

Program Evaluation in New England:

Providing Reliable Energy and Demand Savings, While Facing New Challenges in Light of Emerging Policies

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Overview

1. Program evaluation in New England – background
2. Evaluation “best practices” in the region
3. Energy efficiency savings in state and system planning
4. New challenges for evaluation, measurement and verification (EM&V) in face of recent/emerging policies
5. Current and forthcoming EM&V developments



Who is NEEP?

- Regional non-profit organization founded in 1996 with mission to increase EE in buildings by:
 - >> Advancing EE policy in states/region
 - >> Facilitating coordinated program marketing and implementation across program administrators in region
 - >> Advancing appliance standards
 - >> Updating building energy codes
- Funded through private foundations, EPA, DOE, and sponsors

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Program Evaluation In New England: Background

- Long history of evaluation built over 20+ years – accepted practice and methodologies
- Focus of evaluation on energy savings
- 1985-1995: Evaluations support savings to inform resource acquisition (IRP)
- 1995-2005: Efficiency as a public benefit, greater focus on MT programs, regional evaluation activities (e.g., market assessments, market research)
- Today: Renewed policy focus on energy efficiency as a resource to:
 - >> meet capacity needs
 - >> reduce energy costs
 - >> reduce carbon emissionshence, greater focus on EM&V...

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Impact Evaluations: “Best Practices” in New England

- Selection of most appropriate analytical methods to estimate energy savings:
 - >> stipulated/deemed savings (prescriptive measures);
 - >> econometric modeling (billing analysis with engineering information, weather, other customer behavior information)
 - >> simulation modeling
- Quality-controlled tracking of customer participation information to enable quality sampling
- Quality on-site data collection to verify savings

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Impact Evaluations: Best Practices in New England cont.

- Robust measure of parameters to establish net and gross impacts
- Robust baseline measurement
- e.g., C&I Lighting evaluations - monitoring, billing analysis, telephone surveys on free-ridership, including some estimation of interaction effects of lighting and heating load.
- Not all of the above applies to every state – different strengths/focus, range of experience

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Evaluation Cycles, Budgets and Compilation of Savings Assumptions

- Evaluation cycle/frequency varies by PA
- Evaluation budgets prioritized to focus on elements of portfolio where there is highest risk of being wrong
- Evaluation budgets range from 2-4% of program budgets
- Savings assumptions and algorithms:
 - >> VT Technical Reference Manual
 - >> CT Program Savings Document
 - >> ME Technical Reference User Manual
- MA, NH and RI developed similar documents to support ISO Forward Capacity Market M&V Plans in 2007 (but not public documents)

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Energy Efficiency Savings in State Planning

- Southwest CT – focus on EE to address congestion and reduce Federally Mandated Congestion Charges (FMCCs)
- Vermont – VELCO analysis looks at EE as alternative to transmission expansion proposal
- State annual EE reports to policymakers: document savings, energy, economic and environmental impacts of programs

	2002	2003	2004	2005	2006
Annual GWh	600	640	911	977	1,000
Cumulative Annual GWh	8,865	9,193	11,812	11,555	11,768
Summer Peak Demand Savings*	115	131	144	154	156

* Definitions of summer peak demand vary



Energy Efficiency Savings in System Planning ISO-NE CELT Report (2006)

	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>
NEW ENGLAND											
TOTAL CAPACITY	31147	30958	31116	32114	32345	32335	32335	32335	32278	32278	32056
ADJUSTED LOAD (1)	26662	27143	27473	28019	28659	29305	30005	30636	31142	31602	32018
ISO-NE CONTROL AREA											
1. UNADJUSTED LOAD (2)											
1.1 REFERENCE	28107	28638	29021	29599	30245	30850	31459	32018	32534	33002	33426
2. DEMAND-SIDE MANAGEMENT											
2.1 PROGRAMS	1438	1485	1534	1566	1571	1534	1450	1384	1394	1402	1410
2.2 LOSS ADJUSTMENT (3)	114	118	122	124	125	122	115	110	111	111	112
2.3 TOTAL DSM (4)	1552	1603	1656	1690	1696	1656	1565	1494	1505	1513	1522
3. NETTED FROM LOAD											
3.1 NETTED FROM LOAD	10	10	10	9	9	9	9	9	9	9	9
4. ADJUSTED LOAD (1)											
4.1 ADJUSTED REFERENCE LOAD (4, 5)	26545	27025	27355	27900	28540	29185	29885	30515	31020	31480	31895
4.2 INSTALLED RESERVES MW	4538	3870	3697	4151	3742	3087	2387	1757	1195	735	98
4.3 INSTALLED RESERVES % OF LOAD	17	14	14	15	13	11	8	6	4	2	0
5. CAPACITY (6, 7)											
5.1 GENERATION CLAIMED FOR CAPABILITY	30879	30494	30651	31650	31881	31881	31881	31881	31881	31881	31881
5.2 NET OF FIRM PURCHASES & SALES	204	401	401	401	401	391	391	391	334	334	112
5.3 TOTAL (4)	31083	30895	31052	32051	32282	32272	32272	32272	32215	32215	31993

KEY: 2.3=2.1+2.2; 4.1=1.1-2.3-3.1; 4.2=5.3-4.1; 4.3=(4.2/4.1)*100; 5.3=5.1+5.2

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Opportunities for Improvement in EM&V in New England

- NEEP Report: *The Need for and Approaches to Developing Common Protocols to Measure, Verify and Report Energy Efficiency Savings in the Northeast* (January 2006)
- Identified inconsistencies in EM&V across states, including:
 - >> Terminology/definitions
 - >> M&V methods used
 - >> Baseline condition assumptions
 - >> Deemed savings assumptions
 - >> Transparency of data
- Need greater consistency!

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New Policies Focusing on Energy Efficiency as a Resource

1. ISO-NE Wholesale Forward Capacity Market – M&V Manual developed for Demand Resources (including EE) that set specific M&V standards
2. State policies to procure all cost-effective EE (CT, RI, ME and possibly MA, NJ) and offset load growth (MA goal)
3. Regional Greenhouse Gas Initiative (RGGI) and New England Governors Conf/Eastern Canadian Premiers Climate Change Plan – EE is priority!
4. New England has highest electricity prices in country – ISO NE Scenario Analysis Report (2007) says “this isn’t going to change soon”

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ISO-NE FCM - Implications for Evaluation Activities

- ISO M&V Manual – uses IPMVP framework, sets precision standards (80/10), and more...
- M&V requirements will likely increase evaluation costs – not yet clear on magnitude ...
- State Program Working Group (SPWG), facilitated by NEEP, to improve consistency in EM&V (info sharing and transparency) and conduct regional evaluation activities
- Concern that “tail shouldn’t wag dog” – emphasis on FCM and associated evaluation costs (as well as program design) relative to other policy needs

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SPWG Evaluation Committee – Priority Needs

- Development and adoption of common assumptions where appropriate (e.g., coincidence factors)
- Empirical and analytical research to inform and update savings persistence and measure life
- Development of impact estimates for “new” measures (e.g., ductless mini-splits, quality installation and tune-ups of HVAC for Res & C&I)
- Development of impact estimates for measures delivered through “NCP” (negotiated cooperative promotion) e.g. CFLs, room AC and HVAC

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Next Steps

- NEEP's Northeast EM&V Resource Center Project (2007-08):
 - >> Advisory Committee being convened
 - >> Feasibility Study to test concepts for a construct etc of a potential regional EM&V center (Fall/Winter)
 - >> Recommended Regional EM&V Center Multi-year Plan (April 2008)
- Coordination with NAPEE EM&V Model Guide and North American Energy Standards Board M&V project
- Monitor ISO-NE FCM - ability for EE Projects to meet requirements of M&V Manual - recommend amendments?



Questions?

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