

# NAVIGANT

ENERGY

## Estimating Net Savings – Methods and Implicit Policies

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**NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS**  
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# DOE Uniform Methods Project – Estimating Net Savings

- » Designed to build on prior work and, particularly, on the December 2012 SEE Action Guidebook to EM&V
- » Practitioner's guide to methods that can be used to address the estimation of net savings
- » Methods Addressed:
  - Randomized controlled experiments and quasi-experimental designs
  - Survey Methods – focus on self-report methods
  - Common practice baseline approaches
  - Market sales data analysis
  - Top-down evaluations
  - Structured expert judgment approaches
  - Deemed or stipulated NTG ratios
  - Other methods – Historical tracing
  - Appendix on the use of regression models for estimating net savings from upstream lighting programs.

# Issues addressed

- » Each method had a technical discussion – advantages, applied discussion, examples from the literature and a guide to additional information.
- » The Net Savings Section of the DOE UMP also addressed factors that drive the strategy and selection of methods
  - Evaluation objectives
  - Available information (potential constraints)
  - Value of information:
    - › Cost versus benefits in higher levels of precision around net savings
    - › The goal is to produce the information decision-makers need to make good investments in energy efficiency.
  - Strategies to consider, e.g., timing, integration with implementation, and target accuracy
  - Trends in the estimation of Net Savings Estimation
  - The need for the narrative underlying the method selected, the results, and the context of the effort, i.e., a reasonable accumulation of the evidence.

# Why are net savings estimates so controversial?

- » Many regulatory decisions have a component of “net” implicit in the decision.
  - Approval of a supply-side investment – based on net revenue requirements.
  - Rate approval – often based on a comparison to alternative rate-based allocations of revenue requirements.
  - Setting targets in most any area – EE, DR, or renewables: What would the effect have been if an alternative target had been selected?
- » The net impacts challenge is applicable to investments in any resource:
  - Healthcare
  - Environmental regulations
  - Education
  - Tax subsidies
  - Energy efficiency
  - Other supply-side resource investments
- Assessment requires the development of the appropriate counterfactual, i.e., what would have happened in the absence of the resource investment.
- Re-stated – the question becomes: What is the appropriate baseline?

# Issue: Do we have a good definition of net savings?

- » Yes.  $\text{Net Savings} = \text{Gross Savings} - \text{FR} + [\text{SO} + \text{ME}]$
- » Re-stated -- This is the “total change” over time minus the change that would have occurred anyway, i.e., the appropriate baseline.
- » In practice, care is needed to avoid double counting particularly in determining gross savings.
  - Gross savings should be defined as the engineering-based savings due to a measure or technology installation (or combinations that comprise a program).
  - Net savings takes out the impacts that would have occurred anyway and adds in savings over time as new technology and practices are “pushed” into the market.
  - Technical Reference Manuals (TRMs) are specifying the savings by measure or technology based on a variety of factors, some of which could be viewed as components of net values, and the baseline becomes more complex:
    - › Replacement on failure.
    - › Early retirement – only some years produce net impacts.
    - › Code versus in situ equipment.
    - › One view of TRMs is that they are negotiated or “best practice” gross savings calculations to be used in the program tracking system.

## Issue: Net program Impacts across jurisdictions.

- » While there is general acceptance among practitioners of the definition of net savings, different jurisdictions treat the components of net savings differently.
  - A Navigant review of recent 38 C&I custom program evaluations showed that 28 jurisdictions adjusted gross savings by FR, 3 jurisdictions also used participant spillover, and 7 adjusted for FR and full SO.
  - Research by NEEP has shown similar differences across jurisdictions.
- » These differences represent policy choices made by that jurisdiction.
  - Most agree that SO and ME exist and are positive values, but it can be difficult to determine the magnitudes of these factors.
  - However, there is a trend towards the inclusion of SO in net savings evaluations and ME is also being estimated particularly for market transformation programs.
  - SO and ME estimates will have uncertainty around them, but no more so than what is found in much of the broader evaluation literature from other fields.
  - Is It important to know if these values are small versus potentially large for a given program or portfolio for making EE program investment decisions?
  - It then becomes a policy decision on how to use this information in making decisions about EE investments.

# Issue: Gross versus Net in Target Setting and Incentives

- » Net savings are needed to assess the return on investment in EE, and for program planning; but, net savings may not be appropriate in every context.
- » As jurisdictions consider the delivery of EE programs as a business process requiring an investment of resources, returns on this investment are being considered (more commonly termed incentives).
  - These returns on investment are typically tied to performance targets.
  - The target could be based on reaching a certain level of gross savings or it could be based on achieving a certain level of net savings. Each has pros and cons.
  - A gross savings target for incentives can provide a clearer incentive to the program administrator, and there generally is less controversy over whether the target has been achieved.
  - Incentives are usually based on a calculation of shared benefits with the predominant share of benefits going to ratepayers.
  - Under an 80-20 split of the EE benefits (80% to ratepayers and 20% to the administrator), attributed savings that are over-estimated by 50 percent due to the use of a gross savings target still implies that 70 percent of the benefits goes to ratepayers. What is equitable and practical?

## Issue: Methods used can reflect regulatory decisions

- » Decisions on which elements of net savings are to be counted – FR, SO and ME – can drive evaluation design.
- » Methods themselves have embedded policy contexts, e.g., the common practice baseline approach has an embedded policy element.
  - Prior EE programs may have affected the markets for EE equipment through SO and ME.
  - This results in current standard practice baselines that are more efficient than what would have been the case if these EE programs had not been offered.
  - The market average may contain a number of past participants (e.g., end users, installers and distributors) who have already been influenced by the program.
  - The effect of these past programs is to lower the annual energy use of the measures that constitute the current practice.
  - This argument is partly analytic and partly a policy consideration.
  - Ideally, past evaluations of EE programs should have included all the impacts attributable to the programs; but, estimation of SO and ME were generally not undertaken resulting in a bias in the overall benefits of EE investments over time.



# Issue: Precision and Confidence

- » The goal is to produce the information needed to make good investment decisions in EE.
- » Blanket confidence and precision targets across all programs rarely make sense.
- » The value of information from estimating net savings is being considered in a more structured manner to help manage evaluation costs.
  - Achieving 90 percent confidence and 10 percent precision may be important for a very large EE program.
  - BUT, 90/10 for a program that is one tenth the size of the largest program implies precision levels that represent only one percent of the large program (usually with a more expensive study).
  - Also, one-tailed tests should be considered as attaining a threshold level of net savings is likely to be more important than information on the likelihood that a program has exceeded the target.
- » Blanket targets for survey results (i.e., a 90/10 survey) are problematic as the results for each question will have a different variance and therefore a different confidence and precision.

# Where do we stand?

- » Policy makers and regulators need to consider the value of information when setting up the evaluation regime for Demand-Side investments.
- » Certain simple decision tools can be useful, e.g., a loss function approach.
  - The loss function looks at the penalty associated with assuming one value is correct, when another value is actually the true value.
  - What is the penalty to ratepayers if FR is assumed to be 30% when it really is 50%?
    - Would a different decision be made?
    - Is it still an equitable investment?
  - Obtaining high levels of precision around net savings for programs that comprise 70% to 80% of a portfolio, may allow for lower levels of precision for smaller programs.
  - What is the penalty to ratepayers if certain components of a program's net savings are not identified or dimensioned?
    - Can good decisions still be made?
    - Many important decisions are based on evidence and judgments that are uncertain. What level of certainty is needed for EE investments?

# Conclusion

- » Net savings methodologies continue to evolve and improve over time.
- » No one methodology is appropriate for all programs or measures.
- » It is recommended that the evaluation plan be designed keeping the following elements in mind:
  - The schedule for the evaluation effort over time taking into account the expected value of the information produced versus the cost of the research effort.
  - Program design and maturity.
  - The contribution of the program to overall portfolio savings (past, current, planned).
  - Observations and learnings from other jurisdictions.
  - The evaluation budget, distinct questions to be addressed, and the value of information expected to be produced by the evaluation study.
    - Think about what you would do given different outcomes from the evaluation effort – uncertainty in net savings for a program that counts for 35% of the portfolio versus uncertainty in savings for a program that counts for 5%.

# Key CONTACTS



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