



STATE OF NEW JERSEY
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CLEAN ENERGY

IN THE MATTER OF REVISIONS TO)
NEW JERSEY'S CLEAN ENERGY PROGRAM --)
FISCAL YEAR 2019 PROTOCOLS TO)
MEASURE RESOURCE SAVINGS)
ORDER
DOCKET NO. QO16060525

Parties of Record:

Janja Lupse, CLEAResult Consulting Inc.
Diane Zukas, TRC Energy Services
Michael Ambrosio, TRC Energy Services
Mark Mader, Jersey Central Power & Light
Timothy White, Atlantic City Electric
Sandra Eason-Perez, Orange & Rockland Utilities
Bruce Grossman, South Jersey Gas Company
Susan Ringhof, Public Service Electric & Gas Company
Tracey Thayer, New Jersey Natural Gas
Mary Patricia Keefe, Elizabethtown Gas Company
Stefanie A. Brand, Esq., Director, Division of Rate Counsel

BY THE BOARD:

This Order memorializes action taken by the Board of Public Utilities ("Board" or "BPU") at its June 22, 2018 public meeting, where the Board considered and determined updates and revisions to New Jersey Clean Energy Program's ("NJCEP") Protocols to Measure Resource Savings ("Protocols").

BACKGROUND & PROCEDURAL HISTORY

On February 9, 1999, the Electric Discount and Energy Competition Act ("EDECA" or the "Act") was signed into law, creating the societal benefits charge ("SBC") to fund programs for the advancement of energy efficiency ("EE") and renewable energy ("RE") in New Jersey. Many of such programs are now part of NJCEP.

By Order dated December 16, 2015, Docket No. E009120975, the Board approved a document entitled "Protocols to Measure Resource Savings" dated November 24, 2015 ("FY16 Protocols"), and, by Order dated June 29, 2016, Docket No. QO17050465, it approved an update to the FY16 Protocols ("FY17 Protocols"), which update is the most recent version approved by the Board. The Protocols are used by the program managers to estimate energy savings and renewable energy generation. The Protocols include algorithms for measuring energy and other resource savings or renewable or clean energy generation that result from the implementation of eligible measures under NJCEP. The Protocols require updating from time to time as baselines against which energy savings are measured change due to upgrades in energy codes or appliance efficiency standards, the addition or deletion of programs, the results of program evaluations, or other changes in the assumptions used to measure resource savings.

In June 2017, ERS, a consulting firm, was engaged by the Board through Rutgers Center for Energy, Economic and Environmental Policy ("CEEPP") to evaluate and recommend updates to the FY17 Protocols. On October 25, 2017, ERS's findings and recommendations, including an ERS memo, updated as of October 18, 2017 ("October ERS Memo"), and an updated Protocols, dated October 18, 2017 ("October Draft Protocols"), were released and distributed for stakeholder and public comment, with comments due on November 9, 2017. Comments were submitted, several of which stated that Board Staff ("Staff") should allow more time and opportunity for input. (A summary of the November 2017 comments and Staff's responses to them was distributed along with the May 10, 2018 notice described below and was posted as described below.)

On November 28, 2017, the October Draft Protocols and the comments regarding them were discussed at a Utility Working Group Meeting. On February 1, 2018, further revised Protocols, dated January 12, 2018 ("January Draft Protocols"), were distributed to the Utility Working Group. On March 15, 2018, the January Draft Protocols were discussed at a Utility Working Group Meeting, and a follow-up conference call was held with that Group on April 3, 2018. On April 10, 2018, the New Jersey Division of Rate Counsel ("Rate Counsel") submitted written comments regarding the January Draft Protocols.

On May 10, 2018, a notice was distributed to the EE, RE, and other NJCEP listservs about the posting to the NJCEP website of further revised Protocols with a release date of May 4, 2018 ("Current Proposed Updated Protocols"). In the notice, Staff circulated a document addressing each comment received thus far and noting any changes it made in response to the comments. The distributions and postings requested comments on the Current Proposed Updated Protocols, with a due date of May 31, 2018.

SUMMARY OF THE CURRENT PROPOSED UPDATED PROTOCOLS

The changes in the Current Proposed Updated Protocols reflect changes to the baselines against which energy savings are measured due to upgrades in energy codes or appliance efficiency standards, the addition or deletion of programs, the results of program evaluations, or other changes in the assumptions used to measure resource savings. Some of the more significant updates are as follows:

- Measure Lives
 - Appendix A of the Protocols includes a listing of measure life values. Measure life values were revised to match the 2014 California Database of Energy Efficient Resources¹ (“DEER”), which is the latest full update of DEER. In cases where measures were not included in DEER, alternative sources were noted.
- Introduction
 - On- and Off-Peak Values – updated per PJM peak periods.
 - T&D Losses – updated per recent studies by JCP&L and PSE&G.
- Residential
 - HVAC – updated to a new baseline of IECC 2015.
 - HVAC – new measures: Combination Boiler, Boiler Reset Controls, and Instantaneous Water Heater.
 - Water Heaters – updated to new DOE Uniform Energy Factor (“UEF”) standard rather than EF.
 - Low Income – new measures: Water Heater Pipe Wrap and Gas HVAC Repairs.
 - Lighting – hours of use increased from 2.8 hours/day to 3.3 hours/day.
- Commercial and Industrial (C&I)
 - Lighting – revised the reference for hours of use and coincidence factors by building type.
 - HVAC – updated to a new baseline of ASHRAE 90.1 2013.
 - HVAC – updated the reference for effective full load hours (“EFLH”) from single value to a table of building-type based values.
- Combined Heat & Power (“CHP”)
 - Revised the algorithm per the National Renewable Energy Laboratory’s (“NREL”) Uniform Method’s Project for capturing energy savings.

More detail regarding the foregoing is set forth in the Current Proposed Updated Protocols.

SUMMARY OF COMMENTS FROM PUBLIC STAKEHOLDERS

Written comments regarding the Current Proposed Updated Protocols were submitted by Bloomenergy (“Bloom”), the National Fuel Cell Research Center (“NFCRC”), MaGrann Associates (“MaGrann”), New Jersey Natural Gas (“NJNG”), and Rate Counsel.

Staff notes that the process and schedule for commenting on the Straw Proposal for the FY19-FY22 Comprehensive Resource Analysis (“Straw Proposal”), the associated draft Clean Energy Programs and Budgets for FY19 (“FY19 Compliance Filings and Budgets”), and the Current Proposed Updated Protocols were very similar and that all three proposals are being presented to the Board on the same day. Because some comments do not readily lend themselves to

¹ <http://www.deeresources.com/>

being classified as being about one proposal versus one or more of the others, readers are strongly encouraged to read the comments and responses regarding all three proposals.

Comment: Bloom commented that the proposed changes set forth in the Current Proposed Updated Protocols regarding CHP appear to be an attempt to formalize the inaccurate and discriminatory review of projects in favor of combustion CHP and to the disadvantage of non-combustion fuel cells and especially fuel cells without heat recovery ("FCw/oHR"), also known as All-Electric Fuel Cells. It claimed that, for instance, the proposal first strikes the words "fuel cells" in virtually every instance they are used and then proceeds to claim that because "CHP systems typically use fossil fuels to generate electricity that displaces electric generation from other sources . . . the electricity generated from a CHP system should not be reported" as electric energy savings. However, Bloom claimed, the proposal then goes on to say that "any waste heat recaptured and utilized should be reported as energy savings. Bloom asserted that this was absurd by analogizing the quoted statement to a conclusion that a Prius is inefficient because it runs on fossil fuel. Bloom then claimed that FCw/oHR have been proven to create very significant energy savings through a combination of a lower heat rate (i.e., higher efficiency) than the electric grid power it is displacing and a very high capacity factor. Bloom concluded by arguing that the Current Proposed Updated Protocols should be clarified to ensure that the differential between the efficiency of displaced grid power and the verified efficiency of a CHP/Fuel Cell system should be credited as electric energy savings for each MW/hr generated.

Response: Staff disagrees. It preliminarily notes that, in part in response to input by stakeholders including Bloom, the Board engaged a well-reputed national expert, ERS, to evaluate and update the Protocols, and that expert recommended the changes about which Bloom has commented. Moving to the substance of Bloom's comments, the references to fuel cells were deleted because, at present, FCw/oHR are not eligible to participate in the CHP Program. Further, the statements about CHP are accurate and sensible and indeed align with the approach of National Renewable Energy Laboratory ("NREL") in accordance with ERS's recommendation. Unlike a Prius, which reduces the amount of gasoline usage that would be used by the baseline U.S. automobile, FCw/oHR do not reduce on-site usage and are therefore not EE. Finally, Bloom has failed to demonstrate that FCw/oHR produce energy savings. There is therefore no reason to question or revise the CHP section of the Current Proposed Updated Protocols as Bloom suggested.

Comment: NFCRC commented that the proposed 15-year measure life for fuel cells is erroneous and that it should instead be a 20-year Measure Life. In support of its comment, NFCRC stated:

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.

Response: Staff disagrees. The cited study states: "Overall system life is assumed to be approximately 15 years currently and anticipated to increase to 20 years in the future (2015-2020 timeframe)." In short, the study supports a 15-year measure life at present, recognizing that it may increase to a 20-year measure life at some time over the next few years. Staff recommends basing determinations on what is known at the time of the determination, rather than what is "anticipated" to occur in the future; if in the future there is factual support for a 20-year measure life, the Protocols can be appropriately updated and revised. As to NFCRC's purported observations of a 20-year lifetime, no details or documentation is provided, and even NFCRC carefully hedges its statement by characterizing its observations as "suggesting" that a 20-year lifetime would be "reasonable." Staff submits that its proposed 15-year lifetime is even more reasonable.

Comment: MaGrann asked several questions regarding the application of the protocols to water heaters in typical older multifamily configurations:

- How would the protocols be applied to a system with a boiler & storage tank or an indirect water heater? Neither the Stand-Alone Storage Water Heaters (pg.139) section nor the Instantaneous Gas Water Heaters (pg.142) section appears to apply.
- Particularly, if considering an indirect system, would the efficiency of the combustion equipment be de-rated for the heat exchange process, and if so what would be the protocol for de-rating?
- Is there an approved methodology for de-rating the efficiency of existing equipment that is significantly older than the assumed baseline of ASHARE 901-2007?

Response: For C&I gas water heating measures, incentives are currently restricted to replacement of "free-standing gas-fired booster heaters, tank-style water heaters and tankless water heaters." In the case where the existing system is an indirect water heater, the project would need to apply for custom incentives.

Comment: NJNG commented that the FY16 Protocols contain a methodology that addresses the case of a gas boiler or furnace replacing electric resistance heating and a gas water heater replacing an electric water heater. The approach used addresses the overall fuel cycle efficiency of electric heat by determining the amount of energy, in BTUs, that it takes to create a kWh of electricity. This results in an Annual Fuel Utilization Efficiency ("AFUE_b") value of 35% for resistance heating and is then used to determine the overall quantity of therms saved by replacing electric resistance heating with natural gas heating. In the proposed update to the Protocols, the AFUE_b value for resistance heating has been removed. NJNG concluded that, because of the significant cost and fuel resource savings, an AFUE_b value for resistance heating should be retained in the Current Proposed Updated Protocols.

Response: Staff agrees that the AFUE_b value is useful; the AFUE_b value of 35% will be retained and reinserted.

Comment: Rate Counsel reiterated its prior recommendations that winter coincident factors ("CF") be established for as many measures as possible, that timelines be set for determining how to calculate the effects of free drivers, and to update references to technical reference manuals ("TRM") (recognizing that 14 such references have been updated).

Response: Staff agrees that CFs should be established and, as Rate Counsel recognized, intends to do so after further analysis and public input. Staff has committed to address free drivers during FY19. In certain cases, a revised TRM reference results in a revised algorithm for the respective measure, which result then requires additional analysis and consideration. TRM references will continue to be reviewed and updated as resources and time allow.

Comment: Rate Counsel reiterated its prior recommendations that:

- Transmission and distribution line factors should be established for each customer class;
- Avoided emission factors should be based at least in part on the most recent year and such factors should be based on annual average marginal emission rates rather than annual peak marginal emission rates;
- The Current Proposed Updated Protocols should be updated to use CFs based on a 2014 study prepared by NMR: *Northeast Residential Lighting Hours of Use Study*;
- A more nuanced and better-supported approach to effective full load hour ("EFLH") calculations should be developed; and
- The savings factor for fuel use economizers for commercial boilers and furnaces should be adjusted based on New Jersey-specific enthalpy data.

Response: Staff agrees that all the foregoing should be at least further considered, if not implemented. As Rate Counsel recognized, Staff intends to do so in conjunction with further analysis and public input.

Comment: Rate Counsel commented that the Current Proposed Updated Protocols should retain their current residential insulation 30-year life or use a 25-year life based on the value used in Massachusetts and Pennsylvania and should not use California's Database of Energy Efficiency Resources ("DEER") as the basis for the measure life for insulation.

Response: Staff disagrees with the recommendation. It is important to maintain consistency within the Protocols so as to prevent users from selectively "shopping" among references for the most attractive values. Staff also notes that, per Appendix A, if actual measure lives are available through nameplate information or similar manufacturer documentation, those measure lives should and will be utilized.

Comment: Rate Counsel commented that Staff had indicated that the recommended lighting hours for hospitals had been reviewed and updated based on the Mid-Atlantic TRM V7 but that the Current Proposed Updated Protocols do not appear to include any such update.

Response: The Mid-Atlantic TRM V7 specifies lighting hours for "Health" as being 8,760 hours. Per ERS's recommendation, the Protocols' lighting hours for the generally parallel "Medical – Hospital" classification have been updated to 8,760 hours to reflect the TRM V7 specification.

BOARD STAFF RECOMMENDATIONS

Staff recommends that:

- A set of updates regarding the Calculation of Clean Air Impacts section, as suggested by the New Jersey Department of Environmental Protection after the May 10, 2018 Request for Comments was released, be incorporated into that section of the Protocols;
- A set of updates regarding room air conditioners and dehumidifiers inadvertently omitted from the Appliance Recycling Program section of the Current Proposed Updated Protocols be reinserted into that section of the Protocols; and
- Regarding the methodology that addresses the case of a gas boiler or furnace replacing electric resistance heating and a gas water heater replacing an electric water heater, the AFUE_b value of 35% be retained and reinserted.

After considering the comments, including the comment about retaining the AFUE_b described immediately above, Staff recommends that the immediately-above-recommended revisions to the Current Proposed Updated Protocols be adopted (as so revised, the "Current Updated Protocols") and that the Board set, adopt, and approve the Current Updated Protocols.

DISCUSSION AND FINDINGS

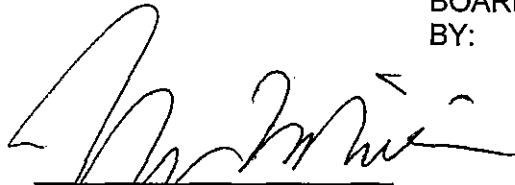
Consistent with the Board's contract with its Program Administrator, Staff coordinated with the Program Administrator regarding the Current Proposed Updated Protocols and previous versions of same. Further, Staff engaged in multiple discussions with stakeholders and the public, sought and considered multiple rounds of informal and formal written comments from the same, substantially revised its original proposal in light of those discussions and comments, solicited formal comments on that revision, i.e., on the Current Proposed Updated Protocols, and, finally, made only non-material changes to that revision to arrive at the Current Updated Protocols. Accordingly, the Board **HEREBY FINDS** the processes utilized in developing the Current Updated Protocols were appropriate and provided stakeholders and interested members of the public with adequate notice and opportunity to comment on them.

The Board **HEREBY FINDS** that the Protocols should continue to be updated from time to time so that they remain current with federal and State codes and standards and are reflective of current technologies and building practices and other changes in the marketplace, including the addition of new NJCEP programs and program components. For the reasons set forth above, the Board **HEREBY FINDS** that the Current Updated Protocols include reasonable methodologies and are appropriate for estimating energy savings and renewable and distributed generation. The Board supports ongoing program evaluation to inform additional updates to the Current Updated Protocols and **HEREBY DIRECTS** Staff to continue coordinating the development of an evaluation plan. Based on the above, the Board **HEREBY APPROVES** the Current Updated Protocols for use in estimating savings from NJCEP program measures.

This Order shall be effective on July 1, 2018.

DATED: 6/22/18

BOARD OF PUBLIC UTILITIES
BY:



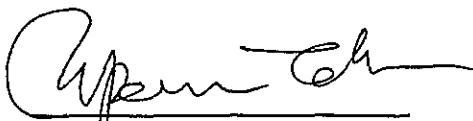
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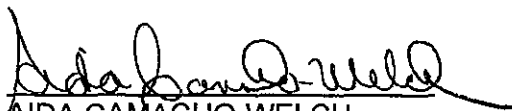
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I HEREBY CERTIFY that the within
document is a true copy of the original
in the files of the Board of Public Utilities.

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FISCAL YEAR 2019 PROTOCOLS TO MEASURE RESOURCE SAVINGS

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