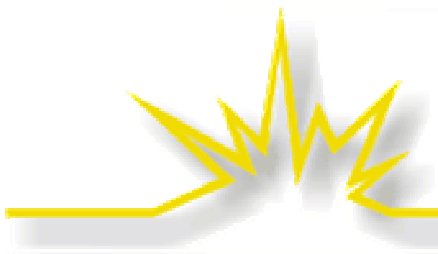
1. Monitoring and Verification
2. Utility Incentives
3. National Action Plan Tables



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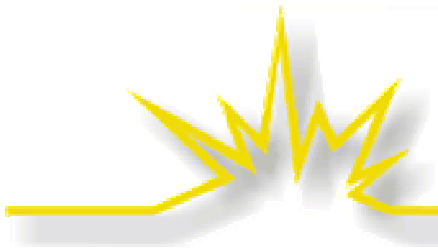
Adaptation of M&V Primer by Jeff Schlegel and Steve Cowell (8/25/06)

Arkansas PSC
Energy Efficiency Collaborative
September 2006



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National M&V Experience

- Decades of experience with M&V of Demand Resources
- State program and merchant (ESCO) M&V
- Industry sharing and collaboration
- Public M&V reports and published conference proceedings
- Regulatory and stakeholder review

Why M&V?

- If the system is paying for a kW, the system should actually get the kW
- To verify that a Demand Resource provides the expected Demand Reduction Value over time
- To ensure adequate capacity resources for system reliability
- To support the regulatory process

Key M&V Questions

- Is the Demand Resource measure installed?
- What is the reduction in connected kW?
- What is the coincidence of kW reduction with system peak (Performance Hours)?
- Over the measure or program life, is the measure still installed and providing the Demand Reduction Value?

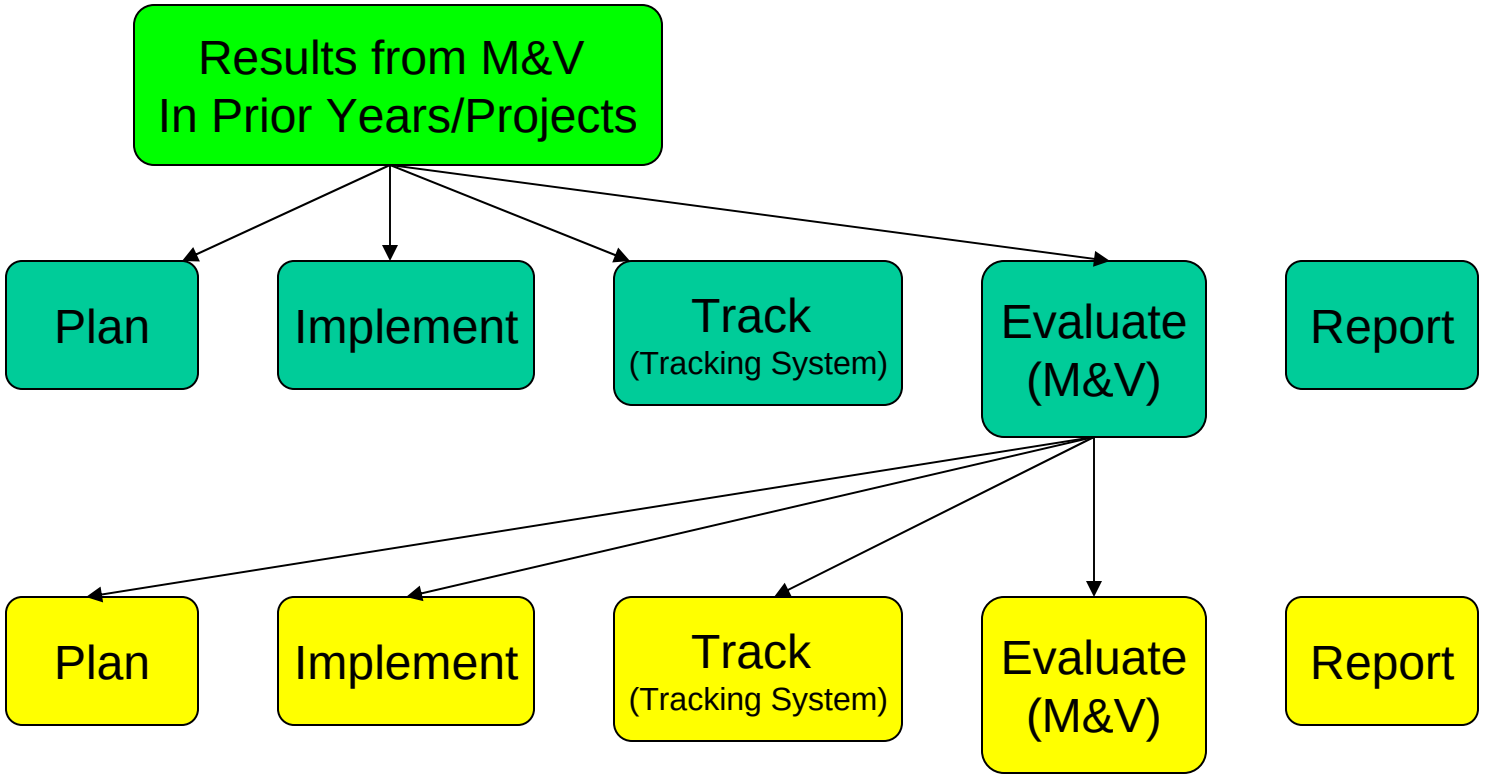
Key M&V Elements – Technical

- Verification of installation
- Baseline condition without the measure
- Actual condition with the installed measure
- Peak period coincidence– coincidence factors and load shapes
- Adjustments for net savings (to account for naturally-occurring conservation and free riders)
- Measure life and persistence (persistence of the measure and persistence of the kW reductions)

M&V Protocols and Approaches

- Continuous improvement cycle and feedback loops in M&V
- M&V protocols for different types of measures, considering the key sources of uncertainty (measures)
- IPMVP: International Performance Measurement and Verification Protocols (different M&V methods)
- Every site vs. sampling (application)

Feedback Loop and Continuous Improvement Cycle



M&V Protocols and Approaches

Type of Measure	Type of M&V Protocol	General M&V Approach	Examples
Standard prescriptive measures	Standard algorithm and standard input values	Number of installed units times standard kW reduction/unit	Residential lighting (number of units installed times standard peak kW reduction/unit)
Measures with important variations in one or more input values (e.g., delta watts, efficiency level, equipment capacity, etc.)	Standard algorithm with one or more measure-specific or site-specific input values	Standard formula in the protocols with one or more input values coming from the application form, worksheet, or field data (e.g., delta watts, efficiency levels of equipment, equipment capacity, etc.) Field tools and/or monitoring to derive site-specific input values	Some prescriptive lighting measures (delta watts on the application or worksheet times standard peak coincidence factor in the protocols) HVAC measures (change in efficiency level times site-specific equipment capacity times peak coincidence factor)
Custom or site-specific measures, or measures in complex comprehensive projects	Site-specific analysis and site-specific data	Greater degree of site-specific analysis and data collection, either in the number of site-specific input values, or in the use of special engineering algorithms	Custom projects Industrial process Complex comprehensive jobs

Note: Standard input values developed from M&V studies and findings.

IPMVP: International Performance Measurement and Verification Protocol

- **Option A: Partially Measured Retrofit Isolation**

  In this option energy savings are determined by measuring the capacity, efficiency, or operation of a system before and after a retrofit and by multiplying the difference by a stipulated factor. The stipulated factor is based on assumptions, analysis of historical data, or manufacturer's data.

- **Option B: Retrofit Isolation**

  This option builds upon Option A through the use of short-term or continuous metering during the performance period to determine energy consumption.

- **Option C: Whole Facility**

  Option C like Option B involves the use of long-term metering data but techniques outlined in Option C determine savings by examining overall energy use in a facility and identifying the impact of ECMs on total building or facility energy use. Option C requires the comparison of monthly billing data recorded for the whole building or project site by a utility meter or sub-meters, before and after project installation.

- **Option D: Calibrated Simulation**

  Unlike the previous options, Option D involves the use of software to create a simulated model of a building and its components and can be used to examine individual ECMs or entire facility savings. In order to assure accuracy the model is calibrated through comparing it with billing or end-use monitored data.

- **New Construction Project Protocol**

Likely Approaches to M&V

- Metering
  - Most applicable to Real Time Demand Response
  - Some application to large customer energy efficiency (at least regarding end use metering)
  - Short term or spot metering
- Metering of samples
  - Likely for small sites (e.g. res. A/C cycling/load control)
- Engineering calculations with input values
  - Most applicable for standard energy efficiency measures targeted to small customers
  - Commonly informed by third party evaluations that involve collecting data on key assumptions and/or analysis of billing data or metered data (pre- and post-installation) from statistical samples of participants.

M&V Protocols and Methods for Different Types of Demand Resources

- Energy Efficiency (EE)
- Distributed Generation (DG)
- Load Management (LM)
- Real-Time Demand Response (RTDR)

- Examples on the following slides

Energy Efficiency Projects
Overview of Key M&V Elements

- Verification of actual installation
- Baseline condition without the measure
- Actual condition with the installed measure
- Peak coincidence factors and load shapes based on prior M&V and metering studies
- Adjustments for net savings (to account for naturally-occurring conservation and free riders)
- Measure life and persistence (persistence of the measure and persistence of the kW reductions)
- *Standard prescriptive measures vs. custom measures*
- *Statistical sampling of sites*

Example 1: Commercial Lighting M&V Elements

- Tables with before/after connected kW for lighting measures based on the baseline (retrofit vs. new/replacement), product reference values, and prior M&V studies
- Peak coincidence factors (by end use or facility type) based on prior studies or current metering
- Standard values for measure life based on effective life and persistence studies
- Net savings adjustments for measured results (realization rate) and free riders
- Statistical sampling and site visits to verify installation and confirm input values
- Custom lighting: site-specific M&V on a sample of custom lighting sites

Example 2: Commercial HVAC M&V Elements

- Tables with before/after connected kW for equipment types and capacities (tons) based on baseline, reference values, and prior M&V studies
- Peak coincidence factors (by equipment or facility type) based on prior studies or current metering
- Standard values for measure life based on effective life and persistence studies
- Net savings adjustments for measured results (realization rate) and free riders
- Statistical sampling and site visits to verify installation and confirm input values
- Custom HVAC: site-specific M&V on a sample of custom HVAC sites

Example 3: Residential Central A/C
Example Approach to Peak kW Reduction

Engineering Calculation:

(installed kW - base kW) x (peak coincidence factor) x (net-to-gross ratio)

Key Definitions:

Installed kW = BTUH/(EER_{base} x 1000)
Base kW = BTUH/($EER_{installed}$ x 1000)
Peak factor = avg op hrs during peak period divided by hrs in period
NTG ratio = units influenced by program divided by units participating
BTUH = capacity of installed unit in BTUs per hour
EER = industry certified efficiency at 95°F

Data Sources

BTUH: program forms, verified thru cross-check w/industry data
EER_{base}: average value from industry or DSM data for SEER 13 units
$EER_{installed}$: avg value from industry or DSM data for diff efficiency tiers
NTG ratio: third party evaluation and/or industry market share data
Peak factor: utility and/or other residential cooling load shapes

Residential Central A/C
Example Approach to Measure Life

- U.S. Dept. of Energy assumption (i.e. 18 years)
  - From recent federal efficiency standard setting process
  - Based on extensive analysis of national industry data
  - Could understate things in New England due to shorter run hours
- Average value applied to all installations

Example 4: Residential Lighting

- Demand Reduction Value varies based on peak coincidence in summer and winter
- Metering using light loggers to determine coincidence with system peak, in the winter and summer
- Analysis of in-service rates to verify measure installation

State Program Process & Experience

- Based on decades of M&V in the field
- Systematic process of M&V planning, implementation, and reporting
- Continuous improvement process, with M&V results used to plan and forecast impacts of current and future programs, as well as to report impacts of past programs
- Systematic regulatory review of M&V

Real-Time Demand Response M&V

Typical Emergency Generator Configuration Operating during System Reliability Events (OP4 Action 12)

Emergency Generator

1 MW Load

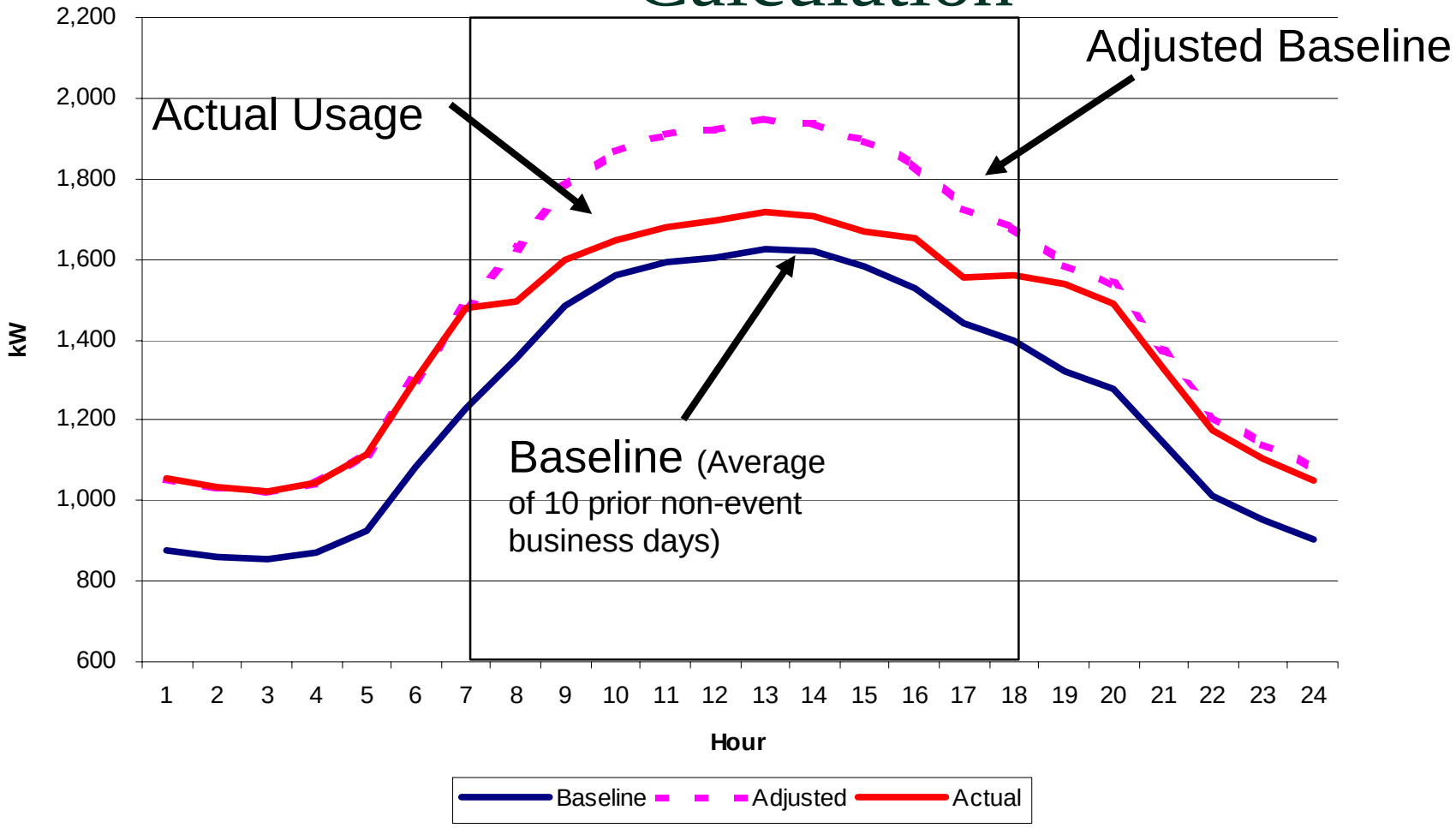
200 kW

800 kW

Electricity Grid

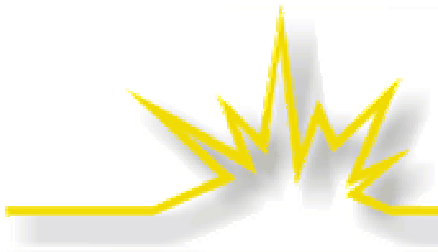
- IBCS metering reports 5-minute output to ISO New England
- Meter data during non-event days used to determine baseline
- On an event day, baseline may be subject to a weather adjustment
- Performance = adjusted baseline – actual usage during events

RTDR Customer Baseline Calculation



Incentives for Energy Efficiency

Arkansas EE Collaborative
Richard Sedano
September 12, 2006



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Funding Energy Efficiency

- Efficiency is a resource, like any other resource necessary to the least-cost provision of service
- How much EE should be purchased?
  - Ideal: all societally cost-effective measures
    - Legal requirement in some states: e.g., CA, VT
  - Practical: Budgets constrained by a variety of considerations

EE Cost Recovery

- Utility EE costs should be treated as any other prudent cost of service item:
  - Rate based: Amortized over a specified period (life of measure or less); unamortized portion earns a return
    - Logic: Reduces initial rate impacts and links cost recovery to the useful life of the investment, similar to supply-side investments
    - Many states took this approach: e.g., CA, WI, NY, VT
  - Expensed: Current year cost recovery; no return on investment but also no risk of stranded regulatory asset
    - With a fuel-adjustment clause and annual adjustments to base rates, net lost revenue impacts are minimized
    - E.g., New England Electric System/National Grid

Traditional Regulation: The Throughput Problem

- Traditional ROR regulation sets *prices*, not *revenues*
  - The revenue requirement is simply an estimate of the total cost to provide service
- Without adjustment, consumption-based rates ($/kWh and $/kW) link profits to sales
  - The more kilowatt-hours a utility sells, the more money it makes
  - This is because, in most hours, the price of electricity is greater than the cost to produce it
    - *Utility makes money even when the additional usage is wasteful, and loses it even when the reduced sales are efficient*
- The profit incentive to increase sales is extremely powerful

Two Solutions

- Adjustments for net lost revenues under traditional ROR ratemaking
  - Compensates utility for contribution to fixed costs that is lost as a consequence of successful energy efficiency
- Decoupling
  - Ratemaking is reformed to break the link between sales and profits entirely

Net Lost Revenue Recovery

- For every kWh saved through EE, the utility avoids a marginal cost but also loses a contribution to fixed costs
  - Recovery of that contribution can be assured through either
    - The use of a projected test year, adjusted for expected EE savings, or
    - An *ex post* calculation (sometimes controversial):
      - Net lost revenues = (P – MC) * kWh saved

Net Lost Revenue Recovery

- In the 80s and 90s, some form of net lost revenue recovery was implemented by almost all the states that were engaged in IRP and DSM
- Most recognized, however, that, though it muted some of the disincentive to EE, it did nothing to eliminate the powerful incentive to increase sales, and many have abandoned lost revenue recovery

Performance Incentives

- Decoupling and, to a lesser extent, net lost revenue recovery remove the profit disincentive to EE investment
- To encourage superior performance, some states offered utilities financial incentives
- Performance Incentives to earn lost revenue
- Penalties for non-performance?

Performance Incentives: For Both ROR and PBR

- Shared savings
  - Return to utility of some fraction (say, 10-20%) of the savings (avoided costs) from the EE
    - Goes directly to utility's bottom line
  - Collars and deadbands
- Performance targets
  - Specified rewards (e.g., % of EE budget) for achieving a mix of targets
    - Energy savings, capacity reductions, customer installations, reductions in program administration costs, etc.
- ROE adder
  - A premium on the ROE applied to unamortized portion of EE costs included in ratebase

1989 NARUC Resolution

- "Reform regulation so that successful implementation of a utility's least-cost plan is its most profitable course of action"

Other Strategies

- Energy efficiency performance (or portfolio) standard
  - Target savings as % of sales or % of growth
  - Verified credits can be traded among utilities
    - EM&V more rigorous to support trading system
  - PSC would not worry about budgets as long as performance is assured
- A commitment to zero or negative sales growth
  - Mid West Natural Gas Initiative: -1% per year

Tables and Text Boxes from the National Action Plan for Energy Efficiency

See
www.epa.gov/cleanenergy/eeactionplan

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Table 6-6. Nevada Resource Planning Programs

	2005 Budget	2006 Budget
Air Conditioning Load Management	$3,450,000	$3,600,000
High-Efficiency Air Conditioning	2,600,000	15,625,000
Commercial Incentives	2,300,000	2,800,000
Low-Income Support	1,361,000	1,216,000
Energy Education	1,205,000	1,243,000
ENERGY STAR Appliances	1,200,000	2,050,000
School Support	850,000	850,000
Refrigerator Collection	700,000	1,915,000
Commercial New Construction	600,000	600,000
Other – Miscellaneous & Technology	225,000	725,000
Total Nevada Resource Planning Programs	$14,491,000	$30,624,000
SolarGenerations	1,780,075	7,220,000
Company Renewable - PV	1,000,000	1,750,000
California Program	370,000	563,000
Sierra Natural Gas Programs		820,000
Total All Programs	$17,641,075	$40,977,000

Austin Energy: Home Performance with ENERGY STAR

Austin Energy's Home Performance with ENERGY STAR program in Texas focuses on educating customers and providing advanced technical training for professional home performance contractors to identify energy efficiency opportunities, with an emphasis on safety, customer comfort, and energy savings. Participating Home Performance contractors are given the opportunity to receive technical accreditation through the Building Performance Institute.

Qualified contractors perform a top-to-bottom energy inspection of the home and make customized recommendations for improvements. These improvements might include measures such air-sealing, duct sealing, adding insulation, installing energy efficient lighting, and installing new HVAC equipment or windows, if needed. In 2005, Austin Energy served more than 1,400 homeowners, with an average savings per customer of $290 per year. **Collectively, Austin Energy customers saved an estimated $410,000 and more than 3 MW through the Home Performance with ENERGY STAR program.**

Source: Austin Energy, 2006

Xcel Energy Design Assistance

Energy Design Assistance offered by Xcel, targets new construction and major renovation projects. The program goal is to improve the energy efficiency of new construction projects by encouraging the design team to implement an integrated package of energy efficient strategies. The target markets for the program are commercial customers and small business customers, along with architectural and engineering firms. The program targets primarily big box retail, public government facilities, grocery stores, healthcare, education, and institutional customers. The program offers three levels of support depending on project size. For projects greater than 50,000 square feet, the program offers custom consulting. For projects between 24,000 and 50,000 square feet, the program offers plan review. Smaller projects get a standard offering. The program covers multiple HVAC, lighting, and building envelope measures. The program also addresses industrial process motors and variable speed drives. **Statewide, the Energy Design Assistance program saved 54.3 GWh and 15.3 MW at a cost of $5.3 million in 2003.**

Source: Minnesota Office of Legislative Auditor, 2005; Quantum Consulting Inc., 2004

Wisconsin Focus on Energy: Comprehensive Commercial Retrofit Program

Wisconsin Focus on Energy's Feasibility Study Grants and Custom Incentive Program encourages commercial customers to implement comprehensive, multi-measure retrofit projects resulting in the long-term, in-depth energy savings. Customers implementing multi-measure projects designed to improve the whole building might be eligible for an additional 30 percent payment as a comprehensive bonus incentive. **The Comprehensive Commercial Retrofit Program saved 70,414,701 kWh, 16.4 MW, and 2 million therms from 2001 through 2005.**

Sources: Thorne-Amann and Mendelsohn, 2005; Wisconsin, 2006.

Table 6-9. Emerging Technologies for Programs

Technology/ Program	Description	Availability	Key Challenges	Key Strategies	Examples
Smart Grid/ GridWise technologies	Smart grid technologies include both customer-side and grid-side technologies that allow for more efficient operation of the grid.	Available in pilot situations	Cost Customer Acceptance Communication Protocols	Pilot programs R&D programs	GridWise pilot in Pacific NW
Smart appliances/ Smart Homes	Homes with gateways that would allow for control of appliances and other end-uses via the Internet.	Available	Cost Customer Acceptance Communication Protocols	Pilot programs Customer education	GridWise pilot in Pacific NW
Load control of A/C via smart thermostat	A/C controlled via smart thermostat. Communication can be via wireless, power line carrier (PLC) or Internet.	Widely available	Cost Customer acceptance	Used to control loads in congested situation Pilot and full-scale programs Customer education	LIPA, Austin Energy, Utah Power and Light, ISO New England
Dynamic pricing/critical peak pricing / thermostat control with enhanced metering	Providing customers with either real time or critical peak pricing via a communication technology. Communication can be via wireless, PLC, or Internet. Customers can also be provided with educational materials.	Available	Cost Customer acceptance Split incentives in deregulated markets Regulatory barriers	Pilot and full- scale Programs Used in congested areas Customer education	Georgia (large users) Niagara Mohawk, California Peak Pricing Experiment, Gulf Power
Control of lighting via wireless, power line carrier or other communication technologies	Using direct control to control commercial lighting during high price periods.	Recently available	Cost Customer acceptance Contractor acceptance	R&D programs Pilot programs	SCE pilot using wireless NYSERDA pilot with power line carrier control
T-5s	Relatively new lighting technology for certain applications.	Widely available	Cost Customer acceptance Contractor acceptance	Add to existing programs as a new measure	Included in most large-scale programs
New generation tankless water heaters	Tankless water heaters do not have storage tanks and do not have standby losses. They can save energy relative to conventional water heaters in some applications. They might increase demand.	Widely available	Cost Customer acceptance Contractor acceptance	Add to existing programs as a new measure	More common in the EU

Table 6-10. Key Stakeholders, Barriers, and Program Strategies by Customer Segment

Customer Segment	Key Stakeholders	Key Program Barriers	Key Program Strategies
Large Commercial & Industrial Retrofit	• Contractors • Building owners and operators • Distributors: lighting, HVAC, motors, other • Product manufacturers • Engineers • Energy services companies	• Access to capital • Competing priorities • Lack of information • Short-term payback (<2 yr) mentality	• Financial incentives (rebates) • Performance contracting • Performance benchmarking • Low interest financing • Information from unbiased sources • Technical assistance • Operations and maintenance training
Small Commercial	• Distributors: lighting, HVAC, other • Building owners • Business owners • Local independent trades	• Access to capital • Competing priorities • Lack of information	• Financial incentives (rebates) • Information from unbiased sources • Direct installation
Commercial & Industrial New Construction	• Architects • Engineers • Building and energy code officials • Building owners • Potential occupants	• Project/program timing • Competing priorities • Split incentives (for rental property) • Lack of information • Higher initial cost	• Early intervention (ID requests for hook-up) • Design assistance • Performance targeting/benchmarking • Training of architects and engineers • Visible and ongoing presence in design community • Education on life cycle costs
Residential Existing Homes	• Distributors: appliances, HVAC, lighting • Retailers: appliance, lighting, windows • Contractors: building, insulation • Homeowners	• Higher initial cost • Lack of information • Competing priorities • Inexperience or prior negative experience w/ technology (e.g., early CFL) • Emergency replacements	• Financial incentives • Partnership with ENERGY STAR • Information on utility Web sites, bill inserts, and at retailers • Coordination with retailers and contractors
Residential New Homes	• Contractors: general and HVAC • Architects • Code officials • Builders • Home buyers • Real estate agents • Financial institutions	• Higher initial cost • Split incentives: builder is not the occupant	• Partnership with ENERGY STAR • Linking efficiency to quality • Working with builders • Building code education & compliance • Energy efficient mortgages
Multifamily	• Owners and operators • Contractors • Code officials • Tenants	• Split incentives • Lack of awareness	• Financial incentives • Marketing through owner and operator associations
Low Income	• Service providers: Weatherization Assistance Program (WAP), Low-Income Home Energy Assistance Program (LIHEAP) • Social service providers: state and local agencies • NGOs and advocacy groups • Credit counseling organization • Tenants	• Program funding • Program awareness • Bureaucratic challenges	• Consistent eligibility requirements with existing programs • Direct installation • Leveraging existing customer channels for promotion and delivery • Fuel blind approach

Table 6-11. Types of Financial Incentives

Financial Incentives	Description	Who Receives Incentive	Notes
Rebate			
prescriptive	per item	customer	
prescriptive	per item	retailer, contractor or distributor	may be invisible to consumer
prescriptive	per item – provided only if measures recommended in program audit	customer	
custom	tied to energy savings	customer	
custom or prescriptive	rebate on audit/technical assistance if measures are implemented	customer	
Performance contracting			
performance contracting	tied to savings	risk premium to financer	
performance contracting	tied to savings	no capital costs for customer	
Low-interest financing	covers project cost	customer	
Cooperative advertising	per advertisement	retailer or contractor	
Retailer buy-down	per item	retailer	lowers "shelf price" of item, invisible to consumer
MW Auction	per MW or MWh	third party or customer	successfully used in CT and NY

Table 6-13. Program Examples for Key Customer Segments

Customer Segment	Program	Program Administrator	Program Description/ Strategies	Program Model		Key Best Practices
				Proven	Emerging	
All	Training and certification components	KeySpan	KeySpan's programs include a significant certification and training component. This includes building operator certification, building code training and training for HVAC installers. Strategies include training and certification.	X	X	Don't underinvest in education, training, and outreach. Solicit stakeholder input. Use utilities channels and brand.
Commercial, Industrial	Non-residential performance contracting program	California Utilities	This program uses a standard contract approach to provide incentives for measured energy savings. The key strategy is the provision of financial incentives.	X		Build upon ESCO and other financing program options. Add program complexity over time. Keep participation simple.
Commercial, Industrial, New Construction	Energy design assistance	XCEL	This program targets new construction and major renovation projects. Key strategies are incentives and design assistance for electric saving end uses.	X	X	Keep participation simple. Add complexity over time.
Commercial, Industrial	Custom incentive program	Wisconsin Focus on Energy	This program allows commercial and industrial customers to implement a wide array of measures. Strategies include financial assistance and technical assistance.	X	X	Keep participation simple. Add complexity over time.
Large Commercial, Industrial	NY Performance Contracting Program	NYSERDA	Comprehensive Performance Contracting Program provides incentives for measures and leverages the energy services sector. The predominate strategies are providing incentives and using the existing energy services infrastructure.	X	Does allow for technologies to be added over time	Leverage customer contact to sell additional measures. Add program complexity over time. Keep participation simple. Build upon ESCO and other financing options.
Large Commercial, Industrial	ENERGY STAR Benchmarking	NSTAR	NSTAR uses EPA's ENERGY STAR benchmarking and Portfolio Manager to assist customers in rating their buildings.	X		Coordinate with other programs. Keep participation simple. Use utility channels and brand. Leverage ENERGY STAR.
Small Commercial	Smart business	Seattle City Light	This program has per unit incentives for fixtures and is simple to participate in. It also provides a list of pre-qualified contractors.	X		Use utility channels and brand. Leverage customer contact to sell additional measures. Keep funding consistent.
Residential	Flex Your Power	California IOU's	This is an example of the CA utilities working together on a coordinated campaign to promote ENERGY STAR products. Lighting and appliances were among the measures promoted.	X		Don't underinvest in education, training, and outreach. Solicit stakeholder input. Use utilities channels and brand.

Large Commercial, Industrial	ENERGY STAR Benchmarking	NSTAR	NSTAR uses EPA's ENERGY STAR benchmarking and Portfolio Manager to assist customers in rating their buildings.	X		Coordinate with other programs. Keep participation simple. Use utility channels and brand. Leverage ENERGY STAR.
Small Commercial	Smart business	Seattle City Light	This program has per unit incentives for fixtures and is simple to participate in. It also provides a list of pre-qualified contractors.	X		Use utility channels and brand. Leverage customer contact to sell additional measures. Keep funding consistent.
Residential	Flex Your Power	California IOU's	This is an example of the CA utilities working together on a coordinated campaign to promote ENERGY STAR products. Lighting and appliances were among the measures promoted. Strategies include incentives and advertising.	X		Don't underinvest in education, training, and outreach. Solicit stakeholder input. Use utilities channels and brand. Coordinate with other programs. Leverage manufacturer and retailer resources. Keep participation simple. Leverage ENERGY STAR.
Residential - Low Income	Residential affordability program	LIPA	Comprehensive low-income program that installs energy saving measures and also provides education. Strategies are incentives and education.	X		Coordinate with other programs. Keep participation simple. Leverage customer contact to sell additional measures.

Customer Segment	Program	Program Administrator	Program Description/ Strategies	Program Model		Key Best Practices
				Proven	Emerging	
Residential Existing Homes	Home Performance with ENERGY STAR	Austin Energy	Whole house approach to existing homes. Measures include: air sealing, insulation, lighting, duct-sealing, and replacing HVAC.	X	X	Start with proven models. Use utilities channels and brand. Coordinate with other programs.
Residential New Construction	ENERGY STAR Homes	Efficiency Vermont	Comprehensive new construction program based on a HERS rating system. Measures include HVAC, insulation lighting, windows, and appliances.	X		Don't underinvest in education, training, and outreach. Solicit stakeholder input. Leverage state and federal tax credits. Leverage ENERGY STAR.
Residential Existing Homes	Residential program	Great River Coop	Provides rebates to qualifying appliances and technologies. Also provides training and education to customers and trade allies. Is a true dual-fuel program.	X		Start with proven models. Use utilities channels and brand. Coordinate with other programs.
Residential Existing Homes	New Jersey Clean Energy Program	New Jersey BPU	Provides rebates to qualifying appliances and technologies. Also provides training and education to customers and trade allies. Is a true dual-fuel program.	X		Start with proven models. Coordinate with other programs.
Commercial Existing	Education and training	BOMA	Designed to teach members how to reduce energy consumption and costs through no- and low-cost strategies.		X	Leverage organizations and outside education and training opportunities. Leverage ENERGY STAR.

Table 6-12. Sample Progression of Program Designs

Sector	Program Ramp Up			Energy & Environmental Co-Benefits (In Addition to kWh)			
	Early (6 Months -2 YRS)	Midterm (2-3 YRS)	Longer Term (3 To 7 YRS)	Other Fuels	Peak (S = Summer, W = Winter)	Water Savings	Other
Residential: Existing Homes	Market-based lighting & appliance program			X	S, W	X	Bill savings and reduced emissions
	Home performance with ENERGY STAR pilot	Home performance with ENERGY STAR		X	S, W		NOTE all programs provide bill and emission savings regardless of state
		HVAC rebate	Add HVAC practices	X	S		
Residential: New Construction	ENERGY STAR Homes pilot (in areas w/out existing infrastructure)	ENERGY STAR Homes		X	S, W	X	Bill savings and reduced emissions
			Add ENERGY STAR Advanced Lighting Package		S, W		
Low-Income	Education and coordination with weatherization programs			X	W		Bill savings and reduced emissions
		Direct install		X	S, W	X	Improved bill payment
			Add home repair				Improved comfort
Multi-Family	Lighting, Audits				S, W		Bill savings and reduced emissions
		Direct install		X	S, W		
Commercial: Existing Buildings	Lighting, motors, HVAC, pumps, refrigeration, food service equipment prescriptive rebates	Custom measures			S, W		Bill savings and reduced emissions
	ESCO-type program		Comprehensive approach		S, W	X	
Commercial: New Construction	Lighting, motors, HVAC, pumps, refrigeration, food service equipment prescriptive rebates				S, W		Bill savings and reduced emissions
		Custom measures and design assistance			S, W	X	
Small Business	Lighting and HVAC rebates				S, W		Bill savings and reduced emissions
		Direct install			S, W		