



Synapse
Energy Economics, Inc.

Driving Efficiency with Non-Energy Benefits

ACEEE National Symposium on Market Transformation

April 1, 2014

Erin Malone

Recent Synapse Research on NEBs

- Best Practices in Energy Efficiency Program Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For
 - prepared for the National Home Performance Council, July 2012, available at: <http://www.synapse-energy.com/Downloads/SynapseReport.2012-07.NHPC.EE-Program-Screening.12-040.pdf>.
- Energy Efficiency Cost-Effectiveness Screening: How to Properly Account for Other Program Impacts and Environmental Compliance Costs
 - prepared for Regulatory Assistance Project, November 2012, available at: <http://www.synapse-energy.com/Downloads/SynapseReport.2012-11.RAP.EE-Cost-Effectiveness-Screening.12-014.pdf>.
- Energy Efficiency Cost-Effectiveness Screening in the Northeast and Mid-Atlantic States
 - Prepared for the Northeast Energy Efficiency Partnership, October 2013, available at: http://www.neep.org/Assets/uploads/files/emv/emv-rfp/emv-products/EMV_Forum_C-E-Testing_Report_Synapse_2013%2010%2002%20Final.pdf
- Energy Efficiency Cost-Effectiveness Tests
 - Prepared for the Council of Michigan Foundations, November 2013, available at: https://www.michigan.gov/documents/energy/ee_report_441094_7.pdf

Overview: Questions to Answer

- What are non-energy benefits?
- Why should NEBs be included in cost-effectiveness testing?
- What is the impact of including NEBs in cost-effectiveness testing?
- How can NEBs be estimated?
- What are states doing with NEBs?

What are Non-Energy Benefits?

- NEBs are those costs and benefits that are not part of the costs, or the avoided cost, of the energy from the utility.
- NEBs also include other fuel savings; the other fuels that are not provided by the utility delivering the energy efficiency:
 - e.g., oil savings,
 - e.g., gas savings (when the program is delivered by an electric utility).
- NEBs fall into three-categories:
 - Utility-perspective NEBs.
 - Participant-perspective NEBs.
 - Societal-perspective NEBs.

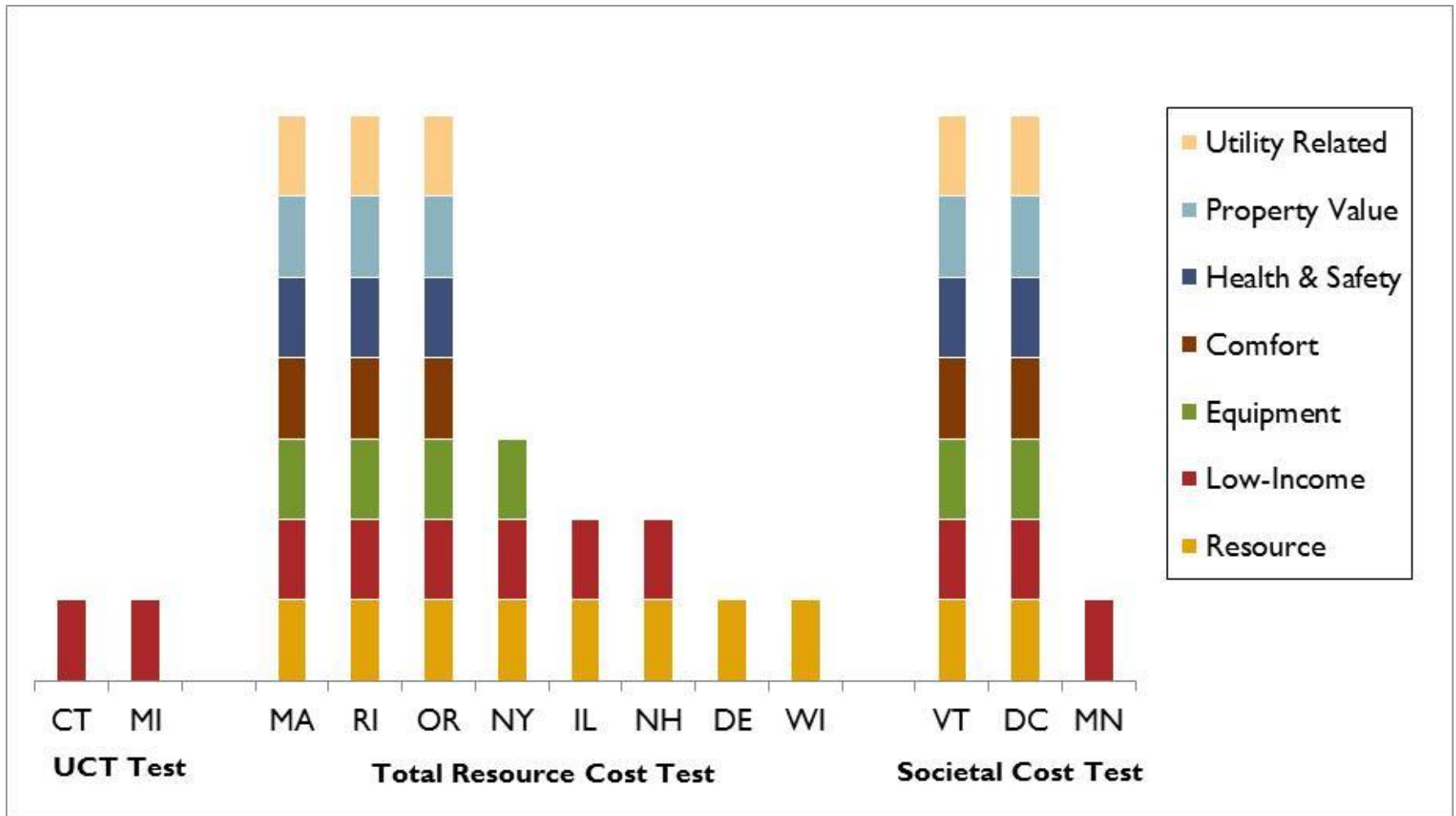
Examples of Non-Energy Benefits

- **Utility-Perspective:**
 - Reduced arrearages.
 - Reduced carrying costs on arrearages.
 - Reduced bad debt.
- **Participant-Perspective:**
 - Improved safety.
 - improved health.
 - reduced O&M costs.
 - increased worker and student productivity.
 - increased comfort.
 - reduced water use.
 - improved aesthetics.
- **Societal-Perspective:**
 - Environmental externalities.
 - Health care cost savings.
 - Reduced reliance on fossil fuels.

Primary Cost-Effectiveness Screening Tests

	Utility Test	TRC Test	Societal Cost Test
Energy Efficiency Program Benefits:			
Avoided Energy Costs	Yes	Yes	Yes
Avoided Capacity Costs	Yes	Yes	Yes
Avoided Transmission and Distribution Costs	Yes	Yes	Yes
Wholesale Market Price Suppression Effects	Yes	Yes	Yes
Avoided Cost of Environmental Compliance	Yes	Yes	Yes
Non-Energy Benefits (utility perspective)	Yes	Yes	Yes
Non-Energy Benefits (participant perspective)	---	Yes	Yes
Non-Energy Benefits (societal perspective)	---	---	Yes
Energy Efficiency Program Costs:			
Program Administrator Costs	Yes	Yes	Yes
EE Measure Cost: Program Financial Incentive	Yes	Yes	Yes
EE Measure Cost: Participant Contribution	---	Yes	Yes

Are States Including Participant Non-Energy Benefits in Cost-Effectiveness Tests?



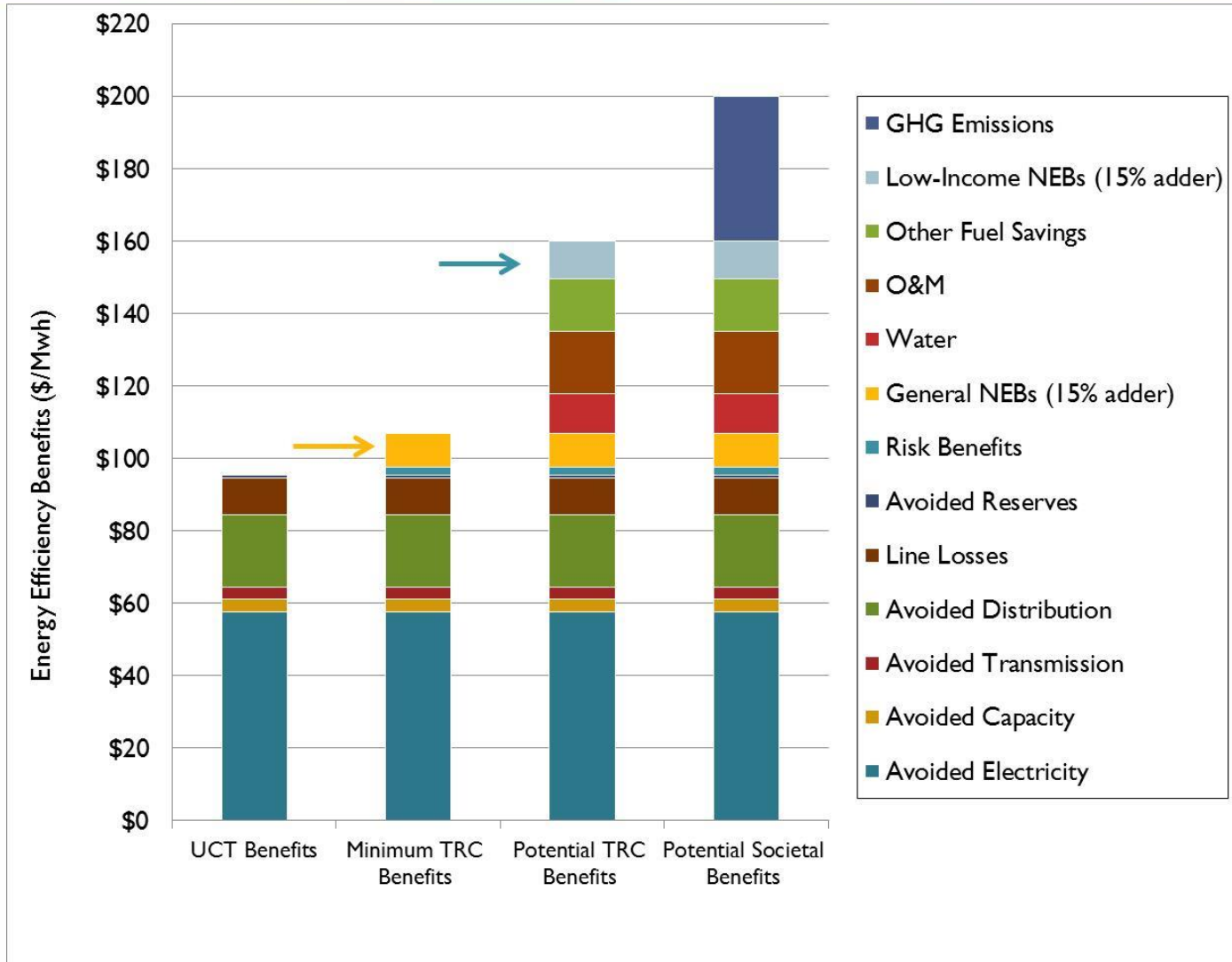
What is the Outcome of not Including NEBs?

- Many states ignore or significantly undervalue NEBs.
 - This is especially true for participant non-energy benefits.
- The outcome:
 - The results of the TRC test are skewed against efficiency.
 - The value of efficiency is significantly understated.
 - Less efficiency is identified as cost-effective.
 - Some key efficiency programs become uneconomic.
 - Less efficiency is implemented.
 - Customers pay higher costs than necessary.

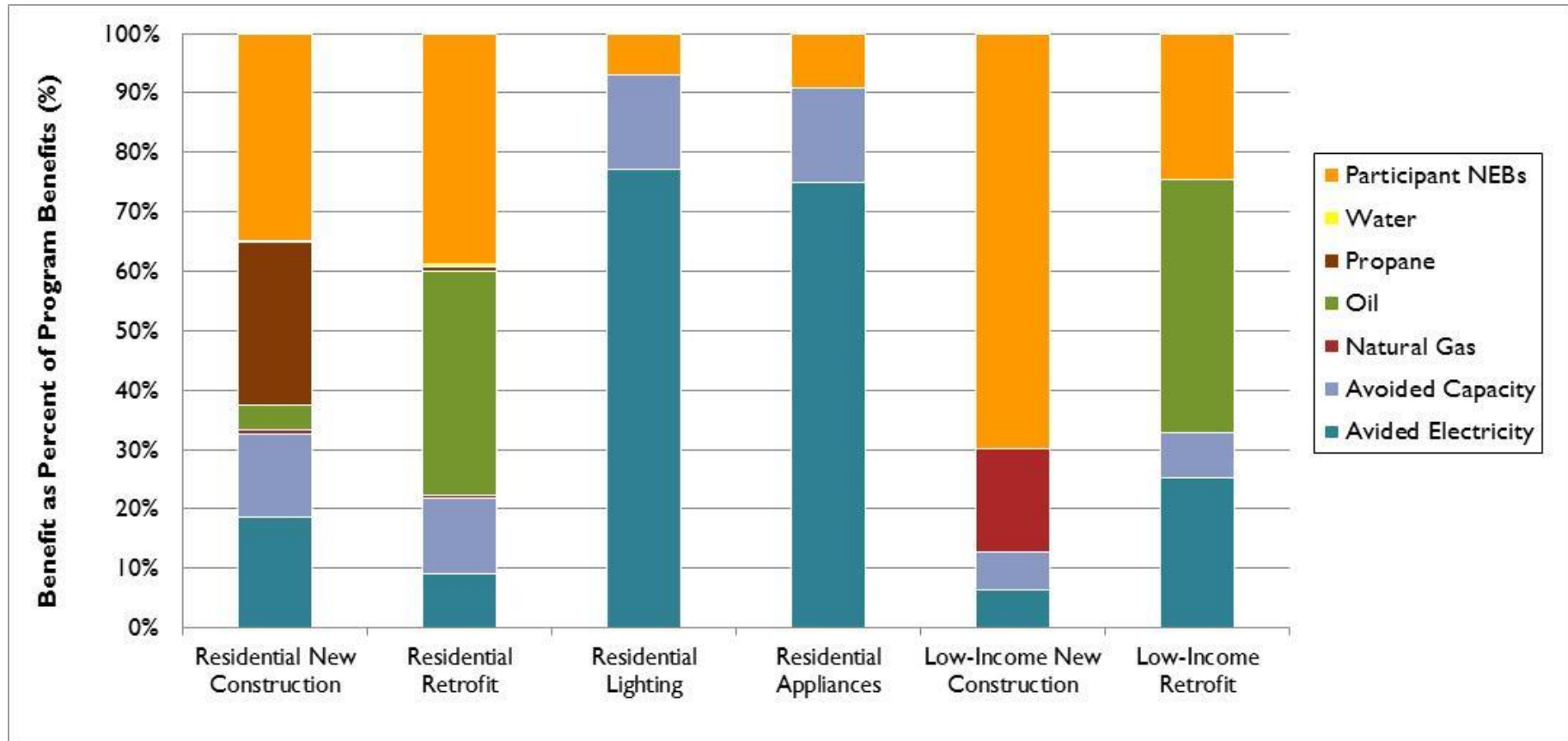
Why should NEBs be included in cost-effectiveness testing?

- Participant NEBs should be included in cost-effectiveness tests in order to ensure that the tests are internally consistent.
 - If the participating customer costs are included, then their benefits should be included as well.
 - Otherwise, the tests are inconsistent, skewed, and misleading.
- Participant's costs can be quite large.
- Participant's non-energy benefits can also be quite large.
 - These should not be excluded simply because they are more difficult to quantify and monetize than participant costs.
- Experience indicates that non-energy benefits are very important to many customers, sometimes more important than the energy benefits.
 - Many efficiency programs are successfully promoted to customers because of the non-energy benefits.

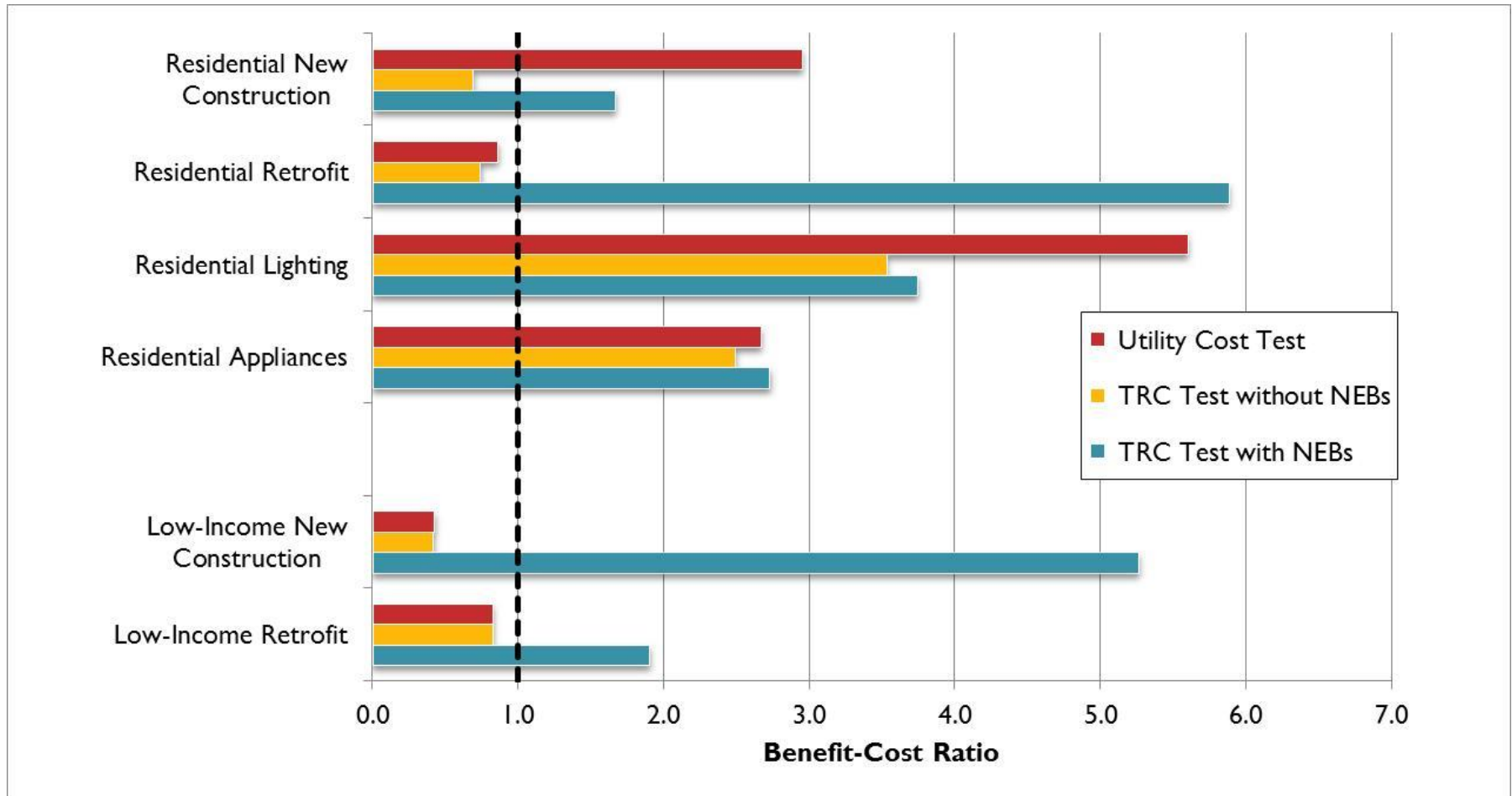
Non-Energy Benefits are Significant: VT Example



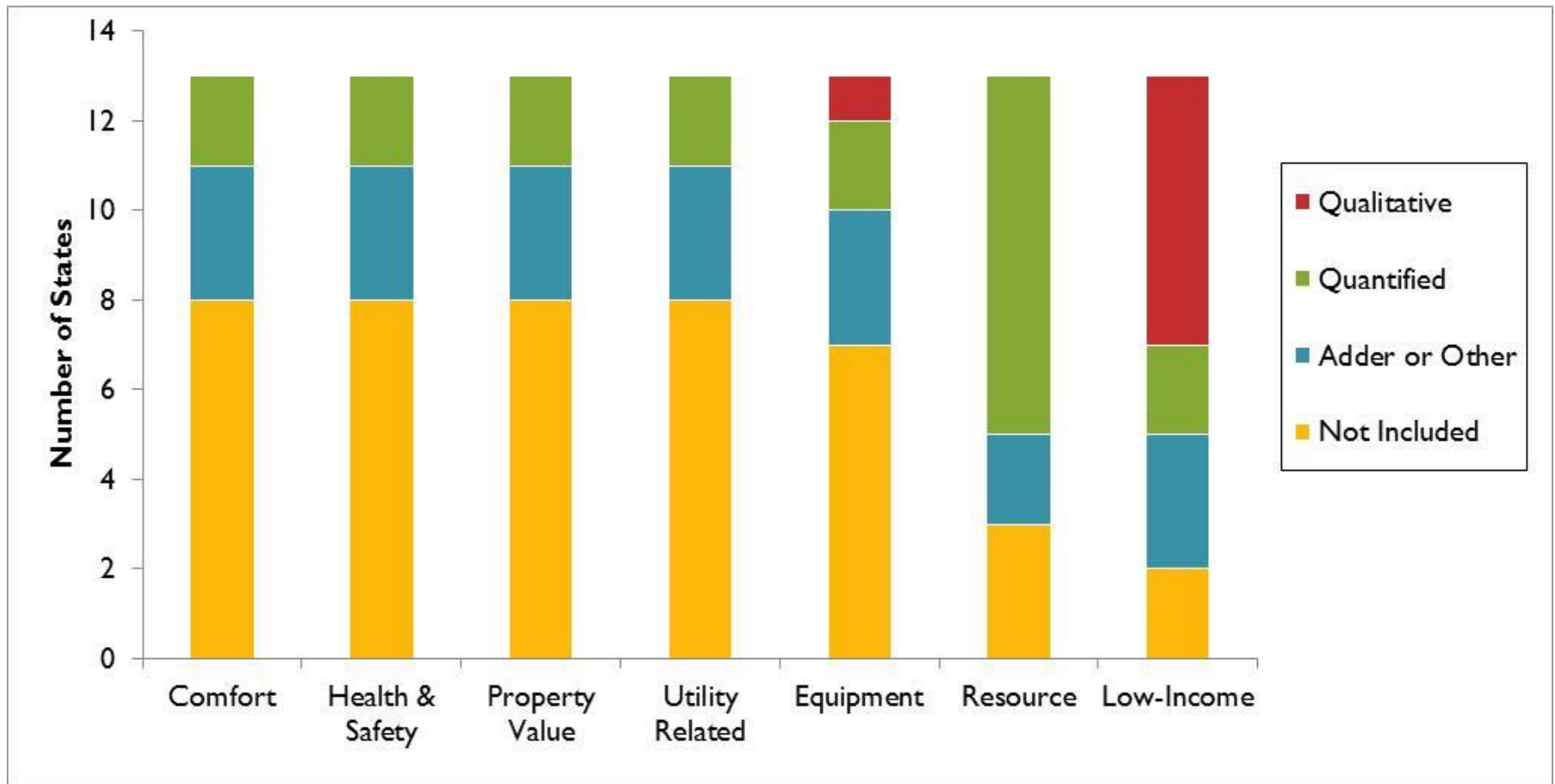
A More Detailed Approach to Non-Energy Benefits: MA Example



What is the impact of including NEBs in cost-effectiveness testing? MA Example



How are States Estimating Non-Energy Benefits?



How can NEBs be estimated?

Recognize that uncertainty can be addressed.

- Many of the EE planning assumptions contain uncertainty (e.g., fuel prices).
 - Using an approximation is better than assuming a value of zero.
1. Conduct a study to provide better estimates.
 - e.g., MA studies on residential and C&I NEBs.
 2. Begin with readily measurable non-energy benefits.
 - Such as resource benefits and O&M savings.
 - Move to more challenging ones later.
 3. Conduct sensitivity analyses.
 - e.g., for programs where there is likely to be a material impact.
 4. Consider proxies or adders.
 5. Consider hybrid approaches.
 - e.g., quantify readily measurable, and use a proxy for the others.

Customer Concerns Raised With Regard to Applying NEBs

1. Including NEBs in the TRC test is likely to expand the universe of cost-effective efficiency.
 - This may result in increased energy efficiency budgets, or
 - A more expensive mix of energy efficiency programs within given budgets.
2. Including NEBs in the TRC test will require electric and gas utility customers to pay for efficiency programs that result in benefits that are not related to the utility service.
 - These benefits could be seen as being outside the sphere of electric and gas utility responsibility.
 - e.g., Why should electric customers pay for participant oil savings, or for participant health and safety benefits?

Addressing Customer Concerns

- Overall customer benefits can be ensured by applying the Utility Cost test to the energy efficiency portfolio.
 - This will ensure that energy efficiency programs will reduce utility costs (i.e., reduce revenue requirements).
 - In the Massachusetts example above, under the Utility Cost test:
 - Utility benefits exceed utility costs by a factor of four.
 - Costs = \$195 mil; Benefits = \$773 mil; Net Benefits = \$578 mil
- Including NEBs helps achieve key energy policy goals.
 - Especially customer equity. In the absence of NEBs (especially participant NEBs) some key programs may appear to be uneconomic:
 - Low-income programs.
 - New construction programs.
 - Whole-house retrofit programs.
 - If these programs are screened out, then there will be less opportunity for some customers to benefit, reducing customer equity.

- Resource Value Framework
 - A framework of principles and recommendations to provide guidance for states to develop and implement tests that are consistent with sound principles and best practices.
- <http://www.nhpci.org/publicationsresources.html>

Erin Malone
Associate
Synapse Energy Economics
617-453-7021

emalone@synapse-energy.com
www.synapse.energy.com

Relevant Literature

- ACEEE 2012. American Council for an Energy Efficient Economy, “A National Survey of State Policies and Practices for the Evaluation of Ratepayer-funded Energy Efficiency Programs,” February 2012, available at: <http://www.aceee.org/research-report/u122>.
- CA PUC 2001. California Public Utilities Commission, “California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects,” October 2001, available at: http://www.energy.ca.gov/greenbuilding/documents/background/07-J_CPUC_STANDARD_PRACTICE_MANUAL.PDF.
- Daykin et al. 2012. Elizabeth Daykin, The Cadmus Group; Jessica Aiona, The Cadmus Group; Brian Hedman, Hedman Consulting, “Whose Perspective? The Impact of the Utility Cost Test,” December 11, 2012, available at: http://www.cadmusgroup.com/wp-content/uploads/2012/11/TRC_UCT-Paper_12DEC11.pdf.
- Eckman 2011. Tom Eckman, “Some Thoughts on Treating Energy Efficiency as a Resource,” ElectricityPolicy.com, May 2, 2011, available at: <http://www.electricitypolicy.com/archives/3118-some-thoughts-on-treating-energy-efficiency-as-a-resource>.
- Haeri and Khawaja 2013. Hossein Haeri and M. Sami Khawaja, “Valuing Energy Efficiency: The Search for a Better Yardstick,” Public Utilities Fortnightly, July 2013, available at: <http://www.fortnightly.com/fortnightly/2013/07/valuing-energy-efficiency?authkey=aa2986b87d0fbbce625f243752a462709bf972274a13deb4b7cc4cdcefd6a5a>.
- Neme and Kushler 2010. Chris Neme and Marty Kushler, “Is it Time to Ditch the TRC? Examining Concerns with Current Practice in Benefit-Cost Analysis.” 2010 ACEEE Summer Study on Energy Efficiency in Buildings, available at: <http://aceee.org/proceedings-paper/ss10/panel05/paper06..>
- Synapse 2012a. Synapse Energy Economics, Inc., “Best Practices in Energy Efficiency Program Screening: How to Ensure that the Value of Energy Efficiency is Properly Accounted For,” prepared for the National Home Performance Council, July 2012, available at: <http://www.synapse-energy.com/Downloads/SynapseReport.2012-07.NHPC.EE-Program-Screening.12-040.pdf>.
- Synapse 2012b. Synapse Energy Economics, Inc., “Energy Efficiency Cost-Effectiveness Screening: How to Properly Account for Other Program Impacts and Environmental Compliance Costs,” prepared for Regulatory Assistance Project, November 2012, available at: <http://www.synapse-energy.com/Downloads/SynapseReport.2012-11.RAP.EE-Cost-Effectiveness-Screening.12-014.pdf>.