State of New Jersey
DIVISION OF RATE COUNSEL
140 EAST FRONT STREET, 4TH FL.
P.O. BOX 003
TRENTON, NEW JERSEY 08625

PHIL MURPHY
Governor

SHEILA OLIVER
Lt. Governor

BRIAN O. LIPMAN
Director

December 14, 2022

Via Electronic Mail board.secretary@bpu.nj.gov
Carmen D. Diaz
Acting Secretary of the Board
44 South Clinton Avenue, 1ST Floor
P.O. Box 350
Trenton, NJ 08625-0350

Re: In the Matter of the New Jersey Energy Storage Incentive Program
BPU Docket No. QO22080540

Dear Acting Board Secretary Diaz:

Please accept for filing these comments being submitted on behalf of the New Jersey Division of Rate Counsel ("Rate Counsel") in accordance with the Notice issued by the Board of Public Utilities ("Board") in this matter on September 29, 2022. In accordance with the Notice, these comments are being filed electronically with the Board's Secretary at board.secretary@bpu.nj.gov.

Due to the complexity of the issues involved in this proceeding, and numerous other matters pending before the BPU involving Rate Counsel's attorneys and consultants, Rate Counsel was unable to submit these comments by the December 12, 2022 deadline set in the Notice. Rate Counsel respectfully requests that the Board and its Staff accept these comments on the above-referenced date on behalf of New Jersey's utility ratepayers.

Please acknowledge receipt of these comments.

Thank you for your consideration and attention to this matter.

Respectfully submitted,

Brian O. Lipman, Esq.
Director, Division of Rate Counsel

By: */s/ Sarah Steindel*
Sarah H. Steindel, Esq.
Assistant Deputy Rate Counsel

SHS
Enclosure

cc: Kelly Mooij, BPU
Stacy Peterson, BPU
Abe Silverman, BPU
Robert Brabston, BPU
Jim Ferris, BPU
Paul Heitmann, BPU
Ian Oxenham, BPU
Pamela Owen, DAG, ASC

STATE OF NEW JERSEY

BEFORE THE BOARD OF PUBLIC UTILITIES

In the Matter of the New Jersey Energy Storage Incentive Program	**)** **)** **)**	**Docket No. QO22080540**

COMMENTS OF THE NEW JERSEY DIVISION OF RATE COUNSEL IN RESPONSE TO THE INITIAL REQUEST FOR STAKEHOLDER FEEDBACK ON THE PROPOSED NEW JERSEY STORAGE INCENTIVE PROGRAM

DECEMBER 14, 2022

INTRODUCTION

The Division of Rate Counsel ("Rate Counsel") thanks the Board of Public Utilities ("Board" or "BPU") for the opportunity to provide comments on the Energy Storage Incentive Program ("SIP") Straw Proposal developed by the Board's Staff. Rate Counsel appreciates the thought and effort that has gone into the Straw Proposal, and is in agreement with many aspects of the proposal. However, Rate Counsel does have some significant concerns, as discussed in more detail below.

In the comments below, Rate Counsel will first offer general comments, followed by comments on the elements of proposed SIP as outlined in the Straw Proposal.

RATE COUNSEL COMMENTS

I. GENERAL COMMENTS

A. Cost-benefit analysis

New Jersey has ambitious energy storage goals with a legislatively-mandated target of 2,000 megawatts ("MWs") of capacity by 2030. Rate Counsel recognizes that energy storage will be an important and integral part of New Jersey's clean energy future. Energy storage can help to accommodate intermittent renewable energy resources on the New Jersey's electric grid, and can often assist in deferring costly transmission and distribution investment. Energy storage also plays a role in facilitating system reliability and resiliency.

While Rate Counsel recognizes the potential benefits of storage, it is also important to achieve those benefits in an economic and effective manner. As the Board is aware, there are many utility ratepayers who struggle to pay their energy bills.[1] This makes it especially important to design New Jersey's SIP based on a careful analysis of costs and benefits. The

[1] Public Utility Arrearages, Electric and Gas Arrearages Summary as of October 2022 (https://www.nj.gov/bpu/newsroom/reports/covid19/October%202022%20Arrearage%20Data%20Energy.pdf).

Straw Proposal contains little information about the costs or benefits of the SIP to New Jersey ratepayers. Staff is proposing to incentivize storage projects using a combination of annual payments that are fixed as of the time the project is accepted into the program, and performance-based incentives based on the each facility's actual charging and discharging activity. According to the Straw Proposal, the "fixed" portion of the incentive would be structured as a fixed annual incentive, to be paid in dollars per kilowatt-hour ("kWh) of storage capacity, and would make up "at least 30%" of the total incentive payments.[2]

This proposal fails to address a fundamental threshold question which is: whether any additional incentives are needed to meet the State's goals for storage development. As discussed in more detail in Section **II.D.** below, there are many other sources of value for storage projects, including the energy, capacity, and ancillary services markets offered by PJM Interconnection LLC ("PJM"), tax benefits, subsidies under the recently enacted federal Inflation Reduction Act ("IRA"), and the incentives that are available for solar-plus-storage projects under the Board's Competitive Solar Incentive ("CSI") program. Based on Rate Counsel's review of data from PJM, it appears likely that these sources are sufficient to incentivize the development of 2,000 MW of storage by 2030. The Straw Proposal recognizes the existence of other incentives for storage, and cites "value stacking" as an important goal, but contains no analysis to quantify the existing sources of value, or assess whether they are sufficient to meet the State's storage goals. This is a critical deficiency which should be remedied before the SIP program is finalized.

More generally, there is no meaningful analysis of the costs and benefits of the proposed SIP. The only concrete cost information contained in the Straw Proposal is Staff's request for comment on suggested levels for the fixed incentive. Staff suggests values of 10 annual

[2] Straw Proposal, p. 1.

payments of $20 per kilowatt-hour ("kWh") of storage capacity for an initial block of grid supply project, and $40 per kWh of storage capacity for an initial block of distribution-level storage, with reductions of $2 to those annual payment amounts for successive capacity blocks.[3] Staff does not specify any suggested values for the performance-based incentive other than stating that the fixed incentive will be at least 30% total incentives.[4] The Straw Proposal contains no analysis of the total costs or rate impacts of either the fixed or performance-based incentives. Further, despite Staff's recognition that grid infrastructure investments will be needed to accommodate the State's energy storage goals, the Straw Proposal reflects no attempt to quantify those costs. Staff states only that infrastructure costs will be the responsibility of the electric distribution companies ("EDCs") [5]—ignoring the fact that these costs will ultimately be paid by the same ratepayers who will pay for the SIP.

Information on benefits is even more limited. The Straw Proposal asserts that cost-benefit studies commissioned in other states have shown that energy storage can create electricity cost savings for ratepayers that exceed the costs of incentives.[6] However, Staff has not commissioned any such study for New Jersey, and has not attempted to quantify cost savings, or other benefits such as reductions in greenhouse gas ("GHG") emissions, that are expected to result from the SIP. This lack of data makes it impossible to determine whether the costs of the program are justified, or to establish benchmarks for future evaluation of the program's performance.

The Board has recognized the importance of cost-benefit analyses in other contexts. As an example, when utilities file their proposed energy efficiency ("EE") programs and budgets for

[3] Straw Proposal, p. 17.
[4] Straw Proposal, p. 1.
[5] Straw Proposal, p. 11.
[6] Straw Proposal, p. 3.

review, they are required to provide detailed documentation of the costs and anticipated benefits of their proposals.[7] The SIP targets development of 1,000 megawatts of 4-hour energy storage, which equates to 4,000 megawatt hours (MWh), or 4 million kWh, of storage capacity.[8] The sheer scale of the proposed program demonstrates the need for a thorough analysis of costs and benefits. A comprehensive analysis of costs and benefits, including the analysis of the need for additional incentives discussed above, should be performed and released for public review and comment as part of this stakeholder process.

Another significant concern is the failure of the Straw Proposal to incorporate competition in the proposed incentive structure. To the extent any additional incentives are needed, the Board should maximize the use of market-based mechanisms to determine incentive levels. The SIP presents the Board with an excellent opportunity to extend its past policy leadership in using market-based mechanisms to minimize costs for ratepayers. Competitive procurement was successfully used in the SREC-Based Financing Programs in which three of New Jersey's electric distribution companies ("EDCs"), Atlantic City Electric Company ("ACE") Jersey Central Power & Light Company ("JCP&L"), and Rockland Electric Company ("RECO") used competitive solicitations to procure solar renewable energy certificates ("SRECs") under long-term contracts with solar developers.[9] More recently the Board has used

[7] I/M/O the Implementation of P.L. 2018, c. 17 Regarding the Establishment of Energy Efficiency and Peak Demand Reduction Programs, BPU Dkt. Nos. QO19010040 et. al., Order Directing Utilities to Establish Energy Efficiency and Peak Demand Reduction Programs, Appendix B (June 10, 2020).
[8] Straw Proposal, p. 13.
[9] The Solar Financing Programs were originally initiated in 2009. The original programs, known as the "SREC I" programs were approved by the Board for ACE and JCP&L in Orders dated March 27, 2009 in the Board's Docket Nos. EO08100875 (ACE) and EO08090840 (JCP&L), which were later modified following an appeal and further settlement discussions among the parties in an Order dated September 16, 2009. The SREC I program for RECO was approved by the Board in an Order dated July 31, 2009 in the Board's Docket No. EO09020097. Following the expiration of the SREC I programs, the three utilities, at the Board's direction, filed for extensions of the program. The extended programs, known as the "SREC II" programs, were approved by the Board in Orders dated December 31, 2013 in the Board's Docket Nos. EO12090799 (ACE), EO12080750 (JCP&L) and EO13020118 (RECO).

competitive solicitations to incentivize offshore wind ("OSW") development,[10] and has explicitly recognized the benefits of competition in its December 7, 2022 Order launching the CSI Program (the "CSI Order").[11]

The Notice accompanying the Straw Proposal states that the Straw Proposal is modeled on the CSI Program but the proposal moves entirely in the opposite direction, with Staff's proposal that the fixed portion of the SIP incentives be entirely administratively determined. The Straw Proposal cites a number of "benefits" of using administratively determined incentives,[12] but does not address the costs and risks of this approach for ratepayers. As Rate Counsel has noted in many other comments, administrative determinations of incentive levels and block sizes are necessarily imperfect, and result in inefficient outcomes and increased costs. This is likely to be particularly problematic in the early part of the SIP program when the total capacity targets are small and information about developers' needs for incentives is sparse. The declining block structure proposed by Staff would provide only limited price discovery, likely resulting in incentives that are higher than necessary, especially given the evidence that little or no incentive may be needed to meet the State's goal of 2,000 MW of storage by 2030. Further, capacity blocks would be filled on a first-come first-served basis, rather than economic factors, such as cost structure and project viability. Given the Board's experience with competitive procurement processes, and its very recent recognition of the benefits of competition in the CSI Order, it is unclear why Staff believes competition would be unworkable for storage projects. Rate Counsel's recommendations for a competitive bidding process for determining the fixed

[10] See DCE Summary of New Jersey Offshore Wind Solicitations (https://www.njcleanenergy.com/renewable-energy/programs/nj-offshore-wind/solicitations).
[11] I/M/O Competitive Solar Incentive ("CSI") Program Pursuant to P.L, 2021, c. 169, BPU Dkt. No. QO21101186, Order Launching the CSI Program at 14 (Dec. 7, 2021).
[12] Straw Proposal, p. 16-17.

component of the storage incentives, in the event such incentives are needed, are discussed in Section **II.E.***A*.i. below.

Another serious concern is the technical hurdles that will need to be addressed in structuring the performance-based incentives. Rate Counsel believes that Staff has underestimated the time and effort that will be required to address these issues. Staff has proposed to base the performance-based incentives for grid-level on the PJM Marginal Emissions Rate. However, as discussed in Section **II.E.***B*.i. below, the Marginal Emissions Rate is poorly suited to incentivizing reductions in GHG emissions, and Staff has also failed to consider how the inefficiencies that are inherent in storage will affect their effectiveness in reduction GHG emissions. The development of performance-based incentives for distribution-level storage would be essentially delegated to the EDCs. As discussed in Section **II.E.***B*.ii, this will require considerable time and effort, along with guidance from Staff that is not included in the Straw Proposal. Further proceedings, including opportunities for stakeholder input, will be required to develop the performance-based incentives.

Finally, the Board has also recognized the importance of assuring that ratepayer-funded programs perform efficiently and effectively. Regular reporting and evaluation are required for the utilities' energy efficiency programs, and the Board has undertaken evaluations of its own clean energy programs. The Straw Proposal is lacking in provisions to assure that the program yields the expected benefits at reasonable costs. The SIP should include robust provisions for monitoring and evaluation of both costs and benefits. Both incentive levels and program performance should be monitored and evaluated on a regular basis.

As discussed above the starting point for this process should be the establishment of budgets and performance benchmarks based on a cost-benefit analysis. Further, the evaluation

process should be should be supported by reporting by program participants, including financial disclosures. The SIP will involve expenditures of many millions of dollars in ratepayer funds to subsidize privately-owned unregulated entities. It is not unreasonable to ask these entities to provide the information the Board needs to assure that ratepayers are not paying too much. Rate Counsel's recommendations for monitoring, reporting and evaluation are detailed in section **II.J.** below.

II. COMMENTS ON THE STRAW PROPOSAL

A. Program Goals

The Straw Proposal sets forth the following eight program objectives:

(1) Achieve the 2030 energy storage goal of 2,000 MW by 2030, as set forth in the CEA in a manner that is consistent with New Jersey's competitive electricity markets;

(2) Promote deployment of private capital by establishing a stable market structure that attracts low-cost capital;

(3) Ensure that energy storage devices are deployed in a manner that decreases GHG emissions by tying operations to pay-for-performance metrics;

(4) Support deployment of energy storage devices interconnected to the transmission or distribution system of a New Jersey EDC;

(5) Grow a sustainable energy storage industry that gradually requires decreased incentives to deploy additional storage resources, in order to ensure that the benefits of energy storage last well beyond the term of this initial program;

(6) Support overburdened communities with energy resilience, environmental improvement, and economic opportunity benefits derived from energy storage;

(7) Encourage storage deployment that accelerates the clean energy transition, including facilitating deployment of renewable energy, electric vehicle or other DER; and

(8) Establish a Program Administrator at the BPU who would oversee the efficient implementation of the program and stay current on all technology and processes used for energy storage.[13]

Rate Counsel is in general agreement with these goals developed by Staff, as they provide an effective framework for evaluation of the incentive mechanisms for the SIP. However, Rate

[13] Straw Proposal, p. 10-11.

Counsel suggests that an additional goal be included concerning the establishment of robust requirements for developer reporting, monitoring and evaluation as a condition of receiving state incentives in order to assure cost control and effectiveness in meeting the objectives of the SIP.

B. Business Model Considerations

The proposal recommends that the Board adopt a storage business model that encourages private ownership and operation of energy storage devices, consistent with New Jersey's restructured competitive market structure. Staff also notes that, while the energy storage devices are expected to be privately owned and operated, there will also need to be an effort by the EDCs to build the necessary grid infrastructure to enable the effective dispatch of energy storage devices and ensure that the grid is capable of connecting storage devices at the distribution and transmission levels. Rate Counsel supports the private development and ownership of energy storage devices and the evaluation of storage investments based on their ability to reduce GHG emissions. However, private developers understand competitive markets and understand their own risk and reward structures better than Staff. These private developers are likely to offer bids in competitive markets that reflect such trade-offs. Rate Counsel strongly encourages the Board to develop incentive structures that have competitive market attributes—not those that are administratively determined.

Rate Counsel also supports Board Staff's recommendation that EDCs should not be allowed to directly participate in the SIP since a conflict of interest could arise given the role EDCs are expected to play in developing performance metrics and financial incentives for distribution-level storage. Rate Counsel further recommends that all EDC costs incurred as part of providing information or assisting the Board or a third-party administrator in the

implementation and ongoing operation of this program should be paid for by program participants.

In addition, Rate Counsel is concerned with the discussion in the Straw Proposal that appears to "throw a bone" to the EDCs by indicating that widespread distribution level investments are forthcoming and should suffice as an offset to the utility SIP exclusion. Rate Counsel disagrees with this "quid pro quo" stance since it could, and hopefully will, be the case, that a large number of energy storage projects will assist in actually avoiding future distribution level capacity and resiliency investments. Large scale distribution investment should not be held out as a quid pro quo for the EDCs' agreement to the final SIP rule. To the extent distribution investment is required, the Board should also continue to support and apply the principles of cost causation for interconnection costs related to new energy resources.

C. Technical Considerations and Proposed Definition of Energy Storage

Staff proposes to adopt the following definition for energy storage:

> A device that is capable of absorbing energy from the grid or from a Distributed Energy Resource (DER), storing it for a period of time using mechanical, chemical, or thermal processes, and thereafter discharging the energy back to the grid or directly to an energy using system to reduce the use of power from the grid.[14]

The Straw Proposal's storage definition is wide and meant to be technologically neutral.[15] In general, Rate Counsel supports a technologically neutral definition; however, more clarity is needed with regards to hydrogen, in particular, as an energy storage resource. Because one of the chief underlying goals of the Straw Proposal is to help New Jersey achieve its state GHG reduction goals, care must be taken not to incentivize investment in hydrogen energy storage systems that become GHG emissions if inevitable leaks occur or rely on fossil energy

[14] Straw Proposal, p. 12.
[15] Straw Proposal, p. 12.

feedstocks that would undermine the state's EMP goals. Furthermore, the combustible nature of hydrogen can create serious safety concerns. Therefore, Rate Counsel recommends that the Board consider narrowing the definition of storage to exclude hydrogen so systems reliant on hydrogen are not eligible for ratepayer-funded incentives for energy storage.

Additionally, Rate Counsel supports a storage definition includes non-battery alternatives such as pumped hydro-electric facilities as well as hot and chilled water and other thermal technologies as these may be the lowest cost technology in some applications.

D. Installed Storage Targets and Deployment Timeline

Staff proposes to split the SIP allocations among grid supply and distribution level storage resources according to the following table:[16]

Table 1: Staff's Proposed SIP Allocations

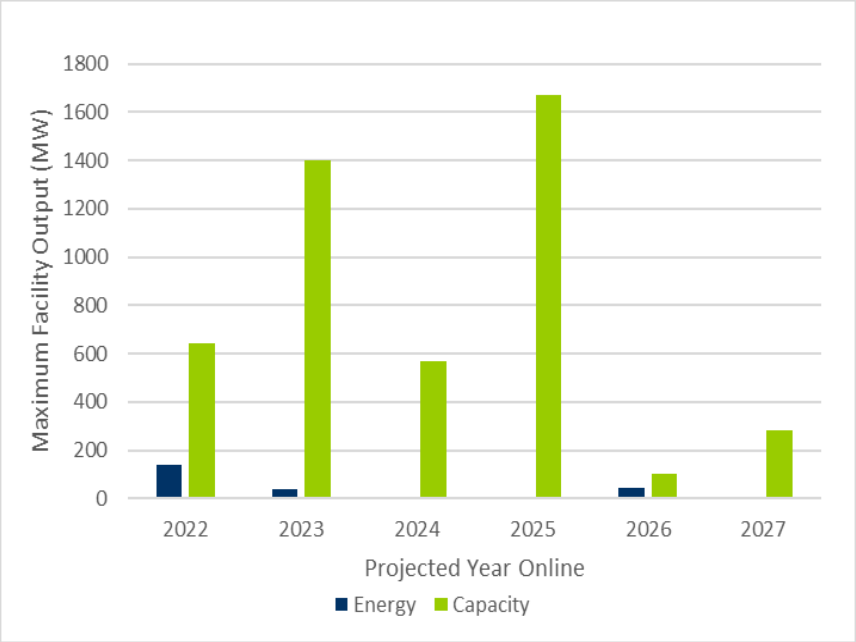
Energy Year in which Awards are Made	Proposed Grid Supply Procurement Quantity (MWs of 4 Hour Storage)	Proposed Grid Supply Procurement Quantity (MWhs)	Proposed Distributed Procurement Quantity (MWs of 4 Hour Storage)	Proposed Distributed Procurement Quantity (MWhs)
2023/2024	30	120	10	40
2024/2025	50	200	10	40
2025/2026	75	300	15	60
2026/2027	105	420	15	60
2027/2028	140	560	20	80
2028/2029	180	720	20	80
2029/2030	300	1200	30	120

While Rate Counsel generally agrees with dividing any SIP among grid supply and distribution level storage resources, PJM data suggests little to no additional incentive may be needed to incentivize grid supply storage resources.

[16] Straw Proposal, p. 14.

The scale of the interest in developing grid storage projects in New Jersey as shown below from data from the PJM interconnection queue, warrants further study regarding the size of the fixed incentive for grid supply storage.[17] Through 2027, grid storage capacity resources currently in the queue totals over 4,800 MW for the State.[18] As seen in Figure 1 below, the projected online date of grid storage interconnection requests is concentrated in the near-term, whereas requests beyond 2026 have not yet materialized. As interconnection applications continue to be submitted, later years will likely materialize as well.

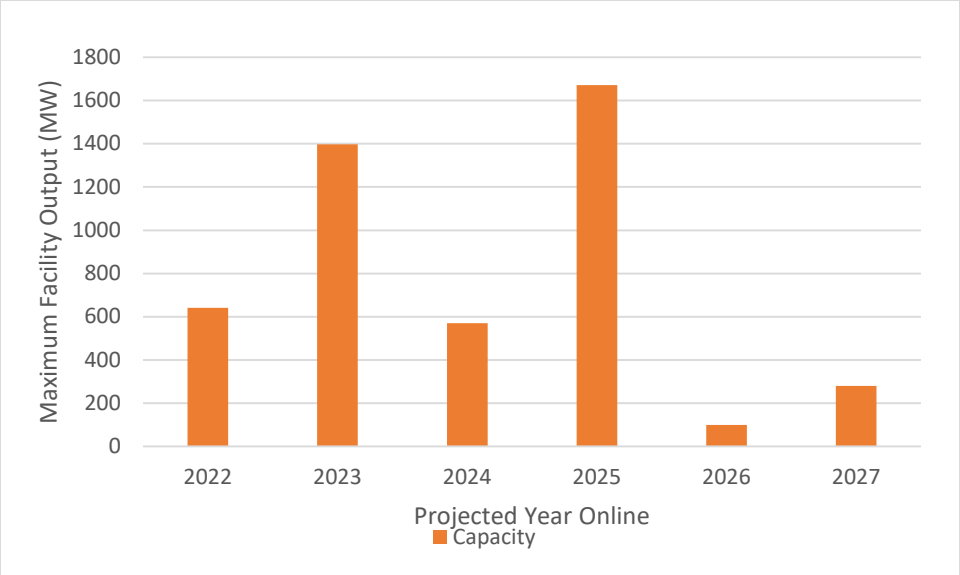
Figure 1: New Jersey Battery Storage within PJM's Interconnection Queue (MW)[19]



[17] PJM's interconnection queue is a list of prospective projects that have submitted requests to PJM to be interconnected to the grid. These requests are often submitted early in a project's development before. Not all interconnection requests that are approved result in finished projects, and not all projects pass the analysis and planning processes necessary for approval. However, the size of interconnection queues provides information about the level of developer interest.

[18] Rate Counsel acknowledges that the PJM interconnection queue contains projects that may not materialize.

[19] Projects included in this figure are those described as battery storage alone; solar plus storage projects have been excluded. Projects have only been included if their interconnection status is "Active," "Engineering and Procurement," or "Under Construction."
Source: PJM New Services Queue, accessed 11/17/2022 (https://www.pjm.com/planning/services-requests/interconnection-queues.aspx).



Rate Counsel notes that the current level of interest of future capacity resources located within the State calls into question the necessity of a general incentive to bring storage projects to New Jersey, because there appears to already be adequate interest to meet the state's 2030 goal. While all the capacity currently in the queue will not result in finished projects, more projects will almost certainly continue to emerge, particularly in light of the federal IRA, which has made zero-emissions storage projects eligible for a production tax credit or an investment tax credit. To be sure, additional incentives may further accelerate storage development. However, given the current level of interest from developers and new tax credits, ratepayer dollars may best be spent in another way.

Table 2: Comparison of PJM Distributed Battery Storage Adjustment with NJ SIP Allocation[20]

Table B-8b 2022 PJM Load Forecast: Distributed Battery Storage Adjustment (MW)								
Zone	2022	2023	2024	2025	2026	2027	2028	2029
ACE	0	0	1	1	2	2	2	3
JCPL	0	1	2	3	4	4	6	7
PS	0	2	4	6	7	9	11	14
RECO	0	0	0	0	0	0	0	0
Total	0	3	7	10	13	15	19	24
Table 2 Distributed NJ SIP Allocation (MW)								
Energy Year		2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
NJ SIP	0	10	10	15	15	20	20	30
Difference	0	7	3	5	2	5	1	6

The table above shows that PJM's January load forecast already includes some amount of distributed energy storage in the absence of any action undertaken by the Board. The difference between the proposed SIP allocation and PJM's forecast is also shown. That difference between the PJM forecast and the SIP allocation should be the targeted level of incremental storage development that the Board should incentivize. Rate Counsel recommends that the Board review its proposed incentive levels to ensure that any program appropriately incentivizes incremental storage development and does not reward naturally forecasted storage development that would already occur within New Jersey without the need for additional ratepayer-funded subsidies. Additionally, because distribution level storage is more expensive than grid supply, Rate Counsel suggests the distribution portion of the SIP start small and involve EDCs in helping to determine where distribution level storage will be most cost-effective.

[20] Rate Counsel notes that the PJM load forecast appears to be in calendar year versus the BPU's presentation in energy year (July to June).

E. Incentive Structure

A. Fixed Incentive

i. Settling the Fixed Portion of the NJ CIP Incentive Level

As discussed above, to the extent fixed incentives are necessary. Rate Counsel strongly urges the Board to use competitive processes to determine incentive levels. A competitive process should be feasible for at least the grid-level component of the SIP. This process should be modeled after the SREC-Based Financing Programs implemented by ACE, JCP&L and RECO, and the CSI Program.

In the SREC-Based Financing Programs ACE, JCP&L and RECO conducted a series of solicitations in which solar developers bid prices to provide SRECs under long-term contracts. These programs utilized a single solicitation with included capacity targets for some types of installations. However, the Board retained the discretion to reject bids that were too high or if they were dominated by any individual developer. Capacity targets were defined, in part, as "aspirational," allowing the Board to re-allocate a segment's capacity. This design allowed the Board to choose less expensive alternatives if cost differentials were too great. The programs also included several features aimed at assuring competitive results that reduced ratepayer costs. The long-term SREC contracting solicitations were administered by a professional solicitation manager, which undertook efforts to facilitate and maximize participation in the solicitations and to assure that only competitive bids received long-term SREC contracting opportunities. Each solicitation, and each segment within a solicitation, included a rigorous bid evaluation, including an assessment of whether SREC bids appeared reasonable given current market conditions and expected developer returns, and a review for any evidence of the exercise of market power. The solicitation manager then vetted its proposed awards to Staff, Rate Counsel, and the utilities

conducting the solicitation. After receiving confidential feedback from these parties, the independent administrator provided recommendations to the Board, which made the ultimate determination as to which bids to accept and reject. Contracts were awarded on an "as-bid" basis, assuring that no single, individual project received a higher level of ratepayer-backed financial support than it needed.

In the CSI Order, the Board established a solicitation process for acquiring Solar Renewable Energy Certificate II's ("SREC-IIs") that is closely modeled on the SREC-Based Financing Programs. SREC-IIs will be procured through solicitations that are to be conducted annually with the assistance of a procurement administrator. Bidders meeting the pre-qualification and maturity requirements set forth in the CSI Order may submit bids to supply SREC-IIs at a fixed price, specified in dollars per MWh of solar production, for a term of 15 years. Bids will be selected based on bid price, subject to confidential price caps that can be established in the Board's discretion as a backstop against excessive prices in the event of low competition, and SREC-II values will be established for successful bidders on an "as bid" basis.[21]

The competitive solicitation process includes projects pairing grid supply with storage, which will compete in a separate tranche in each solicitation. Solar-plus-storage projects will bid both an SREC-II price, and an adder price for storage. Bidders will be allowed to specify whether or not the solar bid should stand as a stand-alone bid in the event the storage bid is not awarded. The storage bids will be ranked by "normalized storage bid," defined as the bid into the CSI Program, calculated in dollars per MWh, corresponding to an incentive for a storage

[21] CSI Order at 20-24, 25, 27-28, 29-30.

facility capable of discharging the equivalent of four hours of the nominal electricity generation capacity of the associated solar facility.[22]

In adopting the above process, the Board affirmed the following "key benefits":

- First, a competitive solicitation process will ensure that New Jersey ratepayers are incentivizing the projects seeking the lowest incentive contribution from them;

- Second, the setting of incentives through a regular process ensures that incentive values will be reflective of the most recent market conditions;

- Third, the fixed, long-term, and guaranteed nature of the incentive provides a relatively low-risk incentive structure for developers, thereby encouraging investment of private capital; and

- Fourth, by requiring projects to remain merchant [sic] in the energy market, the Board would provide developers a clear incentive to maximize the value of the energy they produce despite the fixed incentive. For example, developers would have an incentive to design systems to discharge electricity at times of day when prices are high.[23]

These same benefits apply to storage, and the CSI Order demonstrates that a solicitation process can be designed for storage. Moreover, experience in other states shows that competitive procurement should be feasible for at least the grid supply portion of the SIP. The table below shows the results of a survey of recent front-of-the-meters storage projects with capacities between 1 and 5 MWs that were placed in service during 2020 and 2021. As shown in Table 3, most of these projects were secured through some form of competitive solicitation:

[22] CSI Order at 25, 28.
[23] CSI Order at 14.

Table 3: Survey of Recent 1-5 MW Front-of-Meter Storage Projects[24]

State	Facility	Nameplate Capacity (MW)	Secured through a Competitive Solicitation?	Year Operating
IN	Crane Battery Energy Storage System	5.0	Yes	2020
IN	Nabb Battery Energy Storage System	5.0	Yes	2020
ME	Rumford Battery Storage Plant	5.0	No	2021
NY	KCE NY 3 Battery Storage Plant	3.0	No	2020
CA	Wildcat Energy Battery Storage Project	3.0	No	2021
IA	Decorah Battery Storage	2.5	Yes	2021
TX	Johnson City Energy Storage Project	2.3	Yes	2020
NY	98th Street Battery Storage Station	2.0	Yes	2021
CA	Acorn I Energy Storage Project	2.0	Yes	2021
CA	San Diego International Airport Battery Energy Storage System	2.0	No	2021
WA	Horn Rapids Storage and Training Project	1.0	Yes	2020
CA	Kearny Mesa Storage Project	1.0	Yes	2020
CA	Pacific Union College Energy Storage Project	1.0	No	2020

[24] Sources: S&P Capital IQ Pro (2022), Power Plant Screener, Retrieved November 29, 2022, from S&P Capital IQ Pro database; Petition of Duke Energy Indiana, LLC Pursuant to Ind. Code §§ 8-1-2-42.7 and 8-1-2-61, for (1) Authority to Modify its Rates and Charges for Electric Utility Service Through a Step-In of New Rates and Charges Using a Forecasted Test Period; (2) Approval of New Schedules of Rates and Charges, General Rules and Regulations, and Riders; (3) Approval of a Federal Mandate Certificate Under Ind. Code § 8-1-8.4-1; (4) Approval of Revised Electric Depreciation Rates Applicable to its Electric Plant in Service; (5) Approval of Necessary and Appropriate Accounting Deferral Relief; and (6) Approval of a Revenue Decoupling Mechanism for Certain Customer Classes, Indiana Utility Regulatory Commission, Cause No. 45253, Direct Testimony of Andrew S. Ritch at 6-10 (July 2, 2019) (http://www.indianadg.net/wp-content/uploads/2019/08/45253-DEI-Direct-Testimony-of-Andrew-S.-Ritch-070219-1.pdf);; Martz, Sarah, Energy Storage Demonstration Projects OE-ES Peer Review, Project: Alliant Energy Decorah Battery (Oct, 26, 2021) (https://www.sandia.gov/app/uploads/sites/82/2021/10/101_Martz_Sarah_InnovativeDeploymentProjects.pdf); Pedernales Energy Storage Automation & Management with Solar (PESAMS) Final Report, Pedernales Electric Cooperative, Inc. (Nov. 30, 2020) (https://www.tceq.texas.gov/downloads/air-quality/terp/ntig/ntig-report-pec-20-final-implementation.pdf); Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn Queens Demand Management Program, Case 14-E-0302, Petition at 13-14 (filed July 15, 2014) (https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B2051869-3A4A-4A7D-BB24-D83835E2026F}); "esVolta Selected for Four Energy Storage Projects Totaling 38.5 MWhs in Southern California," BusinessWire (Oct.15, 2018) (https://www.businesswire.com/news/home/20181015005312/en/esVolta-Selected-for-Four-Energy-Storage-Projects-Totaling-38.5-MWhs-in-Southern-California); Invitation for Bid No. 696116 for Balance of Plant Site Construction Horn Rapids Solar, Storage and Training Project at Energy Northwest Horn Rapids Solar, Storage and Training Site (https://www.nwppa.org/wp-content/uploads/IFB-696116-HRSST-BOP-Site-Construction.pdf); Application of San Diego Gas & Electric Company (U902E) for Approval of its 2018 Energy Storage Procurement and Investment Plan, CA PUC Application 18-02-016, Opening Brief of San Diego Gas & Electric Company (U902-E) on AB 2868 Issues at 21-22 (Oct. 5, 2018, p. 31-33 (https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M238/K011/238011178.PDF).

Thus, experience in other states shows that a competitive process is feasible at least for the grid-level component of the SIP. Moreover, based on the PJM data discussed in section **II.D.** above, a competitive process is likely to provide significant benefits for ratepayers, as little or no incentives may be needed to incentivize the construction of storage projects. Developers may bid minimal fixed incentive levels in order to participate in the program and have the opportunity to receive performance-based incentives. Rate Counsel urges the Board build on its experience and implement a competitive solicitation process for at least the grid supply storage program that will determine the level of incentive, if any needed.

ii. Initial Block Incentives, Decreases, Mechanics and Reset Mechanism

The Straw Proposal aims to achieve Goals 1, 2, and 3 primarily through a grid supply and distributed storage fixed incentive, which is designed to lower the cost to build storage resources in New Jersey. This fixed incentive would start higher to "jump start" investments, then incrementally fall by $2/kWh for each successive "block" of time within a year, in keeping with Goal 2. Year one would be broken into three blocks. Each block would be assigned a MW limit with its own incentive level and budgetary allocation. To qualify for incentives within a block, a storage project would be required to be available for dispatch a certain percentage of the year, fulfilling Goal 3.

Staff's lack of analytical support for the proposed initial incentive levels makes it difficult for Rate Counsel to comment on an appropriate level, but as noted above (in Section **II.D.** of these comments), grid supply storage may not require additional incentives to meet New Jersey's storage goals. Further, as the Board notes, the proposed incentives are designed to decrease over time, which is intended to allow the inherent market-based value stack of storage (i.e., profit from participating in PJM's capacity, energy, and ancillary service markets) to take

over. Likewise, the Board notes that the recent passage of the IRA may warrant changing the proposed New Jersey SIP fixed incentive payment since there may be federal money available to put toward this payment and reduce ratepayer contribution. In addition, as noted, the Board has included incentives for solar-plus-storage projects as part of the CSI Program.[25] The level of the incentive in the SIP should also be reviewed in light of the CSI program that can likewise accelerate storage deployment. If the inherent value of participating in PJM markets, federal tax credits, and CSI program are already large enough to incentivize development necessary to meet New Jersey's goals, funding currently slated for the fixed incentive may be best spent elsewhere. Rate Counsel recommends the Board evaluate the need for, and, if necessary, the size of the fixed incentive in light of the IRA tax credits, New Jersey interconnection queue, and CSI Program. Further, the Board should establish a schedule for the Program Administrator to re-evaluate incentive levels.

iii. Initial Block Sizes

Rate Counsel notes that the current interest in developing storage projects in the State is so large that individual projects may be large enough to absorb the entire five MW block one allocation proposed for year one.[26] This indicates that the blocks will likely be quickly exhausted. Since there appears to be limited funding within each block, the block system may slow deployment by incentivizing projects to delay deployment until they enter an open block and receive an incentive payment. For example, if a project initially plans to deploy in year one, but the incentive limit has already been reached, meaning that project will not receive an incentive payment, that project may delay deployment to an open block in a later year when it

[25] CSI Order at 25, 28.
[26] The Straw Proposal proposes three blocks for year one of the SIP. They increase in size from five MW, to 10 MW, to 15 MW for grid-supply resources, but the level of incentive in each block decreases over time. Straw Proposal, p. 19.

will receive an incentive payment. Such a result would contrary to the Board's goals through the SIP.

A possible solution to this problem is to decouple each block from a specific time in a specific year. If there is enough interest in year one to fill more than three blocks, that interest should not be deferred to future years—it could be harnessed now, as a hedge against future uncertainty. If, as the Board expects, storage costs continue to drop, then fewer incentive dollars will be needed in later years.

This structure would more closely follow California and Connecticut's programs. In California's Self-Generation Incentive Program and Connecticut's Energy Storage Solutions program, if an incentive block becomes fully subscribed, the next block is automatically opened at a lower incentive level.[27] If there is no limit on the number of blocks per year, all additional MWs receive an incentive payment and all present interest in storage development can be served. The only limitation to deployment speed would be the budget of the fixed incentive program.

iv. Allocation for Energy Storage Projects Located in Overburdened Communities

The Straw Proposal includes Staff's proposal to set aside a portion of the distributed storage incentive program for projects located in or serving "overburdened communities," which are proposed to have to the same definition as identified in the Community Energy Plant Grant Program ("CEPGP"). In the initial program, Staff does not propose to include additional incentives to locate grid supply storage in overburdened communities because it has determined that those projects typically have fewer localized benefits. Staff is also concerned that, unless the program is carefully managed, it may incentivize developers to locate infrastructure in communities that already bear a disproportionate share of energy infrastructure.

[27] 2022 Self-Generation Incentive Program handbook (https://www.selfgenca.com/documents/handbook/2022); Energy Storage Solutions Homeowner FAQ (https://energystoragect.com/homeowner-faq/).

Rate Counsel agrees with staff that overburdened communities already bear an inordinate portion of the burden of energy infrastructure in their communities, and these infrastructure projects provide little local benefit. Therefore, no additional incentive should be allotted to projects in overburdened communities.

If Staff moves forward to deploying an additional incentive for distribution-level projects in overburdened communities, Rate Counsel recommends setting up a separate capacity block. Further, the qualifications for participation in this block should be carefully drawn to assure that they provide the localized community benefits that Staff aims to achieve. These projects should be required to evaluate and prove localized benefits such as reduced pollutant levels and increased reliability that specifically benefit the overburdened community in which they are located. Rate Counsel understands this adds additional administrative work, but these steps are necessary to assure that these projects benefit overburdened community rather merely saddling them with additional unwanted infrastructure.

Additional incentives such as "adders" and up-front payments for projects in overburdened communities should be considered with caution. Such additional incentive should be based on demonstrated higher costs, or specific localized benefits. Rate Counsel strongly discourages the Board from implementing any "adders" or up-front payments as part of the incentives for these projects, as these forms of incentive are likely to provide windfalls to developers, rather than benefits to overburdened communities. Any additional incentives should be performance-based, based on the delivery of actual localized benefits.

Rate Counsel would like to note that, while Staff's proposed definition of "overburdened community" differs from the definition of an "energy community" in the federal IRA, there is some overlap. The Board should take care to avoid providing unnecessary incentives for

projects that qualify for incentives under the IRA. Under the IRA, clean energy projects, including storage projects, eligible for an investment tax credit or production tax credit can earn an additional 10 percent adder if they are located in an "energy community." Staff should evaluate any incentive overlap between overburdened communities and "energy communities" and consider adjustments to project qualification criteria. Where there is overlap, Staff should put into a place a mechanism that would automatically reduce state incentives.

v. Term of Fixed Incentive

Rate Counsel agrees with a fixed term for incentives which is sufficient to provide financing of successfully bid projects, while minimizing the period ratepayers support each energy storage resource. Rate Counsel believes a 10 year term will balance the costs and benefits of the program projects.

vi. Performance Metrics

Rate Counsel agrees that the performance metrics proposed by Staff to monitor and ensure that storage devices remain on-line and charged so they are available when needed, to ensure grid stability and achieve the environmental benefits goals of the program. However, Rate Counsel believes performance metrics should be applied across all projects including distribution and overburdened communities, which are currently exempt in the proposal. Ratepayers should not be required to subsidize storage projects that are under no requirement to provide the benefits that are the basis for their receipt of incentives.

Rate Counsel encourages Staff to include ongoing monitoring and reporting requirements on performance metrics, as means of independently evaluating individual project performance and overall program performance. Rate Counsel recommends that this process be overseen by a third-party administrator who should be required to incorporate the reported

information in an annual report on the status of the SIP and energy storage development within the State, as discussed further in Section **II.J.** below.

vii. Treatment of Long-Duration Storage

Staff has invited comment on whether to provide incentives for storage devices that have durations of substantially longer than four hours and on the Board's definition of long duration storage as any storage technology greater than 20 hours. Specifically, Board Staff cites a Form Energy claim that its storage technology may be able to provide 100 hours of electricity storage at less than $20/kWh.[28] Rate Counsel agrees with the Board's concern that its proposed fixed annual payments could overpay such storage technologies. That said, if the Board has concerns that a storage technology may be overpaid, then the Board should consider whether subsidies are warranted and let the market determine which technologies will succeed.

B. Performance-Based Incentives

i. Setting the Performance-based Incentive for Grid Supply Resources

a. The PJM data miner is poorly suited to incentivizing behavior that will reduce carbon emissions

Before performance-based incentives can be developed the BPU must work with PJM to develop tools that better predict marginal emissions rates. The goal of the Straw Proposal's grid supply pay-for-performance incentive is to influence storage operator's charging and discharging behavior. This is because energy market prices, which are the primary driver for storage resources' charging and discharging behavior, are not perfectly correlated with the emissions intensity of the grid. Charging and discharging based on energy prices alone, therefore, may not maximize emissions reductions. The pay-for-performance incentive is intended to encourage

[28] Straw Proposal, p 22.

batteries to also plan their charging and dispatch according to what they expect the marginal emissions rate to be.

Currently, the PJM day-ahead energy market provides information 24 hours in advance about market prices in the future, and real-time prices are available five minutes in advance, creating a market signal that informs batteries of when to charge and when to dispatch to optimize energy price arbitrage. To create an incentive that competes with this price-driven market incentive, the final New Jersey SIP must provide emissions data with similar foresight that can inform charging and discharging behavior—or at the very least, provide emissions data with real-time marginal emissions information so that storage providers know the marginal emissions intensity as they are charging or discharging. This is the sort of marginal emissions data provided for storage resources in California's Self-Generation Incentive program; real-time marginal emissions rates are published two to three minutes before the timestamp for which they are valid, and marginal emissions rates forecasts that describe the next 72 hours are updated every five minutes.[29]

Under the current Straw Proposal, marginal grid emissions would be calculated based upon PJM's marginal emissions rate data miner, which does not currently provide real-time emissions information. As PJM states, the data miner does not provide information about the real-time marginal emissions rate or future emissions rates—rather, it is a record of the previous marginal emissions rate up until the previous five minutes.[30] PJM explicitly warns that the previous five-minute marginal emissions rate is uninformative of the real-time marginal emissions rate since the dispatch stack is not organized according to emissions intensity:

---

[29] California Self-Generation Incentive Program Greenhouse Gas Signal (https://sgipsignal.com/api-documentation).).

[30] PJM, "Marginal Emissions Rate – A Primer" (https://www.pjm.com/-/media/etools/data-miner-2/marginal-emissions-primer.ashx).

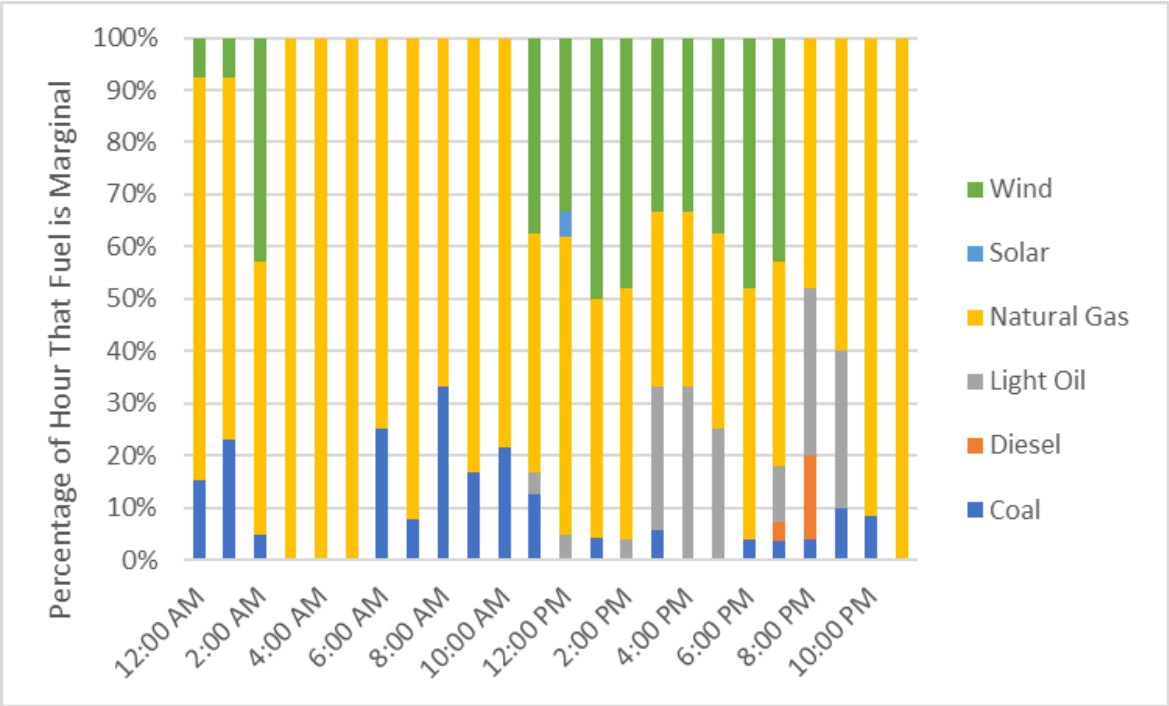
"Because of this, marginal units – and the marginal emissions rates based on them – cannot provide any prediction of the results of an action."[31] Contrary to the intent of the pay-for-performance incentive, relying on the PJM marginal emissions data miner's historical data to inform future operations may cause emissions to increase. For example, if a battery charges because the previous five-minute interval, or set of intervals, had comparatively low marginal emissions rate, the real-time marginal emissions intensity of electricity it uses when it charges may also change the marginal emissions that might result in possibly reduced claimed emissions reductions.

As another illustrative example, marginal fuel data summarized by Monitoring Analytics in

Figure 2 below shows how charging and discharging can increase emissions based on the time it takes to charge and discharge and the variability of marginal units in any given hour for July 20, 2022.[32] July 20, 2022 was a peak load day for PJM.[33]

[31] PJM, "Marginal Emissions Rate – A Primer" (https://www.pjm.com/-/media/etools/data-miner-2/marginal-emissions-primer.ashx).
[32] Marginal Fuel Posting, Monitoring Analytics (http://www.monitoringanalytics.com/data/marginal_fuel.shtml).
[33] https://insidelines.pjm.com/hot-weather-alert-issued-for-pjm-mid-atlantic-and-southern-regions/

Figure 2: Marginal Fuel in PJM by Hour for July 20, 2022.



Monitoring Analytics reports the percentage of the fuel type for each marginal unit over each hour block.[34] The share of each fuel in each hour is calculated based on the number of five-minute intervals that a unit burning each fuel type is marginal or jointly marginal. In the figure above, an energy storage device may start charging in the 2 AM hour when wind is marginal, but throughout the hour would incur the marginal emissions of some combination of wind, natural gas, and coal. If the same device discharges from 4 PM to 5 PM on the same day (not including efficiency losses), then it could displace fuel emissions from wind, oil, and coal. The difference in the maximum and minimum five-minute marginal emissions rates in the charging and discharging intervals may be significant, but given the time it takes to charge and discharge, the difference may become small, or emissions may increase.

[34] Monitoring Analytics also notes that marginal units are the units that set the Locational Marginal Price in each five minute interval. If there is congestion, there can be more than one marginal unit during a five-minute period.

As proposed, the New Jersey SIP will not provide storage operators with adequate information to adjust their charging and dispatching behavior to the marginal emissions rate of the grid. Rather, because marginal emissions are only currently known after the fact, while prices are known in advance, it will reward storage owners for incidental emissions reductions after the storage owners have already begun to charge or dispatch. These non-additional emissions reductions require no incentive and should not be rewarded. It stands to reason that the device provider will plan to charge during periods when energy prices are low, however this may or may not coincide with marginal fuel emissions from fossil generation or it may or may not coincide when a non-fossil fuel unit is on the margin. As shown above, during the period starting at 2 AM, wind resources are the marginal units for 42% of the time during that hour.

Lastly, the PJM data miner is extremely difficult to use. It does not allow large amounts of data to be downloaded at once, and it is generally not user-friendly. A different tool is needed to view predictive information. A solution to the problems relating to the current PJM data miner would be to work with PJM to provide information about the anticipated marginal emissions rate at each node alongside locational marginal prices ("LMPs")[35] in the day-ahead and real-time energy market. This may be possible in theory but would significantly enlarge the New Jersey SIP's data management needs.

b. Storage inefficiency limits emissions reduction potential

The Straw Proposal's pay-for-performance calculation currently does not factor into the impact of storage resources' inefficiency. No resource is 100% efficient. In any given charge-discharge cycle, the amount of energy used to charge the storage resource is always greater than the amount discharged. As an example, a storage resource that is 80% efficient (and 20%

[35] LMP is the marginal price for energy at the location where the energy is delivered or received and is based on forecasted system conditions, including congestion, and the latest approved real-time security constrained economic dispatch program solution. LMP is expressed in dollars per megawatt-hour ($/MWh).

inefficient) must consume 100 kWh, in order to be able to discharge 80 kWh. This 20 kWh "efficiency penalty" effectively raises the carbon intensity of the energy discharged to the grid, since the emissions of the 100 kWh must be incurred in order to use 80 kWh at a later time.

The basis for the marginal emissions incentive is the idea that charging with low-emissions power and selling that power when the grid relies on high-emissions power can reduce emissions. But when storage itself raises the emissions intensity of the power it stores, the range of time when buying low and selling high can reduce emissions may be dramatically reduced. This possibility should be taken into account and studied prior to the implementation of the pay-for-performance incentive.

According to the National Renewable Energy Laboratory's 2021 Annual Technology baseline, the round-trip efficiency of two to 10-hour batteries is about 85 percent, meaning that the grid's emissions intensity must vary by more than 15 percent for storage to reduce emissions by buying lower-emissions energy and discharging to displace higher-emissions energy. Pumped storage is estimated at a slightly lower efficiency of 80 percent, which is reflected in recent years' operational data.[36] Estimates of hydrogen energy storage's round-trip efficiency for electricity production are typically much lower—NREL suggests around 35 percent.[37] While individual projects may not reflect these exact numbers, they are representative—no storage resource is 100 percent efficient. This effect limits the applicability and emissions reduction

[36] National Renewable Energy Laboratory Annual Technology Baseline 2021 (https://atb.nrel.gov/electricity/2021/pumped-storage_hydropower) ;
U.S. Energy Information Administration, "Utility-scale batteries and pumped storage return about 80% of the electricity they store," February 12, 2021 (https://www.eia.gov/todayinenergy/detail.php?id=46756).

[37] National Renewable Energy Laboratory, "Energy Storage: Days of Service Sensitivity Analysis," March 19, 2019 (https://www.nrel.gov/docs/fy19osti/73520.pdf) ; S&P global Market Intelligence, "Hydrogen technology faces efficiency disadvantage in power storage race." June 21, 2021 (https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/hydrogen-technology-faces-efficiency-disadvantage-in-power-storage-race-65162028).

potential of the pay-for-performance mechanism and limits the range of resources that are efficient enough to take advantage of it.

In New Jersey, it is unclear what percentage over the year includes marginal emissions rate differences greater than storage resource's inefficiency. Setting aside real-time energy prices, what are the time periods in New Jersey when charging occurs such that the marginal fuel emissions are 20 percent or lower than the period when the device would discharge? It is also unclear whether differences are close enough together in time or sustained for a long enough period each day for storage resources to take advantage of the emission differences under the proposed pay-for-performance mechanism. Four-hour batteries, for example, typically charge and discharge once per day, meaning that appropriately large marginal emissions differences must also occur on a daily interval. To fully take advantage of a four-hour battery, adequately large emissions rate differences must also last long enough for storage resources to fully charge and fully discharge. More study is needed to see how often these conditions occur in New Jersey. The PJM marginal emissions rate data miner is prohibitively difficult to use in order to answer this question—it is very onerous to download data for periods of time longer than a year for multiple nodes, which presents a challenge for any developer interested in comparing marginal emissions across nodes to select an optimal location for storage from an emissions perspective.

c. Optimizing dispatch for emissions creates other costs

The concept of the incentive is based on the imperfect correlation between market prices and the marginal emissions intensity. This means that greater optimization in terms of emissions reductions come at the cost of less optimal charging and discharging behavior with regard to the price signals created by PJM's current day-ahead and real-time markets. This can create tangible

costs in the form of even higher market costs, which impacts ratepayers, and potentially increased stress on the system. In short, storage resources will be less able to provide all other benefits in their value stack. The benefits of the grid supply pay-for-performance incentive must be carefully weighed against these costs—a calculus that does not appear to have been performed yet.

If these costs are determined to be small, that implies that a pay-for-performance incentive may not be needed, since storage resources that optimize charging and discharging based on LMP prices alone will deliver most of the benefits the pay-for-performance incentive is intended to create. If the cost is large, then that tradeoff must be considered from a ratepayer perspective.

d. Time-of-use emissions rates are better suited to the pay-for-performance mechanism than marginal emissions rates

Electricity emission rates can be calculated on a marginal, average, or time-of-use basis. Marginal emissions, which the Straw Proposal proposes to use for the pay-for-performance incentive, are calculated using the emission rate of the marginal resource, which is the electric generation resource used to meet additional small changes in system load. In PJM in 2021, the marginal resource was most often natural gas (>70%), followed by coal (~15%), wind (~12%) and other resources (<5%).[38] This marginal emission rate may be higher or lower than the average emission rate of the grid at a given time, which includes generation by a mix of emitting and non-emitting resources. For example, the marginal resource in a specific interval may be wind, but the majority of the power supplied to the grid may be from coal, meaning that energy users are using relatively high-emissions power. The opposite is also true; a natural gas unit may be the marginal resource, but the grid may be largely supplied by clean energy resources.

[38] 2021 State of the Market Report for PJM (https://www.pjm.com/-/media/committees-groups/committees/mc/2022/20220506-som/20220427-2021-state-of-the-market-report-presentation.ashx).

Ultimately, the marginal unit is not a good indicator of the carbon intensity of the grid as a whole.

Because storage resources use more than a marginal amount of electricity, a marginal emissions rate would not be appropriate for quantifying the GHG impact of storage charging and discharging. Instead, the pay-for-performance incentive should quantify the emissions of the electricity the storage resource consumes, which is drawn from the grid as a whole and cannot be traced to a single marginal resource.

Time-of-use emission rates are like an annual average emissions rate but are calculated at a more precise time scale. An approach using these rates accounts for the fact that different power plants are used at different times of the day and can more accurately capture the emissions impact of a storage resource's energy usage based on when it consumes electricity to charge and when it discharges energy.

Rate Counsel recommends an aggressive benchmark be set, particularly if the Board opts against a competitively bid fixed incentive structure and uses an administratively determined approach, as proposed in the SIP Straw Proposal. Rate Counsel prefers that the Board not use "performance hours" as outlined in the Straw Proposal and focus simply on the intensity of avoided GHG emissions regardless of the hours in which those occur. Further, to the extent any forecasts are used for baseline emissions levels, Rate Counsel recommends that "natural" improvements in regional GHG emissions be factored into the projected baseline emissions levels. Like technological innovations, there are downward trends arising in regional GHG emissions levels due to a plethora of public and private clean energy initiatives that need to be factored into projects, otherwise, storage projects (or any clean energy initiative tied to these

measures) will be getting financial credits for reductions that go beyond these projects' contributions.

ii. Setting the Performance-based Incentive for Distributed Storage Resources

The Straw Proposal essentially delegates the design of performance-based incentives for distributed storage resources to the EDCs. Staff proposed that each EDC adopt a simple dollars-per-kWh payment, either system-wide or varying based on geographic location, which would be paid to storage resources responding to a call to either inject energy into the grid or reduce the customer's consumption. Under Staff's proposal the payments would be made to participants responding to the calls, but responses to calls would be voluntary. Each EDC would be required to develop a system for issuing and communicating calls.[39]

It is difficult to comment on this aspect of the Straw Proposal, because it provides only broad guidance to the EDCs on how to set the values of the performance-based payments. The Straw Proposal does not specify any methodologies for the determining the incentive levels, but instead directs the EDCs to develop a payment structure that maximizes environmental benefits, minimizes distribution investment, minimizes stresses on the EDC's distribution system, and reduces operating costs.[40]

While Rate Counsel agrees with the principle of coordinating the determination of financial incentives with distribution level benefits, the EDCs payment structures may vary widely depending on their individual system needs, and the degree to which they prioritize the criteria listed in the Straw Proposal. Based on the lack of specifics, the Staff should develop further guidance on determining the incentive levels, with an opportunity for review and public comment before proceeding.

[39] Straw Proposal, p. 25-26.
[40] Straw Proposal, p. 25.

Rate Counsel notes also that the EDCs will need to develop detailed tariff offerings that specify matters, such as when and how utilities will call on storage devices, how that electricity will be used within the distribution system and what obligations utilities have to manage the storage resources and maximize their economic/reliability value, and how customers will be reimbursed. The Board may wish to develop a model energy storage tariff to help facilitate this process.

F. Project Maturity Requirements, Geographic Limitations, and Participation Fees

Rate Counsel agrees with Staff on setting reasonable sets of requirements for SIP participants. Rate Counsel supports a program in which participants, and not ratepayers, pay for the administrative costs of the program and, in which participants must establish commitment levels that assure only bona-fide projects are permitted into any development queue.

A. Project Maturity Requirements

Staff recommends that energy storage meet one of the following criteria at the time they reserve MW capacity in a block: (i) demonstrate a sufficiently advanced position in the PJM queue (taking into account the realities of the ongoing PJM interconnection reform process), (ii) demonstrate a comparable interconnection position in a state-jurisdictional queue, or (iii) for net metered projects, demonstrate conditional approval of their utility interconnection request.[41] Rate Counsel supports Staff's proposed project maturity requirements, as these are requirements that are included in the new solar market design programs set forth in the CSI and Administratively Determined Incentive ("ADI") Programs and should apply equally to energy storage. However, Rate Counsel notes that net-metered projects are mentioned as a type of project that may be eligible for participation in the energy storage program. It is unclear to Rate Counsel what type of net metered project Staff is envisioning as being eligible for the SIP, since

[41] Straw Proposal, p 27.

this program is supposed to be limited to stand-alone storage, which would exclude solar-plus-storage projects that already received a financial incentive under the CSI Program. Accordingly, Rate Counsel requests more clarification on this issue.

B. Bid Participation Fees

The Straw Proposal indicates that energy storage projects would be required to pay a non-refundable solicitation participation fee of $1,000 per MW of nameplate capacity. Rate Counsel supports the proposed bid application fee in the Straw Proposal and agrees with Staff that it is at the low end of the bid fees imposed by other states in connection with similar energy storage programs. As the program develops, these fees should be reassessed to ensure they cover the administrative costs of the program. Rate Counsel does not support capping this fee, nor should the process include provisions that would allow for the returning of the fee to any bidders. Excluding both practices (no caps, no return allowances) will help make the process more meaningful and decrease the amount of projects that are speculative in nature. Further, since the application fee is at the lower end of state fees surveyed in the Straw Proposal, it should not be financially burdensome to developers. The fees will also help cover the administrative costs associated with the SIP, including a third-party administrator.

G. <u>Commercial Operation Date ("COD") Requirements</u>

The Straw Proposal provides that distributed storage projects will receive 18 months to reach commercial operation and extensions are not permitted. However, projects may carry forward their registrations, should the 18-month in-service date requirement not be met, at the lower of either the initial registration price or the currently open block price. Similarly, Staff proposes that grid supply storage projects be required to reach commercial operation within three years, and a developer may renew a project back into the SIP if it does not meet the COD.

However, projects exercising the option to renew would receive the lower of their initial registration price or the block price at the time that they renew their registration. Not only are these COD requirements beneficial to ratepayers because they shift multiple types of performance risks onto developers and away from ratepayers, they also provide upfront deadlines that the encourage the complete build out projects in a timely fashion. Rate Counsel also supports Staff's Straw Proposal to prohibit extensions of CODs, noting that it is reasonable to permit developers to either carry forward their registrations to the next block in the case of distributed storage projects, or renew a project in the next competitive solicitation in the case of a grid supply project, should they exceed the COD.

H. <u>Technical Requirements</u>

Staff proposes that grid supply storage and distributed storage meet the following criteria to be eligible to apply for incentive:

(1) The energy storage system must be comprised of new products, electrically interconnected to the transmission or distribution system of a New Jersey EDC;

(2) Bulk storage devices must be qualified to provide energy, capacity, and/or ancillary services in the wholesale markets established by PJM Interconnection, LLC, while resources at the distribution level may either sell aggregated output, such as the ConnectedSolutions programs in Connecticut and Massachusetts, into PJM or participate in a distribution level incentive program;

(3) Meet the COD requirements, as demonstrated by submitting as-built drawings and confirmation of Permission to Operate from the relevant utility to the Program Administrator;

(4) Meet appropriate financial security and project maturity requirements;

(5) Meet minimum safety requirements by a Nationally Recognized Testing Laboratory as evidenced by specific UL listings defined in the program manual at the time the system enters commercial operation; and

(6) Comply with all manufacturers' and National Fire Protection Association installation requirements, applicable laws, regulations, codes, licensing, and permit requirements[42].

Rate Counsel supports these technical requirements proposed by Staff and recommends that they be monitored by a third-party administrator.

I. Administration of Program and Assignment of Block Priority Dates

To the extent the Board decides to adopt a declining block structure for incentives, Rate Counsel believes that Staff's proposal regarding the administration of incentives, including utilizing block allocations ("block priority dates") established on a first-come, first-served basis dependent upon a date stamp issued when the Program Administrator receives the application; defining a "complete" application and identifying a process for accepting deficient applications, as determined by the Program Administrator is an acceptable process to provide fairness in the administering the program. In addition, Rate Counsel has no issue with Staff's proposal for developers proposing larger projects that exceed the size of an individual block by carrying the project to the next block and offering a blend of the rate of the two blocks and also offering the developer a choice of accepting the blended offer, reducing the size of the project or withdrawing the project.

J. Monitoring, Reporting and Evaluation

As noted above, Rate Counsel believes that the Straw Proposal does not include adequate provisions for monitoring, reporting and evaluation program. It is important to have ongoing evaluation of the program including incentive levels and structure, performance metrics, participant qualifications and technical requirements, and effectiveness in meeting GHG and other goals. Based on the comprehensive cost-benefit analysis that is recommended above, the Board should establish a budget for the SIP, including both direct costs of the program and

[42] Straw Proposal, p. 31.

infrastructure investments, and specific, quantitative goals. The goals should go beyond the legislatively mandated capacity targets, and should include all of the benefits sought to be achieved from the SIP, including reductions of GHG and other emissions, increased hosting capacity for distributed resources, improved system resilience and reduced costs for ratepayers. The budgets and benchmarks should be the foundation for evaluations to be performed on a regular schedule.

The program should be supported by robust reporting requirements including project technology, project performance and costs. Rate Counsel recommends that extensive information about project type/technology, capacity, and cost needs be part of these reporting requirements in order to assess how unit costs are trending as the SIP program progresses. Ongoing monitoring and reporting should also be required of all program participants, particularly reporting of performance metrics, as a means of independently evaluating individual project performance and program performance overall.

The reporting requirements should include detailed financial reporting for the beneficiaries of ratepayer-funded incentives. Currently, the beneficiaries of the New Jersey's Clean Energy program have the best of both worlds. They receive incentives funded by mandatory surcharges paid by captive utility ratepayers, with no responsibility to demonstrate that the incentives are needed or how the incentives impacted their financial status. The SIP provides the Board with an opportunity to change this paradigm. The program participants should be required, as a condition of receiving subsidies, to report overall company financial information that includes an accounting of their costs, including internal rates of returns, and an accounting incentives received from all sources. Such information is critical to evaluating the appropriateness of future incentive levels. This information can be used not to change current

incentives, but ensure that subsequent incentives are appropriate. Ratepayers are providing a subsidy and ratepayers are entitled to know if they are overpaying. While perhaps unable to stop already committed payments, the Board would have the data to stop continued overpayment of subsidies. This ratepayer protection has been lost in prior programs and should be incorporated here.

Rate Counsel understands that the Board requests and receives some financial information from developers as part the stakeholder processes employed to develop its Clean Energy program. However this is not a substitute for mandatory universal reporting. The current process provides an incentive for developers with the highest cost structures to submit financial information to the Board. By requiring universal reporting, the Board can assure that it receives information on a broader range of cost structures. This will enhance the Board's ability to assure that the incentives for the SIP are not higher than they need to be to achieve the program's objectives.

The above process should be overseen by the Board's Program Administrator or other independent administrator which should be responsible for the administrator should be responsible for collecting and reviewing the participant's reports and monitoring other relevant data. The administrator should also be responsible for overseeing the scheduled program evaluations. In addition, the administrator should prepare the annual reports on the status of the SIP and energy storage development in New Jersey, which should made available to the Board, Rate Counsel, other stakeholders, and the public. These reports, or summaries of the reports, should be posted on the Board's website making them available for ratepayer review.