

Energy Efficiency Program Issues

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Outline

- What do energy efficiency programs do?
 - Principal types
 - Relationship to Codes and Standards
 - Combined with Demand Response
 - Industrial Energy Efficiency Issues
 - Administration of Energy Efficiency
 - Regulation of Energy Efficiency
 - Energy Efficiency Spending
 - Rates vs. Bills
 - Leadership



Energy Efficiency Program

- A business plan to address barriers to investment in cost-effective energy efficiency (with ancillary benefits)
 - Best program does just what is required to motivate action by the key decision-maker
 - Who is the decision-maker?
 - What is the problem?
 - What is the answer?



Barriers to Energy Efficiency

- Awareness
- Information, Knowledge, Confidence
 - Customers, stores, contractors, suppliers, etc.
- Opportunity to make a decision
- Upfront cash
- Long run cash, Financing
- Split Responsibility (the renter's dilemma, applies also to new construction)



Typical Program Categories

- Lost Opportunity
- Low Income
- Retrofit
- Emerging Markets and Technologies
- Market Transformation



Program Scope

➤ 1. Lost Opportunity Programs

- Address decision-makers at the time they make purchase decisions concerning energy
 - New construction
 - Point of purchase

➤ 2. Low Income Programs

- Essential, lower benefit/cost threshold



Low Income Programs

- Sometimes called “hard to reach customers”
- Programs may qualify with lower B/C ratios
- Financing, to the extent that the cash flow requirement from the customer is reasonable
 - Split savings, positive cash flow outcome
- Integrate with weatherization
 - Pay weatherization out of program \$\$ to deliver
- Building Energy Codes and Home Energy Ratings raise quality



Program Scope

➤ 3. Retrofit Programs

- More costly to get decision-maker's attention
 - Old Appliance bounty programs good for quick hits
- Reservoir of cost-effective savings is huge in below model energy code buildings

➤ 4. Emerging Markets and Technologies

- Devoting a slice of budget to trying new stuff can be risky, but can also bring a reputation of high expectations and quality
- Geo-targetting



Program Scope

- 5. Market Transformation
 - Investment in changing the way people make energy decisions (information, training), making efficient products widely available to consumers (trade allies, supply chain)
 - There is some market transformation in every energy efficiency program
 - Some program “designs” can have little or no ability to measure savings
 - Requires regulators to take long view



Custom Programs

- Typically for larger customers
 - Large (six figure) commitments of incentives as part of contract for EE investments and services
- Facility and process specific
 - i.e Clean Rooms, Furniture, Injection Molding
 - Multiple efforts in common facilities (chains)
- Often up to half of the overall energy efficiency budget is used to support custom programs



Use of Financial Incentives for Customers

- All ratepayers paying participants to do something helpful
 - Not a give-away or handout
- Justified by B/C analysis
- Manage incentives carefully
 - For generally available programs, link amount to desired effect, expect to ramp down incentive as higher standard becomes ordinary



Financing

- Be realistic
- Make a difference in customer decision
- Program funds can buy down interest rate
- For residential, Fit into standard consumer loan terms
- Partner with financial institution ready to deal effectively with small loans and a pool of borrowers with less than optimal credit quality



Standard Offers

- Generally used for appliance and equipment replacement
 - Stand alone
 - \$150 rebate for a gas furnace for a given efficiency
 - Bundled in a package
 - Part of a whole house audit proposal
 - Enables ESCOs to package their own energy efficiency services
 - A school retrofit/performance contract

Equipment Replacement Program

Thank you for your interest in the Equipment Replacement program.


Vermont Gas provides the following rebates to qualifying residential customers:

Eligible Equipment (must be purchased new)	Required Efficiency (as listed in GAMA)	Rebate
Hot Air Furnace	90% to 92% AFUE	\$100.00
Hot Air Furnace	92.1% to 93.9% AFUE	\$300.00
Hot Air Furnace	94%+ AFUE	\$400.00
Hot Water Boiler	87% to 91.9% AFUE	\$400.00
Hot Water Boiler	92%+ AFUE with outdoor temp. reset	\$600.00
Steam Boiler	82%+ AFUE	\$150.00
Water Heater 40/50 gal.	.62+ EF	\$100.00
Indirect-fired hot water storage tank	Heated by an 87%+ AFUE boiler	\$100.00
Tankless Water Heater	.80+ EF	\$100.00
Drain Water Heat recovery	Call for details	\$200.00



Standard Elements of an EE Program Filing

- Overview of Plan
- Energy Efficiency Program Summary Tables and Charts
- Program Descriptions
- Program Management and Implementation Strategies
- Reporting and Tracking Systems
- Quality Assurance and Evaluation, Measurement and Verification
- Cost Recovery Mechanism
- Cost Effectiveness
- Plan Compliance Information and Other Key Issues
- Appendices



Customer Focus of Energy Efficiency

- Consumers want service, not programs
 - Avoid “silo effect” when managing programs
- Education and Market Transformation
 - Integrate with programs as much as possible
- Bang for the buck
 - Point of decision/purchase
 - “Train the trainer” (contractors, vendors, retail)

Connection to Codes and Standards

- If standard practice for energy consumption becomes more efficient, consumer funded efficiency programs can focus on more valuable objectives.
 - This is the way building energy codes and appliance and equipment efficiency standards work with consumer funded energy efficiency programs





Ancillary Benefits of Energy Efficiency

➤ Environment

- The cleanest kWh is the one not used

➤ Quality, Comfort

- Efficient products and processes also tend to be of higher quality and better engineering; living spaces work better

➤ Economic Development

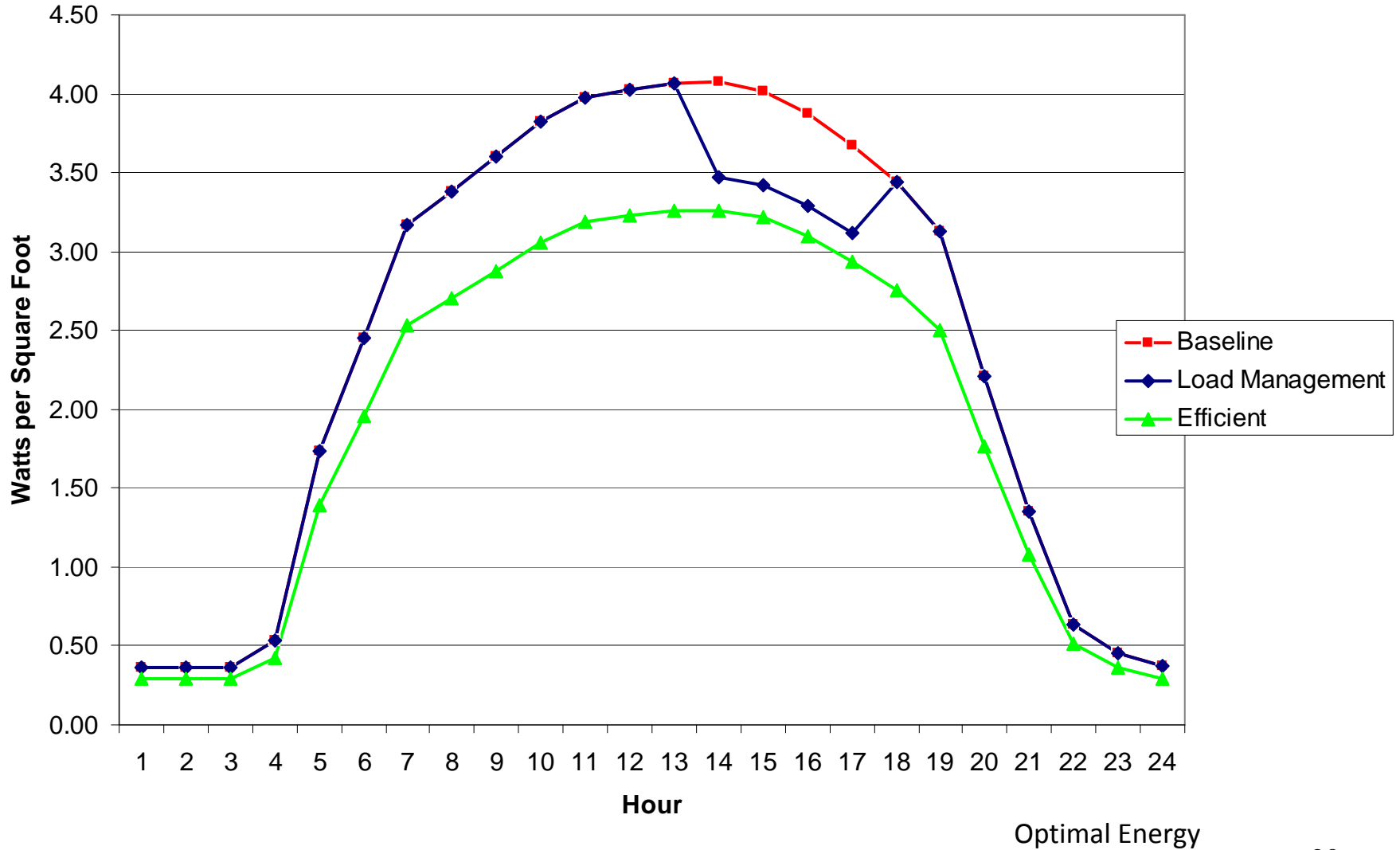
- State can use availability of EE as a quality enhancement in attracting businesses



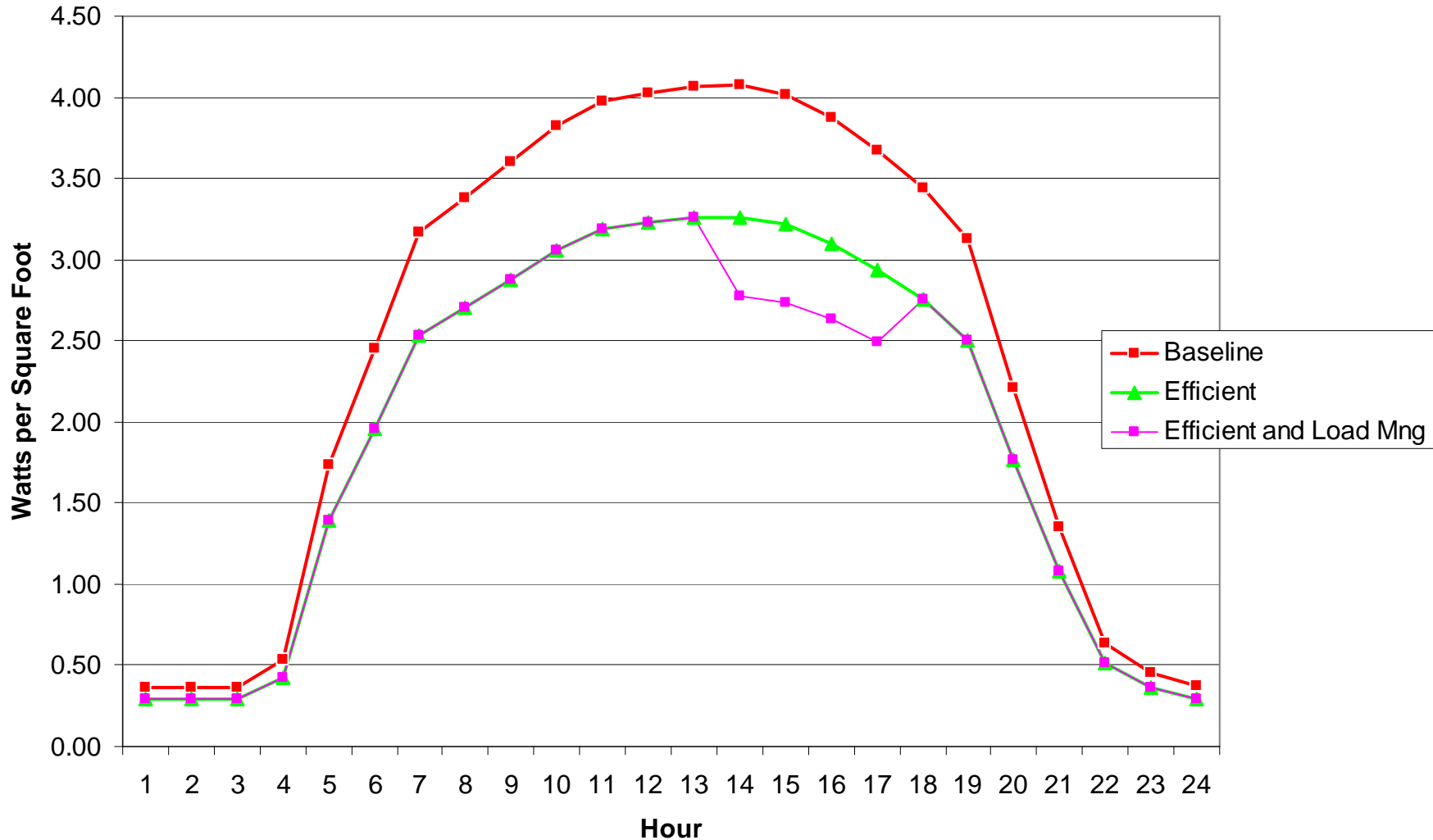
Energy Efficiency and Demand Response


- Most energy efficiency programs don't include demand response, and vice versa
 - Some third parties are trailblazing
 - Nstar and National Grid are trying this
- Advantages: coherence for the customer, and in utility planning
- Challenge: utility delivery systems are often separate and hard to merge

Combined Commercial Cooling and Lighting Loadshape Baseline, Load Management (STDR), and Energy Efficiency



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Industrial Customer Consideration

- “Opt out” or “self-direct” – Some states allow qualifying customers (large manufacturers) to avoid some or all of the cost of energy efficiency programs or use the charge for their own facilities
 - Qualifying means comparable self-directed efficiency efforts
 - Some payment toward system energy efficiency is justified for system benefits



Industrial Customer Perspective

- Industrial customers need to be competitive
- Energy efficiency helps industrial customers be more competitive by lowering production costs and also by inspiring process improvements that can raise quality
- Energy efficiency projects compete with other projects for limited capital
- Winning projects often have payback periods of 24 or even 18 months
- These are projects a motivated industrial customer will do and define as “all cost-effective”



Industrial Customers

- <2% of facilities have on-site energy manager*
 - Need help from programs and outside experts
- Industrial customers prioritize efforts in their plants where they get assistance
- 40% of end-use efficiency potential in US is in industrial sector, according to McKinsey study
- PacifiCorp forecasts industrial sales to grow 4.1% from 2009 to 2018, far higher than other sectors

*2002 data. From McKinsey & Company, 2009, *Unlocking Energy Efficiency in the U.S. Economy*, at www.mckinsey.com/USenergyefficiency




Ratepayer Perspective

- Ratepayers have a different perspective
- Ratepayers want to avoid more expensive new resources
- Total Resource Cost reveals programs that are cost-effective for ratepayers and for society
- Programs and measures with participant paybacks of 5 or even 7 years without incentives (incentives create acceptable payback) will screen via TRC
- Industrial customers will not do these on their own, but they will if given an offer as part of an energy efficiency program that makes it look good enough



Public Interest Perspective

- In that event, the participant wins
 - Gets a capital infusion for plant or process improvement that now meets internal budget screen
 - Lowers operating costs and improves quality
- And the ratepayer wins
 - Gets more cost-effective energy efficiency deployed to avoid more expensive choices
- Promoting industrial customer participation in energy efficiency programs is in the public interest



Delivering Energy Efficiency Through Utility Rates

- Consumers pay because there are system benefits to all from energy efficiency
 - Utilities or 3rd party administrator oversee
 - Network of implementation contractors
- Supply chain of services and products
 - Trade allies
- Leadership reinforces success
- Regulators oversee progress and direction



Administration of Energy Efficiency

- Utility – builds on customer relationship, opportunity to integrate into other resources
- State – addresses throughput conflict
- Third Party – keeps government in its “overseer” role, can add competitive element

- All can work well or fail, and the choice is a preference for what works best, or political



Role of Regulator Overseeing Energy Efficiency Programs

- EE budget is the consumer's money
- Evaluation, Measurement and Verification are vital parts of the EE effort
 - Some states require EM&V independence from the administrator
 - Rough cost: 5% of total, could be more at the beginning, for smaller programs, or could be less in years with a greater EM&V effort
 - Good models in US to draw from



Cost of Energy Efficiency

- Mature energy efficiency programs are being delivered at a cost to consumers of 3 cents per kWh
- Supply sources (plus transmission, losses, etc.) generally cost more
 - Issue to flag for later: capital investments get paid for over time – roughly 15-20% of capital cost is the annual rate effect
- Risks of cost increases from fossil fuel-driven supply, especially in wholesale market structure



Cost of Energy Efficiency

- Recent insight:
 - As energy efficiency scale has grown in states like Vermont and California, the reservoir of low cost savings seems endless – why?
 - More funds allow for comprehensive and custom programs that get more savings in buildings and processes
 - More funds allow for market transforming efforts like training and trade ally work that promote efficient products and practices in markets



Energy Efficiency Program Spending and Savings

- For highest spending states:
 - *Spending* ranges beyond 4% of utility revenues
 - *Savings* are approaching 2% of sales and 2% of peak
- Realistic to consider offsetting or exceeding load growth with energy efficiency alone or in combination with customer-sited generation and demand response

Rates vs. Bills:

EE as a Strategic Resource

- Energy efficiency affects rates
 - Short term increase to pay for programs
 - Long run effect on rates depends on magnitude of avoided cost
 - Significant avoided costs may lead to lower rates even with lower sales
- In the short run, energy efficiency lowers bills to participants, raises bills to non-participants



Bills vs. Total Cost: EE as a Strategic Resource

- Energy efficiency reduces total system costs
 - By definition, based on Benefit/Cost screening
 - Allows more money in general economy to go to investment, saving, fun, etc.
- Non-participants may pay more or less on their bills in the long run, depending on magnitude of avoided costs



Leadership and Clarity

- Leadership is very important with energy efficiency
 - It is a departure from traditional strategies to meet energy needs. Even some experts and highly experienced professionals are skeptical of EE value.
 - It relies on investments in assets not owned or controlled by the utilities
 - To overcome “legacy friction” and apply current imperatives and lessons of success from other states, clear, unambiguous leadership is valuable

Important choice: make new system that takes time to grow and apply lessons, or fast implementation that makes mistakes?



Resources

➤ ACEEE

- America's Best: Profiles of America's Leading Energy Efficiency Programs (report U032)

- <http://www.aceee.org/store/proddetail.cfm?CFID=3972061&CFTOKEN=26906652&ItemID=357&CategoryID=7>

➤ Mid-American Energy

- <http://www.midamericanenergy.com/html/energy1.asp>

➤ Oncor

- <http://www.oncor.com/electricity/teem/default.aspx>

➤ Energy Trust of Oregon (see success stories)

- <http://energytrust.org/>



Resources

- Best Practices Benchmarking for Energy Efficiency Programs (CA govt and utilities)
 - <http://www.eebestpractices.com/index.asp>
- RAP
 - <http://raponline.org>



Thanks for your attention

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- <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.*