

To: New Jersey Clean Energy Council; Energy Efficiency Subcommittee; Renewable Energy Subcommittee

From: Center for Energy, Economic & Environmental Policy

CC: Mike Ambrosio, Applied Energy Group

Date: 1/23/2009

Re: Guidelines for Public Entity Evaluating Energy Efficiency and Renewable Energy Proposals: Request for Input

The Center for Energy, Economic & Environmental Policy (CEEEP) has been asked by the New Jersey Board of Public Utilities' Office of Clean Energy to develop Draft Guidelines for evaluating the energy cost savings and cost effectiveness of renewable energy and energy efficiency proposals for public entities in response to New Jersey Assembly Bill No. 844. Assembly Bill No. 844 allows local public entities to enter into contracts of up to 15 years for energy conservation or provisions of renewable energy production at buildings owned by such entities. In the process of compiling these guidelines, CEEEP would like to solicit input and comments from New Jersey's Clean Energy Council and its Subcommittees.¹

CEEEP has proposed using a cost-benefit test to evaluate the cost-effectiveness of specific projects. This cost-benefit test will be integrated into the current Protocols to Measure Resource Savings, which will be used to calculate the energy savings for specific energy efficiency measures. As part of the development of this framework, CEEEP would like comments on the following inputs of the cost-benefit analysis:

- Discount Rate: Use the New Jersey Bond Rating, Specific Municipal Bond Ratings?
- Retail Natural Gas Price Projections: Applicable to Local Public Entities
- Retail Electricity Price Projections: Applicable to Local Public Entities
- Electricity Savings from various energy efficiency measures per year: expected to be provided by the Energy Service Company (ESCO)²
- Natural Gas Savings from various energy efficiency measures per year: expected to be provided by the ESCo
- Available tax credits and incentives for energy efficiency measures: Federal, State, Local, BPU, and Clean Energy Program incentives for measures.
- Incremental Capital Costs of energy efficiency measures: Provided by ESCo

Any input and comments will be considered in the analysis.

¹ NJ State Legislature (2008). Assembly Bill No. 844.

² An ESCo is a professional business providing a broad range of comprehensive energy solutions including designs and implementation of energy savings projects, energy conservation, energy infrastructure outsourcing, power generation and energy supply, and risk management.



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After input is received and a revised version of the protocols is generated, a workbook will be developed for the public entities to aid them in calculating the cost-effectiveness of the energy efficiency projects.

The attached Appendix provides a Draft version of the proposed methodology for evaluating energy efficiency and renewable energy projects for local public entities.

Public Entity Energy Efficiency and Renewable Energy Cost Savings

Protocols¹

The New Jersey State Legislature passed Assembly Bill No. 844 which allows certain local public entities to enter into contracts of up to 15 years for energy conservation or provisions of renewable energy production at buildings owned by such entities. As part of Bill No. 844 the Board of Public Utilities was tasked with establishing a methodology for computing energy cost savings and energy generation costs for these projects.²

Energy Efficiency Contracts

Protocols

The Participant Cost Test will be used to determine the cost-effectiveness of energy efficiency projects. The Participant Cost Test includes both the participant's costs and benefits to determine the overall cost-effectiveness of the project. The general form of the equation is:

$$\text{Participant Net Benefit} = \text{Total Participant Benefits} - \text{Participant Costs}$$

To determine participant benefits, the net present value of the incentives paid to the participant, tax credits, the yearly electricity bill reductions, and the yearly natural gas bill reductions are summed.³ The yearly electricity bill reductions and yearly natural gas bill reductions are dependent on the annual savings from each component and the retail price projection for each component. Annual savings are dependent on the energy efficiency measure being installed. These savings can be calculated using the equations in this document using each measure's specific equation.

To determine participant costs, the net present value of the capital incremental costs and yearly incremental costs are summed. Capital and yearly incremental costs are dependant on each the measure.

The Participant Cost Test is the measure of the quantifiable benefits and costs to the customer attributed to participation in a program.⁴ The benefits to the participant are equal to the sum of any participant incentives paid, any reductions in bills, and any federal or state tax deductions or credits. Participant costs include any out-of-pocket costs associated with the program.

¹ New Jersey Board of Public Utilities (2007). *New Jersey Clean Energy Program Protocols to Measure Resource Savings*. Trenton, NJ.

² NJ State Legislature (2008). Assembly Bill No. 844.

³ Net present value is defined as the total present value of a time series of cash flows. It is the standard method for using the time value of money to appraise long term projects.

⁴ All cost test definitions are from *California Standard Practice Manual*, Economic Analysis of Demand-Side Programs and Projects, October 2001.

Algorithms⁵

Participant Cost Test = (Participant Benefits + Natural Gas Costs) - Participant Costs

$$PCT = \left[\left(\sum_t^M \left[\frac{(TC * M_T) + (IP * M_T) + (BR * M_T)}{(1+i)^n} \right] \right) + \left(\sum_t^M \left[\frac{(P_G * G_C) * M_T}{(1+i)^n} \right] \right) \right] - \left(PC_Y * M_T + \sum_t^M \frac{PC_Y * M_T}{(1+I)^n} \right)$$

Definition of Terms

- TC = Tax Credits
- IP = Incentives Paid
- BR = Bill Reductions
- M_t = Total Number of Measures
- P_g = Retail Natural Gas Price
- G_c = Incremental Gas Savings
- PC_c = Capital Participant Costs
- PC_y = Yearly Participant Costs
- i = Discount Rate
- n = Life of Measure

Component	Type	Value	Sources
TC	Variable		Application
IP	Variable		Application
BR	Variable		Application
M _t	Variable		Application
P _g	Fixed		
G _c	Variable		Application
PC _c	Variable		Application
PC _y	Variable		Application
i	Fixed		
n	Variable		Application

⁵ Note: Depending on the negotiated contract, the Tax Credits and/or Incentives may be paid to the ESCo or the public entity. The Participant Cost Test takes the point of view of the public entity, so Tax Credits and Incentives may not be included in the calculation.

Renewable Energy Contracts

Protocols

The measurement plan for renewable energy contracts is based on the algorithms that determine the energy cost savings from a negotiated power purchase agreement renewable energy contract. Savings are calculated by calculating the relative difference in rates and multiplying by the total amount of renewable energy purchased. Input is based in fixed assumptions and data supplied from the renewable energy contract application form.

Algorithms

$$\text{Energy Cost Savings (\$)} = \sum_t \frac{(Rate_{eu} - Rate_{ppa}) * Elec_{ppa}}{(1 + i)^n}$$

Definition of Terms

Rate_{eu} = Electric Utility Retail Electricity Rate

Rate_{ppa} = Negotiated Power Purchase Agreement Electricity Rate

Elec_{ppa} = Electricity Purchased Through Power Purchase Agreement

i = Discount Rate

n = Length of Power Purchas Agreement (in years)

Component	Type	Value	Sources
Rate _{eu}	Fixed		
Rate _{ppa}	Variable		Application
Elec _{ppa}	Variable		Application
i	Fixed		
n	Variable		Application