Regulatory Assistance Project
Issuesletter

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THE ROLE OF DECOUPLING WHERE ENERGY EFFICIENCY IS REQUIRED BY LAW

The American Council for an Energy-Efficient Economy (ACEEE) reports that 19 US states have adopted an Energy Efficiency Resource Standard (EERS) requiring achievement of specified energy saving targets.[1] *A comprehensive energy bill pending in the 111th Congress includes a combined efficiency and renewable electricity standard that would allow electricity savings to meet at least one-quarter of the requirement.*[2] *A more targeted proposal calls for a federal EERS that would require distribution utilities to achieve electricity savings of 15 percent and natural gas savings of 10 percent by 2020* (see table).[3]

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Such standards, or broader requirements to acquire all cost-effective energy efficiency, raise the question of whether decoupling of utility profits from utility sales still has a role in meeting state and federal goals for efficiency and other clean energy sources. This *Issuesletter* explains why aggressive standards make it even more urgent that state Commissions reject structural conflict in traditional regulation that frustrates the least-cost, least-risk path to a low-carbon future. Without decoupling – that is, under traditional ratemaking – utilities are told to do one thing (promote energy efficiency) while they typically make more money when they do the opposite (increase sales).

Proposed Federal EERS [5]

Sector	Electricity		Natural Gas	
Year	Annual Savings	Cumulative Savings	Annual Savings	Cumulative Savings
2011	0.33%	0.33%	0.25%	0.25%
2012	0.67%	1.00%	0.50%	0.75%
2013	1.00%	2.00%	0.75%	1.50%
2014	1.25%	3.25%	1.00%	2.50%
2015	1.25%	4.50%	1.00%	3.50%
2016	1.50%	6.00%	1.25%	4.75%
2017	1.50%	7.50%	1.25%	6.00%
2018	2.50%	10.00%	1.25%	7.25%
2019	2.50%	12.50%	1.25%	8.50%
2020	2.50%	15.00%	1.50%	10.00%

Energy Efficiency Resource Standards

An EERS is similar in concept to a renewable energy standard. It requires the state or utility to achieve specified levels of energy savings. Savings targets typically are expressed as a percentage reduction relative to retail energy sales during a baseline period – for example, average sales during a prior two-year period.[4] These savings are generally achieved through efficiency programs for end-use customers. Savings from building codes, appliance efficiency standards, combined heat and power facilities, and distribution system efficiency improvements also may count toward meeting the standard.

If the jurisdiction adopts a cumulative savings objective – say, 15 percent electricity savings by 2020 – annual targets will typically increase over time to reflect the continued impacts of measures installed each year. With a cumulative target, the lifetime savings associated with installation of energy efficiency measures are counted. Thus program administrators are fully credited for installing long-lived and well-maintained measures. Yearly savings targets provide short-term goals and a yardstick for monitoring progress.

An EERS is a performance-based approach that, once established, removes the need to continually address funding levels for energy efficiency – at least for a while. An EERS may allow an alternative compliance payment in lieu of meeting the standard, with the money directed to a state agency charged with achieving the intended savings. A penalty may be assessed for falling short of the requirements. Where the obligation falls on the utility, the law may allow the trading of savings with other utilities as well as contracting with energy service companies or a state agency to administer programs to meet the standard.

Many jurisdictions outside the US have implemented mechanisms similar to an EERS. The longest running of these is in the United Kingdom. Beginning in 1994, the Energy Efficiency Standards of Performance required electricity suppliers (retailers) to spend £1 per residential customer on household energy-saving measures and set energy savings targets to be achieved by the suppliers.[6] In 2000, the program was extended to all electricity and gas suppliers with at least 50,000 customers, becoming the dominant energy efficiency vehicle for residential customers in the UK. In 2002, the program was renamed the Energy Efficiency Commitment with a new focus on reducing greenhouse gas emissions. However, supplier targets were still expressed in terms of energy savings. Now known as the Carbon Emissions Reduction Target, it is the main policy instrument in the UK for reducing carbon emissions from existing homes. Under the program, electricity and gas suppliers must meet specified carbon emissions reductions.[7]

In Australia, New South Wales, Victoria, and South Australia have imposed what are in effect energy efficiency resource standards. These take the form of obligations imposed on electricity retailers, expressed as reductions in greenhouse gas emissions from electricity sold.[8] Specified energy efficiency measures in the residential sector are deemed to achieve set levels of emissions reduction. In New South Wales and Victoria, the emissions reduction obligation is linked to a trading scheme for energy efficiency certificates.[9]

Energy Efficiency Potential and Cost

ACEEE cites a median level of cost-effective, achievable potential for electric savings in the US of 18 percent.[10,11] That means currently available technologies and approaches can reduce by 18 percent the amount of electricity needed to provide the same level of service. The potential for natural gas savings also is large. The American Gas Association reports that annual energy savings of member utility efficiency programs averaged nine percent of usage for residential participants and seven percent for all participants in 2007.[12] Similarly, ACEEE reports savings from Vermont Gas programs from 1999 to 2006 at 7.8 percent of 2006 sales, and Iowa gas utility programs from 1996 to 2006 at 8.2 percent of 2006 sales.[13]

Not only is there a vast potential remaining to be tapped, but energy efficiency also costs far less than supply-side alternatives. The National Action Plan for Energy Efficiency (NAPEE) cites "conservatively high estimates" for the total (utility and participant) cost of efficiency programs at 4 cents per kilowatt-hour (kWh) for electricity measures and $3 per million British thermal units (MMBtu) for natural gas measures.[14] ACEEE reports preliminary research results indicating average program costs of about 3 cents per kWh saved and 29 cents per therm saved ($2.90 per MMBtu).[15]

Compare that to the cost of a new natural gas-fired, combined-cycle combustion turbine. One recent forecast put the real-levelized cost at 8 cents per kWh (2006 dollars), including transmission.[16,17] The same forecast projects natural gas prices for the period 2010 to 2029 at about $8 per MMBtu (2006 dollars).[18] These price estimates do not reflect distribution costs, reserves, line losses, or potential regulatory costs for greenhouse gas emissions.

Given the tremendous potential of energy efficiency, its cost compared to supply-side alternatives, and its zero-carbon footprint,[19] states should do all they can to remove regulatory barriers that stand in the way of accelerating its acquisition – with or without an EERS.

Decoupling Basics

Most utility costs do not change immediately in response to changes in energy consumption. In the short run, capital costs for generation, transmission, and distribution, as well as expenses for meter reading, billing, customer service, and administration, are largely fixed. However, like most businesses, utilities recover a large amount of their fixed costs through volumetric rates. Because so many of the costs of providing service do not change in the short run, a one percent change in sales can result in a disproportionately larger change in utility earnings, on the order of 10 percent or more.[20,21] That's a powerful disincentive to embracing energy efficiency and, conversely, a very strong reason to increase sales.

Decoupling breaks the link between how much energy a utility sells and the revenue it collects to cover fixed costs.[22] Fundamentally, decoupling eliminates a utility's incentive to encourage consumers to increase energy use in order to increase profits as well as its disincentive to promote energy efficiency.

Decoupling is often viewed as a significant deviation from traditional regulatory practice. In fact, it is only a slight modification. The difference is straightforward.

In a rate case, the Commission sets the amount of revenue a utility ought to collect if it experiences the assumed financial, business, and sales conditions. The utility's "revenue requirement" is the sum of its expected expenses, return of – and return on – investment, and taxes, all during the test year used in the case. In theory, the amount collected should be sufficient to cover the utility's cost of service – no more, no less.

Under traditional regulation, the revenue requirement is used only to set prices (revenue requirement ÷ unit sales during the test period). Actual revenue and profit are a function of actual sales and expenses (actual profit = actual sales - actual expenses), which, in reality, have no relationship to the allowed revenue or rate of return in the rate case.

A utility can increase profits two ways under traditional regulation: (1) reduce expenses and (2) increase sales (units sold). It's easier to increase sales, which in turn increases revenue and profit. This is the heart of the throughput incentive, and it's where decoupling comes in.

Under decoupling, the rate case process remains the same. However, the prices computed in the case are in place for an initial period[23] and thereafter are relevant only as a reference point. Prices are adjusted periodically to keep revenue at its allowed level,[24] reflecting differences between the forecasted units sold (in the rate case) and actual units sold. In other words, decoupling fixes the revenue the utility collects and lets prices float up or down with actual sales. If sales increase, prices fall. If sales decrease, prices rise. That's in contrast to traditional regulation which fixes prices between rate cases and lets revenue float up or down with actual sales. A recent study found that decoupling price adjustments for electric and natural gas utilities tend to be small – typically under two percent of the total retail rate, positive or negative, with the majority under one percent.[25]

Decoupling often is considered when introducing or expanding energy efficiency efforts, but it also is desirable outside that context. That's because, under decoupling, the only way a utility can increase its profits is by reducing costs. A strong incentive to manage costs efficiently is especially welcome today, with ratepayers facing mounting pressure on near-term rates as utilities transition to low-carbon energy sources, advanced metering, and distribution and transmission system upgrades – all of which should ultimately reduce consumer bills.

Commissions also should consider adopting or strengthening service quality standards in tandem with decoupling, to ensure that service is maintained at current or improved levels. Such standards include metrics against which utility performance will be evaluated, financial penalties for failure to meet the standards, and public reporting requirements. Among the measures to consider are at-fault customer complaints, billing accuracy, power interruptions, safety violations, vegetative management, and inspections and maintenance.

EERS and Decoupling

Under traditional price-setting regulation, a utility with a legal mandate to acquire energy efficiency[26] feels the financial pinch of reduced sales just as it would without such an aggressive requirement, only more sharply. At the same time, the utility will still have the incentive to increase sales in order to increase profits.

That structural conflict is at best paradoxical. At worst, it makes utilities adversaries instead of motivated partners in the myriad of venues where energy efficiency goals and activities are hammered out, including:[27]

- State and federal processes to improve building codes and appliance standards
- Customer contacts and referrals
- Consumer education
- Customer-specific[28] and aggregate information for third-party program administrators and service providers

Furthermore, the same throughput incentive that deters utilities from making energy efficiency investments also dissuades them from supporting distributed generation and demand response, both of which also can decrease sales.

These conflicts play out within the utility, too. Personnel promoting customer-sited resource programs run up against financial staff stymieing their efforts. When visible, regulators are left to sort out the mixed signals – a frustrating experience in uncovering the facts. Such counteraction also sends confusing messages to consumers and the efficiency marketplace, potentially wasting efficiency funds and momentum.

The stress intensifies under an EERS, with annual savings requirements of, say, two percent of prior period sales. Such requirements do not correct the fundamental problem of a utility business model that is incompatible with reducing energy sales. A utility in this situation will simply have another perverse incentive – to work hard to make it look like the targets are reached, but not necessarily to achieve the actual savings required. That includes "gaming" sales forecasts – as well as savings estimates – in every proceeding that establishes base rates. Absent decoupling, utilities are motivated (only by fear of penalty) to do the bare minimum to meet the standards, regardless of the savings potential or benefits to consumers from exceeding the standards.

Does Third-Party Administration Solve the Problem?

Third-party administration of energy efficiency programs is one tool US states are using to address the utility throughput incentive.[29] Funds collected through a system benefits charge are turned over to an organization whose mission is to acquire energy efficiency on behalf of ratepayers.[30] Programs may serve only customers of the regulated utilities or customers of consumer-owned utilities, as well. Similar programs outside the US use a simple levy on electric utility sales revenue to establish a fund which finances measures implemented by third parties. Often there is a competitive process for allocating the funds.

The third-party model reduces the ability, but not the incentive, for utilities to act on their inherent bias against a reduction in sales. Because under this model the utility does not even face the conflict presented by energy efficiency, it can instead respond solely and fully to the throughput incentive.

US states that have adopted third-party administration, including Oregon, Vermont, and Wisconsin,[31] are places to look for evidence of the continued need for decoupling. In fact, commissions in these states still find decoupling a necessary tool to meet energy efficiency goals. The Oregon Public Utility Commission explained its rationale in a recent ruling approving decoupling for the largest utility in the state, Portland General Electric (PGE):

> [W]hile the parties do not disagree that relying on volumetric charges to recover fixed costs creates a disincentive to promote energy efficiency, they contend that decoupling is unnecessary because, with the ETO running energy efficiency programs in PGE's service territory, the Company has limited influence over customers' energy efficiency decisions. We find this position unpersuasive, because PGE does have the ability to influence individual customers through direct contacts and referrals to the ETO. PGE is also able to affect usage in other ways, including how aggressively it pursues distributed generation and on-site solar installations; whether it supports improvements to building codes; or whether it provides timely, useful information to customers on energy efficiency programs. We expect energy efficiency and on-site power generation will have an increasing role in meeting energy needs, underscoring the need for appropriate incentives for PGE.[32]

Similarly, the Vermont Public Service Board has approved decoupling for Green Mountain Power[33] and Central Vermont Public Service (CVPS).[34] And the Wisconsin Public Service Commission recently approved decoupling for Wisconsin Public Service Corporation. [35]

A third-party provider operates most effectively when it works with the utility, has access to the utility's cost, usage, and demand data, coordinates projects to reduce load on the distribution circuits that face upgrade costs if load grows, and presents itself to customers as a partner with the utility. Without decoupling, the utility has an incentive not to work with the third-party provider.

Another factor elevates the need for decoupling in these states: Utilities can request approval from the state commission to include in base rates funding for energy efficiency that is incremental to the amount that can be acquired through the system benefits charge. Therefore, the utility still has significant control over the funding level, regardless of whether a third-party administrator runs the efficiency programs.

Clearing the Path to High Efficiency

Mounting evidence that efficiency is the least-cost, least-risk energy resource is leading to increasingly aggressive savings requirements. Climate change mitigation strategies compound this trend. However, neither requirements in law nor third-party administration of programs negate efficiency's fundamental conflict with the traditional utility business model, where earnings fall disproportionately with declining energy sales. Decoupling, which eliminates the conflict, is therefore a key policy tool for achieving high levels of energy savings through performance standards like an EERS as well as traditional utility programs, building codes, equipment standards, and consumer education.

[1]California, Colorado, Connecticut, Hawaii, Illinois, Iowa, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Texas, Vermont, Virginia, and Washington. In addition to strict EERS requirements, ACEEE includes states with Commission-ordered efficiency targets, states that allow efficiency to count toward renewable energy standards, and states with a rate cap triggering a relaxation of EERS requirements. See Laura A. Furrey, Steven Nadel, and John A. "Skip" Laitner, ACEEE, *Laying the Foundation for Implementing a Federal Energy Efficiency Resource Standard*, March 2009, at http://aceee.org/pubs/e091.htm.

[2]The proposed standard in H.R. 2454 starts at six percent of sales in 2012 and rises to 20 percent of sales in 2020. State governors can petition the Federal Energy Regulatory Commission to allow utilities to meet up to two-fifths of the standard with electricity savings.

[3]H.R. 889 and S. 548. Annual targets are based on average energy deliveries during the two prior calendar years.

[4]Using a baseline period that lags behind the compliance year – say, by one year – provides utilities, regulators, and stakeholders with concrete energy targets (in kilowatt-hours or therms) for program planning and budgeting. The baseline may be fixed throughout the program, based on energy usage before the standard goes into place. Alternatively, a rolling baseline may be used. For example, the baseline may be average usage during 2007 and 2008 for the 2010 compliance year, average usage during 2008 and 2009 for the 2011 compliance year, etc. Under this approach, the more successful the efficiency programs, the lower the subsequent kWh/therm targets because the updated baseline reflects reduced energy sales.

[5]H.R. 889 and S. 548 (111th Congress) propose cumulative targets beginning in 2012. Annual figures representing incremental savings implied by the cumulative targets are from Furrey, et al., ACEEE, March 2009 (Table 1). According to ACEEE, programs to stimulate this level of savings would begin in 2011.

[6]*Energy Saving Trust, Energy Efficiency Commitment Report 2000-2001*, London, 2001.

[7]Ofgem, *Carbon Emissions Reduction Target (CERT) 2008-2011 Supplier Guidance*, London, 2007.

[8]David Crossley, "White certificates in Australia: States take the lead," *DSM Spotlight*, No. 32, January 2009, at http://www.ieadsm.org/Files/Exco%20File%20Library/Spotlight%20Newsletters/IEA%20DSM%20Spotlight%20newsletter-Issue%2032-January%202009.pdf.

[9]Energy efficiency certificates are also known as "white certificates" or "white tags." In January 2003 the New South Wales scheme became the first such trading system in the world. See D.J. Crossley, "Tradeable energy efficiency certificates in Australia," *Energy Efficiency*, Vol. 1, No. 4, November 2008, at http://www.springerlink.com/content/px01053860418332/fulltext.pdf.

[10]Maggie Eldridge, R. Neal Elliot, and Max Neubauer, ACEEE, *State-Level Energy Efficiency Analysis: Goals, Methods, and Lessons Learned*, proceedings of the 2008 ACEEE Summer Study on Energy Efficiency in Buildings. The study is based on state, regional, and national level analyses with study periods ranging from five to 20 years.

[11]For example, in developing its draft 6th Power Plan, the Northwest Power and Conservation Council estimates achievable, cost-effective conservation in the four-state region at 21 percent of the 20-year forecasted (medium-case) electric load. The identified conservation would meet about 85 percent of medium-case load growth in the region while significantly reducing both system cost and risk. Communication with Charlie Grist, Council senior analyst, August 14, 2009. Study results at http://www.nwcouncil.org/energy/crac/Default.htm.

[12]American Gas Association, *Natural Gas Utility Energy Efficiency Portfolios Report: 2007 Program Year*, December 2008, at http://www.aga.org/NR/rdonlyres/122417D7-E42E-49B4-8EE8-9AB26E421B4F/0/1208EEREPORT.pdf.

[13]Steven Nadel, ACEEE, Replies to Questions at the April 22, 2009, Hearing on Energy Efficiency Resource Standards, May 12, 2009.

[14]See NAPEE, 2006, at http://www.epa.gov/cleanenergy/documents/napee/napee_report.pdf.

[15]See Nadel.

[16]2010 in-service date. Jeff King, "Proposed Combined-cycle Power Plant Planning Assumptions: 6th Northwest Conservation and Electric Power Plan," Oct. 15, 2008, at http://www.nwcouncil.org/energy/grac/meetings/2008/10/Combined-cycle%20planning%20assumptions%20-%206P%20Draft%20101608.ppt#526,14,Natural%20gas%20price%20forecasts.

[17]The Energy Information Agency estimates the levelized cost of new conventional baseload plants in 2015 at about 6 cents per kWh (2006 dollars). See *Annual Energy Outlook 2008*, p. 69, at http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2008).pdf.

[18]The natural gas price forecast is consistent with a recent forecast by Lazard, "Levelized Cost of Energy Analysis," presented at a meeting of the National Association of Regulatory Utility Commissioners, June 2008, at http://www.narucmeetings.org/Presentations/2008%20EMP%20Levelized%20Cost%20of%20Energy%20-%20Master%20June%202008%20(2).pdf.

[19]When efficiency displaces fossil-fuel generation, it has a negative carbon footprint.

[20]Sample calculation for a wires-only company. See Regulatory Assistance Project, *Revenue Decoupling Standards and Criteria: A Report to the Minnesota Public Utilities Commission*, June 2008, p. 36, at http://www.raponline.org/Pubs/MN-RAP_Decoupling_Rpt_6-2008.pdf. A similar calculation for a vertically integrated utility resulted in a seven percent

change in earnings with each one percent change in utility sales.

[21]The exception is a utility with retail rates below wholesale power prices and no adjustment mechanism for fuel and purchased power. In this case, a decrease in sales can increase profits because the additional wholesale power revenue (or avoided wholesale power cost) may exceed the retail revenue loss. During the Western Energy Crisis in 2000-01, for example, utilities without a power cost adjustment had a strong incentive to conserve energy. But at that point it was too little, too late.

[22]Costs that vary directly with consumption and production – fuel, variable operation and maintenance, and purchased power costs – typically are excluded from the decoupling mechanism. Fuel and purchased power costs often are addressed through a separate adjustment mechanism.

[23]In the "accrual" version of decoupling, these prices are in place for an initial accrual period and subsequently adjusted to reflect over- or under-recovery of allowed revenue. In the "current" version of decoupling, the initial prices are never actually put in place; instead they are used as base prices against which decoupling adjustments are applied in each billing cycle.

[24]Allowed revenue may be the revenue requirement established in the last rate case or may be a formula designed to permit revenue to change over time to reflect inflation and productivity, to reflect customer growth, or to address another metric. Whatever the formula, decoupling assures that the targeted revenue is actually collected.

[25]Pamela G. Lesh, "Rate Impacts and Key Design Elements of Gas and Electric Utility Decoupling: A Comprehensive Review," June 30, 2009, at http://www.raponline.org/Pubs/Lesh-CompReviewDecouplingInfoElecandGas-30June09.pdf.

[26]Whether expressed as kWh or therms saved or as reductions in greenhouse gas emissions.

[27]As previously noted, once an EERS is established, target and funding levels for efficiency are no longer at issue – at least for awhile. Absent such a performance standard, decoupling also would be needed to address the utility throughput incentive in proceedings that set these levels. And without decoupling, utilities will object to any ramp-up in EERS requirements.

[28]With appropriate customer consent.

[29]Other reasons for third-party administration may include increasing stakeholder involvement in program design and employing competition among energy efficiency service providers.

[30]The administering organization may be established by state statute, established by the Commission, or selected through competitive bidding.

[31]In Oregon, the third-party administrator is the Energy Trust of Oregon (ETO, www.energytrust.org). In Wisconsin, the Statewide Energy Efficiency and Renewable Administration is called Focus on Energy (http://www.focusonenergy.com). In Vermont, an "Energy Efficiency Utility" (EEU) procures energy efficiency for most utilities in the state. Efficiency Vermont currently serves as the EEU (www.efficiencyvermont.org).

[32]See Order No. 09-020 (Docket UE 197), Jan. 22, 2009, p. 27. The Commission clarified and modified the decoupling mechanism in Order No. 09-176, May 19, 2009, at http://apps.puc.state.or.us/edockets/docket.asp?DocketID=14729.

[33]See order in Docket Nos. 7175 and 7176, pp. 3-4, at http://www.state.vt.us/psb/orders/2006/files/7175-7176finalorder.pdf.

[34]"Under alternative regulation, CVPS will set rates on the basis of customer load forecasts, taking into account the impacts of load changes arising from factors such as self generation, conservation, efficiency, and load management. These measures help to decouple CVPS's earnings from its retail sales volumes between rate cases, thereby promoting resource parity." See order in Docket No. 7336, Sept. 30, 2008, p. 40, at http://www.state.vt.us/psb/orders/2008/files/7336%20Final.pdf.

[35]Final decision in case number 6690-UR-119, Dec. 30, 2008, pp. 15-20, at http://psc.wi.gov/.

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