



2007 Evaluation and Research Plan

New Jersey's Clean Energy Program

Energy Efficiency and Renewable Energy Programs

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I. Introduction

This report is the fourth evaluation and research plan prepared by the Center for Energy, Economic and Environmental Policy (CEEPP) since 2004. It sets out a proposed process for establishing and executing a detailed evaluation and research plan for New Jersey's Clean Energy Program. The three previous plans issued by CEEPP, and available on its website, are:

- The 2004-2005 Evaluation and Research Plan Phase 1 Report,¹ which set out general strategies to be employed in evaluating programs and identified evaluation activities with a high priority that should be initiated in 2005.
- The Revised 2004-2005 Evaluation and Research Plan Phase 2 Report,² which identified specific evaluation and research activities proposed for 2005 for each program and a timeline for implementing the recommended activities.
- The 2006 Evaluation and Research Plan,³ which identified specific evaluation and research activities proposed for 2006.

This 2007 Evaluation Plan is predicated on CEEPP having a contract in place with the Office of Clean Energy by February 28, 2007.

Major evaluation studies recommended in past evaluation plans that are currently underway include the following:

- **Energy Efficiency Market Assessment:** Summit Blue Consulting, Inc, (Summit Blue) submitted a draft final energy efficiency market assessment report, which includes a number of recommended modifications to the energy efficiency programs⁴.
- **Renewable Energy Market Assessment:** Summit Blue was also selected to perform a renewable energy market assessment in October 2006. and a final report is expected by May of 2007.
- **Impact Evaluation:** Treasury released an RFP for impact evaluation services and is in the process of finalizing selection of a contractor to perform the evaluation. The impact evaluation is expected to commence in early 2007.

This report recommends a number of evaluation activities for 2007 related to completing these studies and implementing any recommendations included in these studies. Appendix A of this report includes a full list of previous evaluation plans and reports.

The Board of Public Utilities (Board) has recently commenced, or is expected to commence in the near future, several major policy initiatives that may impact the energy efficiency and renewable energy programs. These initiatives include:

¹ New Jersey Clean Energy Program 2004-2005 Evaluation and Research Plan, Phase I: Activities to be Initiated 2004; Center for Energy, Economic and Environmental Policy, August 5, 2004.

² Revised 2004-2005 Evaluation and Research Plan, New Jersey Clean Energy Program, Energy Efficiency and Renewable Energy Programs; Center for Energy, Economic and Environmental Policy, October 12, 2004.

³ 2006 Evaluation and Research Plan, New Jersey's Clean Energy Program, Energy Efficiency and Renewable Energy Programs; Center for Energy, Economic and Environmental Policy, February 4, 2005.

⁴ Energy Efficiency Market Assessment of New Jersey Clean Energy Programs – Draft Report, Summit Blue Consulting, LLC, May 26, 2006.

- Transitioning program management from the Office of Clean Energy and utilities to Market Managers selected through a competitive procurement process
 - Honeywell Utility Solutions has been selected to manage the residential energy efficiency programs and the renewable energy programs
 - TRC Energy Services has been selected to manage the commercial and industrial energy efficiency programs
- Initiating a proceeding to determine funding levels for energy efficiency and renewable energy programs for the years 2009-2012
- Transitioning from rebate based to more market based incentives for renewable energy measures
- Developing a State Energy Master Plan

This evaluation plan was developed taking into consideration studies that will be needed to support these policy initiatives. For example, updating market potential studies will support the Board's anticipated funding level proceeding, the renewable energy market assessment will support the Board's proceeding related to transitioning from rebate based to more market based incentives for renewable energy measures, and process evaluations will support the transition to Market Managers. Each of the major initiatives identified above is discussed in more detail below including how recommended evaluation activities will support these initiatives.

As stated in the previous plans, the two primary purposes for conducting evaluations and research regarding energy efficiency and renewable energy programs are: 1) to reliably document program effects, and 2) to inform program designs and operations to be more cost effective at meeting energy savings or other specified program goals. The 2006 plan added a third objective, which is to establish a formal methodology for assessing the costs and benefits of the energy efficiency and renewable energy programs and for developing the portfolio of programs that best meets the goals and objectives established by the Board.

Evaluation and research activities are intended to provide a continual feedback loop to policymakers, program administrators and program managers. This report summarizes evaluation activities recently completed or currently underway, identifies major issues facing the Board related to New Jersey's Clean Energy Program, and explains how the evaluation activities proposed in this and past plans will support the Board's decision making process as it addresses these issues.

CEEEP recommends that the Clean Energy Council, through its committees, review proposed evaluation and research activities and provide feedback to the Office of Clean Energy, the full Clean Energy Council and program managers. Appendix B includes a proposed schedule for review and approval of this Evaluation and Research Plan.

Once the Office of Clean Energy approves the proposed Evaluation and Research Plan, CEEEP will review the requirements of the plan and identify where demonstrated expertise resides within Rutgers University and where a need exists to procure outside contractors to perform the work. CEEEP will either commence performance of the evaluation and research activities or assist in the preparation of requests for proposals to be issued by the New Jersey Department of the Treasury (Treasury) to engage outside contractors to perform the work. CEEEP will assist

Treasury in the procurement of evaluation contractors by developing draft RFPs, assisting in the selection of contractors, and overseeing the work of selected contractors.

Framework for Program Evaluation

The following summarizes the framework for program evaluation included in previous evaluation reports issued by CEEEP:

The chief goal of evaluation is to study objectively the effects of the programs. *Qualitative effects* involve customers' awareness and understanding of the benefits of the programs and the energy efficiency and renewable energy technologies. They also include assessments of the program's design and implementation, barriers that limit program performance, changes to codes and standards, and, other actions that signify progress towards the programs goals.

Quantitative effects include kW, kWh and therm reductions or generation due to efficiency improvements or the installation of renewable energy technologies resulting from the program. It also includes all the different types of costs associated with the programs. *Performance indicators* include quantitative and qualitative measures specifically designed to monitor progress towards the goal of market transformation.

The objectives of evaluation of the programs include:

- To assess how well each program is meeting its goals
- To support assessments of energy impacts
- To provide timely feedback to program managers
- To provide the necessary information for decision-making

While program evaluation is driven by these broad objectives, it is important to emphasize that evaluations must be tailored to the specific needs of each program. The approved programs differ widely in accordance with the customers targeted, services provided, program designs, and specific objectives. These programs require different approaches to evaluation. In addition, the need for timely feedback means that program evaluation depends on the implementation schedule of the program and evolves according to changing needs, rather than serving as a static, annual snapshot.

Baseline information is vitally important to assessing market changes. It provides insight on what would have been done without a program, and thus provides the basis for measuring changes attributable to the program.

The major categories of recurring evaluations that should be performed every few years include:

- Market potential studies
- Market assessments
- Impact evaluations
- Process evaluations
- Tracking system assessments

Each of these are defined and discussed further below. These evaluations are intended to track changes in the marketplace due to the programs or other factors, the success of the programs, and

to improve the efficiency of program delivery. Recommendations that result from these studies are used to update programs and program designs. Section II discusses specific evaluation activities recommended for 2007 related to each of the above.

In addition, this report discusses evaluation activities that should be performed each year to support the annual program and budget development process including:

- Annual program evaluation
- Updating protocols for measuring energy savings
- Updating the program review processes and portfolio analysis

Each of these is discussed further in Section III.

II. Major, Recurring, Non-Annual Evaluation Activities

There are a number of evaluation activities that were recommended in past evaluation plans issued by CEEEP that are currently underway that will carry over into and require additional work to be performed in 2007. CEEEP also recommends a number of new initiatives for 2007 discussed below.

The major evaluation activities recommended in past reports that are currently underway include the following:

- **Energy Efficiency Market Assessment:** Summit Blue's has submitted a draft final energy efficiency market assessment report, which includes a number of recommended modifications to the energy efficiency programs. The draft report is awaiting final review from the Office of Clean Energy and is expected to be released shortly.
- **Renewable Energy Market Assessment:** Summit Blue was also selected to perform a renewable energy market assessment. This evaluation commenced in October 2006 and a final report is expected by May of 2007.
- **Impact Evaluation:** Treasury released an RFP for impact evaluation services and is in the process of finalizing selection of a contractor to perform the evaluation. The impact evaluation is expected to commence in early 2007 and be completed in late 2007 or early 2008.

This section of the report proposes several evaluation activities for 2007 related to the above activities as well as several new evaluation activities. Each of the following major evaluation activities are discussed below:

- Market potential studies
- Market assessments
- Impact evaluations
- Process evaluations
- Tracking system assessments

Market Potential Studies

Market potential studies assess the technical, economic and market potential for energy efficiency and renewable energy measures. Technical potential is an estimate of the total level of energy efficiency or renewable energy resources available unrestrained by economics.

Economic potential screens for available energy efficiency and renewable energy resources that are economically viable compared to other available alternatives, and, market potential estimates the realistic level of economic resources that can be developed taking into consideration other market factors.

New Jersey's Electric Discount and Energy Competition Act of 1999 (EDECA) requires the Board of Public Utilities to commence a proceeding every four years, known as the Comprehensive Resource Analysis (CRA) proceeding, and determine energy efficiency and renewable energy programs and funding levels for the succeeding four years. The last CRA proceeding, which concluded in 2004, established programs and funding levels for the years 2005 through 2008.

Two market potential studies were performed in 2004 to provide the Board with information to consider in the 2004 CRA proceeding. KEMA, Inc.⁵ performed an energy efficiency market potential study and Navigant Consulting, Inc.⁶ performed a renewable energy market potential study.

The Office of Clean Energy has indicated that it anticipates that the Board will initiate its third CRA proceeding in 2007 to set funding levels for the years 2009-2012. CEEEP will coordinate the development of updated market potential studies to support the Board's anticipated funding level proceeding.

Specifically, CEEEP will review the market potential studies prepared by Navigant and KEMA, will review other information publicly available and provided as part of the Energy Master Plan process, and will update those studies where sufficient information is available. CEEEP will coordinate with the Office of Clean Energy and provide recommendations regarding whether any additional studies are required to update the market potential studies prepared in 2004.

Deliverables: CEEEP will provide the Office of Clean Energy with updated market potential studies by July 31, 2007.

Market Assessments

Market assessments address market attributes such as customer or market actor awareness and attitudes, program activity, product and service availability, common practice, prices, new products, codes and standards, amount and distribution of energy savings, and market share of energy efficient products and services. Market assessments should be performed every few years to help gauge the success of the programs and to provide updated market information to inform changes to programs.

Energy Efficiency Market Assessment

Summit Blue's energy efficiency market assessment included an assessment of various aspects of the energy efficiency programs and marketplace including:

- Performance indicators
- Market share
- Baseline savings
- Incremental costs
- Market barriers
- Codes and standards
- Rebate levels
- Goals

This market assessment had three main objectives as follows:

- Update baseline studies and estimates used as performance indicators

⁵ New Jersey Energy Efficiency and Distributed Generation Market Assessment - Final Report, KEMA, Inc., August 2004.

⁶ New Jersey Renewable Energy Market Assessment - Final Report, Navigant Consulting, Inc., August 2, 2004.

- Assess the energy efficiency markets building upon recent market potential studies
- Provide information from the evaluation assessments and work efforts, as well as other studies and analyses that can be used as the basis of recommendations for future efforts. This might include information to support modifying the portfolio of programs, modifying rebate levels, adding or removing technologies eligible for rebates or increasing the minimum efficiencies to be eligible for rebates

Summit Blue’s draft energy efficiency market assessment report included a number of recommendations that need to be reviewed, tracked, and implemented, as appropriate, in 2007 as follows:

Update Programs and Budgets

Summit Blue provided information related to the incremental cost of high efficiency equipment compared to standard efficiency equipment. Summit Blue also assessed recent or potential changes to federal and state codes, standards and tax law. This information was utilized as a basis for recommending changes to existing rebate levels. Summit Blue also conducted an assessment of the current portfolio of energy efficiency programs to assist in determining where to best allocate program resources.

Deliverable: CEEEP will coordinate the review, tracking and implementation of any program recommendations made by Summit Blue with the Office of Clean Energy, the Market Managers and the Clean Energy Council by July 31, 2007.

Update Baseline Studies

The objective of Summit Blue’s baseline study was to update the baseline against which the energy savings will be calculated and to measure the program success. This included updating the baselines for:

- Electric savings
- Gas savings
- Market share
- Incremental cost impacts
- Infrastructure impacts

CEEEP will coordinate a review of the baseline study with the Office of Clean Energy, the Market Managers and the Energy Efficiency Committee to determine if any changes need to be made to the protocols, which are used to estimate energy savings/renewable energy generation or to other metrics of program success.

Energy savings from certain programs may be reduced if the baseline against which energy savings are calculated is increased. CEEEP will coordinate the review of the impact of modified baselines on program goals, overall goals, and on any performance incentives that may be included in the contracts with the selected Market Managers. Additional changes to the protocols and baselines may be required subsequent to the completion of the impact evaluation discussed below.

Deliverable: CEEEP will coordinate a review of the baseline study and the impact of modified baselines on: protocols which are used to estimate energy savings/renewable energy generation; other metrics of program success including program goals and overall goals; and, proposed performance incentives, by July 31, 2007.

Performance Indicator Assessment

The performance indicator assessment prepared by Summit Blue included:

- Estimated values for program performance indicators
- Recommended changes to performance indicators
- Recommended performance indicators for new programs
- Recommendations on how to track and measure how program managers are doing relative to performance indicators

Deliverable: CEEEP will coordinate a review of recommended changes to performance indicators with the Office of Clean Energy, the Market Managers and the Energy Efficiency Committee and assist in the development of updated performance indicators by July 31, 2007.

Market Barrier Assessment

Summit Blue performed a market barrier assessment for all programs. This analysis provides an overall summary and prioritization of key barriers to the specification and purchase of energy efficiency equipment and energy-efficient system designs including building designs, mechanical designs and lighting designs.

Deliverable: CEEEP will coordinate a review of the market barrier assessment with the Office of Clean Energy, the Market Managers and the Energy Efficiency Committee to determine what changes should be made to programs or regulations to better address identified market barriers by July 31, 2007.

Goals Assessment

Summit Blue provided an assessment of the completion of each goal, recommended future specific goals for each program, and recommended how to track and measure how program managers are doing against these new goals. Summit Blue also investigated the relationship between the baselines developed in the baseline study and the impacts on future program goals.

Deliverable: CEEEP will coordinate a review of the goals assessment with the Office of Clean Energy, the Market Managers and the Energy Efficiency Committee to determine what changes should be made to update program goals by July 31, 2007.

Renewable Energy Market Assessment

Summit Blue has also been engaged to perform a renewable energy market assessment. The project commenced in October 2006 and a final report is scheduled for completion in May 2007.

In December 2006 the Board commenced a proceeding, commonly referred to as the REC Transition Proceeding, to consider transitioning from rebate based renewable energy programs to programs that rely more on market based incentives such as Renewable Energy Credits (RECs).

Summit Blue's ongoing renewable energy market assessment was expanded to include two additional studies that will be considered in the Board's REC Transition Proceeding.

First, Summit Blue has prepared a draft report, which summarizes and assesses various proposals prepared by members of the Clean Energy Council's Renewable Energy Committee related to the transition to a more market based approach⁷. This report is awaiting final review from Office of Clean Energy prior to release.

Second, Summit Blue has been asked to perform an economic analysis of the impacts on ratepayers of the various options that have been proposed and to develop a proposed multi-year Solar Alternative Compliance Payment (SACP) schedule for consideration. This assessment is scheduled for completion by March 31, 2007. The Board has scheduled public hearings to be held in April 2007, which will include an opportunity for comment on Summit Blue's analysis and recommendations included in this report.

CEEEP anticipates that the following aspects of the renewable energy programs will need to be reviewed and updated upon issuance of Summit Blue's final renewable energy market assessment report, which is scheduled for completion in May 2007:

- Program designs and rebate levels
- Goals and performance indicators
- Protocols for measuring renewable energy generation
- Cost benefit analyses

Deliverable: CEEEP will review any draft and final reports issued by Summit Blue and will coordinate a review of any recommendations included in the reports. This will include assisting the Office of Clean Energy with the development of proposed policies related to transitioning to market based incentives for renewable energy systems.

Energy Impact Evaluation

Energy impact evaluations support the measurement of energy savings or renewable energy generation, the amount and distribution of savings, and the appropriateness and comprehensiveness of measures. An impact evaluation will also address issues such as the following:

- Measurement versus Estimation: How close are actual program impacts to engineering estimates at the measure, building, and program level?
- Appropriateness of Measures: What costs and savings can typically be expected from certain measures in specific settings?
- Amount and Distribution of Savings or Clean Energy Generation: What are the savings or generation at different times of the year? Do the savings vary within the state? How do they vary regionally? Are they persistent?

⁷ Preliminary Review of Alternatives for Transitioning the New Jersey Solar Market from Rebates to Market Based-Incentives-Interim Report, Summit Blue Consulting, January 24, 2007.

Impact evaluations should be performed every few years to update estimates of energy savings or renewable energy generation delivered by the programs. Impact evaluations are critical to ensuring that the programs are delivering estimated savings needed to achieve program goals.

In 2006, Treasury released a request for proposal to engage an impact evaluation contractor. The Board is in the final stages of selecting a contractor to perform this study, which is expected to commence in early 2007. The final report is expected in late 2007 or early 2008 depending on when a contract is awarded.

The impact evaluation will assess the following programs:

- Residential HVAC
- Residential New Construction
- Energy Star Products
- C&I Construction
- Customer On-Site Renewable Energy

Deliverables: Upon award of an impact evaluation contractor by Treasury, CEEEP will review and provide comments on draft work plans and manage the day-to-day activities of the selected contractor on behalf of the Office of Clean Energy. CEEEP will review and provide comments on draft and final reports. Upon release of a final impact evaluation report, CEEEP will track the review and implementation of any recommendations included in the report.

Process Evaluations

Process Evaluations address implementation effectiveness, operational efficiency, and customer and market actor satisfaction, attitudes, and awareness related to specified programs. Process evaluations should be performed every few years and subsequent to implementation of major new program activities.

Process evaluations are concerned with a program's design and operational efficiency. They typically examine both customers' and implementers' reactions to a program. Results of process evaluations can lead to improvements in the cost-effectiveness of the program. A process evaluation typically addresses some of the following issues:

Implementation Effectiveness: How consistent is the implementation with the planning?
Are joint arrangements effective?

Operational Efficiency: Are there any bottlenecks, unnecessary bureaucratic obstacles, staff shortages or other problems affecting delivery of the program?

Satisfaction and Attitudes: How satisfied are program participants? This includes customers, vendors, and others, such as retailers, manufacturers, or trainers, involved in the program.

Program Acceptance: This includes the effectiveness of promotions and incentives as well as why customers, retailers, or manufacturers choose to participate or not. Is the program's promotion reaching the targeted groups? Is the message understood? Do the promotions and incentives encourage participation?

Process evaluations use a variety of data sources and methods to gauge customer and staff reactions. These include:

Telephone and Mail Surveys: Typically random samples of participants and non-participants are surveyed. Surveys generate quantitative and qualitative results.

In-Person Interviews: These often entail open-ended probing questions to learn the reactions of customers, utility/Market Manager Staff, and other market actors.

Focus Groups: The interactions among the participants (typically 8 – 10 people) can yield information not forthcoming in individual interviews.

Two process evaluations were performed in 2004. Aspen Systems Corporation performed an evaluation of the renewable energy programs managed by the Office of Clean Energy⁸ and Applied Public Policy Research Institute for Study and Evaluation (APPRISE) performed a study of the low-income program⁹.

Process evaluations should be performed when major changes to programs are implemented such as hiring new entities to manage a program or when new programs are implemented. Process evaluations should assess the systems and procedures established by new entities managing programs or for new programs to ensure the systems are capturing and tracking any information required for program management, reporting and evaluations, and to ensure the systems operate as planned. Process evaluations should also assess quality assurance procedures.

The Board has begun the process of transitioning many of the programs currently managed by the Office of Clean Energy and the utilities to third party Market Managers. Honeywell Utility Solutions was selected to deliver the residential energy efficiency and renewable energy programs, and TRC Energy Services was selected to deliver the commercial and industrial energy efficiency programs. Both firms have been engaged by the Board and have commenced the process of transitioning the programs, which is scheduled to be completed by March 31, 2007.

Proposed 2007 evaluation activities include performing process evaluations to ensure that the systems and procedures established by the Market Managers operate as designed and include sufficient quality assurance procedures. CEEEP recommends that process evaluations be performed approximately six to nine months subsequent to the end of the transition period to insure the Market Managers are performing as required.

⁸ Process Evaluation of the Renewable Energy Programs Administered and Managed by the New Jersey Board of Public Utilities Office of Clean Energy, Aspen Systems Corporation, November 2004.

⁹ NJ LIWAP and NJ Comfort Partners Comparison of Programs and Evaluation Findings – Final Report, Applied Public Policy Research Institute for Study and Evaluation, June 2004.

Deliverable: CEEEP will coordinate with the Office of Clean Energy to determine what, if any, process evaluations are required. CEEEP will draft RFPs, as needed, for a process evaluation of the activities of the selected Market Managers incorporating the concepts set out above, approximately six months subsequent to the end of the transition period.

Tracking System Assessments

Tracking System Assessments review the tracking systems to ensure consistent tracking and reporting, and collection of all necessary data. The Market Managers are responsible for collecting and electronically compiling and storing in a consistent format data needed to monitor, assess, and evaluate its program performance, report on its activities, and improve the design and delivery of the programs such as:

- Customer/client data
- Customer use data
- Program measures and services data
- Trade ally data
- Distribution utility account data
- Baseline and market indicator data
- Energy savings/renewable energy generation data
- Other data for evaluation purposes

One of the factors critical to successful program evaluation planning is ensuring that appropriate data is available for analysis. Systems are needed to collect, organize, verify, and report the necessary data in a timely manner. The program's goals and the type and number of customers involved determine the data collection systems. Tracking systems need to support consistency of results, consistent reporting and a sound basis for evaluation.

Deliverable: CEEEP will coordinate with the Office of Clean Energy to determine whether any tracking system evaluation activities are required, and if so, will assist in the development of a specific plan for performing an evaluation of the tracking systems. These activities are expected to occur June 2007 through February 2008.

III. Other Evaluation Activities

This section of the report discusses other evaluation activities that occur on an annual or recurring basis.

2006 Program Evaluation

CEEEP will perform a high-level evaluation of the 2006 programs. The 2006 Program Evaluation will provide a program-by-program assessment of 2006 results including a comparison of actual results to program goals. The assessment will include interviews with the Office of Clean Energy and the program managers, and will be performed taking into consideration the ongoing changes to the administrative structure of the program.

CEEEP recently met with Board Staff to discuss the Draft 2005 Program Evaluation Report. Board staff noted a number of desired changes to the report contents, primarily related to incorporating certain aspects of cost-benefit analysis and other evaluation studies into the report.

CEEEP will coordinate with the Office of Clean Energy and other Board Staff to develop an outline for the 2006 Program Evaluation Report that addresses the issues raised by Board Staff.

Specifically, CEEEP will develop a revised 2006 Program Evaluation Report that incorporates high-level results from other evaluation activities and cost-benefit analyses. The intent is a more inclusive report that better defines the costs and benefits of the programs.

Deliverables: CEEEP will present a revised program evaluation format to Board staff by February 28, 2007 and will submit a 2006 Program Evaluation Report by July 31, 2007.

Update Protocols

Protocols¹⁰ are used in New Jersey to track and report program savings and renewable energy generation on a prospective basis. Summit Blue recommended a number of changes to the Protocols in its final draft energy efficiency market assessment. As discussed further below, CEEEP proposes a number of activities for 2007 related to updating the Protocols, including incorporating Summit Blue's recommendations. The impact evaluation is expected to include recommendations for additional modifications to the Protocols.

The Protocols use measured and customer data as input values in industry-accepted algorithms. The data and input values for the algorithms come from the program application forms and tracking systems, or from standard values. The standard input values were based on the best available measured data from prior studies or industry data applicable for the New Jersey programs.

Protocols document the processes for measuring the quantitative results and energy impacts of programs. Whereas evaluation activities are required to support market effect inputs to the protocols, additional work is required to update demand, load shape, and energy usage effects. This should be done on a case-by-case (by program or measure) basis as needed. The impact evaluation will support the Protocols by assessing key data and input values to either confirm that current values should continue to be used or update the values going forward (prospective application).

The New Jersey Clean Energy Protocols to Measure Resource Savings (the Protocols) were prepared in September of 2004 and approved by the Board by Order dated December 23, 2004¹¹. The Protocols were developed to measure resource savings, including energy, capacity, and other resource savings.

Summit Blue's energy efficiency market assessment included recommendations regarding updating the Protocols to comply with updated federal standards such as the Seasonal Energy Efficiency Rating (SEER) and Energy Efficiency Ratings (EER). Summit Blue also recommended several changes to algorithms and inputs that are used to calculate savings

¹⁰ New Jersey Clean Energy Program Protocols to Measure Resource Savings, September 2004.

¹¹ In the Matter of the Adoption of New Jersey's Clean Energy Program Protocols to Measure Resource Savings Docket No. EO04080894, Order dated December 23, 1994.

estimates. In addition, the Board recently approved changes to the C&I rebates for lighting and for air compressors, which necessitates revisions to the Protocols.

CEEEP has developed revisions to the Protocols that incorporate the recommendations made in Summit Blue's draft report and to address recent modifications to programs. CEEEP has also developed proposed protocols for two new programs, the Combined Heat and Power (CHP) Program and the Home Performance with Energy Star Program, that are not included in the Protocols.

CEEEP will coordinate with the Office of Clean Energy to develop a process for circulating the draft modifications to the Protocols for review and comment. CEEEP will compile and assess any comments received, make any required changes to the draft Protocols, and work with the Office of Clean Energy to submit the proposed modifications to the Board for review and approval.

The Board has approved two new programs that are being developed by TRC; the Pay for Performance Program and C&I Direct Install Program. CEEEP will coordinate the development of protocols for these programs as program details evolve.

Deliverable: CEEEP recently submitted proposed revisions to the protocols to the Office of Clean Energy. CEEEP will support the Office of Clean Energy in the review process, will make additional changes to the protocols as required, and will submit final protocols to the Office of Clean Energy by March 31, 2007. CEEEP will assist in the development of protocols for any new programs or program elements as required.

Net Impact Analysis

The Office of Clean Energy is interested in assessing gross versus net savings. Gross savings are calculated for program participants relative to their prior usage or to an established baseline. Net savings controls for savings that would have occurred for these participants over the same period whether the program was offered or not.

Estimates of energy savings should take into consideration both the gross savings that result from installation of a measure as well as the net impacts that take into consideration any other factors that could affect savings. For example, if a customer installs a high efficiency furnace that reduces energy costs, the customer may respond by raising the thermostat thereby "giving back" some of the savings. The impact evaluation will assess both net and gross impacts. Potential adjustments that should be researched include, but are not limited to, factors such as: free riders, free drivers, take back, snap back, spillover and rebound effects.

CEEEP will work closely with the consultant who was awarded the energy impact evaluation contract to assure that as many variables as possible rely on New Jersey specific data. Where inferences are made from studies done in other states or regions and applied to New Jersey, CEEEP will assess whether additional analyses on energy efficiency applications and behavior specific to New Jersey residents, businesses, and industry are required.

Deliverables: CEEEP will assess the methodology, as well as the data sets and sources used by the impact evaluation consultant and will determine if there is a need for additional studies so that net impacts may be quantified as accurately as possible.

Update Program Review Process/Portfolio Analysis

Portfolio analysis, as used in this report, encompasses a number of activities related to the development of a portfolio of programs that best meet the goals and objectives of the programs. Such activities include:

- Cost-benefit analysis
- Assessment of program goals and the contribution of each program to the overall goal
- Procedures for performing trade-off analysis
- Assessment of inter-relationship and cross implications of program measures and program changes

Based upon its review of the Summit Blue report and other distributed resources evaluation literature, CEEEP proposed to the Office of Clean Energy an analytical framework for the evaluation of energy efficiency and renewable energy programs. CEEEP recommended that the analytical framework consist of three major components: cost-benefit analysis, tradeoff analysis, and portfolio analysis.

Cost-benefit analysis allows for the evaluation of programs and measures in solely monetary terms. There are several standard cost-benefit analysis approaches; their variations depend on which costs and which benefits are included in the calculations. Tradeoff analysis enables decision makers to evaluate the consequences of their decisions along dimensions that cannot be reliably reduced to a monetary value. Portfolio analysis allows decision-makers to evaluate the combination of programs and how these programs interact in the context of uncertainty and risk.

Summit Blue, as part of the energy efficiency market assessment discussed above, performed an assessment of the overall portfolio of energy efficiency programs and provided recommendation for a portfolio analysis process going forward. CEEEP recommends continuing the development of processes and procedures for performing a more thorough and rigorous analysis of programs and budget and having revised processes and procedures in place to be used in the development of 2008 programs and budgets.

Further, CEEEP has developed a methodology and tool for performing a cost-benefit analysis at the program level. CEEEP will apply this analytical framework on both completed and proposed energy efficiency programs. The purpose of performing the analysis on *completed* programs is to determine how cost-effective the programs were to determine if the programs should be continued in the future. The purpose of performing the analyses on *proposed* programs is to project how cost-effective the proposed programs are and to have a common point of comparison to compare the various programs and measures.

The model is a fairly simple input-output model where a portion of the inputs come from program administrators (electricity savings estimates, tax credits, etc), a portion of inputs come from data sources such as PJM or EIA (electricity or natural gas prices), and a portion of the

inputs come from CEEEP (discount rate, transmission and distribution costs, etc.). The model takes these inputs and produces specific outputs such as emission savings, program participant benefits, participant costs, etc. It depends on quality information from the program implementers who propose various programs and measures. Therefore, program implementers will be asked to complete a small spreadsheet of requested information that will become input for the model.

CEEEP believes that the Board should consider formally approving the methodology to be used to assess the costs and benefits of the programs. CEEEP will work with the Office of Clean Energy and the Clean Energy Council to facilitate a coordinated review of proposed cost benefit analysis methodologies and develop recommendations for consideration by the Board.

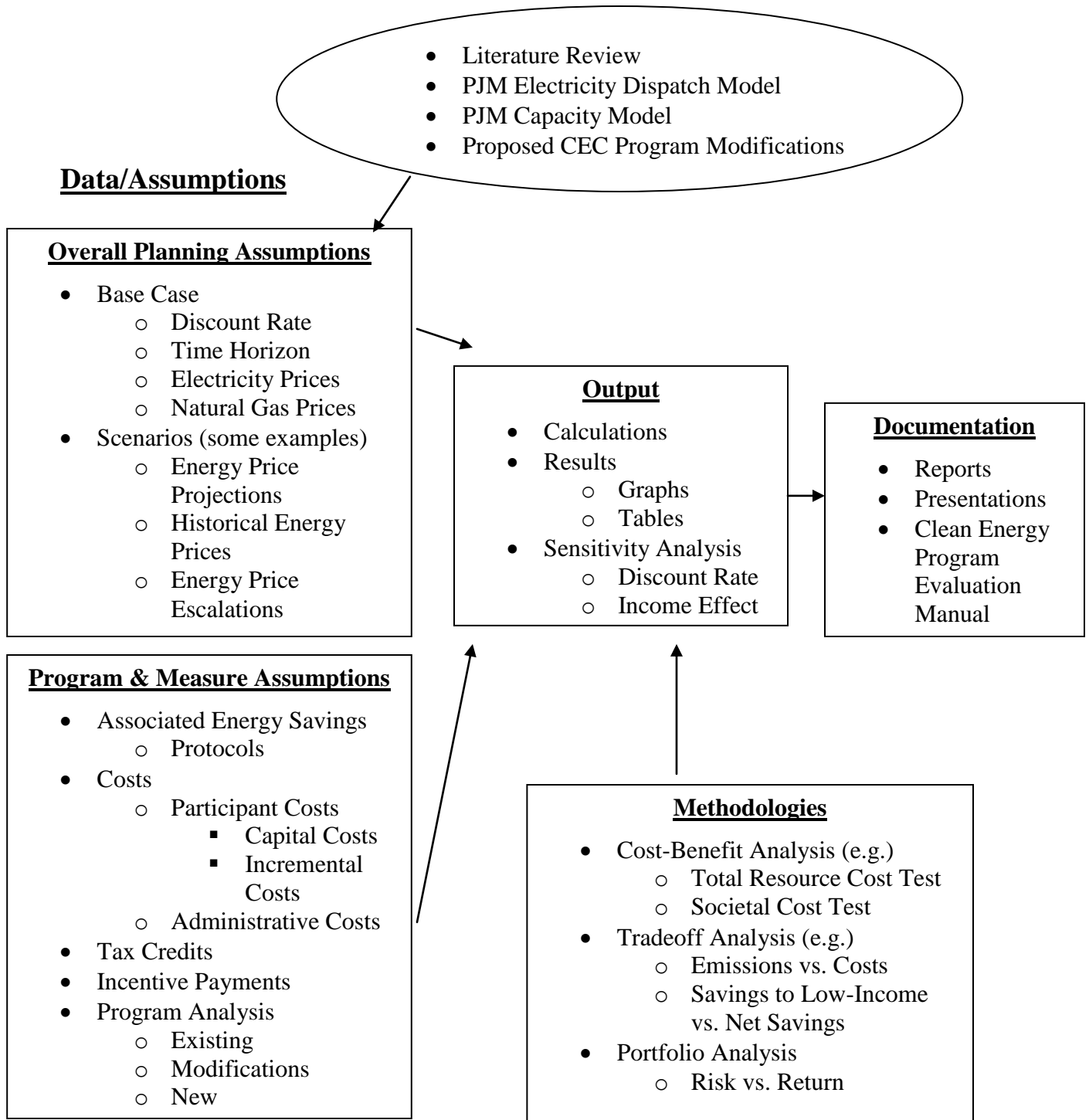
CEEEP anticipates working extensively with the Office of Clean Energy and with Clean Energy Council members and committees on refining the framework and tailoring it to the needs of New Jersey. Figure 1 below outlines the proposed framework.

Deliverable: CEEEP will coordinate with the Office of Clean Energy and the Clean Energy Council in the development of a more thorough and rigorous process for assessing annual programs and budgets by April 30, 2007.

The following are the anticipated outcomes from the development of this evaluation framework:

- Developing and articulating planning assumptions used in the various analyses of programs and measures (e.g., time horizon, discount rate, price of electricity, etc.);
- Promulgating data requirements for proposed new or modified programs and measures (e.g., proposal description, estimate of electric or natural gas savings, types and amounts of costs, etc.);
- Developing spreadsheets that document, calculate, and present the various analyses (e.g., total resource cost test, tradeoff between costs and reductions in carbon dioxide emissions);
- Drafting of a manual that documents the previous three bullets.

Figure 1: Proposed Energy Efficiency Program Evaluation Process



New Jersey Energy Master Plan

The Board has commenced development of a State Energy Master Plan and anticipates the release of a final plan in October 2007. Working groups have been formed and the Board is in the process of receiving public input regarding energy policies to be considered for inclusion in the Energy Master Plan.

Policies under consideration, such as establishing a statewide goal for energy savings, could have significant implications on future funding levels and programs. CEEEP is assisting the Board in assessing the economic impact of various proposals submitted to the Board and will work with the Office of Clean Energy to revise any programs or program goals needed to reflect recommendations included in the Energy Master Plan.

Appendix A: Previous Evaluation Plans and Studies

Evaluation Plans

1. New Jersey Clean Energy Program 2004-2005 Evaluation and Research Plan, Phase I: Activities to be Initiated 2004; Center for Energy, Economic and Environmental Policy, August 5, 2004.
2. Revised 2004-2005 Evaluation and Research Plan, New Jersey Clean Energy Program, Energy Efficiency and Renewable Energy Programs; Center for Energy, Economic and Environmental Policy, October 12, 2004.
3. 2004-2005 Evaluation and Research Plan, Phase 2: Activities to be Initiated 2005; Center for Energy, Economic and Environmental Policy, February 4, 2005.
4. 2006 Evaluation and Research Plan, New Jersey's Clean Energy Program , Energy Efficiency and Renewable Energy Programs; Center for Energy, Economic and Environmental Policy, February 4, 2005.

Evaluation Reports

1. Evaluation of Home Energy Audit Tools; Center for Energy, Economic and Environmental Policy, February 19, 2004.
2. New Jersey Clean Energy Program, 2003 Program Evaluation, Energy Efficiency and Renewable Energy Programs; Center for Energy, Economic and Environmental Policy, June 2004.
3. New Jersey Energy Efficiency and Distributed Generation Market Assessment - Final Report, KEMA, Inc., August 2004.
4. NJ LIWAP and NJ Comfort Partners Comparison of Programs and Evaluation Findings – Final Report, Applied Public Policy Research Institute for Study and Evaluation, June 2004.
5. New Jersey Renewable Energy Market Assessment - Final Report, Navigant Consulting, Inc., August 2, 2004.
6. Process Evaluation of the Renewable Energy Programs Administered and Managed by the New Jersey Board of Public Utilities Office of Clean Energy, Aspen Systems Corporation, November 2004.
7. Economic Impact Analysis of a 20% New Jersey Renewable Portfolio Standard; Center for Energy, Economic and Environmental Policy, December 1, 2004.
8. Program Cost-Benefit Analysis of 2003 New Jersey Clean Energy Program Energy Efficiency Programs; Center for Energy, Economic and Environmental Policy, July 28, 2005.

9. New Jersey Clean Energy Program, 2004 Program Evaluation, Energy Efficiency and Renewable Energy Programs; Center for Energy, Economic and Environmental Policy, August 26, 2005.
10. Appliance Cycling Evaluation; Center for Energy, Economic and Environmental Policy, September 2, 2005.
11. Energy Efficiency Market Assessment of New Jersey Clean Energy Programs – Draft Report, Summit Blue Consulting, LLC, May 26, 2006.

The evaluation plans and reports listed above are available at:

http://www.policy.rutgers.edu/ceep/events_new.html

Appendix B: Timeline for 2007 Evaluation Plan Approval

1. CEEEP submits Draft 2007 Evaluation and Research Plan to Clean Energy Council and Committees: by February 19, 2007
2. Comments of Clean Energy Council Committees regarding the Plan submitted to CEEEP: by February 26, 2007
3. CEEEP submits revised Plan incorporating Committee comments to the Clean Energy Council: by March 2, 2007
4. Comments of Clean Energy Council submitted to CEEEP: by March 9, 2007
5. CEEEP submits revised Plan to the Office of Clean Energy: by March 16, 2007
6. Obtain Office of Clean Energy Approval of Plan: by March 23, 2007