Agenda Date: 8/24/20
Agenda Item: 8A

# STATE OF NEW JERSEY

**Board of Public Utilities**
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CLEAN ENERGY AND ENERGY

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| IN THE MATTER OF THE IMPLEMENTATION OF P.L. 2018, c. 17 REGARDING THE ESTABLISHMENT OF ENERGY EFFICIENCY AND PEAK DEMAND REDUCTION PROGRAMS | ) | ORDER ADOPTING THE FIRST NEW JERSEY COST TEST |
| | ) | DOCKET NO. QO19010040 |
| IN THE MATTER OF THE CLEAN ENERGY ACT OF 2018 – NEW JERSEY COST TEST | ) | DOCKET NO. QO20060389 |

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BY THE BOARD:

By this Order, the Board directs electric public utilities and gas public utilities in the state to use the New Jersey Cost Test to perform benefit-cost analyses during the first three-year program cycle of energy efficiency ("EE") and peak demand reduction ("PDR") programs pursuant to the EE provisions of the Clean Energy Act of 2018.[1]

[1] New Jersey's electric and gas public utilities include Atlantic City Electric Company ("ACE"), Butler Power and Light Company ("Butler"), Elizabethtown Gas Company ("Elizabethtown"), Jersey Central Power & Light Company ("JCP&L"), New Jersey Natural Gas Company ("NJNG"), Public Service Electric and Gas Company ("PSE&G"), Rockland Electric Company ("RECO"), and South Jersey Gas Company ("SJG") (collectively, "utilities").

## INTRODUCTION

On May 23, 2018, Governor Murphy signed into law the Clean Energy Act of 2018 ("CEA" or the "Act").[2] The CEA plays a key role in achieving the State's goal of 100% clean energy by 2050 by establishing aggressive energy reduction requirements, among other clean energy strategies. The CEA emphasizes the importance of EE and PDR and requires the Board to adopt an efficiency program "to ensure investment in cost-effective energy efficiency measures, ensure universal access to energy efficiency measures, and serve the needs of low-income communities . . . ."[3] The CEA also calls upon New Jersey's electric and gas public utilities to play an increased role in delivering EE and PDR programs to customers by requiring the utilities to reduce the use of electricity and natural gas in their service territories.[4]

The CEA also includes specific requirements for the benefit-cost analyses ("BCAs") that are used to evaluate the efficiency programs. The CEA states that:

> The energy efficiency programs and peak demand reduction programs shall have a benefit-to-cost ratio greater than or equal to 1.0 at the portfolio level, considering both economic and environmental factors, and shall be subject to review during the stakeholder process established by the board pursuant to subsection f. of this section. The methodology, assumptions, and data used to perform the benefit-to-cost analysis shall be based upon publicly available sources and shall be subject to stakeholder review and comment. A program may have a benefit-to-cost ratio of less than 1.0 but may be appropriate to include within the portfolio if implementation of the program is in the public interest, including, but not limited to, benefitting low-income customers or promoting emerging energy efficiency technologies.
>
> [N.J.S.A. 48:3-87.9(d)(2).]

The Act's requirement that each portfolio of programs must have a benefit-to-cost ratio ("BCR") greater than or equal to 1.0 means that each portfolio must yield positive net benefits. Staff has developed a proposal for a benefit-cost test, called the New Jersey Cost Test ("NJCT"). Public utility and State program administrators would use this primary test to evaluate the benefits and costs of EE and PDR programs established in the state pursuant to the CEA during the first three-year program cycle, starting with program year 1 ("PY1") on July 1, 2021 and running through the end of program year 3 ("PY3") on June 30, 2024. Staff designed the test to carefully steward ratepayer dollars, confirm that the efficiency investments are cost-effective, and ensure that the programs are universally accessible and serve the needs of low-income communities throughout the state.

## BACKGROUND

New Jersey has historically used five standard cost-effectiveness tests, based on the California Standard Practice Manual ("CSPM"), to review the costs and benefits of EE programs. These

[2] P.L. 2018, c. 17 (N.J.S.A. 48:3-87.8 et al.).

[3] N.J.S.A. 48:3-87(g).

[4] N.J.S.A. 48:3-87.9(a).

five tests, described below, reflect varying stakeholder perspectives and include different costs and benefits.

- **Total Resource Cost Test ("TRC")** and **Societal Cost Test ("SCT")**: The TRC measures the combined impacts of a resource option based on the total costs and benefits of the program, including for the participants and the utility. The SCT is a variant of the TRC. It goes beyond the TRC in that it attempts to quantify the change in the total resource costs to society as a whole rather than to only the service territory (the utility and its ratepayers). The SCT uses essentially the same input variables as the TRC test, but they are defined with a broader societal point of view. For example, the SCT includes the effects of externalities (e.g., environmental, national security), excludes tax credit benefits, and applies a social discount rate. As noted in the CSPM, traditionally, implementing agencies have independently determined the details of the SCT, such as the components of the externalities, the externality values, and the policy rules that specify the contexts in which the externalities and tests are used.

- **Program Administrator Cost Test ("PACT")**[5]: The PACT measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant.

- **Participant Cost Test ("PCT")**: The PCT measures quantifiable benefits and costs to the customer due to participation in a program. As noted in the CSPM, since many customers do not base their decision to participate in a program entirely on quantifiable benefits, this test cannot be a complete measure of the benefits and costs of a program to a customer.

- **Ratepayer Impact Measure Test ("RIM")**: The RIM measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementation are less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

There are also other methods for developing primary cost tests, such as through those described in the National Standard Practice Manual ("NSPM").[6] The NSPM method results in a state-specific test, referred to as a Resource Value Test ("RVT"), which assesses cost-effectiveness from a regulatory perspective. While its principal objective is to provide customers with safe, reliable, low-cost energy services, it is also designed to be able to incorporate a particular jurisdiction's additional, relevant policy objectives.

[5] The PACT is also referred to as the "utility cost test" ("UCT"); however, PACT is preferred because program administrators may not always be utilities, and it is reasonable to consider the entire costs and benefits on both gas and electric systems (which may reflect different utilities) when programs are addressing both fuels.

[6] National Efficiency Screening Project, "National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources," *available at* https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf.

## PROCEDURAL HISTORY

Since passage of the CEA, Staff has hosted an ongoing stakeholder process related to the development of the state's next generation of EE and PDR programs ("EE transition"). As part of this EE transition, Staff solicited input related to the evaluation, measurement, and verification of these programs at a public meeting on December 18, 2019 and accepted written comments through January 17, 2020. Staff released a full "Energy Efficiency Transition Straw Proposal" ("Full Proposal") on March 20, 2020, accepted comments at a public stakeholder meeting on April 1, 2020, and accepted written comments through April 13, 2020. In the Full Proposal, Staff noted the CEA's requirement for a primary BCA test and recommended that an RVT or similar approach be considered for the benefit-cost testing of the state's EE and PDR programs. Stakeholders commenting on the Full Proposal raised concerns that to develop an RVT by the fall of 2020, in time for the first filing of EE and PDR programs, would be complex, contentious, and unrealistic.

On June 10, 2020, the Board approved an EE transition framework for implementation of EE and PDR programs in New Jersey, including requirements for the utilities to establish programs that reduce the use of electricity and natural gas within their territories.[7] As part of this framework, Staff recommended establishing a primary cost-effectiveness test to be called the NJCT, delaying development of an RVT to be used as the NJCT, adopting a modified TRC for the first three-year program cycle, requiring program planners and administrators to continue to report the results of the five CSPM tests, and charging the Evaluation, Measurement, and Verification Working Group ("EM&V WG") with developing ongoing recommendations to evaluate and modify the NJCT. The Board adopted Staff's recommendations to (1) work toward development of an NJCT that will be the primary cost-effectiveness test used to evaluate utility and State-led EE and PDR programs and (2) propose a modified TRC test while continuing to use the CSPM tests for information purposes for the first three-year program cycle. The Board also directed Staff to ensure that the EM&V WG evaluate non-energy impacts for inclusion in the NJCT, recommend third-party studies to further evaluate and quantify non-energy impacts as needed, recommend on an ongoing basis additional non-energy impacts for inclusion in future updates to the NJCT, and develop and recommend an approach to estimating avoided costs on a statewide basis, using utility-specific inputs where appropriate.

Staff released a proposed interim NJCT on July 24, 2020, hosted a public meeting on the proposed interim NJCT on July 30, 2020, and accepted written comments through August 5, 2020. A summary of comments and Staff responses is included as Appendix B.

## STAFF RECOMMENDATIONS

To develop the initial NJCT, Staff started with the energy costs and benefits traditionally included in the TRC, as a foundation. Staff then proposed for inclusion additional avoided energy benefits and non-energy impacts that are relevant to New Jersey's policy goals and can be applied based on readily available research and industry consensus. The result is a test that Staff believes both better reflects the full range of benefits and costs that result from EE and PDR programs and allows for the timely development of the programs. The table below includes a summary of the benefits and costs included in the NJCT.

[7] In re the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency and Peak Demand Reduction Programs, BPU Docket No. QO19010040 (Order dated June 10, 2020) ("June 10, 2020 Order").

**Table 1. Summary of New Jersey Cost Test Inputs and Values**

| | Input | Description | Calculation method or value |
|---|---|---|---|
| **Utility System Costs** | Measure incremental costs | Total costs associated with the efficiency measure implemented (i.e., material and labor) less the costs of the baseline measure | Monetized |
| | Program administration costs | Non-measure costs, including program-specific (such as overhead, marketing, and data tracking costs) and non-program-specific costs (such as administration and planning; and evaluation, monitoring, and verification costs) | Monetized |
| **Utility System Benefits** | Avoided wholesale electric energy costs | Value of electric energy directly avoided by reductions in energy consumption | Calculated using the three-year rolling average of historic PJM wholesale prices multiplied by the quantity of electricity not consumed |
| | Avoided wholesale electric capacity costs | Value of electric capacity costs directly avoided by reductions in electric peak demand requirements | Calculated as either: (1) revenues earned from the PJM capacity market associated with offering and clearing EE into the RPM; or (2) for customers that do not monetize their capacity into the RPM, the direct savings are equal to the difference in capacity costs at their pre-EE measure baseline load minus their load after the EE improvements are made. |
| | Avoided wholesale electric transmission and distribution costs | Value of future transmission and distribution costs avoided by reductions in electric consumption | Avoided transmission costs: calculated by using the most recent Network Integration Transmission Service (“NITS”) Rate as applicable to individual utility service territories<br>Avoided distribution costs: calculated by determining the total annual distribution charges that the customer would have paid before its participation in the program and then subtracting the total distribution charges the customer paid after the implementation of the EE measures |

| | | | |
|---|---|---|---|
| | Avoided wholesale electric ancillary services costs | Value of avoided electric ancillary services (e.g., spinning reserves, frequency regulation, black start capability, reactive power, etc.) required for safe and effective grid operation | Calculated using a three-year rolling average of historic prices multiplied by the quantity of ancillary services products not purchased |
| | Avoided wholesale natural gas supply costs | Value of natural gas supply costs avoided by reductions in natural gas consumption | Calculated using NYMEX forward trading prices multiplied by the quantity of gas not purchased |
| | Avoided delivered fuel costs | Avoided costs of delivered fuels such as propane or fuel oil | Calculated using a three-year rolling average of historic EIA NJ residential fuel oil and propane prices multiplied by the quantity of fuel not purchased |
| | Electric energy demand reduction induced price effects ("DRIPE") | Value of price effects resulting from reduced demand in the electric energy market | Calculated by regressing historical electric energy prices as a function of load to determine the impact of load on electric energy prices |
| | Electric capacity DRIPE | Value of price effects resulting from reduced demand in the electric capacity market | Calculated using a linear extrapolation of price differentials between auction results and the scenario in which PJM removes 3000 MW of capacity supply from the bottom of the supply curve in MAAC |
| **Non-Energy Impacts** | Avoided emissions impacts | Carbon dioxide ($CO_2$): Avoided damages for each ton of $CO_2$ avoided | Calculated for electric and natural gas using the 3% discount rate "Annual SC-$CO_2$," adjusted for today's dollars, as published in the 2016 Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis by the Interagency Working Group on Social Cost of Greenhouse Gases |
| | Low-income benefits | Adder applied to account for additional benefits (including health and safety) to low-income participants and community | Proxy: 10% adder |

| | | | |
|---|---|---|---|
| | Non-energy benefits | Adder applied to all non-low-income programs to account for non-energy benefits not already included in the NJCT that are difficult to quantify (including public health, water and sewer benefits, economic development, etc.) | Proxy: 5% adder |
| **Global Inputs** | Discount rate | Interest rate that calculates the present value of expected yearly benefits and costs | 3% |
| | Electric line losses | Electric marginal line losses, using approved line loss factor in utility's tariff | Utility-specific line loss factor grossed up for marginal losses by 1.5 |
| | Natural gas losses | Natural gas marginal losses, using approved losses factor in utility's tariff | Utility-specific loss factor |

Staff recommends that the Board adopt the proposed NJCT (included as Appendix A) as the primary cost-effectiveness test to be used by program administrators during the first three-year program cycle of EE and PDR programs implemented pursuant to the CEA. Staff also suggests that, in addition to the NJCT, the results of the existing TRC, SCT, PACT, PCT, and RIM should be reported for informational purposes.

Staff recognizes that the interim NJCT may not include the full range of possible benefits and costs that could be included in a primary test. Staff notes that, pursuant to the June 10, 2020 Order, the EM&V WG will review the NJCT for potential future updates on an ongoing basis. More specifically, as part of each triennial review process, the EM&V WG will further evaluate and provide recommendations on all relevant benefits and costs for inclusion in the NJCT for future program cycles, which may include implementing third-party studies to further evaluate and quantify impacts as needed. Further, the EM&V WG will develop and recommend an ongoing approach to estimating avoided costs on a statewide basis, using utility-specific inputs where appropriate, for consideration by Staff and the Board.

## DISCUSSION AND FINDINGS

The Board **FINDS** that the processes utilized in developing Staff's recommendations were appropriate and provided stakeholders and interested members of the public with adequate notice and opportunity to comment.

The Board has reviewed the stakeholder comments and Staff's recommendations. The Board **FINDS** that Staff's proposed NJCT will benefit New Jersey's residents, energy users, ratepayers, and electric and gas public utilities and are consistent with the goals of the Clean Energy Act. Therefore, the Board **HEREBY APPROVES** Staff's recommendation and **ADOPTS** the New

Jersey Cost Test as the primary benefit-cost test for the purposes of evaluating EE and PDR programs proposed and implemented pursuant to the Clean Energy Act. The Board also **DIRECTS** program administrators to continue to report the results of the existing TRC, SCT, PACT, PCT, and RIM for informational purposes.

The effective date of this order is August 24, 2020.

DATED: August 24, 2020

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SECRETARY

In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency and Peak Demand Reduction Programs, Docket No. QO19010040

In the Matter of the Clean Energy Act of 2018 – New Jersey Cost Test
Docket No. QO20060389

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Appendix A to Board Order:

In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency and Peak Demand Reduction Programs, Docket No. QO19010040

In the Matter of the Clean Energy Act of 2018 – New Jersey Cost Test
Docket No. QO20060389

# New Jersey Cost Test

Summer 2020

**New Jersey Board of Public Utilities**
**Division of Clean Energy**
44 S. Clinton Ave.
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# Introduction

The Clean Energy Act of 2018[1] ("CEA" or "the Act") included requirements to increase the energy savings enjoyed by New Jersey consumers through a new generation of efficiency ("EE") and peak demand reduction ("PDR") programs. Key to the legislation was the concept that the Board of Public Utilities ("Board" or "BPU") shall "ensure investment in *cost-effective* energy efficiency measures," while also ensuring "universal access to energy efficiency measures" and serving "the needs of low-income communities . . . ." (emphasis added). This summary describes the primary benefit-cost test for the first three years of EE and PDR investments in New Jersey that is designed to carefully steward ratepayer dollars by ensuring that these investments are cost-effective, while also ensuring universal access and serving the needs of low-income communities. The CEA requires that:

> *The energy efficiency programs and peak demand reduction programs shall have a benefit-to-cost ratio greater than or equal to 1.0 at the portfolio level, considering both economic and environmental factors, and shall be subject to review during the stakeholder process established by the board pursuant to subsection f. of this section. The methodology, assumptions, and data used to perform the benefit-to-cost analysis shall be based upon publicly available sources and shall be subject to stakeholder review and comment. A program may have a benefit-to-cost ratio of less than 1.0 but may be appropriate to include within the portfolio if implementation of the program is in the public interest, including, but not limited to, benefitting low-income customers or promoting emerging energy efficiency technologies.*[2]

The Act specifically requires that each portfolio of EE and PDR programs must have a benefit-to-cost ratio ("BCR") greater than or equal to 1.0, which means that the portfolio yields positive net benefits (i.e., benefits less costs) to the New Jersey economy and is therefore "cost-effective." The Act allows (and in fact, for the purposes of serving low-income communities or ensuring universal access to EE, requires) that every program may not meet this cost-effectiveness standard. However, reasonable policy interests should support the adoption of programs with BCRs below 1.0, as their inclusion in a portfolio will reduce overall net benefits achieved. Similarly, individual efficiency measures do not need to be cost-effective, although the cost-effectiveness of individual measures may be considered during the review of program filings. As with programs, non-cost-effective measures should typically only be included for good reason, such as to promote health and safety, to ensure equitable access, or to spur innovation, the adoption of other measures, or longer-term market transformation.

While the CEA is not explicit in prescribing a cost-effectiveness test beyond requiring the inclusion of economic and environmental factors, it is clear that such a test is needed to achieve the purpose of the state's EE and PDR programs serve the public interest of all New Jersey residents. As such, the primary cost-effectiveness test used to evaluate these programs should reflect the impacts of the programs on the state's overall economy and environment, including not only energy but also non-energy benefits that EE and PDR programs can provide to the residents of New Jersey. This summary outlines the primary cost test for New Jersey's EE and

[1] P.L. 2018, c. 17 (N.J.S.A. 48:3-87.8 et al.).

[2] N.J.S.A. 48:3-87.9(d)(2).

PDR programs, including the costs, benefits, sources for such inputs, and guidelines for the use of the test.

## Executive Summary

New Jersey has historically used five standard benefit-cost tests to evaluate the costs and benefits of EE programs: the Total Resource Cost Test ("TRC"), Societal Cost Test ("SCT"), Program Administrator Cost Test ("PACT"), Participant Cost Test ("PCT"), and Ratepayer Impact Measure Test ("RIM"), which are described in more detail in the "Background" section below.

In order to implement the CEA's requirement that EE and PDR portfolios have BCRs greater than or equal to 1.0, all program administrators shall use a primary benefit-cost test. BPU staff ("Staff") worked with stakeholders to design an initial New Jersey Cost Test ("NJCT") to fulfill the CEA's requirements to consider economic and environmental factors, ensure universal access to EE, and serve the needs of low-income communities.[3] This initial NJCT, which will apply to the first three-year term of EE and PDR programs,[4] will evolve over time through the efforts of the EM&V Working Group ("EM&V WG") and may include additional or different impacts as they are studied further and evaluated for use in New Jersey.

In considering which impacts to include in the initial NJCT, Staff used the TRC as a foundation and added inputs, including non-energy impacts ("NEIs"), that are both relevant to New Jersey's policy goals and can be applied based on readily available research and industry consensus.

Staff has also identified near-term and potential long-term sources for the values for each cost and benefit included in the NJCT.

[3] *See* In re the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency and Peak Demand Reduction Programs, BPU Docket No. QO19010040 (Order dated June 10, 2020) ("June 10, 2020 Order") at 3.

[4] Each program year will commence on July 1 and end on June 30 of the following year, in alignment with State fiscal years. The first three-year term will include Program Year 1 (July 1, 2020 – June 30, 2022), Program Year 2 (July 1, 2022 – June 30, 2023), and Program Year 3 (July 1, 2023 – June 30, 2024).

**Table 1: Summary of New Jersey Cost Test Inputs and Values**

| | Input | Description | Calculation method or value |
|---|---|---|---|
| **Utility System Costs** | Measure incremental costs | Total costs associated with the efficiency measure implemented (i.e., material and labor) less the costs of the baseline measure | Monetized |
| | Program administration costs | Non-measure costs, including program-specific (such as overhead, marketing, and data tracking costs) and non-program-specific costs (such as administration and planning; and evaluation, monitoring, and verification costs) | Monetized |
| **Utility System Benefits** | Avoided wholesale electric energy costs | Value of electric energy directly avoided by reductions in energy consumption | Calculated using the three-year rolling average of historic PJM wholesale prices multiplied by the quantity of electricity not consumed |
| | Avoided wholesale electric capacity costs | Value of electric capacity costs directly avoided by reductions in electric peak demand requirements | Calculated as either: (1) revenues earned from the PJM capacity market associated with offering and clearing EE into the RPM; or (2) for customers that do not monetize their capacity into the RPM, the direct savings are equal to the difference in capacity costs at their pre-EE measure baseline load minus their load after the EE improvements are made. |
| | Avoided wholesale electric transmission and distribution costs | Value of future transmission and distribution costs avoided by reductions in electric consumption | Avoided transmission costs: calculated by using the most recent Network Integration Transmission Service ("NITS") Rate per kw-year as applicable to individual utility service territories<br><br>Avoided distribution costs: calculated by determining the total annual distribution charges that the customer would have paid before its participation in the program and then subtracting the total distribution charges the customer paid after the implementation of the EE measures |
| | Avoided wholesale electric ancillary services costs | Value of avoided electric ancillary services (e.g., spinning reserves, frequency regulation, black start capability, reactive power, etc.) required for safe and effective grid operation | Calculated using a three-year rolling average of historic prices multiplied by the quantity of ancillary services products not purchased |

| | | | |
|---|---|---|---|
| | Avoided wholesale natural gas supply costs | Value of natural gas supply costs avoided by reductions in natural gas consumption | Calculated using NYMEX forward trading prices multiplied by the quantity of gas not purchased |
| | Avoided delivered fuel costs | Avoided costs of delivered fuels such as propane or fuel oil | Calculated using a three-year rolling average of historic EIA NJ residential fuel oil and propane prices multiplied by the quantity of fuel not purchased |
| | Electric energy demand reduction induced price effects ("DRIPE") | Value of price effects resulting from reduced demand in the electric energy market | Calculated by regressing historical electric energy prices as a function of load to determine the impact of load on electric energy prices |
| | Electric capacity DRIPE | Value of price effects resulting from reduced demand in the electric capacity market | Calculated using a linear extrapolation of price differentials between auction results and the scenario in which PJM removes 3000 MW of capacity supply from the bottom of the supply curve in MAAC |
| **Non-Energy Impacts** | Avoided emissions impacts | Carbon dioxide ($CO_2$): Avoided damages for each ton of $CO_2$ avoided | Calculated for electric and natural gas using the 3% discount rate "Annual SC-$CO_2$," adjusted for today's dollars, as published in the 2016 Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis by the Interagency Working Group on Social Cost of Greenhouse Gases |
| | Low-income benefits | Adder applied to account for additional benefits (including health and safety) to low-income participants and community | Proxy: 10% adder |
| | Non-energy benefits | Adder applied to all non-low-income programs to account for non-energy benefits not already included in the NJCT that are difficult to quantify (including public health, water and sewer benefits, economic development, etc.) | Proxy: 5% adder |
| **Global Inputs** | Discount rate | Interest rate that calculates the present value of expected yearly benefits and costs | 3% |
| | Electric line losses | Electric marginal line losses, using approved line loss factor in utility's tariff | Utility-specific line loss factor grossed up for marginal losses by 1.5 |
| | Natural gas losses | Natural gas marginal losses, using approved losses factor in utility's tariff | Utility-specific loss factor |

## Background

New Jersey has historically used five standard cost-effectiveness tests, based on the California Standard Practice Manual ("CSPM"),[5] to review the costs and benefits of EE programs. More specifically, the BPU's Division of Clean Energy ("DCE") has required New Jersey's electric and gas public utilities to evaluate their EE programs using the five tests. The DCE has also used the five tests to evaluate New Jersey Clean Energy Program ("NJCEP") offerings, which in turn use avoided cost assumptions developed by the Rutgers Center for Green Building ("RCGB").[6]

These five basic cost-effectiveness tests, as defined below by the CSPM, reflect varying perspectives and include different costs and benefits. Of the jurisdictions that have a primary test, most leading states rely on the SCT or a modified TRC, both of which consider costs and benefits from the entire jurisdiction's economy.

- **Total Resource Cost Test ("TRC")** and **Societal Cost Test ("SCT")**: The TRC measures the combined impacts of a resource option based on the total costs and benefits of the program, including for the participants and the utility. The SCT is a variant of the TRC. It goes beyond the TRC in that it attempts to quantify the change in the total resource costs to society as a whole rather than to only the service territory (the utility and its ratepayers). The SCT uses essentially the same input variables as the TRC test, but they are defined with a broader societal point of view. For example, the SCT includes the effects of externalities (e.g., environmental, national security), excludes tax credit benefits, and applies a social discount rate. As noted in the CSPM, traditionally, implementing agencies have independently determined the details of the SCT, such as the components of the externalities, the externality values, and the policy rules that specify the contexts in which the externalities and tests are used.
- **Program Administrator Cost Test ("PACT")**[7]: The PACT measures the net costs of a demand-side management program as a resource option based on the costs incurred by the program administrator (including incentive costs) and excluding any net costs incurred by the participant.

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[5] California Public Utilities Commission, "California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects" (October 2001), *available at* https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/CPUC_STANDARD_PRACTICE_MANUAL.pdf. As noted on page 6 of the manual, the tests are not intended to be used individually or in isolation. Rather, the manual suggests that the results of tests must be compared and that there are tradeoffs between the various tests. The manual provides a description of the strengths and weaknesses of each test to assist users in qualitatively weighing test results.

[6] *See, for example, Energy Efficiency Cost-Benefit Analysis Avoided Cost Assumptions Technical Memo: May 1, 2019 Update* ("2019 RCGB Avoided Cost Memo"). For a list of recent RCGB Avoided Cost Memos, *see* https://njcleanenergy.com/main/public-reports-and-library/market-analysis-protocols/market-analysis-baseline-studies/market-an

[7] It is also referred to as the "utility cost test" ("UCT"); however, PACT is preferred because program administrators may not always be utilities, and it is reasonable to consider the entire costs and benefits on both gas and electric systems (which may reflect different utilities) when programs are addressing both fuels.

- **Participant Cost Test ("PCT")**: The PCT measures quantifiable benefits and costs to the customer due to participation in a program. As noted in the CSPM, since many customers do not base their decision to participate in a program entirely on quantifiable benefits, this test cannot be a complete measure of the benefits and costs of a program to a customer.
- **Ratepayer Impact Measure Test ("RIM")**: The RIM measures what happens to customer bills or rates due to changes in utility revenues and operating costs caused by the program. Rates will go down if the change in revenues from the program is greater than the change in utility costs. Conversely, rates or bills will go up if revenues collected after program implementation are less than the total costs incurred by the utility in implementing the program. This test indicates the direction and magnitude of the expected change in customer bills or rate levels.

There are also other methods for developing primary cost tests, such as through the methods described in the National Standard Practice Manual ("NSPM"). The NSPM method results in a state-specific test, referred to as a Resource Value Test ("RVT"), that is based on a jurisdiction's articulated policy and other objectives.

## Procedural History

Following the passage of the CEA, Staff provided multiple opportunities for stakeholder input on a range of topics related to the development and implementation of the EE and PDR programs required by the CEA. Staff solicited input specifically related to the evaluation, measurement, and verification ("EM&V") of the programs and their associated energy savings through a public stakeholder meeting on December 18, 2019, including recommendations for BCA methodologies, and invited stakeholders to provide written comments by January 17, 2020. As a result of these recommendations, Staff proposed an EM&V framework for New Jersey's next generation of EE and PDR programs through a Full Straw Proposal, released on March 20, 2020, and accepted comments through April 13, 2020.

In comments on the Full Straw Proposal, stakeholders voiced concerns about using the NSPM to develop a primary test for New Jersey, given the time required to develop an RVT before program implementation in July 2021. Stakeholders further suggested that the EM&V WG could consider development of an RVT in the future. Additionally, based on the CEA's emphasis on the importance of including both environmental and economic benefits in BCA methods, several commenters suggested that the SCT should be used as the primary cost test for the first program cycle.

Based on stakeholder comments, Staff recommended to the Board that a primary cost test be developed for use by all program administrators in the state and that this test be called the New Jersey Cost Test. Staff recommended that the State's current TRC Test be modified to balance the State's policy objectives with the goal of developing a test in the near-term that has reasonably quantifiable inputs and is based on publicly available sources. On June 10, 2020, the Board adopted Staff's recommendation to propose a modified TRC Test as the primary test

used to evaluate utility- and State-led EE and PDR programs while continuing to use the CSPM tests for informational purposes for the first three-year program cycle.[8]

On July 24, Staff sought stakeholder input about Staff's specific recommendations for the costs and benefits to be included in the NJCT, including NEIs, as well as the practices and assumptions used to develop common statewide inputs. Staff hosted a stakeholder meeting on July 30 and accepted written comments through August 5. Staff provided its final recommendations on the NJCT to the Board for adoption on August 24 following stakeholder input. As adopted by the Board, the NJCT shall be used by all program administrators for the first program cycle and will be reviewed by the EM&V WG for potential future updates on an ongoing basis.

## New Jersey Cost Test Framework

The NJCT is the State's primary test for determining cost-effectiveness of EE and PDR programs, to be used in plan development, approval, and evaluation assessments. The NJCT shall be used to determine compliance with the CEA's 1.0 BCR requirement. The NJCT has been designed to include all costs and benefits relevant to a proposed portfolio of EE programs that are reasonably quantifiable and that align with the policies articulated in the CEA, as well as additional public interest goals of the BPU and the State of New Jersey.

As adopted by the Board, program administrators will use the NJCT as the primary cost-effectiveness test during the first three-year program cycle. In addition to the NJCT, the results of the existing TRC, SCT, PACT, PCT, and RIM will be reported for informational purposes.

Efficiency programs can provide additional benefits to society beyond the ratepayer cost savings directly resulting from using less energy. Including appropriate NEIs to adequately capture the full range of impacts that these programs have on participants and society helps to ensure that benefit-cost screening is balanced and symmetrical. Given the requirements of the CEA and the participant and societal benefits provided by EE programs, the NJCT includes NEIs.

The EM&V WG will review the overall NJCT framework on an ongoing basis and consider modifications in collaboration with Staff. In addition, the Board has tasked the EM&V WG with developing a process for all EE and PDR programs through which the methodologies for developing the value of relevant costs and benefits are appropriately updated and memorialized ahead of each program cycle and/or as needed. All NJCT changes will be adopted by the Board before being considered final.

The methods and policies used to administer the NJCT shall be consistent across all program administrators. Inputs should be established according to the process described above prior to each three-year program cycle and for retrospective evaluation of program performance related to a given cycle. In addition, most input values should reflect average statewide estimates, rather than be utility-specific. This will ensure fair comparisons of all BCA results across program administrators and for statewide co-managed and BPU-administered programs. However, utility-specific values may be used for certain inputs where deemed appropriate by

[8] June 10, 2020 Order at 32.

the Board and where the use of such values is in keeping with the CEA's requirement that input values be publicly available.[9]

To the extent that they are not specifically discussed below, the starting point for inputs and methods used to develop the values for the NJCT is to maintain current practices, as articulated in the RCGB Avoided Cost Memo,[10] which has historically provided the inputs and methods utilized to update the avoided cost assumptions for integration into cost-benefit analyses of the New Jersey Clean Energy Program.

## Global NJCT Inputs

Most of the key inputs for conducting the NJCT are variable and measure-, program-, or portfolio-specific, such as the actual stream of annual costs and savings. Others are consistent statewide ("global") but updated with each three-year EE and PDR program cycle. This section outlines the key global inputs or methods used by the NJCT.

### *Discount Rate*

EE measures typically have relatively high upfront costs that need to be recovered by savings over the life of the measure. Benefit-cost analyses for programs or projects with streams of costs or benefits over more than one to two years use the standard accounting practice of discounting the value of future benefits and costs using an interest rate to calculate the present value of expected yearly benefits and costs. Discounting is especially important when comparing projects or programs with different lifespans. Discounting to a present value therefore allows a more apples-to-apples comparison of projects with various lifespans.

As explained by the Office of Management and Budget ("OMB") in Circular A-94, "[the] higher the discount rate, the lower is the present value of future cash flows."[11] For example, as described in EPA *Guidelines for Preparing Economic Analyses*, if the benefits of a given program occur 30 years in the future and are valued in real terms at $5 billion at that time, the rate at which the $5 billion in future benefits is discounted can dramatically alter the economic assessment of the policy. $5 billion 30 years in the future discounted at 1% is $3.71 billion, at 3% it is worth $2.06 billion, at 7% it is worth $657 million, and at 10% it is worth $287 million.[12]

States that promote EE programs use a range of discount rates, ranging from the utility weighted-average cost of capital ("WACC") on the high end, to near-zero discount rates on the low end. OMB Circular A-94 indicates that a real discount rate of 7% should be used as a base-

[9] N.J.S.A. 48:3-87.9(d)(2).

[10] 2019 RCGB Avoided Cost Memo, *available at* https://www.njcleanenergy.com/files/file/BPU/Avoided%20Cost%20Memo.pdf.

[11] U.S. Office of Management and Budget, *Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (October 29, 1992) at 8, *available at* https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/circulars/A94/a094.pdf.

[12] U.S. Environmental Protection Agency, *Guidelines for Preparing Economic Analyses* (2016) at 75.

case for regulatory analysis, as that rate approximates the marginal pretax rate of return on an average investment in the private sector, and that a rate higher than 7% should be used if the "main cost is to reduce business investment."[13] OMB also states that a lower discount rate is appropriate "when regulation primarily and directly affects private consumption (e.g., through higher consumer prices for goods and services)."[14] The lower rate that is most often used to reflect the "social rate of time preference" is the rate at which "society" discounts future consumption flows to their present value, which can be estimated according to the real rate of return on long-term government debt.[15]

In deciding on the appropriate discount rate, the Board first and foremost considers the importance of EE to New Jersey's energy future and meeting our climate change objectives. While there is no single "correct" discount rate, the Board therefore selects a discount rate that is on the low end of the range of defensible values, reflecting the desire to reasonably maximize the amount of EE, consistent with protecting ratepayers. Thus, the interim NJCT will use a 3% real discount rate of to align with public policy in the state and account for how implementation of the EE programs will significantly and directly affect private consumption (e.g., reduce energy consumption by utility customers), as well as result in costs and benefits that impact not only utilities and program participants but New Jersey ratepayers, residents, and society at large over many years.

***Line Losses***

Due to electric line losses, a kWh saved from efficiency at an end-user's site translates to a reduction of more than one kWh at the point of generation. The higher the load on the electric system, the higher the line losses. This means that the line losses from energy saved through efficiency – that is, marginal line losses – can be significantly higher than average system losses.

Each utility should specify the line loss factor used in its tariff and then convert the average losses to marginal losses. A factor of 1.5 is used to convert average line losses to marginal line losses.

While there are no line losses per se on the natural gas side, a certain amount of natural gas is lost as part of the transportation process. This figure is generically referred to as "Lost and Unaccounted for Fuel" and typically specified in each natural gas utility's tariff. Each utility electing to include natural gas losses should explain the factor selected, with citation to the appropriate tariffed rate.

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[13] U.S. Office of Management and Budget, *Circular A-94: Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs* (October 29, 1992) at 9.

[14] U.S. Office of Management and Budget, *Circular A-4* (September 17, 2003), *available at* https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4.

[15] Id.

Consideration of a multiplier for converting average energy losses to marginal losses during times of peak demand may be explored in the next update to the NJCT.

## Costs

### Efficiency Measure Incremental Costs

Efficiency measure incremental costs are the total costs (to the utility, installer, participant, etc.) associated with the efficiency measure implemented (i.e., material and labor) less the costs of the baseline measure. Specific values currently in use for measure incremental costs appear in Table 2 of the *Cost-Benefit Analysis of the NJCEP Energy Efficiency Programs* report.[16] As estimates are further developed or New Jersey-specific values are quantified, they may be documented in the Technical Resource Manual ("TRM") to provide consistency of approach among all program administrators and incorporated in the NJCT.

Other measure-related costs and benefits, such as impacts on equipment operation and maintenance ("O&M"), equipment replacement, and deferral of capital expenditures over the life of the measure, are yet to be quantified and incorporated in the NJCT. As with the measure incremental costs described above, as estimates or actual values are developed for New Jersey, they may be documented in the TRM and incorporated in the NJCT.

Additional costs related to economic effects that are difficult to quantify may be considered for inclusion in the next update of the NJCT.

### Program Administration Costs

Staff recommends including all non-measure program costs (i.e., those costs that do not directly cover some portion of the incremental measure costs) in overall portfolio level cost-effectiveness. Non-measure costs can generally be divided into two broad categories: non-measure program-specific costs and non-program-specific costs.

#### *Non-Measure Program Costs*

Non-measure specific program costs include those costs attributable to specific programs but not individual measures. Such costs may include, but are not limited to, overhead, marketing, and data tracking costs.

#### *Non-Measure, Non-Program-Specific Costs*

Non-program specific costs include, but are not limited to, non-program-specific administration, planning and analysis, EM&V, and regulatory costs. Non-program costs that are not able to be reasonably allocated or assigned to a specific program should only be included at the portfolio level.

[16] Rutgers Center for Green Building, *Cost-Benefit Analysis of the NJCEP Energy Efficiency Programs: FY2017 Retrospective and FY2019 Summary Reports* (May 2019), *available at* https://www.njcleanenergy.com/files/file/BPU/FY17%20CBA%20Report%20Update%20Final.pdf.

## Benefits

### Energy Savings

EE investments provide two main types of energy savings that need to be quantified in any cost-benefit analysis. First, program participants enjoy *direct* savings associated with lower utility bills when they consume less electricity or other forms of energy. Second, New Jersey residents benefit from *indirect* savings because of the reduced generation and transmission costs that result when energy consumption decreases. The energy savings economic benefits to society are the sum of these direct and indirect savings values. There are numerous components to avoided costs to account separately for energy and peak capacity reductions and to reflect electric generation, transmission, and distribution ("T&D") and natural gas and delivered fuels avoided costs.

#### *Avoided Energy Costs*

Avoided energy costs are created when utilities do not have to purchase electricity or natural gas because a consumer has invested in EE infrastructure and reduced its total consumption. The reductions in wholesale purchases by the utility represent a net savings to society equal to the quantity of avoided electricity or natural gas multiplied by the wholesale cost of procuring that energy, including capacity and other associated costs. For purposes of measuring these benefits, the NJCT considers the following factors:

- Avoided wholesale electric energy costs (in $/MW-hour);
- Avoided wholesale electric capacity costs (in $/MW-day);
- Avoided wholesale electric transmission and distribution costs (in $/kw-year);
- Avoided wholesale electric and ancillary services costs;
- Avoided wholesale natural gas supply costs; and
- Avoided delivered fuel costs.

*Avoided Wholesale Electric Energy Costs Using the PJM Energy Rate*

The NJCT calculates avoided wholesale electric energy costs as the three-year rolling average of historic PJM wholesale prices multiplied by the quantity of electricity not consumed.

*Avoided Wholesale Electric Capacity Costs*

The direct benefit of avoided electric capacity costs are generally equal to the difference in a customer's total capacity costs before and after the EE investment. For some customers, those savings may take the form of revenues earned from the PJM capacity market associated with offering and clearing EE into PJM's Reliability Pricing Model ("RPM"). For customers that do not monetize their capacity into the RPM, the direct savings are equal to the difference in capacity costs at their pre-EE measure baseline load minus their load after the EE improvements are made. For each customer, the utility must select between one of these two methodologies.

*Avoided Wholesale Electric Transmission and Distribution Costs*

The NJCT estimates the direct benefits of avoided wholesale PJM transmission costs using the most recent Network Integration Transmission Service ("NITS") Rate, as measured in dollars per kw-year, as applicable to individual utility service territories.[17]

The NJCT calculates the direct benefits of avoided electric distribution costs by determining the applicable distribution rate for each customer enrolled in the program based on the customer's specific customer class and usage. The savings is determined by determining the total annual distribution charges that the customer would have paid before its participation in the program and then subtracting the total distribution charges the customer paid after the implementation of the EE measures.

The methods to calculate these benefits should be further considered during the triennial review process for the second three-year cycle.

*Avoided Wholesale Electric Ancillary Services Costs*

The NJCT calculates the avoided wholesale electric energy ancillary services costs using a three-year rolling average of historic prices multiplied by the quantity of ancillary services products not purchased. Using historic values has the benefit that if electricity prices rise, more EE would pass the CBA, all other factors staying the same. If electricity prices fall, the reverse is true. It also avoids the danger of using automatic price escalators, which may over- or under-estimate actual pricing trends. Further, forward net electric ancillary services calculations are not well developed yet, and Staff believes it will likely take years of experience to improve these forward calculations.

*Avoided Wholesale Natural Gas Supply Costs*

EE projects can also be structured to reduce a customer's consumption of natural gas against an established baseline. The NJCT includes avoided natural gas consumption costs, using New York Mercantile Exchange ("NYMEX") forward trading prices for Henry Hub multiplied by the quantity of gas not purchased. The utility may include actual gas transportation rates and any local distribution company transportation rates to determine the full delivered cost of gas for any individual customer.

*Avoided Delivered Fuel Costs*

The value of avoided delivered fuel costs (propane or fuel oil) should be included in the NJCT. Avoided costs for #2 fuel oil and propane should be calculated using a three-year rolling average of historic EIA New Jersey residential fuel oil and propane prices

[17] *See, for example,* PJM, Annual Transmission Revenue Requirements and Rates (January 2020), *available at* https://www.pjm.com/-/media/markets-ops/settlements/network-integration-trans-service-january-2020.ashx?la=en.

multiplied by the quantity of fuel not purchased. Table 2 shows the most recent residential propane and fuel oil projections developed for benefit-cost analysis.

**Table 2: Residential Propane and Heating Oil Prices (Nominal $/Gallon)**

| | *Propane Residential* | *Heating Oil Residential* |
|---|---|---|
| **2018** | $3.84 | $3.29 |
| **2019*** | $4.39 | $3.46 |
| **2020*** | $4.82 | $3.65 |

* Please note that 2019 and 2020 fuel oil prices are based on 2018 historical prices and EIA AEO projections as described in footnote below.

***Demand-Reduction-Induced Price Effects***

In addition to the energy benefits resulting from the avoided costs outlined above, the reduced load associated with EE and PDR deployment may also reduce indirect energy and capacity prices for all New Jersey consumers. PJM operates a single-clearing price market, and the price is set at the point that supply and demand meet. PJM determines the clearing price by creating a "supply stack" of all eligible resources based on their strike price. The least expensive resources are lower on the supply stack and are selected first. The next least expensive resource is selected next, and so on, until supply matches the anticipated demand. However, EE investments reduce demand, which in turn tends to push prices down. This effect is often referred to as the Demand-Reduction-Induced Price Effect ("DRIPE") and occurs in both the PJM energy and capacity markets.

The DRIPE effect in the PJM capacity market for EE deployment is somewhat complicated in PJM due to the "EE-addback" to the capacity market. The NJCT attempts to recognize the impact of the EE-addback by differentiating between the indirect effects of EE-related capacity registered in the RPM and reduction in demand that is not registered with PJM.[18]

For EE projects that are not registered in the PJM market, the benefit occurs because PJM reduces its load forecast to reflect the reduced need for capacity caused by the EE investments. The reduced energy demand translates directly into reduced wholesale

[18] *See* June 10, 2020 Order at n.21 citing PJM Manual 18, § 2.4.5 ["After EE Providers propose EE Resource(s) in their EE Measurement and Verification Plans and PJM reviews and accepts the Nominated EE Value of the proposed EE Resource(s), PJM will use the resulting Nominated EE Value to: (1) create an EE Resource to be offered into the upcoming auction, and (2) **increase the reliability requirement to be satisfied for the region and for any affected Zones (or sub-Zonal LDAs). For each BRA, the Reliability Requirement of the RTO and each affected LDA will be increased by the total UCAP Value of all EE Resource(s) for which PJM accepted an EE M&V Plan for that auction, and upon which PJM created an EE Resource to be offered into that upcoming BRA"**] (emphasis added).

prices because the most expensive resource in the supply stack is no longer needed as demand decreases. These savings represent a societal benefit to all consumers in New Jersey, whether they invested in EE themselves or not, and is thus appropriate to include in the tally of EE benefits. We refer to this type of EE as "DRIPE-eligible" below.

However, for EE offered into and cleared in the PJM Reliability Pricing Model, the value of the indirect benefits is limited for a period of time by the EE-addback. For the years in which the EE capacity registered into RPM is "added back" to the demand curve, there is very little initial DRIPE value, and thus it would not be appropriate to recognize this value. We refer to this type of EE as "non-DRIPE-eligible" below.

DRIPE effects are relatively small when expressed in terms of an impact on market prices. However, DRIPE impacts can be significant when expressed in absolute dollar terms when applied to all wholesale purchases by New Jersey consumers.

DRIPE impacts included in the NJCT are listed below. Additional DRIPE impacts, including for natural gas, may be considered for inclusion in the next update of the NJCT.

*Electric Energy DRIPE*

The NJCT calculates electric energy DRIPE by regressing historical electric energy prices as a function of load to determine the impact of reduced load on electric energy prices. DRIPE is calculated as the price difference, as determined by the regression, between the price at the average zonal load and zonal load minus the MW of EE measures installed. Please see Figure 1 as an example of regressing electric energy prices as a function of load for a utility (Commonwealth Edison) in Illinois. Figure 2 illustrates how DRIPE is calculated as the price difference, as determined by the regression, between the price at the average zonal load (represented as "Demand, no EE") and zonal load minus the MW of EE measures installed.

Figure 1: Regressing Electric Energy Prices as a Function of Load

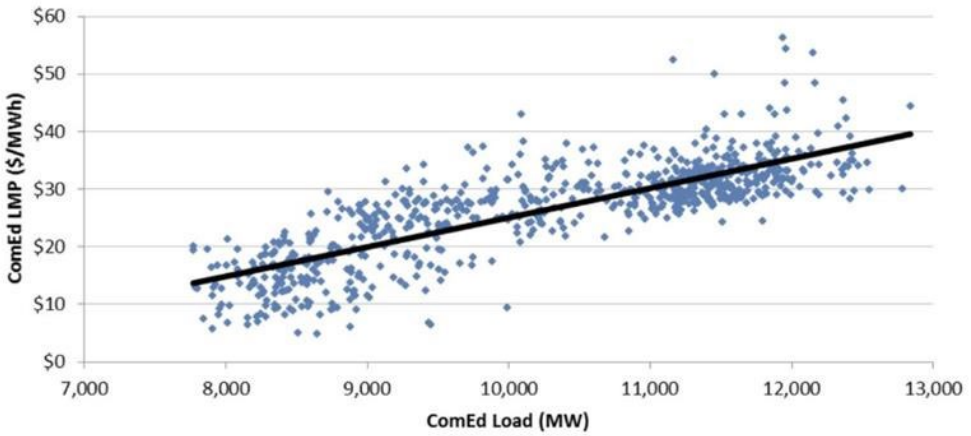
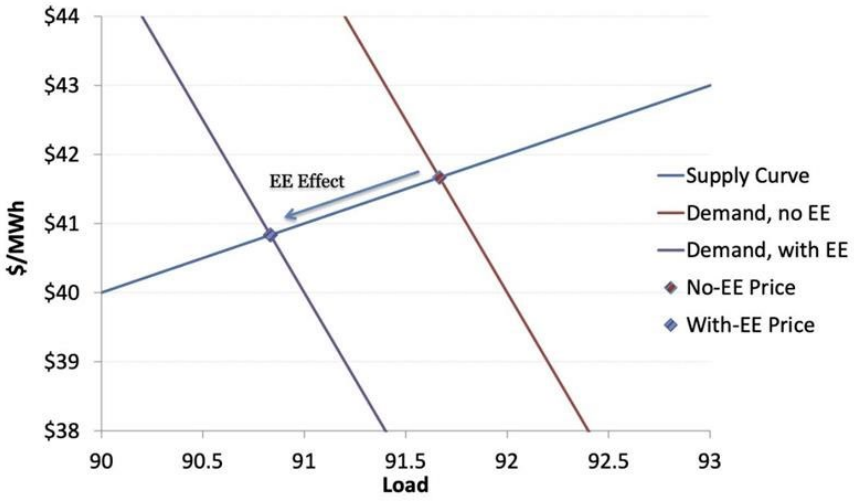


Figure 2: Lower Prices Resulting from Lower Load




*Electric Capacity DRIPE*

The NJCT calculates electric capacity DRIPE using linear extrapolation of price differentials between the actual auction results and the scenario in which PJM removes 3000 MW of capacity performance supply from the bottom of the supply curve in the Mid-Atlantic Area Council ("MAAC") capacity zone. For example, 1000 MW of DRIPE-eligible EE would be credited with a price impact equal to one-third of the 3000 MW figure developed by PJM. Values should be calculated on a delivery year (June–May) basis. This methodology relies on publicly available PJM data. Non-DRIPE eligible EE should not be counted in this methodology.

**Non-Energy Impacts**

There are three general types of non-energy impacts ("NEIs"): (1) utility NEIs, such as reduced arrearages and debt collection costs; (2) participant NEIs, such as reduced operations and maintenance costs; impacts on occupant health and productivity; and increased property values; and (3) societal NEIs, such as economic development, environmental, and public health impacts. Including NEIs will ensure that the NJCT reflects a symmetrical treatment of costs and benefits and accounts for the full range of benefits that are not captured in traditional avoided costs.

It is common practice for jurisdictions to account for NEIs in their cost-effectiveness tests. NEIs are typically included through measured values, adders, or a combination of these two approaches. Measured NEIs are derived from independent studies of efficiency programs or measures that use methodologies such as utility data analysis, engineering models, or surveys and interviews. NEI adders apply a multiplier to total energy or resource benefits, thereby serving as a proxy for impacts that have yet to be evaluated in a jurisdiction. While measured NEIs are more precise than adders, the studies needed to develop values can be costly, time consuming, and difficult for hard to quantify impacts. Adders provide a simpler method to account for NEIs in the absence of specific evaluations that precisely measure their values.

Many jurisdictions have approved the use of adders to account for general non-energy benefits. General non-energy benefit adders range from 5% in Washington D.C. to 20% in Colorado. Nevada, New Hampshire, and Montana use a general adder of 10% to account for the range of benefits attributable to EE programs.[19] These adders reflect a range of impacts including public health, water resources, and economic development.

Jurisdictions also often include separate adders for specific programs such as those that serve low-income customers. Low-income programs provide many difficult to quantify benefits beyond energy savings, which include improved household health and safety, improved comfort, reduced energy burden, and others. States that include additional adders in their cost-effectiveness tests to account for hard to measure low-income program benefits are Colorado (25%), Nevada (25%), New Mexico (20%), New Hampshire (20%), and Vermont (15%).[20] It is important that these benefits are captured in the NJCT, given the CEA's focus on serving the needs of the state's low-income customers and communities.

Adders may serve as interim, conservative proxies for non-energy benefits and be updated and refined as more precise values become available. The adders included in the NJCT will be evaluated during the first triennial review period and refined or replaced with measured values as the EM&V WG undertakes state-specific NEI studies.

***Avoided Emissions Impacts***

*Carbon dioxide ($CO_2$)*

To account for the environmental benefits of avoided $CO_2$ emissions, the NJCT uses the social cost of carbon as listed in the August 2016 Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis.[21] The NJCT uses the 3% discount rate "Annual SC-$CO_2$," adjusted for today's dollars, for avoided emissions from both electric and natural gas.

The NJCT uses an electric emission factor of 1,374 pounds per MWh and a natural gas emission factor of 11.7 pounds per therm saved, as published in the NJCEP Protocols to Measure Resource Savings, to calculate avoided emissions.[22]

[19] National Efficiency Screening Project, Database of State Efficiency Screening Practices, *available at* https://www.nationalenergyscreeningproject.org/state-database-dsesp/

[20] *Id.*

[21] Interagency Working Group on Social Cost of Greenhouse Gases, United States Government, *Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Executive Order 12866* (August 2016), *available at* https://www.epa.gov/sites/production/files/2016-12/documents/sc_co2_tsd_august_2016.pdf

[22] New Jersey Board of Public Utilities, *NJCEP Protocols to Measure Resource Savings* (June 2018) at 13, *available at* https://njcleanenergy.com/files/file/Board%20Orders/FY19/1g2%20-%20NJCEP%20Protocols%20to%20Measure%20Resource%20Savings%20FY19%20%20v3a.pdf

### *Non-Energy Benefits*

The NJCT includes a non-energy impacts adder equal to 5% of the total electric, natural gas, and delivered fuel benefits outlined in the Energy Savings section. The 5% adder serves as a proxy for general non-energy benefits, including water resource savings, public health benefits, and macroeconomic benefits.

### *Low-Income Benefits*

The NJCT includes a low-income benefit adder equal to 10% of the total electric, natural gas and delivered fuel benefits outlined in the Energy Savings section that are attributable to low-income programs. The 10% adder is included in addition to the 5% general non-energy benefits adder.

Agenda Date: 8/24/20
Agenda Item: 8A

Appendix B to Board Order:

In the Matter of the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency and Peak Demand Reduction Programs, Docket No. QO19010040

In the Matter of the Clean Energy Act of 2018 – New Jersey Cost Test
Docket No. QO20060389

# STAFF RESPONSES TO STAKEHOLDER COMMENTS ON STRAW PROPOSAL

## COSTS

### Efficiency measure incremental costs

SUMMARY:

The New Jersey Division of Rate Counsel ("Rate Counsel"), Gabel Associates, and Natural Resources Defense Council ("NRDC") agreed that there should be common practice approaches to determine incremental costs and that incremental cost assumptions should be transparent, consistent, and documented in the Technical Resource Manual ("TRM"). Google called for the inclusion of actual and regularly updated equipment costs to the program/implementer, while Enervee recommended removing this input because estimates are often outdated. Enervee also argued that including participant costs penalizes programs that focus on eliminating barriers, thereby transforming markets and leveraging private investment into energy efficiency without incentives. Enervee noted that including participant costs but not participant benefits will result in an imbalance in the test. The Energy Efficiency Alliance of New Jersey ("EEANJ") recommended that the test adjust the approach to quantifying benefits resulting from retrofit projects so as to account for benefits of retrofit measures.

Rockland Electric Company ("RECO") and NRDC also specifically expressed support for tracking and reporting incremental, operations and maintenance ("O&M"), and deferred capital expenditures in a consistent manner, with RECO suggesting that they should be documented in the TRM based on independent third-party evaluation results but not tracked and reported by program administrators because this information is not available at a project level.

PSE&G noted that O&M impacts are more likely to be benefits rather than costs. Gabel Associates recommended calculating avoided O&M and replacement costs based on the specific characteristics of each individual measure proposed to be installed in an energy efficiency ("EE") program.

STAFF RESPONSE:

Staff appreciates the comments in agreement with the NJCT proposal that incremental cost methodologies should be transparent, consistent, and documented in the TRM. While actual equipment costs are not yet available, the NJCT will use specific values currently in use for incremental costs as contained in the latest cost-benefit analysis report performed by the Rutgers Center for Green Building ("RCGB") and referenced in the NJCT. As estimates are further developed or New Jersey-specific values are quantified, they should be documented in the TRM and incorporated in the NJCT.

Staff also agrees that both participant benefits and costs should be included in the NJCT. While New Jersey-specific values are not currently available, as estimates or actual values are developed regarding impacts on O&M, equipment replacement, and deferral of capital expenditures, they should be documented in the TRM and incorporated in the NJCT.

**Program administration costs**

SUMMARY:

Regarding general program administration costs, Gabel Associates recommended allowing utilities and program administrators latitude to determine what costs fall in the category of program administration and commented that all costs included in the NJCT proposal were reasonable non-measure-specific program costs.

Regarding non-measure program costs, NRDC recommended that the Board be flexible in determining which costs to include as non-measure program costs. New Jersey Natural Gas ("NJNJ") encouraged the Board to allow utilities to identify but exclude from the NJCT certain policy-related, non-measure program costs, such as workforce development costs, that do not directly contribute to energy savings. Rate Counsel argued that costs attributable to specific programs should be accounted for as such (e.g., costs associated with building and managing an online marketplace should be accounted for in a utility's efficient products program).

Regarding non-measure, non-program-specific costs, RECO agreed that that O&M costs should be quantified and included in the NJCT. JCP&L recommended that any non-program costs not able to be reasonably allocated to a specific program (e.g., planning and analysis, EM&V, regulatory) should only be included at the portfolio level. Rate Counsel argued that only costs that are spread across all programs, such as overall administrative costs, should be included at the portfolio level. PSE&G recommended that certain costs not be included in the NJCT, even at the portfolio level, and cited the following costs as examples: costs related to ramp-up and development of new programs and pilots because they reflect higher expenditures in the early years and decline as programs operate at full scale; data tracking systems and information technology expenditures because they are long-term investments that provide benefits beyond the first three-year program cycle; evaluation, measurement, and verification ("EM&V") expenditures because they are regulatory requirements but not essential to the programs themselves; pilot program costs (and benefits) because to include costs would discourage their pursuit given their exploratory nature; education and outreach. At the same time, PSE&G also recommended that expenditures on data tracking and other IT, education and outreach, program management, and program design and development be put in the non-program-specific category because they benefit the entire portfolio without a direct link to individual programs.

STAFF RESPONSE:

Staff thanks the stakeholders for their feedback requesting flexibility in allowing utilities and program administrators to exclude certain non-measure program costs from the NJCT, whether policy-related costs related to workforce development initiatives, long-term costs such as ramp-up and information technology ("IT") costs, EM&V expenditures, or pilot program costs. In general, Staff believes that it is important to include all expenditures connected to the EE programs, including those that are attributable to policy-related initiatives, ramp-up of programs, IT, EM&V, education and outreach, program management, and program design and development. More specifically regarding policy-related expenditures such as those related to workforce development, Staff also notes that, while these expenditures will be included as costs, the NJCT is designed to also capture the benefits of such initiatives through the inclusion

of non-energy benefits. Staff further notes that, if utilities wish to submit waiver requests for specific types of costs, they may file those with the Board.

Staff agrees that non-measure costs that can be reasonably allocated to specific programs should be and that non-measure costs that cannot be reasonably allocated to specific programs (i.e., non-measure, non-program-specific costs) should be included at the portfolio level.

## BENEFITS

### General

SUMMARY:

Sunrun recommended that the NJCT include avoided distribution investments attributed to EE- and peak demand reduction ("PDR")-driven load reductions to determine direct and indirect energy and capacity savings value. They noted that savings from EE and PDR programs that delay transmission or distribution upgrades can be tracked and quantified through distribution system planning.

STAFF RESPONSE:

Staff thanks Sunrun for the comment and agrees that the NJCT should include avoided transmission and distribution investments due to EE- and PDR-driven load reductions. The NJCT includes the avoided energy costs, as well as demand-reduction-induced price effects, discussed in more detail below, for the first program cycle, and additional or revised inputs will be considered for inclusion in the next update of the NJCT.

### Avoided energy costs

SUMMARY:

In general comments on avoided energy costs, Rate Counsel recommended calculating them based on projected costs, with location-specific forecasts used to the extent practicable, and argued that historic locational marginal prices are a poor predictor of future energy prices. Gabel Associates also recommended the use of forecasts, with specific recommendations outlined below. RECO recommended using utility-specific avoided costs values, based on publicly available data, where appropriate, for avoided energy, capacity, and transmission costs rather than statewide avoided costs values based on PJM data.

Also in general comments on avoided energy costs, the Building Performance Association commended the inclusion of impacts on generation, transmission, and distribution.

STAFF RESPONSE:

Staff provides responses to specific avoided costs below. Staff also notes that the Board has directed Staff to ensure that the Evaluation, Measurement, and Verification Working Group ("EM&V WG") continues to develop and recommend an approach to estimating avoided costs on a statewide basis, using utility-specific inputs where appropriate.

***Avoided wholesale electric energy costs***

SUMMARY:

Gabel Associates recommended using publicly available forward prices, as a representation of actual prices paid today for future energy, based on the current energy market forward trading price for PJM-Western Hub, congestion-adjusted for each applicable energy delivery zone. As an alternative, Gabel Associates recommended using industry standard market fundamental dispatch modeling software to forecast energy prices. More specifically, Gabel Associates recommended that the NJCT use forward prices for two years into the future, blend them into a longer-term forecast for the following three years, such as one provided by the Energy Information Administration ("EIA") in its most recent Annual Energy Outlook ("AEO") generation reference case for the PJM/East region, and follow them thereafter with an EIA escalator. Gabel Associates stated that values should be calculated for on- and off-peak prices on a monthly basis for each utility zone.

JCP&L supported the approach outlined by Gabel Associates and offered the following specific recommendation on blending: 66% forwards and 33% AEO in year 1; 33% forwards and 66% AEO in year 2; 0% forwards and 100% AEO in year 3; and use of electricity pricing projections from the most recent AEO thereafter.

PSE&G also supported the approach outlined by Gabel Associates, suggesting the use of monthly PJM Western Hub day ahead future prices for the first two years, adjusted for congestion to the New Jersey region specific to each utility's zone, after which the price series would be transitioned to reflect the price escalation of the AEO generation reference case for the PJM/East region.

STAFF RESPONSE:

Although some commenters recommended using price forwards, Staff maintains that the three-year rolling average of historic PJM wholesale prices multiplied by the quantity of electricity not consumed is reasonable and appropriate for this first cycle.

***Avoided wholesale electric capacity costs***

SUMMARY:

Gabel Associates recommended forecasting avoided electric capacity costs based on each separate LDA/Zone of pricing. JCP&L supported use of the rolling three-year average of PJM Reliability Pricing Model ("RPM") Base Residual Auction ("BRA") clearing prices, adjusted for inflation prior to averaging and application of a fixed escalation rate. PSE&G also recommended using BRA prices, escalated based on the historical price escalation rate of BRA prices and adjusted to reflect how demand savings are measured at retail but the benefit grosses up to the wholesale level (e.g., using a Forecast Pool Requirement factor).

STAFF RESPONSE:

As explained in the NJCT, the direct benefit of avoided electric capacity costs are generally equal to the difference in a customer's total capacity costs before and after the EE investment. For some customers, those savings may take the form of revenues earned from the PJM capacity market associated with offering and clearing EE into PJM's Reliability Pricing Model ("RPM"). For customers that do not monetize their capacity into the RPM, the direct savings are equal to the difference in capacity costs at their pre-EE measure baseline load minus their load after the EE improvements are made. For each customer, the utility must select between one of these two methodologies.

***Avoided wholesale electric transmission and distribution costs***

SUMMARY:

Gabel Associates and NRDC recommended that the NJCT include both wholesale electric transmission and distribution ("T&D") capacity costs, with Gabel Associates suggesting that the NJCT use the Rutgers Avoided Cost Memo recommended rate, adjusted for inflation for each program year. PSE&G also supported this approach. RECO commented that avoided distribution costs should be quantified and included in the NJCT based on utility-specific information and aligned with methodologies used to quantify this cost for other initiatives, such as non-wires alternatives and distributed energy resources.

STAFF RESPONSE:

Staff believes that it is reasonable and appropriate to estimate the direct benefits of avoided wholesale PJM transmission costs using the most recent Network Integration Transmission Service ("NITS") Rate, as measured in dollars per kw-year, as applicable to individual utility service territories.

Staff also believes that it is reasonable and appropriate to estimate the direct benefits of avoided distribution costs by determining the applicable distribution rate for each customer enrolled in the program based on the customer's specific customer class and usage. The savings is determined by determining the total annual distribution charges that the customer would have paid before its participation in the program and then subtracting the total distribution charges the customer paid after the implementation of the EE measures.

In its avoided cost memo, RCGB notes that a comprehensive avoided T&D study should be conducted in the near future to estimate these values. The methods to calculate the direct benefits of avoided wholesale T&D costs should be further considered during the triennial review process for the second three-year cycle.

***Avoided wholesale electric ancillary services costs***

SUMMARY:

The Building Performance Association and NRDC stated that the NJCT should include avoided wholesale electric ancillary costs. Gabel Associates recommended calculating them based on the historic relationship between energy and ancillary service prices using a predictive regression model using historic energy and ancillary prices, as well as the electric energy forecast. Gabel Associates stated that the forecast can also incorporate consideration of market changes and how those may impact future outcomes. They noted that, for 2019, this method equates to about $1 per MWh, and they stated that values should be calculated on a monthly or annual basis.

STAFF RESPONSE:

Staff maintains that calculating avoided wholesale electric ancillary services using a three-year rolling average of historic prices multiplied by the quantity of ancillary services products not purchased is reasonable and appropriate for this first cycle. As noted in the NJCT, Staff's view is that forward net electric ancillary services calculations are not yet well developed and that it will take years of experience to improve them.

***Avoided wholesale natural gas supply costs***

SUMMARY:

Gabel Associates, Elizabethtown Gas Company and South Jersey Gas Company ("ETG/SJG"), and PSE&G recommended estimating avoided wholesale natural gas supply costs using gas consumption price forecasts. Gabel Associates and ETG/SJG suggested that estimates should be based on New York Mercantile Exchange ("NYMEX") forward trading for the summation of Henry Hub (to represent the commodity component) and the marginal interstate pipeline basis (to represent the transportation component). Gabel Associates further suggested that forward prices should be used for two years into the future, then blended into the longer-term EIA forecast using the most current AEO reference case for Henry Hub and delivered gas for the following three years, and followed by an EIA escalator thereafter. Gabel Associates stated that values should be calculated on a monthly basis for each marginal transportation pipeline. PSE&G recommended using monthly Henry Hub future prices with adjustment for the monthly basis for the first two years, transitioning to 2020 EIA AEO prices, and escalating the monthly future prices in alignment with the EIA price series.

Rate Counsel stated that Henry Hub prices are not an appropriate basis for evaluating New Jersey avoided gas costs and recommended that forecasts be developed to represent natural gas Citygate prices for New Jersey, suggesting that these proxies would render unnecessary the separate calculation of the commodity and transportation components of natural gas.

STAFF RESPONSE:

For the first NJCT, Staff believes that it is a reasonable and appropriate approach to estimate avoided natural gas consumption costs using NYMEX forward trading prices for Henry Hub multiplied by the quantity of gas not purchased. The utility may include actual gas transportation rates and any local distribution company transportation rates to determine the full delivered cost of gas for any individual customer. This approach may be further developed or revised in future updates to the NJCT.

***Avoided wholesale natural gas transmission capacity costs***

SUMMARY:

Gabel Associates, ETG/SJG, and the Building Performance Association recommended that the NJCT account for avoided natural gas transmission capacity costs. Gabel Associates and ETG/SJG recommended calculating them based on recent costs to subscribe for capacity on interstate pipelines. Gabel Associates further stated that data to calculate this cost is available in FERC filings by interstate pipelines as they negotiate prices with shippers. They provided an avoided natural gas transmission capacity cost of $0.7902, which was based on a review of such filings.

STAFF RESPONSE:

Staff thanks stakeholders for their feedback and recommendations. The inclusion of avoided natural gas transmission capacity costs should be evaluated during the triennial review, as the EM&V WG further reviews the avoided costs in the NJCT.

***Avoided delivered fuel costs***

SUMMARY:

Gabel Associates and the Building Performance Association expressed support for the inclusion

of avoided delivered fuel costs in the NJCT.

STAFF RESPONSE:

Staff thanks the stakeholders for their feedback.

### *Avoided RPS compliance costs*

SUMMARY:

Gabel Associates, PSE&G, the Building Performance Association, and NRDC submitted comments in support of including avoided RPS compliance costs in the NJCT. Gabel Associates and PSE&G further recommended that these costs should be calculated based on the required percentages set forth in statutes for each renewable type as well as price forecasts for each renewable source. They stated that the product of these percentages and State requirements would provide a weighted average price per MWh.

STAFF RESPONSE:

Staff thanks stakeholders for their comments and recommendations. The inclusion of avoided environmental compliance costs, including RPS compliance costs, should be evaluated during the triennial review, as the EM&V WG further reviews the avoided costs included in the NJCT.

## Demand-reduction-induced price effects ("DRIPE")

### *General*

SUMMARY:

Rate Counsel, Gabel Associates, PSE&G, and the EEANJG supported the inclusion of DRIPE in the NJCT. PSE&G suggested that utilities should perform their own analyses on price effects during the first three-year program cycle and work toward a standard approach for the next program cycle.

STAFF RESPONSE:

Staff agrees that the NJCT should include DRIPE and notes that the methodologies to estimate the multiple types of DRIPE should be further developed during the triennial review, as the EM&V WG reviews the energy benefits included in the NJCT.

### *Electric energy DRIPE*

SUMMARY:

Gabel Associates proposed two methods to calculate electric energy DRIPE in their comments. First, they suggested that it be calculated based on the relationship between electric energy prices, natural gas prices, and load. Using the electric energy and natural gas price forecasts above, they said that electric energy DRIPE should be calculated using a predictive multivariate regression model to determine the impact of reduced load on electric energy prices. Second, they suggested that, alternatively, it could be calculated based on an industry standard market fundamental dispatch model, which would sync the avoided wholesale electric energy forecast and the electric energy DRIPE forecast.

STAFF RESPONSE:

Staff thanks Gabel Associates for their recommendation. The NJCT calculates electric energy DRIPE by regressing historical electric energy prices as a function of load to determine the impact of reduced load on electric energy prices. DRIPE is calculated as the price difference, as determined by the regression, between the price at the average zonal load and zonal load minus the MW of EE measures installed.

***Electric capacity DRIPE***

SUMMARY:

Rate Counsel did not agree that the "EE-addback" necessarily eliminates electric capacity DRIPE benefits in the PJM capacity market because adding low-cost supply to the market has the same effect on prices as reducing demand does. They suggested that utilities should be encouraged to bid EE-based capacity into the RPM to the extent allowable under PJM rules and reach agreement on the best way to calculate resulting price effects.

Gabel Associates provided a methodology to calculate electric capacity DRIPE in their comments that relies on publicly available PJM data. They recommended that electric capacity DRIPE be estimated based on scenario analyses released by PJM following each capacity auction that detail how the market would have cleared under different conditions. They suggested that electric capacity DRIPE should be calculated using a predictive regression model of price differentials between the actual auction results and the scenario in which PJM removes 3000 MW of capacity performance supply from the bottom of the supply curve in MAAC. They also suggested that values should be calculated on a delivery year (June–May) basis for each capacity zone in New Jersey (PSEG or PS-North, and EMAAC).

STAFF RESPONSE:

Staff thanks Gabel Associates and Rate Counsel for their recommendation and discussion. The NJCT will calculate electric capacity DRIPE using linear extrapolation of price differentials between the actual auction results and the scenario in which PJM removes 3000 MW of capacity performance supply from the bottom of the supply curve in the Mid-Atlantic Area Council ("MAAC") capacity zone.

***Natural gas DRIPE***

SUMMARY:

Gabel Associates and ETG/SJG recommended including natural gas DRIPE in the NJCT and estimating it based on the relationship of scheduled gas on pipelines to New Jersey and market prices for that natural gas. Gabel Associates further recommended this should be calculated by using a predictive regression model between natural gas prices and scheduled gas quantities.

STAFF RESPONSE:

Staff thanks stakeholders for their comments and recommendations. The inclusion of natural gas DRIPE will be evaluated during the triennial review, as the EM&V WG further reviews the energy benefits included in the NJCT.

***Avoided wholesale volatility costs***

SUMMARY:

Gabel Associates, ETG/SJG, and PSE&G recommended that avoided wholesale volatility costs be included in the NJCT through a 10% adder for energy and capacity benefits.

STAFF RESPONSE:

Staff thanks stakeholders for the comments and recommendations. The inclusion of avoided wholesale volatility costs will be evaluated during the triennial review, as the EM&V WG further reviews the avoided costs in the NJCT.

***Avoided O&M and replacement costs***

SUMMARY:

Gabel Associates recommended including avoided O&M and replacement costs and calculating them based on the specific characteristics of individual measures. PSE&G recommended including these inputs as well and noted that O&M impacts are more likely to result in net benefits rather than net costs.

STAFF RESPONSE:

Staff agrees that the NJCT should include both participant benefits and costs. While measure-specific values are not yet available for inclusion in the NJCT, as estimates or actual values are developed for New Jersey regarding impacts on O&M, equipment replacement, and deferral of capital expenditures, they should be documented in the TRM and incorporated in the NJCT.

***Avoided New Jersey sales tax***

SUMMARY:

PSE&G commented that the NJCT Proposal omitted New Jersey sales tax costs and suggested that it should be included because customers will avoid taxes as they use less energy.

STAFF RESPONSE:

Staff appreciates PSE&G's suggestion to include avoided New Jersey sales tax as part of the avoided costs included in the NJCT. The EM&V WG should review this topic as it undertakes its review of the NJCT's avoided costs during the triennial review period.

## NON-ENERGY IMPACTS

**General**

SUMMARY:

Rate Counsel agreed that the non-energy benefits Staff recommended including in the proposed NJCT can represent important benefits for ratepayers and the public in general. However, they noted that many of the benefits listed by Staff are secondary impacts that are difficult to quantify. Rate Counsel expressed continued support for Staff's recommendation in the July 10 Order that this interim NJCT should include non-energy impacts only if they are "readily documented and have agreed upon values either in New Jersey or which can be

reasonably used in New Jersey." Rate Counsel expressed concerns that, without clear guidelines, there is significant risk of double-counting benefits and that by adding so many monetized secondary benefits, the benefit-cost analysis could be rendered meaningless. They mentioned that the CEA already exempts low-income programs from achieving a benefit-cost ratio of 1.0, which partly reflects the participant benefits of these programs. For customer-specific impacts such as avoided water and sewer costs, Rate Counsel noted that these benefits can be reasonably included in the Participant Cost Test; however, they are small on the societal level and largely represent a transfer payment. Regarding emissions, Rate Counsel mentioned that it is reasonable, common practice, and consistent with the CEA's mandate to include some sort of proxy for avoided emissions as a benefit in a modified Societal Cost Test, but there is significant risk of double-counting when emission costs and public health benefits are included.

The Building Performance Association supported the inclusion of non-energy impacts, and RECO agreed specifically with the proposal's inclusion of non-energy resource savings associated with public health, low-income health and safety impacts, and water and sewer benefits. Additionally, Bloom Energy expressed support for the inclusion of public health benefits from the avoided emissions of $NO_X$, $SO_2$, and particulate matter.

NRDC recommended that the NJCT should include specific monetary values for non-energy benefits based on publicly accessible research and data modeling tools. As an example, they mentioned the EPA's COBRA tool, which can be used by regulatory agencies to determine the health benefits of marginal reductions in emissions from reduced power plant operation.

STAFF RESPONSE:

Staff appreciates the comments and suggestions received related to non-energy benefits.

Regarding low-income program benefits, Staff acknowledges that the CEA allows for these programs to be exempt from the 1.0 benefit-cost ratio requirement. However, Staff felt that it was important to quantify these benefits in the NJCT given the CEA's focus on serving the needs of the state's low-income customers and communities. While the 10% low-income program benefits adder included in the interim NJCT is a conservative proxy, Staff believes it is an appropriate value for the test at this time.

In determining which impacts to include in the interim NJCT, Staff was careful to only consider those that could be reasonably applied in New Jersey at this time. Staff was aware of the risks of including unreasonable non-energy impacts and double-counting and ultimately decided on the non-energy benefit adder approach to mitigate these risks.

**Avoided emissions impacts: general**

SUMMARY:

Stakeholders[1] submitted comments in support of including avoided emissions benefits in the NJCT. They recommended that both avoided greenhouse gas emissions, such as $CO_2$ and methane, and avoided air pollutant emissions be quantified in the NJCT.

The Institute for Policy Integrity suggested that the Board should consider adopting a methodology to account for avoided emissions that is more sensitive than the EPA benefits per kilowatt-hour approach included in the proposal. They recommended using the approach outlined in their 2018 *Valuing Pollution Reduction* report to assign a value to the local air

[1] Gabel Associates, RECO, Bloom Energy, Google, Sunrun, ACEEE, the Building Performance Association, NFCRC, NRDC, and the Institute for Policy Integrity

pollution avoided by EE and PDR investments. Additionally, the NFCRC recommended the use of this approach to account for avoided emissions in the NJCT.

STAFF RESPONSE:

Staff thanks commenters for the suggestions provided and agrees that the NJCT should account for the benefits of avoided emissions. The interim NJCT will account for avoided greenhouse gas emissions by using the social cost of carbon. Public health benefits from the reduction of emissions of other air pollutants will be reflected in the 5% general non-energy benefits adder (described in more detail in the "Non-Energy Benefits" section below).

During the triennial review, the EM&V WG should evaluate the inclusion of additional avoided emissions and the methodologies used to calculate them in the NJCT.

***Avoided emissions: carbon dioxide***

SUMMARY:

Stakeholders noted the importance of including an appropriate price for carbon pollution and suggested that the social cost of carbon as published by the Interagency Working Group on Social Costs of Greenhouse Gases be used to calculate the avoided $CO_2$ emissions benefits. Gabel Associates and EEANJ supported adopting the social cost of carbon associated with a 3% discount rate. NRDC further suggested that the high impact social cost of carbon be used.

STAFF RESPONSE:

Staff agrees with stakeholders that it is important to value avoided $CO_2$ emissions and believes that the social cost of carbon is appropriate for use in the NJCT. For the first program cycle, the NJCT will use the 3% discount rate "Annual SC-$CO_2$", adjusted for today's dollars, to calculate avoided $CO_2$ emissions for both electric and natural gas.

***Other avoided emissions***

SUMMARY:

Gabel Associates recommended that the benefits of other avoided pollutants such as $SO_2$ and $NO_X$ be included in the NJCT. They recommended that these benefits be calculated by the using the average of the Krewski and Lepeule cases from the EPA's 2018 *Technical Support Document: Estimating the Benefit per Ton of Reducing PM2.5 Precursors from 17 Sectors*. Gabel provided a methodology and schedule of avoided emissions damages through 2050 in their comments. They further recommended that New Jersey should evaluate the inclusion of additional emissions during the triennial review process such as $PM_{2.5}$, HG, $O_3$, $HG_4$, VOCs and other emissions. The American Council for an Energy-Efficiency Economy ("ACEEE") supported the inclusion of other avoided pollutants, particularly $NO_X$, $SO_2$, mercury, and methane, but did not provide a specific recommendation for calculating benefits.

STAFF RESPONSE:

Staff thanks stakeholders for their feedback and appreciates the recommended methodology and schedule to account for avoided pollutant damages that was included in the comments. Given the absence of information specific to New Jersey and the risk of double-counting benefits, Staff believes that it is appropriate to delay the inclusion of additional avoided pollutant benefits until this can be evaluated by the EM&V WG. For the first program cycle, these additional avoided emissions benefits will be reflected as part of the 5% general non-energy

benefits adder (described in more detail in the "Non-Energy Benefits" section below).

**Public health**

SUMMARY:

EEANJ, the Environmental Groups (joint commenters), and the NFCRC expressed support for the inclusion of public health benefits in the NJCT. While Health Care Without Harm appreciated the intent of including public health NEIs, they noted that the EPA analysis included in the proposal focuses only on a subset of air pollutants. They suggested that public health NEIs should be expanded beyond just the impacts from reduced air pollution. They further recommended that a working group with the Department of Health that interacts with the EM&V WG be established to facilitate the inclusion of public health impacts. ACEEE similarly recommended that the health and safety impacts of whole-house interventions be included for both low-income and non-low-income houses and provided suggested specific values for New Jersey derived from their recent *Making Health Count Report*.

STAFF RESPONSE:

Staff thanks stakeholders for their feedback and appreciates the recommended values provided. However, Staff believes it is appropriate to delay the inclusion of monetized public health benefits in the NJCT until their inclusion can be reviewed by the EM&V WG. For the first program cycle, public health benefits will be reflected as part of the 5% general non-energy benefits adder (described in more detail in the "Non-Energy Benefits" section below).

**Low-income benefits**

SUMMARY:

There was broad support among comments submitted by stakeholders for the inclusion of low-income benefits in the NJCT. PSE&G expressed support for the household health and safety benefits included in the proposal as a starting point but noted that additional factors should be included in the future. RECO advised that the health and safety impacts attributable to income-qualified customers should be careful not to be double-counted along with associated greenhouse gas reduction benefits. EEANJ further recommended that the use of adders and multipliers should be pursued by the EM&V WG to account for low-income program benefits.

STAFF RESPONSE:

Staff agrees with the comments received and supports the inclusion of low-income program benefits in the NJCT. For the first program cycle, a 10% adder has been included in the NJCT to account for low-income program benefits.

**Low-income benefits adder**

SUMMARY:

ACEEE identified other states using adders to capture the many other benefits of efficiency beyond the quantified benefits calculations for energy, health, and environmental benefits. They noted that adders ensure that this broad range of benefits are valued rather than assumed to be zero. They stated that a low-income adder would reflect the wide range of additional benefits to low-income participants and to the community from EE programs targeted at that sector, including housing stock preservation; reduced transience in the community; improved comfort

and livability in the home, which could also improve school and work performance; lower household energy burdens, which could lead to increased disposable income to use for other household needs (which could also benefit the local economy). They suggested that it could prove useful to have an agreed-upon adder for low-income programs given the BPU's stated priority objective to reach low-income communities and recommended including an adder of at least 20% for low-income programs.

The Environmental Groups (joint comments) and NRDC also submitted comments in support of the low-income benefits identified by Staff and suggested that an adder of 20% be included for low-income programs.

STAFF RESPONSE:

Staff agrees with the use of an adder to account for low-income program benefits in the NJCT. For the first program cycle, a 10% adder will be used to account for low-income program benefits. Staff has decided to delay the inclusion of quantified low-income benefits, such as those suggested in the original proposal, until the EM&V WG is able to evaluate the impact of these benefits specific to New Jersey. While the 10% adder is a conservative proxy, Staff believes it is an appropriate value for the NJCT for the first program cycle.

**Water and sewer benefits**

SUMMARY:

PSE&G and RECO submitted comments in support of including water and sewer benefits in the NJCT. In their comments, PSE&G disagreed that there are currently no electric or natural gas efficiency measures that impact water usage. They noted the examples of low-flow showerheads and faucet aerators that conserve both heat and water. Both commenters suggested that the average avoided cost of water and wastewater should be used to determine the financial benefits of reduced water usage from energy efficiency programs. RECO further suggested that utilities should be permitted to use utility-specific information where available.

STAFF RESPONSE:

Staff appreciates these comments related to water and sewer benefits and agrees that they should be included in the NJCT. However, in the current absence of avoided water and sewer costs for New Jersey, Staff believes that it is appropriate to include these benefits as part of the 5% general non-energy benefits adder at this time (described in more detail in the "Non-Energy Benefits" section below). Avoided water and sewer costs will be evaluated as the EM&V WG studies non-energy impact and avoided cost values specific to New Jersey.

**Economic development**

SUMMARY:

Stakeholders supported including the economic development impacts of EE and PDR programs in the NJCT. Gabel Associates, PSE&G, and Rate Counsel recommended that an input/output model such as IMPLAN be used to calculate the values for statewide economic development benefits. Gabel Associates suggested that the analysis should be holistic and consider direct program spending, participant bill savings, and increased participant bills. PSE&G also suggested that the National Renewable Energy Laboratory's ("NREL's") Jobs and Economic Development Impact ("JEDI") model be used to determine indirect and induced jobs. Rate Counsel further stated that both the positive and negative economic impacts of EE programs on participant and ratepayer income must be included.

STAFF RESPONSE:

Staff appreciates the recommendations provided on the methodologies to calculate the economic benefits of EE programs in the NJCT, such as the use of input/output models and NREL's JEDI model. Further, Staff acknowledges the importance of including both the positive and negative economic impacts of EE programs when including these impacts. In the absence of such modeling for the first program cycle, economic benefits will be included in the NJCT as part of the 5% general non-energy benefits adder (described in more detail in the "Non-Energy Benefits" section below). The EM&V WG should evaluate economic impacts of EE programs specific to New Jersey during the first triennial review period.

**Non-energy benefits adder**

SUMMARY:

Stakeholders were largely supportive of Staff's recommendation that the NJCT account for the range of non-energy benefits provided by EE programs. Multiple stakeholders[20] recommended that the NJCT use a 10% adder for general non-energy benefits for the first program cycle. This recommended adder would account for hard to quantify non-energy benefits such as public health, water resource savings, economic development, small business customer benefits, increased grid resiliency, improved comfort, and others. Gabel Associates and NRDC further recommended that the Board should undertake a broad non-energy benefit study during the triennial review period to establish a specific approach for quantifying these benefits in future program cycles.

STAFF RESPONSE:

Staff agrees with the suggested approach of using an adder to quantify non-energy benefits in the NJCT for the first program cycle. The NJCT will include a 5% adder for non-energy benefits such as public health, water resource savings and macroeconomic benefits. Staff acknowledges that the 5% adder is a conservative proxy for non-energy benefits, but believes it is appropriate for the first program cycle. This adder will be evaluated during the triennial review and refined or replaced with quantified values as the EM&V WG undertakes its evaluation of non-energy benefits in New Jersey.

## GLOBAL INPUTS

**Discount rate**

SUMMARY:

Staff received comments from multiple stakeholders[25] in support of using a low-risk or social discount rate of 3% or lower in the NJCT. The commenters stated that such a discount reflects the long-term, societal benefits provided by EE programs. Gabel Associates specifically recommended a 3% discount rate be used and noted that this is consistent with the lower end of OMB guidance in Circular A-94. Additionally, PSEG and the Building Performance Association recommended the use of a 3% discount rate, while Google suggested the use of a negative discount rate. NRDC recommended that utility-specific cash flow should be discounted at a rate between 5-7%, which is similar to supply side sources, and a discount rate of 2% should be used for projects carried out by the private sector that serve the public good. ACEEE stated that the choice of a discount rate is an important factor in the ability of a

state to achieve its efficiency goals. In their comments, they noted that nine states use a low-risk discount rate of 3% or less and six of those states are ranked in the top 10 of actual utility energy efficiency savings achieved according to their most recent State Scorecard Report. They further noted that states with lower discount rates tend to be national leaders in utility EE accomplishments.

Rate Counsel supported using a 7% discount rate or one that is based on the utility weighted average cost of capital in the NJCT and disagreed with the other commenters who suggested a lower discount rate. Rate Counsel argued that evaluating the costs and benefits of EE programs using a societal discount rate is inappropriate because the EE programs are not a public good that is "non-rival" in consumption since the primary benefits of the project are being developed on behalf of NJ ratepayers. They further stated that, while EE programs will facilitate a number of positive externalities, this is not justification for evaluating EE programs entirely as a "public good." Rate Counsel additionally noted that the Board has historically used a higher discount rate when assessing EE program benefits and that a 7% discount was used recently by the Board in its Guidelines for Application Submission for Proposed Offshore Wind Facilities.

STAFF RESPONSE:

Staff thanks stakeholders for the in-depth comments about the discount rate. In deciding on the appropriate discount rate to recommend to the Board, Staff considered the importance of EE to New Jersey's energy future and meeting the State's climate change objectives. While there is no single "correct" discount rate, Staff therefore recommended a discount rate that is on the low end of the range of defensible values, reflecting the desire to reasonably maximize the amount of EE, consistent with protecting ratepayers. Thus, the interim NJCT will use a 3% real discount rate to align with public policy in the state and account for how implementation of the EE programs will significantly and directly affect private consumption (e.g., reduce energy consumption by utility customers), as well as result in costs and benefits that impact not only utilities and program participants but New Jersey ratepayers, residents, and society at large over many years.

**Line losses - general**

SUMMARY:

Gabel Associates, Rate Counsel, EEANJ, ACEEE, and the Building Performance Association submitted comments that the NJCT should use marginal line losses, as this rate is consistent with the incremental savings associated with EE programs.

STAFF RESPONSE:

Staff agrees with this recommendation and has included the use of marginal line losses in the NJCT.

**Electric line losses**

SUMMARY:

Stakeholders recommended that adjustments for electric line losses be based on utility specific data and that marginal line losses be used. Gabel Associates and RECO specifically recommended that a factor of 1.5 be used to convert average lines losses to marginal. PSE&G further recommended that program specific line losses be used due to the

differences in line losses across sectors. RECO also recommended that separate line loss factors for annual energy losses and peak energy losses be used.

STAFF RESPONSE:

Staff agrees that electric line losses should use utility specific data and that they should be converted from average to marginal losses using an appropriate conversion factor. Each utility should specify the line loss factor used in its tariff and then convert the average losses to marginal losses. A factor of 1.5 will be used to convert average line losses to marginal line losses, which is consistent with the methods described in the Rutgers Avoided Cost Memo.

Staff appreciates the recommendations of stakeholders to use more specific factors related to programs and annual versus peak times. The use of such factors should be evaluated by the EM&V WG during the first triennial review period.

**Natural gas losses**

SUMMARY:

Gabel Associates, ETG/SJG, and PSE&G advocated that natural gas losses should be accounted for in the NJCT and recommended they be calculated based on the loss factor in each natural gas utility's tariff, as approved by the Board.

STAFF RESPONSE:

Staff agrees with this recommendation and has indicated that each utility electing to include natural gas losses should explain the factor selected, with citation to the appropriate tariffed rate.

## GENERAL COMMENTS

**General**

SUMMARY:

NRDC recommended that the following principles be followed in developing the NJCT: the test should be comprehensive, balanced, and be applied to all energy resources fairly. PSE&G also included guiding principles in their comments, as follows: all elements of the test should reflect the most up to date information available; data should be forward looking whenever possible and avoid using historic data when forward looking, publicly available data exists; calculation methodologies should reflect the best scholarship available; and calculation methodologies should be consistent with prior Board action and information whenever possible.

In their comments, JCPL noted that that they appreciated Staff's recognition that the proposed test will evolve over time and be reviewed and refined through the work of the EM&V WG. They added that Staff appropriately relied on current or industry practices, values, and sources and has worked to not overcomplicate the test, which will be beneficial to all parties since there is insufficient time to analyze and redesign the test prior to plan filing deadlines.

NJNG recognized that some suggestions made in the proposed NJCT reflect the most practical approach given the timeline and that it is critical that the interim test is willing to accept some temporary approaches in valuing benefits.

EEANJ applauded the BPU for the strides it has made so far in the development of EE programs and noted the next step in the implementation process is to develop a robust, symmetrical and state-specific NJCT.

Enervee expressed support for the general concepts of the NJCT as proposed by Staff.

ACEEE commended Staff's approach of using a primary NJCT and commended the proposal for including the multiple benefits of energy efficiency, such as non-energy impacts.

The Building Performance Association was encouraged by the focus on symmetry, transparency, and the inclusion of NEIs in the development of the NJCT.

Core Metrics expressed concerns about the approach the Board is taking in developing the NJCT. Specifically, they noted that the Board may be acting too quickly in adopting a cost-effectiveness test that hasn't been adequately vetted by stakeholders. In their comments, Core Metrics opposed the adoption of the NJCT for the following reasons: how incomplete the test was as of July 30, 2020, the time needed to complete it, all the consequences of basing decisions on test results, and the inability of utilities and program administrators to plan for some consequences. They recommended that the NJCT be based on guidance from the new August 3, 2020 version of the NSPM through a formal stakeholder process beginning no sooner than October that enables stakeholders to plan.

The Environmental Groups (joint commenters) noted in their comments that the NJCT as proposed would advance an ambitious, forward-thinking framework for evaluating EE investments. They expressed particular appreciation for the proposal's process to ensure continuous review and improvement of the NJCT and the initial list of NEIs.

STAFF RESPONSE:

Staff appreciates the comments received and thanks stakeholders for their feedback on the NJCT proposal.

**Choice of tests**

SUMMARY:

Rate Counsel and Gabel Associates support the continued use of the five existing CSPM tests for informational purposes during the first program cycle. Rate Counsel noted that the existing five tests will provide valuable insights on program design from a variety of perspectives, even if they are no longer the primary threshold tests for determining cost effectiveness. Further, Rate Counsel suggested that there should be agreement among stakeholders on the methodologies and approaches for all five tests to make their results more useful to the Board and stakeholders.

PSE&G supports the use of the NJCT and also finds it appropriate to include non-energy impacts. They suggest that NEIs values be approximated from work in other jurisdictions for NEIs that are complex to quantify.

ACE, Core Metrics, and NRDC continued to recommend the use of the SCT for the first program cycle in their comments. ACE further suggested that the NSPM approach be considered for subsequent program cycles.

STAFF RESPONSE:

Staff appreciates the comments in support of the continued use of the existing five CSPM tests and agrees with Rate Counsel that the information included in them will continue to offer important insights on program design.

Staff conducted research on the practices of other jurisdictions for the inclusion of NEIs and utilized this to inform their application in the NJCT. The Order Directing the Utilities to Establish Energy Efficiency and Peak Demand Reduction Programs adopted by the Board on June 10, 2020 directed Staff to work toward the development of the NJCT that will serve as the primary cost-effectiveness test for the program administrators in the state. The NSPM approach should be evaluated for use in New Jersey through the work of the EM&V WG.

**Ratepayer impacts**

SUMMARY:

Rate Counsel expressed concern that the NJCT Proposal does not adequately address ratepayer impacts. They noted that the necessary rate increases to fund any EE programs will lead to a certain level of negative economic impacts on New Jersey's economy. Rate Counsel further stated that while the benefit cost analysis will include program expenditures as a cost, this does not adequately account for the impact that the overall change in rates will have for ratepayers and how those impacts ripple through the New Jersey economy.

STAFF RESPONSE:

Staff acknowledges the concerns raised by Rate Counsel regarding ratepayer impacts and the NJCT proposal. The five existing CSPM tests will be retained for informational purposes during the first program cycle, allowing for rate impacts to be monitored by evaluating programs using the RIM. Information on program design provided by the RIM and how the NJCT addresses ratepayer impacts should be evaluated by the EM&V WG during the triennial review.

**Energy storage as an EE resource**

SUMMARY:

Sunrun recommended that the NJCT should be designed to accurately evaluate energy storage as an EE and PDR resource. In their comments, they noted that the Massachusetts Department of Public Utilities has incorporated energy storage as an EE resource in the state. They made reference to a 2019 Clean Energy Group study that highlights energy storage as an efficiency measure and recognizes that, in addition to reducing consumption, there is also value in shifting consumption from times of high to low demand.

STAFF RESPONSE:

Staff appreciates Sunrun's comments and the information on energy storage as an efficiency measure provided. The value of energy storage as an efficiency resource, and its application in the NJCT, is a topic that should be evaluated during the triennial review period by the EM&V WG.

**Future development of the NJCT**

SUMMARY:

The Building Performance Association encouraged the BPU to consider the NSPM and to lay out a plan to systemically evaluate its application in New Jersey. Specifically, they urged that the inclusion of benefits related to reliability, reduced risks, avoided collection costs, and avoided environmental compliance costs be considered during a more comprehensive review by the EM&V WG. The Building Performance Association further commended the transparent approach taken to date in developing the NJCT and urged continued transparency moving forward as the EM&V WG reviews the NJCT framework for future program cycles.

STAFF RESPONSE:

Staff acknowledges the merits of the NSPM and expects that its application in New Jersey will be evaluated as the EM&V WG undertakes its comprehensive review of the NJCT during the triennial review period.

Staff appreciates the comments related to transparency and will endeavor to maintain a transparent process as the NJCT undergoes its ongoing review.