



STATE OF NEW JERSEY
Board of Public Utilities
Two Gateway Center
Newark, NJ 07102
www.nj.gov/bpu/

CLEAN ENERGY

IN THE MATTER OF COMPREHENSIVE ENERGY)
EFFICIENCY AND RENEWABLE ENERGY RESOURCE)
ANALYSIS FOR THE 2009 -2012: GUIDELINES FOR)
CALCULATING ENERGY SAVINGS)

ORDER

DOCKET NO. EO09020128

(SERVICE LIST ATTACHED)

BY THE BOARD:

Background and Procedural History

P.L. 2008, Chapter 83, enacted on September 10, 2008, amends N.J.S.A. 18A:18A-42; 18A:64A-25.28 and 40A:11-15. (the Legislation) to allow local boards of education, county colleges and local government entities to enter into contracts for a term not to exceed 15 years for the provision of energy conservation and renewable energy. The Legislation mandates that "these contracts shall be entered into only subject to and in accordance with guidelines promulgated by the Board of Public Utilities establishing a methodology for computing energy cost savings. In this Order the Board will consider proposed guidelines required by the Legislation.

Proposed Guidelines

Several standard cost benefits tests have been used historically in both New Jersey and by many other states across the country. The tests that have become standard practice across the country are set out in the *California Standard Practice Manual, Economic Analysis of Demand Side Programs and Projects*. These tests include the Participant Cost Test which assesses the costs and benefits of energy efficiency and renewable energy projects from the perspective of the customer.

By Order dated January 18, 2008, Docket No. EO07120961, the Board approved Protocols to Measure Energy Savings (the Protocols). The Protocols estimate energy savings in units of energy such as kilowatt hours or therms. The intent of the guidelines under discussion herein is

to monetize the estimated energy savings or renewable energy generation and to compare the savings in dollars to the costs.

The Participant Cost Test compares the net cost to a customer, including capital costs, financing costs and ongoing operation and maintenance (O&M) costs, less any rebates, tax credits or other incentives, to the savings realized from installation of the measures including the cost of avoided purchases of electricity and natural gas and O&M savings. A result greater than 1.0 demonstrates that the savings exceed the costs.

The Legislation allows school boards, county colleges and local government entities to enter into long-term contracts for the purchase of energy efficiency or renewable energy services. The Participant Cost Test will provide school boards with the information needed to make informed decisions regarding the benefits of proposed energy efficiency and renewable energy projects and will provide a basis for comparing competing proposals.

Subsequent to the enactment of the Legislation, the Office of Clean Energy (OCE) engaged Rutgers University Center for Energy, Economic and Environmental Policy (CEEPP) to develop draft guidelines for computing energy cost savings for energy efficiency and renewable energy systems. CEEPP proposed that the Participant Cost Test be used to determine the cost-effectiveness of energy efficiency projects. The Participant Cost Test estimates both the participant's costs and benefits to determine the overall cost-effectiveness of the project. The general form of the equation is:

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

The proposed guidelines included algorithms for calculating energy savings incorporating the concepts set out above and recommend standard values for certain inputs.

The proposed guideline for renewable energy projects is based on algorithms that determine the energy cost savings from a negotiated power purchase agreement. Calculating the relative difference in rates and multiplying by the total renewable energy purchased will show the resulting savings. Input is based on fixed assumptions and data supplied from the renewable energy contract application form.

At the January 21, 2009 Energy Efficiency (EE) Committee meeting OCE alerted meeting participants that it would be circulating draft guidelines for comment. On January 23, 2009, the OCE circulated draft guidelines prepared by CEEPP to the Clean Energy Council¹ and the EE and Renewable Energy (RE) committees and requested comments on the proposal. CEEPP also requested comment on a number of cost benefit input values.

Summary of Comments

The only comments submitted were from Nautilus Solar Energy (Nautilus). Nautilus recommended adding language that would exempt PPA's from the statutory requirement that multiyear contracts include a clause making such contracts subject to the availability and appropriation annually of sufficient funds. Nautilus recommended that the term participant be clarified to mean the utility ratepayer; that the language be clarified to confirm that the Participant Cost Test includes tax incentives; and that for renewable energy contracts that the calculation should not include any discount rate with respect to savings.

¹ The Clean Energy Council is open to any member of the public and functions as a public stakeholder group.

Response: The Board has no authority to exempt PPA's from the statutory requirement that multiyear contracts include a clause making such contracts subject to the availability and appropriation annually of sufficient funds. The proposed guidelines have been modified to clarify that the participant is the utility ratepayer and that the Participant Cost Test includes tax incentives.

The OCE disagrees with the recommendation that for renewable energy contracts the calculation should not include any discount rate with respect to savings. Renewable energy contracts could include payment streams where prices exceed alternative costs in some years and are lower than alternative costs in other years. In these situations it is necessary to discount the savings to determine if the contract produces overall savings over its term.

Subsequent to the receipt of comments and further discussions with the OCE, CEEEP submitted revised proposed guidelines that incorporated the clarifications discussed above. OCE has reviewed the revised proposed guidelines for calculating energy cost savings and believes they represent a reasonable approach to meeting the requirements of the legislation and will allow for public school, county colleges and local government entities to develop energy efficiency and renewable energy projects as anticipated by the Legislation.

OCE has also reviewed the input values proposed by CEEEP. Some input values, such as the estimated annual increase in electric or natural gas prices, use established, well known forecasts prepared by the US Department of Energy, Energy Information Administration (EIA) which are published on the EIA website. Others, such as the appropriate discount rate, were recommended by CEEEP utilizing its best judgment. OCE notes that although comments were requested regarding specific input values, no comments were received regarding the input values. OCE has reviewed the proposed input values and believes they are reasonable. Based on the above, OCE recommends approval of the guidelines for calculating energy cost savings.

Discussion and Findings

Public schools, county colleges and local government entities face significant obstacles to developing energy efficiency and renewable energy projects, primarily difficulty in obtaining the upfront capital needed to finance such projects. The Board supports the goal of this Legislation of increasing opportunities for public schools, county colleges and local government entities to participate in energy efficiency and renewable energy by allowing schools to enter into long term contracts for the purchase of energy efficiency and renewable energy, thereby foregoing the need to raise the upfront capital. The proposed guidelines are intended to allow public schools, county colleges and local government entities to proceed to enter into long term contracts for energy efficiency and renewable energy while ensuring that the contracts result in energy cost savings to the schools.

As noted above by the OCE, the Participant Cost Test proposed by CEEEP has been utilized in New Jersey and other states in the past and is included in the *California Standard Practice Manual, Economic Analysis of Demand Side Programs and Projects*. The test is a straightforward assessment of the costs and benefits of proposed energy efficiency and renewable energy projects that will provide school boards, county colleges and local government entities with the information needed to make informed decisions regarding the benefits of proposed energy efficiency and renewable energy projects and will provide a basis for comparing competing proposals. The Board has also reviewed the input values proposed by CEEEP and concurs with the OCE that they are reasonable as discussed above.

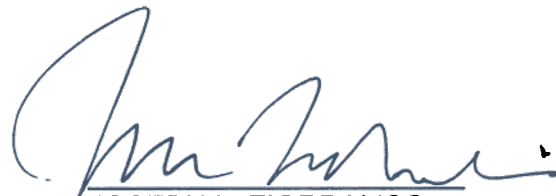
Therefore, the Board **HEREBY APPROVES** the proposed guidelines entitled *Public Entity Energy Efficiency and Renewable Energy Cost Savings Guidelines* appended to this Order and directs the OCE to work with CEEEP to develop a workbook that will be posted on the Board's website and made available to school boards, county colleges and local government entities to assist them with complying with the requirements of the Legislation.

DATE: 2/27/09.

BOARD OF PUBLIC UTILITIES
BY:


JEANNE M. FOX
PRESIDENT


FREDERICK F. BUTLER
COMMISSIONER

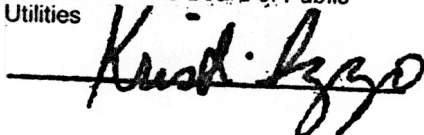

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I HEREBY CERTIFY that the within
document is a true copy of the original
in the files of the Board of Public
Utilities



Public Entity Energy Efficiency and Renewable Energy Cost Savings Guidelines

February 20, 2009

Protocols

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.¹

Energy Efficiency Contracts (If the Public Entity invests capital)

Protocols

The Participant Cost Test will be used to determine the cost-effectiveness of energy efficiency projects where the entity invests their own capital on the project.² 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 the measure's specific equation. Retail price projections are variable and dependent on the specific customer and the utility that services them.

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 dependent on 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

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

² Note: The participant is from the perspective of the utility ratepayer.

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.

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.

Algorithms⁵

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

$$PCT = \left[\left(\sum_t^M \left[\frac{(TC * M_T) + (IP * M_T) + (BR * M_T)}{(1+i)^n} \right] \right) + \left(\sum_t^M \left[\frac{(P_g * G_c) * M_T}{(1+i)^n} \right] \right) \right] - \left(PC_c * M_T + \sum_t^M \frac{PC_y * M_T}{(1+i)^n} \right)$$

TC = Tax Credits

IP = Incentives Paid

BR = Bill Reductions

PC_c = Capital Participant Costs

PC_y = Yearly Participant Costs

P_g = Retail Natural Gas Price

G_c = Incremental Gas Savings

M_t = Total Number of Measures

i = Discount Rate

n = Years

Definition of Terms

TC = Tax Credits and Incentives⁶

IP = Incentives Paid

BR = Bill Reductions

M_t = Total Number of Measures

P_g = Retail Natural Gas Rate

P_e = Retail Electricity Rate

G_c = Incremental Gas Savings

PC_c = Capital Participant Costs

PC_y = Yearly Participant Costs

E_g = Yearly Natural Gas Price Escalation Rate

E_e = Yearly Electricity Price Escalation Rate

i = Discount Rate

⁵ Note: This equation is an example for the Participant Cost Test using gas savings. If there are electric savings you must substitute the gas price and incremental savings for the measure with electric prices and incremental savings.

⁶ 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.

n = Years

Component	Type	Value	Sources
TC	Variable		Application
IP	Variable		Application
BR	Variable		Application
M _t	Variable		Application
P _g	Variable		Application ⁷
P _e	Variable		Application
E _g	Fixed	2.4% per year	Energy Information Administration
E _e	Fixed	2.2% per year	Energy Information Administration
G _c	Variable	Calculated by New Jersey Protocols to Measure Resource Savings	New Jersey Protocols to Measure Resource Savings ⁸
PC _c	Variable		Application
PC _y	Variable		Application
i	Fixed	8%	New Jersey Bond Rating
n	Variable		Application

Energy Efficiency Contracts (If the Public Entity does not invest capital)

Protocols

The measurement plan for energy efficiency contracts where the entity does not invest their own capital is based on the algorithms that determine the energy cost savings from a negotiated power purchase agreement energy efficiency contract. Savings are calculated by calculating the relative difference in rates and multiplying by the total amount of energy purchased through the power purchase agreement. Input is based on fixed assumptions and data supplied from the renewable energy contract application form.

Algorithms

$$\text{Energy Cost Savings (\$)} = (\text{Rate}_{\text{eu}} - \text{Rate}_{\text{ppa}}) * \text{Elec}_{\text{ppa}}$$

Definition of Terms

⁷ Retail natural gas and electricity rates are either the utility tariff rate if the commodity is supplied by the utility or a negotiated contract rate if the customer is served by a third party supplier. Retail rates will be escalated at the commodity's escalation rate.

⁸ New Jersey Board of Public Utilities (2007). *New Jersey Clean Energy Program Protocols to Measure Resource Savings*. Trenton, NJ.

Rate_{eu} = Electric Utility Retail Electricity Rate
 Rate_{ppa} = Negotiated Power Purchase Agreement Electricity Rate
 Elec_{ppa} = Electricity Purchased Through Power Purchase Agreement

Component	Type	Value	Sources
Rate_{eu}	Variable		Application
Rate_{ppa}	Variable		Application
Elec_{ppa}	Variable		Application

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

$$\text{Energy Cost Savings (\$)} = (\text{Rate}_{\text{eu}} - \text{Rate}_{\text{ppa}}) * \text{Elec}_{\text{ppa}}$$

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

Component	Type	Value	Sources
Rate_{eu}	Variable		Application
Rate_{ppa}	Variable		Application
Elec_{ppa}	Variable		Application