

2022 PROGRESS REPORT ON NEW JERSEY'S RESOURCE ADEQUACY ALTERNATIVES

Update Regarding Staff's Investigation of Resource
Adequacy Alternatives, Docket #EO20030203

New Jersey Board of Public Utilities

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Executive Summary

In March, 2020, the New Jersey Board of Public Utilities (“Board”) directed Board Staff (“Staff”) to evaluate “whether New Jersey can achieve its long-term clean energy and environmental objectives” while continuing to participate in the regional electricity markets administered by PJM Interconnection, LLC (“PJM”). Further, the Board directed that Staff should “recommend how best to meet New Jersey’s resource adequacy needs in a manner consistent with the State’s clean energy and environmental objectives, while considering costs to utility customers.”¹

As part of its investigation, Staff worked with The Brattle Group (“Brattle”) to conduct a detailed analysis of resource adequacy alternatives (“2021 Resource Adequacy Report” or “2021 Report”). In July 2021, the Board accepted the 2021 Report, including its findings that incorporating New Jersey’s clean energy goals in the regional market is the most efficient way to provide customers with reliable, affordable, and carbon-free electricity. Additionally, the 2021 Report found that a newly developed integrated clean capacity market design (“ICCM”) would be a highly effective way of accelerating the grid transition envisioned in New Jersey’s Energy Master Plan. The Board further instructed Staff to engage in efforts to develop regional market reforms, including the ICCM or other alternatives, and to assess whether PJM and stakeholder processes have demonstrated sufficient progress toward viable regional market reforms. If not, the Board directed Staff to consider whether New Jersey should independently pursue its preferred clean resource procurement platform. Staff was directed to report back on its efforts and make any further recommendations within one year.

¹ New Jersey Board of Public Utilities Board Order Initiating Proceeding: *In the Matter of BPU Investigation of Resource Adequacy Alternatives*, issued March 27, 2020, BPU Docket No. EO20030203.

In response to the Board’s directive to provide a progress report and make additional recommendations, Staff has prepared this 2022 Progress Report on New Jersey’s Resource Adequacy Alternatives (“Progress Report” or “2022 Report”). After two years of intensive investigation and consultation with our fellow PJM states, market design experts, and stakeholders, this Progress Report largely echoes the conclusions of the initial Resource Adequacy Report, including that:

1. The Board can meet the State’s clean energy targets at substantially lower costs by participating in a regional clean energy “buying pool,” such as an ICCM, to purchase clean energy attributes on behalf of New Jersey consumers and other interested state, corporate, and municipal buyers; and
2. The Board should adopt a formal policy preference for relying on clean electricity technologies instead of fossil fuel generators to meet its reliability needs, which means purchasing sufficient capacity from non-carbon emitting resources to meet New Jersey’s resource adequacy needs.

Taken in conjunction, these policies would substantially reduce carbon emissions and provide significant public health benefits by limiting the consumption of fossil fuels, as well as reaching our clean energy goals at the lowest possible costs.

In reaching these recommendation, Staff has participated in numerous discussions with interested stakeholders, including two region-wide efforts aimed at establishing a regional clean electricity marketplace: (1) an effort chartered by the Organization of PJM States, Inc. (“OPSI”) to consider how best to incorporate state policy goals into regional markets, known as the Competitive Policy Achievement Working Group (“CPAWG”); and (2) an effort sponsored by PJM, which is specifically designed to examine how PJM can best facilitate achievement of state policies, known as the Clean Attribute Procurement Senior Task Force (“CAPSTF”).

While both forums are promising avenues for meeting New Jersey’s policy goals in a reliable, cost effective, and competitive fashion, the certainty and timeframe for success of these

efforts remains unclear. Staff thus recommends that the Board undertake its own efforts to develop a regional clean energy market in parallel with ongoing regional market design efforts. New Jersey's effort will serve as a catalyst for a new market to address these major gaps in our clean energy supply chain and either inform an eventual PJM solution or allow New Jersey and other interested states to move forward with a solution to these pressing issues. Specifically, Staff recommends that the Board find that:

- (i) An Integrated Clean Capacity Market Would Result in Significant Cost Savings and Accelerate the Clean Energy Transition; New Jersey Should Continue to Advocate for its Adoption at the Regional Level;
- (ii) While Regional Efforts Continue Under Uncertainty, New Jersey Should Develop a Regional Voluntary Clean Energy Market; and
- (iii) New Jersey Should Favor Procurement of Clean Capacity Over Capacity From Emitting Resources.

In all cases, New Jersey Load Serving Entities would be required to participate in these new markets and purchase the new products on behalf of New Jersey customers. Additionally, Staff recommends that the Board open any new markets to voluntary participants outside of New Jersey, including other states, corporate buyers, municipalities or others. In order to further the Board's efforts to reduce carbon emissions, Staff recommends the Board consider indexing clean energy compensation to the carbon intensity of the grid at the time the clean energy is produced, with the idea of providing higher compensation for clean energy produced when emissions are high, while providing lower levels of compensation to clean energy produced during times when the grid is relatively clean.

Taken in conjunction, these actions would substantially reduce carbon emissions and help drive the creation of green jobs in New Jersey and across the PJM region, while also providing significant public health benefits by limiting the consumption of fossil fuels. Creating an

independent clean energy market will ensure that these reforms, which are critical to cost-effectively meeting New Jersey's clean energy objectives, will not be delayed by lengthy PJM stakeholder processes or awaiting potential approval by the Federal Energy Regulatory Commission ("FERC"), which oversees PJM market rules. If PJM, its stakeholders, or federal regulators prove unwilling or unable to incorporate state and consumer preferences for clean energy into the PJM markets, this independent market will serve as a capable and valuable alternative.

Finally, this Progress Report highlights the need for New Jersey to continue developing realistic options should PJM or FERC policies hinder achievement of state policies. The 2021 Report noted that certain PJM capacity market rules, including the expanded Minimum Offer Price Rule ("MOPR"), could have increased consumer costs by hundreds of millions of dollars a year, and substantially delayed achievement of our clean energy policies. Among other options, the 2021 Report examined the impacts and alternatives for New Jersey to exit the PJM capacity market. Given that PJM has since repealed the most egregious aspects of its 2019 Expanded MOPR rules and launched a good-faith investigation into how to most efficiently incorporate clean energy demand into the wholesale market, Staff recommends that New Jersey not exit the PJM capacity market at this time. However, caution is warranted. While the current FERC appears friendlier to states than the prior administration, the Board should continue to carefully monitor the ongoing litigation over the MOPR, particularly as it is likely that the matter will be appealed to the Supreme Court over the next several years. This litigation uncertainty is another reason Staff believes the Board should begin developing an independent market framework that it and other collaborating states could administer in parallel with continuing efforts to advocate for the incorporation of state public policy resources in the PJM capacity market.

I. Background on New Jersey’s Goals, PJM Markets and the Board’s Resource Adequacy Investigation

A. New Jersey’s Clean Energy Efforts

New Jersey, under the leadership of Governor Phil Murphy, is combatting the negative health and environmental consequences of climate change through advancing and diversifying its clean energy portfolio to reduce the energy sector’s greenhouse gas (“GHG”) emissions. The State has therefore committed to eliminating most GHG emissions and achieving a predominantly clean energy economy by 2050. These goals are encapsulated in the Global Warming Response Act,² the Clean Energy Act,³ Governor Murphy’s Executive Order No. 28,⁴ and the 2019 Energy Master Plan.⁵ To arrive at this clean energy future, New Jersey has adopted a target-based Renewable Portfolio Standard (“RPS”) approach, requiring 35% of the energy sold in the state to come from qualifying energy sources by 2025 and 50% by 2030.⁶ By Executive Order, the Governor has since required New Jersey to achieve a reduction of economy-wide GHG emissions to 50% below 2006 levels by 2030.⁷

New Jersey’s clean energy efforts date back to 1999 when the legislature established the State’s RPS, which set initial renewable targets for meeting a portion of the State’s generation supply.⁸ The RPS has served as one of New Jersey’s primary tools for building a clean energy

² “The Global Warming Response Act” at N.J.S.A. § 26:2C-37 (P.L. 2007, c.112).

³ An Act Concerning Clean Energy, Amending and Supplementing P.L. 1999, c.23, Amending P.L. 2010, c.57, and Supplementing P.L.2005, c.354. (“Clean Energy Act” P.L. 2018, c.17).

⁴ New Jersey Government Executive Order No. 28, *issued May 23, 2018*.

⁵ See [2019 New Jersey Energy Master Plan: Pathway to 2050](#).

⁶ See N.J.S.A. § 48:3-87(d)(2).

⁷ New Jersey Government Executive Order No. 274, *issued November 10, 2021*.

⁸ Electric Discount and Energy Competition Act, P.L. 1999, c. 23.

future. The RPS “encourage[s] the development of renewable sources of electricity and new, cleaner generation technology” and, among other things, “support[s] the reliability of the supply of electricity in NJ.”⁹ Eleven out of the fourteen PJM jurisdictions currently have comparable RPS programs. Acknowledging the need to recognize renewable energy attributes, PJM created a Renewable Energy Certificate (“REC”) marketplace, the Generation Attribute Tracking System (“GATS”). GATS is a platform which allows buyers and sellers to trade renewable energy attributes by certifying generators with predetermined state-selected characteristics and issuing RECs that represent and convey ownership of the renewable energy attributes of every megawatt-hour produced by these generators. States have the ability to define their resource preferences based on location restrictions, emissions output, generator fuel source, when the RECs were created, and the age of the generation unit.

New Jersey defines eligible resources that can contribute toward RPS goals based the renewable energy attributes the resource produces and the age of the generation unit. New Jersey has defined two broad categories of renewable resources, Class I Renewable Energy (“Class I REC”) and Class II Renewable Energy (“Class II REC”). Class I Renewable Energy sources include, solar technologies, photovoltaic technologies, wind energy, fuel cells powered by renewable fuel, geothermal technologies, wave or tidal action, among others. Class II Renewable Energy consists of energy produced by eligible resource recovery facilities and small hydroelectric power facilities. RECs that represent the attributes of Class I Renewable Energy are Class I RECs; those that represent the attributes of Class II Renewable Energy are Class II RECs. The State also tracks additional, more specific, clean energy attributes to meet the State’s

⁹ Renewable Portfolio Standards: *Purpose and Scope*, at N.J.A.C. § 14:8-2.1.

more granular policy goals and has created a marketplace for eligible resources to be recognized as preferable to New Jersey retail suppliers for producing specifically defined, clean generation.

New Jersey RPS rules require that each third party supplier (“TPS”) and basic generation service (“BGS”) provider that sells electricity to retail customers in the State include a certain level of renewable energy generation in their supply mix. Collectively, TPS and BGS providers are load serving entities (“LSEs”). LSEs have specific resource-type requirements to satisfy these standards. The RPS includes target levels of specific renewable energy attributes that increase annually, prescribed thus far until suppliers reach a total renewable energy level of 52.50% in 2033.¹⁰

Another key resource contributing to the overarching goal of a carbon-free future and transitioning to 100 percent clean energy by 2050 is the State’s non-renewable, yet carbon-free, nuclear fleet. In 2018, Governor Murphy signed a law directing the Board to establish a zero emissions certificate (“ZEC”) program¹¹ to accredit eligible nuclear generation with “fuel diversity, air quality, and other environmental attributes.”¹² While nuclear energy is not renewable, it is a carbon-free resource that provides reliable energy and reduces GHG emissions by displacing fossil fuel generation. Three in-state nuclear units are currently eligible and receive ZEC payments.

B. PJM’s Energy and Capacity Markets

The regional marketplace serves as a resource pool for buyers to purchase energy, capacity, and ancillary services at transparent, cost-competitive prices. One critical goal of PJM

¹⁰ Renewable Portfolio Standards: *Amount of renewable energy required*, at N.J.A.C § 14:8-2.3.

¹¹ See N.J.S.A. § 48:3-87.3.

¹² New Jersey Board of Public Utilities Order “Motions to Intervene and Participate and Access to Confidential Information,” *Docket No. ER20080558*, issued September 15, 2020. Page 1.

markets is to ensure that the PJM grid has sufficient “Resource Adequacy,” meaning that there is a sufficient supply of electric generating capacity, in the right areas of the electric grid, to reliably meet customers’ electricity needs. This includes providing an adequate buffer or “reserve margin” to accommodate periods of unexpectedly high demand or stress on the electric grid, and to allow the grid to continue functioning even when isolated generation or transmission resources fail. Since restructuring, New Jersey has relied on the centralized, regional capacity market, known as the Reliability Pricing Model (“RPM”), run by PJM, to meet our resource adequacy needs and ensure a reliable grid.

The RPM structure procures capacity sufficient to meet a reliability standard of no more than one expected loss-of-load event in ten years (0.1 “LOLE” or “1-in-10”) based on forecasted peak loads plus an installed reserve margin (“IRM”). This reliability standard, or resource adequacy, is met through the competitive, three-year-forward Base Residual Auctions (“BRAs”), which incorporates locational and transmission system constraints to derive auction results. PJM, as the auction administrator, sets a downward-sloping demand curve, the Variable Resource Requirement (“VRR”) curve, based on prices and demand relative to the IRM.¹³ In auction years when supply exceeds resource adequacy needs, the RPM will produce low prices; in auction years when capacity supply is scarce, the RPM will result in high prices. Thus far, RPM “has been able to attract new investment and procure capacity that exceeds the reliability requirement, and at prices below the administrative estimate of Net [cost of new entry]” enabling

¹³ PJM Interconnection Capacity Market & Demand Response Operations, “PJM Manual 18: PJM Capacity Market,” Revision 47, Section 3, *January 27, 2021*.

PJM to meet its regional demand even while coal, nuclear, oil-fired, and high-heat-rate natural gas plants age and retire.¹⁴

As a participant in the PJM wholesale capacity market since its inception, New Jersey has relied on the regional marketplace to provide low-cost and reliable electricity, which are the stated goals of RPM. However, the current RPM is not designed to incorporate state public policies, and thus fails to procure capacity resources that are consistent with New Jersey’s long-term clean energy objectives. As the Resource Adequacy Investigation Report found:

While the regional competitive market has performed well in offering secure low-cost supply to New Jersey, the PJM wholesale power market was not designed to meet the State’s growing demand for a cleaner electricity supply mix. At best, the current wholesale market is indifferent to carbon emissions; at worst, the wholesale market is acting at cross purposes to environmental goals (e.g., through the application of MOPR to clean energy projects incentivized through state programs and by attracting investments in new gas-fired power plants).¹⁵

The BRA runs approximately three years in advance of the Delivery Year, to ensure adequate resources exist to meet future peak demand periods. The goal of this “forward-auction” structure is to align capacity pricing with system reliability needs far enough in advance to allow market participants to respond to signals for needed investment realized through the transparent auction design.¹⁶ This feature makes expedited efforts to integrate clean energy goals with the RPM model crucial, as implementing capacity market reforms today would not allow states to reap the benefits for at least three years. Each subsequent auction, without such reform, will only further delay the actualization of a regional capacity market design that accommodates the State’s clean energy goals.

¹⁴ [Alternative Resource Adequacy Structures for New Jersey: Staff Report on the Investigation of Resource Adequacy Alternatives](#) (“Resource Adequacy Alternatives Report”), *BPU Docket No. EO20030203*, issued June 2021, at p. 11.

¹⁵ Resource Adequacy Alternatives Report, at p. 9.

¹⁶ PJM Manual 18: PJM Capacity Market, Section 1.1: Overview of the PJM Capacity Market.

While the RPM was not designed to incorporate state policy, a complex relationship between the two exists where certain aspects of the regional market are advantageous while other aspects hinder the State’s ability to meet its clean energy goals. The PJM market structures acknowledge and support the new level of renewable, intermittent generation sources, by providing an adequate level of IRM to ensure reliable grid operations. However, under the current RPM design, the capacity market does not offer a means for states to demonstrate their preference for specific resource-types needed to comply with policy mandates.

1. PJM’s Minimum Offer Price Rule

In 2019, at the direction of FERC, PJM expanded the capacity market’s minimum offer price rule (“Expanded MOPR”) to apply a capacity market price floor on resources that receive state support.¹⁷ FERC justified the Expanded MOPR as a measure to protect the competitiveness of the market, which was “threatened” by out-of-market payments designed to incentivize states’ preferred generation resources.¹⁸ FERC reasoned that state policy resources could decrease capacity market prices, thus displacing fossil generation that could no longer compete.¹⁹ The Board’s view was that excluding state preferences from the RPM ignores customer demand for clean energy resources, and results in the over-procurement of capacity by PJM, as well as substantially higher capacity prices. The Resource Adequacy Report identified that the Expanded MOPR would increase capacity costs to New Jersey ratepayers by \$260 and \$300 million per year in 2025 and 2030 respectively, with increased costs of over \$1.7 billion per year

¹⁷ Request for Rehearing of New Jersey Board of Public Utilities, *FERC Docket No. EL16-49-000*, filed July 30, 2018; Initial Argument of the New Jersey Board of Public Utilities, *FERC Docket No. EL18-178-000* filed October 2, 2018, and Reply Argument of the New Jersey Board of Public Utilities, *Docket No. EL18-178-000*, filed November 6, 2018.

¹⁸ *Calpine Corp., et al. v. PJM Interconnection, LLC*, 169 FERC ¶ 61,239 (December 19, 2019).

¹⁹ *Id.*

across the entire PJM footprint. For these reasons, the Expanded MOPR led New Jersey to its investigation of alternative options for procuring capacity to maintain resource adequacy in the State.

C. The Board’s Investigation of Resource Adequacy Alternatives

On March 25, 2020, the Board initiated the “Investigation of Resource Adequacy Alternatives,” led by Staff and conducted through various stakeholder proceedings. The Board also hired a consultant, Brattle, to assist in the investigation, and to model and assess resource adequacy alternatives that support New Jersey’s clean energy transition. The Board launched this investigation as a direct response to the capacity market uncertainty created by the Expanded MOPR.

Approximately one year ago, the Board released to the public the “Alternative Resource Adequacy Structures for New Jersey: Staff Report on the Investigation of Resource Adequacy Alternatives.” The 2021 Report modeled various alternative resource adequacy structures’ impact on prices and clean energy deployment, and compared these results to outcomes under the Expanded MOPR rules, as well as a “No MOPR” scenario. Most of these options involved leaving the PJM capacity market and procuring capacity through the FRR Alternative instead, which would have required directing a qualified FRR Entity to procure capacity for some or all of New Jersey’s customers outside of the PJM market. Additionally, the Report recommended various options for better integrating demand for clean energy into the PJM market through an ICCM structure or the related Forward Clean Energy Market (“FCEM”).

1. Description of an Integrated Clean Capacity Market

The ICCM design allows market participants to buy and sell both capacity and clean energy attributes on a forward basis in a single auction. Ideally, an ICCM would function similarly to the existing RPM, where PJM, or market administrator, would conduct a three-year forward auction to procure megawatts (“MWs”) of capacity to meet resource adequacy needs consistent with PJM’s existing reliability standards. However, an ICCM would also simultaneously procure clean energy attributes with explicit demand expressed by states or voluntary customers, measured in MW-hours of clean electricity attributes.²⁰ Under the ICCM, generators submit a single, combined price at which they are willing to sell their capacity and, if qualified, their clean energy attributes.²¹ The ICCM then generates a clearing price for both capacity and clean energy attributes. This allows the ICCM to select the optimal mix of resources that satisfy both clean energy and resource adequacy requirements at the lowest overall cost.

In an ICCM, only those buyers who wished to purchase clean energy attributes, or who are required to do so by state law, would pay for them. This would allow the regional market to accommodate the diversity of state policy goals by acknowledging that not all states wish to pay a premium for carbon-free resources, while enabling those states willing to pay such premium to meet both their reliability and policy needs at competitive prices. The inclusion of regionally-defined clean energy attribute products will expand the pool of eligible clean energy resources and broaden buyer participation to not only states with required REC purchases, but also to

²⁰ Resource Adequacy Alternatives Report, at 36.

²¹ Grant Glazer, Katie Siegner, Chaz Teplin & Sarah Toth, Rocky Mountain Inst., [Scaling Clean: Assessing Market Options for Clean Energy and Capacity in PJM](#), 2022.

voluntary clean energy consumers, therefore, driving down costs and increasing efficiencies of the clean energy transition.

The 2021 Report demonstrated that an ICCM construct would “procure capacity and clean energy requirements sufficient to meet all system and local reliability needs and serve all demand for clean energy attributes at the lowest combined cost.”²² However, implementing an ICCM would either require FERC approval of a PJM proposal to comprehensively reform the RPM and BRA, or New Jersey must be willing to exit the PJM regional market, and self-run a co-optimized clean energy and capacity marketplace. As the 2021 Report explained:

[A] New Jersey-alone or multi-state ICCM could be implemented under the current PJM Tariff rules for an FRR. As with other FRR structures, this would necessitate establishing an independent auction administrator and FRR entities to engage in settlements with PJM.²³

Staff’s 2021 Report concluded that “New Jersey should continue to explore the option to implement a New Jersey or multi-state ICCM under the FRR structure” and “[i]n case ongoing regional reforms fail to deliver the clean energy marketplace that New Jersey requires, the State should maintain the option to utilize” a competitive auction design.²⁴

2. Description of a Forward Clean Energy Market

An FCEM is similar in concept to an ICCM, except that it is a forward auction only for clean energy attributes and is entirely separate from the capacity market. An FCEM would run its auction prior to the BRA and drive down the cost for clean energy attributes demanded by the region, but would not consider the capacity needs of clean energy purchasers, as this remains a

²² 2021 Resource Adequacy Report at p. 37.

²³ *Id.* at 38.

²⁴ *Id.* at 4.

function solely of the BRA. In other words, the FCEM does not co-optimize the procurement of clean energy attributes and capacity products. Rather, a clean energy generator participating in an FCEM must commit to a clean energy attribute sale price before it knows what its capacity revenue will be. Due to this additional risk overall procurement costs tend to be slightly higher under an FCEM structure than expected under an ICCM structure. However, both an ICCM and FCEM have demonstrated substantial potential cost savings to consumers, and the differences are rather small.²⁵ Specifically, if either structure were implemented in the PJM region, an FCEM would yield a majority of the same economic benefits as realized under an ICCM structure.

The main benefit of an FCEM structure over an ICCM structure is that it requires less federal and PJM involvement than the ICCM, while still achieving many of the economic benefits. Consistent with the Board’s 2019 findings, efforts at PJM and FERC for such market reforms may result in “never ending” stakeholder discussions and the realities of climate change prioritize the timeliness of implementing any new market structure. The FCEM creates an alternate route for establishing a clean energy market outside of PJM’s market rules, and therefore outside of lengthy stakeholder processes and potentially much more timely than an ICCM. An FCEM could thus be created through coordinated state action faster than other options, and New Jersey could serve as a catalyst for forming such a market. Further, any FCEM market has the potential to be integrated with the PJM market if some of the PJM and FERC implementation challenges can be addressed.

²⁵ See FCEM potential cost savings in: Kathleen Spees, et al., “How States, Cities, and Customers Can Harness Competitive Markets to Meet Ambitious Carbon Goals: Through a Forward Market For Clean Energy,” September 2019 and the New Jersey Board of Public Utilities’ “Alternative Resource Adequacy Structures for New Jersey: Staff Report on the Investigation of Resource Adequacy Alternatives”, Docket No. EO20030203, July 2021.

II. Progress Toward Implementing the Board’s Identified Improvements

A. Efforts with the Organization of PJM States, Inc. to Improve the Regional Market

New Jersey was not the only PJM state frustrated by the inability to incorporate state public policies in the RPM, even after the Expanded MOPR was repealed. In total, PJM States require approximately 82,000 MW of additional renewable generation capacity to achieve State RPS targets in 2035.²⁶ In September 2021, only a few months after the Board issued the 2021 Report, OPSI sent a letter requesting PJM prioritize “allowing States, on a voluntary basis, to meet their policy objectives through the PJM markets.”²⁷ The OPSI Board further directed OPSI Staff to establish the Competitive Policy Achievement Working Group, or CPAWG, to develop a proposal for a new, voluntary, market procurement process that facilitates state policy goals.²⁸

Since its establishment, the CPAWG has held regular meetings where commission staff from multiple states discussed similar ongoing efforts throughout the nation, heard from industry experts, and began identifying attractive market design components. On January 8, 2021, the OPSI Board sent a letter to PJM recommending the following four core principles to guide future discussions at the PJM stakeholder level regarding evolution of the regional market:

1. State procurements or competitive solicitations, policy choices, emissions levels, and clean energy requirements must be respected and accommodated, rather than over-ridden or made infeasible by PJM market rules.
2. States should have the option of specifying the clean energy, emission levels, or other content of their own resource mix, in whole or in part, which the PJM market would then account for or procure on a competitive, least-cost basis, consistent with reliability.

²⁶ PJM’s Offshore Wind Transmission Study Phase 1, *released October 2021*.

²⁷ OPSI Board [Resource Adequacy Letter to PJM](#), *sent September 8, 2021*, at 1.

²⁸ OPSI Competitive Policy Achievement Staff Working Group [Guiding Principles](#), *sent October 21, 2021*, at 1.

3. Because states retain primary authority for resource adequacy under the Federal Power Act, any re-imagined resource adequacy solution must continue to allow states the option of meeting resource adequacy through a mechanism independently, similar to the current Fixed Resource Requirement.
4. Effective and appropriate market power mitigation is imperative for a properly functioning market design, and for PJM-administered markets generally.²⁹

The CPAWG core principles are consistent with both Staff and the New Jersey stakeholders' expressed desires and concerns for future regional market reform.³⁰

Recognizing the urgency of some states' clean energy policy timelines, OPSI's CPAWG began addressing the complexities involved in implementing such market reforms without waiting for PJM to launch its own efforts. The CPAWG has evaluated the various design components of a new market including but not limited to product-type, eligible technologies, procurement, participation, bid parameters, administration, governance, constraints, and integration with the RPM.

Following early discussions at PJM regarding potential future capacity market reforms, the OPSI Board sent another letter to the PJM Board of Directors, listing the market characteristics which OPSI States have reached consensus:

- Allowing States and other buyers the option to voluntarily purchase energy that meets State policy specifications, including the ability to preference capacity from certain resource types, purchase energy attributes which satisfy State objectives, or advance other State policies, in a manner that collectively meets these preferences on a competitive, least-cost basis, consistent with reliability.
- Purchases should be voluntary for States and other buyers, and respect existing jurisdictional boundaries.

²⁹ OPSI [Board Letter to PJM](#) Re: The Future of Resource Adequacy, *sent January 8, 2021*.

³⁰ See Comments in New Jersey Board of Public Utilities Investigation of Resource Adequacy, BPU Docket No. EO20030203.

- Any voluntary market for these products must respect and accommodate State procurements, competitive solicitations or policy choices and must allow States to continue to meet their energy policies/preferences without change to existing policies.
- Any reformed construct should enable a wide variety of voluntary buyers to participate, accommodate regulatory models represented across the PJM States, and continue to allow States the option of independently meeting resource adequacy needs through a mechanism such as the Fixed Resource Requirement.
- Effective and appropriate market power mitigation is imperative for properly functioning market design, and for enabling additional transparency to States and consumers regarding the cost and resources contained in their supply mix.³¹

Board Staff is fully engaged in these conversations and continues to help shape the development of potential future market designs. The CPAWG has two expert consultants, Brattle and the Rocky Mountain Institute (“RMI”), that provide external education, research on existing state policy market constructs, and guidance on possible future implementation of such markets.

B. PJM’s Response to New Jersey’s and Other States’ Efforts to Improve Clean Energy Procurement.

PJM is in the process of considering major reforms to its market structures, in part, to better integrate consumer demand for clean energy attributes. On April 27, 2022, at the behest of New Jersey and other interested stakeholders, PJM formed the Clean Attribute Procurement Senior Task Force (“CAPSTF”) to allow for focused consideration of various clean attribute procurement proposals, including both New Jersey’s ICCM proposal, the related FCEM proposal, and the clean capacity product proposals.

The first meeting of the CAPSTF was held on June 3, 2022 and included a detailed presentation from OPSI about state concerns and preferences for incorporating state demand for

³¹ OPSI [Board Letter to PJM](#) Re: Issue Charge for Initial Direction for Evaluation of Procurement of Clean Resource Attributes, *sent March 18, 2022*.

clean energy and other public policy resources into the PJM markets. The meeting identified the interests of its participating stakeholders, many of which align with the interests of the CPAWG. Participation in the CAPSTF thus far has depicted PJM as a potential avenue for arriving at the optimal, co-optimized ICCM structure, down the road. However, the CAPSTF work plan aims to “conduct [a] detailed design and develop market rules for implementation”³² by June of 2023.³³ After which, PJM will conduct its formal stakeholder voting process and, if approved, file Tariff changes with FERC. While the CAPSTF’s initial meetings have left Staff hopeful, PJM’s market reform is contingent on stakeholder support and there is no guarantee that PJM will arrive at a satisfactory outcome through these efforts, as “no solution” is a potential solution. Furthermore, even if PJM files new Tariff language with FERC and the Commission approves the proposal, it would still take several years to implement a FERC-jurisdictional, regional clean capacity market as gaining such regulatory approval is a lengthy process. In the interim, procurement of capacity and clean energy attributes needed to satisfy policy requirements would continue to be unnecessarily inefficient, absent additional action on the part of New Jersey.

III. Staff Recommendations for Future Action

In the year since the Board issued the Resource Adequacy Alternatives Report, Staff has continued to investigate various options for the best way to achieve New Jersey’s clean energy objectives. Staff’s analysis continues to support many of the key conclusions of the 2021 Report, which include:

³² Clean Attribute Procurement Senior Task Force [Issue Charge](#): Key Work Activity #8.

³³ [Clean Attribute Procurement Senior Task Force](#): June 28, 2022 Meeting Materials, Item 03- Work Plan.

1. Incorporating New Jersey's clean energy goals into the regional market is the most efficient way to provide New Jersey consumers with reliable, affordable, and carbon-free electricity.
2. Existing PJM markets have fulfilled their design objectives to maintain reliability at competitive prices, but do not adequately include state clean energy policies.
3. Without further reform, the PJM market will continue to attract investments in new fossil fuel plants rather than clean energy resources.
4. New Jersey should continue, in parallel, to explore the option to implement a New Jersey or multi-state forward clean energy market, whether under the FRR or other state-led structure.

After two years of intensive investigation and consultation with our fellow OPSI states, market design experts, and stakeholders, the 2022 Report affirms these findings and continues to see expanded access to competitive clean energy markets as critical to fulfilling New Jersey's ambitious clean energy goals at a price that consumers can afford. Staff recommends that the Board to seek comment on the 2022 Report and use this proceeding to focus on establishing a market for the forward procurement of clean energy attributes; and to design a market framework capable of separately tracking Clean Capacity Credits and indexing clean energy products to track the amount of carbon displaced by RECs and CCCs. The proceeding will also investigate how to incorporate such new products into New Jersey's existing restructured market.

Staff recommends that the Board take these actions in parallel with regional market reforms efforts. While the PJM reforms currently under consideration in the CAPSTF are a promising potential vehicle for implementing reforms, the benefits of regional markets are too compelling for New Jersey customers to rely solely on a PJM-focused effort. Moreover, there are many important policy and legal implications of housing a clean energy market within PJM that will need to be resolved, including issues such as providing state regulators an enhanced governance role over any new market products.

Therefore, while the PJM efforts continue, Staff believes that it is in the State’s best interest to pursue a stand-alone, clean energy market, open to voluntary participants, and clean capacity tracking system that, in the aggregate, will yield many of the same benefits as a region-wide co-optimized approach to clean energy attribute and clean capacity procurement. Staff therefore recommends that the Board direct Staff to proceed to establish a forward clean energy market within the PJM footprint and to direct New Jersey LSEs to purchase capacity from certified clean resources.

A. An Integrated Clean Capacity Market Would Result in Significant Cost Savings and Accelerate the Clean Energy Transition; New Jersey Should Continue to Advocate for its Adoption at the Regional Level.

1. Implementing an Integrated Clean Capacity Market.

The Resource Adequacy Report identified the ICCM as the optimal forward clean energy market, largely because it integrates state clean energy goals into PJM’s best-in-class competitive market and takes advantage of PJM’s existing RPM structure. As proposed by Staff, the ICCM would “be a three-year forward auction to procure two products: (1) capacity in units of UCAP [(unforced capacity)] MW as under the current RPM; plus (2) clean energy in MWh of unbundled clean energy attributes.”³⁴ Buyers will determine the quantity of clean energy attributes they wish to procure, including the ability for states to procure state-defined RECs subject to a downward sloping demand curve. Staff continues to believe that an ICCM represents the most economical solution for reliably achieving New Jersey’s clean energy vision.

Staff recognizes that an ICCM requires active cooperation from PJM and its stakeholders to become a reality, and that the PJM process can take a number of years. Any proposal must be

³⁴ Resource Adequacy Alternatives Report, at 36.

approved by PJM membership, the PJM Board of Directors, and then approved by FERC. Thus, while the ICCM provides the optimal economic solution to incorporating state clean energy goals into the regional electricity markets, it is also potentially more difficult to achieve than other forms of regional forward clean energy markets.

2. Benefits and Challenges of a PJM-Wide ICCM.

A PJM-run ICCM would involve amending PJM’s existing RPM rules in a manner that incorporates aggregate clean energy demand from all participating clean energy buyers, and then determines the least-cost, reliable, system mix that also met the clean energy demand. As set forth in the Resource Adequacy Report, the ICCM is envisioned as a single settlement, two-price market, comprised of a price for capacity and a price for Clean Energy Attribute Credits (“CEACs”). As the ICCM administrator, PJM would determine the capacity price by “adjust[ing] the selection of cleared resources until the most advantageous portfolio of resources in the system is identified” to meet the quantity of capacity identified by PJM as needed to maintain reliability consistent with the current 1-in10 standard.³⁵

Under the new ICCM construct, PJM would procure clean energy attribute products within the same regional marketplace that capacity commitments are made and with the same participants and resources that exist today, but with the ability to credit resources for providing clean capacity or other state-defined products. Consistent with the Report’s recommendations, Staff continues to view the ICCM as the optimal market solution.

³⁵ Resource Adequacy Alternatives Report, at p. 38.

3. Benefits and Challenges of New Jersey Creating its Own ICCM Through the FRR Alternative

The PJM tariff allows eligible load serving entities (“FRR entity”) to operate outside of the PJM capacity market. If utilized, an FRR entity is responsible for securing capacity commitments on behalf of its designated customers.³⁶ The FRR alternative was originally designed for vertically integrated utilities to conduct resource planning, outside of the competitive market and therefore not be subject to the uncertainty and risks associated with the capacity market. New Jersey, while not a vertically integrated state, explored the FRR alternative as a possible response to the extra costs potentially imposed by the Expanded MOPR. On September 18, 2020 and November 9, 2020, the Board hosted a Technical Conference and Work Session, respectively, dedicated to investigating the FRR alternatives.

While the investigation led Staff to believe that the FRR alternative provided a more appropriate capacity market for the State’s clean energy needs, the investigation also surfaced certain risks associated with the FRR alternative which reduce its appeal, particularly in light of PJM’s repeal of the Expanded MOPR rules. These shortfalls include legal uncertainty, higher costs to ratepayers, unmitigated market power, and reliability risks.³⁷ Considering these “substantial implementation challenges,” the Resource Adequacy Investigation Report found that while it may help mitigate impacts of the Expanded MOPR, the FRR alternative would only be

³⁶ PJM Manual 18: PJM Capacity Markets, Section 11.

³⁷ See Comments of Atlantic Shores Offshore Wind, LLC; Vitol, Inc.; Direct Energy; Atlantic City Electric; Calpine Corporation; Calpine Retail Holdings, LLC; Electric Power Suppliers Association; Enel North America, Inc.; NRG Energy, Inc.; EDP Renewables North America LLC; Monitoring Analytics LLC; Institute for Policy Integrity; LS Power Development, LLC; Natural Gas Supply Association; New Jersey Conversation Foundation and New Jersey Sustainable Business Council; Large Energy Users Coalition; PJM Power Providers; New Jersey Division of Rate Counsel; Retail Energy Suppliers Association; Rockland Electric Company; and Vistra Energy in the New Jersey Board of Public Utilities Investigation of Resource Adequacy, BPU Docket No. EO20030203.

worthwhile if it was also used as a mechanism for implementing a New Jersey or multi-state ICCM construct.³⁸

The main advantage of creating an ICCM through the FRR alternative (“FRR ICCM”) is that it would enable New Jersey to create an ICCM, without having to secure the permission of PJM or FERC. Keeping the ICCM separate from PJM’s capacity market makes this option less susceptible to the uncertainties of future FERC Commissions. Additionally, a New Jersey FRR ICCM would ensure that the market design is tailored to the State’s specific policy needs.

The main disadvantage of an FRR ICCM is that it would likely result in higher capacity costs for New Jersey, especially given the fact that PJM’s RPM is producing historically attractive procurement levels and prices. The most recent BRA, the first auction conducted since the repeal of the Expanded MOPR, resulted in an overall lower-carbon resource mix at clearing prices nearly half the price of the previous BRA.³⁹ Under current market rules, absent the Expanded MOPR, exiting the competitive capacity market in order to create an FRR ICCM would likely lead to higher capacity prices for New Jersey consumers for two reasons. *First*, a single-state capacity market could create an increase in the market power of capacity sellers, by offering purchases outside of the competitive market. This market power could be mitigated through participation of other states or voluntary buyers, but their participation not guaranteed under this go-at-it-alone approach. *Second*, electing the FRR alternative requires the FRR entity to meet resource adequacy needs and to be responsible for the performance of all committed resources under the FRR plan. If the FRR entity fails to procure adequate resource levels, New Jersey consumers would be burdened with PJM penalty charges. Creating an FRR ICCM would

³⁸ Resource Adequacy Alternatives Report, at 23.

³⁹ [PJM Capacity Auction Secures Electricity Supplies at Competitive Prices: Auction for 2023/2024 Delivery Year Attracts a Diverse and Reliable Resource Mix at Lower Cost for Consumers](#). PJM [News Release](#), June 21, 2022.

therefore result in higher capacity costs for New Jersey ratepayers than if New Jersey were to remain in the current PJM capacity market or secure the implementation of a region-wide ICCM.

However, should the Expanded MOPR be reinstated as a result of the ongoing legal challenge to its repeal, the FRR ICCM remains an attractive alternative to the RPM subject to Expanded MOPR rules. As the Resource Adequacy Report found, the cost savings of shielding New Jersey ratepayers from the Expanded MOPR would likely exceed the costs resulting from the inefficiencies of a New Jersey-only ICCM by over \$100 million per year.⁴⁰ Additionally, while Staff hopes that the efforts of CPAWG and CAPSTF bear fruit, there remains the possibility that all of these effort fall short of Staff's expectations and never result in a regional, competitive, and clean market structure. Staff therefore believes the Board should not reject the FRR alternative, although it does not recommend proceeding to an FRR-based solution at this time.

B. While Regional Efforts Continue Under Uncertainty, New Jersey Should Develop a Regional Voluntary Clean Energy Market

In addition to the ICCM options, Staff has examined a series of other regional clean energy market designs that would serve both New Jersey customers and other interested voluntary participants, whether this be other states, municipalities, or corporate buyers. A Forward Clean Energy Market is a simplified version of an Integrated Clean Capacity Market and Staff's analysis shows that the FCEM will yield most, though not all, of the benefits that implementing an ICCM would yield.

While slightly less economically efficient, an FCEM could potentially be implemented significantly quicker than an ICCM. An FCEM takes the concept of trading Clean Energy

⁴⁰ Resource Adequacy Alternatives Report, at 6.

Attribute Credits in a regional competitive market, similar to the ICCM, but separates clean energy attribute products from PJM’s capacity market. The forward clean energy market will provide a platform for participating states and voluntary buyers to purchase CEACs in advance of PJM’s BRA and then allow market participants to continue to purchase their reliability needs through the RPM to maintain resource adequacy. An FCEM, as proposed in Staff’s 2021 report “involves forward contracting for clean energy resources by a state or group of states and has clean energy and economic outcomes that are almost as positive as an ICCM structure.”⁴¹

The key difference between the ICCM and an FCEM is that the FCEM does not co-optimize auction outcomes, as capacity and clean energy attributes would continue to be traded in distinct markets. Under a separate FCEM and RPM structure, sellers in the FCEM will likely submit higher bid offers for clean energy attributes to compensate for the risk of not knowing what their capacity market revenues will be. This risk premium will likely result in slightly higher CEAC clearing prices, than a co-optimized market.

Nonetheless, the FCEM will deliver results similar to the ICCM because it still enables market participants that would purchase clean energy attributes in the ICCM to purchase them in a separate voluntary market, an option that does not exist today. Thus, the FCEM would also provide the competitive price-reducing advantages of a regional market. At the same time, the FCEM auctions would be designed to maintain the competitive structure and three-year ahead strategy of PJM’s BRA. Staff believes that the “forward” component of the FCEM will provide clean energy demand signals that the current PJM markets do not and, therefore, will spur increased development of clean capacity resources, while lowering the demand signaled for

⁴¹ Resource Adequacy Alternatives Report, at 36. *See* footnote 61.

future fossil fuel resources. Additionally, clean resources tend to have high up-front capital costs but low ongoing operational costs.⁴² Upfront costs are therefore the main financial hurdle for developers, which makes sending market signals for megawatts of clean capacity crucial for accelerating the clean energy transition. An FCEM, similar to the RPM, would send these signals three-years in advance, by enabling the forward procurement of Clean Energy Attribute Credits and Clean Capacity Credits, while also providing a revenue stream to support such upfront costs.

Authorizing Staff to develop a FCEM market will ensure that New Jersey continues to enjoy the benefits of the highly-competitive PJM market, while also introducing new competitive clean energy products at the regional level. Thus, Staff requests that the Board authorize Staff to further develop a FCEM market with the goal of having New Jersey LSEs purchase clean energy attributes sufficient to meet the State’s clean energy demand, which would then be aggregated, with that of all other voluntary participants’, in order to create a market of sufficient size to attract clean energy developers and facilitate the mass deployment of low-cost clean energy resources.

1. Establishing a Regional Market Would Provide Significant Benefits Beyond Those Realized by New Jersey.

One of the major recommendations of Staff’s initial Investigation into Resource Adequacy was for the Board to accept that a regional clean energy market would better achieve New Jersey’s clean energy objectives.⁴³ Over the past year, Staff has continued to see enormous

⁴² See Comments of the American Council on Renewable Energy, at page 6. Investigation of Resource Adequacy, BPU Docket: 20030203.

⁴³ See Resource Adequacy Alternatives Report Key Findings, at 3: “Incorporating New Jersey’s clean energy goals in the regional market is the most efficient way to provide New Jersey consumers with reliable, affordable, and carbon-free electricity.”

benefits from analyzing a regional clean energy market approach, and further investigation continues to show that New Jersey’s clean energy investments can have an outsized impact on carbon emissions across the entire 65 million person-strong PJM electricity market. The evidence developed by Staff suggests that a regional clean energy structure would:

- Preserve reliability across the PJM footprint while growing the clean energy economy;
- Reduce GHG emissions across the PJM footprint, beyond what could be achieved by New Jersey alone;
- Create a transparent, forward price for clean energy attributes that does not currently exist in today’s energy markets; and
- Create substantial net benefits for New Jersey consumers.

While New Jersey has positioned itself to be a leader in driving the formation of a regional clean capacity market, Staff believes New Jersey can simultaneously sponsor a New Jersey-led FCEM, open to voluntary external buyers, developed with the ability to integrate into, or coexist with, any future proposal that may develop through the CPAWG or CAPSTF as regional efforts continue. Staff further believes that implementing a New Jersey-led forward market may help accelerate the development of a regional clean capacity market, which remains Staff’s ideal solution yet lacks a reasonable timeline for New Jersey’s needs. Staff summarizes the evidence associated with each of these findings below.

2. A Forward Clean Energy Market Will Preserve Reliability Across the PJM Footprint While Growing the Clean Energy Economy.

Staff takes the Board’s obligation to ensure reliable services seriously, and recommends that any solution eventually developed not diminish the high level of bulk system reliability that the PJM market currently secures for New Jersey customers. Staff fully supports the conclusion of the Resource Adequacy Report that “[e]xisting PJM markets have fulfilled their design

objectives to maintain reliability at competitive prices.”⁴⁴ Staff therefore recommends that New Jersey continue to rely on the PJM markets to meet reliability needs at competitive prices, so long as the BRA is not subject to the Expanded MOPR or any other mechanism inconsistent with New Jersey’s clean energy objectives

Critically, Staff believes that any regional ICCM or clean energy (or capacity) market structure should continue to enforce existing PJM reliability metrics, as established by PJM and FERC, including appropriate reserve margins, enforcement of localized transmission and generation constraints, and other operational parameters that have historically led PJM to have a high degree of bulk system reliability. Staff notes that each of Staff’s recommendations included in this report will allow PJM to secure the same high level of bulk system reliability that New Jersey consumers receive today.

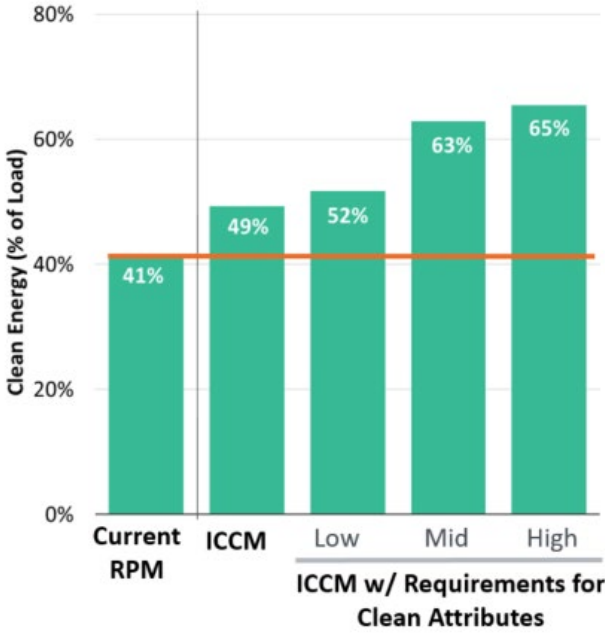
3. A Regional Forward Market Reduces Greenhouse Gas Emissions Across the PJM Footprint, Beyond What Could Be Achieved by New Jersey Alone.

As demonstrated in the chart below, New Jersey’s participation in a regional clean energy market could be a potential driver of substantial clean energy deployment, continuing the State’s natural role as a green economy leader:

⁴⁴ Resource Adequacy Alternatives Report, at 3.

Energy Mix

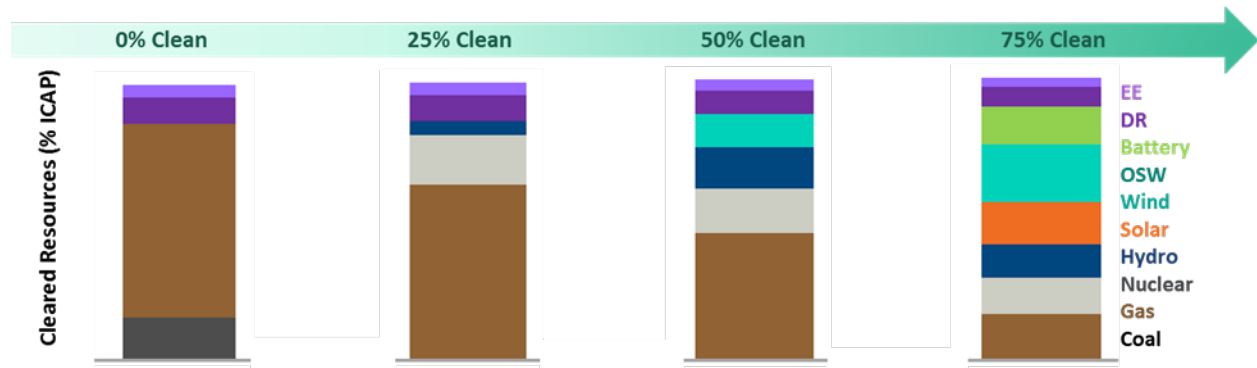
Regional marketplace can substantially accelerate clean energy investment



This investigation has brought to light that with the facilitation of a regional clean energy market, the pricing of aggregate clean energy demand and signaling the desire to purchase future clean energy attributes, regional investment can significantly increase. Through sponsoring the development of such model, New Jersey can contribute to the potential spur of increased clean energy resources from 41% of the region’s load to up to 65%. Under an FCEM model with a clean capacity product available, that Staff will begin to develop in parallel with regional efforts, the forward market will send the same signals to developers and the market will also significantly increase investment in clean energy resources.⁴⁵

⁴⁵ See Appendix: Figure 1. The Forward Clean Energy Market as proposed in this report would have the ability to procure both the REC and CCC attributes, generating results similar to the ICCM co-optimization benefits. Whereas ICCM and FCEM + CCC should yield nearly identical resource mixes and health and environmental benefits, at slightly higher costs due to the inefficiencies of multiple markets.

As illustrated in the graphic below, injecting additional clean energy supplies into the PJM footprint has a direct impact on the amount of coal and natural gas serving customers throughout the PJM region, which leads to significant emissions reductions.



Under the existing RPM rules, there is no ability to signal preference for clean resources and thus fossil fuel resources will continue to clear. Yet, forward purchases of clean capacity through CCCs or a capacity constraint on the BRA, could significantly decrease the amount of cleared fossil fuel resources. Thus, increasing clean energy requirements imposed on New Jersey LSEs would not only directly reduce fossil resources underlying the State’s supply of energy, but also reduce carbon emissions across the entire PJM region by between 14% and 40%⁴⁶ by replying on more carbon-free resources. Additionally, as the region’s reliance on fossil fuels decreases, the newly signaled demand for clean supply will support the retention of nuclear resources throughout PJM. Whereas the amount of nuclear resources that clear in the capacity market could potentially double,⁴⁷ generating a larger revenue stream for nuclear operators and decreasing the plants’ risk of shuttering from economic pressures.

⁴⁶ *Id.*

⁴⁷ See Appendix: Figure 2.

C. Creation of a Transparent Forward Price Signal For Clean Energy Attributes Will Result in a More Efficient Market and Promote Low-Cost Procurement of Clean Energy.

Staff finds that a regional clean energy market has the potential to drive significant amounts of additional investment into the clean energy economy by providing clean energy buyers and sellers an efficient means of trading clean energy on a forward, competitive basis. Currently, buyers and sellers in the PJM market lack a transparent and easy-to-use mechanism for engaging in clean energy attribute transactions. This leaves many corporations, cities, municipalities and other interested voluntary buyers without access to a transparent means of purchasing clean energy at scale, while also denying clean energy developers a liquid market in which to sell their output. The lack of a low transaction-cost avenue for voluntary purchases also drives up costs for buyers who nonetheless manage to, or are mandated to, procure clean energy.

Currently, most purchasers procure clean energy through bilateral transactions, without the benefit of a regionalized market structure that would reduce the friction costs involved in purchasing clean energy attributes today. Based on Staff's discussions with such voluntary buyers, there is real interest to participate in a centrally-cleared clean energy marketplace to reduce friction costs and make financing new energy infrastructure easier. Thus, Staff sees substantial evidence that a regional forward clean energy market, whether ICCM or FCEM structure, would drive additional private investment dollars into the clean energy economy by providing corporations, cities, municipalities and other interested voluntary buyers a liquid and transparent means of purchasing clean energy at scale, on a forward basis.

Further, a regional clean energy market structure could make it easier for clean energy suppliers to finance and build their projects by developing a market that allows the developer to sell long-term clean energy attributes at a fixed price. This can be accomplished by incorporating a "price lock" for a period of 7 to 12 years, to signal to developers that a project

receiving the price lock is guaranteed the price at which it sells its clean energy attributes. A fixed contractual price for the project's output significantly reduces project risk, thereby enabling low-cost financing and savings that can be passed on to consumers. Further, because many clean energy resources produce variable amounts of electricity in any given year, Staff recommends that the Board explore how to incorporate a performance-based true up to hold developers accountable for supplying the clean energy attributes.

Another advantage of a regional market approach is that it allows New Jersey to improve the “quality” of the underlying RECs procured as part of the RPS program, by signaling a preference for *new* clean generation or by indexing REC values to track the amount of GHG emissions abated. While RECs represent clean energy being added to the PJM grid at some time in the last two years, there is no mechanism for clean energy buyers to preferentially select RECs from new sources of clean energy. However, promoting the construction of new clean energy resources, a concept known as “additionality,” is a key feature for many voluntary buyers, including large corporate buyers, municipalities, and others.⁴⁸ Staff likewise recommends that New Jersey explore using “additionally” as a constraint in the State’s clean energy preference and enable the regional clean energy market to assist the State in ensuring that a portion of all RPS resources are sourced from new clean energy facilities. By making such a change, New Jersey would ensure that an increasing percentage of the clean energy attributes purchased on

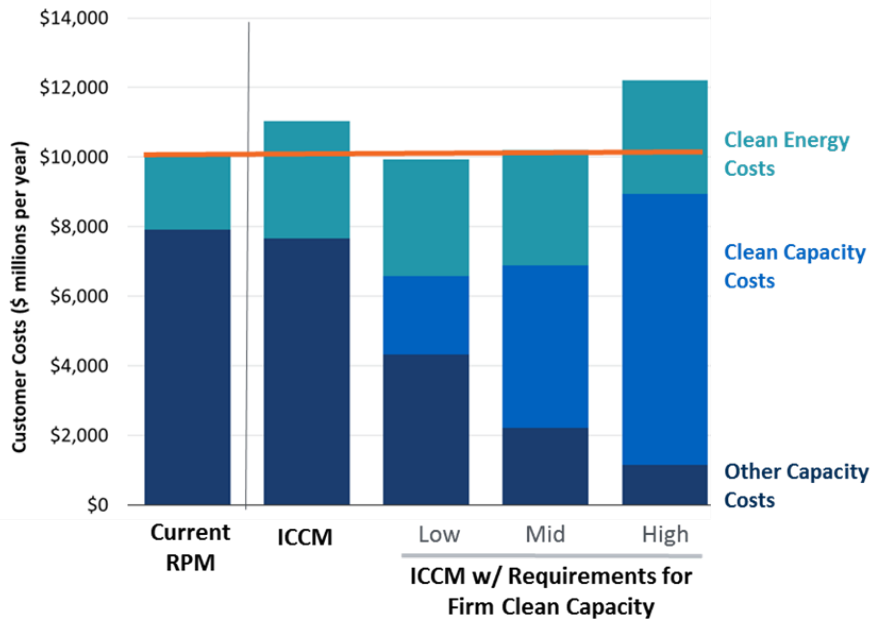
⁴⁸ See, e.g., Google, [Achieving Our 100% Renewable Energy Purchasing Goal and Going Beyond](#) (2016), at 6: “To ensure that Google is the driver for bringing new clean energy onto the grid, we insist that all projects be ‘additional.’ This means that we seek to purchase energy from not yet constructed generation facilities that will be built above and beyond what’s required by existing energy regulations”

behalf of its consumers are sourced from new clean energy generation resources⁴⁹, rather than existing resources, and therefore foster growth of the clean energy industry.

D. A Forward Clean Energy Market Results in Significant Net Benefits to Consumers.

Staff's research also shows that a regional clean energy market structure is affordable for consumers, and provides significant net benefits. As shown in the graph below, a regional clean energy market has the potential to lower total consumer costs. Under the ICCM scenario with low requirements for clean capacity, we see that overall costs to consumers can actually be reduced compared to the current RPM. However, the total impact on costs from a co-optimized regional clean energy market will ultimately depend on the level of constraint imposed that requires clean capacity resources to clear. The purchase of clean energy attributes directs revenues away from fossil generating units and towards clean energy resources, as we can see by the decrease in costs of "other" and increase in costs to consumers, and revenue to suppliers, for both clean capacity and clean energy resources increase in each scenario. The model also demonstrates that in all scenarios, the use of the regional, competitive market helps limit electricity price increases to modest levels, whereas even when suppliers must procure large amounts of clean capacity, the cost of clean energy remains steady. Therefore, under implementing a clean capacity constraint or issuing Clean Capacity Credits, only those who voluntarily purchase such attributes will bear the cost premium of an increase in clean capacity costs, while clean energy costs remain consistent across all ICCM scenarios:

⁴⁹ The Energy Master Plan recommended two additional reforms to the RPS that Staff also recommends that the Board consider in future proceedings: (i) requiring that clean energy be produced in the same hour as it is consumed by New Jersey customers; and (ii) indexing the value of each REC to the amount of carbon it displaces (i.e., clean energy resources with a higher marginal carbon abatement receive more revenue).



Moreover, due in part to the cost containment provided by a regional market, the value of the carbon reduction and human health benefits more than offset the price increases that occur under highly stringent clean attribute procurement requirements. The combination of a regional market and aggressive clean energy goals thus results in significant net benefits.

In fact, an FCEM would yield the same carbon reduction and human health benefits, just at a slightly higher cost do to the loss of economic efficiency from segregating the two products from a co-optimized market. Implemented with additional tools, such as a clean capacity constraint in PJM’s RPM or a Clean Capacity Credit product, the FCEM has the ability to create nearly all of the economic efficiencies, environmental benefits, and human health value that would be realized under an ICCM structure and would be sufficient to achieve New Jersey’s clean energy goals.

1. Governance & Jurisdictional Issues

Should New Jersey elect to adopt either an ICCM or FCEM clean energy market structure, the questions of who is in charge of setting the rules for the new market and how a

regional market fits into the federal-state regulatory framework are key. Staff investigated a variety of governance models, including governance for an ICCM-style market that operates within or outside of the PJM system as well for an FCEM-style market that could operate outside of PJM. In all cases, the overarching questions are: how does the market run; who sets the rules for the market; who administers the auction; and who oversees the market?

Staff believes that, whatever market design is selected, a strong State-led governance model will be critical to giving New Jersey and other states the confidence to participate in a long-term clean energy market. Indeed, Staff has identified that the fact that states do not have any formal role in the PJM stakeholder process creates a disconnect between PJM efforts and the PJM states, and is a drawback to implementing an ICCM or FCEM within the existing PJM structure. To resolve this issue, New Jersey and other OPSI states have been exploring potential governance models that could govern a new market structure.

Staff recommends that the Board continue to work with the larger OPSI group to design a governance model that:

- ▶ Provides state regulators a clear role in overseeing any market comparable to the rights exercised by the existing PJM Board of Directors, including appropriate filing rights at the Federal Energy Regulatory Commission;
- ▶ Provides participants in the clean energy market, including buyers, sellers, consumer advocates and state regulators with a dominant share of stakeholder votes;
- ▶ Ensures that states retain primary jurisdiction over their clean energy policies;
- ▶ Relies, as much as possible, on the existing PJM system for tracking environmental attributes, known as the PJM Generator Attribute Tracking System (“GATS”); and
- ▶ Includes a fully qualified and equipped market administrator, potentially a neutral, third party, to conduct the design work and run the auction.

Staff believes that these principles can be met through several different market administration models. *First*, interested clean energy states could enter into an agreement, similar to one governing operation of the Regional Greenhouse Gas Initiative (“RGGI”), which allowed participating states to jointly administer an emissions pricing regime. Currently, New Jersey and eleven other states participate in RGGI. A group of states could band together to form a comparable market, which would then carry out the design and administration of an FCEM and/or Clean Capacity Credit market. *Second*, interested states could work within the existing PJM system to implement a governance approach that ensures that the jurisdictional framework set forth in the Federal Power Act, whereby states retain jurisdiction over generation mix, is respected.

2. Implementation Mechanism

Under either an ICCM or FCEM concept, the obligation to contract with clean energy resources rests with the entity serving the New Jersey load. In general, this would mean that New Jersey’s basic generation suppliers and third party suppliers (all LSEs) would be assigned an obligation to purchase clean energy attributes, on a forward basis, for a minimum percentage of their load (the “Clean Energy Market Purchase Obligation”). Each NJ supplier would also be required to purchase a certain level of Clean Capacity Credits prior to meeting their capacity obligations in PJM’s RPM auction. This design would function similar to the existing REC market in which TPS and BGS providers are required to purchase a certain level of their annual energy from the REC market, and meet additional technology-specific requirements, using the State’s REC programs. The purchase obligation in a Forward Clean Energy Market will also assist in creating both a promising participation level of both Clean Capacity Credits and clean

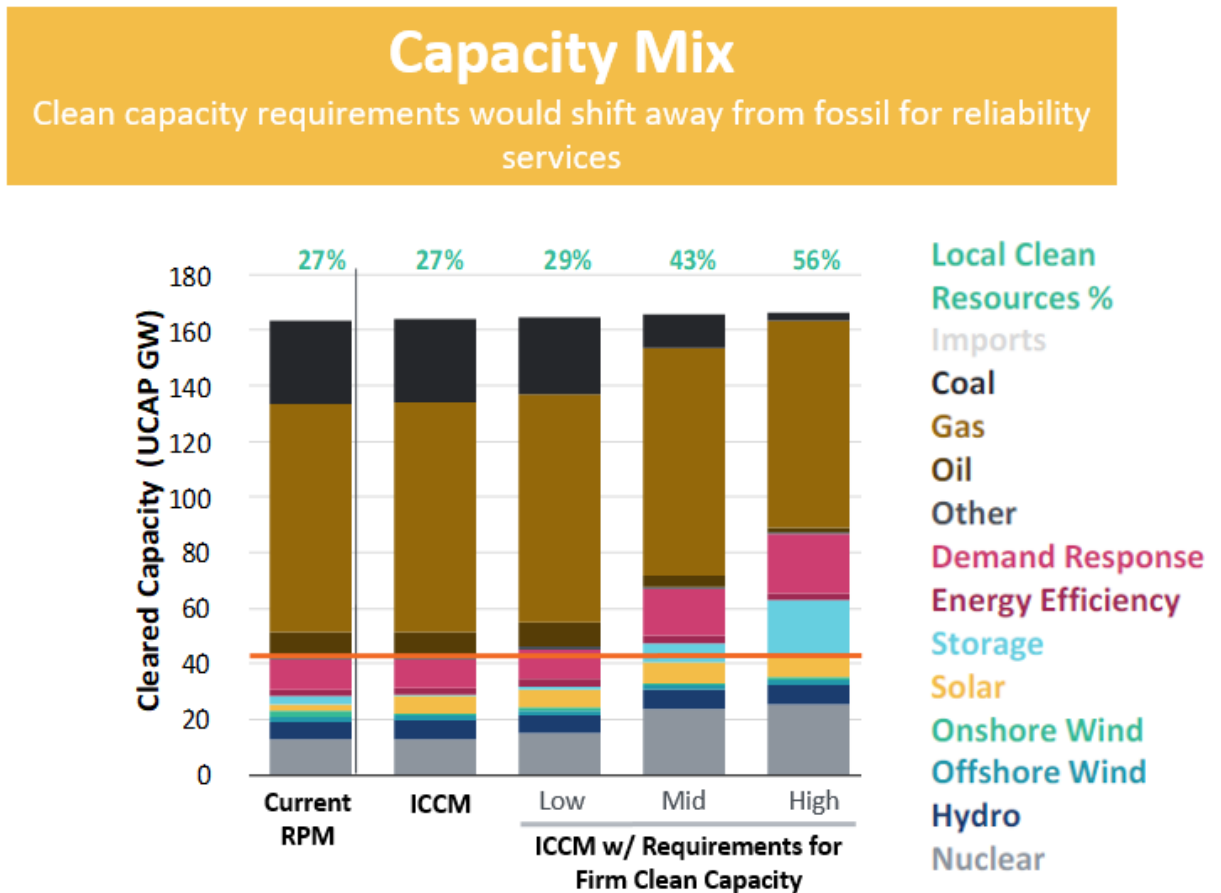
energy attributes buyers and help reach New Jersey’s clean energy future by decreasing the State’s reliance on fossil fuel resources.

E. New Jersey Should Favor Procurement of Clean Capacity Over Capacity From Emitting Resources

Another of the main recommendations of this Report is that New Jersey should adopt a formal policy requirement for purchasing capacity from clean resources over capacity produced by fossil fuel resources. Staff proposes to define clean capacity as capacity from non-carbon emitting generation resources that contribute toward New Jersey’s resource adequacy needs, as defined by PJM’s existing one-in-ten-year loss of load expectation standard. A Clean Capacity Credit requirement would promote multiple technologies that are of direct interest to New Jersey policy makers, including nuclear, demand response, energy efficiency and energy storage devices – resources that will be critical to maintaining reliability during the clean energy transition but that currently do not have access to RECs or other RPS-based funding streams. For example, nuclear does not count towards the State’s renewable energy goals, even though New Jersey will rely on its existing nuclear capacity to ensure reliability while reducing emissions for the foreseeable future.

As the following chart demonstrates, establishing a clean capacity procurement mechanism decreases the percentage of PJM load being served by fossil resources, while substantially increasing the percentage of load served by nuclear, demand response, energy storage, and other clean energy resources. Whereas under a competitive regional market with an imposed clean capacity constraint, both the total local clean resources cleared in the BRA and, of specific interest to New Jersey, the amount of nuclear cleared can double. In fact, under such regime, fossil fuel resources will decrease by over 85% and regional reliance significantly shifts

toward non-carbon emitting generation sources, with the ability to lower PJM’s carbon footprint by up to 40%.⁵⁰



By providing a price signal that demonstrates demand for clean capacity, New Jersey LSEs and other interested buyers can use a transparent, competitive market structure to signal the increasing need for clean MWs of capacity years in advance and provide an additional stream of revenue to clean resources. This revenue will reward zero-carbon resources for providing capacity value in addition to clean energy, thereby providing a market-based incentive to develop and scale the types of resources needed to maintain reliability as the clean energy transition continues. The State should be particularly interested in how such forward price signaling can

⁵⁰ See Appendix: Figure 1.

provide additional revenue to existing resources, such as nuclear generators, for their carbon-free attribute, which will help create financial stability for the State’s nuclear fleet. Staff’s research shows that all of the clean energy market models discussed here achieve significant additional retention of nuclear power across the PJM footprint, as well as significant improvements in the amount of energy storage and demand response resources. Traditional Class I REC resources, including solar and wind, would also meet the criteria for producing Clean Capacity Credits, but also pose a legal question as to whether the Clean Capacity Credit can be segregated from other clean energy attributes, such as RECs.⁵¹

Staff proposes to define a Clean Capacity Credit as representing: “one UCAP megawatt of capacity, as certified by PJM, for a particular delivery year or season, and particular PJM capacity zone that is produced by a resource that does not directly emit GHGs, including nuclear, energy storage, demand response, energy efficiency, a resource capable of producing Class I REC, or an emitting resource that either uses a 100% carbon-free feedstock or that captures and sequesters 100% of the carbon that would otherwise be produced.” A Clean Capacity Credit would be tracked similar to a Renewable Energy Certificate, in that the purchasing LSE would “retire” sufficient Clean Capacity Credits equal to a percentage of its PJM-determined total and locational capacity obligations. Unlike a REC, a CCC could only be used for a specific PJM

⁵¹ Staff’s preliminary view is that the renewable attributes RECs represent and convey are the attributes of the renewable *energy* produced by renewable generators, and thus were previously an inseparable component of an energy-only product. See *Wheelabrator Lisbon, Inc. v. Conn. Dep’t of Pub. Util. Control*, 531 F.3d 183, 186 (2d Cir. 2008) (“RECs are inventions of state property law whereby the renewable energy attributes are ‘unbundled’ from the *energy* itself and sold separately.” (emphasis added)); *Wheelabrator Lisbon, Inc. v. Dep’t of Pub. Util. Control*, 931 A.2d 159, 176 (Conn. 2007) (“[T]he renewable attribute of the energy generated by renewable energy sources is an inherent attribute of the *energy* In other words, the term ‘electricity’ necessarily included the renewable attribute that later was ‘unbundled’ from the *energy* and represented by [RECs].” (emphasis added)). It therefore follows that RECs do not convey ownership of any *capacity* attributes or products. Similarly, Clean Capacity Credits would represent and enable the unbundling of the clean capacity attributes of the currently bundled capacity product that clean resources produce, and would not convey ownership of any *energy* attributes or products. As such, there should be no overlap or double counting between the products Clean Capacity Credits and REC represent.

Delivery Year, and would not be bankable, in order to maintain consistency with existing capacity market practices. Staff also recommends that the Board consider indexing any future Clean Capacity Credit. The indexing feature on a CCC would track the level of carbon emissions related to the generation resource in which the CCC is produced from and would have the ability to quantify the amount of carbon emissions displaced by using the CCC compared to a non-clean capacity certified resource.

1. Role of New Jersey’s RPS in Meeting Clean Energy Targets and the Added Benefits of Enforcing a Clean Capacity Constraint.

It is important to recognize the critical role that New Jersey’s RPS plays in meeting our clean energy objectives; but also to recognize its limitations. The New Jersey RPS program pays for megawatt-hours of clean electricity equal to a certain percentage of annual retail sales in the state to be injected into the PJM system over the course of a given energy year. However, this is only one part of building a successful and reliable PJM grid capable of meeting New Jersey’s clean energy goals. REC markets cannot ensure that New Jersey’s resource adequacy needs are met with clean resources, especially in times of grid congestion, lack of availability of intermittent resources, or locational constraints when the grid is likely being supplied by predominantly fossil fuel technologies. New Jersey must ensure that it can meet increasing portions of its resource adequacy needs without relying on carbon-emitting resources and that its customers reap the full benefits of clean energy resources, which they pay a premium to receive, to ultimately achieve the State’s long-term clean energy and climate objectives.

Generally, RECs are produced by qualifying resources anywhere in the PJM system and thus typically provide the same financial incentive to clean energy generators located near load centers (which typically have more resource adequacy value to the system) as those that are far

from load (which typically have less resource adequacy value). Similarly, RECs do not reward clean energy generators for producing power during peak demand periods, and therefore do not create an incentive for project developers to build system configurations optimized to provide the greatest possible capacity value.⁵² Therefore, even with a very high RPS percentage, LSEs will likely continue to purchase capacity from carbon-emitting generators within the PJM region to maintain system reliability.

Under the current rules, PJM does not have any means of allowing buyers, including New Jersey's LSEs, to signal their preference to purchase capacity from non-emitting resources. Therefore, without a clean capacity constraint or Clean Capacity Credit purchase requirements, New Jersey consumers will continue to rely on fossil fuel generation to meet their resource adequacy needs, continuing the disconnect between state policy and wholesale markets. This forced reliance on emitting resources does not align with New Jersey's ambitious GHG emission reduction targets.

2. Designing a Potential Clean Capacity Credit Purchase Obligation

To solve this mismatch between our need for capacity and our clean energy goals, Staff recommends that the Board sponsor the creation of a new tracking system for Clean Capacity Credits. Under a Clean Capacity Credits market, interested LSEs would be required to purchase Clean Capacity Credits from eligible producers (whether bilaterally or through a future ICCM/FCEM structure) and then retire the annual or seasonal Clean Capacity Credits in proportion to their load obligations. Staff proposes that New Jersey sponsor a product structure that could be utilized both by New Jersey-jurisdictional LSEs as well as voluntary participants

⁵² While the PJM capacity market does send a price signal that favors high capacity resources over low capacity resources, that price signal is fairly attenuated and has not historically been a driver of clean energy resources.

from outside of New Jersey to create a robust, competitive marketplace, similar to the market for existing REC purchases.

Under Staff's proposal to establish a Clean Capacity Credit and for a state-led marketplace, the program administrator would aggregate clean capacity demand and track compliance with the clean capacity mandates by requiring compliance entities to retire the appropriate quantity of Clean Capacity Credits, including accounting for a minimum share of the CCC that must be sources within the relevant capacity Locational Deliverability Areas ("LDA"), parent LDAs, and unconstrained RTO region. For eligible suppliers of clean capacity, each Clean Capacity Credit would be defined consistent with the resources' LDA or from the unconstrained region of PJM in proportion to the LSE's load obligations, as assigned by PJM. This ensures that the clean capacity is deliverable to New Jersey customers, and that the State, as well as interested buyers from outside of New Jersey, can begin the process of moving to a truly clean energy grid, including meeting our reliability needs from clean energy resources. Staff likewise recommends that the Board require those LSEs to purchase a minimum quantity of clean capacity, and offer an Alternative Compliance Payment ("ACP") option to ensure that the clean capacity constraint does not unduly increase prices. Staff further recommends that in the creation of a Clean Capacity Credit, the Board consider indexing this new product so that the State can ensure that through its efforts, carbon emissions are being displaced; and so that the State is able to quantify its benefits to ensure that consumers reap the environmental and human health benefits of such costs.

Staff notes that it would also be possible for PJM to administer a Clean Capacity Credit market.⁵³ In that case, PJM would incorporate the minimum quantity of clean capacity into its existing RPM clearing engine. PJM would produce two prices for each LDA; one for the base capacity product, and another for the clean capacity product. This would likewise ensure that all reliability metrics continue to be met, while allowing interested states and voluntary buyers with clean capacity goals to signal their willingness to meet their resource adequacy needs from non-emitting resources. Under the PJM integration model, LSEs within PJM would be permitted to identify the amount of clean capacity that they wish to procure (either as a percentage of their total obligation or as a fixed quantity), along with a price premium that they are willing to pay for meeting their clean capacity preferences.

Both a State-administered and PJM-administered Clean Capacity Credit would meet the fundamental goal of allowing New Jersey and other interested buyers to signal their preference for sources of clean capacity. The main advantage of a state-sponsored Clean Capacity Credit program is that it would be simpler to set up, could be implemented by New Jersey without additional oversight or approvals from other bodies including PJM or FERC, and would allow New Jersey to determine what resource types qualify as clean.

3. Legal Authority to Direct Changes to New Jersey's Retail Suppliers

The BPU has been granted authority by the legislature to regulate electric services in New Jersey, including the procurement of electric power and ensuring that the State's electric

⁵³ It is possible that PJM's non-jurisdictional affiliate, PJM Environmental Information Systems ("PJM-EIS") would undertake the tracking and retirement of Clean Capacity Credits. However, PJM-EIS is would be performing this function independent of PJM's administration of the wholesale electricity markets.

customers and the State as a whole benefit from clean, reliable service.⁵⁴ The Legislature specifically charged the Board with the authority to “require any public utility to furnish safe, adequate and proper service, including furnishing and performance of service in a manner that tends to conserve and preserve the quality of the environment and prevent the pollution of the waters, land and air of this State. . . .” N.J.S.A. 48:2-23.

Along with the general authority over public utilities, the Legislature also directed the Board to “implement its responsibilities under [the RPS] in such a manner as to:

1. place greater reliance on competitive markets, with the explicit goal of encouraging and ensuring the emergence of new entrants that can foster innovations and price competition;
2. maintain adequate regulatory authority over non-competitive public utility services;
3. consider alternative forms of regulation in order to address changes in the technology and structure of electric public utilities;
4. promote energy efficiency and Class I renewable energy market development, taking into consideration environmental benefits and market barriers;
5. make energy services more affordable for low and moderate income customers;
6. attempt to transform the renewable energy market into one that can move forward without subsidies from the State or public utilities;
7. achieve the goals put forth under the renewable energy portfolio standards;
8. promote the lowest cost to ratepayers; and
9. allow all market segments to participate.”

The various proposals discussed herein, including the ICCM, FCEM, and CCC are all fully consistent with the Legislature’s directives to “place greater reliance on competitive markets” and to

⁵⁴ See N.J.S.A. 48:2-21.24. Department of Public Utilities: Board Commissioners- Jurisdiction, Powers, and Duties. *Findings, declarations relative to production, delivery of electricity, natural gas*: “The Legislature finds and declares that it is the policy of the State to foster the production and delivery of electricity and natural gas in such a manner as to lower costs and rates and improve the quality of choices of service for all of the State’s consumers...to achieve federal and State environmental objectives in a cost effective manner; to promote...the efficient use, production and procurement of energy...”

“promote ... Class I renewable energy market development, taking into consideration environmental benefits and market barriers,” among others. Further N.J.S.A. § 48:3-87 specifically directs that the Board, after notice and consultation with the Department of Environmental Protection and other interested stakeholders:

...shall periodically consider increasing the renewable energy portfolio standards beyond the minimum amounts set forth in subsection d. of this section, taking into account the cost impacts and public benefits of such increases including, but not limited to:

1. reductions in air pollution, water pollution, land disturbance, and greenhouse gas emissions;
2. reductions in peak demand for electricity and natural gas, and the overall impact on the costs to customers of electricity and natural gas;
3. increases in renewable energy development, manufacturing, investment, and job creation opportunities in this State; and
4. reductions in State and national dependence on the use of fossil fuels.

Taken as a whole, Staff believes that these provisions of the Clean Energy Act of 2018 clearly provide the Board the authority to amend existing RPS compliance requirements so as to mandate participation in a regional or state-led clean energy market.

Staff further notes that the Board has the authority to direct changes to New Jersey’s retail supply design as clearly demonstrated through previous restructuring Orders that have benefitted New Jersey consumers. On April 30, 1997, the Board issued an Order Adopting and Releasing Final Report,⁵⁵ which among other things adopted the findings in the report that would restructure the electric power industry. In 1999, through the Electric Discount and Energy Competition Act (the “Act”), the Board was granted authority to “implement electric retail

⁵⁵ New Jersey Board of Public Utilities Board Order Adopting and Releasing Final Report: *Restructuring the Electric Power Industry in New Jersey: Findings and Recommendations*, issued April 30, 1997.

choice” in a market that supplied bundled product services at the time. The Act provided the Board with guidelines and parameters for restructuring-related issues, but in many areas leaves important decision-making details to the expertise of the Board.⁵⁶ Since the restructuring of New Jersey’s electric business model, the Board has established a Basic Generation Service auction and created a BGS Master Service Agreement in which the State’s four electric distribution companies (“EDCs”) are required to participate.⁵⁷ Staff believes that there is ample evidence that it is in the ratepayer’s best interest to consider requiring LSEs to meet a portion of their RPS obligations through a regional clean energy market structure or Clean Capacity Credit requirement, to ensure the State takes a cost-effective path in its clean energy transition.

By Board Order Dated April 13, 2005, the Board established a program for EDCs to “develop and implement a voluntary retail program that will provide customers an option to support the development of renewable energy beyond the levels established by the [RPS] and foster the development of a competitive marketplace for renewable energy.”⁵⁸ The goals set by the Green Power Choice Program were to: empower choice and participation in a market for renewable energy, expand markets for renewable energy and related certificates, and expand access to clean products; all of which Staff finds consistent with the goals and intentions of establishing a regional clean energy market requirement.

⁵⁶ Electric Discount and Energy Competition Act, P.L. 1999, c. 23.

⁵⁷ See Board Decision and Order: In the Matter of The Provision Of Basic Generation Service Pursuant To The Electric Discount And Energy Competition Act, N.J.S.A. 48:3-49 et seq. BPU Docket No. EX01050303, issued December 11, 2001.

⁵⁸ See Board Order of Approval In the Matter of the Voluntary Green Power Choice Program BPU Docket #EO05010001, issued April 13, 2005.

IV. Conclusion

Based on Staff's investigation with participating stakeholders, the status of ongoing regional market reform efforts and the findings above, Staff is confident in the following:

- (i) An Integrated Clean Capacity Market Would Result in Significant Cost Savings and Accelerate the Clean Energy Transition; New Jersey Should Continue to Advocate for its Adoption at the Regional Level;
- (ii) While Regional Efforts Continue Under Uncertainty, New Jersey Should Develop a Regional Voluntary Clean Energy Market; and
- (iii) New Jersey Should Favor Procurement of Clean Capacity Over Capacity From Emitting Resources.

Staff recommends that the Board confirm these findings and support future action in the implementation of a voluntary regional market and establishment of a formal policy to demonstrate preference for clean capacity resources over carbon emitting resources.

Moving forward, Staff will continue to engage at the regional level and advocate for the optimal Integrated Clean Capacity Market solution. However, recognizing the uncertainties mentioned throughout this report, at this moment Staff finds that sponsoring a New Jersey-led voluntary, regional market is the most appropriate pathway. Further, the creation of a Clean Capacity Credit and clean energy compensation indexing will be vital tools for implementing a market structure that reaps the most benefits to New Jersey consumers.

APPENDIX⁵⁹

Figure 1

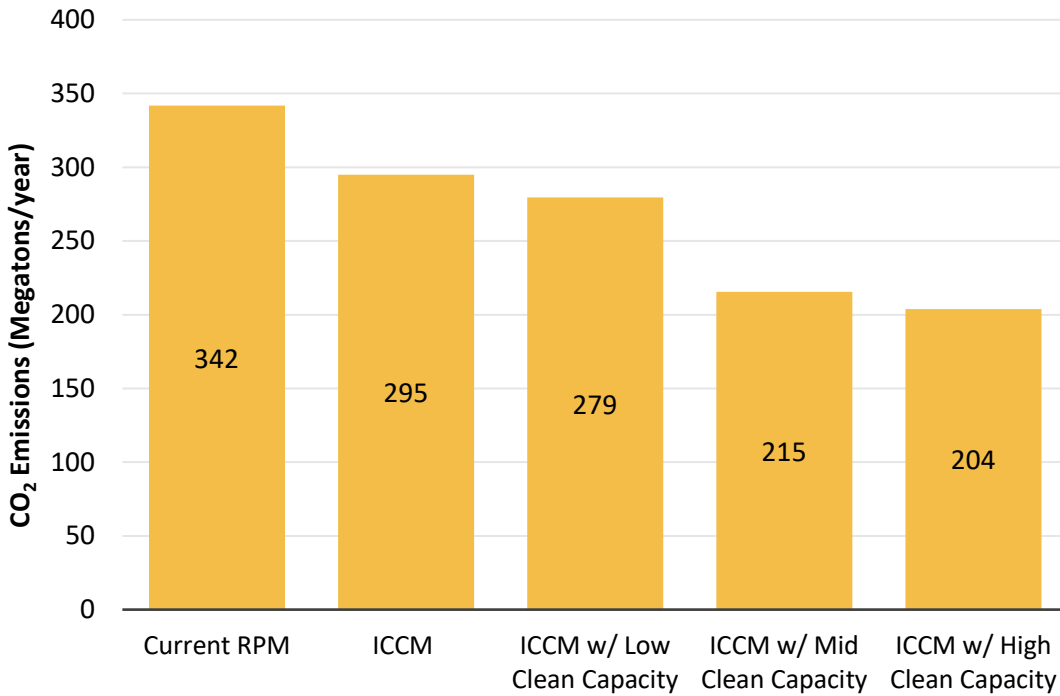
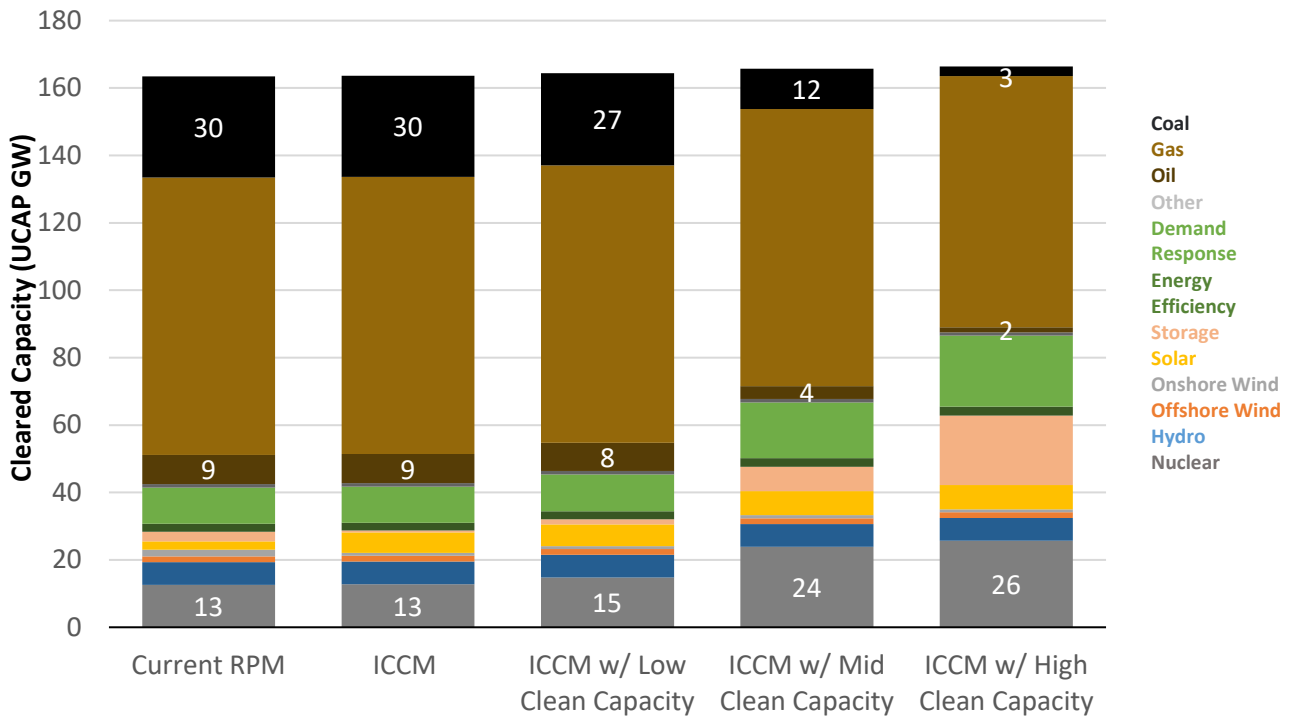


Figure 2



⁵⁹ All numbers are for the 2030 study year, in 2030 dollars.