144 Westminster Street
Suite 203
Providence, RI 02903
(401) 276-0600
www.env-ne.org

Rockport, ME
Boston, MA
Providence, RI
Hartford, CT
Ottawa, ON
Canada

May 17, 2013

Recommendations on Cost-Benefit Analysis
ENE Comments to the MA DPU Grid Modernization Docket

Introduction:

In the spirit of fostering a robust discussion of regulatory considerations for grid modernization, ENE offers the following comments on the role of cost benefit analysis. At the outset, we believe that to the extent reasonable, transparent cost-benefit analysis should be a significant factor in the Department's grid modernization decision-making.

ENE acknowledges that public, transparent cost benefit analysis might be more appropriate for some categories of grid modernization investments (i.e. customer-facing vs. grid-facing). Thus, we recommend that the distinctions among investments be an issue for further Department and stakeholder consideration.

The following recommendations are consistent with ENE's Grid Modernization Advisory Council (GMAC) proposal. ENE's regulatory proposal suggests that the Department adopt an analytical cost-benefit model with input from the GMAC and utilities, and selection or approval of grid modernization investments be informed by an evaluation of costs and benefits, among other factors as determined by the DPU. The GMAC proposal also recommends a comparative analysis of alternative investments or strategies (both traditional and grid modernization) that might achieve similar or better results.

Objective:
The Department should adopt a standardized cost-benefit framework for grid modernization investments and guidance for conducting analyses. Cost-benefit analysis is important to assure regulators, consumers, and other stakeholders that cost effective solutions are being proposed, and regulators need analysis to be able to make sound decisions. Cost-benefit analyses for grid modernization investments or approaches should require a meaningful assessment of the costs, benefits, and risks implicit in the investment. The cost-benefit framework adopted should include comparative cost-benefit assessments of alternative approaches (if any) to grid modernization investments, including examinations of different approaches for achieving the estimated benefits or objectives of the proposed investment.

Considerations and Recommendations:

- **Discount rate**: Energy efficiency program administrators in MA, VT, and RI use societal discount rates that are based on the long-term interest rate on a 10 year U.S. Treasury bond. RI and MA currently use a real interest rate of 1.15%. This rate reflects that fact that energy efficiency investments are predictable, low risk, and spread across all ratepayers. An alternative approach would be the use of a discount rate that is closer to the utility weighted average cost of capital. A recent report from the European Union suggests that the discount rate should balance the higher degree of risk associated with

grid modernization investments with the potential societal benefits of these investments. Discount rates between 3.5 and 5 percent have been proposed in Europe.[1] Discount rates used in the analyses, and the rationale for their use, should be clearly documented.

- **Uncertainty**: Uncertainty regarding the magnitude of benefits from grid modernization investments should be incorporated into the cost-benefit framework through the use of sensitivity analysis. The magnitude of benefits from some investments might be dependent on the timing of the investment or the rate of customer participation or customer behavior change or persistence, among other elements of uncertainty. These factors should be included in the sensitivity analysis. Sensitivity analysis also serves to identify the determining factors for a positive economic and societal outcome.
- **Stranded Costs**: From a strictly economic perspective, the costs of prior investments are sunk costs and new investments should be evaluated on their own merit.[2] However, these costs are still being paid by, and are relevant to, ratepayers. Therefore, stranded costs from prior investments should be recognized as a separate line item in any cost-benefit analysis.
- **Double-Counting**: The costs and benefits of existing statutorily required investments (e.g. existing energy efficiency programs or renewable portfolio requirements) should be evaluated separately from grid modernization proposals. Where there is program overlap or synergies, care should be taken to only count the costs and benefits of investments once.
- **Comparing Alternatives**: A cost-benefit assessment of grid modernization investments and approaches should include identification, analysis, and discussion of other investments or approaches (both "non-wires alternatives" or grid modernization and "traditional" investments, if any) that reasonably might achieve similar or better results. To the extent those expected benefits can be achieved through other investments, the cost benefit analysis should identify the incremental costs and benefits of the non-wires or grid modernization proposal.
- **Bundling Investments**: It may be appropriate to bundle a set of applications or investments together for cost benefit analysis purposes if the investments work together to deliver the intended functionality or objectives.[3]
- **Emerging Technologies**: To support the demonstration of emerging technologies, ENE supports the phased approach proposed by the Energy Storage Association.[4]

---

[1] European Commission Joint Research Center, Guidelines for conducting a cost-benefit analysis of smart grid projects. 2012.

[2] Illinois Statewide Smart Grid Collaborative, Collaborative Report. September, 2010.

[3] European Commission Joint Research Center, Guidelines for conducting a cost-benefit analysis of smart grid projects. 2012.

[4] From the Electric Storage Association regulatory framework proposal (introduced 5/14/2013):

"Phase 1: Utilities should have a small budget to be determined by the utilities and DPU (e.g., approximately $50 million), included in the rate base, which is devoted specifically to the pilot deployment of new technologies. These deployments should be fast-tracked to the field without regulatory hurdles.

Phase 2: Once a technology has been tested on the system, and a utility wants to expand the use of that technology, a more thorough regulatory proceeding should be adopted that includes cost-effectiveness analysis, utility reporting requirements and a cost-recovery mechanism.

Phase 3: After the technology has been utilized in the field for a sufficient period such that impacts are known, the technology should be considered as part of the class of regular transmission and distribution assets, and be eligible for funding by the utility through their annual budget for deployment without regulatory proceedings."

Recommendations on Costs and Benefits:

- Costs and benefits should be significant, and should be able to be reasonably and transparently quantified and monetized.
- Cost benefit analyses should identify the costs and benefits of grid modernization proposals that are incremental to the baseline or business-as-usual scenario (i.e. identify what costs and benefits would be incurred in the absence of the grid modernization investment).
- All assumptions should be clearly documented, including assumptions regarding costs, benefits, discount rate, time frame, investments' useful life, bundling of investments, etc.
- To the extent that they can be reasonably quantified and attributed to the investment, environmental and reliability benefits should be included. A reasonable effort should be made to estimate reliability benefits separately for different customer groups.[5]
- Where benefits cannot be reasonably quantified, a qualitative impact analysis or description of potential benefits may be included to provide the Department with the whole range of potential benefits. The Department may consider weighting the relative importance of qualitative benefits.[6]
- Estimated costs may include, but not be limited to:
    - Utility capital investments, including metering, infrastructure, software, communications, etc.
    - Operations & maintenance costs
    - Other program administrator expenses, including incentives paid to participants or third parties
    - Program administrator return, incentives, or rewards
    - Stranded costs
    - Customer costs, including transactions costs, changes in reliability, and other costs associated with participation (e.g. value of lost service due to demand response)
    - Costs associated with increased energy consumption, including environmental compliance costs and negative environmental impacts
- Potential benefits may include, but not be limited to:
    - Avoided capacity costs
    - Avoided energy costs
    - Avoided T&D costs
    - Avoided ancillary service costs
    - Reduced O&M costs
    - Other benefits associated with changes in the load curve
    - Market price suppression effect
    - Revenues from grid resources
    - Improved reliability
    - Avoided greenhouse gas emissions and other environmental externalities
    - Avoided environmental compliance costs
    - Value to third parties, including competitive suppliers

[5] Illinois Statewide Smart Grid Collaborative, Collaborative Report. 2010.

[6] European Commission Joint Research Center, Guidelines for conducting a cost-benefit analysis of smart grid projects. 2012.

Recommendations on Analytical Framework:

- The cost-benefit framework should capture costs and benefits realized by utilities, customers, society, and third parties. Energy efficiency models provide a good basis for capturing impacts on multiple parties.
- EPRI recommends directly applying traditional cost-benefit tests to grid modernization investments- "in general, these tests are applicable to smart grid evaluations because a major driver of smart grid benefits will be avoided supply costs realized through demand reductions, and assessing these impacts was the original driver behind the development of these models."[7]
- ENE contends that traditional cost-benefit tests are a good, flexible starting point for the Department's consideration. For example, the Total Resource Cost Test or Societal Cost Test could be modified to include the range of costs and benefits unique to grid modernization.
- ENE recommends that utilities should be required to utilize at least one cost-benefit framework, including the Total Resource Cost Test or Societal Cost Test.
- Additional financial analyses may be conducted. Alternatives may include the determination of deferred investment savings from non-wires or grid modernization investments through the use of net present value of the deferred revenue requirement analysis or the net present value of alternative investment proposals.[8,9]
- All known and measureable costs and benefits should be transparently incorporated.
- Potential non-regulated, third party revenue from grid modernization investments should be identified in the cost-benefit analysis.

Concluding Recommendations

- The cost-benefit analysis is meant to provide the DPU with valuable perspective on the economic value of the grid modernization investment and should be given considerable weight by the DPU in its overall evaluation.
- The DPU should consider the cost-benefit analysis in addition to other factors in the decision-making process, such as public policy objectives, potential for synergies that meet multiple objectives, ability to meet identified system needs, anticipated reliability of the investments, operational complexity and flexibility, implementation issues, customer impacts, and other relevant decision-making factors.
- The DPU should not approve investments that do not pass at least one cost-benefit test.

[7] Electric Power Research Institute, Methodological Approach for Estimating the Benefits and Costs of Smart Grid Demonstration Projects. January, 2010).
[8] Rhode Island Public Utilities Commission, Docket 4202, Standards for System Reliability Procurement. July, 2011.
[9] European Commission Joint Research Center, Guidelines for conducting a cost-benefit analysis of smart grid projects. 2012.

Summary Matrix:

Decision Points:	Recommendation
Should the DPU require explicit, public cost-effectiveness analyses?	Yes
Which cost-effectiveness test(s) should be used?	Cost-benefit analysis should be employed. ENE recommends at least a modified Total Resource Cost or Societal Cost Test.
Should different tests by used for different activities?	Multiple analyses or frameworks can be presented.
Should the C-E results be reviewed/approved by DPU prior to implementation?	Yes
Should the C-E results be reviewed/approved by DPU after implementation?	On-going EM&V should inform future investment decisions and cost benefit assumptions.
What costs should be included?	Capital, O&M, stranded costs, other potential costs
What benefits should be included?	Customer value, utility value, third party & competitive supplier value, ISO & wholesale market value, societal value, public policy value
What study period should be used?	TBD- useful life of the investments
What discount rate should be used?	TBD- rationale for the discount rate should be documented.
Should all costs and benefits be quantified?	Yes, to the extent possible.
If not, how should qualitative impacts be accounted for?	The C/B analysis is not the only factor in decision-making; DPU and utility decision making should also include an assessment of qualitative impacts, public policy objectives, etc.
How should reliability be accounted for?	To the extent reasonable, reliability impacts should be quantified and monetized for different customer groups.
How should risk be accounted for?	Risk and uncertainty should be addressed through the presentation of scenario analyses.
What type of evaluation, measurement and verification will be required?	On-going
What is the objective of the cost-benefit analysis?	See above
How should overlap between activities be accounted for?	Investments should not be double-counted. Existing statutorily required investments should be counted separately.