



**COMMENTS BY THE BUILDING PERFORMANCE ASSOCIATION
BEFORE THE NEW JERSEY BOARD OF PUBLIC UTILITIES
JUNE 12, 2019**

**IN THE MATTER OF NJCEP PROTOCOLS TO MEASURE RESOURCE SAVINGS
Public Stakeholder Comments**

As leaders in the residential energy efficiency industry, the Building Performance Association¹ (formerly the Home Performance Coalition) respectfully responds to the June 5, 2019 request by the New Jersey Board of Public Utilities (NJ BPU) to provide comments on the NJCEP Protocols to Measure Resources Savings for Fiscal Year 2020. This response links to several studies and resources to assist the NJ BPU staff.

Role of Protocols in Cost-Effectiveness Analysis

Given that the NJCEP Protocols to Measure Resource Savings will be used in part to provide inputs for cost-effectiveness calculations, the Building Performance Association would like to underline the importance of developing a primary cost-effectiveness test that produces a sound and balanced assessment and meets relevant policy goals of New Jersey. The Association requests that NJ BPU review the fundamental principles of the [National Standard Practice Manual \(NSPM\)](#), published May 2017 by the National Efficiency Screening Project, which provides an implementation guide for reforming cost-benefit analysis methods. The NSPM also specifies that technical reference manuals (TRMs) like the NJCEP Protocols should use information that is as up-to-date as possible and should account for jurisdiction-specific costs as much as possible. The Building Performance Association and other members of the National Efficiency Screening Project would be pleased to brief the NJ BPU or other state Agencies on this and other methodologies described in the NSPM, and how a “New Jersey” test could be developed to best meet the needs of the policymakers and ratepayers in New Jersey.

As we noted in our comments submitted June 11, 2019 to the BPU in the matter of FY20 CRA, Budgets and Program Plans:

The NSPM offers a framework that is based on a set of core principles that focuses on ensuring alignment of testing practices with a jurisdiction’s applicable policy goals. It addresses the importance of treating energy efficiency as a resource and the range of associated utility system impacts that should be considered in any cost-effectiveness analysis. The NSPM further emphasizes the principle of symmetrical treatment of relevant costs and benefits, and provides

¹ The Building Performance Association is a 501(c)6 industry association dedicated to advancing the home and building performance industry by ultimately delivering improved energy efficiency, health, safety, and environmental performance of buildings. The Association was created to combine the expertise and resources of the Home Performance Coalition, Efficiency First, and Home Energy magazine.

a range of approaches that can be used to account for applicable hard-to-monetize costs and benefits (such as non-energy impacts). The guidance covers a wide range of fundamental aspects of cost-benefit analyses (including data, assumptions, and methodology) and on the adequate consideration of all relevant costs and benefits for both the utility system and the non-utility system. The Building Performance Association believes the NSPM framework and its step-by-step approach would provide NJ BPU an opportunity to determine whether its current cost-effectiveness testing reflects New Jersey’s own energy goals and policies.

National Standard Practice Manual Principles

Efficiency as a Resource	EE is one of many resources that can be deployed to meet customers’ needs, and therefore should be compared with other energy resources (both supply-side and demand-side) in a consistent and comprehensive manner.
Policy Goals	A jurisdiction’s primary cost-effectiveness test should account for its energy and other applicable policy goals and objectives. These goals and objectives may be articulated in legislation, commission orders, regulations, advisory board decisions, guidelines, etc., and are often dynamic and evolving.
Hard-to-Quantify Impacts	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified based on policy goals,) even those that are difficult to quantify and monetize. Using best-available information, proxies, alternative thresholds, or qualitative considerations to approximate hard-to-monetize impacts is preferable to assuming those costs and benefits do not exist or have no value.
Symmetry	Cost-effectiveness practices should be symmetrical, where both costs and benefits are included for each relevant type of impact.
Forward-Looking Analysis	Analysis of the impacts of resource investments should be forward- looking, capturing the difference between costs and benefits that would occur over the life of the subject resources as compared to the costs and benefits that would occur absent the resource investments.
Transparency	Cost-effectiveness practices should be completely transparent, and should fully document all relevant inputs, assumptions, methodologies, and results.

Data Standardization for Input Values

Recognizing that some of the protocol algorithms require one or more input values coming from program application forms, worksheets, or field tools, the Building Performance Association recommends that the NJ BPU support data standardization by requiring the use of the national open data standard, [Home Performance Extensible Markup Language](#) (HPXML), for all residential energy efficiency programs. HPXML includes a data transfer protocol and incorporates automated data checks for energy savings and quality assurance. Data standardization using HPXML would help to reduce error and variation in calculations of measure resource savings.

Inclusion of Smart Technologies

The Building Performance Association believes that smart technologies can be used to advance residential energy efficiency, as well as to provide valuable data and granular-level monitoring to support evaluation.² While funding for smart technology is included in the Draft FY20 Budget, we note that residential smart technology measures are not included in these protocols. We hope that this is an oversight and encourage due consideration of smart technologies and the resource savings that they can provide.

Evaluation Protocols for C&I Pay for Performance

The New Jersey Pay for Performance program is being consolidated with the C&I program to improve flexibility for customers and for vendors to grow their business models. The Building Performance Association requests that evaluation protocols governing this program also consider greater flexibility to support new and innovative business models. Instead of requiring a simulation model for project eligibility, partners should also be able to submit a portfolio of projects with an estimated fractional savings uncertainty, track the projects in the portfolio and submit a savings claim based on the portfolio performance. Open source software, OpenEEmeter, is available to support this type of flexibility, providing an automated application of IPMVP Option C whole building pre-post analysis based on the CalTRACK methods (see caltrack.org).

Thank you for this opportunity to submit comments. Please do not hesitate to contact me with questions.

Sincerely,

Kara Saul Rinaldi
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Building Performance Association
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² Detailed in the Building Performance Association's recent report, [Redefining Home Performance in the 21st Century: How the Smart Home Could Revolutionize the Industry and Transform the Home-to-Grid Connection](#).



June 12, 2019

VIA ELECTRONIC FILING

Aida Camacho-Welch, Secretary of the Board
Board of Public Utilities
44 South Clinton Avenue, 9th Floor
Post Office Box 350
Trenton, New Jersey 08625-0350
Email: publiccomments@njcleanenergy.com

Re: FY20 Proposed NJCEP Protocols to Measure Resource Savings

Dear Aida Camacho-Welch:

Please accept these comments on behalf of the National Fuel Cell Research Center in response to the New Jersey Board of Public Utilities Notices requesting comments on the following documents New Jersey's Clean Energy Program Protocols to Measure Resource Savings for Fiscal Year 2020.

Respectfully Submitted,
 /s/ Jack Brouwer _____
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NEW JERSEY BOARD OF PUBLIC UTILITIES
OFFICE OF CLEAN ENERGY

**NEW JERSEY'S CLEAN ENERGY PROGRAM PROTOCOLS TO MEASURE
RESOURCE SAVINGS FOR FISCAL YEAR 2020**

Comments of the National Fuel Cell Research Center

I. Introduction and Background

The National Fuel Cell Research Center (“NFCRC”) appreciates the opportunity to submit comments on the New Jersey Clean Energy Program (“NJCEP”) proposed Protocols to Measure Resource Savings for Fiscal Year 2020 (“FY20”). The NFCRC comments focus on the Combined Heat and Power & Fuel Cell Program.

The NFCRC facilitates and accelerates the development and deployment of fuel cell systems; promotes strategic alliances to address the market challenges associated with the installation and integration of fuel cell systems; and educates and develops resources for global distributed generation and combined heat and power (“CHP”) stakeholders.

Distributed Energy Resources (“DER”) include generation, storage and controllable loads, that are connected to the distribution system and close to the loads they serve. Highly efficient stationary fuel cell systems can generate both combined heat and power (fuel cells with heat recovery), or function as all-electric generation (fuel cells without heat recovery). Stationary fuel cell systems are non-combustion DER that today generate over 400 megawatts (“MW”) of clean, stable, continuous, and dispatchable power and heat in New Jersey and across the U.S. These fuel cell systems are installed in microgrids and at wastewater treatment plants, food and beverage plants, grocery stores, office buildings, telecommunication hubs, data centers, retail stores, universities, hospitals, hotels, government facilities, emergency shelters and other applications.

Stationary fuel cells significantly reduce greenhouse gas emissions¹ and also improve

¹ *SGIP 2016-2017 Self-Generation Incentive Program Impact Evaluation Report*. Submitted by Itron to Pacific Gas & Electric Company and the SGIP Working Group, September 28, 2018 at 6-9.

the quality of power while contributing to cleaner air and the improved health of citizens. Fuel cell systems can be sited near or even inside buildings, due to virtually zero pollutant emissions, acoustically benign attributes, and the advantage of avoiding emissions permitting and zoning challenges, even in regions with the strictest emissions standards.

The Fuel Cell program within the NJCEP has resulted in the successful deployment of over nine MW of fuel cell generation systems in New Jersey. These clean, non-combustion systems have been verified by the New Jersey Board of Public Utilities to be operating as expected, with very high efficiency, high capacity factor, and large carbon emissions reductions, while also providing resilient backup power during grid outages. Fuel cell systems with and without heat recovery provide unique clean power generation advantages to address the State of New Jersey's long-term energy and emissions reduction goals.

II. Discussion

The FY20 Protocols to Measure Resource Savings ("Protocols") must be updated to reflect changes to the FY20 NJCEP, as well as current data with respect to useful life.

A. Proposed changes to the FY20 Clean Energy Program include both Fuel Cells with Heat Recovery and Fuel Cells without Heat Recovery and the Protocols should consistently reflect the same change in the Combined Heat and Power Program Description of the Protocols.

The Fiscal Year 2020 Program Description and Budget states that eligibility in the Combined Heat and Power – Fuel Cells (CHP-FC) program *“is expanded to include Fuel Cells without Heat Recovery (FCwoHR). All Fuel Cells (FCs) will receive Program incentives.”*² The NFCRC emphasizes that all fuel cell systems, operating with or without heat recovery, are deemed eligible for the FY20 New Jersey Clean Energy Program as long as they meet the program emissions reduction and energy savings criteria. The FY20 Protocols should reflect this change as well in the Combined Heat and Power Program description beginning on page 165 of the Protocol document.

Similarly, the title of this program should be updated in the Protocols from *“Combined Heat and Power”* to *“Combined Heat and Power – Fuel Cells (CHP-FC)”* to

² New Jersey's Clean Energy Program Fiscal Year 2020 Summary of Proposed New Initiatives and Program Changes May 29, 2019 at 10.

align with other FY20 NJCEP documents, and recognize the inclusion of all fuel cell systems in the NJCEP.

B. The NFCRC recommends that the NJBPU use a twenty-year useful life for a fuel cell system, based upon current industry performance characteristics.

The Protocols propose reducing the useful life of fuel cell systems from 20 years to 15 years. The justification for this reduction is a reference to a 2015 study from the Lawrence Berkeley National Laboratory (Berkeley Lab). The NFCRC recommends that the NJBPU reinstate a fuel cell system useful lifetime of 20 years based upon the following observations:

- The discussion on page 5 of the study does not cite any sources for the Berkeley Lab assumptions on lifetime and none of their tables cite information that is in the literature, nor any data or observations of real systems. These lifetime assumptions are therefore assumptions only that are not justified by observations. The Berkeley Lab study that is cited concludes that almost all future systems (2020) are expected to have a 20-year lifetime. Because these protocols are proposed for 2019 and beyond, it is clear that the very Berkeley Lab report that the NJBPU cites also recommends a 20-year lifetime. The NFCRC also has observations of many fuel cell installations that suggest a 20-year lifetime is reasonable and strongly recommends that NJBPU use this 20-year lifetime to support their analyses.
- Based on NFCRC data and knowledge, it appears that the assumptions contained in this study are based on data from six years ago. The stack life and cost estimates should not be taken as fixed, but as only estimates from the best data that was available at the time (five years ago). The 10kW performance characteristics presented in the Berkeley Lab report are not relevant since no commercial solid oxide systems in this size class are available, and the 100+kW performance characteristics presented do not represent any of the systems that are commercially available to participate in the NJBPU Program. The NFCRC suggests that this report does not contain up-to-date information and thus cannot

serve as an accurate reference for the Protocols. NJBPU should rather use data gathered from the latest installations in New Jersey and around the world.

III. Conclusion

The NFCRC appreciates the proposed changes to the FY20 CEP Protocols to Measure Resource Savings, and requests that these Protocols align with other FY20 Program Documents, and reflect up-to-date market information and technology data. We look forward to ongoing discussions with the BPU to support the gathering of information on current fuel cell system performance characteristics and to inform any assumptions used to determine program requirements and eligibility.



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June 21, 2019

By Hand Delivery and Electronic Mail

Honorable Aida Camacho-Welch, Secretary
NJ Board of Public Utilities
44 South Clinton Avenue, 3rd Floor,
Suite 314, P.O. Box 350
Trenton, New Jersey 08625-0350

Re: **NJCEP Protocols to Measure Resource Savings for Fiscal Year 2020
Comments of the New Jersey Division of Rate Counsel on Proposed Revisions**

Dear Secretary Camacho-Welch:

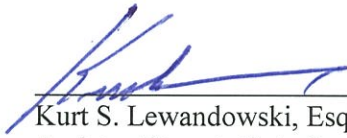
Please accept an original and ten (10) copies of these comments on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel") in the above-captioned matter.

We are enclosing one additional copy of the comments. Please stamp and date the extra copy as "filed" and return it in our self-addressed stamped envelope.

Respectfully submitted,

STEFANIE A. BRAND
Director, Division of Rate Counsel

By:


Kurt S. Lewandowski, Esq.
Assistant Deputy Rate Counsel

KSL

Enclosure

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New Jersey Board of Public Utilities

Clean Energy Program

Proposed Revisions:

Protocols to Measure Resource Savings FY2020

Comments of the New Jersey Division of Rate Counsel

June 21, 2019

The Division of Rate Counsel (“Rate Counsel”) would like to thank the Board of Public Utilities (“BPU” or “Board”) for the opportunity to present the within comments on the proposed revisions (“Draft Protocols”) to the Clean Energy Program (“CEP”) Protocols to Measure Resource Savings (“Protocols”) circulated in red-line form by the BPU’s Office of Clean Energy (“OCE”) on June 5, 2019 to stakeholders for comment.¹

Introduction and Summary

The proposed revisions to the Protocols are limited to FY2020 and focus on several measures that require updates to savings assumptions as well as new measures associated with the Residential Existing Homes program proposed in a recent FY2020 compliance filing.² However, Rate Counsel identified several additional issues where the Draft Protocols have not addressed Rate Counsel’s previous comments on the proposed FY19 protocols, submitted on May 31, 2018 (“Rate Counsel’s 2018 Comments”).

Rate Counsel’s comments on the Draft Protocols for FY2020 consist of two main sections. The first section addresses several of the major issues raised in the previous comments

¹ The Draft Protocols circulated for comment was entitled: “New Jersey Board of Public Utilities, New Jersey Clean Energy Program, Protocols to Measure Resource Savings, FY2020, Release Date: May 2019.”

² TRC FY20 CEP Compliance Filing, May 29, 2019.

by Rate Counsel, including: (a) winter coincident factors; (b) free riders and free drivers; (c) source references; (d) transmission and distribution line loss factors; (e) lighting hours for hospitals; (f) residential HVAC equivalent full load hours; (g) measure life; and (h) avoided emissions.

The second section addresses specific new measures or new revisions in the following areas: (a) residential ENERGY STAR room air conditioner; (b) residential ENERGY STAR lighting; (c) Residential Existing Homes Program – air sealing; (d) Residential Existing Homes Program – duct sealing and repair; (e) Residential Existing Homes Program – ductless, mini-ducted, or hybrid heat pump systems; and (f) Hours of Operation and Coincidence Factor by Building Type.

I. Major Issues Raised in Rate Counsel’s Previous Comments

a) Winter Coincident Factors

In its previous comments on the proposed FY2019 Draft Protocols, Rate Counsel raised concerns about the lack of winter coincident factors (“CF”) in the Protocols and recommended that OCE establish winter CFs for as many measures as possible.³ PJM’s capacity market Reliability Pricing Model (“RPM”) requires the owners of capacity resources to provide (or seek from other parties) equal amounts of summer and winter capacity reductions in a given load-serving zone.⁴ Including the winter CFs would enable the CEP to offer its energy efficiency resources into the PJM RPM market and obtain additional funds for the programs. However, the Draft Protocols do not address this concern or adopt Rate Counsel’s earlier recommendations.

³ Rate Counsel’s April 10, 2018 FY19 Draft Protocols Comments, pp. 2-3; Rate Counsel’s 2018 Comments, p. 3.

⁴ PJM (n.d.) “Seasonal Resources and Aggregation in RPM,” pp. 25 and 26. Available at <http://www.pjm.com/~media/committees-groups/subcommittees/drs/20170407/20170407-item-04a-intermittent-resources-in-rpm-training.ashx>.

Thus, Rate Counsel reiterates its previous recommendation on this issue. Rate Counsel further recommends that OCE should at least address within the FY20 Protocols its plan to incorporate winter CFs in the near future and provide a schedule for developing and rolling out these factors.

b) Free Riders and Free Drivers

Given that the Protocols do not include the impacts of free ridership and spillover (also known as effects of “free drivers”), Rate Counsel previously recommended that OCE establish specific timelines to evaluate free riders and free drivers as soon as possible.⁵ In response to Rate Counsel’s 2018 Comments, OCE noted that free ridership and other related net effects would be examined in FY19 and that a schedule would be developed and shared.⁶ However, Rate Counsel is not aware of any evaluation study by OCE on this subject scheduled for FY19 or FY20. Thus, Rate Counsel reiterates its earlier recommendation on free riders and free drivers.

c) References

Rate Counsel previously recommended that the OCE review, reference, and adopt the values from the latest versions of the technical reference manuals (“TRM”) from other jurisdictions where applicable. Further, Rate Counsel recommended that OCE provide clarification regarding its reasons for referencing the earlier version of the TRMs.⁷ The Draft Protocols still adopt many values from the Mid-Atlantic Technical Reference Manual, Version 6 (published May 2016) and Version 7 (published May 2017), as well as the New York Standard Approach for Estimating Energy Savings, Version 4 (published April 2016). These TRM

⁵ Rate Counsel’s April 10, 2018 FY19 Draft Protocols Comments, p. 3; Rate Counsel’s 2018 Comments, p. 4.

⁶ OCE May 10, 2018. Comments and Responses: FY19 Update to FY16 NJCEP Savings Protocols, p. 7. Available at: http://www.njcleanenergy.com/files/file/public_comments/FY18/3c%20-%20NJCEP%20Protocol%20Comments%20and%20Response%20Doc%20v1.pdf.

⁷ Rate Counsel’s April 10, 2018 FY19 Draft Protocols Comments, pp. 3-4; Rate Counsel’s 2018 Comments, p. 4.

versions are outdated. The Mid-Atlantic TRM was updated in May 2018 as Version 8.⁸ New York's TRM was updated a few times since Version 4, and the latest version was issued last month (Version 7).⁹ Rate Counsel reiterates its previous recommendation that OCE review and adopt the values from the latest versions of the TRMs where applicable.

d) Transmission and Distribution Line Loss Factors

The current and Draft Protocols use a single transmission and distribution ("T&D") loss factor. Draft Protocols, p. 12. Previously, Rate Counsel raised a concern on this assumption when commenting on the proposed revisions to the FY19 Protocols.¹⁰ Rate Counsel pointed out that line losses vary with different voltage levels, in particular for large customers, and that PSE&G and Pennsylvania utilities use different loss factors for different customer classes. The table below presents line loss factors used by several Pennsylvania utilities. Rate Counsel reiterates its previous concern and recommends that line loss factors be defined for specific rate classes to accurately account for savings through energy efficiency programs.

⁸ Northeast Energy Efficiency Partnership. 2018. Mid-Atlantic TRM Version 8. Available at https://neep.org/sites/default/files/resources/Mid_Atlantic_TRM_V8_0.pdf.

⁹ New York Technical Resource Manual, Version 5.1 - Filed March 15, 2018 (effective January 1, 2018), <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/72C23DECFF52920A85257F1100671BDD?OpenDocument>.

¹⁰ Rate Counsel's April 10 FY19 Draft Protocols Comments, p. 4-5; Rate Counsel's 2018 Comments, p. 5.

Table 1. Line Loss Factors – Sample of Several Pennsylvania Utilities¹¹

Utility	Residential	Small C&I	Large C&I
Met-Ed	9.5%	7.2%	7.2%
Penelec	9.5%	7.2%	7.2%
Penn Power	9.5%	5.5%	5.5%
WPP	9.4%	7.9%	7.9%
PPL	8.8%		4.2%

There is also another issue with the use of a single T&D loss factor for both energy and peak savings. T&D line losses during system peak hours - when generation capacity and T&D investments can be avoided - are considerably higher than losses during off-peak hours because line losses grow quadratically as the overall system load increases.¹² A 2016 study by the Regulatory Assistance Project analyzed in detail how line losses could change based on load levels on the system and noted that “[d]uring the highest critical peak hours (perhaps 5-25 hours per year) when the system is under stress, the losses may be four to six times as high as the average.”¹³ Thus, Rate Counsel recommends that OCE consider investigating and developing separate, higher T&D loss factors that are applicable for avoided generation capacity and avoided T&D systems.

¹¹ Source: First Energy (2017) First Annual Report to the Pennsylvania Public Utility Commission, Phase III of Act 129, Program Year 8 (November 15, 2017), page 45, available at <http://www.puc.pa.gov/pcdocs/1544648.pdf>; Statewide Evaluator Annual Report, Act 129 Program Year 8 (February 28, 2018), p. C-32, available at http://www.puc.pa.gov/Electric/pdf/Act129/Act129-SWE_AR_Y8_022818.pdf.

¹² Line losses are proportional to the square of the flow on the lines. See Regulatory Assistance Project (2016): *Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements*. p. 4. Available at <https://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-eeandlinelosses-2011-08-17.pdf>.

¹³ *Id.*

e) Lighting Hours for Hospitals

The current and Draft Protocols assume 8,760 hours of lighting operation for hospitals based on an assumption that hospitals operate year-round. Draft Protocols, p. 85. Rate Counsel previously commented that while some lighting fixtures at hospitals operate throughout a year, other lighting fixtures are turned off during certain times of the day or year. Accordingly, Rate Counsel recommended in its earlier comments on the FY19 revisions that the OCE review and consider adopting the value used in the New York TRM, which assumes 7,674 hours of lighting operation for hospitals.¹⁴ Rate Counsel reiterates this recommendation for the FY20 Draft Protocols.

f) Residential HVAC Equivalent Full Load Hours

For the FY2019 Protocols revisions, the OCE proposed the use of New York City-specific equivalent full load hours (“EFLH”) for residential cooling and heating in various parts of the Protocols, but decided to maintain the existing values based on Vermont Energy Investment Corporation (“VEIC”) estimates.¹⁵ The references to the VEIC estimates are found throughout the Draft Protocols for several measures, such as Source 1 on page 63, Source 3 on page 75, and Source 3 on page 81.¹⁶ Because the VEIC analysis is not publicly available and it is not clear how relevant and applicable the VEIC estimates are, Rate Counsel recommended the following in its comments on the draft FY19 Protocols:

“[I]f the current EFLH values are maintained pending further analysis, the OCE should provide additional clarification regarding the source of these values and whether they have been obtained from a New Jersey-specific study and any reasons for their prioritization over the New York City EFLH values.”¹⁷

¹⁴ Rate Counsel’s 2018 Comments, p. 12.

¹⁵ See OCE FY19 Draft Protocols, pp. 37, 38, 40, and 41; Draft Protocols for the current values.

¹⁶ The full reference included in the Protocols is, “VEIC Estimate. Consistent with analysis of PEPCo and LIPA, and conservative relative to ARI.”

¹⁷ Rate Counsel’s 2018 Comments, p. 9.

The Draft Protocols do not provide a justification for using the Vermont VEIC estimates for New Jersey. Thus, Rate Counsel reiterates this recommendation for the Draft Protocols.

g) Measure Life

In Appendix A of the Draft Protocols, several measure lives have been added to the Protocols. These include residential solar water heaters, doors, weather stripping, and carbon monoxide alarms, as well as commercial air sealing, insulation, computers, and printers.

The OCE also added weather stripping with a measure life of 15 years. Draft Protocols, Appendix A, p. 195. The Draft Protocols indicate that the source of this measure life is New York's TRM Version 6.1. In turn, in Appendix P, the New York TRM references a GDS study as the source of the measure life for air leakage sealing.¹⁸ The GDS study indicates that the effective life of "Weatherstrip window, door sweep or kit" is five years, one-third of the 15-year life that OCE proposes to use.¹⁹ Rate Counsel recommends that the Protocols use an effective life of five years for weather stripping, consistent with the original source of the New York TRM.

A carbon monoxide alarm is listed in Appendix A of the Draft Protocols with a measure life of seven years. Some carbon monoxide alarm manufacturers claim that their products save energy. However, it appears that the CEP may be promoting these measures strictly for safety rather than for energy savings benefits, since the Draft Protocols do not provide or energy

¹⁸ New York Standard Approach for Estimating Energy Savings from Energy Efficiency Programs – Residential, Multi-Family, and Commercial/Industrial Measures, Version 6.1, January 31, 2019. Available at [http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/72c23defff52920a85257f1100671bdd/\\$FILE/TRM%20Version%206.1%20-%20January%202019.pdf](http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/72c23defff52920a85257f1100671bdd/$FILE/TRM%20Version%206.1%20-%20January%202019.pdf).

¹⁹ GDS Associates. 2006. *Measure Life Report: Residential and Commercial/Industrial Lighting and HVAC Measures*, Appendix C p. C-6. Available at https://library.cee1.org/system/files/library/8842/CEE_Eval_MeasureLifeStudyLights%2526HVACGDS_1Jun2007.pdf.

savings assumptions or calculations for this measure. Rate Counsel requests that the OCE provide information about eligible carbon monoxide alarms, savings information for this measure, and an explanation of how this measure can yield energy savings.

An effective life of 20 years for insulation in commercial applications has been added to the Draft Protocols.²⁰ No source of this assumption was provided, although this effective life is consistent with the value that the Protocols indicate for residential insulation. Rate Counsel has concerns with the use of the 20-year measure life. The 20-year effective life for residential insulation traces back to at least the FY16 Protocols. The 20-year measure life in the FY16 Protocols was based on two data points: 25 years from the Mid-Atlantic TRM and 15 years from Pennsylvania's TRM.²¹ As Rate Counsel noted in previous comments, Pennsylvania's TRM limited the measure life of insulation because Pennsylvania legislation limits the claim of savings to 15 years.^{22,23} The Pennsylvania TRM referenced the measure life value used in Massachusetts, which continues to use a 25-year measure life.²⁴ Rather than adopting Rate Counsel's recommendation that a longer life be used, the OCE proposed to use California's savings protocols as the basis for a 20-year measure life.²⁵ Rate Counsel expressed concern about the use of California data for New Jersey in its earlier comments, but the 20-year measure life remains in the current and proposed version of the Protocols - with no data source provided at all. Rate Counsel recommends that the Protocols use an insulation measure life value of 25

²⁰ FY19 Draft Protocols, p. 193.

²¹ OCE Presentation to the Utility Working Group, "Review of Proposed Revisions to NJCEP Protocols per ERS Report, March 14, 2018, slide 5; ERS 2017. "NJCEP Protocols - Comparative Measure Life Study and Summary of Measure Changes to NJCEP Protocols, p. 2.

²² Rate Counsel's April 10, 2018 FY19 Draft Protocols Comments, pp. 9-10.

²³ Pennsylvania TRM, June 2016, p. 180.

²⁴ Massachusetts TRM, 2019-2021 - Plan Version, October 2018. Available at <https://etrm.anbetrack.com/#/workarea/trm/MADPU/RES-BS-I/2019-2021%20Plan%20TRM/version/1?measureName=Insulation>.

²⁵ OCE May 10, 2018 Summary, p.11.

years, consistent with the value used in Massachusetts, for both residential and commercial applications.²⁶

The footnote for the effective useful life of computers and printers includes a link to an ENERGY STAR workbook that covers audio/visual, telephony, and television measures. Computers and printers are not covered in this workbook.²⁷ The OCE should provide the correct link or find a different source for the useful life of these measures.

h) Avoided Emissions

In Rate Counsel's 2018 Comments, Rate Counsel made two recommendations on avoided emissions: (1) the Protocols should use the emission rates from the most recent year for which avoided emissions data are available; and (2) the Protocols should use annual average marginal emission rates rather than annual peak marginal emission rates. The Draft Protocols address both recommendations. Rate Counsel acknowledges and accepts these changes in the Draft Protocols.

II. Specific New Revisions

a) Residential ENERGY STAR Room Air Conditioner

Rate Counsel's recommendations regarding the new Residential ENERGY STAR Room Air Conditioner measure refer to the references found within the footnotes on page 62 of the Draft Protocols and the listed sources on page 63. Rate Counsel recommends adding page numbers to footnotes 22 and 23, as well as Sources 3 and 4.

The sources of the values provided in this section of the Draft Protocols, listed on page 63, contain several instances of incomplete references. As discussed in Section I above, the VEIC analysis for Source 1 does not appear to be publicly available and it is not clear how

²⁶ Rate Counsel's April 10, 2018 FY19 Draft Protocols Comments, p. 9-10.

²⁷ Draft Protocols, p. 197.

relevant and applicable the VEIC estimates are for New Jersey. Rate Counsel recommends that the Protocols provide the date the study was published and a URL link to this study. If the study is not currently available online, OCE should make it available online or share it directly with the stakeholders. Source 2 cites a report but does not present an author. Rate Counsel suggests that the Protocols include the author to complete the citation. For Source 3, the hyperlink attached to the URL sends the reader to the correct document, but the link text, when copied to a browser rather than selected, presents the user with an error page. It appears the link may have been updated and should be corrected accordingly in the Protocols.

b) **Residential ENERGY STAR lighting**

In the opening summary for Residential ENERGY STAR Lighting, the Draft Protocols state that the wattage associated with a lamp complies with the Energy and Independence and Security Act (“EISA”) of 2007. Draft Protocols, p. 64. The table titled “Standard CFL and LED Lamp Wattage Equivalency” on page 66 of the Draft Protocols shows wattage levels based on Northeast Energy Efficiency Partnership (“NEEP”)’s Mid-Atlantic TRM Version 6 published in May 2016. It appears these data are outdated for base wattage levels for calendar year 2020 or FY2020. According to the latest Mid-Atlantic TRM Version 8, the base wattage levels included in the Draft Protocols on the first table on page 66 are for omnidirectional lightbulbs for 2017 to 2019. The EISA’s backstop minimum standards - set to take effect starting in 2020 - are generally more stringent than the wattage levels for 2017 to 2019, as shown on Table 2 below. Further, the Mid-Atlantic TRM Version 8 provides base wattage levels for various other types of light bulbs, on pages 31 through 34. Rate Counsel requests that the Draft Protocols update the Residential Lighting section with the latest base wattage data for omnidirectional light bulbs and other types of lighting, found in the Mid-Atlantic TRM Version 8.

Table 2. Base Wattage Levels from NEEP TRM Version 8 for Omnidirectional Medium Screw Base Lamps²⁸

	Lower Lumen Range	Upper Lumen Range	2017-2019 WattsBase	2020+ WattsBase
Omnidirectional, Medium Screw Base Lamps (A, BT, P, PS, S or T)	250	309	25	25
	310	749	29	12
	750	1049	43	20
	1050	1489	53	28
	1490	2600	72	46
	2601	3300	150	66
	3301	3999	200	200
	4000	6000	300	300

The values for the hours of use for interior and exterior lighting can also be improved. The Draft Protocols propose to use 1,205 hours for interior lighting and 2,007 hours for exterior lighting as shown for Source 2 in the “Residential ENERGY STAR Lighting” table on page 65. Source 2 references two sources: (1) the *Technical Reference User Manual from Efficiency Vermont* and (2) a study by NMR Group, Inc. titled *Northeast Residential Lighting Hours-of-Use Study*. It is unclear how the two studies were weighted to develop the final values for interior and exterior lighting. Rate Counsel recommends that the Protocols clarify how the two sources were used to develop the lighting use hours. In addition, the NMR study data used in the Draft Protocols do not appear accurate or the best data from that study. Source 2 states that the Draft Protocols use average daily hours of use of 3.3 from Table 3-5, on page 43 of the NMR study, value for Living Space for Upstate New York. Based on a review of this NMR study, Rate Counsel found that

²⁸ Source: NEEP Mid-Atlantic TRM Version 8, page 31.

Table 3-5 appears on page 46 instead of page 43.²⁹ Further, Table 3-5 shows values for Downstate New York. The value for Living Space for Downstate New York is 5.1. Because New Jersey is close to Downstate New York, Rate Counsel recommends that OCE consider using the value for Downstate New York. Finally, the Protocols should make it clear how they derived the value for exterior lighting hours of 2,007 hours because the cited NMR study does not provide any values for exterior lighting.

c) **Residential Existing Homes Program – Air Sealing**

The text for the air sealing measure for the Existing Homes Program appears appropriate, but Rate Counsel has several concerns and questions regarding the algorithms, summary of inputs, and sources.

First, in the definition of variables section under the algorithms, there is a definition for “CF” – that is, the Coincidence Factor. Draft Protocols, p. 70. However, this variable is not used in either of the two algorithms proposed for this measure. An algorithm for peak demand savings appears to be missing and should be added.

Next, the summary of inputs section relies on several values from the New York TRM, Version 7. These include the values included in the “Impact per 1,000 ft² Table.” Rate Counsel was not able to identify these values in the New York TRM and thus request that OCE to provide the page numbers for these values.

Finally, Rate Counsel has comments related to the sources. First, OCE should provide a date for the first source from BG&E on page 71. OCE should also provide a source for the

²⁹ NRM Group, Inc., 2014: Northeast Residential Lighting Hours-of-Use Study. Available at <http://ma-eeac.org/wordpress/wp-content/uploads/Northeast-Residential-Lighting-Hours-of-Use-Study-Final-Report1.pdf>.

assumptions documented in footnote 28, as well as any page numbers associated with the source document.

d) **Residential Existing Homes Program – Duct Sealing and Repair**

On page 73 of the Draft Protocols, in the “Residential Duct Sealing and Repair” table in the summary of inputs section, the first two values listed are for boilers. Source 1 referenced and used to support the values for the boilers distinguishes between hot water boilers and steam boilers for both gas-fired and oil-fired boilers. However, the values listed in the table are for hot water boilers according to the original source. Rate Counsel recommends clarifying this distinction within this section to prevent a user from misinterpreting the source data.

This measure section also repeats an incomplete citation Rate Counsel noted above in Section I (f) regarding a source from VEIC. On page 75 of the Draft Protocols, Source 3, lists a VEIC estimate. Without access to this study, Rate Counsel is unable to verify the reasonableness of the proposed value. OCE should provide this study or make it available online.

The Draft Protocols also lack a source for Fuel BTU in the Table titled “Residential Insulation Upgrades” on page 77. Rate Counsel recommends including a source or explaining why a source is not needed for these values.

e) **Residential Existing Homes Program – Ductless, Mini-Ducted, or Hybrid Heat Pump Systems**

The Draft Protocols propose to add savings assumptions for ductless, mini-ducted, or hybrid heat pump systems under the Residential Existing Homes program.³⁰ The proposed algorithms and assumptions are reasonable, except the EFLHs for heating and cooling (which are address in the first section of this memo) and the CF. The proposed CF is 69 percent based on the Mid-Atlantic TRM Version 8, as indicated on page 81 of the Draft Protocols in reference

³⁰ Draft Protocols, p. 79

number 2. However, this value is a Maryland-specific value, and not for the PJM peak period according to NEEP TRM. The Mid-Atlantic TRM in fact provides PJM specific CFs, which are 66 percent for central air conditioning (“AC”) and 30 percent for room AC. Rate Counsel recommends that the Draft Protocols use the Mid-Atlantic TRM values specific for the PJM peak period and provide a rationale for the use of a selected value based on room AC or central AC, or a combination of these two types of AC systems.

f) **Hours of Operation and Coincidence Factor by Building Type**

The revisions to the Protocols include the following addition to hours of operation and coincidence factor for multi-family building types, under Commercial & Industrial Performance Lighting.³¹

Building Type	Sector	CF	Hours
Multifamily – Common Areas	Multifamily	0.86	5,950
Multifamily – In-Unit	Multifamily	0.59	679
Multifamily – Exterior	Multifamily	0.00	3,338

Hours for operation of LED recessed downlight luminaires for multi-family buildings appear to be provided on pages 22-23 of the Mid-Atlantic TRM, not on p. 25. The annual operating hours listed in the Protocols for in-unit multi-family luminaires (679 hours) and multi-family common areas (5,950 hours) match the Mid-Atlantic TRM values. However, the Mid-Atlantic TRM does not provide values for operation of exterior lighting associated with LED recessed downlight

³¹ The footnotes for all three of these new rows in the Protocols reference the NEEP Mid-Atlantic TRM V8, page 25. Draft Protocols, p. 85.

luminaires. The Protocols should clarify the source of the 3,338 hours and provide an explanation as to how this value is appropriate in the context of multi-family exterior lights.

CFs for operation of LED recessed downlight luminaires are provided on p. 25 of the Mid-Atlantic TRM. The Protocol's values for coincident factors for Multi-family common areas and in-unit lamps are consistent with the Mid-Atlantic TRM values. However, the Mid-Atlantic TRM does not provide CFs for exterior lighting associated with LED recessed downlight luminaires. On page 38, the Mid-Atlantic TRM indicates that exterior installations of screw-based LED lamps have a CF of 0.018. The Protocols should consider whether this CF is more appropriate than the value added in the Draft Protocols.



June 21, 2019

Honorable Aida Camacho-Welch, Secretary
New Jersey Board of Public Utilities
44 S. Clinton Ave., 9th Floor
P.O. Box 350
Trenton, NJ 08625-0350

Re: REQUEST FOR COMMENTS NJCEP PROTOCOLS FOR FY20

Dear Secretary Camacho:

Please accept these comments on behalf of New Jersey Natural Gas Company (“NJNG”) in response to the June 5, 2019 release of the Proposed Changes for Fiscal Year 2020 (“FY20”) Protocols for New Jersey’s Clean Energy Program (“NJCEP”). NJNG appreciates the Office of Clean Energy’s effort to solicit stakeholder input and the extension of time for this review period.

Given the more aggressive energy savings targets established by the Clean Energy Act, NJNG suggests that a more robust review of the protocols should be performed with the opportunity for stakeholders to engage with the consultants or subject matter experts that are supporting the review. It is critical to ensure that protocols reflect the best assumptions possible in order to:

- Build confidence in the assumptions regarding deemed energy savings for specific measures
- Ensure cost effective energy savings opportunities aren’t missed because the protocols understate energy savings potential.
- Facilitate the regulatory review process by incorporating more measures in the protocols instead of having to review proposed protocols within individual cases.

NJNG would like to share these specific examples as indications that further review is needed:

- The protocols reference programmable thermostats within specific programs but do not include smart thermostats with the Efficient Products category. Smart thermostats have proven energy savings and can earn the ENERGY STAR label. Given the importance of this measure for both the energy savings it can generate as a measure itself and the ability to facilitate more demand response, it should be included as a standalone measure in the Efficient Products category.

- While NJCEP is not proposing any changes to the Equivalent Full Load Hours (EFLH) for heating at this time, some of the assumptions by facility type for the commercial programs warrant further review. The current and proposed protocols currently reflect an assumption of 431 EFLH for heating for small office facilities. We believe this assumption is low in comparison to a large office building having an assumed EFLH of 2,034 and even religious worship facilities having an assumed EFLH of 731 for heating.

We are confident that a more detailed review with interactive stakeholder input, including the opportunity to leverage the knowledge of our utilities with strong program experience in other states, will lead to a stronger set of protocols to rely upon as New Jersey ramps up energy efficiency programs.

In closing, NJNG remains committed to partnering with the State to help achieve its energy-efficiency goals. Thank you, again, for the opportunity to provide these comments and allow us to be a part of the State's energy future.

Respectfully submitted,



Anne-Marie Peracchio

June 11, 2019

Honorable Aida Camacho-Welch, Secretary of the Board
Board of Public Utilities
44 S. Clinton Ave., 9th Floor
P.O. Box 350
Trenton, NJ 08625-0350

Re: New Jersey Board of Public Utilities (“Board”)
New Jersey’s Clean Energy Program (“NJCEP”)
Protocols to Measure Resource Savings – FY 2020

Dear Secretary Camacho-Welch:

In connection with the above-referenced matter, the New Jersey Utilities Association (“NJUA”) joins in the New Jersey Division of Rate Counsel’s (“Rate Counsel”) June 10, 2019 application seeking an extension of time to provide comments on the NJCEP Protocols to Measure Resource Savings for Fiscal Year 2020 (the “Protocols”). As Rate Counsel notes in its application, the one-week comment period on the nearly 200-page Protocols document does not provide stakeholders a sufficient amount of time to offer meaningful feedback, particularly given the other initiatives that are currently ongoing before the Board (*e.g.*, the June 11, 2019 deadline for comments on the Office of Clean Energy’s Fiscal Year 2020 budget and Comprehensive Resource Analysis). As the Board is aware, NJUA member companies in the past have provided meaningful comments regarding the Protocols, and endeavor to do the same with respect to the FY 2020 Protocols.

For the reasons set forth above and in Rate Counsel’s application, we respectfully request that the Board extend the comment period on the Protocols until June 21, 2019.

Respectfully submitted,



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June 12, 2019

Via E-mail (publiccomments@njcleanenergy.com)

Aida Camacho-Welch, Secretary of the Board
Board of Public Utilities
44 South Clinton Avenue, 3rd Floor
Post Office Box 350
Trenton, New Jersey 08625-0350

Re: NJCEP Protocols to Measure Resource Savings for Fiscal Year 2020

Dear Secretary Camacho-Welch:

Please accept this correspondence on behalf of Public Service Electric and Gas Company (“PSE&G” or the “Company”) in connection with the above-referenced matter. PSE&G thanks the Board of Public Utilities (“BPU” or “Board”) for the opportunity to submit comments on New Jersey’s Clean Energy Program Protocols to Measure Resource Savings for Fiscal Year 2020 (the “Protocols”). PSE&G has two general comments regarding the Protocols. First, at prior energy efficiency stakeholder meetings when changes to the Protocols were being discussed, PSE&G raised the issue of developing winter peak values for most measures, as PJM now requires an assessment of peak reductions during certain winter hours in order for the measures to qualify for winter peak savings. While there appeared to be consensus that this would be a valuable effort, to the Company’s knowledge, no action has been taken on this topic to date. We encourage the Office of Clean Energy (“OCE”) to work with its vendors to begin to develop winter peak value protocols for all measures.

Second, PSE&G requests that the OCE clarify the meaning of the phrase “inactive 2017, not reviewed”, which appears throughout the Protocols.

PSE&G’s specific comments regarding the Protocols are as follows:

1. Commercial sector pipe insulation useful life is not consistent with observed results and other Technical Reference Manual (“TRM”) assessments

Appendix A to the Protocols states that the measure life for commercial pipe insulation is 11 years. PSE&G has experience with installing commercial grade pipe insulation for its Hospital and Multifamily energy efficiency programs, and has observed that the current materials used for commercial grade pipe insulation are not prone to degradation over time, and see little to no human or animal traffic that may cause insulation to fall into disrepair. Therefore, an 11-year life is inconsistent with the observed durability of the materials. Notably, the ASHRAE HVAC

applications handbook cites the measure life for pipe insulation as 20 years. Additionally, the most current versions of the Illinois and New York TRMs cite the measure life as 15 years. PSE&G believes a more reasonable measure life for commercial pipe insulation should be in the range of 15-20 years.

2. Multifamily lighting in common areas Hours of Use (“HOU”) does not fully capture the range of sector-specific usage patterns

PSE&G credits the OCE for adding multifamily-specific lighting applications, as the Company’s extensive experience with this customer segment supports the need for sector-specific lighting measures. However, the Multifamily Common Areas HOU was established at 5,950, which PSE&G believes is too broad. There should be another category for Multifamily common area 24/7 operations, since in many multifamily buildings all corridors and stairwells have 24/7 operation. The NY TRM has a Multi Family (Common Areas) facility type that has 7,665 HOU. This better aligns with 24/7 operations. PSE&G suggests that the OCE either replace the current common area HOU with 7,665, or create a separate 24/7 common area category with this value.

3. Multifamily Exterior Lighting – Hours of Use

The Lighting Multifamily Exterior table on page 85 of the Protocols establishes the HOU at 3,338. Exterior lighting at most multifamily properties is operated from dawn to dusk. This equals 12 hours a day on average over the course of one year. The NY TRM has two values that approximate dusk to dawn operation: Parking Garages with an HOU of 4,368, and Parking Lots with an HOU of 4,100. PSE&G recommends this value be changed to 4,368.

4. Motors

On pages 95-96 of the Protocols, within the motors section, the reference to hp base refers to the ASHRAE 90.1-2013 table, which appears on page 96. However, this page also contains a table labeled “baseline motor efficiency table.” It is unclear which table should be used to determine baseline values for motors. PSE&G requests that the OCE clarify the applicability of the tables in this section.

5. Evaporator Fan Control Measure (refrigeration)

The Protocols assumes on page 125 that the control is installed on a traditional motor, not a higher efficiency, electronically commutated (“EC”) motor. There may be instances where a new EC motor has been installed along with the control equipment. The algorithm may therefore overstate the energy savings by as much as 50%. PSE&G recommends that the formula be changed to account for the actual motor efficiency related to the control measure.

6. Clarity on building types

On page 86 of the Protocols, within the Performance Lighting section, the interactive factor (HVACg) for annual fuel savings is determined by selecting either large retrofit or small retrofit. PSE&G requests that the OCE provide the threshold gross square footage value for each category, or some other parameter from which to select small or large.

7. Clarity on hot water conservation measures

There are three different methods for calculating savings for water conservation measures. More specifically, there are two methods under the Residential Low Income Program, and a third method under the Direct Install Program. There should be only one method to calculate savings for this measure type to ensure consistency in savings. PSE&G suggests using the Direct Install Program algorithm, which is more straightforward, while allowing for specific quantities of aerators and showerheads. In PSE&G's experience, the Low Income algorithm may overstate the energy savings. However, PSE&G suggests one change to the Direct Install method, which would allow the efficiency of the water heating equipment to be an input variable, rather than a fixed 80% value, to allow for the situation where both the heating system and the low flow devices are being upgraded.

Again, PSE&G thanks the BPU for providing stakeholders with the opportunity to comment on the Protocols, and it looks forward to continuing to work collaboratively with the OCE. Please do not hesitate to contact me if you have any questions regarding this submission.

Respectfully submitted,

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