

Energy Efficiency Financing: Turning Value into Money

National Council on Electric Policy
Energy Efficiency Financing Workshop
September 15, 2005
Richard Sedano



The Regulatory Assistance Project

*50 State Street, Suite 3
Montpelier, Vermont USA 05602
Tel: 802.223.8199
Fax: 802.223.8172*

*177 Water St.
Gardiner, Maine USA 04345
Tel: 207.582.1135
Fax: 207.582.1176*

Website:
<http://www.raonline.org>



Introduction

Regulatory Assistance Project

RAP is a non-profit organization, formed in 1992, that provides workshops and education assistance to state government officials on electric utility regulation. RAP is funded by the Energy Foundation and the US DOE.

Richard Sedano was Commissioner of the Vermont Department of Public Service, 1991-2001, and presently serves on the Montpelier Planning Commission

Demand for power reduced By MICHAEL JAMISON Missoulian

KALISPELL - A new report by the **Northwest Power and Conservation Council** finds the **cost of energy conservation down by more than half** in the past decade.

Late last year, the council released a new regional power plan that predicted the growing Northwest would need a whole lot more electricity in the coming two decades. **About half that electricity - some 2,500 megawatts - would be gained through energy conservation rather than new power plants.**

In 1991, the price for conserving an average megawatt of electricity was \$3.9 million. (An average megawatt is 1 million watts supplied continuously for one year, or enough to keep 10,000 100-watt light bulbs burning for that period.) Today, that same average megawatt can be had for \$1.6 million.

"At a time of record-high energy prices, it's good news for electricity ratepayers that demand for power is being reduced in a cost-effective manner," said council chairwoman Melinda Eden.

The report, she said, was compiled from a number of sources. The council surveyed regional utilities, calculated savings gained through new state and federal energy codes, and tallied sales of energy-efficient appliances and machinery. The conclusion was that saving electricity was cheaper than ever.

Since 1978, the council estimates, energy conservation has saved the region about 2,925 megawatts, more than enough to power two cities the size of Seattle. More gains are possible, the report concludes, now that **each conservation dollar is buying more than twice as much energy efficiency as it did just 15 years ago.**

The upfront cost of conservation remains high, Eden admits, even higher than the first-year cost of building a new power plant. But energy efficiency measures are generally paid for all at once, she added, noting that power plant construction costs are spread out over years.

Level the playing field over the time of the plant payment, and today's conservation costs are less than half the cost of building a new power plant.

That means lower rates for everyone, Eden said, as well as **reduced need for costly transmission and grid upgrades.**

According to the survey, and perhaps not surprisingly, the amount of energy saved went up as the cost of saving energy went down.

Other big energy efficiencies were found thanks to **stiffer federal standards and improved state energy codes** each of which saved about 550 megawatts.

In just the past five years, a full 185 megawatts were picked up simply through energy-efficient appliances, machinery and lighting.

Conservation, the council has stressed, **reduces not only the individual power bill, but also the chance of rolling blackouts and power shortages.**

And now, it appears, cheaper bulbs and appliances, among other things, are making conservation and energy efficiency more affordable.

If BPA and others continue to pursue energy savings, Eden said, the region can **"reduce the need for new and more expensive generating plants in the future" and at the same time "protect ratepayers from future high power-market prices."**



We know it's good for us, but the value chain is broken

- How to channel more money to Energy Efficiency investment?
 - ❖ Policy Solutions
 - ❖ Market/Regulatory Solutions
- The customer is paying
 - ❖ But how much choice in the investment does the customer get?
 - ❖ Overcome utility throughput incentive
 - ❖ <http://www.raonline.org/Pubs/General/ProfitsandProgressdr.pdf>



Ideas for Today

- More Money Allocated for EE
 - ❖ System benefit fund, cost of service, performance standard
- Value-Based Reforms
 - ❖ Utility incentives
 - ❖ T&D deferral
 - ❖ Generation replacement
 - ◆ **Energy efficiency power plant**



Change Policy

➤ Allocate more money

❖ Increase level of commitment to EE programs

- ◆ Raise EE allocations past 3% ceiling to value-based levels, which might be double, triple, or more
 - Intent of California “procurement” process & loading order?
 - Recognize total cost, market, environmental, security benefits and barriers to EE investments
- ◆ Dollar allocation continues “social program” attitude of EE – undercuts value arguments
 - How much can you do for \$50 million
 - How much can you deliver that is competitive



Solutions

- Make the political case for allocating more money to energy efficiency
 - ❖ Rely on external values
 - ◆ Avoided T&D&Gen
 - ◆ Security
 - ◆ Environment
 - ◆ Lower cost long term

- Some places just won't do this



Energy Efficiency Performance Standard

- Another policy response
 - ❖ Every utility gets a target program outcome
 - ◆ More result oriented than dollars into programs
 - ❖ PA includes EE in new Clean Energy Standard
- Promoted by EPACT 2005 Sec 139, 140
- Financing questions not addressed
 - ❖ Demand for EE creates demand for financing



Revealing EE Value Will Justify More Investment

- Unrealized values
 - ❖ Avoid T&D
 - ❖ Avoid Generation
 - ❖ Resource risk management
 - ◆ Including energy security
- Throughput incentive is a great barrier to utility embrace of valuable energy efficiency



Bias in paying for energy efficiency

- Large assets are paid for in rates over decades
- T&D and some generation is paid for via FERC-jurisdictional wholesale tariffs over decades
- EE is often expenses, or amortized over 3-5 years, and excluded from wholesale tariffs
 - ❖ Yet program life averages 10-15 years.
 - ❖ And measures have wholesale value



Solutions

- Amortize EE costs over average measure lives to reduce initial rate impact
 - ❖ Adds cost for return on unamortized balance
 - ❖ Deals with regulatory barrier of near term rate concerns
 - ❖ Expense if you can, but if it's a choice between no programs and amortization, take amortization.



Solutions

- Revise RTO/transco planning and investment expectation to include energy efficiency when it is addressing reliability or persistent congestion
 - ❖ FERC under prior chair has sent signals that it would welcome proposals along this line
 - ❖ Current chair appears less interested.
- Reference: Efficient Reliability
<http://www.raonline.org/Pubs/General/EffReli.pdf>



Move to Competition

- Competition challenges everyone
 - ❖ Wholesale electric competition is weak and riddled with protections and work-arounds
- Can energy efficiency compete with transmission and distribution?
 - ❖ Expanding rights of way and building in new rights of way are hard – are they always necessary?



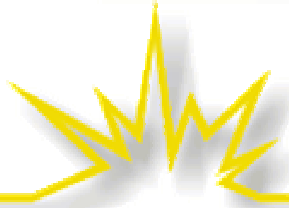
Value from Transmission and Distribution

- Build more transmission to keep up with load growth?
- Build more distribution to keep up with load growth?
- Is it cheaper to curtail the load growth with targeted energy efficiency?
- Unless the utility/RTO asks and reports, no one will know!



Limited Experience with EE to avoid T&D

- Southwest Connecticut emergency RFP by ISO-New England
 - ❖ Energy efficiency bid among those selected to provide three years worth of capacity and energy value
- Bonneville Power Administration Olympic Peninsula Pilot
- National Grid pilots



Solutions

- State PUCs can require utilities to do distribution planning and investment that considers energy efficiency as an alternative to wires solutions
 - ❖ Start with a pilot to get utility and regulatory staff used to the idea
 - ❖ Corollary benefit: when are really needed, public more convinced if EE is deployed first to avoid wires



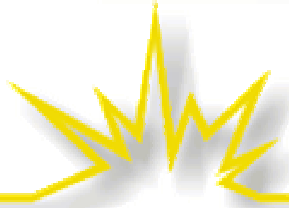
Move to Competition

- Competition challenges everyone
 - ❖ Wholesale electric competition is weak and riddled with protections and work-arounds
- Can energy efficiency compete with generation?
 - ❖ Accountability for new generation has great value, as anyone who remembers Seabrook and other adventures will agree



Energy Efficiency Power Plant

- From a system design and from a finance perspective, a generator is a set of specifications for performance, cost and revenues.
- Energy Efficiency programs can be aggregated to in a comparable way



Resource Specs

- MW (peak, coincident)
- MWh (capacity factor)
- Capacity shape
- Cost per MW & MWh
- Life of the investment
- Link to demand response for extra peak value



Project with Asian Development Bank

- Considering 300 MW “energy efficiency power plants” for Shanghai and Jaingsu
- The EPP would deliver a portfolio of customer-based efficiency measures that can provide the electric grid with *the demand-side equivalent of a conventional supply-side power plant* – and do so faster (2 year lead time), and at lower cost than building that generator.



Energy Efficiency Power Plant in Development

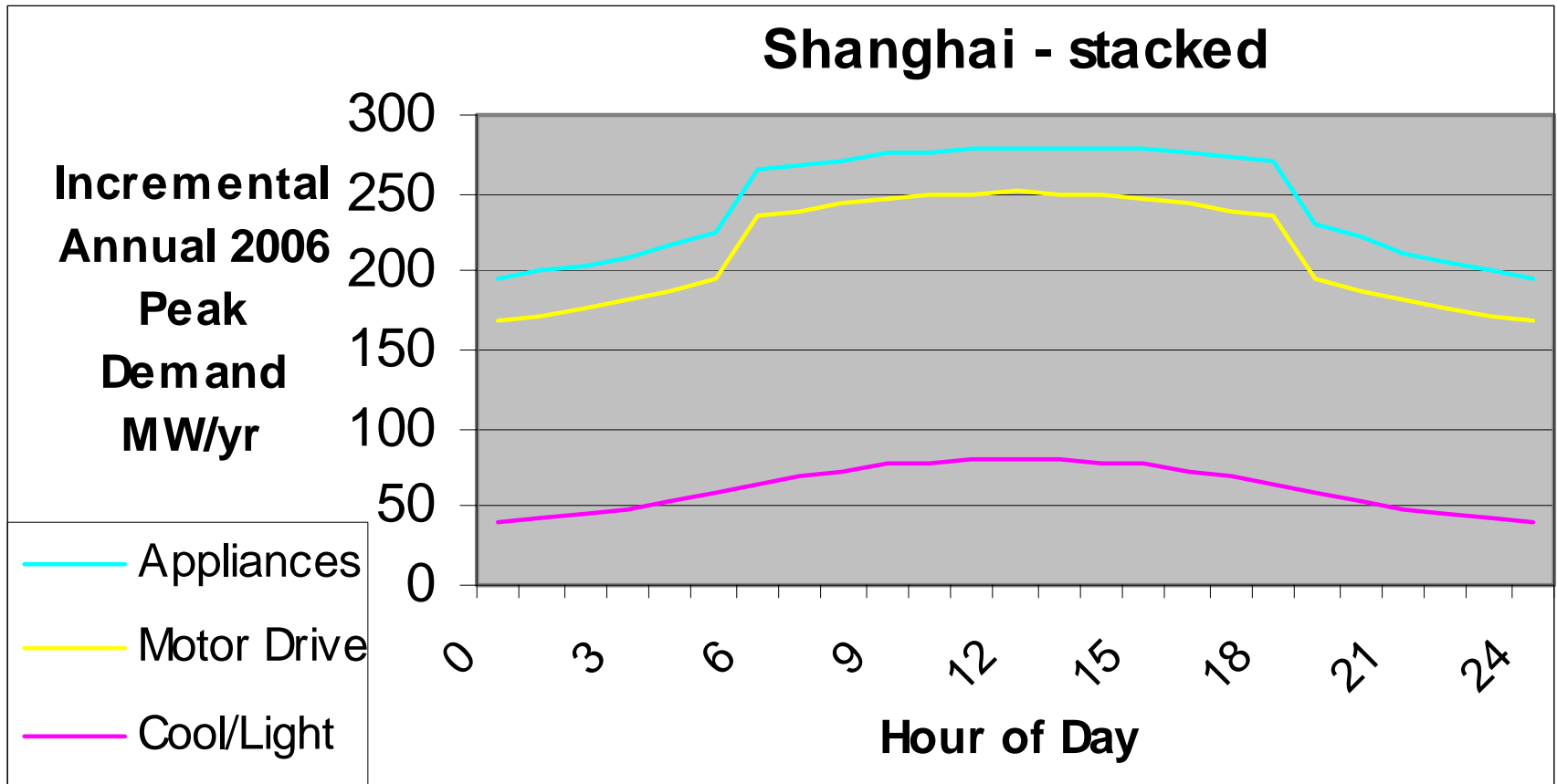
- Identify and deploy a select group of efficiency measures that will deliver energy-saving megawatts and megawatt-hours to the electric system.
 - ❖ The total impact of those measures will be the equivalent of a medium-sized power plant, measured in capacity, energy, and their impact on system load shape.
 - ❖ The initial target is a 300-MW Efficiency Power Plant with high peakload coincidence and a capacity factor comparable to a conventional power plant.



EPP – Key Details in Jiangsu Model

- 300 MW
- Deploy over 2 yrs
- 30% in yr 1
- \$142.6 million invest
- 10 yr payback sched
 - ❖ 0.01 ¢/kWh
 - ❖ 10 yr Debt cost 4.62%
- 10% load growth
- Range of C&I and residential programs, notably
 - ❖ Motors
 - ❖ Cooling
 - ❖ Lighting
 - ❖ Appliances
- Less than full EE potential in those 2 yrs

Component Load Factors from Shanghai Model





Utility Perspective

- Where all requirements service prevails, EPP investment earns return for utility just like a power plant
- In retail competition states, EPP can be deployed by distribution company, or it can compete for a place in default service portfolio



Reliable Monitoring and Verification

- A necessary Condition for Value-Based EE
 - ❖ Markets and reliability coordinators need reliable assessments of peak and load shape effects of energy efficiency
 - ❖ Use of probabilistic assessments are new and will be able to satisfy reliability concerns.
 - ❖ Deemed savings methods may suffice for purely market (tradable credit) needs
- States must pay attention to M&V to assure financial backers of value and repayment



Thanks for your attention

❖ rapsedano@aol.com

❖ <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.*