

# Energy Efficiency Incentives for Utilities: A Review of Approaches So Far

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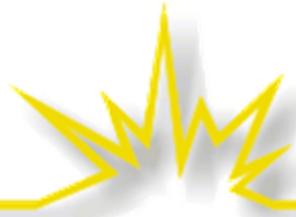
Presented at Idaho Office of Energy Resources Workshop

October 6, 2009



*The Regulatory Assistance Project*

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



# Regulatory Assistance Project

- Nonprofit organization founded in 1992 by experienced energy regulators
- Advises policymakers on economically and environmentally sustainable policies in the regulated energy sectors
- Funded by U.S. DOE & EPA, the Energy Foundation, ClimateWorks and other foundations
- We have worked in 40+ states and 16 nations



# Today's Workshop

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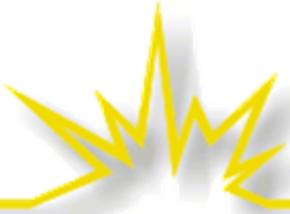
- Idaho Power's current regulatory structure
- Role of positive financial incentives for utilities in promoting all cost-effective energy efficiency
- Types of incentives, key design features, pros and cons, and challenges
- Modeling results for a prototype Southwest utility
- Straw proposals to flesh out for next workshop



# Do Utilities Need Energy Efficiency Incentives?

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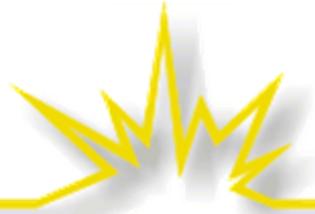
- All regulation is “incentive regulation.”
  - What utility behavior is motivated by the financial incentives inherent in regulation in Idaho?
- If you want to achieve aggressive demand-side savings goals, you need utilities motivated to get there.



# Do Utilities Need Energy Efficiency Incentives?

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- Decoupling only removes the throughput incentive; it does not provide an incentive to acquire energy efficiency.
- The energy efficiency program manager functions best with:
  1. Clear performance metrics
  2. Alignment of financial risks and rewards for those metrics
- Incentives make EE manager squarely responsible for developing best program designs, partnerships and marketing strategies
- Shareholder incentives should encourage superior performance
  - Incentives should be put into place when EE programs are ramping up to high levels or to motivate a utility to continue performing at a high level



# Challenges

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- Creating meaningful financial incentives for EE requires approaches and complementary policies that will keep program administrators digging deep and comprehensively for both energy and capacity savings.
- Measurement and verification takes on new importance when earnings and penalties hang in the balance. How to link earnings recovery to M&V results remains challenging and controversial.



# Types of Positive Financial Incentives

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## ➤ Performance Based

- **Shared Savings:** Earnings based on percentage of “net” benefits (resource savings minus costs) or avoided costs of EE, often tied to a minimum threshold of kWh/kW reductions
- **Management Fee:** Earnings based on percentage of program costs if manager achieves or exceeds goals – e.g., energy/capacity savings, participation or installation levels, reductions in administrative costs
- **Standard Performance Contracting:** Incentive payments per kWh and kW of savings from installed measures, under standardized terms

## ➤ Cost Capitalization

- Annual EE program costs included in rate base and amortized over time; utility earns authorized rate of return on equity, potentially with a bonus ROE



# Performance-Based Incentives

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- Pro – Well-designed mechanisms can control utility DSM expenditures by rewarding increased program penetration and minimizing program costs
- Con – Requires more analysis (determining net benefits) and, for shared-savings mechanisms, M&V is even more critical



# Design Considerations for Performance-Based Incentives

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## ➤ Performance metrics

- Focus on *savings* – kWh, kW, therms, carbon – not just “net benefits”
- Consider additional metrics – e.g., market transformation indicators, maximizing cost-effectiveness and net benefits, minimizing costs, equity
- Should be observable, measurable, verifiable, clearly aligned with policy objectives, and not create perverse incentives

## ➤ Earnings structure

- Earning rates
  - Compare with risk, return on utility-owned supply-side resources?
  - Don't pay more than it takes to induce the investment you want
- Steep changes in incentive rates vs. sliding scale incentives
  - Avoid structures where a *small* change in *savings* means a *large* change in *earnings*
- Minimum thresholds for earnings - Moderate vs. aggressive savings levels
- Rewarding results above and below performance goals



# Design Considerations for Performance-Based Incentives

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- Penalties for failing to reach minimum levels of savings
- Caps for earnings and penalties
- Whole building approaches
- Programs for low-income households
  - Keep entirely separate from performance incentive?
  - Exclude when calculating net benefits and savings? (e.g., Colorado)
  - Include in minimum thresholds for earnings? (e.g., Vermont)
- EE requirements in statute – e.g., EE in RPS (not in Idaho)
- EM&V
  - Next slide

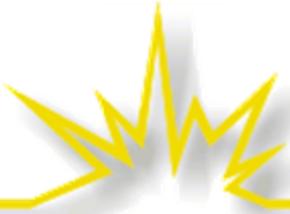


# EM&V Considerations for Performance-Based Incentives

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- *Ex ante* vs. *ex post* performance metrics
- Vetting of M&V reports and dispute resolution
- Lag between results and incentives, linkage to earnings in next round
- Controllability, measurability and fairness\*
  - Administrator’s perspective may be that it has little control over dynamic and complex markets, variations in technology performance across end-user applications, trade ally practices, and consumer decision-making and behavior. But influencing markets, targeting and directing technology applications, and changing industry practice and consumer behavior are core objectives of EE policy.
  - Performance risks include factors such as measure adoption, free ridership, baseline specification and performance, measure specification and performance, measure life and measure costs.
  - Evaluation – and incentives – should be based on performance elements the EE administrator has reasonable control over.
  - The degree to which performance incentives are tied to planned vs. actual savings should depend in part on attaining some minimum level of certainty in measurement.

\*See Rufo, 2009



# Percent of Budget Management Fee

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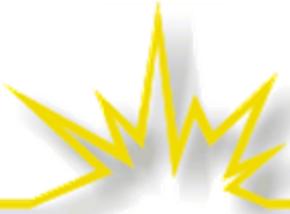
- Pro – Utility has incentive for EE *spending*
- Con – May create a perverse incentive to spend more
  - Not necessarily on cost-effective programs
  - Not focused on net benefits, savings, etc.
  - May be able to address these concerns by basing incentive rates on carefully vetted and approved budgets, not expenditures, by adopting aggressive goals and clear performance metrics, and through good oversight



# Cost Capitalization – With ROE Bonus Option

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- Capitalizing allows utility to earn a return on unamortized EE asset
  - Amortizing instead of expensing EE better matches cost recovery to its useful life (7 to 10 years). Amortization period can be less – say, 3 to 5 years.
  - Mitigates initial rate impacts
  - Helps level playing field with utility-owned supply-side resources
    - But a power plant may still be more attractive to utility
  - Apply only to funds expended by utility which are not otherwise covered by revenue – e.g., don't include system benefit charge
- ROE adder makes EE most profitable investment
- Approach is generally out of favor among utilities
  - Don't want a regulatory asset that increases imputed debt, potentially affecting credit ratings
  - Need capital to finance asset – raise new capital or use retained earnings or internal cash flow
  - But seems to be embraced and used in Nevada



# Standard Performance Contracting (Standard Offer)

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- Program administrator (utility) establishes level of incentive payments to “project sponsors” (e.g., ESCOs) for installing eligible measures in all sectors
- For many measures, incentive is based on engineering estimates of savings (avoided costs). For more complicated installations, the contract with the project sponsor may require on-site metering, billing analysis or computer simulation to verify savings and calculate payments.
- Project sponsors earn the difference between the incentive and their installation costs
  - No requirement to pass through any portion of incentives to customers

**Example:** A commercial HVAC project saves 25 kW of summer peak demand and 50,000 kWh yearly. Demand and energy incentives are as shown below.

$$(25 \text{ kW} \times \$175/\text{kW}) + (50,000 \text{ kWh} \times \$0.06/\text{kWh}) = \$7,375 \text{ payment}$$



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**SURVEY OF INCENTIVES  
IN THE U.S.**



# Shared Savings - Arizona Public Service Company

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- DSM funded through base rates, plus adjustor for amounts over/under
- Shared savings incentive: 10% of net economic benefits achieved – benefits minus costs (*Decision No. 67744, 2005*)
  - Capped at 10% of DSM spending
- No decoupling mechanism
  - Under proposed DSM rules, Commission would decide if lost revenues should be recovered



# California Risk/Reward Incentive Mechanism

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- Adopted for all IOUs via Rulemaking 06-04-010  
*(D.07-09-043 issued September 2007, [http://www.cpuc.ca.gov/PUBLISHED/FINAL\\_DECISION/73172.htm](http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/73172.htm))*
  - Broad inquiry into EE policies, programs, evaluation, measurement and verification, and related issues
  - Decoupling already in place
- Performance-based incentive kicks in at 85% of CPUC-adopted goals
  - That level of savings is higher than had ever been achieved
  - Savings level is calculated using a simple average of each utility's kWh, kW and therm savings achievements as a % of CPUC goals
  - No single metric can fall below 80% of the Commission-established goal
- Incentive is 9% of net economic benefits (TRC test) between 85% and 100% achievement of goals; 12% at 100% or higher
- Deadband – Greater than 65% and less than 85% of goals



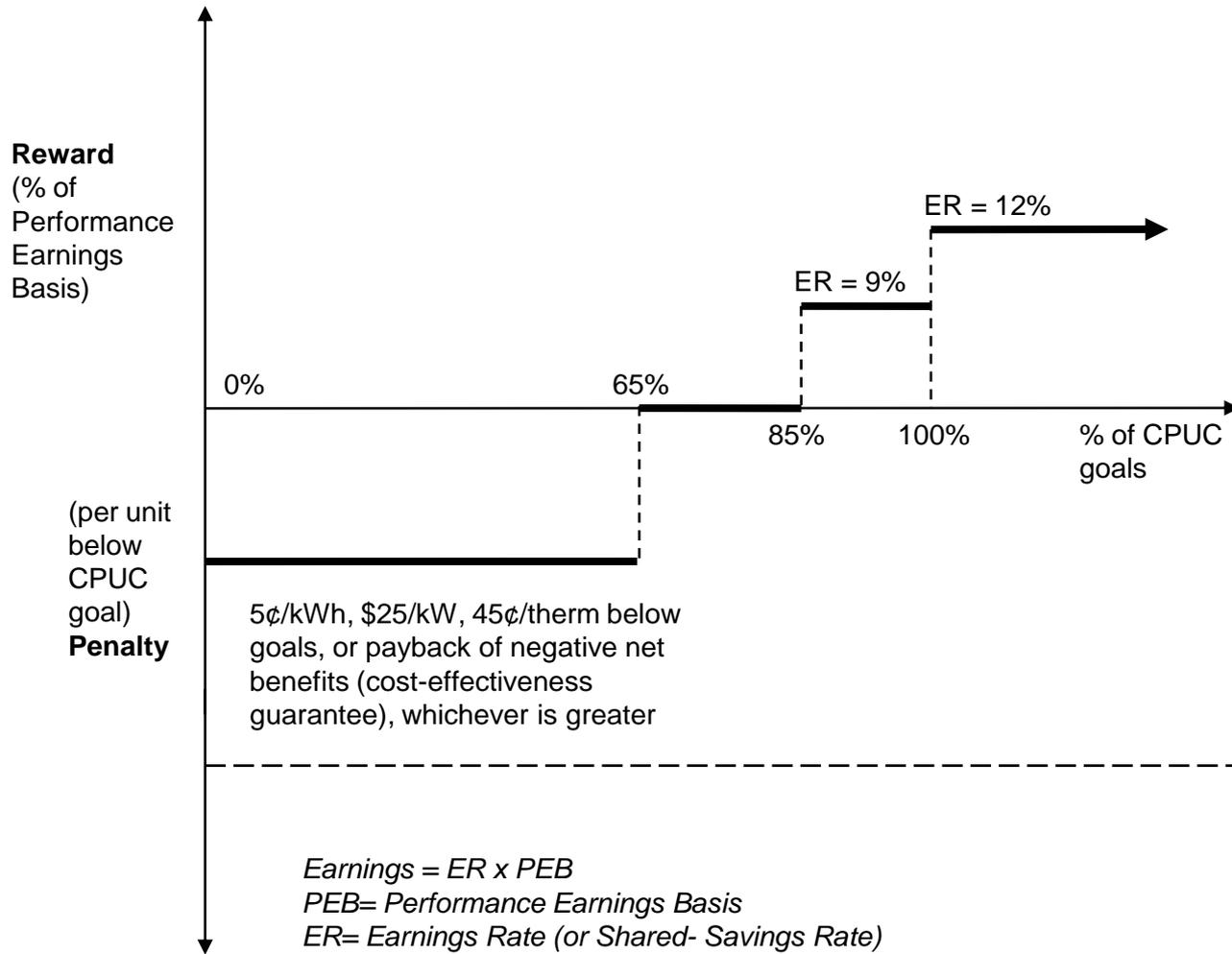
# California RRIM

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- *Combined* reward for the three IOUs capped at \$150 million/year pre-tax\*
  - <1% of consumers' total annual costs for electricity and natural gas
- Penalties for failure to achieve at least 65% of goals
  - That's higher than annual savings from 1995 to 2003
  - Penalty equals higher of: 1) negative net benefits or 2) the sum of per-unit penalty rates (5¢/kWh, \$25/kW and 45¢/therm) for every kWh, kW and therm below the Commission's minimum savings goals
  - Maximum penalty levels (\$) symmetrical with incentives
- Three-year DSM funding cycle
  - *Interim* payments after verifying actual measures installed and program costs
  - *Final* incentive payment after EM&V reports document per-measure savings
  - Hold-back 30% of claimed incentive pending verification
- 1<sup>st</sup> verification report recommended little or no incentive for 2006 and 2007
  - Report was delayed and controversial
  - “Serious questions concerning the validity of *ex ante* assumptions used to validate” IOUs' 2006-2007 incentive claims

\*Breakdown by utility on next slide

# California Risk/Reward Incentive Mechanism, 2006-2008



See California PUC D.08-09-043 at 8. Earnings and penalties are capped by utility as follows: PG&E - \$180 million, SCE - \$200 million, SDG&E - \$50 million and SoCalGas - \$20 million.



# California RRIM

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- D.08-01-042 (Feb. 2008) and D.08-12-059 (Jan. 2009)
  - Required review of first verification report (not previously specified)
  - Allowed incentive payments based on utility's performance reports for 2006 and 2007, but required at least 65% of incentive claims held back pending verification
  - Allowed utility to keep any interim incentive payments despite *ex post* findings as long as it continues to exceed 65% of goals on each metric on an *ex post* basis
  - Any overpayment can be deducted from future earnings claims
  - If *ex post* true-up of savings finds utility <85% of goals (or <80% on any goal), utility gets no incentives beyond interim incentives already paid
- EE goals adopted in D.08-07-047 (July 2008)
  - Adopted annual and cumulative total market gross savings goals for 2012 through 2020 for each utility service territory on an interim basis
    - Recognizes savings beyond IOU programs, including state and federal codes/standards
    - *Minimum* thresholds for calculating performance incentives for 2009-2011 changed from net to gross goals, but performance earnings still to be calculated using *net* benefits
    - Update due October 2010 to include utility-specific savings goals
  - Energy Division to study impact of adopted gross savings goals for the RRIM, including how activities are counted and potentially lowering earnings rates and incentives cap



# Shared Savings in California

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- Rulemaking 09-01-019 opened in Jan. 2009
  - “Consider a more transparent, more streamlined and less controversial RRIM program”
  - Suspended schedule for verification and review of incentive claims for 2006-2008
  - New framework for interim review of 2008 EE activities (to be completed by Dec. 2009)
  - Final review of 2006-2008 EE activities (in 2010)
    - Any final payments for 2006-2008 issued no later than Dec. 2010
  - Establish long-term review framework for 2009 and beyond



# Lessons Learned in California

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- Careful thought is needed to link earnings recovery to EM&V.
  - Parameters evaluated *ex post*, and the portion of earnings based on *ex post* evaluations, should be based on careful consideration of measurability, controllability and fairness.
- The EM&V process needs to be reliable.
  - Studies must be produced in a timely manner by independent evaluators.
    - Can be contracted by PUC staff or set up as independent council for a region
- Sufficient resources and effort are required to:
  - Carefully evaluate *ex ante* assumptions, especially those that will not be trued up for earnings claims
  - Conduct *ex post* EM&V studies during and after the cycle to true up *ex ante* assumptions for earnings claims
  - Use those studies to timely inform the next round of *ex ante* assumptions



# Lessons Learned in California

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- Avoid steep changes in incentive rates that put pressure on a single performance point.
  - Fixed shared-savings rate does not cause this pressure, whereas a step function does
  - There are tradeoffs in smoothing out the curve (no discontinuities that put pressure on a single point)
- The incentive mechanism should be reevaluated after one or two full funding cycles.
  - Can review earlier if significant problems are uncovered.
- Review and dispute resolution processes should be built into incentive mechanisms that rely on *ex post* EM&V evaluations.
- A clear and transparent process is needed for updating *ex ante* metrics for the next round.



# Colorado

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- HB 1037 (2007) directed Commission to offer utilities an opportunity to make DSM investments more profitable than other investments
  - By 2018, EE savings in aggregate must reach at least 5% of 2006 sales
- Docket No. 07R-371G established natural gas utility performance incentives (*Decision No. C08-0248-E, March 2008*)
- Docket 07A-420E established performance incentives for Public Service Company of Colorado (*Decision No. C08-0560, May 2008*)
- Docket 08I-113EG opened a high-level examination in March 2008 “concerning regulatory structures and incentives that influence electric and gas utility actions under existing regulatory structures in Colorado and concerning alternative incentives and alternative regulatory and rate structures that may alter or influence utility actions.” (*Decision No. C08-0448 at 4*)



# Colorado DSM Incentive for Natural Gas Utilities

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- Colorado DSM “bonus” for natural gas utilities is a percentage of net economic benefits
- Percentage equals Energy Factor multiplied by the Savings Factor
  - Energy Factor = Zero plus 0.5% for each percentage of achieved savings exceeding 80% of the approved savings target
  - Savings Factor = Actual savings achieved divided by the approved savings target (per \$1 million expended)
- No penalties, but portion of costs representing programs with B/C < 1 “loses presumption of prudence and is subject to review”
- Example: Utility’s savings target is 15,000 dekatherms and it achieves 106% of its target (18,000 dekatherms)
  - Energy factor is  $0.5\% \times (106 - 80) = 13\%$
  - Savings factor is  $18,000/15,000 = 1.2$
  - Bonus percentage is  $13\% \times 1.2 = 15.6\%$
  - **Bonus amount is 15.6% of net economic benefits**



# Public Service Company of Colorado

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- Biennial plans include goals for energy savings and peak demand reduction
  - DSM goals set at “modest levels,” particularly in early years
    - DSM goals as % of 2006 sales: 0.53% in 2009, 0.76% in 2010
    - Cut projected *growth* of sales in half by 2018 = 1.15% of 2006 sales (the mid-point within acceptable range, from 80% to 130% of goal)
    - 11% of 2006 sales by 2020
  - Portfolio approach targeting overall B/C ratio of 1 or better
  - B/C of individual programs (e.g., low income, pilot programs, market transformation) can fall below 1
- Expense EE via DSM cost adjustment mechanism (rider)
  - Costs forecasted with true-up for over-/under-recovery
  - Utility pays interest on over-recovery



# Public Service Company of Colorado

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- Upfront “Disincentive Offset”
  - “Signing bonus” each year the utility pursues Commission-approved DSM goals
  - *Not* lost margin recovery, which Commission finds difficult to uncover or value
  - \$2 million in after-tax revenue (about \$3.2 million gross) each year utility implements an approved DSM plan
  - Recovered via DSM rider over 12 months following year DSM plan is implemented
  - Subject to downward adjustment in future years for failure to achieve at least 80% of Commission-approved savings goal



# Public Service Company of Colorado

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## ➤ Performance incentive

- Percentage of net economic benefits
  - TRC analysis includes avoided emissions, reduced customer O&M costs, and other clear non-energy benefits on a program-by-program basis, as well as incentive payments to utility
- 0.2% of net economic benefits for each 1% of DSM goal attainment beyond 80%, up to 10% of net benefits at 130% of goal attainment
  - 4% of net economic benefits if 100% of DSM goal is achieved
- 0.1% of net economic benefits for each 1% of DSM goal attainment beyond 130%, up to 12% of benefits at 150% of goal attainment
- Adjusted for 2009 to reflect earlier commitments (transition issue)
- Payment to occur in two installments – over two years following program year
  - Allows time for analysis to be factored into economic benefits calculation
  - Annual utility DSM reports include proposed incentive amounts

## ➤ Cap: disincentive offset and performance incentive *combined* not to exceed 20% of total DSM expenditure for the year



# Connecticut Performance Management Fee

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- For prudently incurred expenditures on approved and successfully implemented programs and measures, electric and gas utilities are eligible for either: 1) a return in rate base between 1% and 5% higher than the otherwise applicable rate of return or 2) a “return” within the same range if treated as operating costs (*Conn. Gen. Stat. §16a-49(a)(2)*)
- Annual hearings to review past year’s results and determine incentive
- Department of Public Utility Control tied incentive levels to achieving percentage of approved savings goals: 2% (achieving 70% of goal) to 8% (achieving 130% of goal)
  - 5% incentive for achieving 100% of goal
  - Figures are pre-tax; based on *approved budget*, not expenditures
  - Majority of the incentive is tied to kWh and kW savings; additional performance measures may include low-income programs, audits for industrial customers, residential new construction, and targeting regions with reliability issues
- Utilities have earned up to 8% of certain EE budgets



# Connecticut Performance Management Fee

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## ➤ Connecticut Light & Power

- Claimed an incentive of \$5,394,524 in 2008
  - Represents 6.9% of residential spending and 8.0% of C&I spending
  - Versus budgeted incentive of \$2,680,503
- Overspent budget by \$35 million in 2008 (about 35%)
- DPUC directed an additional \$10 million from CL&P's 2009 budget to fund its 2008 programs, after the utility suspended more than 600 C&I projects due to over-spending
  - CL&P will not earn performance incentives on the \$10 million, but will receive a return at the rate of its short-term cost of debt
- DPUC *adjusted* actual incentive to \$4,788,385 to reflect the effects of the additional spending by adjusting the savings and net benefit goals
  - “The kWh, kW and customer participation goals are all tied directly to the budget. It would be unfair to customers to allow the Companies to earn a higher bonus incentive by simply increasing their budget.” (*Decision in Docket No. 07-10-03 at 39, June 19, 2008*)



# Connecticut Performance Management Fee

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## ➤ United Illuminating Company

- Claimed earnings of \$1,439,734 in 2008 based on spending maximum goal of 8.0% in both the residential and C&I sectors
  - Versus budgeted incentive of \$633,636
- UI overspent its budget by \$27 million (>50%)
- DPUC granted an *adjusted* performance management fee of \$933,131



# Hawaii Shared Savings

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- Utilities eligible for shared savings incentives until transition to 3<sup>rd</sup> party energy efficiency administrator is complete
  - Four EE goals – MWh and MW savings for residential and C&I sectors
  - Based on gross savings (including free riders)
  - Incentive: 1% of net system benefits if utility meets 100% of *averaged* performance goals, increasing incrementally to 5% of benefits for exceeding goal by 10% or more
    - Net benefits = NPV of energy savings and load reductions, less program costs
  - Utility not eligible for incentive if it fails to meet *any* of the goals
  - Incentives limited to foregone earning opportunities from supply-side investments
- No penalties
  - “[N]egative incentives would have the same effect as an under-recovery of costs”
  - Assymetrical structure supports requirement that HECO meet 100% of all four goals

*Order 23258 (2/13/07), Docket No. 05-0069; Order in Docket No. 2007-0341 (11/14/08)*



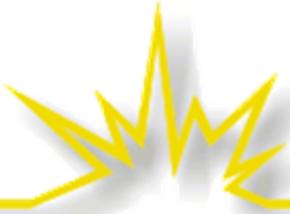
# Minnesota Shared Savings

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## ➤ Shared Savings Incentive since 2000\*

- Viewed as rewarding utilities both for achieving higher energy savings levels and for increasing cost-effectiveness of conservation programs by granting utility a small percentage of the net benefits
  - Net benefits increase when the utility achieves cost-effective savings and when a project's costs are reduced
- Threshold: 91% of savings goal
- Cap: 150% of savings goal
- As the level of energy savings increases, so does the percentage of net benefits awarded, up to the incentive cap
  - Incremental incentive for additional energy savings achieved is significantly higher than the average incentive
- Xcel Energy's average annual incentive has been \$1.3 million, corresponding to average savings equal to 1.18% of sales
  - Cap limited the incentive nearly every year

*\*Docket No. E,G-999/CI-98-1759 (April 7, 2000)*



# Minnesota Shared Savings

- Next Generation Energy Act set savings goals and incentive provisions for electricity and natural gas utilities
  - Achieve energy savings each year equal to 1.5% of retail energy sales by 2012
    - Includes end-use and market transformation programs, rate design, codes and standards, and utility infrastructure improvements
  - Commission may order submission of incentive plans for approval and must consider whether the plan:
    1. is likely to increase utility investment in cost-effective conservation
    2. is compatible with the interest of ratepayers and other interested parties
    3. links incentive to performance in achieving cost-effective conservation
    4. is in conflict with other provisions of the law
  - Commission may:
    1. Change allowed ROR on EE investment based on utility's efforts and success
    2. Share between ratepayers and utilities net savings to extent justified
    3. Adopt any mechanism that makes cost-effective conservation a preferred resource choice for the utility, considering impact on utility earnings

*Minnesota Statutes 2007, 216B; as amended by 2008 Legislature*

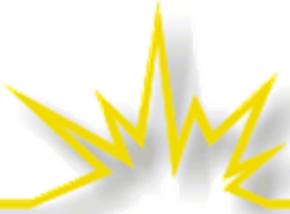


# Minnesota Shared Savings

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- Xcel Energy's New Shared Savings proposal in docket reviewing incentive mechanisms to encourage utility EE investment
  - Conservation Improvement Plan includes electric savings at 1.13% of sales in 2010, 1.2% in 2011 and 1.3% in 2012 through customer-based programs
    - Average increase of 45% over historical achievements and exceeds what company's market potential study determined to be achievable
  - \$0.10/kWh when savings = 1.5% of sales (roughly avr. annual sales growth)
  - Incentive increases with savings level; % of net benefits set annually
  - Threshold equal to lower of: 1) 50% of avr. annual energy savings achieved in the most recent five-year period, after removing the lowest and highest annual achievements, *or* 2) Energy savings equal to 0.4% of annual retail sales
  - When Xcel meets its annual goals, it would retain 11% to 14% of the net benefits; >85% of the benefits would go to ratepayers
  - Cap: Total portfolio net benefits divided by the total energy saved
    - Incentive would never exceed net benefits
  - Only savings from direct utility programs are included in incentive calculation

*Filed in Docket No. E,G-999/CI-08-133 (July 1, 2009)*



# Nevada Bonus ROE

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- Nevada law gives utility authorized return on equity plus 5 percent for prudent and reasonable conservation and demand management investments

*NAC 704.9523(3)(e)(4), at <http://www.leg.state.nv.us/NAC/NAC-704.html#NAC704Sec9523>*

- If utility’s authorized ROE is 8%, EE investments earn 13%

- Statute also allows utility to request a bonus ROE for “critical facilities” such as reliability investments in the same manner

*NAC 704.9484, at <http://www.leg.state.nv.us/NAC/NAC-704.html#NAC704Sec9484>*



# Duke Save-A-Watt Ohio

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- SB 221 requires cumulative, annual energy savings of 22% by 2025
- Under Save-A-Watt, effective 1/1/09, Duke gets 50% of NPV of avoided costs for conservation and 75% of avoided costs for demand response, up to cap
  - From this, Duke pays all program costs (administration, incentives, marketing, M&V, etc.)
  - Duke cannot earn a profit for meeting the state's mandatory savings requirements; can only earn on savings beyond those standards
  - Duke hires independent M&V evaluator (costs capped at 5% of program costs)
- Cost recovery rider: \$1.20/month for typical residential customer (750 kWh/month)
- Earnings cap: True-up in 4<sup>th</sup> year of rider based on actual kW and kWh savings less actual program costs (after taxes)



# Duke Save-A-Watt Ohio

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## Maximum Incentives

<b>% Mandate Achieved*</b>	<b>Capped Cumulative ROI on Program Costs</b>
<b>&gt;125%</b>	<b>15%</b>
<b>116% to 125%</b>	<b>13%</b>
<b>111% to 115%</b>	<b>11%</b>
<b>101% to 110%</b>	<b>6%</b>
<b>&lt; or = 100%</b>	<b>0</b>

\*Benchmarks and baseline for DSM set pursuant to Revised Code 4929.66



# Duke Save-A-Watt Ohio

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- Lost margin recovery until any decoupling or straight fixed variable rate is adopted
- Part of energy security plan approved by Commission
- Customers 3 MW or larger at a single site or in aggregate can opt out if they commit energy savings or peak demand reduction capabilities to Duke's programs
  - Reductions must be at least as large as Duke's statutory requirements

*Docket No. 08-920-EL-SSO (approved December 17, 2008)*



# Duke Save-A-Watt Indiana

*(Pending)*

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- Statute allows Commission to approve incentives *(170 IAC 4-8-7)*
  - Including but not limited to % of net benefits, bonus ROE, or adjusting ROE for DSM performance
    - Must reflect value to customers of avoided or deferred supply-side resource costs minus DSM program costs
- Stipulated settlement for Duke Save-A-Watt program *(Case 43374)*
  - Compensation (including recovery of program costs) at 60% of NPV of generation costs avoided for conservation programs and 75% of the generation costs avoided for demand response programs
    - Difference in recovery % intended to eliminate bias between DR and EE
  - Duke would collect 85% of claimed incentive for 4-year term of agreement
  - True-up at end of period – Duke would refund over-collections at 6% interest; under-collections recovered at no interest over two years
  - Independent third party would verify actual MW and MWh reductions



# Duke Save-A-Watt Indiana

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## Maximum Incentives

<b>% Target Achievement</b>	<b>Capped Rate of Return on Program Costs</b>
<b>90% to 100%</b>	<b>15%</b>
<b>80% to 89%</b>	<b>12%</b>
<b>60% to 79%</b>	<b>9%</b>
<b>&lt;60%</b>	<b>5%</b>

- Estimated avoided cost savings of \$260 million (nominal) if Duke achieves the proposed energy savings and peak reduction targets over the four-year pilot
- Max. rate impact to residential customers is 3%; large customers can opt out
- Lost revenue recovery until rate case, decoupling or other mechanism adopted



# Texas Standard Performance Contracts

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- Context: Electric distribution companies in Texas own no generation
- SB 7 (1999): At least 10% of an IOU's annual growth in electricity demand must be met through EE programs
- HB 3693 (2007) amended EE goals for 2008 (15%) and 2009 (20%)
  - Beginning in 2009, a utility's demand reduction goal (MW) for any year shall not be less than the previous year
  - Savings achieved through hard-to-reach customers shall be no less than 5% of the utility's total demand reduction goal
- IOUs administer EE programs, contracting with retail electric providers and EE service providers via a standard contract
  - Utilities cannot be project sponsors and are subject to strict conflict of interest rules with potential sponsors
- Programs are designed to reduce energy consumption, system peak demand or energy costs



# Texas Standard Performance Contracts

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- Utilities must achieve savings through standard offer programs or targeted market transformation programs
  - Standard offer programs are limited to projects that result in consistent and predictable energy or peak demand savings over a period of time based on the life of the measure
  - Market transformation programs are strategic efforts to provide incentives and education to reduce market barriers for EE technologies and practices and go beyond savings achieved through codes, equipment standards or standard offer programs
- Customer selects the EE service provider
- EE service provider does not receive final compensation until it establishes that work is complete and verification of savings is in accordance with adopted protocols
  - However, EESP can use Commission-approved *deemed* savings
- Adopted avoided cost savings (\$ values for energy and capacity)



# Texas Standard Performance Contracts

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## ➤ Energy Efficiency Performance Bonus

- Utility receives a bonus equal to 1% of the net benefits for every 2% that demand reduction goals are exceeded
  - Net benefits are total avoided costs of the programs minus all utility program costs
  - Bonus capped at 20% of utility program costs
- A utility that meets at least 120% of its demand reduction goal with at least 10% of its savings achieved through hard-to-reach programs (for low-income households) receives an additional bonus
- Utilities routinely hit the caps within weeks of the programs becoming available each year, indicating that targets, programs, or both are not aggressive
- Many programs do not require aggressive technologies or savings in order to comply



# Texas Standard Performance Contracts

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- Energy Efficiency Cost Recovery Factor
  - New in 2009, for timely recovery of reasonable costs of providing EE programs
  - Set to allow the utility to earn:
    1. revenue equal to EE costs, net of costs included in base rates;
    2. EE performance bonus earned for the prior year; and
    3. any adjustment for past over- or under-recovery of EE revenue
  - Administrative costs may not exceed 10% of program costs
  - R&D costs may not exceed 10% of program costs



# Management Fee for Vermont EE Utility

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- Performance-based contract between Vermont Public Service Board and third-party “Energy Efficiency Utility”
  - Vermont Energy Investment Corporation
- Three-year contract includes specific goals for weighted performance indicators
  - Cumulative annual electricity savings (net of free riders), peak demand savings by season and geographic area, total resource benefits, and specific program goals (e.g., increased measure penetration in certain business end uses)
- Performance incentives capped at 2.6% of total budget for 2009-2011
- Linear scaling of incentives with performance
- Minimum Performance Requirement standards
  - B/C ratio, spending on residential sector and low income, program participation by small nonresidential customers, and geographic equity



# Avista Utilities (Gas) Washington

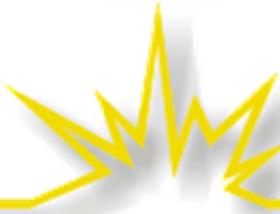
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- “Incentive” is part of decoupling mechanism
  - If utility does a better job on EE acquisition, its earnings are higher
- Sliding scale: At 100% of EE target, utility recovers 90% of decoupling deferrals
- If utility achieves <70% of EE target, it is not allowed recovery of decoupling deferrals



# Puget Sound Energy Conservation Incentive Mechanism - Washington

- Energy savings targets are set annually
- Incentive for reaching the Baseline Target (100% of goal)
  - “MWh Incentive” = \$10/MWh (\$2,780,000), *plus*
  - Shared savings incentive = Baseline Target (278,000 MWh) \* Net Shared Incentive (\$45/MWh) \* Shared Savings Incentive Rate (5%) = \$625,500
- Additional incentives for savings *above* Baseline Target are equal to sum of incentives calculated for each percentage savings band
  - MWh Incentive = Incremental savings (MWh) \* \$20/MWh, *plus*
  - Shared Savings Incentive = Incremental savings (MWh) \* Net Shared Incentive (\$45/MWh) \* Shared Savings Rate
    - Shared Savings Rate (percent of savings eligible for incentive) = 10% for savings between 100% and 110% of target
    - Shared Savings Rate rises incrementally to 100% at 150% of target – e.g., the rate is 20% for savings between 110% and 120% of target
  - Within the top band, subtract threshold of band from actual savings achieved to calculate Shared Savings Incentive



# Puget Sound Energy Conservation Incentive Mechanism - Washington

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- Deadband: 90% of target to <100%
- Penalties below 90% of target
  - Penalties are much larger than incentives
- Thresholds
  - At least 75% of savings must be achieved in both the residential and C&I sectors
  - Weighted average measure life must be at least 9 years
  - Program portfolio must pass both total resource cost and utility cost tests
- 75% of incentive is recovered the year following implementation, 25% recovered in subsequent year

[http://www.pse.com/SiteCollectionDocuments/rates/elec\\_sch\\_121.pdf](http://www.pse.com/SiteCollectionDocuments/rates/elec_sch_121.pdf)

# Puget Sound Energy Conservation Incentive Mechanism - Washington

Band	Incentive Range	\$/MWH Incentive	Shared Savings Incentive	MWh by Band	Per MWh Incentive	Shared Savings Incentive	Total Incentive
A	140.0 - <150.0%	\$ 20	100%	-	\$ -	\$ -	\$ -
B	130.0 - <140.0%	\$ 20	80%	-	\$ -	\$ -	\$ -
C	120.0 - <130.0%	\$ 20	40%	14,053	\$ 281,059	\$ 253,516	\$ 534,575
D	110.0 - <120.0%	\$ 20	20%	21,637	\$ 432,744	\$ 195,168	\$ 627,912
E	100.0 - <110.0%	\$ 20	10%	21,421	\$ 428,417	\$ 96,608	\$ 525,024
F	100% Baseline Target	\$ 10	5%	216,372	\$ 2,163,720	\$ 487,919	\$ 2,651,639
				273,483	\$ 3,305,940	\$ 1,033,210	\$ 4,339,150
	<b>Penalty Range</b>	<b>\$/MWH Penalty</b>		<b>MWh Shortfall by Band</b>			<b>Total Penalty</b>
G	90.0% - <100% Deadband	\$ -		-			\$ -
H	80.0 - <90.0%	\$ 75		0			\$ -
I	70.0 - <80.0%	\$ 80		0			\$ -
J	60.0 - <70.0%	\$ 85		0			\$ -
K	50.0 - <60.0%	\$ 90		0			\$ -
L	<50.0%	\$ 95		0			\$ -
				0			\$ -



# Some Other States With EE Incentives for Utilities

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- DC – Performance-based incentives for “Sustainable Energy Utility” under contract to DC Energy Office
- GA – Shared savings incentive for one program
- MA - National Grid after-tax incentive of 5% of expenses on a program-by-program basis, with threshold performance set at 75% of target savings
- NH - Shareholder incentives are 8% to 12% of EE program budgets (minus shareholder incentives), by sector – residential and C&I; threshold performance level of 65% of planned savings to qualify
- OK – 25% of program costs with measurable results; 15% of program costs with non-measurable results, such as education
- SD – Otter Tail gets a share of net benefits if it achieves 100% of goal
- WI – WP&L’s on-bill financing allows ROI equal to supply-side options
- Statutes in other states explicitly allow the Commission to grant incentives. Cases are pending in these and other states.



# Other Incentive Ideas

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- Sliding scale incentive based inversely on usage per customer
  - Would cover any savings, regardless of source, including programs, codes/standards, market
  - Utility would need to recalculate value considering additional customers (meters)
- Others?



# **FINANCIAL ANALYSIS FOR PROTOTYPE UTILITY**

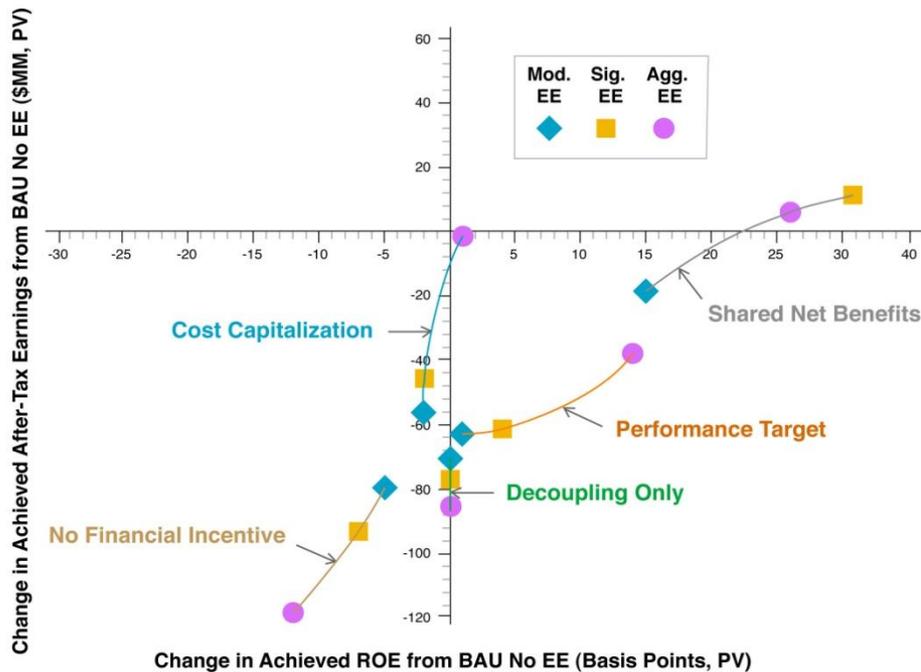


# Financial Analysis of Incentives for a Prototypical SW Utility

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- Three shareholder incentive mechanisms studied
  - Performance Target (aka Management Fee)
    - Utility receives performance-based incentive of an additional 10% of program costs if it achieves EE portfolio goals
  - Cost Capitalization (similar to approach used in NV)
    - Utility capitalizes the annual cost of the EE program over the first 5 years of the installed measures at authorized ROE (10.75%) + 500 basis points
  - Shared Net Benefits (aka Shared Savings)
    - Utility retains 15% of the PV of TRC net benefits from the portfolio of EE programs

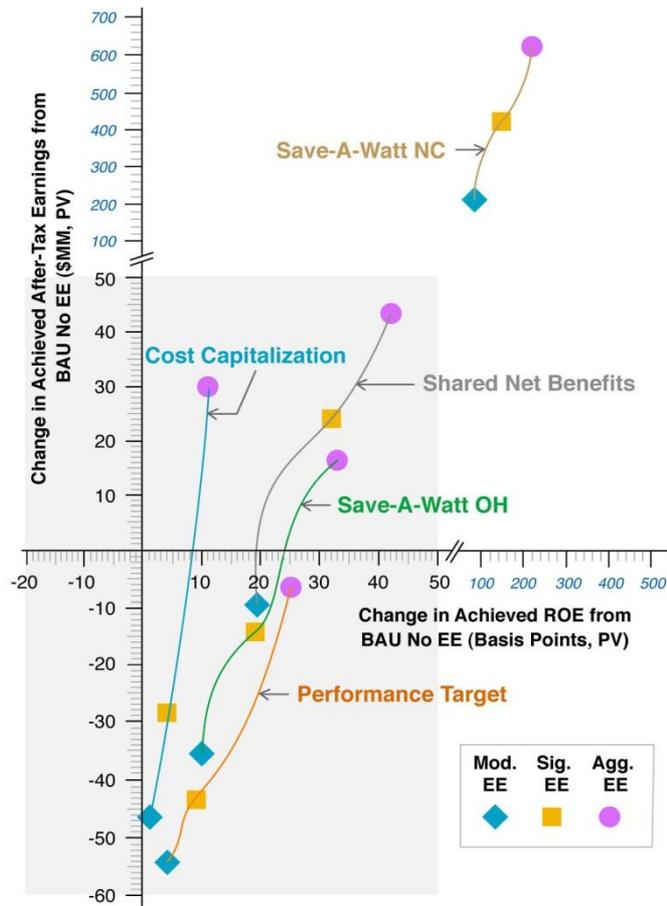
# Effect of Decoupling or Shareholder Incentives on Utility ROE and Earnings



Finance theory suggests that preferred metric to assess value to shareholders of alternative investment options is impact on earnings per share (EPS) on a risk-adjusted basis; not total earnings. ROE is a good proxy for this when no additional equity is issued.

- Application of full Revenue Per Customer decoupling entirely removes short-term disincentive from any reduction in sales between rate cases, but does not improve earnings opportunities
- Performance Target and Shared Net Benefits are only mechanisms that produce positive change in ROE for all EE savings levels if implemented alone
- Increase in earnings with Shared Net Benefits in Significant and Aggressive EE cases, compared to BAU No EE case

# Effect of Decoupling and Incentive Mechanisms on Utility ROE and Earnings



- EE more likely to be “profit center” for utility if combine mechanisms
- ROE of SW utility always increases with combined decoupling and incentive mechanism, compared to BAU No EE case
- Earnings generally increase only in the Aggressive EE case



# **STRAW PROPOSALS**



# Some Considerations for Straw Proposals

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- EE goals
  - Goals for peak demand reduction, too?
- Type of mechanism
- Performance metrics and M&V
- Thresholds (minimum performance)
- Incentive levels and caps
- Penalties?
- Time period initially in place
- Reports and review



# Resources

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- National Action Plan for Energy Efficiency, *Aligning Utility Incentives with Investment in Energy Efficiency*, prepared by Val R. Jensen, ICF International, November 2007, at <http://www.epa.gov/cleanenergy/documents/incentives.pdf>.
- Peter Cappers, Charles Goldman, Michele Chait, George Edgar, Jeff Schlegel and Wayne Shirley, *Financial Analysis of Incentive Mechanisms to Promote Energy Efficiency: Case Study of a Prototypical Southwest Utility*, Ernest Orlando Lawrence Berkeley National Laboratory, March 2009, at <http://eetd.lbl.gov/EA/EMP/reports/lbnl-1598e.pdf> and <http://eetd.lbl.gov/EA/EMP/reports/lbnl-1598e-app.pdf> (appendices).
- Peter Cappers and Charles Goldman, *Empirical Assessment of Shareholder Incentive Mechanisms Designs Under Aggressive Savings Goals: Case Study of a Kansas “Super-Utility,”* Ernest Orlando Lawrence Berkeley National Laboratory, August 2009, at <http://eetd.lbl.gov/EA/EMP/reports/lbnl-2492e.pdf>.
- Michael W. Rufo, Itron Inc., “Evaluation and Performance Incentives: Seeking Paths to (Relatively) Peaceful Coexistence,” Proceedings of the 2009 International Energy Program Evaluation Conference, Aug. 12-14, 2009, pp. 1030-1041, at <http://docs.cpuc.ca.gov/efile/CM/106837.pdf>.



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