



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

NET SAVINGS PART 1: FUNDAMENTALS, CURRENT PRACTICE, ISSUES & CHALLENGES

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Welcome!

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Please respond to Polling Question 1.

Agenda



- 1) Overview and Purpose...*“Why is this an important discussion?”*
- 2) Issues and Definitions Related to Gross Savings (GS) and Net Savings (NS)
- 3) Setting Out Regulatory Choices
- 4) Comparative Analyses of State Policies on GS and NS
- 5) A Pathway for Making Decisions on Measurement and Use of NS
- 6) Key Takeaways

Section 1: Overview and Purpose

“Why is this an important discussion?”



Overview and Purpose



PROBLEM STATEMENT: States are challenged in determining the appropriate use of and/or estimation methods for Net Savings (NS) and Gross Savings (GS).

- States are actively assessing whether GS and NS best fit a use and is consistent with their views.
- Whether the NS and advanced GS studies provide information whose value exceeds its costs.
- Measurement that captures the full benefits of EE is a growing issue.
- Concerns over how GS and NS impacts Program Administrators' ability to manage EE programs and efforts to meet goals and targets.
- There are also concerns about the economic efficiency of program planning and investment equity.

Against this background:

- The interpretation of gross and net savings concepts are evolving.
- Measurement methods are numerous, varied, and have pros and cons.
- Aspects of both GS and NS are nuanced and context-dependent.

Building on Other Work



- Builds on prior NEEP EM&V Forum work:
 - 1) Net Savings Scoping Paper - *FINAL* (11/2010)
 - 2) *Regional Net Savings Research, Phase 2: Definitions and Treatment of Net and Gross Savings in Energy and Environmental Policy* (12/2012)
 - 3) *Cost-Effectiveness Screening Principles And Guidelines For Alignment with Policy Goals, Non-Energy Impacts, Discount Rates, and Environmental Compliance Costs* (11/2014)
 - 4) *Model EMV Methods Standardized Reporting Forms* (7/2014)
- SEE Action: *Energy Efficiency Program Impact Evaluation Guide, Evaluation, Measurement, and Verification* Working Group (12/2012)
- Uniform Methods Project: *Methods for Determining Energy Efficiency Savings for Specific Measures--Chapter 23: Estimating Net Savings: Common Practices* (09/2014)

New Trends and Updates



- There have been some changes in regulatory policies in some states, and in the factors that drive these changes.
- Today, policies are not viewed separately, but are viewed as a mutually re-enforcing set of decisions to support goals.
- A new focus is on the portfolio of research that needs to be undertaken to support regulatory goals.
 - May blend different types of Gross and Net Savings Research.
 - Based on more explicit development of views regarding the goals of the regulatory process to try and narrow differences between stakeholders.
 - Value of information (VOI) is being used within program evaluations and across programs in portfolio to organize and provide perspective on information needs.

New Trends and Updates (cont'd)



BIG DATA--more data, more frequently and more granularity.

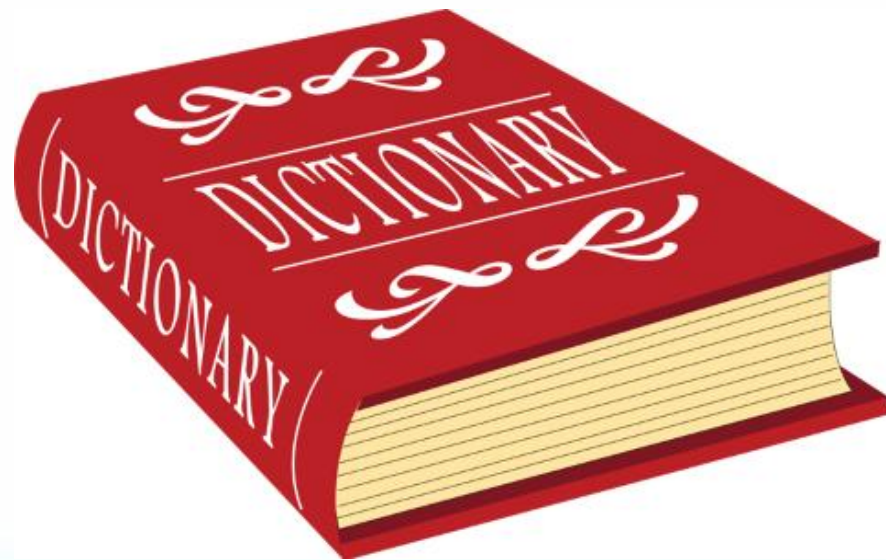
These data can be used to more precisely estimate levels of energy use at a point in time, but this is not the same as estimating savings.

- NS and GS are “change” estimates that also depend on attribution, and understanding the reason for the changes.
- Does not address issues such as operational changes, interactions, early replacement, replacement on burnout, persistence, lifetimes, etc.

Higher value uses of “Big Data” may be in program implementation and process evaluation.

- M&V will ensure that installed equipment is performing as expected.
- Changes from expected energy profiles will alert implementers that equipment needs to be repaired or tuned up.
- Analytics may enhance target marketing both in terms of need and location - produces higher value yield for the EE program.

Section 2: Issues and Definitions Related to Gross Savings (GS) and Net Savings (NS)



Factors in Favor of Measuring NS



- From NEEP Forum Report #1 (2010):
 1. Establishes that the program brought about energy savings that would not have occurred in its absence
 2. Quantifies the amount of savings achieved as a result of the program in a specific time period
 3. Assesses the effectiveness of various program designs and whether the designs should be replicated, expanded, revised, or discontinued
 4. Ensures that ratepayer or taxpayer funds are being spent responsibly, and in a manner that ensures efficiency truly is the lowest-cost resource
 5. Uncovers fraudulent program implementation practices such as the claiming of savings from installations that occurred prior to any interaction with the program
 6. Complies with regulatory requirements to report estimates of net savings along with gross savings

Factors for Not Measuring Net Savings



- From NEEP Forum Report #1 (2010):
 1. Focuses too heavily on narrowly defined metrics of individual program success or failure -- especially free ridership.
 2. Deemphasizes other important impacts, such as non-energy benefits and behavioral effects, as well as portfolio- and policy-level impacts.
 3. Creates the impression that the estimates accurately represent the savings attributable to the program when, in reality, the methods are unreliable and often yield estimates that are biased or lack validity.
 - Results may not accurately represent actual program-induced savings.
 4. Requires expenditures of resources that are not in keeping with the importance of the estimates and their reliability, thereby diverting resources from other planning, evaluation, and implementation activities that could yield greater benefits.

Counter-Factual Dilemma - The Hammer



One critique of EE evaluations is that they depend on a counter-factual that can never be observed - i.e., what would have occurred if the program had not been offered.

HOWEVER, all decisions have a counter-factual that can never be assessed with certainty.

- Assessments of supply-side investments, renewable investments, and EE investments are also based on a counter-factual.
 - One can never truly know what would have happened if an action had not taken place or a different decision had been made - this spans all resource decisions.
 - If a gas turbine had not been built, what else would have happened instead - what is the appropriate counter-factual for net benefits?
- The need for an appropriate counter-factual baseline against which an evaluation is conducted is not unique to EE.

Defining Common Terms: GS, NS, and FR



$$\text{NS} = \text{GS} - \text{FR} + \text{SO} + \text{ME} \text{ [not already captured by SO]} \text{ (DOE UMP, 2014)}$$

- **Gross savings (GS)** - ‘the change in energy consumption and/or demand that results directly from program-related actions taken by participants in an efficiency program, regardless of why they participated.’ NEEP (2012)
- **Net savings (NS)** - ‘the change in energy consumption and/or demand that is *attributable* to a particular energy-efficiency program.’ NEEP (2012)
- **Free Ridership (FR)** - ‘the program savings attributable to free riders (program participants who would have implemented a program measure or practice in the absence of the program).’ DOE UMP (2014)

Appropriately defining and discussing SO and ME poses some issues, and the concept of Market Transformation (MT) is also a complicating factor.

All of these elements are interrelated and care needs to be exercised when using these terms.

Spillover and Market Effects



These definitions tend to overlap and there are differences in current practice.

- **Spillover (SO)** - ‘refers to additional reductions in energy consumption or demand that are due to program influences beyond those directly associated with program participation.’ DOE UMP (2014)
- **Market Effect (ME)**: ‘A change in the structure of a market or the behavior of participants in a market that is reflective of an increase (or decrease) in the adoption of energy efficient products, services, or practices and is causally related to market interventions (e.g., programs).’ DOE UMP (2014)
- **To distinguish between ME and SO** - categories of SO have been developed:
 - **Participant Spillover (PSO)** - Actions take at participants’ sites that are not accounted for in the program tracking system (so are not counted); but were, in fact, due to the program.
 - **Non-Participant Spillover (NPSO)** - Actions taken at customer sites who did not formally participate in the program but resulted from the existence of the program. *[NOTE: This still overlaps with market effects, but does focus on actual equipment installed at a customer’s site].*

Market Transformation



- The term **Market Transformation (MT)** is used prominently as a goal in a number of jurisdictions; but, markets are always changing and defining “transformed markets” is viewed as problematic by some -- there are different perspectives.
- NEEP (2012) and DOE UMP (2014) did not define MT. However, SEE Action (2012) defines MT as:
 - **Market Transformation (MT)**: A reduction in market barriers resulting from a market intervention, as evidenced by a set of market effects that is likely to last after the intervention has been withdrawn, reduced, or changed.
 - In this regard, MT may be viewed as a directional goal or a program design goal.
- An emergent trend is to view ME and MT as part of SO, i.e., EE influences that are not directly linked to a customer’s participation in a program.

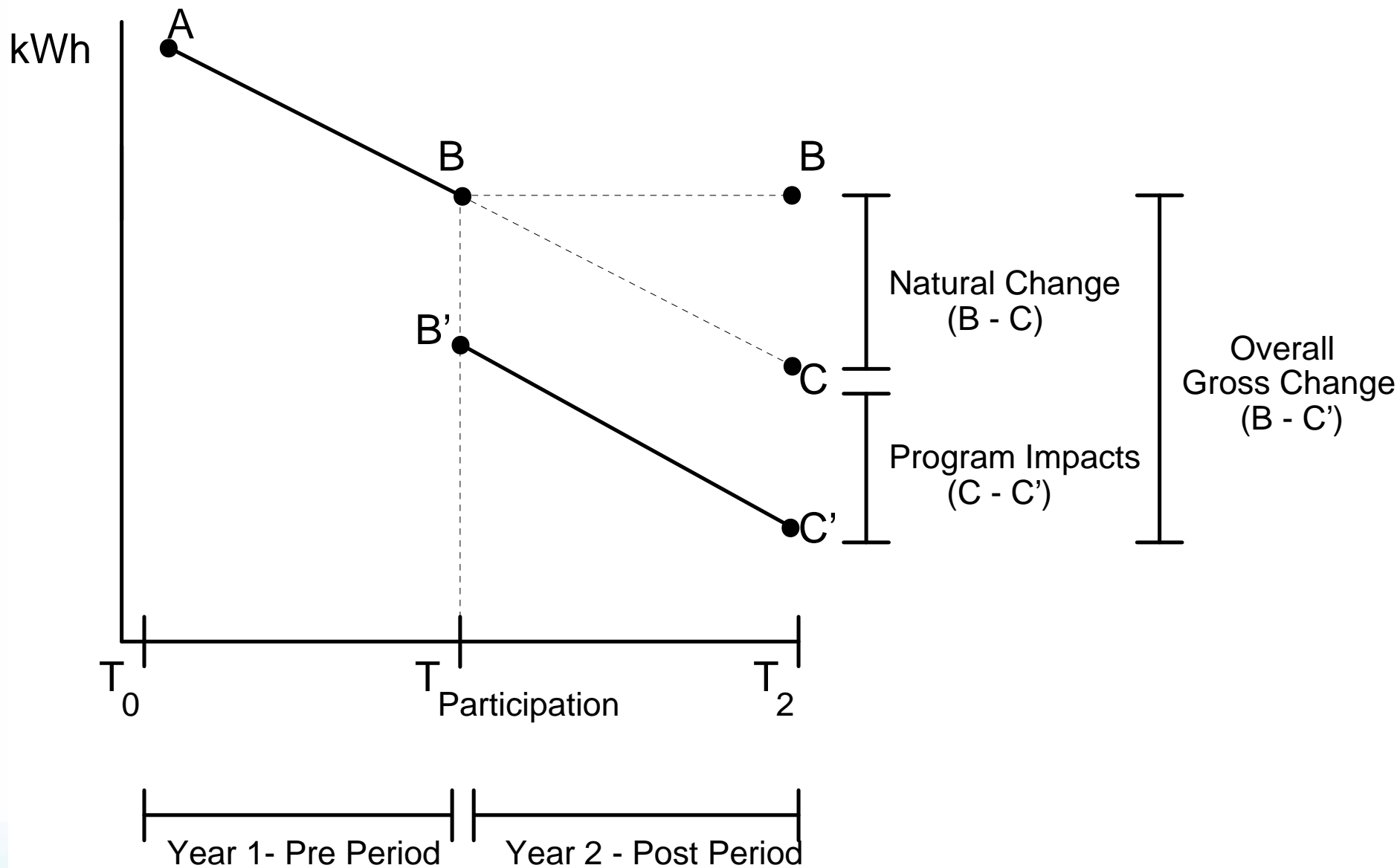
Additional Definitions



- **Net-to-Gross (NTG)** ratio is a term that is most commonly defined as the ratio of net savings to gross program savings. The NTG ratio is applied to gross program savings to convert them into net program savings. (Note: This is an intermediate calculation)

- **Realization Rate (RR)** is primarily used for the ratio of gross evaluated savings to gross claimed savings.
 - It provides a measure of evaluated gross savings compared to the ex ante claimed gross savings predicted in the tracking system.
 - Gross claimed savings are usually based on:
 - 1) Estimates contained in the tracking system developed for each participant through an implementation process.
 - 2) Ex Ante estimates of savings where individual participants cannot be identified - Home Energy Reports (HERS) and Up-Stream Programs such as lighting.

Early Versions of GS Closer to Gross Change



Gross Savings Evolution Over Time



- **Early days of evaluation** - GS baselines were based on the energy used by the equipment replaced with few adjustments.
- **Today** - GS baselines have evolved with more adjustments made to the observed gross change in energy use:
 - early replacements versus replace on failure,
 - adjustment to bring the gross baseline values up to current market levels of equipment efficiency,
 - adjustments for changes in energy service levels
 - other adjustments and role of TRMs, etc.
- Raises the issue of certain factors being double counted in current NS work.
- NS focuses on accounting for the “why” in the action decision.

State Views on Market Effects



- Some states embrace ME and others disallow its inclusion in NS estimates.
- SO has some acceptance even where ME may not have traction.
 - Can be based on actual customer actions, installations at customer sites, and products sold.
 - May need to use trade ally panels to develop estimates as customers may be unaware of all the influences of a program (e.g., upstream lighting).
 - They can capture the influence of EE programs / activities on market-type attributes - e.g., awareness, availability, and trade ally activities.
- How close does SO get us to capturing the broader set of EE program activities?
- If we know that ME is not zero, should we ignore it just because it is difficult to estimate?

What is Tracked Seems to Gain Acceptance



- EE evaluation leverages the tracking system containing claimed savings (i.e., hypotheses about savings):
 - The more accurate the tracking system (better initial data) the more accurate will be the evaluated savings.
 - Programs with identifiable participants have claimed savings for each participant to allow for sampling and RR estimation.
 - For programs without identified savings, estimates of average savings per participant should be made to allow for RR estimation.
- One view of SO is that it is savings due to the program that are not accounted for by the program tracking system.
- Can the tracking system be expanded to include estimates of PSO and NPSO - possibly through negotiated values.
- Need to recognize limitations in program tracking.

Polling Question 2



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Section 3: Setting Out Regulatory Choices



Policy Areas



- 1) EE Targets - Gross or Net:
 - i. Set by legislative mandate (e.g., 20% reduction by 2025)
 - ii. Policy-driven variable targets (e.g., all cost-effective EE)

- 2) Tracking towards targets:
 - i. Use of Gross Savings Estimates
 - ii. Use of Ex Post Net Savings Estimates

- 3) Lost Revenue Recovery:
 - i. Lost margin recovery due to EE
 - ii. Decoupling

- 4) Incentives:
 - i. Performance targets for EE
 - ii. Shared benefit incentives.

- 5) Other:
 - i. Resource planning
 - ii. Meeting environmental goals

Choosing Between GS and NS Values



- Decoupling is based on reconciliation to actual sales and does not depend on a choice between GS and NS.
- For all other policies, GS and NS decisions need to be made:
 - 1) Use of GS:
 - I. The prospective Ex Ante GS value (claimed savings);
 - II. The retrospective Ex Post values (evaluated GS adjusted by the RR).
 - 2) Use of NS:
 - I. Prospective (Ex Ante) NS values.
 - a) Use of evaluated values from prior studies.
 - b) Negotiated values based on different types of information.
 - II. Retrospective (Ex Post) NS values based on researched values for the recent/current program year.

Choosing Between Retrospective and Prospective



- Prospective values provide more planning certainty for program administrators - there is not a surprise adjustment made retrospectively.
 - They know how they will be judged on both gross and net if prospective values are used.
 - Utilities receiving lost margins want to plan and don't want the values changed in what may seem like an arbitrary process.
- General move to use prospective values for NS.
 - These may be negotiated values based on several sources of information on all the factors that go into NS (e.g., FR, PSO, NPSO and possibly ME)
 - Just completed researched values for GS and NS are not used to revise current estimates, but are used looking forward to set targets and incentives for the next round of EE programs.

Matrix of Decisions



POLICY	GROSS SAVINGS (GS) ESTIMATES		NET SAVINGS (NS) ESTIMATES	
	Prospective - Not adjusted by RR	Retrospective - Adjusted by RR ¹	Prospective - Ex Ante NS	Retrospective - Ex Post NS
1. Setting EE Targets				
2. Tracking Towards Targets				
3. Lost Revenue Recovery – Lost Margins				
4. Incentives – Performance or shared savings				

¹RR's used to adjust claimed GS are near 1.0 for many types of programs and are less controversial than Ex Ante NS, but not all RR's are near 1.0 and the adjustments can be significant.

Making Decisions - Views on the Confidence in EE Savings Estimates



- Both GS and NS estimates are “change” estimates - each needs a baseline from which the change is estimated.
- Issues:
 - 1) Some people believe that the process by which GS is estimated is more straightforward.
 - The factors that need to be estimated are more straight forward - (i.e., changes in operations, ratings of equipment, operating hours, baseline efficiency, etc.).
 - 2) NS depends on factors that are more difficult to estimate - why customers take certain actions.
 - 3) Some are concerned that the cost of conducting NS studies may outweigh the value in terms of producing reliable results.

Confidence in EE Savings Estimates (cont'd)



- If a goal is to make good decisions regarding EE investments, might different levels of confidence be appropriate for different types of applications and programs?
 - Use of EE estimates in forward resource planning
 - *Tougher to get high levels of confidence across all types of resources - EE and Supply-Side*
 - Verifying attained savings levels over a time interval
 - Confidence will vary across program types and sizes.
 - Improving program design to increase economic efficiency of programs
 - Lower levels of confidence may be acceptable by some - just want to have the odds in favor of a particular design choice
 - Setting across-the-board standards for confidence of EE estimates in different applications may not be productive.

Supply-side versus Demand-side Uncertainties



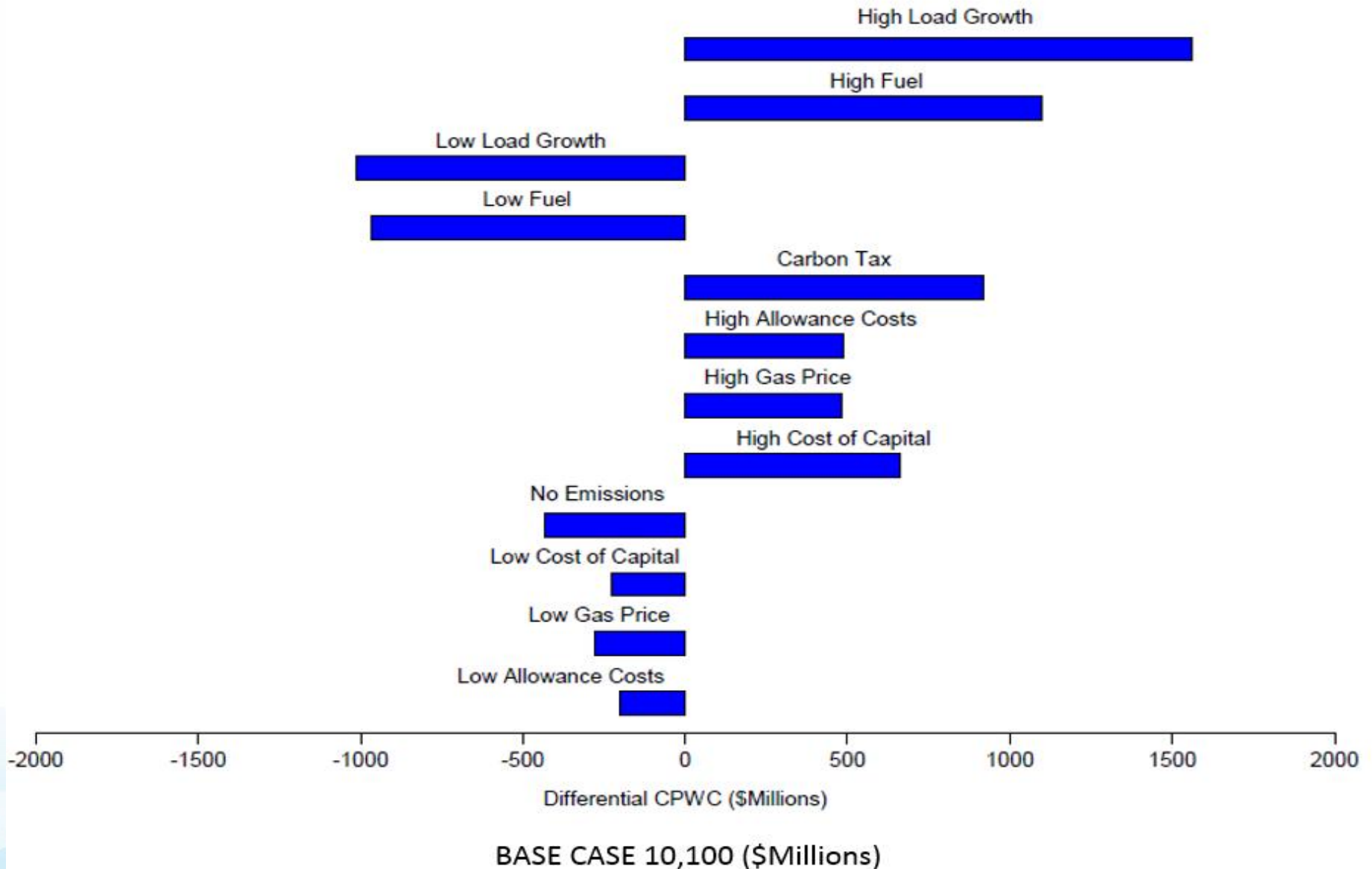
- Uncertainty is not unique to gross and net savings estimates, as all decisions and investments are made under uncertainty and all have an associated counterfactual.
- EE and supply-side investments both face considerable uncertainty.
- Many uncertainties on the supply-side are not amenable to statistical treatment, and the MWh cost of a planned future supply-side resource may be quite uncertain.
- The goal is to make good resource investment decisions.

Assessing Supply-Side Uncertainty - An Example



The high side sensitivities are plus 55% above mean net revenue requirements.

Sensitivity Analysis - Plan 1



Confidence - Things to Keep in Mind



- Different estimation methods are used to estimate a change in energy use as opposed to a level of energy use at a site (e.g., a total peak demand contribution at a site)
- It is easier to obtain higher levels of confidence when program impacts are large (i.e., more easily documented).
- Programs with large savings per site (high signal to noise ratio) will be able to achieve higher precision levels at lower evaluation costs.
- Care is needed when setting target confidence levels for EE programs and portfolios, and levels for other consumption factors (e.g., contribution to peak demand for cost of service).

Polling Question 3



Section 4: Comparative Analyses of State Policies on GS and NS

[Not all States make the Same Choices]



Jurisdictions are Re-assessing Their Views



- Several Jurisdictions are re-assessing their positions:
 - 1) On NS research
 - 2) Role of GS and NS research on policies.
- NEEP Forum Report #2 (2012) reviewed applications of GS and NS across Forum States:
 - *“Compared to New England, states in the Mid-Atlantic more commonly use evaluated gross savings for utility regulatory compliance and net savings for program planning and measurement of cost effectiveness.”*
 - *“In contrast, New England is more likely to use evaluated net savings; in doing so, they apply NTG values prospectively rather than retrospectively.”*
 - A table of each state’s approach was included as an appendix to the NEEP Forum Report #2.

National Research on Current Views



➤ In progress work¹ can provide some insights - policies examined:

- 1) **Overall NS Policy**. Report savings and assessment against goals at the gross or the net level.
- 2) **Definition of Net Savings (Allowance for Spillover)**. Within the net savings jurisdictions, there is a wide variation of which attributes of NS are allowed - PSO, NPSO, ME and MT.
- 3) **NTG Methods Protocols**. Certain states have developed NTG method protocols that recommend specific approaches.
- 4) **Fixed or Researched Net Savings**. Locked in “fixed” NTG values that apply to all, or most, programs and not based on researched values.
- 5) **Prospective versus Retrospective Application of Net Savings Values**. The use of prospective NTG values, where NTG values are researched in a current program year are applied prospectively to future year(s).
- 6) **Other issues**. Include frequency of NS research studies (may vary by program), and NS research on subsets of participants.

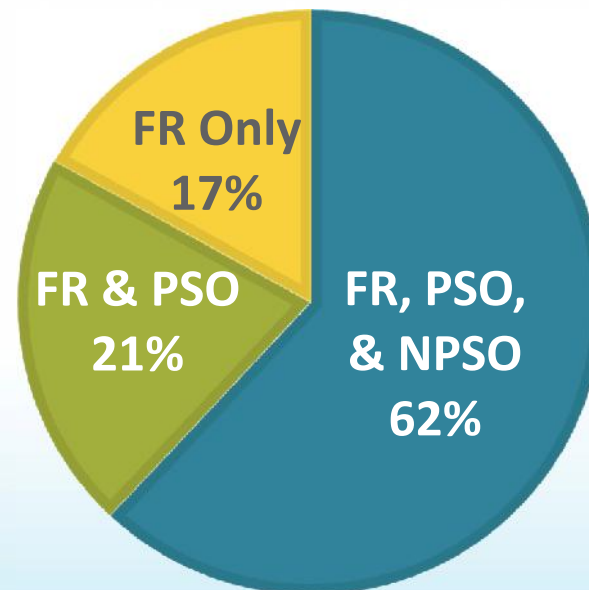
¹Joint work by Navigant and Apex Analytics (on-going)

Included Attributes of NS Estimates



- Nearly two-thirds (62%) of those jurisdictions nationally that use NS allow for FR, PSO, and NPSO. *[Note: Earlier research showed a steady increase in the inclusion of some SO over recent years]*
- 21% allow for FR and PSO but do not allow for NPSO (possibly due to similarity between NPSO and ME which is viewed as having less confidence).
- Only 17% of the jurisdictions with NS (a total of four states) limit NS to net of FR (i.e., do not allow for contributions from SO to count toward the NS estimates).

**Inclusion of FR, PSO,
and NPSO in NS (n=24)**

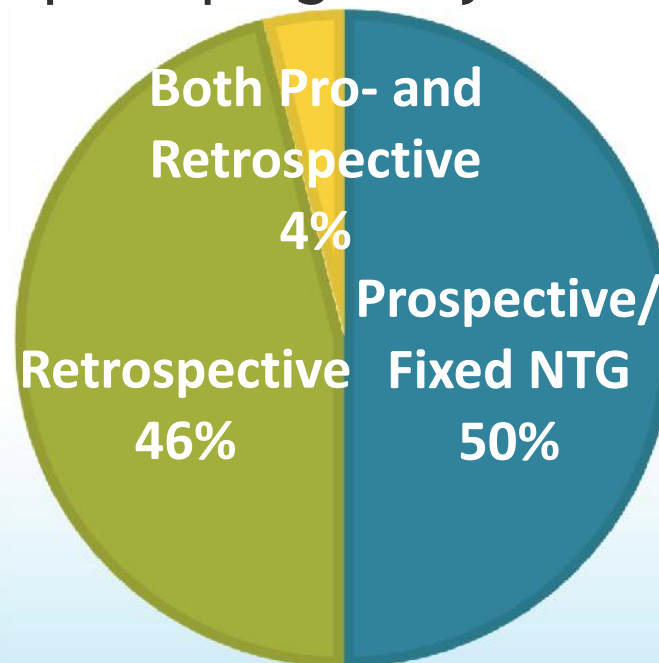


Retrospective versus Prospective Application



- NS values and NTG ratios are perceived by program administrators as posing significant risk and uncertainty with retrospective application.
- A number of states have moved to the use of NS and NTG results prospectively, rather than retrospectively.
- As described above, prospective NTG means that any updates to NTG values are applied in future program years, not in the year in which they are developed or to prior program years.

Use of prospective and retrospective NTG (n=24)



NS Policies Often Co-exist with Other EE Policies



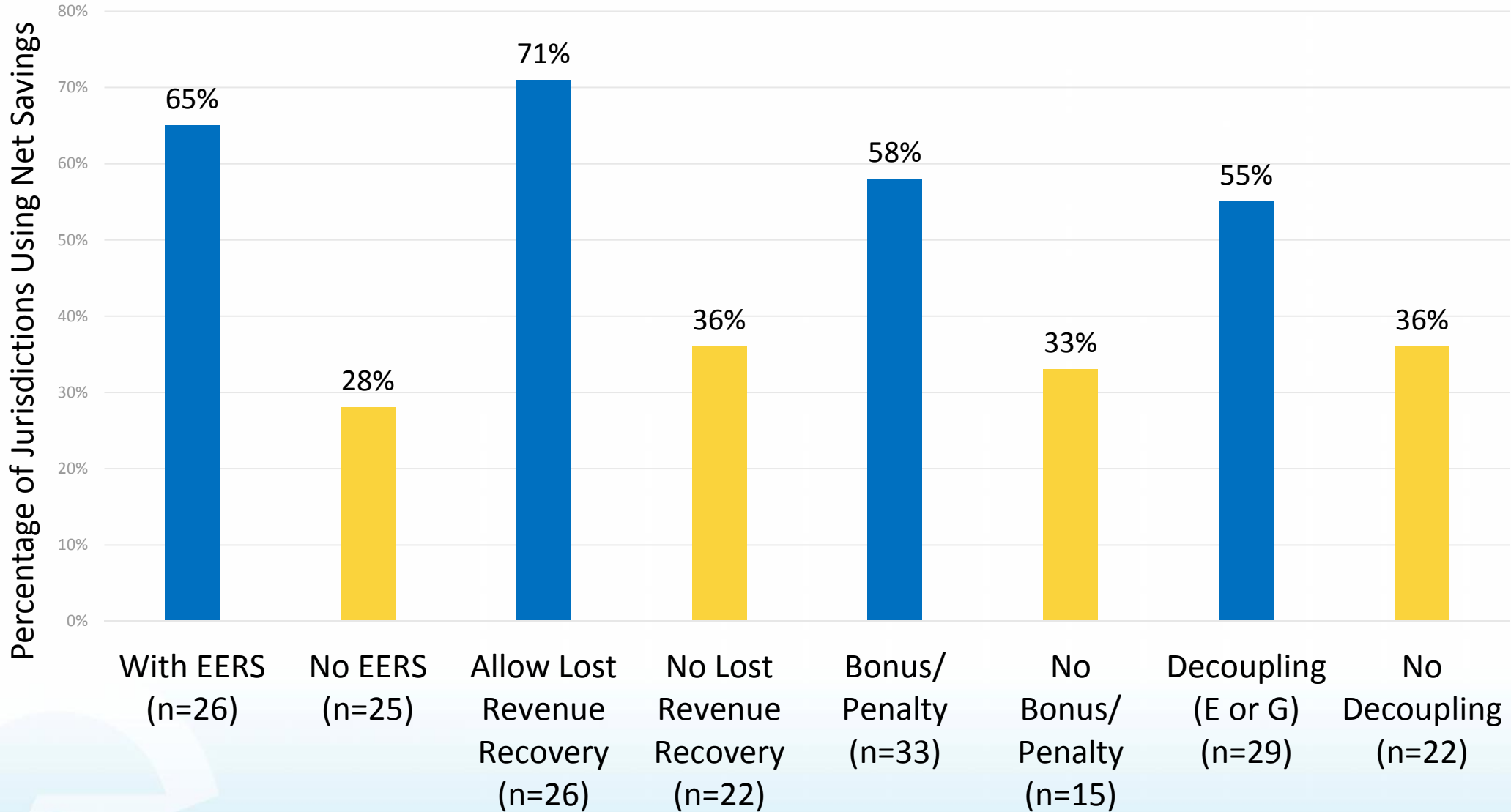
Other Policies include:

- **Energy Efficiency Resource Standards (EERS)**. State-level policy that sets long-term mandatory energy savings targets for utilities and energy-efficiency program administrators.
- **Decoupling**. A regulatory tool that serves as a means of helping utilities overcome the throughput incentive:
 - The contribution to gross income that occurs with every energy unit sold because the unit (variable) price recovers some of a utility's fixed costs.
 - A decoupling mechanism separates a utility's revenue from its unit sales volume without affecting the design of customer rates.
- **Lost Margin/Revenue Recovery**. Allows a utility to recover the lost margin attributable to EE programs by increasing revenue by that same amount. Can be based on decoupling (see above) or by adjustments (rate adjustment).
- **Risk-Reward Mechanisms**. Allows utilities to earn bonuses for meeting or exceeding goals, or imposes financial penalties for savings shortfalls.

Jurisdictions with NS and an EE Policy



Note: The first blue bar indicates that 65% of the states that have an EERS require NS and the second blue bar says that 71% of the states that allow for lost revenue recovery also require NS.



Summary of Trends from Reviews of States' Policies



- NS plays a larger role if there are other EE policies - EERS, lost margins, decoupling, or risk-reward mechanisms.
- There is a trend towards defining NS more comprehensively - i.e., inclusion of first PSO, then NPSO, and ME.
 - Over 50% of the states allow for the inclusion of spillover (67% of those surveyed - this is an increasing trend)
- There is also a trend towards the use of NS on a prospective basis rather than on a retrospective basis.
 - 50% of the states surveyed now use NS on a prospective basis.
 - One Exception -- where lost margins (aka, lost revenues) are allowed - most states apply NS retrospectively.
- Care is needed in interpretation as policies are changing.
- Specific case studies of states with different policies are planned.

Section 5: A Pathway for Making Decisions on Measurement and Use of NS



NS Policy and Research: A Sample Approach



- How to go about:
 - 1) Deciding on changes to GS and NS policy
 - 2) Implications for an accompanying consistent research agenda and application of resulting GS and NS estimates.
- The answer depends on one's perspectives -- broadly in terms of program portfolios, and specifically, regarding individual programs, time horizons and other considerations.
 - Political, regulatory and financial realities influence perspective
- Different stakeholder views can be held and be consistent with select policies.
- Three views were developed in one stakeholder process.
 - Each is a corner solution, and a blend of the three views with different weights may best represent different perspectives.

Three Views on NS from this One Process



VIEW ONE: EE as a resource investment - NS research should focus on EE as a resource that can be counted on.

- A focus on participant FR and PSO, and NPSO due to higher confidence in these factors as a resource contribution.
- Importance of more certainty around what return the utility is getting for its EE investments.
- NS research may be performed for key programs on a regular basis, or only as often as changes in the market or changes in the program dictate.
- ME considered but through market trade ally studies to determine whether ME are small or large (i.e., order of magnitude studies); and, to develop market metrics to be tracked over time.
- Serves as a check on an appropriate program design and implementation.
- Equity is a major consideration - ratepayers should not be paying for EE that would have occurred anyway [NOTE: Related to appropriate program design and implementation]

Three Views on NS (cont'd)



VIEW TWO: NS as Deemed (prospective) - NS research should focus on prospective (ex ante) analyses of attributable impacts, often through secondary research, which gets you close enough.

- Based in a Value of Information (VOI) Construct - approaches are now being developed to incorporate VOI as an element in NS decision making.
- NS studies are subject to bias and large error bounds which may not provide reliable information. Potential sources of difficulty include:
 - Difficulty in accessing well-informed market experts
 - Need for difficult to obtain sales, market share, and other data
 - Lack of in-field research poses risks (i.e., if one has a resource view).
- Deemed NS value decisions may be informed by researched NTG findings from other jurisdictions and programs:
 - Lock down prospective value by program, groups of customers or groups of programs
 - A careful review is always in order.

Three Views on NS (cont'd)



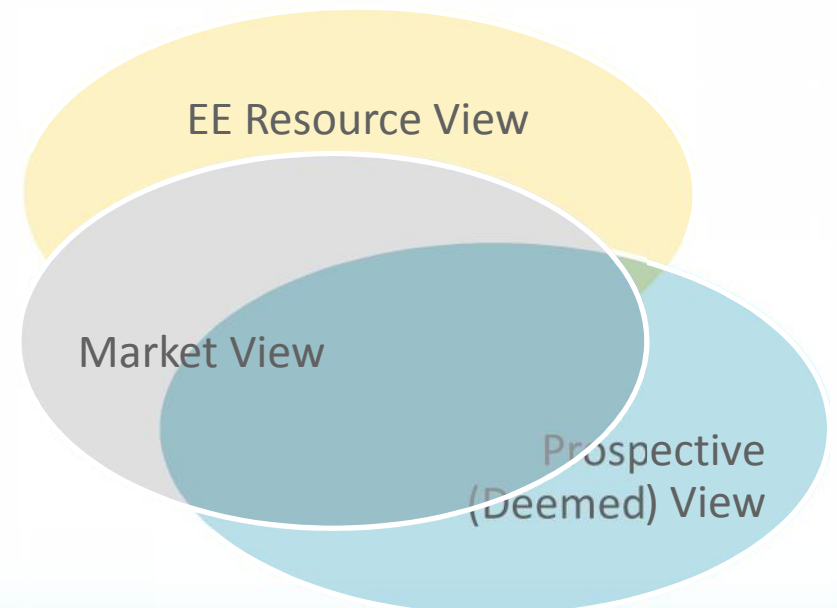
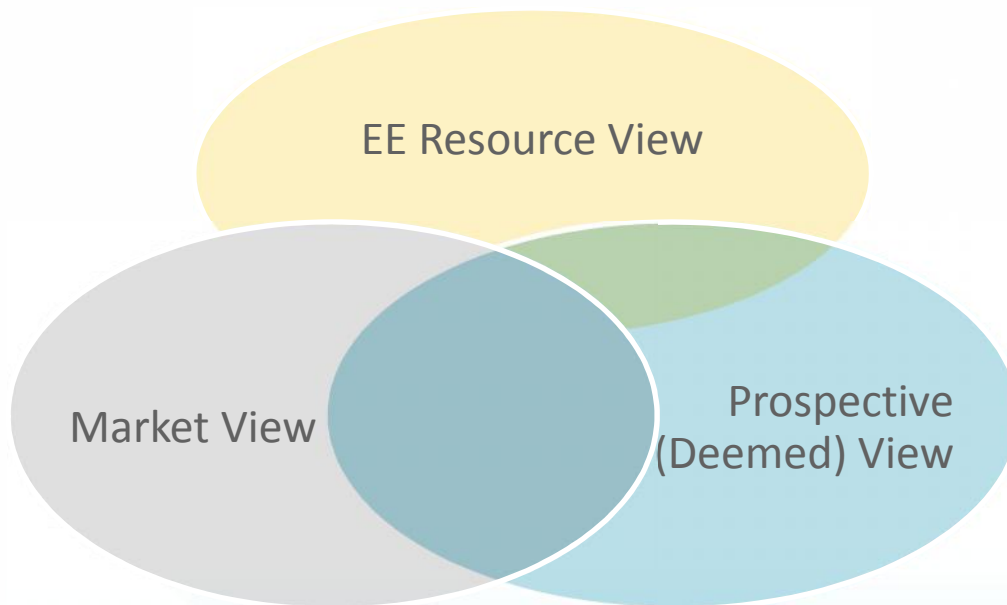
VIEW Three: EE as a Market Influencer - NS policies and research should focus on attribution of programs' *influence in the market*.

- Do not overly emphasize EE as a discrete resource, but focus is on changes in the market for EE.
- Year-to-year NS is generally not estimated (although it could be).
- Focus is on developing a time series of indicators in the market showing programs contribute to changes in the market for EE.
- Leads to market characterization studies focusing on trade ally practices, stocks of equipment in retailers and distributors, knowledge of EE technologies and practices among building managers, ESCOs, and A&E firms.
- Trade ally panels over time can be important.

Blended or Overlapping Views



- One stakeholder may hold multiple or blended views.
- Multiple views may apply to a single program.
- Identifying perspectives can be important as a starting place for developing GS and NS research agenda, and uses for these estimates.



Stakeholder Affiliation with the Three Views



- The energy resource, market and deemed views are not mutually exclusive.
- A stakeholder may hold different views depending on whether they are considering:
 - The entire energy efficiency portfolio;
 - A particular program and subset of customers within that program; or,
 - The type of program and how important it is to the overall portfolio.
- This example:
 - One set of stakeholders identified with the deemed / prospective view (in this case, it was the PA's who wanted certainty for their planning).
 - Other stakeholders identified with EE as a resource for planning and equity / efficiency leading to more frequent and detailed NS research.
 - AGREEMENT - All stakeholders were interested in market characterization research, and trade ally and other market actor experiences to assess how EE impacts market.
 - Based on this area of agreement, NS and GS policies and research plan was developed (or is under development).

Value of Information (VOI) Perspective



- A common concern with NS research is whether the value of the information (VOI) produced exceeds the cost of the research.
 - Impacts the research design and methods used.
 - Frequency of NS studies.
 - Loss in information from using the prospective view of GS and NS research - lag in ability to design programs to achieve greater incremental savings.
- Structured VOI analyses are a consideration for NS research.
 - Tends to develop new views on the way research may be conducted.
 - Based on decision-analytic approaches to assessing the value of market research or the value of R&D investments.
 - Formal models with distributions have been constructed to assess VOI.
- **CONCERN:** Looks scientific, which can mask much of the judgment involved - it is a way of organizing information for better decisions.

Value of Information (VOI) Perspective



- A VOI construct can influence the types of GS and NS research conducted and this perspective was found helpful by Stakeholders.
- Examples:
 - Four programs out of a portfolio of 10 programs may account for 80% of the portfolio savings.
 - Within some of these programs, particularly C&I programs, 5 to 10 customers out of 250 participants may account for as much as 40% of the savings.
 - Similarly, 25 to 50 customers may in total account for less than 3% of total program savings.
 - Performing evaluated GS RR research costs money in terms of on-site work, surveys, and verification.
 - The value of learning whether the largest customers contributed to the expected savings may be high.
 - A sample frame which includes the smallest contributors, e.g., a participant in the segment that contributes less than 3% to overall program savings, may result in a sample point where the costs of the verification work exceeds the VOI.

Section 6 - Key Takeaways



TAKEAWAYS



Some New Insights on Old Axioms:

- 1) **Definitions are evolving:** Particularly for SO, ME and MT.
- 2) **The counter-factual dilemma:** “This is the way life is”...all decisions, regardless of the discipline, deal with this uncertainty.
- 3) **Completeness of NS Estimation:** Trend towards more inclusion of SO and ME in NS estimates, but only half of the states that estimate NS allow for any inclusion of these factors.
 - If we know a factor is non-zero, should we not consider it just because it is difficult to estimate - or should there be a policy?
- 4) **EE Program Tracking:** All important impacts, influences and parameters that form hypotheses that could be tested in the field are not typically included in the program tracking and documentation.

TAKEAWAYS (cont'd)



Some New Insights on Old Axioms:

- 5) **Value of information:** Useful in estimating GS and NS to ensure best use of research funds; caution against overvaluing the “science” behind the VOI assessment
- 6) **Confidence:** Generally, estimates of GS are viewed as having more confidence and NS estimates having less confidence.
 - BUT, NS estimates provide different information - e.g., NS information can help program design and improve program economic efficiency by reducing savings that would have occurred anyway.
- 7) **Different Perspectives:** Each jurisdiction may have different perspectives leading to different policies that may all be consistent with a valid GS and NS framework.
 - Developing that framework with consistent definitions of terms and issues is important to facilitate productive discussion for determining policies most useful within each jurisdiction.



Thank you for participating today. Before leaving, will you please...

- ✓ Respond to Polling Question 4.
- ✓ Register for July 7th webinar.
- ✓ Email Elizabeth Titus about what you would like to hear more about from NEEP.

References



NEEP EM&V Forum:

- *Cost-Effectiveness Screening Principles And Guidelines For Alignment with Policy Goals, Non-Energy Impacts, Discount Rates, and Environmental Compliance Costs, Version 1.0 (11/2014)*
<http://www.neep.org/file/2873/download?token=f4VbVWAH>
- *Net Savings Scoping Paper (11/2010)*
http://www.neep.org/file/1088/download?token=n6G8s2n_
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MOOSE on the Pearl Street Mall in Boulder, CO
June 22, 2015 - Visiting Navigant.