UTILITY-SECTOR ENERGY EFFICIENCY POLICIES
and
DISCUSSION ON IMPLEMENTING SUCH POLICIES IN NEVADA

Presentation to the Interim Legislative Committee on Energy
Las Vegas, Nevada
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by
Martin Kushler, Ph.D.
Senior Fellow
American Council for an Energy-Efficient Economy
The American Council for an Energy-Efficient Economy (ACEEE)

- Nonprofit 501(c)(3) dedicated to advancing energy efficiency through research, communications, and conferences. Founded in 1980.
- ~40 staff in Washington DC, + field offices in DE, MI, and WI.
- Focus on End-Use Efficiency in Industry, Buildings, Utilities, and Transportation; and State & National Policy
- Funding: Foundations (34%), Federal & State Grants (7%), Contract work (21%) Conferences and Publications (34%), Contributions and Other (4%)

Martin Kushler, Ph.D. (Senior Fellow, ACEEE)

- 30 years conducting research in the utility industry, including:
  - 10 years as Director of the ACEEE Utilities Program
  - 10 years as the Supervisor of the Evaluation section at the Michigan PSC
- Have assisted over a dozen states with utility EE policies
TOPICS

- Energy efficiency as a utility system resource
  - Concepts
  - Data
- Why energy efficiency is important for Nevada
  - Dollar drain
  - Current Scorecard results
- Comparison of results from 4 major policy options
- Recommendations
- Q&A and discussion
Energy Efficiency as a utility system resource
RATIONALE FOR ENERGY EFFICIENCY AS A UTILITY SYSTEM RESOURCE

SIMPLY STATED:
• Utility systems need to have adequate supply resources to meet customer demand
• To keep the system in balance, you can add supply resources, reduce customer demand, or a combination of the two
• In virtually all cases today, it is much cheaper to reduce customer demand through energy efficiency programs than to acquire new supply resources
WHAT IS AN “ENERGY EFFICIENCY PROGRAM”?

An organized effort to try to encourage customers (residential and business) to implement energy efficiency improvements to their buildings and equipment

Key elements

• Public information, education and persuasion
• Information, training, and incentives to “trade allies” (retailers, contractors, etc.)
• Economic incentives for customers (e.g., rebates)
• Quality control, monitoring, and evaluation
KEY POINT #1

It is much cheaper to save energy than it is to produce it.

[We can save electricity for about one-third the cost of producing it through a new power plant .... With no carbon (CO₂) emissions]
LEVELIZED ELECTRICITY RESOURCE COSTS
[source: Lazard, 2014]
In a 2009 ACEEE analysis*, we reviewed the reported results from 14 states with large-scale utility funded energy efficiency programs:

➢ **The average cost per kWh saved was 2.5 cents**

In a new 2014 ACEEE analysis**, we reviewed the reported results from 20 states:

➢ **The average cost per kWh saved was 2.8 cents**

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ENERGY EFFICIENCY ON A “POWER PLANT” SCALE

• Some leading state examples
  ❖ Minnesota has saved over 2,300 MW since 1990
  ❖ The Pacific Northwest has saved over 5,500 MW since 1980, 2000 MW just since 2005
  ❖ California has saved over 1,500 MW in just the last 5 years

• Over a dozen states have EE programs on a scale large enough to displace power plants (i.e., save 1% of load or more each year)
  • AZ, CA, CT, IA, IL, MA, MI, MN, NY, OR, RI, VT, WA, WI
Why is energy efficiency important for Nevada?

1) By far the cheapest energy resource

2) Additional economic benefits
KEY POINT #2
NEVADA’S ENERGY DOLLAR DRAIN

• Nevada is essentially totally dependent on fuels imported from other states and countries

Nevada imports:
– 100% of the natural gas
– 100% of the coal
– 100% of oil & petroleum products it consumes

• Total energy dollar drain from Nevada is over $7.5 billion per year!

➢ Every dollar of fuel imports reduced through energy efficiency is a dollar that can stay and circulate in the Nevada economy
How is Nevada doing on energy efficiency?
2015 State Energy Efficiency Scorecard Rankings

Source: American Council for an Energy-Efficient Economy
2009 State Energy Efficiency Scorecard Rankings
# Nevada State Scorecard Performance

<table>
<thead>
<tr>
<th>Year</th>
<th>Utility &amp; public benefits programs &amp; policies</th>
<th>Transportation policies</th>
<th>Building energy codes</th>
<th>CHP</th>
<th>State govt initiatives</th>
<th>Appliance efficiency standards</th>
<th>TOTAL SCORE (50 pts.)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>4</td>
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<td>13</td>
<td>31</td>
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<td>2014</td>
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<td>0.5</td>
<td>6</td>
<td>1</td>
<td>3.5</td>
<td>0</td>
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<td>4.5</td>
<td>1</td>
<td>2.5</td>
<td>0</td>
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<td>2012</td>
<td>9.5</td>
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<td>4.5</td>
<td>1</td>
<td>1.5</td>
<td>0</td>
<td>16.5</td>
<td>31</td>
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<tr>
<td>2011</td>
<td>11.5</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>1.5</td>
<td>1.5</td>
<td>22.5</td>
<td>22</td>
</tr>
<tr>
<td>2010</td>
<td>11</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>2.5</td>
<td>2.5</td>
<td>22</td>
<td>19</td>
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<td>2009</td>
<td>11</td>
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<td>2</td>
<td>6</td>
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<td>16</td>
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<tr>
<td>2008</td>
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<td>0</td>
<td>5</td>
<td>0.5</td>
<td>2</td>
<td>1</td>
<td>17</td>
<td>15</td>
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<tr>
<td>2007</td>
<td>7</td>
<td>0</td>
<td>4</td>
<td>2</td>
<td>1.5</td>
<td>0</td>
<td>14.5</td>
<td>18</td>
</tr>
</tbody>
</table>

Note that specific scoring criteria and points available in each chapter have changed from year to year.
How Does Nevada Stack Up Regionally?

Utilities
Building Codes
State-Led Initiatives
Transportation
CHP
Appliance Standards
What might Nevada do to improve its Energy Efficiency performance?

A: The single most effective action would be to establish a strong Energy Efficiency Resource Standard (EERS)
FOR PUBLIC POLICY: UTILITIES ARE ESSENTIAL TO ACHIEVING ENERGY EFFICIENCY GOALS

Substantial utility ratepayer-funded energy efficiency resource programs are the cornerstone of the policy efforts of every leading state on energy efficiency

• The utility system is where electricity resource decisions are made...and paid for
  (States don’t spend tax dollars on energy efficiency programs ... they are all broke)

• The utility system spends $billions on energy every year. Just direct 2% - 4% to energy efficiency

• Utilities have universal customer access and unmatched market information relating to energy use

• Utilities as regulated entities are subject to unique oversight & accountability requirements, thus protecting ratepayers
Why are public policy requirements needed for utility energy efficiency?
THE CORE CHALLENGE...
KEY POINT #3:

Utilities do not voluntarily engage in (or fund) “serious” customer energy efficiency programs

[“Customer education programs” don’t count as “serious” energy efficiency]

Why not?

Economics

• Higher energy sales means higher profit (and vice-versa)

Organizational Traditions

• Institutional focus traditionally on supply side
UNDERSTANDING UTILITY ECONOMICS REGARDING CUSTOMER ENERGY EFFICIENCY

TWO KEY FINANCIAL MOTIVATING FACTORS:

1) **Drive to increase sales revenues** - Under traditional regulation, once rates are set, if utility sales go up the utility’s profits generally increase. And if utility sales go down (e.g., through customer energy efficiency) the utility’s profits decline.

Therefore, utilities have strong economic incentives to seek greater energy sales and avoid declines in sales.

[This is sometimes referred to as: “throughput addiction”. Affects ALL utilities, whether traditional vertically integrated or “restructured”]
2) **Opportunity for earnings** - Utilities earn a “rate of return” on their supply side investments (e.g., power plants, wires, meters), but not on energy efficiency programs.

[Those 2 factors apply to both vertically integrated and “restructured” utilities in “competitive” states]

Not surprisingly…. the combination of those two factors results in what you typically see from utilities: proposals to build more power plants and sell more energy…. (& passive or active opposition to strong energy efficiency requirements)
INITIAL CONCLUSIONS

• Utilities play an essential and unavoidable role in our society for electricity resource decisions and funding

• Energy efficiency is without question the lowest-cost supply ‘resource’ available

• If the utility system is not fully capturing the energy efficiency resource, then additional *higher-cost* resources will need to be purchased….and costs for all ratepayers will be increased

• Utilities will not seriously pursue the energy efficiency resource on their own. Policy and regulatory requirements and incentives are essential

• We have many good examples of successful policy (and programs) to achieve utility energy efficiency results

• *The challenge is not engineering or economics…it’s political*
Assuming that one wanted to achieve strong utility energy efficiency results….

What are the best state policies for getting there?
### 4 Common State Policies for Achieving Utility EE

<table>
<thead>
<tr>
<th>Policy</th>
<th>EE Spending (% revenues)</th>
<th>EE Savings (% of sales)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Integrated Resource Planning (IRP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 states ‘yes’</td>
<td>1.79</td>
<td>0.78</td>
</tr>
<tr>
<td>10 states ‘no’</td>
<td>1.53</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>2. Decouping/Lost Revenue Recovery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 states ‘yes’</td>
<td>2.04</td>
<td>0.85</td>
</tr>
<tr>
<td>23 states ‘no’</td>
<td>1.53</td>
<td>0.59</td>
</tr>
<tr>
<td><strong>3. Utility Shareholder Incentives</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25 states ‘yes’</td>
<td>1.79</td>
<td>0.90</td>
</tr>
<tr>
<td>25 states ‘no’</td>
<td>1.66</td>
<td>0.50</td>
</tr>
<tr>
<td>26 states ‘yes’</td>
<td>2.63</td>
<td>1.11</td>
</tr>
<tr>
<td>24 states ‘no’</td>
<td>0.76</td>
<td>0.30</td>
</tr>
</tbody>
</table>
26 STATES WITH ELECTRIC EERS POLICIES IN PLACE DURING CALENDAR YEAR 2014
KEY POINT #4: NATIONAL DATA OVERWHELMINGLY SHOW THAT ENERGY EFFICIENCY RESOURCE STANDARDS (EERS) ARE EXTREMELY EFFECTIVE (e.g., produce nearly 4X the savings.... 2013 national data below)

<table>
<thead>
<tr>
<th></th>
<th>EE spending as a % of Revenues</th>
<th>EE savings as a % of Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>States with EERS (n=26)</td>
<td>2.63</td>
<td>1.11</td>
</tr>
<tr>
<td>States w/o EERS (n=24)</td>
<td>0.76</td>
<td>0.30</td>
</tr>
</tbody>
</table>

(p<.001)
ENERGY SAVINGS FOR STATES WITH AN EERS VS. STATES WITHOUT EERS

[EE savings as a % of retail sales (2013)]

The top 19 states in EE savings all have EERS
No state has saved 1% per year without an EERS
A COMPREHENSIVE APPROACH (EERS PLUS DECOUPLING AND INCENTIVES) CLEARLY PRODUCES THE STRONGEST RESULTS

<table>
<thead>
<tr>
<th>Policy</th>
<th>No. of States</th>
<th>Average EE investment as % of revenues</th>
<th>Average EE savings as % of sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>EERS, Decoupling and Incentives</td>
<td>8</td>
<td>4.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Partial set of policies</td>
<td>42</td>
<td>1.3</td>
<td>0.6</td>
</tr>
</tbody>
</table>
State Energy Efficiency Resource Standards (April 2015)

SOME KEY REFERENCES FOR EE POLICY

  [http://aceee.org/white-paper/policies-matter](http://aceee.org/white-paper/policies-matter)


• **Making the Business Case for Energy Efficiency: Case Studies of Supportive Utility Regulation**, ACEEE Research Report U133, December 2013

  [http://www.aceee.org/research-report/u1403](http://www.aceee.org/research-report/u1403)
SOME GOOD REFERENCES FOR EE PROGRAM DESIGN

  [http://www.aceee.org/research-report/u081](http://www.aceee.org/research-report/u081)

- **The Promise and the Potential of Comprehensive Commercial Building Retrofit Programs**, ACEEE Research Report A1402, May 2014
  [http://www.aceee.org/research-report/a1402](http://www.aceee.org/research-report/a1402)

  [http://www.aceee.org/research-report/e118](http://www.aceee.org/research-report/e118)

Data on the Success of Michigan’s EERS

- Energy efficiency has been repeatedly found to be very cost-effective (latest MPSC report September, 2015)
- The utilities have exceeded the EE targets every single year (saving over 1.3% per year)
- EE programs produced cost savings of $4.38 for every $1 spent on the programs, $4.2 billion in savings in 6 years*
- EE is by far the least-cost utility system resource**
  - **Energy efficiency costs 2 cents/kWh….**
    - vs. 13.3 cents/kWh for a new coal plant
    - vs. 6.4 cents/kWh for a new combined cycle gas plant
    - vs. 6.4 cents/kWh average of all power supply costs


NEVADA UTILITY EE POLICY FRAMEWORK

Cost recovery for EE programs: Yes
Decoupling: No
Utility shareholder incentives: Limited
EERS: Not really
RECOMMENDATIONS FOR AN OPTIMAL STATE POLICY FOR UTILITY ENERGY EFFICIENCY PROGRAMS

1. Establish an ‘Energy Efficiency Resource Standard (EERS)’ that sets specific energy savings requirements
   - Use EE potential studies, IRP, & other states to set the targets
   - Provide reasonable and timely cost recovery for program costs

2. Create a utility incentive mechanism to reward utilities for achieving/exceeding the savings goals
   - Cap incentives at a “reasonable” level (to avoid excesses) (“Reasonable” somewhere around “rate of return”)  
   - Reward savings, not spending (& higher savings = higher reward)
   - “Penalty” usually not needed, but reserve option for gross failure
   - Reward longer-lived measures with true resource value

3. Implement true ‘symmetrical’ decoupling
   - Not “lost revenue adjustment mechanism” (LRAM)
   (See appendix for more details)
4. Establish a process for public participation in energy efficiency plan development and review

5. Require independent evaluation, with PSC oversight

6. Don’t have an artificial ‘cap’ on energy efficiency spending, rather, use cost-effectiveness tests to protect ratepayers
   - Utility cost test for “resource” value
   - Societal test for “public interest” determination

7. Require all customers to pay for the energy efficiency resource, just like they all pay for a new power plant (i.e., no “opt-outs”)
APPENDIX 1

A DISCUSSION OF ISSUES AND OPTIONS RELATING TO “LOST REVENUES”
Utilities have 3 specific regulatory concerns regarding the financial effects of EE programs:

[In order of importance]

- **Cost recovery** for the direct costs of a program
- **Addressing the disincentives** of “lost revenues” resulting from energy efficiency improvements that reduce customer energy use
- **Providing an opportunity for earnings** from energy efficiency program activity (to reflect the fact that they can generate earnings from supply-side investment)
3 Legs of the financial stool for utility energy efficiency programs

1. Cost recovery (of expenditures on programs, incl. customer incentives and program costs)

2. Addressing “Through-put incentive” (more sales = more revenue).

3. Opportunity to earn on investments (comparable to supply-side)
KEY BASIC PRINCIPLE ON “LOST REVENUES”

Utilities have rates established based on approved costs and an authorized rate of return, spread over a forecasted level of sales.

The only legitimate “moral” argument for asking ratepayers to compensate a utility for so-called “lost revenues” from customer energy efficiency programs…

is if the utility’s sales are below forecast, and the utility is failing to recover their authorized fixed costs.

In that case, the utility is truly suffering “harm” from the energy efficiency programs, and ratepayers arguably have some obligation to rectify that.  However…
… if a utility’s sales are above forecast, they are already recovering their authorized fixed costs (including “return”). Granting “lost revenues” in that situation would actually be subsidizing excess profits.

There is no legitimate “moral” obligation for ratepayers to pay extra to ensure that a utility realizes revenues above authorized. (And in fact, under perfect regulation, if a utility’s sales were above forecast, rates would be lowered to eliminate that excess recovery.)

[NOTE: providing a utility an “incentive” for good performance in meeting EE goals is ok, but is a different matter. “Lost revenues” should not be used for that purpose.]
WHAT METHODS ARE AVAILABLE TO ADDRESS THE “LOST REVENUES” ISSUE

Three commonly mentioned options:
1. “straight-fixed-variable” (SFV) rates (i.e., shifting more costs into the monthly fixed charge)
2. “Lost Revenue Adjustment Mechanism” (LRAM) (i.e., directly compensating for sales lost due to EE programs)
3. True symmetrical decoupling (i.e., “truing up” revenues to forecasted levels, if sales are above or below forecast)
PROBLEMS WITH 'STRAIGHT-FIXED-VARIABLE' RATES

1. Greatly reduces the “price signal” to the customer to conserve energy (e.g., recent MGE proposal 14.4 to 7.6 cents/kWh)
   - Encourages wasteful behavior
   - Makes energy efficiency measures less financially attractive

2. Penalizes customers who use less energy (e.g., elderly, lower income, people trying to be energy efficient)

3. Subsidizes high users (higher income, energy wasters)

4. Not economically efficient
   Many short-term “fixed costs” are actually long-term variable costs (i.e., are affected by the amount of energy use)
PROBLEMS WITH ‘LRAM’

1. The “moral” problem of ratepayers subsidizing excess earnings discussed previously
2. Greatly increases the “cost” of energy efficiency (can equal or exceed the actual EE program costs)
3. Does nothing to dissuade utility “load building” (can be promoting increased usage with one hand while operating EE programs with the other and collecting “lost revenues”)
4. Strong incentive to claim savings that aren’t “real”
   - Makes evaluation much more contentious because money is at stake on every kWh
   - Ideal scenario for a utility is to claim credit for “savings” that don’t actually occur (can “double” or even “triple” collect fixed costs)
HOW DECOUPLING SOLVES THOSE PROBLEMS

1. “Price signal” to customers is not reduced
2. No shift of costs from high users to low users
3. No “moral” problem of subsidizing excess utility profits
   - Decoupling is “symmetrical”. If sales are above forecast, the excess is returned to customers
4. Does not increase the “cost” of EE programs. It’s an overall ratemaking function (and in many cases there is no additional cost in any case)
5. Removes the incentive to load-build (excess sales are refunded)
6. Eliminates need to fight over EE evaluation methods and results (uses actual total sales as the metric)
7. Removes incentive to “game” the forecast in rate cases (up or down), because it’s all trued up to actual later
CONCERNS ABOUT DECOUPLING

1. Can lead to automatic rate increases for customers
   - True, but the actual data shows these are usually quite small, and nearly as often **refunds** rather than rate increases
   - Comprehensive national study showed nearly two-thirds of adjustments were less than 2%, and 37% of adjustments were refunds. [That NEVER happens under LRAM!]

2. Reduces risk for utility
   - It does reduce risk…. But also eliminates their ability to “profit on the up-side” from sales above forecast
   - and history shows that utilities nearly always “win” the traditional game
     - If sales are above forecast, the “stay out” and pocket the excess revenues
     - If sales are below forecast and they are under-recovering, they file a new rate case and raise rates

Symmetrical decoupling is actually better for consumers than the 1-sided traditional game
SOME ADDITIONAL FACTORS TO CONSIDER

1. Decoupling is not an “incentive” for a utility to provide EE programs. It helps remove a negative factor (fear of not recovering authorized fixed costs), but it alone does not make a utility want to provide EE programs. Need other policies & mandates to do that.

2. Decoupling by itself is not the real “benefit” for consumers. The real benefit is to get substantial energy efficiency programs….and decoupling can help make that possible. Decoupling should be “bundled” with an agreement to provide substantial EE programs.

3. A utility’s opinion of decoupling will depend upon whether they think they can “win on the upside” in the foreseeable future. If so, they’ll resist decoupling and much prefer LRAM. (that is when decoupling is MOST important)
CONCLUSIONS

1. True symmetrical decoupling is clearly a better deal for customers than either LRAM or SFV (No cost-shifting from high users to low users, excess utility revenues are refunded)

2. Decoupling is also a better policy approach for achieving real energy efficiency (doesn’t damage the price signal, takes away incentive to push load building)

- If something has to be done about the issue of “lost revenues” from energy efficiency, decoupling is by far the best option

WHAT’S NOT TO LIKE?????
### Comparing States with LRAM to States with Decoupling

<table>
<thead>
<tr>
<th></th>
<th>Average EE spending as % revenues</th>
<th>Average EE savings as % sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>States with LRAM</td>
<td>0.82</td>
<td>0.48</td>
</tr>
<tr>
<td>(n=17)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>States with decoupling</td>
<td>4.11</td>
<td>1.47</td>
</tr>
<tr>
<td>(n=10)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Energy Efficiency is a Bipartisan Issue

State House/Senate and Governor party affiliation at the time of the first enactment of statewide energy efficiency policy.
BEWARE OF THE NATURAL GAS DISTRACTION: “CHEAP” NATURAL GAS DOES NOT ELIMINATE THE NEED FOR, OR COST-EFFECTIVENESS OF, OF ENERGY EFFICIENCY

Levelized Cost of Combined Cycle Combustion Turbine at Alternative Natural Gas Prices and Lifetime Capacity Factors Compared to Utility Cost of Conservation

(source: Northwest Power and Conservation Council, 2012)
7. “Federal energy efficiency standards on lighting and equipment make utility energy efficiency programs unnecessary/not cost-effective.”

A: The federal energy standards have a relatively small effect on overall energy efficiency potential. There is still a tremendous amount of energy efficiency to capture. (See next slides.)
FEDERAL STANDARDS HAVE RELATIVELY LITTLE EFFECT ON ENERGY EFFICIENCY POTENTIAL
(Northwest Power & Conservation Council, 2014)
Proportion of 6th Plan Goals that will be met by the New Federal Energy Efficiency Standards

![Graph showing proportion of goals met by new federal energy efficiency standards between 2010-2014 and 2015-2019.](image)
WHY INDUSTRIAL CUSTOMERS “ON THEIR OWN” DO NOT CAPTURE ALL COST-EFFECTIVE EE

The Problem

A typical large corporation will not invest in a project unless there is a very quick return...a historical “rule of thumb” has been about a two-year ‘payback’ [With the current tight economy, it is likely closer to 1-year now]

Assume a 2-yr. payback  [device costs $2, saves $1 per year]
Typical industrial rate: 7.5 cents/kWh  [$1/.075 = 13.33 kWh]
For the utility, a device that cost $2 and saved 13.33 kWh/yr., levelized over a 10-yr. life, would cost just 1.9 cents/kWh
That means that any EE with a cost over 1.9 cents per kWh will likely not get done by the customer, “on their own”

Here’s how utility EE programs overcome that problem....
EXAMPLE OF HOW A UTILITY EE PROGRAM FOR INDUSTRIAL CUSTOMERS PRODUCES COST-EFFECTIVE EE THAT WOULD NOT OTHERWISE HAPPEN

• Assume an EE project with a four-year payback
  Cost: $4, annual savings: $1 (again, 13.33 kWh/yr.)
On its own, the customer would not do this project

The Utility EE Program

The utility provides a $2 incentive to the customer, to “buy down” the payback to 2 yrs, allowing the project to proceed

➢ The utility is essentially “buying” energy efficiency savings from the customer….in this case at a levelized cost of just 1.9 cents/kWh  [$2 x CRF of .1294/13.33 kWh]

➢ This is about one-fourth the cost of electricity from building, fueling and operating a new power plant.

➢ The industrial customer benefits directly, the utility system (all ratepayers) benefit by avoiding higher-cost supply