.

15 *See, e.g.*, U.S. Dep't of Energy, *Green Pricing: Utility Programs by State*, http://apps3.eere.energy.gov/greenpower/markets/pricing.shtml?page=1 (last visited Apr. 11, 2013) (showing a range of adders for renewable energy programs as high as 6.379 cents/kWh at NSTAR in Massachusetts); Sacramento Mun. Util. Dist., *Solar Shares: Solar for Everyone,* https://www.smud.org/en/residential/environment/solar-for-your-home/solarshares/index.htm (last visited Apr. 11, 2013) (giving customers of the Sacramento Municipal Utility District the option of paying up to $65/month to participate in the utility's Solar Shares program, which offsets energy usage from electricity produced at a local solar farm). Although in recent years consumer willingness to pay extra for green power appears to have declined, 26% of respondents in a 2010 survey indicated that they were willing to pay an extra $5–$20/month to have some portion of their electricity come from a renewable source. Natural Mktg. Inst., Consumer Attitudes About Renewable Energy: Trends and Regional Differences 12 fig.8 (2011), *available at* http://apps3.eere.energy.gov/greenpower/pdfs/50988.pdf.

16 The efficiency gap was analyzed in detail in the landmark 2009 McKinsey & Company report, which identified both significant cost effective energy efficiency potential and persistent barriers to its adoption. *See* Hannah Choi Granade et al., Unlocking Energy Efficiency in

available, cost-effective energy efficiency policies and their adoption rate by utilities and consumers, even while above-market voluntary renewable resource programs continue to grow.[17] In states with an RPS, utilities are required to expend above-market costs for renewable resource projects. Many go even further and establish feed-in tariffs or special set-aside requirements to jump start non-cost effective renewable technologies, including solar photovoltaics and geothermal power generation.[18] Yet in some of the very same states, utilities are only permitted to fund cost effective energy efficiency programs that cost the same or less than fossil fuel alternatives.[19] In short, support for energy efficiency is strictly tied to its ability to save customers money, while renewable resources receive support even in the face of cost disparities.

The purpose of this Article is to illuminate key differences in the regulatory treatment of energy efficiency and renewable resources, and to provide concrete recommendations for enhancing energy efficiency programs by creating a more balanced regulatory treatment. Part II provides an overview of the utility industry, along with a background on utility regulation and ratemaking that are essential to understanding the incentives provided by differing regulatory regimes. Part III considers the parallel development of energy efficiency and renewable energy programs. Part IV contrasts the two, and highlights the way regulatory differences have impeded the deployment of energy efficiency programs. Part V suggests policy changes to level the playing field between the two resources and lessen the regulatory burden placed on implementing energy efficiency programs. As Part VI concludes, addressing the regulatory and market barriers to energy efficiency investment could transform the nation's energy portfolio, to the benefit of both utilities and their customers.

THE U.S. ECONOMY iii (2009), *available at* http://www.mckinsey.com/Client_Service/Electric_Power_and_Natural_Gas/Latest_thinking/~/media/204463A4D27A419BA8D05A6C280A97DC.ashx. For a good illustration of an efficiency gap related to a specific program (adoption of longer-lasting CFL lightbulbs over traditional incandescents), see 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, 4–7 (2010); *c.f.* Hunt Allcott & Michael Greenstone, *Is There an Energy Efficiency Gap?*, 26 J. ECON. PERSP. 3, 5 (2012) (arguing that the efficiency gap has been overestimated).

17 Annual growth rates in voluntary green power sales averaged 43% from 2004–2007. *See* LORI BIRD ET AL., GREEN POWER MARKETING IN THE UNITED STATES: A STATUS REPORT 12 tbl.9 (2008), *available at* http://www.nrel.gov/docs/fy09osti/46581.pdf.

18 *See* Michael Dorsi, *Clean Energy Pricing and Federalism: Legal Obstacles and Options for Feed-In Tariffs*, 35 ENVIRONS ENVTL. L. & POL'Y J. 173, 183–85 (2012) (describing a variety of municipal and state feed-in tariff programs).

19 For example, in Missouri, at least 15% of electric utility sales must come from renewable resources by 2021, and 2% of those sales must come from solar energy. MO. ANN. STAT. § 393.1030(1) (West Supp. 2013). A cost cap limits rate increases due to the renewable portfolio standard to 1% above a portfolio not including renewable resources. MO. ANN. STAT. § 393.1030(2)(1) (West Supp. 2013). On the other hand, the State has a non-mandatory efficiency goal that is limited to cost-effective resources. MO. CODE REGS. ANN. tit. 4, § 240.20.094 (2012); MO. ANN. STAT. § 393.1075(3) (West Supp. 2013) ("It shall be the policy of the state to . . . allow recovery of all reasonable and prudent costs of delivering cost-effective demand-side programs.").

II. Utility Regulation and Ratemaking

Understanding the disincentives to investment in energy efficiency requires an explanation of the complex, and occasionally archaic, world of utility regulation and ratemaking. This Part provides a brief background on the utility industry and describes cost-of-service ratemaking.

A. The Regulated Utility

The utility industry includes a variety of participants, from small power producers and federal power agencies, to power marketers. Within the retail market, however, customers are served primarily by investor-owned utilities (IOUs), cooperatives, and publicly owned utilities (publics). Approximately 70% of retail customers are served by IOUs,[20] which are regulated by state and federal agencies, including state public utility commissions and the Federal Energy Regulatory Commission (FERC).[21] Publics and cooperatives face significantly different regulatory structures than IOUs.[22] Many are exempt, in whole or in part, from state and local regulatory jurisdiction, and may be governed by private boards or local government entities. The focus of this Article is IOUs, because they are subject to overarching regulatory structures regarding both renewable resources and energy efficiency, and because they constitute the majority of the utility market. Also, unlike publics and cooperatives, which do not have a profit motive, IOUs are uniquely sensitive to profit margins and regulatory incentive mechanisms.

Extensive state and federal regulation of electric utilities began in the 1920s with the determination that utility service constituted a "natural monopoly."[23] This conclusion resulted from the belief that providing utility service required a significant capital investment, and that as a result, duplication of services and industry competition would ultimately result in higher, not lower, prices for customers. Government regulators believed that

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20 *See* Elec. Energy Mkt. Competition Task Force, Report to Congress on Competition in Wholesale and Retail Markets for Electric Energy 14 tbl.1-1 (2007), *available at* www.ferc.gov/legal/fed-sta/ene-pol-act/epact-final-rpt.pdf (providing data showing that, as of 2004, publics, cooperatives, and IOUs served 95.5% of retail customers).

21 Generally, state public utility commissions regulate retail sales and distribution of electricity, while FERC regulates wholesale transactions and transmission. *See* New York v. Fed. Energy Regulatory Comm'n, 535 U.S. 1, 5–7 (2002) (describing history of state and federal regulation of public utilities).

22 *See generally* Paul A. Meyer, *The Municipally Owned Electric Company's Exemption From Utility Commission Regulation: The Consumer's Perspective*, 33 Case W. Res. L. Rev. 294, 298–315 (1983) (describing a history of public and privately-owned utility regulation and highlighting differences between the two); *see also* Robert W. Patton, *History of the Rural Electrification Industry,* Mgmt. Q., Winter 1997, at 7 (describing the development of the rural electric industry and cooperative efforts between government agencies and rural organizations to extend electricity service to rural areas).

23 *See* G. Bruce Doern & Monica Gattinger, Power Switch: Energy Regulatory Governance in the Twenty-First Century 48 (2003); *see also* James C. Bronbright, Principles of Public Utility Rates 10–13 (1961) (qualifying the concept of a natural monopoly as it applies to public utilities).

granting utilities exclusive service territories—i.e., creating regulated monopolies—would result in lower prices and more reasonable rates for customers.[24] In addition, by granting a monopoly, regulators could demand in return that utilities agree to serve all customers. This bargain became known as the "regulatory compact": utilities agreed to serve all customers within their service territory on a non-discriminatory basis; in return, regulators agreed to provide the utility with an exclusive service territory and allow the utility to set rates so as to earn a reasonable rate of return on its capital investments, consistent with similarly-situated businesses.[25]

At the same time, the separate functions of generation, transmission, and distribution became increasingly "vertically integrated" within the same entity.[26] Thus were formed the prototypical utilities of the twentieth century: large, privately-owned entities that controlled the entire supply chain related to providing utility service, with government entities overseeing a cost-based rate setting process.

The energy crises of the 1970s provided the first challenge to this traditional model of utility service.[27] Recognizing a need to diversify the nation's energy supply portfolio and begin to transition away from fossil fuels,[28] Congress passed the Public Utility Regulatory Policies Act of 1978 (PURPA).[29] PURPA required utilities to purchase energy from "qualifying facilities" (QFs) at "avoided cost" prices; that is, the cost the utility would have incurred to generate the power itself.[30] QFs were small producers of certain renewable energy projects, including hydro and biomass.[31] PURPA also required state utility commissions to consider conservation in ratemaking procedures, encouraging the growth of utility DSM programs.[32]

24 *See* Brad Sherman, *A Time to Act Anew: A Historical Perspective on the Energy Policy Act of 2005 and the Changing Electrical Energy Market*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 211, 215–16 (2006) (explaining *Munn v. Illinois*, 94 U.S. 113 (1876), the Supreme Court case that provided for government control of monopoly industries that affect the public good); WILLIAM E. MOSHER & FINLA G. CRAWFORD, PUBLIC UTILITY REGULATION 10 (1933) ("Where competition fails to serve the public, a regulated monopoly may take its place, for the well-being of the public is the paramount consideration of the sovereign state.").

25 *See* CHARLES F. PHILLIPS, THE REGULATION OF PUBLIC UTILITIES 21 (1988); *see also* Lincoln L. Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1346–47 (2010).

26 *See* Davies, *supra* note 25, at 1347–48.

27 *See* Sherman, *supra* note 24, at 214–15.

28 Stanley A. Martin, *Problems with PURPA: The Need for State Legislation to Encourage Cogeneration and Small Power Production*, 11 B.C. ENVTL. AFF. L. REV. 149, 151, 157 (1983).

29 Pub. L. No. 95-617, 92 Stat. 3117 (1978) (codified at 16 U.S.C. §§ 2601–2645 (2006)).

30 ELEC. ENERGY MKT. COMPETITION TASK FORCE, *supra* note 20, at 16–17 (discussing avoided cost pricing and the dramatic response to PURPA by small power producers).

31 *See* Michael D. Hornstein & J.S. Gebhart Stoermer, *The Energy Policy Act of 2005: PURPA Reform, the Amendments, and Their Implications*, 27 ENERGY L.J. 25, 26–30, 32–33 (2006) (discussing the original definition of qualifying facility and amendments adopted pursuant to the Energy Policy Act of 2005).

32 16 U.S.C. § 2621 (2006) (requiring state commissions to consider taking into account a variety of conservation issues, including rate design, load management techniques, and compensation for investments in conservation and efficiency).

The early 1990s saw the beginning of deregulation in the utility industry.[33] The Energy Policy Act of 1992 (EPAct)[34] and subsequent rulemaking by FERC required the functional "unbundling" of electric utilities, with the expectation that breaking apart the separate functions of generation, transmission, and distribution would lead to greater innovation and ultimately drive down prices for customers.[35] Part of the impetus for the EPAct was also the desire to drive the electric industry toward greater efficiency.[36] Significantly, the EPAct created a greater role for FERC, which regulates the wholesale sale and transmission of electricity, while state regulators remained in control of rate setting at the retail distribution level.[37]

B. Utility Rate Setting

A basic review of utility cost-of-service ratemaking is necessary to understand the economic consequences facing utilities when they consider investments in renewable resources and energy efficiency.[38]

Utility rates are set through a process that involves utility regulators, customer groups, and a variety of other interested stakeholders. Generally, the utility calculates an annual revenue requirement based on the operating expenses it incurs in a hypothetical test year plus a desired rate of return (ROR) applied to invested capital (rate base) less accumulated depreciation. Regulators and interest groups review the utility's proposed rates and seek changes. Ultimately, regulators must approve rates that are considered "just and reasonable," while balancing the needs of utility customers and investors.[39] According to the seminal Supreme Court cases, *Bluefield Water Works and Improvement Co. v. Public Service Commission of West*

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33 For a thorough history of the regulation and deregulation of the natural gas and electric industries, see Jacqueline Lang Weaver, *Can Energy Markets Be Trusted? The Effect of the Rise and Fall of Enron on Energy Markets*, 4 HOUS. BUS. & TAX L.J. 1, 6–16 (2004).

34 Pub. L. No. 102-486, 106 Stat. 2776 (1992) (codified in scattered sections of 42 U.S.C.).

35 *See* DOERN & GATTINGER, *supra* note 23, at 73–74; Sherman, *supra* note 24, at 252–53.

36 *See* Sherman, *supra* note 24, at 234–35, 248–49.

37 *See* DOERN & GATTINGER, *supra* note 23, at 73–74; *see also supra* note 22 and accompanying text.

38 Utility ratemaking is a complex process that cannot be fully addressed within the scope of this article. For a thorough discussion of general cost of service ratemaking and the controversial process of setting the utility's rate of return, see generally PHILLIPS, *supra* note 25, at 168–72, 243–443. *See also* LEONARD S. HYMAN ET AL., AMERICA'S ELECTRIC UTILITIES: PAST, PRESENT, AND FUTURE 237–77 (2000).

39 The phrase "just and reasonable" is ubiquitous among state and federal utility ratemaking statutes and regulations. *See, e.g.*, Public Utility Regulatory Policies Act of 2005, 16 U.S.C. § 824d (2006) ("All rates and charges made, demanded, or received by any public utility for or in connection with the transmission or sale of electric energy subject to the jurisdiction of the Commission, and all rules and regulations affecting or pertaining to such rates or charges shall be just and reasonable"); DEL. CODE. ANN. tit. 26, § 311 (West 2012) ("In determining the just and reasonable rate to be charged, the Commission shall consider the revenue needs of the utility, its past and projected rates of return on its rate base, or, when appropriate, its operating ratio."); FLA. STAT. Ann. § 366.06 (West 2012) ("[T]he commission shall have the authority to determine and fix fair, just, and reasonable rates that may be requested, demanded, charged, or collected by any public utility for its service.").

Virginia,[40] and *Federal Power Commission v. Hope Natural Gas Co.*,[41] rates of return must be set at levels that compensate investors fairly, and are consistent with other, similarly situated industries.[42]

The basic equation for a utility's calculation of its revenue requirement may be summarized as:

Revenue Requirement = Operating Expenses + ROR (Rate Base - Depreciation)[43]

The hypothetical test year is created by considering actual utility expenses and normalizing for events that are not regular or recurring, or are not considered representative of utility operating expenses going forward. The purpose of the test year is to create a generic picture of utility expenses going forward, rather than trying to calculate rates based on specific expenses.[44] Rate base, on the other hand, is calculated from actual utility investments.[45] Regulators review new capital investments at the time of a rate case and will only include in the rate base those investments deemed "prudent."[46]

Utility rates cannot be changed outside of the rate-setting process, even if operating expenses increase or decrease significantly. This is a key aspect of the process: utility rates are set on a hypothetical, generic basis, and are not intended to guarantee profits.[47] If actual expenses are higher than the

40 262 U.S. 679 (1923).

41 320 U.S. 591 (1944).

42 The constitutional floor for the rate regulation of utilities was established in *Bluefield Water Works & Improvement Co.*, 262 U.S. at 692 ("A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties . . . .") and in *Hope Natural Gas Co.*, 320 U.S. at 603 ("[T]he return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.").

43 *See, e.g.*, 16 TEX. ADMIN. CODE § 25.231 (2012) (defining cost of service ratemaking); Darryl Tietjen, Pub. Util. Comm'n of Tex., Briefing for the NARUC/INE Partnership: Tariff Development I: The Basic Ratemaking Process (Feb. 27, 2008), *available at* http://www.narucpartnerships.org/Documents/Tariff%20Development%20I—Basic%20Ratemaking%20Process%20-%20final%20draft%20ver%201%200.pdf.

44 *See, e.g.*, QUESTAR GAS, A GUIDE TO UTILITY RATEMAKING 2 (2002), *available at* http://www.questargas.com/brochures/59027.pdf.

45 *Id.* at 2, 7.

46 Utility prudence is a nuanced principle outside the scope of this Article. For a brief discussion of the prudence standard applied to utility investments, see Jonathan Kahn, *Keep Hope Alive: Updating the Prudent Investment Standard for Allocating Nuclear Plant Cancellation Costs*, 22 FORDHAM ENVTL. L. REV. 43, 49–54 (2010).

47 Many commentators falsely refer to utilities as having a "guaranteed" return on their investment. *See, e.g.*, David B. Spence, *The Future of Energy Policy: A National Renewable Portfolio Standard: The Political Barriers to a National RPS*, 42 CONN. L. REV. 1451, 1457 (2010) ("When electric utilities were vertically integrated operations, and investors could count on a guaranteed return on investment (through cost of service ratemaking), investment in a power plant or a transmission line was a much less risky venture."). This is not the case. Cost-of-service ratemaking offers utilities the *opportunity* to earn an authorized rate of return;

hypothetical test year, the utility will earn less than the authorized rate of return. If actual expenses are less than the test year, the utility can earn more than the authorized rate of return. Rates are typically only set on a prospective basis. Traditional ratemaking either entirely bars "retroactive ratemaking" (the recovery of past profits or losses) or creates a strong presumption against it.[48]

This rate-setting formula ensures that utility profits are driven by investment. The more rate base the utility accumulates, the more it can profit.[49] Utility *expenses* do not earn the utility money—unless they are cut between rate cases.

The final piece of the rate-setting puzzle has to do with the way utility rates compensate utilities for individual units of electricity sold. Once the utility's annual revenue requirement is determined, individual rates are set. Part of the rate is set on a volumetric basis (per kilowatt-hour), based on a forecast of total sales for the test year period. A portion of the utility's fixed costs are embedded in these volumetric rates, and a portion is recovered through a fixed customer charge. As is the case with operating expenses, if the utility's actual sales are less than its forecast, it will not earn its authorized rate of return. If sales are higher, it will earn more.[50]

Given this rate-setting structure, it does not take an advanced degree in economics to understand that investor-owned utilities seek to maximize capital investment, cut operating expenses between rate cases, and sell as many units of energy as possible.

III. Parallel Development: Separate, But Not Equal

Over the past four decades, energy efficiency and renewable resources have evolved from esoteric concepts to familiar phrases for both those in the utility industry and individual consumers. The parallel

variances in the utility's actual sales and expenses between rate cases will almost always result in returns above or below levels authorized in a rate case.

48 Although state courts and utility commissions apply this principal differently, a number of Supreme Court cases have been cited in support of the concept that utility rates must be set on a prospective basis and cannot be used to recover past profits or losses. *See* L.A. Gas & Elec. Co. v. R.R. Comm'n of Cal., 289 U.S. 287, 313 (1933) (holding that agencies cannot use past profits to support confiscatory rates on a future basis). For a thorough discussion of this principle, see generally Stefan H. Krieger, *The Ghost of Regulation Past: Current Applications of the Rule Against Retroactive Ratemaking in Public Utility Proceedings*, 1991 U. Ill. L. Rev. 983 (1991).

49 In the early 1960s, Averch and Johnson published a widely cited study arguing that this rate-setting formula results in the overcapitalization of the utility industry. Harvey Averch & Leland J. Johnson, *Behavior of the Firm Under Regulatory Constraint*, 52 Am. Econ. Rev. 1052 (1962). This unintended consequence of classic cost-of-service ratemaking is generally known as the Averch-Johnson affect. More recently, authors Douglas, Garrett, and Rhine argued the practice of disallowing certain capital investments enhances the incentive to overcapitalize. Stratford Douglas, Thomas Garrett & Russell Rhine, *Disallowances and Overcapitalization in the U.S. Electric Utility Industry*, 91 Fed. Res. Bank of St. Louis Rev. 23 (2009).

50 *See* Nat'l Action Plan for Energy Efficiency, Aligning Utility Incentives with Investment in Energy Efficiency 2-3 to 2-7 (2007), *available at* http://www.epa.gov/cleanenergy/documents/suca/incentives.pdf (discussing the throughput incentive).

development of these two resource options is instructive of both their similarities and their differences.

A. Energy Efficiency

At the outset, it is worth spending a moment to define the term "energy efficiency." While numerous definitions abound, energy efficiency may generally be thought of as a technological improvement or process that enables end-use devices (from steam turbines to household appliances) to provide the same service using less energy.[51] Utilities generally "obtain" energy efficiency resources by offering individuals and businesses financial and technical assistance in adopting new energy efficiency technologies.[52] For example, a utility might distribute compact fluorescent light (CFL) light bulbs to customers to replace more energy-intensive incandescent lights, or provide financial incentives for businesses to replace inefficient heating and cooling systems.[53] Utilities may also be directly involved in "market transformation," which may be broadly defined as efforts to raise regulatory standards (i.e., building codes, appliance efficiency standards), or make higher efficiency products ubiquitous within the market.[54]

Regulatory policies that encourage energy efficiency grew out of the energy crises of the 1970s. From 1974 to 1992, a number of federal measures were established to encourage energy efficiency, with the underlying rationale primarily being one of increasing energy and economic security.[55] In the 1980s, states also began to mandate utility-operated energy efficiency programs, with the ostensible purpose of saving utility customers money by avoiding costly new power plants and unnecessary investments.[56]

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51 *See*, *e.g.*, SARA HAYES ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., CARROTS FOR UTILITIES: PROVIDING FINANCIAL RETURNS FOR UTILITY INVESTMENTS IN ENERGY EFFICIENCY 2 (2011), *available at* http://www.areadevelopment.com/article_pdf/id60859_U111.pdf. This concept is not to be confused with energy curtailment, which occurs when consumers make the choice to use less of a given product, thereby conserving energy. For example, turning down a thermostat or opting not to operate an air conditioner would be considered energy curtailment. *See* FRED J. SISSINE, CONG. RESEARCH SERV., IB 95085, ENERGY EFFICIENCY: A NEW NATIONAL OUTLOOK? 1 (1996).

52 Utility programs are just one aspect of energy efficiency, which also includes building codes, appliance standards, transportation policies (including Corporate Average Fuel Economy Standards), and management of government energy use. *See* Kenneth Gillingham et al., *Energy Efficiency Policies: A Retrospective Examination*, 31 ANN. REV. ENV'T. & RESOURCES 161, 162 (2006).

53 Other examples of commercial efficiency projects include incentives for efficient outdoor lighting, cooling systems for data servers, and Energy Star appliances for commercial kitchens. *See, e.g.*, Efficiency Vermont, *Ways to Save & Rebates*, http://www.efficiencyvermont.com/for_my_business/ways-to-save-and-rebates.aspx (last visited Apr. 11, 2013) (discussing examples of commercial efficiency programs offered by the energy efficiency administrator for the State of Vermont).

54 Gillingham et al., *supra* note 52, at 167.

55 Fred Sissine, *Energy Efficiency Policy: Budget, Electricity Conservation, and Fuel Conservation Issues*, *in* ENERGY EFFICIENCY, RECOVERY & STORAGE 75, 81 (Konrad A. Hofman ed., 2007).

56 *Id.*

By the early 1990s, utility funding for energy efficiency was stable and growing, reaching a high of $2 billion in 1993.[57] However, that robust figure abruptly droped to approximately $900 million in 1998 as states shifted their regulatory focus to energy restructuring and deregulation.[58] In the midst of this regulatory evolution, many utilities found it difficult to justify expenses for programs classified as "customer service." Those utilities that were divested into separate generation, transmissions, and distribution entities found no place for energy efficiency programs, which do not fit neatly into any of these industry functions.[59]

As deregulation slowed and energy prices continued to rise, funding for energy efficiency began to rebound. A number of states sought to address regulatory barriers to energy efficiency by creating dedicated "public benefits funds" (PBFs) that collected money from utility customers in order to fund energy efficiency.[60] As of 2007, eighteen states had some sort of PBF.[61] Generally, support of energy efficiency varied widely among states. In 2004, the top twenty states accounted for 88% of all efficiency spending.[62]

In 2006, a National Action Plan for energy efficiency highlighted the cost effectiveness of energy efficiency and set a goal of obtaining comprehensive cost effective energy efficiency by the year 2025.[63] Sounding a drum that many others would take up in the years to come, the National Action Plan concluded:

> [T]he efficiency resource available may be able to meet 50[%] or more of the expected load growth over this time frame, similar to meeting 20[%] of electricity consumption and 10[%] of natural gas consumption. The benefits from achieving this magnitude of energy efficiency nationally can be estimated to be more than $100 billion in lower energy bills in 2025 than would otherwise occur, over $500 billion in net savings, and substantial reductions in greenhouse gas emissions.[64]

By 2007, nationwide funding for energy efficiency had grown to approximately $2.2 billion as energy efficiency was "rediscovered" as a means of saving money, avoiding new utility investments, and diversifying utility portfolios away from fossil fuels.[65] Two years later, the landmark McKinsey Study of 2009 estimated that cost-effective energy efficiency

57 YORK ET AL., *supra* note 8, at iii.
58 *Id.* at iii, 3–4.
59 *Id.* at 4.
60 *Id.* at 4–5; *see also* Carley, *supra* note 3, at 8–9.
61 Carley, *supra* note 3, at 9.
62 YORK ET AL., *supra* note 8, at iv.
63 NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at ES-2. For a description of the National Action Plan, including participating agencies and organizations, see Sissine, *supra* note 55, at 87.
64 NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at ES-2.
65 YORK ET AL., *supra* note 8, at iv.

programs could reduce non-transportation energy use by more than nine quads[66] in 2020, representing approximately 23% of estimated demand.[67]

Energy efficiency now figures prominently in many energy policy plans. For example, in Oregon's Draft 10-Year Energy Plan, Governor John Kitzhaber proposed to meet 100% of new electricity load growth through energy efficiency.[68] In 2010, the Northwest Public Power Planning Council (Council) estimated that 85% of the region's load growth through 2030 could be met by cost effective energy efficiency.[69] Energy efficiency also figured prominently in the American Recovery and Reinvestment Act (ARRA).[70]

Meanwhile, a number of recent studies have highlighted the significant disparity between energy efficiency's potential and its likely realization under a "business as usual" scenario. In the 2011 book, *Reinventing Fire*, author Amory Lovins and a team of researchers from the Rocky Mountain Institute estimated that energy efficiency could reduce demand in 2050 from 117 quads to 71 quads.[71] In a study released in January 2012, the American Council for an Energy-Efficient Economy (ACEEE) estimated that aggressive, yet cost effective, energy efficiency programs could reduce overall U.S. energy requirements 59% by 2050.[72] That figure includes changes throughout residential, industrial, and commercial processes, including transportation and direct fuel use.[73] Other detailed studies have suggested

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66 A quad is a quadrillion (10^{15}) Btus of energy. As a point of reference, in 2010, the United States consumed 97.722 quads of energy. U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY REVIEW 2011, at 5 (2012), *available at* http://www.eia.gov/totalenergy/data/annual/pdf/aer.pdf.

67 *See* GRANADE ET AL., *supra* note 16, at 8.

68 JOHN KITZHABER, DRAFT 10-YEAR ENERGY ACTION PLAN 13 (2012), *available at* http://www.oregon.gov/energy/AnalyticsReports/Ten_Year_Energy_Action_Plan.pdf.

69 NW. POWER AND CONSERVATION COUNCIL, SIXTH NORTHWEST CONSERVATION AND ELECTRIC POWER PLAN, COUNCIL DOCUMENT 2010-09, at 1 (2010), *available at* http://www.nwcouncil.org/energy/powerplan/6/default.htm. The Northwest Power and Conservation Council (Council) was authorized by Congress with the passage of the Pacific Northwest Electric Power Planning and Conservation Act, 16 U.S.C. § 839b(a) (2012). The Council is made up of representatives from Montana, Washington, Idaho, and Oregon and has the responsibility for periodically developing a 20-year electric power plan to meet the needs of the Pacific Northwest. *Id.* § 839b(a)–(e). The plan gives the highest priority to cost-effective conservation. *Id.* § 839b(e).

70 American Recovery and Reinvestment Act of 2009, Pub. L. 111-5, 123 Stat. 138 (2009) (appropriating $16.8 billion for energy efficiency programs). For a variety of resources related to ARRA, see the official government website: Recovery.gov, *The Recovery Act*, http://www.recovery.gov/About/Pages/The_Act.aspx (last visited Apr. 11, 2013). *See also* Neil Peretz, *Growing the Energy Efficiency Market Through Third-Party Financing*, 30 ENERGY L.J. 377, 382–84 (2009) (describing ARRA resources available for efficiency programs).

71 AMORY LOVINS, ROCKY MOUNTAIN INST., REINVENTING FIRE 10–11 (2011).

72 JOHN A. "SKIP" LAITNER ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., THE LONG-TERM ENERGY EFFICIENCY POTENTIAL: WHAT THE EVIDENCE SUGGESTS v–vi (2012), *available at* http://www.aceee.org/research-report/e121 (referencing savings in the "Phoenix Scenario"). The study provides for a Reference Case, an Advanced Scenario (including currently known technologies), and a Phoenix Scenario (with new technologies and changes to the built environment). Under the Advanced Scenario, total energy could be reduced by 42% in 2050. *Id.*

73 *Id.* at v. For example, the Phoenix Scenario phases out conventional light-duty gasoline vehicles entirely and reduces aviation energy use by 70%. *Id.* at vi.

similar potential, estimating a reduction between 60 and 70 quads by the year 2050.[74]

Despite impressive estimates of the potential for cost savings and extensive rhetoric supporting it, funding for energy efficiency programs by utilities remains highly variable. In 2012, the ACEEE found that twenty-six states budgeted less than 1% of utility revenues for energy efficiency, and in four states, utilities budgeted zero dollars for energy efficiency.[75]

Today, efficiency programs are touted as a means of supporting local economies by reducing energy costs, improving business processes, and creating local jobs.[76] In an era of increasing concern over global warming and environmental pollutants, efficiency is also seen as a powerful tool for minimizing the harm associated with energy production.[77]

> Improving energy efficiency in our homes, businesses, schools, governments, and industries—which consume more than 70 percent of the natural gas and electricity used in the country—is one of the most constructive, cost-effective ways to address the challenges of high energy prices, energy security and independence, air pollution, and global climate change.[78]

The benefits offered in support of energy efficiency programs are fairly predictable. First and foremost, energy efficiency is seen as a way of saving money through a reduction in energy bills. Particularly in the 1970s, when faced with rising fuel and capital costs for new power plants, efficiency proponents argued that cost-effective efficiency programs would result in significant savings to utility customers in the form of reduced capital

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74 *Id.* at 7.

75 BEN FOSTER ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., THE 2012 STATE ENERGY EFFICIENCY SCORECARD 26 (2012), *available at* http://www.aceee.org/sites/default/files/publications/researchreports/e12c.pdf.

76 For example, Efficiency Vermont, the program administrator of Vermont's utility efficiency programs, claimed in an annual report: "In 2011, we continued to help reduce energy costs for all Vermonters, strengthening our state and local economy . . . ." EFFICIENCY VERMONT: 2011 ANNUAL HIGHLIGHTS 2 (2011), *available at* http://www.efficiencyvermont.com/docs/about_efficiency_vermont/annual_summaries/2011_Highlights_EfficiencyVermont.pdf; *see also* Casey Bell, Am. Council for an Energy-Efficient Econ., *How Does Energy Efficiency Create Jobs?*, http://aceee.org/blog/2011/11/how-does-energy-efficiency-create-job (last visited Apr. 11, 2013) (describing how energy efficiency creates new jobs); U.S. Envtl. Prot. Agency, *Energy Efficiency*, http://www.epa.gov/statelocalclimate/local/topics/energy-efficiency.html (last visited Apr. 11, 2013) (claiming "[e]nergy efficiency can also boost the local economy and create downward pressure on natural gas prices and volatility").

77 Electricity generation remains a persistent and significant percentage of overall environmental contamination in the United States. *See* Sidney A. Shapiro & Josephy P. Tomain, *Rethinking Reform of Electricity Markets*, 40 WAKE FOREST L. REV. 497, 499–502 (2005); *see also* Benjamin K. Sovacool & Christopher Cooper, *The Hidden Costs of State Renewable Portfolio Standards (RPS)*, 15 BUFF. ENVTL. L.J. 1, 13–22 (2007) (describing impacts of conventional fossil fuel and nuclear electrical generating facilities).

78 NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at ES-1.

expenditures.[79] At the same time, efficiency was seen as a way of reducing dependence on foreign fuels and increasing energy security.[80]

In recognition of the benefits of efficiency and its underutilization as a policy tool, a number of states have adopted requirements for utilities to implement energy efficiency programs. The primary mechanisms used by states to encourage energy efficiency are PBFs, energy efficiency resource standard (EERS), and financial incentives targeted to specific levels of energy savings.

First, a number of states have adopted PBFs, or dedicated funds collected from utility customers that must be spent on energy efficiency programs.[81] Under this model, utilities collect a certain amount of revenue from all customers, which is to be deposited into a central fund. The utility is required to use the fund to support energy efficiency programs.[82]

The second common mechanism used by states is an EERS. The EERS sets a target for energy efficiency savings, either on a utility-specific or statewide basis.[83] As of February 2013, twenty-seven states have adopted an EERS.[84] The goal of an EERS is to achieve a higher level of energy savings than would have occurred in the absence of a regulatory standard.[85] Proponents of EERS also argue that environmental externalities are not reflected in the cost of fossil fuels, and programs to support energy efficiency are necessary to correct market failures.[86] In this way, an EERS looks very similar to a renewable portfolio standard (RPS), which sets a target for the percent of utility sales to come from renewable resources. However, unlike an RPS, which sets a hard target based on somewhat arbitrary goals, an EERS only require the acquisition of *cost-effective* energy

79 TOSHI H. ARIMURA ET AL., COST-EFFECTIVENESS OF ELECTRICITY EFFICIENCY PROGRAMS, RESOURCES FOR THE FUTURE 1 (2011), *available at* http://rff.org/rff/Documents/RFF-DP-09-48-REV.pdf.

80 *See* Edan Rotenberg, *Energy Efficiency in Regulated and Deregulated Markets*, 24 UCLA J. ENVTL. L. & POL'Y 259, 273 (2006). Rotenberg points out that this argument is slightly disingenuous, in that energy production is not strictly tied to oil, and might be addressed through a greater use of coal, which is produced domestically. The U.S. could also improve energy security simply by increasing use of domestically produced natural gas, proven reserves of which hit their highest recorded levels in 2010. *See* U.S. ENERGY INFO. ADMIN., U.S. CRUDE OIL, NATURAL GAS, AND NATURAL GAS LIQUIDS PROVED RESERVES, 2010, at 1 (2012), *available at* http://www.eia.gov/naturalgas/crudeoilreserves/pdf/uscrudeoil.pdf; U.S. Energy Info. Admin., *U.S. Natural Gas Imports by Country*, http://www.eia.gov/dnav/ng/ng_move_impc_s1_a.htm (last visited Apr. 11, 2013).

81 *See* Carley, *supra* note 3, at 8–9.

82 *See id.*

83 *See* MICHAEL SCIORTINO ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., ENERGY EFFICIENCY RESOURCE STANDARDS: A PROGRESS REPORT ON STATE STANDARDS 1–2 (2011), *available at* http://www.aceee.org/sites/default/files/publications/researchreports/u112.pdf.

84 U.S. DEP'T OF ENERGY, DATABASE OF STATE INCENTIVES FOR RENEWABLES & EFFICIENCY, ENERGY EFFICIENCY RESOURCE STANDARDS (2013), *available at* http://www.dsireusa.org/documents/summarymaps/EERS_map.pdf.

85 U.S. DEP'T OF ENERGY, STATE ENERGY EFFICIENCY RESOURCE STANDARDS ANALYSIS 6 (2010), *available at* http://www1.eere.energy.gov/manufacturing/states/pdfs/eers_web_final.pdf.

86 *See* Rotenberg, *supra* note 80, at 274–79.

efficiency[87]—i.e., efficiency that is cheaper than, or an equivalent price to, supply-side alternatives.[88] In some states, the EERS is even more limited, including rate impact caps, budget caps, or "exit ramp" procedures whereby utilities can request to lower efficiency goals.[89]

The size of the EERS goal varies significantly across states. In Virginia, the state has targeted reducing electricity consumption 10% by 2022,[90] whereas in Maine, an aggressive EERS seeks 30% reduction in electricity consumption by 2020.[91] However, it must be emphasized that these targets are explicitly tied to cost effectiveness limits.

A few states have also implemented more direct forms of financial incentives to encourage deployment of energy efficiency. California, for example, has for many years supported aggressive energy efficiency goals with an incentive mechanism tied to realization of efficiency targets.[92]

B. Renewable Resources

Determining what constitutes a renewable resource is surprisingly controversial. Intuitively, we imagine a renewable resource as one that will naturally renew, or replenish over time. Yet the timescale of the

87 *See* SCIORTINO ET AL., *supra* note 83, at 1 (noting "EERS policies maintain strict requirements for cost-effectiveness so that programs are insured to provide overall benefits to customers").

88 For example, in Massachusetts utilities must prepare three-year efficiency plans that are submitted to the Department of Public Utilities for review. Under state law, "Each plan shall provide for the acquisition of all available energy efficiency and demand reduction resources that are cost effective or less expensive than supply." MASS. GEN. LAWS ch. 25, § 21(b)(1) (2012). Similarly, Arizona regulations set a cumulative energy efficiency standard of 22% by the year 2020, but that efficiency is to be achieved through "cost-effective DSM energy efficiency programs." ARIZ. ADMIN. CODE § 14-2-2404 (2012).

89 SCIORTINO ET AL., *supra* note 83, at 13. Texas, North Carolina, and Illinois all have budget caps. *See* TEX. UTIL. CODE ANN. § 39.905(a)(3) (West Supp. 2012) (allowing utility commission to set cost ceilings); TEX. ADMIN. CODE § 25.181(f)(7) (2012) (establishing cost caps per kWh); N.C. GEN. STAT. § 62-133.8(h) (2012) (establishing cost caps per customer class/annual bill); 4 N.C. ADMIN. CODE 11 R08-67(e) (2012); 220 ILL. COMP. STAT. § 5/8-103 (2012) (limiting customer bill increases associated with energy efficiency measures); N.M. STAT. ANN. § 62-17-5(H) (2012) (permitting commission to set "lower minimum energy savings requirements for the utility based on the maximum amount of energy efficiency and load management that it determines can be achieved."); OHIO REV. CODE ANN. § 4928.66 (West 2012) ("The commission may amend the benchmarks . . . if . . . the commission determines that the amendment is necessary because the utility cannot reasonably achieve the benchmarks.").

90 *See* COMMONWEALTH OF VA. STATE CORP. COMM'N, STATUS REPORT: IMPLEMENTATION OF THE VIRGINIA ELECTRIC UTILITY REGULATION 16 (2008), *available at* http://www.scc.virginia.gov/comm/reports/2008_ceur.pdf (describing the process whereby the Commission reviewed efficiency goals and found them to be reasonable).

91 ME. REV. STAT. tit. 35-A, § 10104(4)(F)(4) (2012). Efficiency programs in Maine are developed, planned, and implemented by the Efficiency Maine Trust, which is also required to develop a triennial efficiency, alternative energy, and conservation plan. *Id.* §§ 10104 (1), (4).

92 The incentive mechanism is currently under debate at the California Public Utilities Commission (CPUC). *See* Order Instituting Rulemaking to Reform the Commission's Energy Efficiency Risk/Reward Incentive Mechanism, R.12-01-005, at 19 (Cal. Pub. Util. Comm'n Jan. 19, 2012), *available at* docs.cpuc.ca.gov/PublishedDocs/PUBLISHED/FINAL_DECISION/157786.htm.

replenishment matters; fossil fuels, including oil and natural gas, will "renew" over time, but not at the rate at which we use them. Other resources that may be considered renewable are, in fact, limited. Damming a river to create hydropower will reduce the amount of power that can be generated by the river. Build enough dams and the potential for energy production will be exhausted.

When setting renewable resource targets, the term "renewable resource" is defined in a way that reflects environmentally desired resources. For example, even if a resource is *renewable* (e.g., ethanol, or biomass produced from waste or wood), if it creates significant waste or other attendant environmental harms, it may be excluded from the regulatory definition of a renewable resource.[93] Particular care is often given to hydroelectric resources, which may cause environmental harms to fish and river ecosystems.[94] Similar controversies arise over whether to include biomass and ethanol. The Energy Policy Act of 2005[95] broadly defines renewable energy as, "electric energy generated from solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project,"[96] though many states exclude municipal waste or certain forms of hydroelectric power from their definition of renewable resources.[97]

Although renewable resources have been used as a source of energy for centuries, the notion of renewable resources as an environmentally preferable resource, as well as a means of transitioning the United States away from fossil fuels, arose during the energy crises of the 1970s, and was codified in PURPA.[98] As noted above, PURPA required utilities to purchase

93 Other commentators have defined the term as that which "does not diminish with use and generally does not pollute or cause harm to the environment." Robin J. Lunt, *Recharging U.S. Energy Policy: Advocating for a National Renewable Portfolio Standard*, 25 UCLA J. ENVTL. L. & POL'Y 371, 378 (2007) (citing NANCY RADAR, AMERICAN WIND ENERGY ASSOC., THE MECHANICS OF A RENEWABLE PORTFOLIO STANDARD APPLIED AT THE FEDERAL LEVEL (1997), http://web.archive.org/web/20101024050601/http://www.awea.org/policy/rpsmechfed.html (last visited Apr. 11, 2013)). Note that renewable energy is different from "clean energy" which has been defined by some, including President Obama, to include fossil fuel resources such as natural gas and clean coal. *See* Evan Lehmann, *Obama, Announcing Clean Energy Standard, Looks for Compromise*, N.Y. TIMES, Jan. 26, 2011, http://www.nytimes.com/cwire/2011/01/26/26climatewire-obama-announcing-clean-energy-standard-looks-27848.html?pagewanted=all.

94 David C. Coen & Robert J. Thormeyer, *Should Large Hydroelectric Resources be Treated as Renewable Resources?*, 32 ENERGY L. J. 541, 543–44 (2011).

95 Energy Policy Act of 2005, Pub. L. 109-58, 119 Stat. 64 (codified primarily in scattered sections of 42 U.S.C.).

96 42 U.S.C. § 15852(b)(2) (2006).

97 *See* RYAN WISER ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NAT'L LAB., LBNL-62569, RENEWABLE PORTFOLIO STANDARDS: A FACTUAL INTRODUCTION TO EXPERIENCE FROM THE UNITED STATES 5 (2007), *available at* http://eetd.lbl.gov/ea/emp/reports/62569.pdf. For an overview of which resources are allowed by which states, see U.S. ENVTL. PROT. AGENCY, RENEWABLE PORTFOLIO STANDARDS FACT SHEET fig.3 (2009), http://www1.eere.energy.gov/seeaction/pdfs/see_action_chp_policies_guide_chap_5.pdf (last visited Apr. 11 2013).

98 *See* Martin, *supra* note 28, at 157.

energy from QFs at avoided cost prices.[99] While the notion of avoided costs was intended to prevent alternative resources from raising the cost of energy to customers, PURPA helped establish the paradigm of giving preference to renewable resources.

Over time, consumers became more interested in and educated about the environmental, political, and economic benefits of renewable resources. The Energy Act of 1992, and later FERC orders requiring "unbundling" in the electric industry opened the way for small generators and renewable energy producers.[100] However, renewables remained significantly more expensive and harder to obtain than traditional fossil fuels, which ensured that they were unlikely to be utilized by cost-conscious utilities.

In 1985, Iowa passed the nation's first law mandating purchases of renewable resources.[101] In the late 1990s, a number of states passed RPS legislation setting hard targets for renewable resource acquisition.[102] Today, twenty-nine states have mandatory requirements for renewable resource acquisition; another eight have aspirational goals.[103]

While it is difficult to precisely match the growth of renewable resources to specific policies, like an RPS, there can be no doubt that non-hydroelectric renewable resources are growing. In 1949, excluding conventional hydroelectric power, 0.2% of U.S. electric generation came from renewable resources. In 2011, that figure was 5.1%.[104] As a share of total energy production, non-hydroelectric renewables have grown from 2.4% in 1973 to 7.7% in 2011.[105] In March 2012, the Bonneville Power Administration's (BPA) system hit record levels of wind production, with wind turbines accounting for more than twice as much power as that coming from coal, gas, and nuclear sources combined.[106] In its Annual Energy Outlook 2012, the U.S. Energy Information Administration predicted the share of electric

99 *See supra* note 30 and accompanying text.

100 *See id.* at 23–25. FERC Orders 888 and 889 required vertically integrated utilities to separate the functions of generation, transmission, and distribution, and provide non-discriminatory access to transmission facilities. This made it possible for small generators that did not own transmission to have access to electricity markets. *Id.*

101 *See* Sovacool & Cooper, *supra* note 77, at 3.

102 *Id.*

103 *See Most States Have Renewable Energy Standards*, U.S. Energy Info. Admin. TODAY IN ENERGY, Feb. 3, 2012, http://www.eia.gov/todayinenergy/detail.cfm?id=4850 (last visited Apr. 11, 2013). For an up-to-date list of states with renewable portfolio standards and goals, see U.S. DEP'T OF ENERGY, *supra* note 12.

104 U.S. ENERGY INFO. ADMIN., SEPTEMBER 2012 ANNUAL ENERGY REVIEW 244 tbl.8.2a (2012), *available at* http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb0802a. When conventional hydropower is included, the share of electric generation from renewable resources actually declines from 32.1% in 1949 to 12.7% in 2011. *Id.*

105 U.S. ENERGY INFO. ADMIN., SEPTEMBER 2012 MONTHLY ENERGY REVIEW 5 tbl.1.2 (2012), *available at* http://www.eia.gov/totalenergy/data/monthly/archive/00351209.pdf.

106 *Wind Power on BPA System Sets Another New Record*, BONNEVILLE POWER ADMIN. NEWSROOM, Mar. 22, 2012, http://www.bpa.gov/news/newsroom/Pages/Wind-power-on-BPA-system-sets-another-new-record.aspx (last visited Apr. 11, 2013).

generation from renewable resources in 2035 would rise to 15.3% in the reference case, or 23.3% in a scenario with a high carbon adder.[107]

As with energy efficiency programs and incentive mechanisms, a variety of benefits have been touted in support of the growth of the renewable resource industry. The most important benefits offered by renewable resources are environmental. Fossil fuel combustion produces carbon dioxide, sulfur dioxide, and nitrogen oxides, the primary contributors to global warming, as well as contributors to smog, acid rain, and other health risks.[108] Switching to renewables mitigates or eliminates these harms.

Historically, one of the primary reasons advanced in support of PURPA's goal of increasing renewable and small power producers was increasing the United States' independence from foreign sources of energy.[109] Similarly, many argue that an RPS can help mitigate price fluctuations related to volatile global energy markets, or mitigate U.S. dependence on resources imported from areas experiencing political instability or even hostility to U.S. interests.[110]

Renewable portfolio standards impose mandatory renewable purchase requirements on utilities, and proponents argue that these mechanisms can enhance local economies, particularly in today's struggling national economy.[111] The supply and distribution of renewable resource technologies is part of a growing global market—by supporting that industry, the argument goes, states support the growth of U.S. businesses and workers. Renewable resource jobs are often locally based, allowing politicians to point to job growth at home.[112] Even in the current stagnant economy,

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107 *See* U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2012, 49 fig.49 (2012), *available at* http://www.eia.gov/forecasts/aeo/pdf/0383(2012).pdf. "Carbon adders" are a tool used to determine the potential costs of mitigating greenhouse gas emissions. Specifically, carbon adders are the anticipated cost of Equivalent Carbon Dioxide (CO_2e) emitted in the future, which is assumed when evaluating various investment options. In particular, carbon adders are used to make cost comparison between fossil and renewable fuels. Ctr. for Climate and Energy Solutions, *California PUC Carbon Adder*, http://www.c2es.org/us-states-regions/news/2007/california-puc-carbon-adder (last visited Apr. 11, 2013).

108 *See* Lunt, *supra* note 93, at 373–74, 376–78; *see also supra* notes 5–6.

109 *See* Martin, *supra* note 28, at 157.

110 *See, e.g.*, CLIFF CHEN ET AL., ERNEST ORLANDO LAWRENCE BERKELEY NAT'L LAB. WEIGHING THE COSTS AND BENEFITS OF STATE RENEWABLE PORTFOLIO STANDARDS: A COMPARATIVE ANALYSIS OF STATE-LEVEL POLICY IMPACT PROJECTIONS 25–31 (2007); Melanie Grant, *Where Are They Now? A Look at the Effectiveness of RPS Policies*, 2011 BYU L. REV. 849, 850 (2011) (stating, "the overarching drive of RPS policies is to develop a greater amount of renewable energy supply in order to diversify and improve upon current state energy policies"). *But see* Roger Sant & Michael Kinsley, *The Focus on Energy Independence is Misplaced*, WASH. POST, Dec. 14, 2008, http://www.washingtonpost.com/wp-dyn/content/article/2008/12/12/AR2008121203280.html?nav=rss_opinion/columns (last visited Apr. 11, 2013) (characterizing the goal of energy independence as a "red herring").

111 *See* BARRY RABE, RACE TO THE TOP: THE EXPANDING ROLE OF U.S. STATE RENEWABLE PORTFOLIO STANDARDS 6 (2006), *available at* http://www.c2es.org/docUploads/RPSReportFinal.pdf.

112 The group "Michigan Energy, Michigan Jobs," which sought unsuccessfully in 2012 to increase Michigan's renewable portfolio target from 10% in 2015 to 25% in 2025, claimed that the

renewable energy remains an area of strong, continued growth.[113] Because of these economic issues, RPSs have not been a singularly liberal or Democratic phenomenon. In Texas, for example, the state RPS was promoted as a means of addressing air quality problems, growing the local economy, and stabilizing the electric grid—and it has been widely lauded for accomplishing all three.[114]

The benefits described above are not dissimilar to those propounded for the development of energy efficiency programs, yet the regulatory mechanisms used to advance renewable adoption have been far more comprehensive. The first mechanism used to support renewable generators was PURPA, which, as described above, was intended to develop smaller, cleaner alternatives to large fossil fuel generators. The second, and far more direct, regulatory mechanism is a renewable portfolio standard. An RPS generally requires a utility to supply a certain percentage of its load from renewable resources. The percentage of the load that must be supplied, the definition of eligible resources, penalties for non-compliance, and the availability of trading credits that may be used in lieu of actual renewable resource purchases, are all key—and often controversial—aspects of an RPS.[115]

One of the key goals of an RPS is to grow the market for renewable resources, a market that has traditionally received fewer federal subsidies than fossil fuels.[116] RPSs are also intended to incubate new technologies so they can be more cost effective in the future.[117] Many also argue that the supply market for electricity does not recognize the true cost of externalities resulting from the use of fossil fuels, such as the health effects of pollution, or the long-term effects of global warming. Because the market does not include such externalities, just like it does not account for the broad benefits to society from renewable resources, government intervention is justified to provide a market correction.[118] For similar reasons, a few states have also begun to adopt feed-in tariffs, which compensate renewable resource

proposal would bring at least 74,000 jobs "that can't be outsourced" and $10 billion in new investment into the state. *See* Bob Matyi, *Michigan 'Green' Advocates Submit Signatures for Fall Referendum on 25% by 2025 RPS,* Elec. Util. Week, July 16, 2012; *see also* Mich. Energy Mich. Jobs, *Investment Impact Study of 25 by 25 Policy*, http://mienergymijobs.com/EconomicImpact.aspx (last visited Apr. 11, 2013).

113 "World-wide investment in solar energy for instance increased by more than 250[%] annually from 2004 to 2008. Clean technology and renewable energy were the only segments to experience growth in venture capital investment amidst the 2008/2009 economic downturn." Felix Mormann, *Requirements for a Renewables Revolution*, 38 Ecology L.Q. 903, 906 (2011).

114 Rabe, *supra* note 111, at 10–13.

115 *See* Lunt, *supra* note 93, at 381–82 (describing the basic elements of a RPS).

116 *Id.* at 375.

117 *See* Davies, *supra* note 25, at 1358 (arguing that the "core objective" of a RPS is to promote the renewable energy market).

118 *See* Aki Suwa & Joni Jupesta, *Policy Innovation for Technology Diffusion: A Case Study of Japanese Renewable Energy Public Support Programs*, 7 Sustainability Sci. 185, 188 (2012) ("Government intervention is justified theoretically as a means to correct the negative externalities relating to the use of conventional energy sources and technologies.").

developers at above-market prices with the goal of expanding and growing the specific renewable market.[119]

Of course, this is not to say that there have been no arguments against RPSs. Chief among these arguments is the concern that requiring utilities to purchase renewable resources will significantly increase customers' utility bills.[120] Others have argued that RPSs will not produce the desired economic effects, or that the presence of an RPS will distort utility resource selection and displace cleaner natural gas plants in favor of cheaper options in the resource stack, including coal and nuclear.[121] The exclusion of energy efficiency programs from most RPSs has caught the attention of at least one commentator, who argues that the lack of symmetry between renewables and energy efficiency could damage the market for energy efficiency.[122]

Another common means for directly supporting renewable resources is tax incentives. The best-known tax credit offered to renewable energy generators is the production tax credit, on which the success and failure of the wind industry has been said to fall.[123] The American Recovery and Reinvestment Act (ARRA) also created a host of short-term government subsidies, grants, and tax credits for renewable energy.[124]

IV. DANCING BACKWARD: DIFFERING TREATMENT OF RENEWABLE RESOURCES AND ENERGY EFFICIENCY, AND THE OBSTACLES THAT RESULT

When comparing Fred Astaire and his long-time partner, Ginger Rogers, cartoonist Bob Thaves famously said, "Sure he was great, but don't forget that Ginger Rogers did everything he did, backwards . . . and in high heels."[125]

119 *See* Dorsi, *supra* note 18, at 183–85.

120 Based on this concern, many RPSs include spending caps to protect customers from significant bill increases. *See* K.S. CORY & B.G. SWEZEY, NAT'L RENEWABLE ENERGY LAB., RENEWABLE PORTFOLIO STANDARDS IN THE STATES: BALANCING GOALS AND IMPLEMENTATION STRATEGIES 17 (2007), *available at* http://www.nrel.gov/docs/fy08osti/41409.pdf.

121 *See* Davies, *supra* note 25, at 1374–75.

122 *See* Robert J. Michaels, *National Renewable Portfolio Standard: Smart Policy or Misguided Gesture?*, 29 ENERGY L.J. 79, 84 (2008); *see also* Sean Casten, *A Better Renewable Portfolio Standard*, 22 ELEC. J. June 2009, 29, 31 (arguing for a "fossil energy reduction standard" that would focus on reducing fossil fuel demands rather than providing incentives for specific renewable resources).

123 *See generally* Erin Dewey, *Sundown and You Better Take Care: Why Sunset Provisions Harm the Renewable Energy Industry and Violate Tax Principles*, 52 B.C. L. REV. 1105, 1107 (2011) (arguing that the sunset provisions attached to the production tax credit have significant impacts on renewable adoption and transactions). On January 1, 2013, President Obama signed into law the American Taxpayer Relief Act, which temporarily renewed the Production Tax Credit (PTC) and Investment Tax Credit (ITC). American Taxpayer Relief Act of 2012, § 407, Pub. L. No. 112-240, 126 Stat. 2313 (2013).

124 *See generally* WHITE HOUSE COUNCIL OF ECON. ADVISORS, THE ECONOMIC IMPACT OF THE AMERICAN RECOVERY AD REINVESTMENT ACT OF 2009 SUPPLEMENT TO THE THIRD QUARTERLY REPORT: THE ARRA AND THE CLEAN ENERGY TRANSFORMATION (2010), http://www.whitehouse.gov/administration/eop/cea/factsheetsreports/economic-impact-arra-3rd-quarterly-report/supplement_greenjobs (last visited Apr. 11, 2013).

125 This quote can be found in a 1982 Frank and Ernest comic strip created by Thaves. Cartoonist Group, *Frank and Ernest*, www.thecomicstrips.com/store/add_strip.php?iid=69155

This same sort of comparison might be made of the regulatory treatment afforded energy efficiency and renewable energy resources. As discussed in Part III, efficiency and renewable resources share a similar history, offer similar benefits, and receive similar rhetorical support. It is therefore notable that key regulatory structures promote renewable resources while impeding the adoption of energy efficiency resources.

This Part sets out the differences in the regulatory treatment of energy efficiency and renewable resources and the obstacles to efficiency that result from those differences. The disparities include structural differences related to ratemaking, as well as those associated with measuring and evaluating efficiency programs. Beyond these regulatory differences, there are significant market barriers that inhibit individual investment in energy efficiency resources. While market barriers are not regulatory in conception, regulatory mechanisms could be used to address the unique burden efficiency programs place on individual consumers.

A. Ratemaking Differences in the Treatment of Energy Efficiency and Renewable Resources

A number of ratemaking differences distinguish energy efficiency and renewable resources. The first, and perhaps most important, is that money spent by the utility to invest in renewable resources is generally treated as a capital expense and added to the utility's rate base. Money spent on energy efficiency is generally treated as an annual expense item and is not added to the rate base.[126] This presents an enormous challenge to the adoption of energy efficiency policies. As explained above, utility profits come primarily from returns on invested capital. The more investment the utility is able to include in its rate base, the higher its returns to investors.[127] The utility has no opportunity to profit from expense items, unless it is *minimizing* those expenses between rate cases. Choosing to steer financial resources toward energy efficiency programs therefore presents a significant and daunting opportunity cost to utilities.[128]

(last visited Apr. 11, 2013). The official Ginger Rogers website credits Thaves and uses his original line. Ginger Rogers: The Official Site, *Quotes*, www.gingerrogers.com/about/quotes.html (last visited Apr. 11, 2013). At other times, the quote has been attributed to Faith Whittlesey and Ann Richards. *See* Wikipedia, *Bob Thaves*, http://en.wikipedia.org/wiki/Bob_Thaves (last visited Apr. 11, 2013).

126 *See* NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at 4-1, 4-5 ("With a very few exceptions, capitalization is no longer the method of choice for energy efficiency cost recovery").

127 *See supra* Part II.B.

128 At least one study has attempted to quantify the size of this opportunity cost. *See generally* Larry Blank and Doug Gegax, *Objectively Designing Shared Savings Incentive Mechanisms: An Opportunity Cost Model for Electric Utility Efficiency Programs*, 24 ELECTRICITY J. 31 (2011). In their study, Blank and Gegax use an illustrative example of a hypothetical utility contemplating an energy efficiency program that costs $10 million and reduces energy consumption by 64,000 MWh. By comparing the cost of the efficiency investment with the avoided cost of a combustion turbine, including the return on equity to the utility, the authors calculated an opportunity cost to the utility of 4.72% of net customer benefits. The authors propose using such calculations to create a shared savings incentive payment for the utility. *Id.* at 37–39.

Second, expenses related to energy efficiency, particularly in the case of significant projects for industrial or commercial customers, often vary significantly from year to year. Because of this fluctuation, utilities are likely to over- or under-recover efficiency expenses if they are included in the base rates, which are derived from normalized test-year expenses, not actual expenses.[129] As a result, utilities may have no certainty that they will be able to recover costs associated with energy efficiency programs unless energy efficiency expenses are paid from dedicated public funds, or are subjected to a balancing account. This ratemaking treatment directly contrasts with the treatment of renewable resources: if determined to be prudent, all costs related to the renewable resource investment can be capitalized and added to the rate base, and in turn, recovered on a predictable basis.

A third problem lies in the link between utility sales and profits. As described in Part II.B, utility rates are based on forecasted sales, and a portion of the utility's fixed costs are embedded in volumetric rates.[130] If the utility sells fewer units of energy than projected, it will not fully recover its fixed costs. One study estimates that a full-scale energy efficiency program could cut utility earnings by 172 basis points, even while customer benefits totaled $131 million.[131] This rate structure presents a clear barrier to adopting energy efficiency policies. The officers and directors of IOUs have a fiduciary duty to act in the best interests of the utility and its investors.[132] Finding ways to maximize a *loss* of revenue is unlikely to meet this standard.

In sum, if a utility invests in a renewable resource, it will meet existing load, may increase its rate base, and will have expenses covered in rates. However, if it invests in energy efficiency, it may lose revenue, suffer unrecovered program costs, *and* miss an opportunity to build its rate base. Given this regulatory structure, it is unsurprising that many utilities do not aggressively invest in energy efficiency—or perhaps surprising that any actually do.

B. The Challenge of Measuring Efficiency

Utility regulators evaluate the costs and benefits of both renewable and energy efficiency resources prior to deciding whether to allow the utility to recover costs related to the acquisition of those resources. However, evaluating the cost and output of energy efficiency is, quite simply, much more complex. First, there is the challenge of measuring a so-called "negawatt"—the absence of a unit of demand. Then there is the proliferation

129 *See* NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at 4-2.

130 *See id.* at 2-3.

131 Eric Hirst & Eric Blank, *Quantifying Regulatory Disincentives to Utility DSM Programs*, 18 ENERGY 1091, 1101 (1993).

132 Corporate officers and directors generally owe a duty of care and a duty of loyalty to the corporations that they serve. Defining the exact nature of this duty, and the entity or entities to which it is owed, is surprisingly complex. For a discussion of this subject, see Paula J. Dalley, *To Whom it May Concern: Fiduciary Duties and Business Associations*, 26 DEL. J. CORP. L. 515, 523–27 (2001).

of individual projects (everything from replacing light bulbs to installing more efficient air conditioners), each of which has a different cost-output profile. Finally, there is the short-term nature of the cost effectiveness assessment, which requires an ongoing comparison to the cost of supply-side alternatives. The result of these challenges is that utilities, regulators, and interests groups must expend an enormous amount of time and money on the evaluation process. Utilities' confidence in their ability to recover expenses or earn incentives related to efficiency programs may be undermined by shifting determinations of energy efficiency potential and methods of evaluation. In the end, cost effective projects may not be funded, or utilities may be reluctant to aggressively engage in new efficiency programs.

1. Evaluating Energy Efficiency and Renewable Resources

Evaluating the cost and potential output of a renewable resource is fairly straightforward. While the energy produced by wind or solar facilities will vary based on location, models provide a fair degree of accuracy in predicting output.[133] Using generally accepted techniques, utilities and regulators can compare the estimated cost and output of a resource with other options.[134] Once the resource is acquired or constructed, the utility will seek to include the capital cost in its rate base. After costs are approved, the utility will recover on the investment until it is fully depreciated or removed from service, a period of time that may last as long as sixty years for a coal plant.[135]

Evaluating the cost and output of an efficiency program is significantly more complex.[136] Generally, an evaluation will seek to measure energy consumption before and after the implementation of an efficiency program, or measure the pre- and post- "energy intensity" of a given service or technology.[137] Energy intensity can be defined as, "the ratio

133 *See generally* NAT'L RENEWABLE ENERGY LAB., WIND RESOURCE ASSESSMENT HANDBOOK: FUNDAMENTALS FOR CONDUCTING A SUCCESSFUL MONITORING PROGRAM (1997), *available at* http://www.nrel.gov/docs/legosti/fy97/22223.pdf (providing an introduction to the assessment of a prospective wind turbine site).

134 This comparison generally occurs during the IRP process, if the utility uses such a process. *See supra* note 1 and accompanying text.

135 *See, e.g.*, Glustrom v. Colo. Pub. Util. Comm'n, 280 P.3d 662, 668 (Colo. 2012) (upholding Public Utility Commission's determination of a 60-year depreciation rate).

136 The process of assessing efficiency programs is often referred to as "EM&V," denoting the multiple component tasks of evaluation, measurement, and verification of energy savings and project impacts. *See* STEVEN R. SCHILLER ET AL., NATIONAL ENERGY EFFICIENCY EVALUATION, MEASUREMENT AND VERIFICATION (EM&V) STANDARD: SCOPING STUDY OF ISSUES AND IMPLEMENTATION REQUIREMENTS 4–6 (2011), *available at* http://www1.eere.energy.gov/seeaction/pdfs/emvstandard_scopingstudy.pdf (defining key terms in the EM&V process). A common reference source within the industry for EM&V strategies is the California Standard Practice Manual. *See* CALIFORNIA STANDARD PRACTICE MANUAL: ECONOMIC ANALYSIS OF DEMAND-SIDE PROGRAMS AND PROJECTS (2011), *available at* http://www.cpuc.ca.gov/PUC/energy/Energy+Efficiency/EM+and+V. For ease of reference, this Article refers to EM&V as "evaluation."

137 *See* U.S. ENERGY INFO. ADMIN., MEASURING ENERGY EFFICIENCY IN THE UNITED STATES' ECONOMY: A BEGINNING 3 (1995), *available at* http://www.eia.gov/emeu/efficiency/ee_report_html.htm (providing an introduction to the process of efficiency evaluation).

of energy consumption to a unit of measurement."[138] If the total requirement for service can be met by a smaller amount of energy consumption, the energy intensity will increase, and efficiency is said to increase. Then the challenge becomes determining to what extent that increase can be specifically attributed to the efficiency project. The problem, as noted by the U.S. Energy Information Association (EIA) in a 1995 study, is that "[c]hange in energy use over time is driven by a combination of efficiency, weather, behavioral, and structural effects that may be only partially separable and may differ among energy services."[139]

To get a sense of how complex the evaluation process can be, imagine the following scenario: a natural gas utility decides as part of its resource planning process to decrease demand on its system by getting its customers to install highly efficient gas furnaces. In order to achieve this efficiency gain, the utility plans to offer customers an incentive ($200) toward the purchase of the new, highly efficient furnaces. However, because the utility must purchase enough gas to meet the needs of its customers, it must have a somewhat reliable predictor of the average savings that will be gained by installing these more efficient furnaces. To determine the actual amount of energy savings that can be expected, the utility will need data that measures customers' gas usage before and after installation of the highly efficient furnaces. Assuming the usage declines, a variety of factors must then be considered. For example, the impact of weather during the period in question must be taken into account, as well as any changes to the customer's home and living patterns. Obviously, assessing efficiency on a customer-by-customer basis would be impractical; on the other hand, the utility must have somewhat granular data from which to extrapolate reliable results. Efficiency gains from a furnace replacement program at a utility in Boca Raton, for example, are unlikely to be predictive of results at a utility in Minneapolis.

Assuming evaluators can come up with an average representative efficiency estimate that can be assigned to this particular furnace in this particular market, regulators then must consider whether the $200 incentive program is cost effective. Typically, cost effectiveness compares costs and benefits—but which costs and which benefits are included in this calculation? On the cost side, evaluators could consider costs to the customer (i.e., cost of the furnace, installation, home improvements necessary to support the new furnace, lost days from work to oversee installation), costs to the utility (i.e., data collection, marketing, personnel, carrying costs), or third party costs (i.e., contractors, outside program administrators).

On the benefit side, evaluators must obviously estimate gas cost savings that can be attributed to the efficiency program. Yet they must also choose whether to value the savings from the perspective of the utility or the customer. Evaluators might include non-economic benefits to customers, such as the health, comfort, or safety of an efficiency improvement. In

138 *Id.* at 4.
139 *Id.*

addition, they could include utility avoided costs on an individual customer basis or to the utility as a whole, factoring in avoided costs for transmission and distribution infrastructure. Some evaluation tests also include societal costs and benefits, such as a reduction in carbon emissions and other environmental externalities, or reduced dependence on international fuel markets. Finally, evaluators of the efficiency program must decide whether to look at the gas furnace rebate in isolation, or whether to look at the utility's overall portfolio of efficiency projects.[140] Accurate resource planning and evaluation necessitates that the utility also predict the extent to which the financial incentive will actually drive consumers to purchase high efficiency furnaces. This leads to the persistent question of how to account for "free-riders," or those who take advantage of financial incentives even if they would have made the efficiency improvement without the incentive.[141] For example, imagine a homeowner has analyzed her gas bill and decided she will save money by purchasing a more efficient furnace. Later, she discovers that the furnace she has picked out also carries with it a $200 rebate. Happily, she pockets her $200, though it played no part in her decision-making process. The questions are how to estimate the number of free-riders, and whether to include efficiency savings related to free-riders in utility efficiency program evaluations.

A final challenge to regulators is determining whether to account for the "rebound effect"—a controversial theory offered by some researchers.[142] The rebound effect suggests that, when faced with diminishing energy costs caused by energy efficiency programs, consumers may simply buy more products or use more of the service in question. For example, a homeowner experiencing lower electric bills due to a more efficient furnace may simply turn up the thermostat, much like a driver with a more fuel-efficient car may drive more when presented with lower monthly gas costs.

2. Obstacles Created by Cost Effectiveness Limits

The regulatory focus on cost effectiveness has proven to be a sharp, double-edged sword. While numerous studies demonstrate that energy

140 At the end of this myriad of variables, four primary cost-benefit analyses have emerged: Participant, Ratepayer Impact Measure (RIM), Program Administrator Cost (PAC), and Total Resource Cost (TRC). These four tests are summarized and described in the CALIFORNIA STANDARD PRACTICE MANUAL, *supra* note 136, at 4–5. This is not to suggest that cost-benefit tests across states are uniform—they are not. In a 2012 analysis by the ACEEE, the authors conclude, "this study clearly confirm[s] the widespread perception that there is a great diversity among the states in how they handle the evaluation of ratepayer-funded energy efficiency programs." MARTIN KUSHLER ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., A NATIONAL SURVEY OF STATE POLICIES AND PRACTICES FOR THE EVALUATION OF RATEPAYER-FUNDED ENERGY EFFICIENCY PROGRAMS iii (2012), *available at* http://aceee.org/research-report/u122.

141 *See* Eric Malm, *An Actions-Based Estimate of the Free Rider Fraction in Electric Utility DSM Programs*, 17 ENERGY J., no. 3, 1996, at 41, 41 (describing the phenomenon and a potential method of evaluation).

142 *See* Lorna A. Greening et al., *Energy Efficiency and Consumption—The Rebound Effect—A Survey*, 28 ENERGY POL'Y (SPECIAL ISSUE) 389, 399 (2000) (surveying the literature and concluding that estimates for the size of the purported rebound effect range from very low to moderate).

efficiency is far less costly than other energy sources in the aggregate,[143] state energy efficiency programs do not rely on these broad-based analyses. They use the complex, individualized evaluation processes developed with the input of local regulators, interest groups, and utilities, as described above. The problem with these evaluation processes is three-fold. Strict and complicated cost-effectiveness tests can lead to utilities under-committing to efficiency programs and underestimating efficiency goals. They can tie up administrative bodies in endless, costly litigation over standards, and they can result in the elimination of efficiency programs—both individual programs, such as home insulation, or entire utility programs—when no cost effective efficiency programs seem viable.

Complex and frequently changing standards create uncertainty as to the amount of savings that will be attributed to projects and as to whether at the end of the evaluation process, such projects will be found cost effective. This uncertainty can make utilities reluctant to commit financial resources to efficiency projects, for fear they will be unable to recover the costs for such projects. Uncertainty may also incentivize utilities to underestimate conservation targets in order to ensure they are able to meet those goals and avoid state-imposed penalties for failing to do so.

Washington State provides a good example of how uncertainty in measurement and evaluation, and related fears for cost recovery or the threat of penalties for failure to meet targets, can influence utility behavior and lead to protracted litigation. In 2006, Washington voters passed the Energy Independence Act (EIA),[144] which established requirements for utilities to "pursue all available conservation that is cost effective, reliable, and feasible," and to estimate available conservation in a biennial report, using "methodologies consistent with those used by the Pacific Northwest electric power and conservation planning council."[145] In late December 2009, Puget Sound Energy (PSE) circulated via email a projected ten-year conservation target of approximately 427.9 average megawatts (aMW), based on its 2009 Integrated Resource Plan (IRP) plus certain generation improvements.[146] Approximately one month later, in compliance with EIA requirements, the company filed an official report, based on a calculator created by the Council, providing a ten-year achievable conservation potential of 213.7 aMW—nearly half that of the earlier estimate.[147]

Predictably, Washington Utility and Transportation Commission (WUTC) staff, customer advocates, and conservation groups protested, arguing to the WUTC that PSE should have been required to use the higher number for its ten-year plan. PSE staff reportedly admitted that part of their

143 Carley, *supra* note 3, at 10.

144 WASH. REV. CODE §§ 19.285.010–19.285.903 (2012).

145 WASH. REV. CODE § 19.285.040(1) (2012).

146 Wash. Util. & Transp. Comm'n v. Puget Sound Energy, Docket No. UE-100177, Order 04, ¶ 10 (Wash. Util. & Transp. Comm'n June 4, 2010), *available at* http://www.utc.wa.gov/docs/Pages/DocketLookup.aspx?FilingID=100177 (click on hyperlink entitled "Puget Sound Energy," then click on "Documents," then scroll down to click on hyperlink entitled "06/04/2010").

147 *Id.* ¶ 11.

reason for submitting the lower estimate was a concern for cost recovery and potential penalties.[148] Upon order by the WUTC, PSE refiled its ten-year achievable potential—this time at the higher level. The utility and other interested parties then entered into extensive negotiations over whether to accept the revised report.[149]

Years later, there is continuing litigation regarding PSE's and other utilities' EIA compliance. On June 1, 2012, PSE filed its "Biennial Electric Conservation Achievement Report" required under the EIA.[150] In response, several interest groups sought adjustments to PSE's reported savings, while WUTC staff requested clarification from the WUTC as to whether the EIA requirement that the utility "pursue all available conservation" simply means meeting targets set out and approved in biennial conservation reports, or whether it means something more.[151] WUTC staff suggests that the utility be required, among other things, to continuously reassess cost-efficiency potential and eliminate programs that are no longer cost effective or add new programs that may become so.[152] One can only imagine the litigation that might ensue if the WUTC determines that PSE was not only required to meet the target set in the approved biennial report, but also the additional requirements envisioned by WUTC staff. Even if regulators are not tied up in battle, extensive program evaluation is costly.[153]

As WUTC staff's suggestion implies, because cost-effectiveness determinations are tied to a utility's avoided cost (i.e., the measure of the lowest cost alternative energy supply, usually a fossil fuel resource), when

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148 News accounts after a public hearing on the matter quoted Tom DeBoer, director of rates and regulatory affairs for PSE, as stating that his utility's lower conservation targets reflected PSE's concern over penalties for not meeting more aggressive targets, and inability to recover costs for its efficiency programs. *See* Pam Radtke Russell, *Washington State Regulators at Odds With Utilities Over Conservation Goals*, ELEC. UTIL. WK., Mar. 15, 2010.

149 Nearly ten months after the initial filing by PSE, the WUTC approved a settlement by the parties establishing the company's ten-year target at the level set in the re-filed biennial conservation report. Wash. Util. & Transp. Comm'n v. Puget Sound Energy, Docket No. UE-100177, Order 05, ¶¶ 23, 24, 42 (Wash. Util. & Transp. Comm'n. Sept 28, 2010), *available at* http://www.utc.wa.gov/docs/Pages/DocketLookup.aspx?FilingID=100177 (click on hyperlink entitled "Puget Sound Energy," then click on "Documents," then scroll down to click on hyperlink entitled "09/28/2010").

150 *See* PUGET SOUND ENERGY, BIENNIAL ELECTRIC CONSERVATION ACHIEVEMENT REPORT, DOCKET UE-100177 at 2 (Jun. 1, 2012), *available at* http://www.utc.wa.gov/docs/Pages/DocketLookup.aspx?FilingID=100177.

151 Evaluating Electric Utility Conservation Achievements Under the Energy Independence Act, RCW 19.285 and WAC 480-109, Dockets UE-100170, UE-100176, UE-100177, Staff Comments, at 6–7 (Wash. Util & Transp. Comm'n July 16, 2012), *available at* http://www.utc.wa.gov/docs/Pages/DocketLookup.aspx?FilingID=100177.

152 Staff suggested consideration of a utility's participation in national and/or regional conservation or efficiency organizations, participation in the Council's Regional Technical Forum (RTF), participation in collaborative conservation programs with neighboring utilities, adaptive management of conservation programs, and comparison of measures implemented in company programs with measures approved by the RTF. *See id.* at 7.

153 In California, for example, from 2006–2008, approximately 5% of the approximately $2 billion in funds spent on efficiency were directed toward evaluation. *See* Carl Blumstein, *Program Evaluation and Incentives for Administrators of Energy-efficiency Programs: Can Evaluation Solve the Principal/Agent Problem?*, 38 ENERGY POL'Y 6232, 6233 (2010).

the price of alternative fuels changes, the amount of cost-effective energy efficiency also changes. This creates a constantly shifting target for utilities, and, as seen in the case of PSE, encourages them to underestimate energy efficiency potential. It can also result in the elimination of programs that were previously approved and determined to be cost effective, when the price of alternative fuels drop.

This latter concern is not simply speculative. As technological advances in fracking have led to significant decreases in the cost of natural gas, many natural gas utilities have seen their cost effective efficiency potential drop. In its 2009 IRP, NW Natural, an Oregon-based natural gas utility, estimated a reduction of approximately 2.6% in available energy efficiency based on a 10% drop in the gas price forecast.[154] In 2012, the Energy Trust of Oregon, the entity responsible for Oregon's energy efficiency programs, was forced to petition the Oregon Public Utility Commission to allow it to waive cost effectiveness requirements for certain basic programs, including gas home weatherization, because those programs were no longer cost effective.[155] The Avista Corporation, a Northwest IOU, petitioned the Washington and Idaho state utility commissions to *eliminate* its entire natural gas energy efficiency programs because it did not find them to be cost effective.[156]

C. A Need for Customer Participation

When a utility meets demand using a renewable resource, it pays 100% of the cost of that resource upfront and recovers the cost over time from ratepayers. This ratemaking treatment is logical because renewable resources are integrated into the utility's overall supply. Although some customers pay more for "green power," unless a customer generates and uses renewable energy on site, the utility cannot actually track "green" electrons, and instead must sell those customers power generated by different sources. On the other hand, energy efficiency is delivered on an individual customer basis. Efficiency programs such as highly insulated windows or improvements to commercial boilers provide location-specific benefits in the form of reduced energy bills and improved property values, even while they provide a system-wide benefit of reduced load. Because of concerns about parity, individual customers benefiting from the improvements are generally required to pay some portion of the costs. Unfortunately, this need for upfront investment creates significant problems for the adoption of efficiency programs.[157]

154 NW NATURAL, 2011 INTEGRATED RESOURCE PLAN, DOCKET LC 51, at 4.15–4.18, (Jan. 12, 2011), *available at* http://edocs.puc.state.or.us/efdocs/HAA/lc51haa9327.pdf.

155 *See* PUB UTIL. COMM'N OF OR., STAFF REPORT, RE: ENERGY TRUST OF OREGON (DOCKET UM 1622) REQUEST APPROVAL OF EXCEPTIONS TO COST EFFECTIVENESS GUIDELINES 8 (Oct. 1, 2012), *available at* http://www.oregon.gov/puc/meetings/pmemos/2012/100912/reg1.pdf (noting OPUC Staff requests for exceptions to cost effectiveness limitations for specific efficiency programs).

156 *See* Press Release, Avista Corp., Avista Requests Suspension of Natural Gas Energy Efficiency Programs Due to Low Wholesale Prices (July 2, 2012), *available at* http://avistacorp.mwnewsroom.com/News/in/Avista-requests-suspension-of-natural-gas-energy-e.

157 *See* Peretz, *supra* note 70, at 379–81; Hofmeister, *supra* note 16, at 15–17.

First, consumers are reluctant to make investments in energy efficiency unless they can be guaranteed significant returns. Analyses have put the discount rate consumers require for energy efficiency to range from 15–75%, applying inversely with income.[158] These high discount rates may result in part from the loss-aversion effect.[159] This classic theory of behavior states that individuals place a greater emphasis on losses than on gains of the same magnitude. Thus, consumers will place a higher value on the initial investment in energy efficiency programs than on the long-term benefits that might be gained.

Another common impediment to upfront investment in efficiency programs is the landlord-tenant problem. A landlord who owns rental property has little incentive to make investments in energy efficiency because—assuming the tenant pays the utility bills—she won't see the benefit. The tenant has a similar barrier in that he doesn't own the property and may not live on the property long enough to recover the benefit of the energy efficiency investment.[160]

A third problem inhibiting upfront investment in efficiency is the complexity of the data surrounding the benefits for energy efficiency projects, as well as the lack of information at a granular level. While additional home insulation or a more efficient appliance might save a consumer money over time, individual utility bills make it difficult, if not impossible, for customers to estimate just how much money they could save.[161] Even if utility bills could reach an appliance-specific level, measuring the exact amount of energy saved by an energy efficiency project is difficult to estimate, as described in Part V.B. Thus, customers must rely on general studies, averages, and estimates of energy efficiency potential, without having specific, individualized data from which to make their investment decision.

V. UNLEASHING THE POTENTIAL OF ENERGY EFFICIENCY

> [W]ith projections showing that access to currently-defined cost effective modes of efficiency is diminishing, and with our understanding that efficiency is still the cleanest, cheapest form of energy and absolutely essential to resilience and success in a resource-constrained environment, it is time to pioneer a new regulatory regime and business model[.]
>
> — Oregon Governor John Kitzhaber[162]

158 Matt Croucher, *Potential Problems and Limitations of Energy Conservation and Energy Efficiency*, 39 ENERGY POL'Y 5795, 5796 (2011) (citing Jerry A. Hausman, *Individual Discount Rates and the Purchase and Utilization of Energy-Using Durables*, 10 BELL J. OF ECON. 33 (1979)). A discount rate measures the time value of money by quantifying the amount of money a consumer would require in the future to part with money today. If a consumer would require $110 in a year to part with $100 today, the investment can be described as having a 10% discount rate.

159 *See* Croucher, *supra* note 158, at 5797 (discussing Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decisions Under Risk,* 47 ECONOMETRICA 313 (1979)).

160 *See* Peretz, *supra* note 70, at 386.

161 *See* Hofmeister, *supra* note 16, at 17–18.

162 KITZHABER, *supra* note 68, at 18.

The differing regulatory treatment outlined above provides a guide for identifying new mechanisms and structures that have the potential to significantly increase the adoption of energy efficiency programs. States can jumpstart the development of such programs by simply adopting tactics similar to ones already in place to increase renewable resource penetration, including: 1) modifying ratemaking treatment of energy efficiency investments to ensure both recovery of costs and an incentive for investment; 2) creating an EERS with hard targets not tied to cost effectiveness caps; 3) streamlining cost effectiveness tests; and 4) supporting utilities' market transformation activities that attempt to overcome individual market barriers. This Part describes the modifications needed to bring about these changes and unleash the potential of efficiency in the utility, residential, and commercial sectors.

A. Meeting the Challenge of Utility Rate Structures

As described in Part IV.A, utility rate structures strongly incentivize utilities to invest in renewable resources, while discouraging them from adopting energy efficiency programs. Straightforward methods do exist to remedy these disincentives. States can address ratemaking challenges by creating public benefits funds, using ratemaking mechanisms to decouple the link between utility sales and revenues, and establishing performance incentives for the adoption of efficiency programs.

The use of a PBF assures utilities that the cost of energy efficiency programs will be recovered from customers, and eliminates the problem of over- or under-recovery of program costs embedded in base rates. Utilities with a PBF generally report greater efficiency savings than those with no mechanism to encourage efficiency adoption.[163] A PBF alone may not be sufficient to encourage utilities to make significant investments in energy efficiency, but in combination with the mechanisms suggested below, it can solve utilities' concerns that efficiency programs will generate unrecoverable expenses.[164]

"Decoupling" is the common name given to regulatory mechanisms that sever (or at least weaken) the link between utility sales and revenues.[165] These mechanisms can take a number of forms. The most straightforward removes all fixed costs from variable rates, leaving customers with high fixed monthly charges and low variable charges based on usage. This rate structure, known as "straight fixed variable rates," is popular with utilities because it provides more stability in fixed cost recovery, but worries conservationists, who fear that lowering variable charges (by moving fixed costs out of variable rates) will have the perverse incentive of encouraging

163 Carley, *supra* note 3, at 20.
164 *Id.* at 26.
165 NATIONAL ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at 5-2.

customers to use more, not less, energy.[166] Other decoupling mechanisms calculate the difference between forecasted load and actual load, and compensate utilities for lost margin based on lower sales, either on a per customer or total revenue basis.[167]

In total, fifteen states have a decoupling mechanism in place for electric utilities, while sixteen states have implemented decoupling for gas utilities.[168] Another nineteen states have instituted limited lost margin recovery mechanisms for electric utilities (sixteen for gas utilities) that compensate utilities only for lost revenues that can be directly tied to efficiency programs.[169]

While decoupling mechanisms may add complexity to utility rate structures, and the precise form of the decoupling mechanism may be debated by local stakeholders, they are essential to eliminating environmentally nonsensical ratemaking models that reward utilities for higher sales and penalize them for efficiency.

To address the lost opportunity cost for utilities investing in energy efficiency rather than in capital projects (including renewables), states must adopt positive financial incentives to reward utilities for investing in energy efficiency. Studies suggest that utilities operating in states with performance incentives are more likely to participate in energy efficiency and secure greater energy savings.[170] Unlike other mechanisms, such as a PBF or decoupling, performance incentives on their own have been shown to be sufficient to encourage utility participation, where financial rewards for implementing energy efficiency are equal to or greater than supply-side investments.[171] As of 2011, eighteen states had some sort of incentive mechanism in place to provide a benefit to the utility from efficiency programming.[172]

Incentive mechanisms can come in different forms. Perhaps the most straightforward incentive mechanism, which was adopted in a number of states in the 1980s and 1990s but has since fallen out of favor, is allocation of an additional rate of return on efficiency investments, similar to the rate of return allowed for capital investments.[173] Currently, only Nevada and Wisconsin have such programs.[174]

The most common incentive method used today is a "shared benefit" program, whereby utilities can earn a portion of the financial benefits

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166 *See* AM. ELEC. POWER, ISSUES IN ELECTRICITY: STRAIGHT FIXED VARIABLE, *available at* http://www.aep.com/about/IssuesAndPositions/Financial/Regulatory/AlternativeRegulation/docs/StraightFixedVariable.pdf.

167 *See* NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at 5-1 to 5-2.

168 FOSTER ET AL., *supra* note 75, at 36–37.

169 *Id.*

170 Carley, *supra* note 3, at 18–20; HAYES ET AL., *supra* note 51, at 10.

171 Carley, *supra* note 3, at 28.

172 HAYES ET AL., *supra* note 51, at 5–6.

173 NAT'L ACTION PLAN FOR ENERGY EFFICIENCY, *supra* note 50, at 6-11.

174 In Nevada, utilities can earn up to an additional 5% rate of return on efficiency investments; in Wisconsin, utilities earn a return equivalent to that allowed for capital investments. *See* HAYES ET AL., *supra* note 51, at 11, 44, 56.

created by efficiency programs.[175] Other states have adopted incentives tied to measurements of cost-effective savings achieved by the utility. In Massachusetts, a complex assessment of utility savings, value, and performance can yield a reward of up to 5% of total efficiency program costs.[176] In New Hampshire, utilities can earn 8–12% of total efficiency program budgets based on savings achievements.[177]

A different option would take energy efficiency out of the hands of utilities. Hawaii, Oregon, and Vermont have independent, third party entities administer energy efficiency programs using funds collected from utility customers. While this option is intended to circumvent some of the ratemaking incentives driving utilities toward supply-side acquisition, these states still see the need to adopt ratemaking changes to remedy the negative incentives described above.[178]

Incentive programs are an essential component in driving utility investment in energy efficiency and negating the powerful Averch-Johnson effect that encourages unnecessary capital investment by utilities. As Sanya Carley states in her 2012 assessment of DSM programs, "Utilities that operate in states that offer performance incentives are . . . more likely to participate in DSM/EE [energy efficiency] programs, as well as to secure greater electricity savings[.]"[179] A 2011 study by ACEEE reached a similar conclusion: "[P]er capita spending is notably higher in states that have adopted a shareholder incentive mechanism. We also found that many states have had immediate and substantial increases in efficiency investments following adoption of an incentive."[180]

The link between ratemaking and efficiency adoption is well-documented and logical. Policy assessments undertaken to improve the adoption of efficiency programs affirm that the more ratemaking inequities are addressed, the greater the efficiency savings realized.[181] If ratemaking structures ensure that utilities lose money by investing in efficiency, utilities will avoid making

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175 *Id.* at 11.

176 *See* Order Approving 2006 Energy Efficiency Plan, D.T.E./D.P.U. 06-45, at 11–12 (Mass. Dep't of Pub Util. May 8, 2007), *available at* http://www.env.state.ma.us/dpu/docs/electric/06-45/5807dpuorder.pdf (approving three year efficiency plans for NSTAR Electric and explaining incentive mechanism).

177 *See* Order No. 24,995 Approving Energy Efficiency Plan, DG 09-049, at 5 (N.H. Pub. Util. Comm'n July 31, 2009), *available at* http://www.puc.nh.gov/Regulatory/Orders/2009orders/24995g.pdf.

178 Oregon and Vermont have decoupling mechanisms in place for both electric and natural gas utilities, while Hawaii has decoupling in place for electric utilities. Vermont and Hawaii also provide performance incentives for energy efficiency investments. *See* FOSTER ET AL., *supra* note 75, at 36–37.

179 Carley, *supra* note 3, at 18.

180 HAYES ET AL., *supra* note 51, at 16.

181 Carley *supra* note 3, at 26; *see also* Nicole Hopper et al., *Energy Efficiency as a Preferred Resource: Evidence From Utility Resource Plans in The Western US and Canada*, 2 ENERGY EFFICIENCY, NO. 1, 2009 at 1, 15, 18 ("The adoption of multiple, aggressive policies targeting energy efficiency and climate change does appear to produce sizeable energy-efficiency commitments . . . .").

these investments. Alternatively, by providing financial incentives and remedying disincentives states can secure greater efficiency savings.

B. Setting Hard Targets for Energy Efficiency

A majority of states have committed to the development of targeted levels of renewable resources through establishing an RPS. Although many RPSs include some type of off-ramp to address extreme cost increases, those off-ramps are set in excess of cheaper fossil fuel alternatives, not limited to parity with alternatives.[182] On the other hand, even in the twenty-six states that have adopted an EERS, targets for energy efficiency are always tied to cost effectiveness. Establishing an EERS is a valuable step toward encouraging efficiency savings. However, it is difficult to defend limiting energy efficiency investment to "cost-effective" levels if renewable resources have no similar limitation. If states are committed to reducing the strain on the electric grid, diversifying utility resource portfolios, reducing dependence on foreign markets, and reducing carbon and other GHG emissions through the adoption of renewable resources, they should be just as willing to do so through the adoption of energy efficiency resources. Limiting EERS this way also compounds the problem of utilities under-estimating and under-funding efficiency, and encourages utilities to overestimate the cost of efficiency programs so as to avoid committing to them.[183]

The simplest solution to this problem would be to create hard EERS targets that are based on policy objectives and goals, and that are not strictly limited by cost effectiveness. Targets could be set based on aspirational goals (i.e., 25% by 2025) as is often done with RPS, or could be tied initially to cost effectiveness, but then set for some period of years. Targets could also be tied to economic growth or job creation. A more moderate solution would include setting a hard target, but allowing an off-ramp (similar to that in some state RPSs) for costs that exceed market-based costs by more than a predetermined percentage.

When envisioning how such a policy could be conceived of and implemented, it may be instructive to consider how RPS policies have been implemented. First, these policies have been uniquely targeted to appeal to the individual state in which they are being adopted,[184] and this would almost certainly be necessary when adopting more rigorous efficiency standards. In Nevada, for example, RPS policies have successfully followed the state's interest in supporting its solar industry and in promoting alternatives to

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182 *See* Cory & Swezey, *supra* note 120, at 17. Interestingly, early projections of the impact of RPS policies suggested that they will not significantly increase rates in participating states. *See* Cliff Chen et al., Weighing the Costs and Benefits of State Renewable Portfolio Standards: A Comparative Analysis of State-Level Policy Impact Projections 58 (2007), *available at* http://eetd.lbl.gov/ea/ems/reports/61580.pdf.

183 *See, e.g.*, Carley, *supra* note 3, at 28.

184 Melanie Grant, Note, *Where Are They Now? A Look at the Effectiveness of RPS Policies*, 2011 BYU L. Rev. 849, 852 (2011).

nuclear energy.[185] In Texas, on the other hand, the RPS has largely supported the state's wind industry.[186] Second, RPS policies have grown over time, with many states, including Nevada, revising upward initial RPS targets in a so-called "race to the top" inspired by other state policy goals.[187] To have a significant impact, then, an EERS could start with a moderate hard target, and increase over time as the policy either demonstrates positive impacts on the local economy, or results in only slight rate increases.

Setting a hard target for energy efficiency along with non-compliance penalties could also reduce the need for the ratemaking changes described above—offering a "stick" alternative to the "carrot" approach of providing utility incentives. Given the significant financial disincentives for utility participation in efficiency programs, such a system could simply encourage even more "gaming" in evaluation numbers by utilities than honest, aggressive programming. However, researchers at the National Renewable Energy Laboratory have concluded that, "[t]he strongest RPS policies incorporate noncompliance penalties, either in the form of fines or an alternative compliance payment."[188]

Another method of encouraging additional efficiency investment within existing regulatory structures could be to allow utilities to use energy efficiency to meet RPS goals without requiring programs to meet strict cost-effectiveness standards.[189] The weakness of this approach is that, unless matched with some sort of incentive mechanism or other policy measure designed to address the ratemaking concerns described above, utilities would have no incentive to adopt energy efficiency in lieu of renewables, even when efficiency adoption would save customers money in the long run.[190] In a 2010 hypothetical analysis of a Kansas "super-utility," researchers demonstrated that, if faced with a combined efficiency and renewable resource standard, the utility would "prefer to build its own renewable generation resources and would be unlikely to aggressively pursue energy efficiency."[191] Researchers

185 RABE, *supra* note 111, at 16. Nevada's interest in demonstrating alternatives to nuclear energy has been tied to its position as a potential receptacle for the nation's nuclear waste at Yucca Mountain, in the southern part of the state. *Id.*

186 *See id.* at 10–13.

187 *See* WISER ET AL., *supra* note 97, at 2; RABE, *supra* note 111, at 16–17.

188 CORY & SWEZEY, *supra* note 120, at 15.

189 *See* Lenard, *supra* note 10, at 56 (arguing that energy efficiency should be included into a national renewable energy standard). Currently, eight states allow energy efficiency to meet renewable resource targets, although none of them exempt energy efficiency programs from meeting cost effectiveness standards. These states are Connecticut, Hawaii, Illinois, Michigan, North Carolina, Nevada, Ohio, and Pennsylvania. SCIORTINO ET AL., *supra* note 83, at 4–7.

190 *See* Carley, *supra* note 3, at 28.

191 Peter Cappers & Charles Goldman, *Financial Impact of Energy Efficiency Under a Combined Efficiency and Renewable Energy Standard: Case Study of a Kansas "Super Utility,"* 38 ENERGY POL'Y 3998, 4006–07 (2010). The authors developed this analysis in part as a response to the American Clean Energy and Security Act (also known as the Waxman-Markey bill), which contained a provision for a national combined efficiency and renewable resource portfolio standard. For an analysis of the Waxman-Markey bill, which was passed by the House of Representative in 2009 but ultimately died in the Senate, see Nadine Etienne, Note, *Should We Go Green for the Waxman-Markey Bill?*, 21 FORDHAM ENVTL. L. REV. 345 (2010).

went on to conclude, "Given the erosion in earnings and reduced ROE [return on equity] when energy efficiency is implemented, it is likely that regulators will have to implement policies that establish a more attractive business model for energy efficiency in order to motivate the [utility] to pursue the least cost strategy from the ratepayers' perspective."[192]

Successful state RPSs have grown organically from the particular policy environment of the state. When an RPS is matched with an economic development goal, as it was in Nevada and Texas, the RPS is likely to receive greater bipartisan support.[193] Implementing an EERS with a hard target will likely require a pragmatic analysis of the potential for economic development within the state, and a means of linking increased energy efficiency with direct benefits to state residents.

C. Streamlining Cost-Effectiveness Tests

The evolution of the labyrinthine system of cost-effectiveness measurement and evaluation is understandable, given the desire to fairly evaluate programs, make accurate projections about utility load patterns, and compensate utilities for lost revenue due to efficiency. Particularly if utilities are going to receive financial incentives for savings, there must be some means of ensuring that they have actually gained the savings that justify those incentive payments. Unfortunately, this system has evolved to become an impediment to the adoption of efficiency programs. The reason, as demonstrated above, is that tying the value of efficiency programs to fluctuating fuel costs and constantly changing evaluation mechanisms drives utilities to invest less money in efficiency programs, and threatens the success of those programs over time.

Short of eliminating cost-effectiveness tests altogether, what can be done to avoid negative impacts to efficiency programs from evaluation and measurement processes? One option is to end measurement at the individual project level and assess utility performance as an entire program. This would allow utilities to mix together projects that may fall slightly above or below cost-effectiveness standards over short periods of time, while maintaining overall levels of cost effectiveness. A number of states have adopted this structure, and it has been praised by the ACEEE as a positive tool for encouraging efficiency.[194]

Regulators must also avoid putting too much reliance on what is an inherently uncertain process. Evaluation of a "negawatt" will always be imprecise; program design should therefore not hinge too closely on the minutia of cost-effectiveness determinations,[195] and likewise performance

192 *See* Cappers & Goldman, *supra* note 191, at 4007.

193 *See supra* notes 185–86 and accompanying text.

194 *See* KUSHLER ET AL., *supra* note 140, at 35–36.

195 *See* ANNA CHITTUM, AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., MEANINGFUL IMPACT: CHALLENGES AND OPPORTUNITIES IN INDUSTRIAL ENERGY EFFICIENCY PROGRAM EVALUATION iv (2012), *available at* http://www.aceee.org/research-report/ie122 (concluding "the emphasis on high levels

incentives should not be measured solely on the basis of complex evaluation and verification processes.[196] As the California Public Utility Commission recently observed:

> Our current approach measures and verifies energy savings down to the kilowatt-hour. It is reasonable to question the benefits and costs of achieving this level of precision. . . . In the uncertain science of measuring energy use that did not occur due to a certain intervention, it may be necessary to reform cost-effectiveness tests and . . . [performance incentives] to acknowledge that results may be fairly accurate, but not exact.[197]

Some have suggested that national evaluation and measurement standards would improve the morass of cost-effectiveness testing. National standards would provide more certainty and predictability to utilities, minimize problems of measurement for multijurisdictional utilities that work across state lines, and eliminate some of the litigation that currently bogs down individual state commissions.[198]

The problem of cost-effectiveness testing will be difficult to fully remedy, but these steps—conducting assessments at a programmatic level, streamlining the precision of cost-effectiveness tests, and considering the development of national standards—will move the bar forward, and help address some of the unfortunate and unintended consequences of the current adherence to unnecessarily strict cost-effectiveness limits.

D. Addressing Market Barriers

A number of market barriers tie back to the need for direct up-front consumer investment in energy efficiency programs. Because of the loss-aversion effect, the lack of available information, and the need for available capital to invest, consumers may not be in the best position to adopt even cost-effective energy efficiency. This problem may be addressed by increasing the size of utility incentives, potentially up to 100% of the cost of the efficiency improvement.[199] A policy of reimbursing customers 100% for efficiency programs would likely raise equity issues, as some customers receive direct benefits for efficiency improvements that other customers do not enjoy. However, even without 100% funding for efficiency projects,

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of precision within program evaluation activities may not always be justified or useful when other types of assessments would suffice or where such precision is not achievable").

196 *See* Blumstein, *supra* note 153, at 6238 (arguing for utility incentives to be based on factors other than program impact evaluation).

197 Order Instituting Rulemaking to Examine the Commission's Post-2008 Energy Efficiency Policies, Programs, Evaluation, Measurement, and Verification, and Related Issues, Decision 10-10-033, R.09-11-014, at 29 (Cal. Pub. Util. Comm'n Nov. 2, 2010), *available at* http://www.cpuc.ca.gov/NR/rdonlyres/E5342224-F683-4731-8DCE-166EEBCA54C9/0/D1010033.pdf.

198 STEVEN R. SCHILLER ET AL., NAT'L ENERGY EFFICIENCY EVALUATION, MEASUREMENT AND VERIFICATION (EM&V) STANDARD: SCOPING STUDY OF ISSUES AND IMPLEMENTATION REQUIREMENTS v (2011), *available at* http://www1.eere.energy.gov/seeaction/pdfs/emvstandard_scopingstudy.pdf.

199 *See* Croucher, *supra* note 158, at 5798.

utilities could increase the size of incentives and find ways to make incentives more attractive to customers through advertising and education.[200] Indeed, a number of high performing states with robust efficiency programs, including Michigan and Colorado, are doing just that.[201]

Another way to address market barriers is to pursue mandatory codes and standards for increased efficiency in buildings and appliances. Utilities in a number of states receive credit toward efficiency saving goals when they participate in successful efforts to increase compliance with or adoption of more stringent efficiency codes.[202] These types of market-transformation programs can be difficult to measure, as their evaluation may require subjective determinations, which in turn may make them less likely to pass more stringent cost effectiveness measures.[203] The difficulty in measuring market-transformation efforts may also deter utilities from participating in these activities.[204] One solution would be to create different standards for market transformation, or to exempt market-transformation efforts from cost-effectiveness calculations.[205] Different entities may also be established to operate standard efficiency programs and market-transformation efforts, as has been done successfully in Oregon and Vermont.[206]

VI. CONCLUSION

Energy efficiency is a low-cost, low-risk resource that provides significant benefits to utilities and their customers. Yet substantial barriers follow from the unique regulatory treatment afforded this important resource. Investing in energy efficiency subjects the majority of investor-owned utilities to the risk of unrecovered expenses, high opportunity costs, and little reward. Uncertain and complex standards for judging cost-effectiveness incentivize utilities to underestimate and underinvest in efficiency resources.

Utilities profit from investments in renewable resources. RPSs in a majority of states require targeted investments in renewables, even when costs for those resources exceed fossil fuel alternatives. While inalterable differences between renewable resources and energy efficiency make it impossible to treat these two resources identically, regulators must consider amending existing policies to achieve greater equity. Using the regulatory treatment of renewable resources as a guide, this Article has proposed

200 *See* SETH NOWAK ET AL., AM. COUNCIL FOR AN ENERGY-EFFICIENT ECON., ENERGY EFFICIENCY RESOURCE STANDARDS: STATE AND UTILITY STRATEGIES FOR HIGHER ENERGY SAVINGS 12, 18–19 (2011), *available at* http://www.aceee.org/sites/default/files/publications/researchreports/u113.pdf (describing the tactics of offering more rebates and bigger rebates as effective strategies that can be used to meet high savings goals and ramp-up new programs).

201 *See id.* at 18–19

202 FOSTER ET AL., *supra* note 75, at 51.

203 *See* Carl Blumstein et al., *Who Should Administer Energy-Efficiency Programs?*, 33 ENERGY POL'Y 1053, 1066 (2005).

204 Blumstein, *supra* note 153, at 6234.

205 KUSHLER ET AL., *supra* note 140, at 36.

206 Blumstein, *supra* note 153, at 6236.

concrete and achievable regulatory reforms to encourage energy efficiency program development. In the area of utility ratemaking, these reforms—such as updating ratemaking policies, adding decoupling mechanisms and incentives for efficiency investments—have the potential to significantly increase efficiency adoption. Addressing cost-effectiveness tests by minimizing individual project assessment, streamlining complexity, and considering national standards, can reduce some of the underestimation and underinvestment by utilities in efficiency resources. Finally, using the market power of utilities to address impediments to individual investment can help remedy the market barriers that plague efficiency investment.

By addressing the disincentives and barriers to efficiency investment, states can turn around the momentum of this crucial energy resource, and allow it to lead, rather than follow, the transformation of the United States' energy portfolio.