

Energy Efficiency and Utility Profits/Revenues

Energy Foundation Advocates Meeting

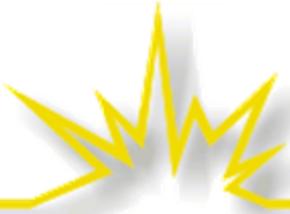
June 2, 2010

Richard Sedano



The Regulatory Assistance Project

Vermont ♦ Maine ♦ New Mexico ♦ California ♦ Illinois ♦ Oregon ♦ Washington



About the Regulatory Assistance Project

- RAP is a non-profit organization providing technical and educational assistance to government officials on energy and environmental issues. RAP Principals all have extensive utility regulatory experience.
 - Richard Sedano was commissioner of the Vermont Department of Public Service from 1991-2001 and is an engineer.
- Funded by foundations and the US Department Of Energy. We have worked in nearly every state and many nations.
- Also provides educational assistance to stakeholders, utilities, advocates.



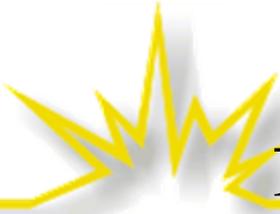
Today's Menu

- Why the utility business model is getting so much attention today
- A menu of solutions
- A quantitative study led by Lawrence Berkeley National Lab helps to understand the issues and challenges
- Lessons, ideas, closing thoughts



Utility of the Future

- Service Focus
- Performance Oriented (metrics)
- Information Driven (measure)
- Carbon Metric
 - Adds to value of energy efficiency
- Continued opportunity to earn fair return
- Continued attention to reasonable rates



How does the utility of the future address **climate change**?

- Embrace solutions
- Hold their noses
- Fight it
- Do whatever the regulators tell them to do
 - Who is most important: customer or regulator?
- Traditional Regulation seems ill-equipped to encourage the “embrace solutions”

Utility Motivation and the Throughput Incentive

- Regulatory Incentives
- Financial Incentives
- What to do about the throughput incentive?
 - Traditional regulation rewards utility for more sales and penalizes utility for less sales – this is the throughput incentive and discourages EE and DG, even if CEO is sympathetic





Regulatory Incentives for Energy Efficiency

- Cost Recovery Process is Fair and Timely
- **Throughput incentive is eliminated or at least significantly reduced**
- **Financial incentives for performance are available**
- Program reviews (pre- and post-) are efficient



Financial Disincentives: A list of solutions

- Existing (strengthened) regulation
- Decoupling
- Shift costs to customer charge
- Return lost revenues/lost margins from energy efficiency program savings
- Add financial incentives
- Non-utility (3rd party) EE administration



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The Rate Case focus on Revenue Requirement

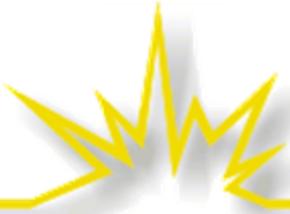
- $\text{Rev Reqmnt} = (\text{Exp} + \text{Return} + \text{Taxes})_{\text{Test yr}}$
- $\text{Price} = \text{Rev Reqmnt} \div \text{Units Sold}_{\text{Test yr}}$
- Expenses:
 - Production
 - Non-production

Traditional Regulation Example	
Revenue Requirement Calculation	
Expenses	100,000,000
Net Equity Investment	100,000,000
Allowed Rate of Return	10.00%
Allowed Return	\$10,000,000
Taxes (35% tax rate)	\$5,384,615
Total Return & Taxes	\$15,384,615
Total Revenue Requirement	\$115,384,615
Price Calculation	
Revenue Requirement	\$115,384,615
Test Year Sales (kWh)	1,000,000,000
Rate Case Price (\$/kWh)	\$0.1154



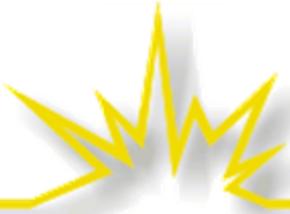
Traditional Regulation is about Compliance

- Utilities will comply with requirements
 - Or else... (no upside, just downside)
- How will regulators measure compliance?
 - Are “all-cost effective EE” and “compliance” mutually consistent terms?
- Performance regulation can overlay traditional regulation and can help promote public interest outcomes



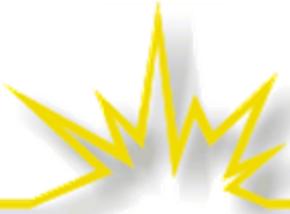
Existing Regulation

- Regulators apply performance expectations and reviews with explicit penalties if compliance or performance is lacking
- Rate cases might get more frequent if energy efficiency ramps up to high levels, approximating what decoupling would do
 - A rate case just to account for sales reductions without significant expense changes?



Financial Disincentives: A list of solutions

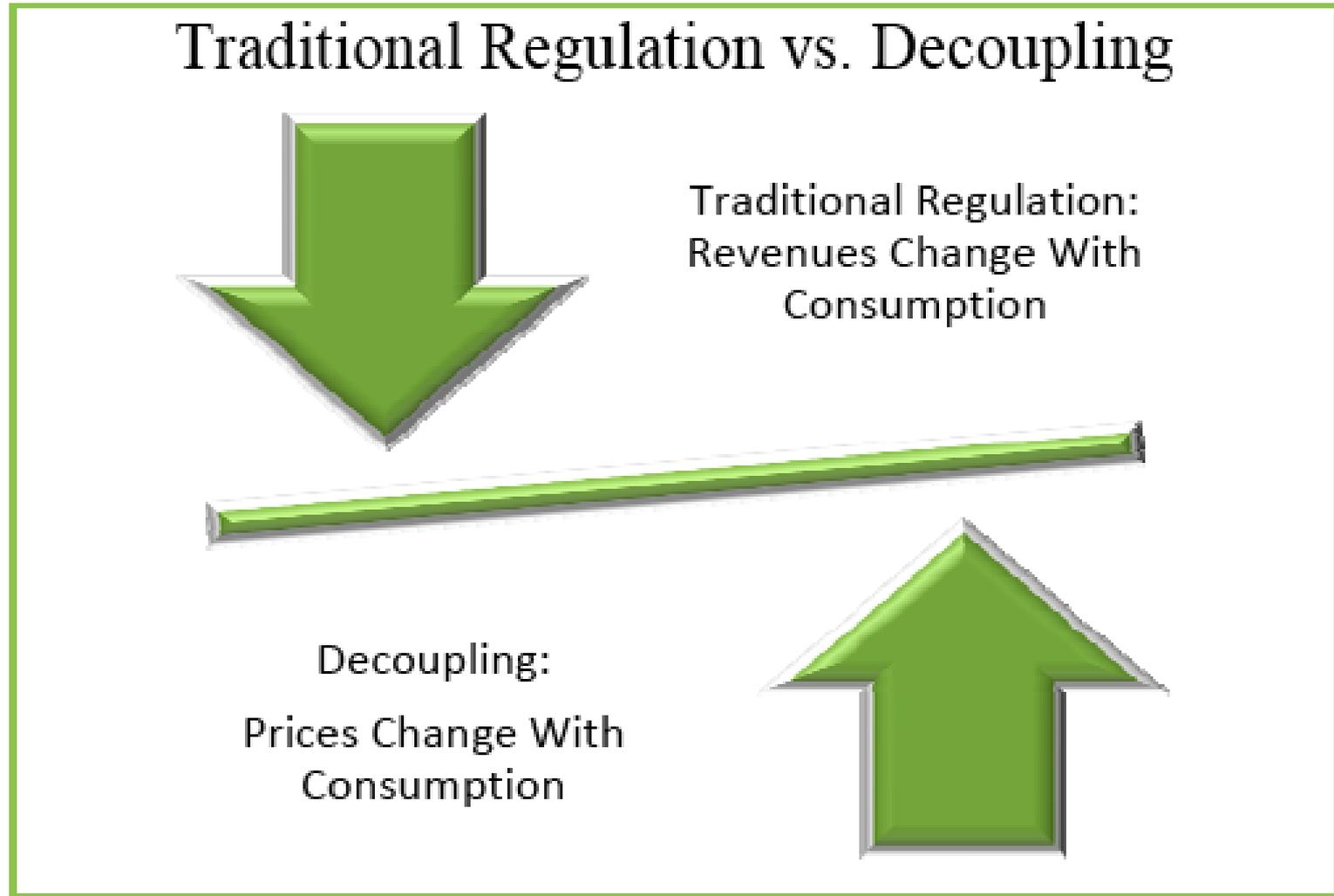
- Existing (strengthened) regulation
- **Decoupling**
- Shift costs to customer charge
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Decoupling: Sales no longer matter

- Focus on fixed costs from the last rate case
- Reconcile rates periodically to recover those costs, perhaps adjusted by a formula that captures major changes over time
- Enhancements can bound rate change size and resulting earnings
- Can successfully make utility indifferent to sales

What happens when consumption goes below rate case expectations?



From Revenue Decoupling, Standards and Criteria, A Report to the Minnesota Public Service Commission, June 30, 2008 by Regulatory Assistance Project

Key Decoupling Formulas: Post Rate Case

➤ $\text{Price}_{\text{Post Rate Case}} = \text{Rev}_{\text{Allowed}} \div \text{Units Sold}$

Actl

➤ $\text{Revenues}_{\text{Actual}} = \text{Revenues}$

➤ $\text{Profits}_{\text{Actual}} =$
 (Revenues
 – Expenses
 – Taxes)_{Actual}

Decoupling Example	
Revenue Requirement Calculation	
Expenses	\$100,000,000
Net Equity Investment	\$100,000,000
Allowed Rate of Return	10.00%
Allowed Return	\$10,000,000
Taxes (35% tax rate)	\$5,384,615
Total Return & Taxes	\$15,384,615
Total Revenue Requirement	\$115,384,615
Price Calculation	
Revenue Requirement	\$115,384,615
Actual Sales (kWh)	990,000,000
Decoupling Price (\$/kWh)	\$0.1166
Decoupling Adjustment (\$/kWh)	\$0.0012



Decoupling issues

- How rates change (approx. future rate cases)
 - Revenue per customer is one way
- Full, partial, limited decoupling
 - All effects on sales
 - Just sales effects from EE programs
 - Eliminate only part of the throughput incentive
- Reflecting risk changes
- ~~Include~~ power, Connection to Fuel clause



Risk Changes

- Customers pretty much pay for everything
- Decoupling should reduce the risk of the firm
 - And thus reduce what consumers pay in the long run
 - Risk reduction may not be recognized by financial markets right away, eventually will be
 - Risk shifting (zero sum game) is not the idea



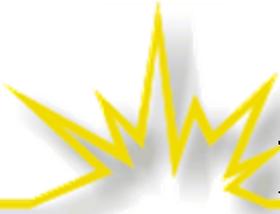
Financial Disincentives: A list of solutions

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Shift Revenue to Customer Charge, reduce volume rate

- Customer charge might go from \$3-\$10/mo. to \$30 in order to make utility indifferent to sales, with reduction in volume charge
 - Low use customer see an increase
 - Energy efficiency less beneficial to customer
- Known as “Straight-Fixed-Variable” (SFV)



SFV Rate Design

for 500 kWh/month customer

- A. $\$5/\text{month} + \$0.10/\text{kWh} = \$55/\text{month}$
 - \$5.00 is approximately equal to per-customer metering and billing costs.
 - \$.10 recovers the balance of the embedded revenue requirement, and is approximately equal to total system long-run incremental cost (TSLRIC) for power, transmission, delivery, and carbon

- B. $\$30/\text{month} + \$0.050/\text{kWh} = \$55/\text{month}$
 - \$30 is approximately equal to the so-called "fixed" costs.
 - \$.05 is approximately equal to short-run marginal cost for power and line losses, with no assumed variable cost for transmission or delivery, and no monetized price for carbon.

- Let's call the second an SFV rate. The consumer will consume power based on Short Run Marginal Cost of \$.05. Assuming a very conservative arc elasticity of 0.1, increasing the price from \$.05 to \$.10 (100% increase) would produce a **10% decrease in the usage. That decrease is what we give up with SFV.**



Why Some Like SFV

- Effective solution for utility revenue concern
- Easy to administer
- Rates don't change outside a rate case

Why Some Oppose SFV

- Reduces value of EE to consumers (reduces EE)
- Reduces volumetric charge below long run margin, so not really economically efficient
- Transition hurts low volume users the most



Financial Disincentives: A list of solutions

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Lost Revenue Adjustment

- Returns to utility **net margin** that would have accrued without energy efficiency
- Utility still has incentive to build load and to avoid sales reductions not directly due to its programs
 - Focus only on programmatic savings, not total savings
- History of tough regulatory process to calculate



Trends

- Lost revenue adjustment was a preferred solution in early days of energy efficiency
- Its limitations caused it to nearly disappear 10-15 years ago
- States are considering it again
 - Because many with experience are gone?
- Utilities want a solution to their “revenue to cover fixed cost” problem



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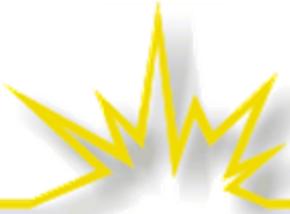
Financial Incentives

- In addition to or instead of reducing throughput incentive, regulators can apply an opposite force, putting a reward on the administrator achieving a certain level of spending, savings, or other metric
 - Puts energy efficiency in comparison with other assets to contribute to utility profits
 - Can be an acceptable substitute for decoupling in some circumstances



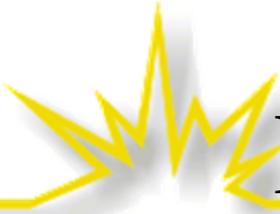
Proper Basis for Financial Incentives

- Performance
- Not spending, no bonus for just showing up
- Performance for what? For what matters!
 - “Stretch” performance
 - Overall portfolio savings (energy, capacity)
 - Sub-categories too (keyed to public interest)
 - Impact effects by customer class or program
 - Market effects
 - Process achievements, milestones too



Why Financial Incentives for Energy Efficiency?

- To create behavior and performance from the utility beyond what would be expected from pure regulatory compliance
 - How do you **measure** innovation, inspiration?
 - Wrong question
 - Align, Harmonize regulatory incentives
- Why? Because EE is equivalent or superior to other resources



Energy Efficiency as a Resource Equivalent to Others

- Does that mean EE has to be an investment?
 - Or are the important aspects the **opportunity** to earn, and perhaps secondarily, the **magnitude** of the bottom line effect?
- G&T investments earn a return, but...
 - Purchased Power earns nothing but thanks and exposes the utility to prudence risk
 - Logic is different with munis and coops



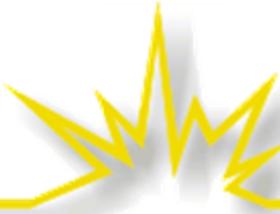
Energy Efficiency Superior to Other Resources

- How will utility management be motivated to allocate resources, financial and human, to truly maximize cost effective EE?
 - Emphasis from the CEO (support from CFO)
 - Supported by regulation
 - Organize all departments around EE
 - Reward employees for EE success
 - Service, not throughput, is prime directive
- Comprehensive culture shifts (are hard)



Check on Magnitude of Financial Incentive

- Can a third party accomplish sustained equivalent or superior results at less cost?
 - Possible reason for EE returns to be less than generation returns
- State has an option to switch if utility demand for incentive is too big
 - If state is ultimately unwilling to switch, result may need to be greater financial incentives owing to utility leverage



Financial Incentives for Energy Efficiency: Methods

- Return on Equity Bonus (NV)
- Performance Bonus (RI)
- Shared Saving (CA)
- Shared Avoided Cost (Duke)



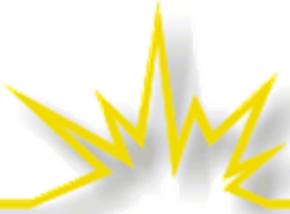
Key Choices

- How much money is available?
 - Capped? % of program budget? % of COS?
 - Compared to alternative earning opportunity?
- How money is earned
 - Performance
- Mechanism
 - Ease of administration
 - Incentives to promote sales reductions (EE, DG)



If you do financial incentives

- You want them to matter
 - To utility management – motivate CEO
 - To Wall Street and analysts
 - To Earnings per Share
 - To employees
 - To program performance, and thus customers



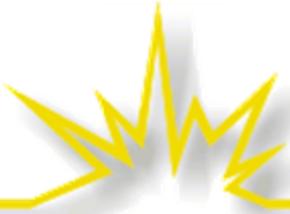
Measuring Implications

- Pressure on EM&V to show performance indicator results
 - Performance thresholds are reached or not
 - Shared savings rewards every unit
- Bottom line cost to ratepayers is a key consideration, so choice among methods should be comparable this way
 - Caps are typical, regardless of method
 - Incentives included in B/C calcs as appropriate



Performance Bonus (MA)

- Performance targets for energy efficiency programs
- Incentive rewards the utility with a percentage of total program costs for meeting targets---essentially a “bonus” on top of cost recovery.
- Targets can focus on overall results and on performance of a sampling of programs with a reward attached to each target, or can be associated with achievements associated with the public interest.



Cost Capitalization (NV)

- Utility “capitalizes” energy efficiency program costs—similar to investments in supply-side assets
 - The energy efficiency investment may be amortized over the average lifetime of the energy efficiency measures
 - Or over a shorter period to balance other financial concerns
- Utility earns a return on the un-depreciated energy efficiency regulatory asset, a modest incentive
- A bonus to its authorized return on equity can create a more substantial incentive comparable with other methods



Shared Savings (CA 06-08)

- Utility retains a percentage of the “Net Resource Benefits” achieved by the total energy efficiency portfolio
- Incentive levels tied to achievement of energy savings goals or specified level of net benefits.
- Net Resource Benefits are typically defined as avoided costs of energy, capacity, transmission & distribution and environmental benefits where allowed.

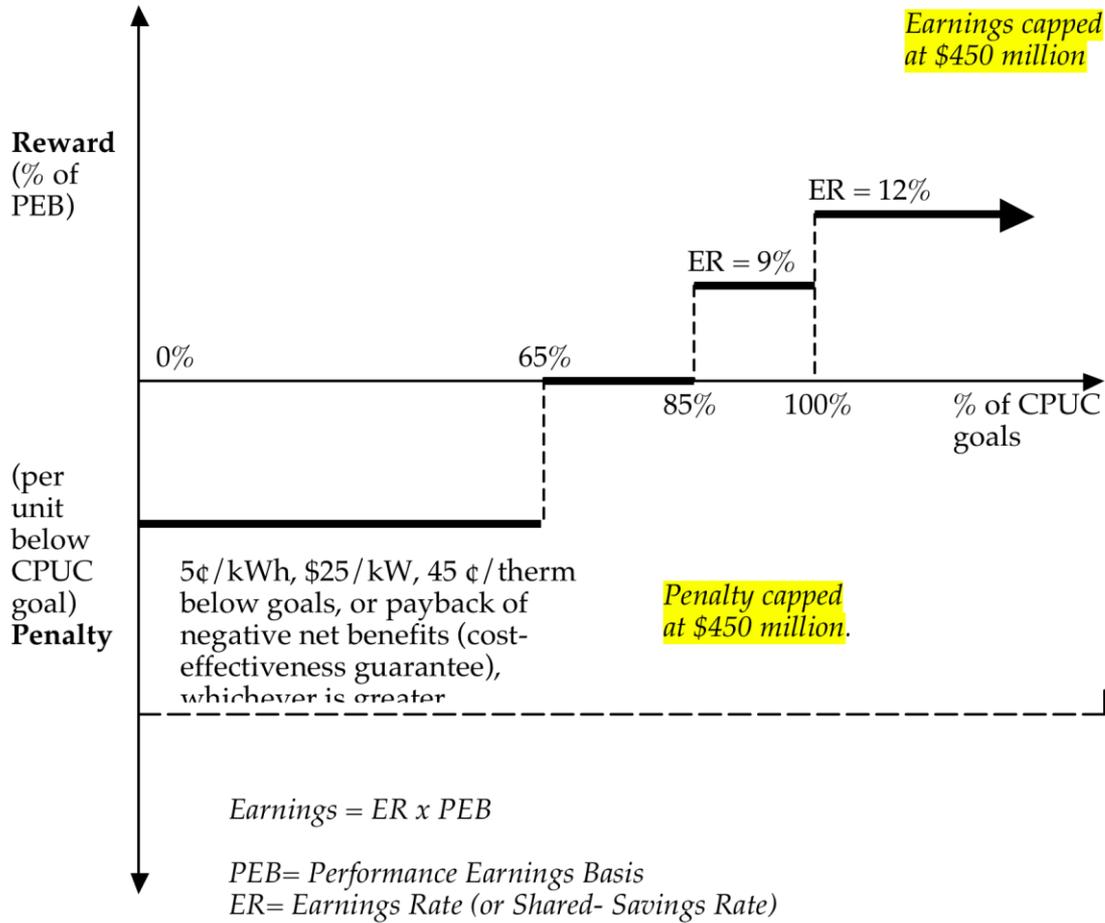


TABLE 1

**Ratepayer and Shareholder “Share” of Verified Net Benefits
Under Adopted Shareholder Risk/Reward Incentive Mechanism
(Based on 2006-2008 Portfolio Costs and Savings Goals)**

Verified Savings % of Goals	Total Verified Net Benefits	Shareholder Earnings	Ratepayers' Savings
125%	\$3,919	\$450 cap	\$3,469
120%	\$3,673	\$441	\$3,232
115%	\$3,427	\$411	\$3,016
110%	\$3,181	\$382	\$2,799
105%	\$2,935	\$352	\$2,583
100%	\$2,689	\$323	\$2,366
95%	\$2,443	\$220	\$2,223
90%	\$2,197	\$198	\$1,999
85%	\$1,951	\$176	\$1,775
80%	\$1,705	\$0	\$1,705
75%	\$1,459	\$0	\$1,459
70%	\$1,213	\$0	\$1,213
65%	\$967	(\$144)	\$1,111
60%	\$721	(\$168)	\$889
55%	\$475	(\$199)	\$674
50%	\$228	(\$239)	\$467
45%	(\$18)	(\$276)	\$258
40%	(\$264)	(\$378)	\$114
35%	(\$510)	(\$450) cap	(\$60)



Avoided Cost

- Energy efficiency savings valued at a set percentage of avoided generation costs
- This approach covers program costs, any net lost revenue, and traditional incentive payment.



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Non-utility (3rd Party) Administration

- If utility throughput incentive is irreconcilable, or for other reasons, government can assign energy efficiency task to someone else
 - As in OR, VT and HI, a 3rd party
 - NY, ME, WI have state govt responsible
 - CT and MA have a public-private board making management decisions



Synthesis

- An objective of any state government is to offer consistent policy to the public.
- Finding the right balance of these regulatory reforms will promote strategies consistent with the overall objective of supporting energy efficiency.

Kansas CC

Docket GIMX-441-GIV pg 29

“The Commission has stated it views energy efficiency as an energy resource. The Commission has an obligation to steer utilities toward resources, whether demand side or supply side, in a manner that results in just and reasonable prices. And because the Commission is in the energy regulation business, the Commission views energy efficiency as a means to an end — energy at a low cost to consumers within the context of a balanced energy resource portfolio -- not an end in itself that must be rewarded.”

Oregon PUC Order 09-020

pg 27

“... 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.”



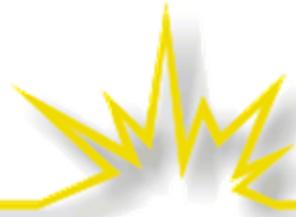
Leadership

- Many imminent changes to power sector
- Energy efficiency will be more valuable than ever
- Yet supply-orientation remains powerful in utility and government cultures
- Leadership will be needed to nurture changes



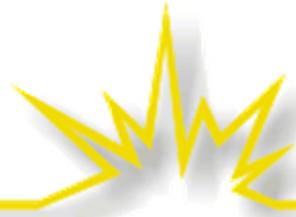
My Preferences

- Decoupling to remove reasons for utility to fight energy efficiency
- Financial incentives to give utility reasons to promote energy efficiency
- Third party administrator if
 - There is reason to doubt utility capability to ever overcome aversion to energy efficiency
 - There is reason to doubt utility will champion EE



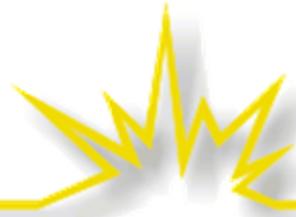
My Preference: Decoupling

- Decoupling directly addresses the throughput incentive, applied not just to savings from energy efficiency programs, but to savings from all sources
- Respects imperative to cover fixed costs as found in most recent rate case with revenue
 - Respects most recent rate case
- Rate design preserved (no SFV)



My Preference: Decoupling

- Rate reconciliation can be ministerial and will tend to be small, smaller than fuel clause adjustments (and can be applied in current time, monthly)
- Fewer Rate Cases may be needed
- Works compatibly with financial performance incentives and with 3rd party
- Reduces business risk, which reduces costs that customers pay (not a zero sum game)



My Preference: Decoupling

- Rationalizes incentives so regulation is not as much about correcting past wrongs, utility more interested in customer value
- Decoupling can be simple or complex, but complexities only serve to more precisely strike a balance between the utility interest and the public interest
- Legislature in some states does direct consideration of decoupling



Paradigm Shifts Are Here

- Every state can choose a strategy
 - Based on its priorities
 - Energy efficiency a compelling resource and does not “just happen”
- Statutes should be reviewed to see if they are unnecessarily and unproductively precluding or narrowing useful options



Information about the LBNL work & crediting the team

- Financial Analysis of Incentive Mechanisms to Promote Energy Efficiency: Case Study of a Prototypical Southwest Utility
- Peter Cappers, Charles Goldman (LBNL)
- Michele Chait (E3)
- George Edgar (WECC)
- Jeff Schlegel
- Wayne Shirley (RAP)

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Technologies Division
LBNL-1598E
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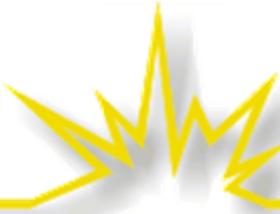
Attention to balance Customer and Company

- Whether and if so how to share the estimated net resource benefits from energy efficiency between customers and utility
- Key model outputs
 - Retail rates
 - Total cost (average bills)
 - Shareholder earnings
 - Return on equity



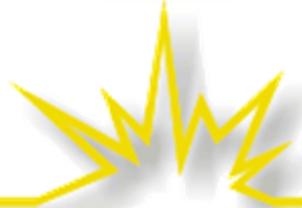
Some Report Findings

- Application of full RPC decoupling entirely removes short term disincentive from reduced sales between rate cases, but does not improve earnings opportunities
- Shared benefit incentive, as modeled, increases utility earnings compared with no EE case
 - Any method could if you make them rich enough



Some More Report Findings

- Energy Efficiency more likely to be a “profit center” for utility if decoupling and performance incentive are combined
 - ROE increases compared with BAU case
- Earnings increase in Aggressive EE case
 - More financial benefits to share with utility
- Incentives tied to benefits have more variable effect on cost of EE



LBL Model References

- <http://eetd.lbl.gov/EA/emp/reports/lbnl-2590e.pdf>
- <http://eande.lbl.gov/EA/EMP/ee-pubs.html>
- <http://eande.lbl.gov/EA/EMP/reports/lbnl-1598e.pdf>



Key Issue

- Sharing benefits of energy efficiency
 - Overall balance between consumer and shareholder is an important “front page” test
 - More sharing to shareholder may be appropriate at higher levels of savings to address deeper hit to earnings
 - More sharing may also be more justifiable after some period of sustained performance

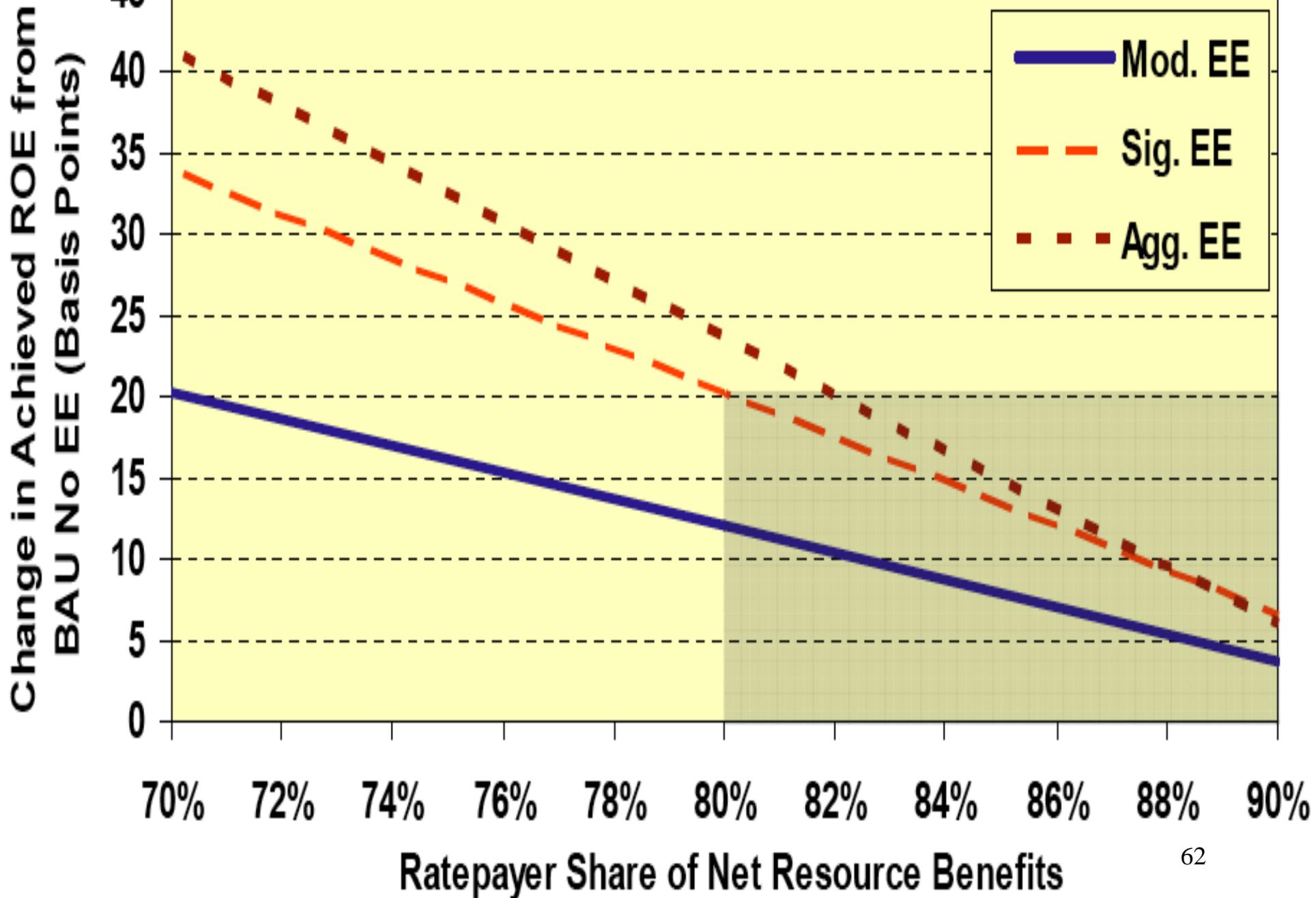
Targeted Design for Shareholder Incentive Mechanisms

- Illustrative example: PUC decides EE shareholder incentive mechanism should provide “fair share of benefits” to ratepayers and opportunity for a significant reward to utility for superior performance:
 - Ratepayers retain 80% of net resource benefits
 - Utility shareholders have opportunity to see after-tax ROE increase by at most 20 basis points
- Approach provides implicit determination by a PUC of “how much is enough”:
 - To motivate utility managers to achieve superior performance
 - To gain support of customer and other stakeholder groups for utility EE business model by putting upper bounds on financial and rate impacts



Designing an incentive plan: Study finds...

- Savings pie has to be big enough to divide to get a meaningful earnings bump,
 - Moderate EE is not enough
 - Enough savings in Significant and Aggressive cases





Key Issue

- Public interest concerns will bound what is realistic to pay for incentives
 - Limits on earnings (front page test) will bound incentive levels
 - 3rd party test – if utility demand excessive incentives, 3rd party administration is always available alternative
 - Decoupling appropriate even with 3rd party or mandated resource standard to motivate cooperation



Last Words

- Success will balance distinct interests in pursuit of public interest
- Incentives are best if they reward (defined) superior performance
- Earnings potential may grow if savings targets and public benefit also grow



RAP, other References

- http://www.raonline.org/docs/RAP_Schwartz_IssuesletterSept09_2009_08_25.pdf
- http://www.raonline.org/docs/GSLLC_Lesh_CompReviewDecouplingInfoElecandGas_2009_06_30.pdf
- http://www.raonline.org/docs/RAP_Shirley_DecouplingRevenueRpt_2008_06_30.pdf
- http://www.raonline.org/docs/rap_cowart_dsresourcesinpowersystemandmkts_2001_06.pdf
- http://www.raonline.org/docs/RAP_Moskovitz_DistributedResourceProfitAndProgress_2000_02.pdf



Thanks for your attention

- rседano@raponline.org
- <http://www.raponline.org>
- RAP Mission: *RAP is committed to fostering regulatory policies for the electric industry that encourage economic efficiency, protect environmental quality, assure system reliability, and allocate system benefits fairly to all customers.*