PSEG LONG ISLAND

Annual Report to LIPA Board of Trustees on Resource Planning and Clean Energy

JUNE 23, 2021

PSEG LONG ISLAND
We make things work for you.

Background

The LIPA Board of Trustees Resource Planning and Clean Energy policy requires annual reporting on:

- Compliance with regulatory and environmental standards as well as the State's clean energy goals
- Management of power supply portfolio
- Procurement of generation and distributed energy resources
- Activities representing interests of Long Island electric customers at state, regional and federal levels
- Resource adequacy of the power supply portfolio

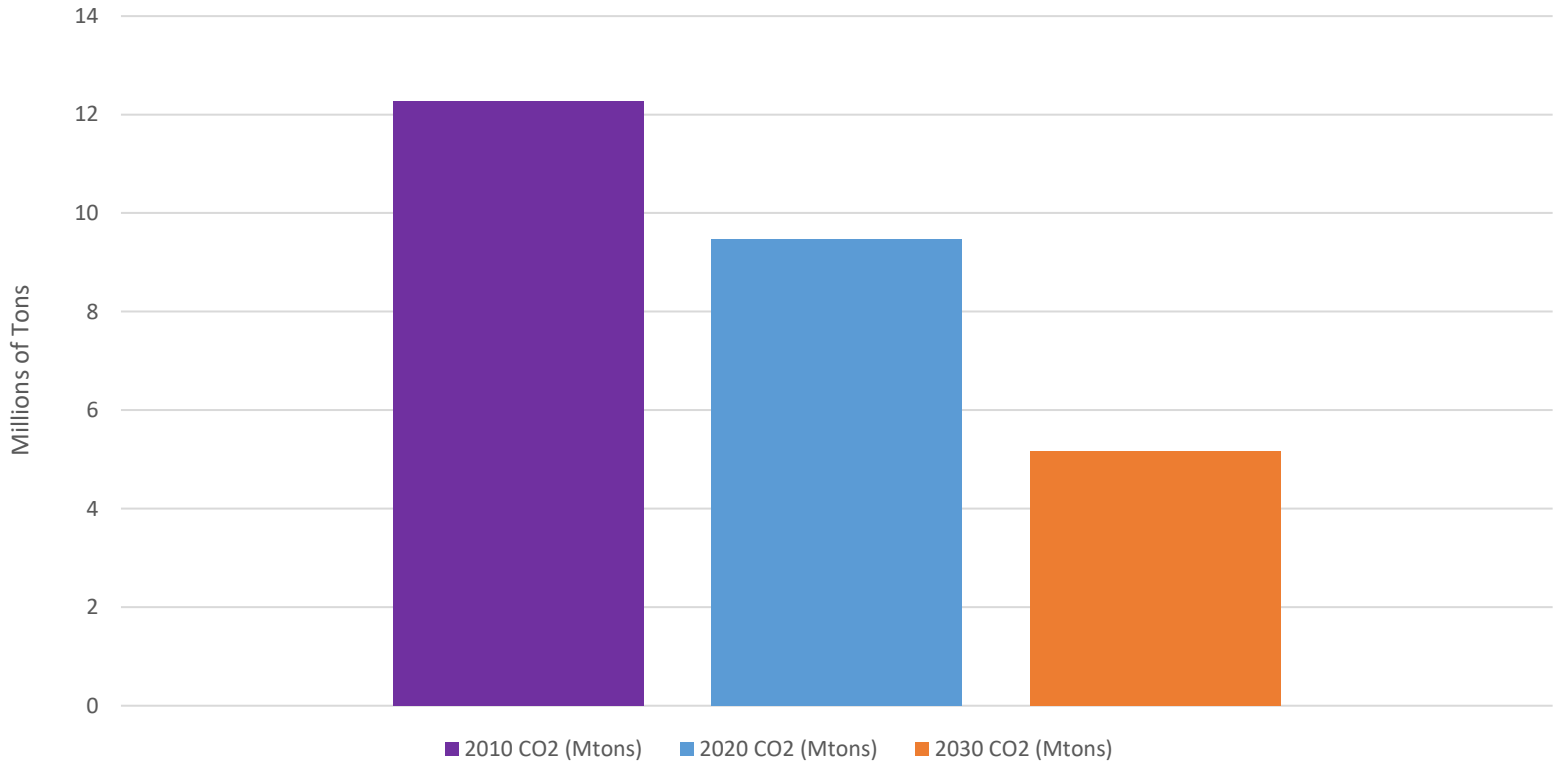
Climate Leadership and Community Protection Act (CLCPA)

- Passed by Legislature in late June 2019
- Established statewide targets:
  - 85% reduction of GHG by 2050 (from 1990 levels)
  - 100% zero-emission electricity by 2040
  - 70% renewable energy by 2030
  - 9,000 MW of off-shore wind by 2035
  - 3,000 MW of energy storage by 2030
  - 6,000 MW of solar by 2025
  - 22 million tons of carbon reduction through energy efficiency and electrification
- REC programs
  - LIPA BOT approved participation in Tier 2 REC program (pre-2015)
  - Tier 4 is associated with bringing renewable projects into NYC via transmission (all LSE's will pay their pro-rata share)
- Grandfathered natural gas fuel cells as renewable energy sources*

*Provides eligibility as they were subject to existing contracts prior to CLCPA, through 2029

LIPA's Carbon Footprint (2010 vs. 2020 vs. 2030)

- LIPA's carbon emissions expected to decrease approximately 46% by 2030 due to statewide 70% renewable energy target
  - ~1,100 MW of solar and ~2,300 MW of off-shore wind by 2030 assumed



Note: 2010 CO2 emissions based on NorthStar presentation

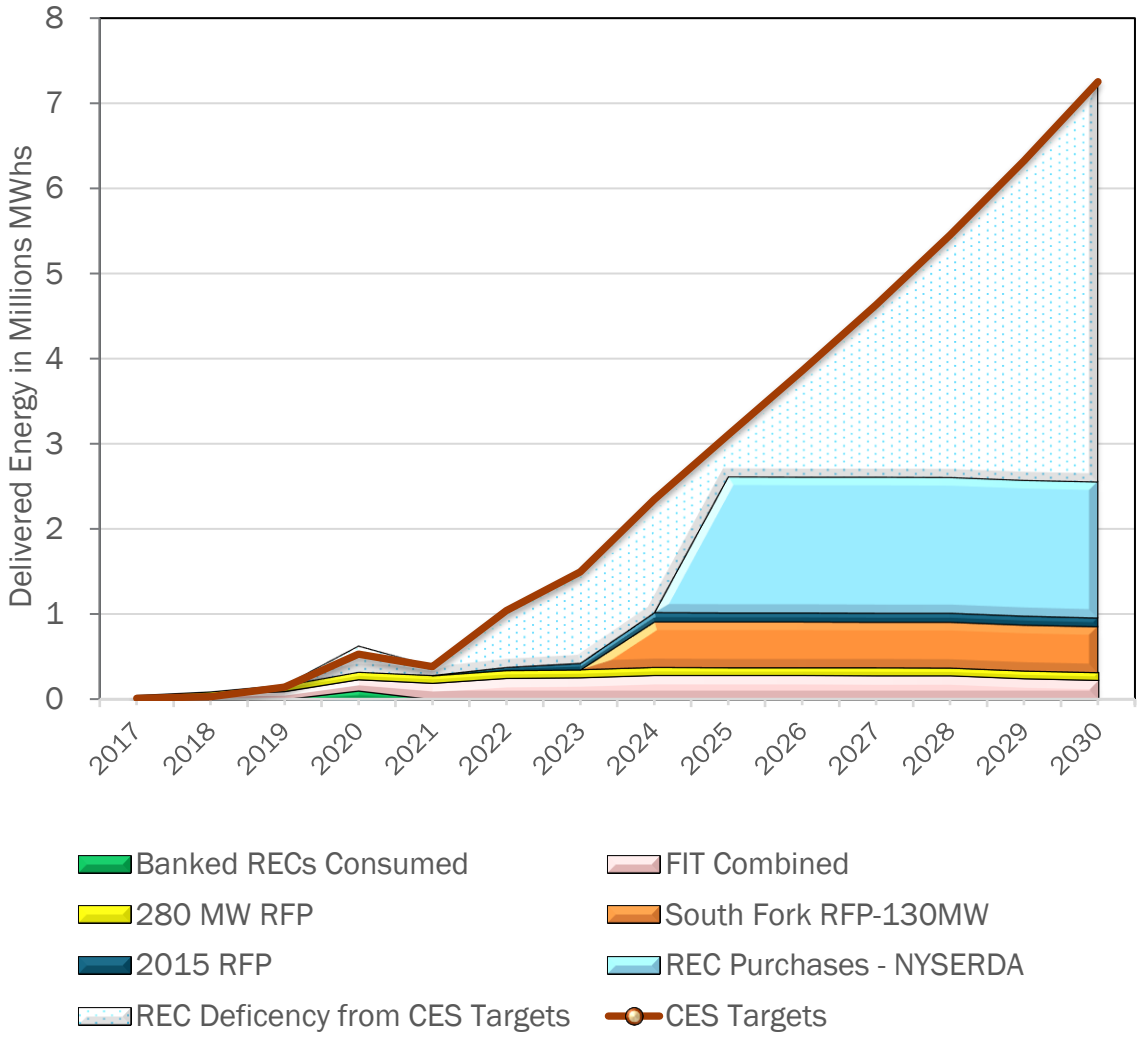
Renewable Procurement Activities

Procurement	Date of Issuance	Operational As Of June 1, 2021 (MW)	Projected (MW)
FIT I	July 2012	38.8	38.8
FIT II	October 2013	30.3	31.9
280 MW RFP	October 2013	48.9	48.9
FIT II (Non-Solar)[1]	March 2014	6.0	6.0
South Fork[2]	June 2015	0	130.0
2015 Renewable RFP	December 2015	0	59.0
FIT III	September 2016	11.4	18.0
FIT IV[3]	September 2016	0	7.4
FIT V	June 2020	0	21.5
Energy Storage	June 2015 and April 2021	10	165-185
Total		145.4	526.5 – 546.5

[1] Natural gas-fired fuel cells were grandfathered as they had a contract prior to CLCPA, with eligibility through 2029
[2] Wind
[3] Yaphank Solid Waste fuel cell project (7.4 MW) is in construction

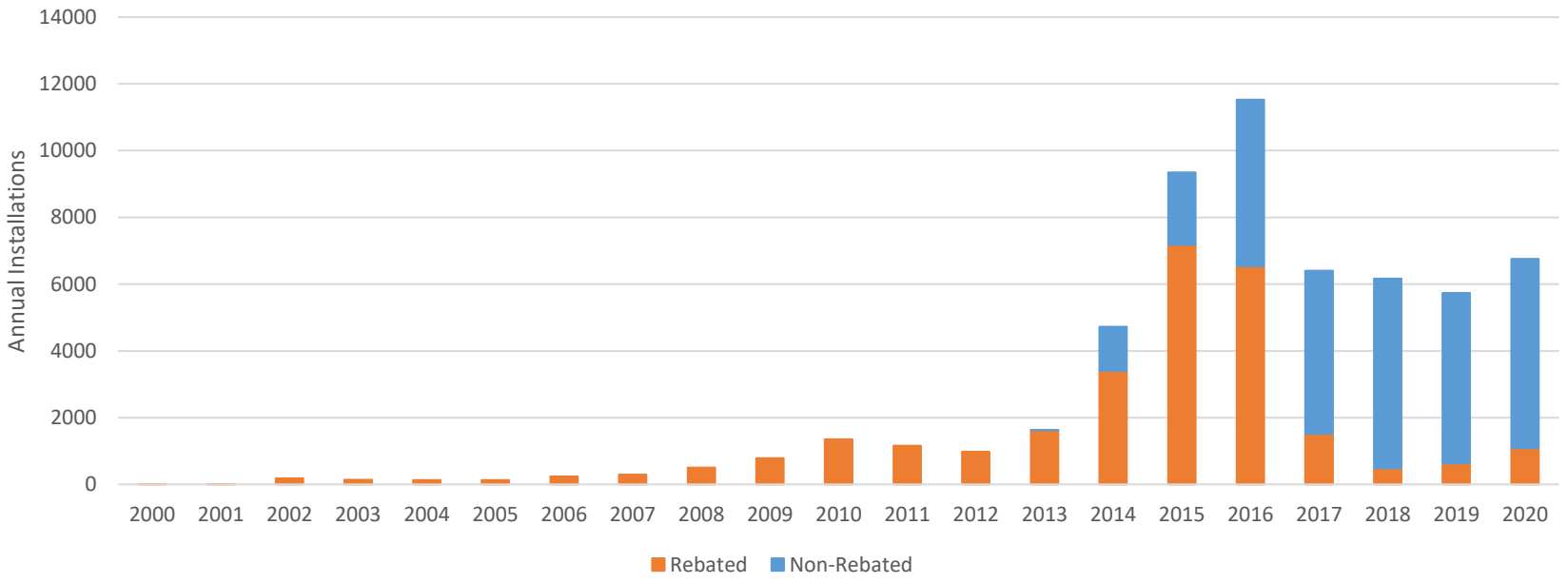
Projected CES Targets and Anticipated Supply

- Targets for Tier 1 REC obligations are set thru 2023. Other values are projected.
- LIPA established Clean Energy Compliance Fund to fund future REC purchases or renewable projects in the event of shortfalls
- Long term Tier1 REC purchase agreement awaiting OSC approval that may provide up to 1.6M RECs each year starting 2025
- South Fork Wind projected COD 12/31/2023



Rooftop Solar Program

- As of 12/31/2020, rooftop solar installations total 58,112 systems and 443 MWs (AC), providing an estimated 612 GWhs per year of energy (as an offset to consumption)
- 2020 additions were 6,762 systems and 47 MWs (AC) providing an estimated 68 GWhs of energy



As of December 31, 2020

2020 Energy Efficiency Program

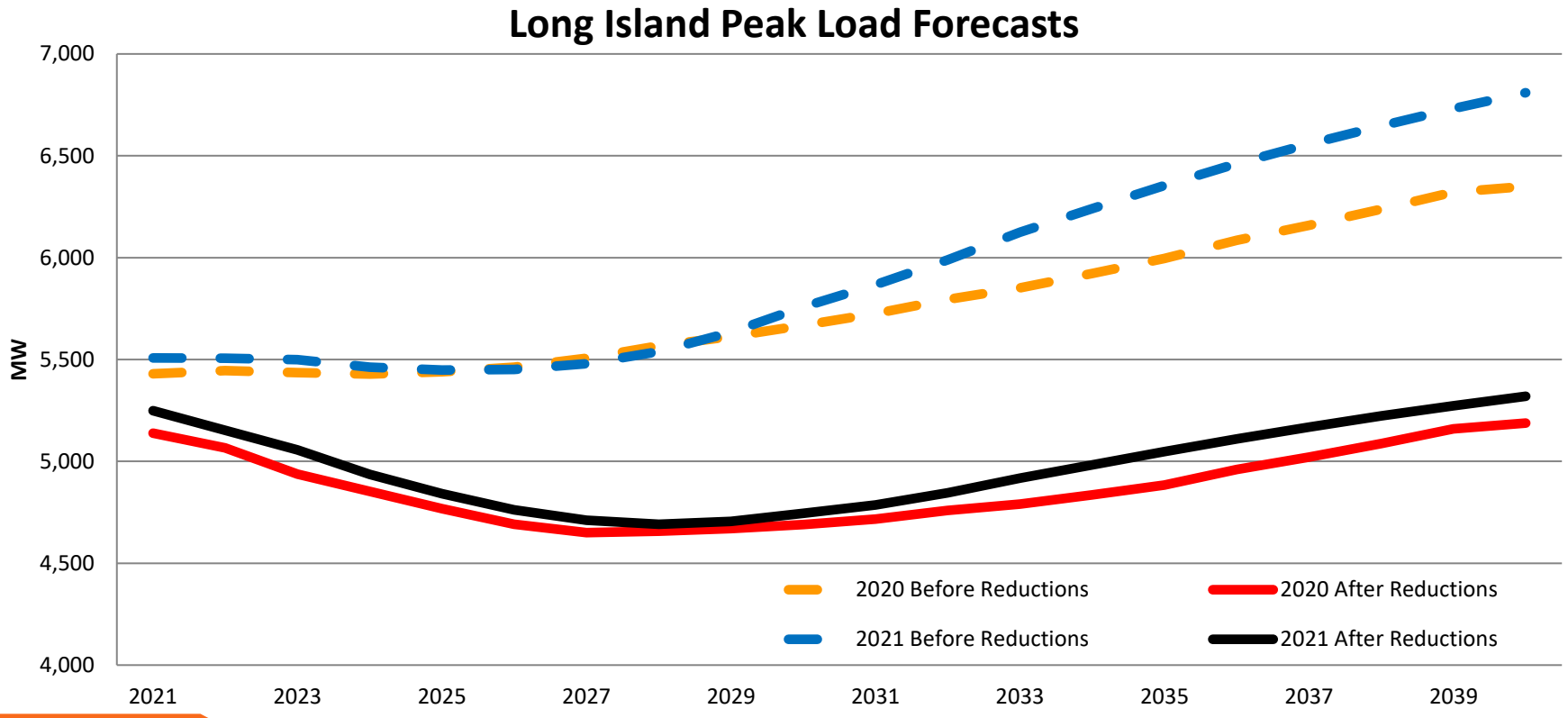
- 2020 Performance
  - Energy savings (MWh) were 120% of goal
  - Expenses were 6% below budget

Program	Energy Savings (MMBtu)		Energy Savings (MWh)		Coincident Demand Savings (MW)	
	Goal	Achieved*	Goal	Achieved*	Goal	Achieved*
Commercial Efficiency Program	**329,232**	**377,041**	**96,549**	**107,763**	19.9	20.7
Residential Programs						
Energy Efficient Products	324,990	461,184	109,902	155,854	35.4	32.7
Home Comfort	111,021	83,243	2,633	2,963*	1.0	1.1*
Residential Energy Affordability Partnership (REAP)	3,903	2,785	1,238	973*	0.3	0.2*
Home Performance	28,387	30,266	2,014	1,388	0.2	0.9
Home Energy Management	233,883	238,507	68,547	69,902	N/A	N/A
Subtotal Residential	**702,184**	**815,985**	**184,334**	**231,080**	36.9	34.9
Total Portfolio	1,036,077	1,204,036	280,883	338,843	56.8	55.6

* Per February 16, 2021 Memorandum issued by Demand Side Analytics

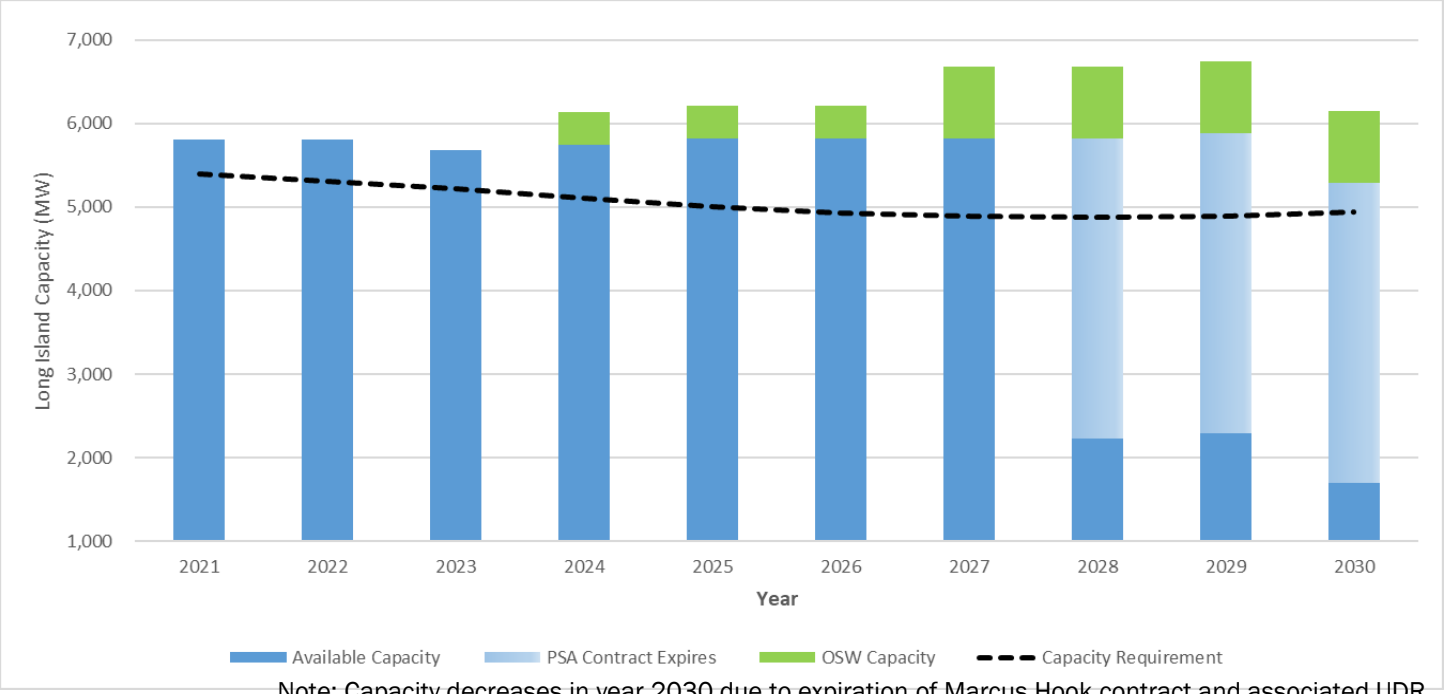
Load Forecast Change From Last Year

- Comparison of NYISO Gold Book Forecasts
  - Little change in long term net load trend after making reductions for energy efficiency and renewables
  - Full recovery from Covid-19 pandemic anticipated by 2023



Resource Adequacy

- Current resources meet projected LI Locational Capacity Requirement through 2030
- PSA contract expires May 2028, most other contracts expire before 2030
  - 400 – 800 MW of potential retirements are anticipated by 2027 (not shown)
- Implementation of CLCPA will require replacement of existing fossil units with renewable, storage, and other clean energy options by 2040
  - 2021-2022 Integrated Resource Plan (IRP) will provide guidance as to the order, amount and timing of plant retirements



Note: Capacity decreases in year 2030 due to expiration of Marcus Hook contract and associated UDR

*As of May, 24,2021

Generating Unit Environmental Compliance

- Compliance with applicable regulatory and environmental standards
  - Air permits and continuous emissions monitoring
  - Water discharge permits – monthly sampling and reporting
  - Petroleum and chemical bulk storage
  - Waste management

- Power Supply Agreement with National Grid
  - NO_X emission controls systems for legacy gas turbines are in engineering review for material procurement, installation & implementation
  - 316b of Federal Clean Water Act requires best technology available to reduce fish entrainment and impingement at circulating water intake systems
    - Port Jefferson – Installation of fish friendly traveling screens and circulating water pumps to meet updated DEC permit requirements has been completed and is now in the verification cycle
    - Northport – Installation of fish friendly traveling screens and circulating water pumps is underway. Northport 4 unit is complete, units 1, 2, & 3 on schedule for completion in 2022. All Units commence five (5) year compliance period – March 2022 to March 2027
    - E.F. Barrett – In process with NYSDEC to determine required technology. Likely outcome to be similar to Port Jefferson and Northport. No changes since last year

Generating Unit Performance 2020 vs. 2019

- All units met or exceeded contract targets
- Based on data from EIA Forms 860 and 923, Nine Mile Point 2's 2020 capacity factor (90%) was slightly less than national average (92%). This is mainly due to a scheduled re-fueling outage that resulted in 1 month of foregone generation
- Availability of fleet is slightly lower than in 2019 (96.21% in 2020 versus 98.25% in 2019) and in line with the New York average
- Heat rate (efficiency) performance of fleet is similar to last year
- Peaking units performed better than national average

Cable Challenges 2020 - 2021

- NYPA Y-49
  - Three recent outages Oct 2020, Dec 2020 and Feb 2021
  - NYPA is completing a life extension evaluation
  - Current contract ends Nov 2022. Potential extension is under evaluation

Regulatory Markets – Aligning Long Island Interests

New York State and Independent System Operator Participant Process

- **Resource Adequacy** – continue to work on Capacity and Energy Market redesigns in order to align them with state renewable energy policies and targets
- **Reliability Requirements –** reviewing proposed revisions to methodologies used to determine Installed Reserve Margin and Locality Requirements
- **Transmission System Rights** – working to define Transmission Owner "Rights of First Refusal" on transmission system enhancements identified through the Public Policy Process
- **Renewable Energy** – continue to develop rules governing the participation and operation of energy storage, solar and off-shore wind resources in the NYISO Markets

Public Service Commission & DPS Staff

- **Long Island to Con Edison Transmission Cable (2020 Public Policy)** – working to define a fair cost allocation methodology for project costs
- **Retail Access** – working through a collaborative process to better align LI Choice Program rules & requirements with existing programs across New York State

LIPA PJM Challenge – FERC

- **Fair Rates for use of Neptune Cable** – challenging PJM's export charges and cost allocation for transmission upgrades charged to imports across the Neptune Cable.

FOR CONSIDERATION
June 23, 2021

TO: The Board of Trustees

FROM: Thomas Falcone

SUBJECT: Approval of the Annual Report on the Board Policy on Resource Planning and Clean Energy

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Requested Action

The Board of Trustees (the "Board") of the Long Island Power Authority ("LIPA") is requested to adopt a resolution: (i) approving the annual report on the Board Policy on Resource Planning and Clean Energy (the "Policy"); and (ii) finding that LIPA has complied with the Policy since the last annual review, which resolution is attached hereto as **Exhibit "A."**

Background

By Resolution No. 1372, dated July 26, 2017, the Board adopted the Policy. The Policy was last reviewed and amended by the Board by Resolution No. 1551, dated July 22, 2020.

The Policy sets objectives for resource planning, power supply procurement, portfolio management, and energy efficiency programs that support LIPA's mission and the State's clean energy goals. The Policy also establishes regular performance reporting by LIPA Staff to enable the Board to assess performance against the objectives of the Policy.

Compliance with the Policy

LIPA Staff recommends that, for the reasons set forth below, the Board find that LIPA has complied with the Policy since the review of the policy last year.

Compliance with each element of the Policy is discussed in detail below.

Planning

"Planning for a power supply portfolio that meets applicable New York State Independent System Operator and New York State Reliability Council requirements, environmental standards, and the State's clean energy goals; and updating the Integrated Resource Plan to reassess system needs, as necessary, but no less than every five years."

- Long Island capacity reserves and future additions are expected to meet the New York Independent System Operator's ("NYISO") minimum Locational Capacity Requirement ("LCR") through 2030. The current 2021/22 LCR of 102.9% of peak load is satisfied mainly with fossil-fueled generation and a smaller contribution from renewable resources. As offshore wind and energy storage resources are interconnected into Long Island, in

compliance with the Climate Leadership and Community Protection Act of 2019 ("CLCPA"), it is expected that some of the existing fossil-fuel generation will be retired while continuing to satisfy the LCR, which is expected to increase moderately over time as more intermittent resources are added to the system.

- Implementation of the CLCPA will require the total replacement of existing fossil fuel plants by 2040 with renewable energy, energy storage, and other carbon-free technologies.
- The load forecast continues to decline through the late 2020s. Projections for electric vehicles and heat pumps, as well as load reductions for behind-the-meter solar and other distributed energy resources, are captured in the 2021 load forecast update.
- PSEG Long Island is currently in the process of developing LIPA's 2022 IRP ("IRP"), with the scheduled completion in the second half of 2022. The IRP will identify preferred options for making the transition to a clean energy grid.
- LIPA plans to meet its share of the State's Renewable Energy Standard through future procurements or REC purchases from the New York Energy Research and Development Authority ("NYSERDA"). See discussion on Clean Energy below.

Managing the Portfolio

"Managing the power supply portfolio to minimize cost and maximize performance, including the economic scheduling of assets, power plant availability and thermal efficiency, within contractual constraints."

- All power supply portfolio contracts met or exceeded contract targets in 2020.
- A contract billing dispute with Cross Sound Cable is the subject of litigation regarding the cable owner's claim for capacity payments related to a six-month outage of the cable.
- LIPA is coordinating with NYPA on a life extension and modernization study of the LIPA-owned Y-49 cable from Yonkers to Long Island. A significant portion of the land-based facilities on the Long Island side is likely to require replacement. LIPA's contract with NYPA for the use of the cable is currently scheduled to terminate in November 2022.
- Heat rate (i.e., efficiency) and availability of the generation fleet continue to be better than the industry average for comparable technologies.
- Nine Mile Point Unit 2's capacity factor for 2020 (90.0%) was slightly less than the industry average (92.0%) due to a scheduled re-fueling outage in 2020 which resulted in one month's less production.
- PSEG Energy Resource & Trade has met or exceeded all contractual performance targets, including Neptune and Cross Sound cable performance, generation bidding to the NYISO, load forecasting, fuel procurement, and scheduling, as well as settlements and invoicing.
- PSEG Energy Resources & Trade works with each of LIPA's power supply contract generators to schedule generation outages and testing activities with the goal of reducing overall power supply costs to LIPA's customers.

Competitive Procurement

"Minimizing cost by competitively procuring generation and distributed energy resources through wholesale market purchases, bilateral contracts, and if appropriate, after balancing cost and risk,

ownership or pre-payments for energy, utilizing to the extent feasible and cost-effective, Authority-owned land and rights to acquire generating sites."

- In 2020-21, PSEG Long Island initiated new procurement processes on LIPA's behalf for energy storage and solar power, including:
    - RFI (Issued March 2020)/RFP (Issued April 2021) for up to 175 MW of energy storage projects, in compliance with the storage mandate in the CLCPA. RFI (Issued March 2020) and RFP (Issued April 2021) for up to 175 MW of energy storage projects, in compliance with the storage mandate in the CLCPA. Proposals are due in July 2021 and may include sites to be offered by LIPA in addition to sites owned by developers or acquired from third parties; and
    - Community Solar feed-in tariff for up to 21.5 MW of new renewable resources whose benefits will be directed toward low- and moderate-income customers.

Clean Energy

"Procuring cost-effective renewable resources, renewable energy certificates ("RECs"), and behind-the-meter resources such as energy efficiency and demand response, including acting in coordination with other State energy authorities, if advantageous to our customers; integrating cost-effective distributed energy production and storage technologies; and enabling the economic and secure dispatch of resources deployed within the distribution system and on customer premises."

- LIPA is undersupplied in Tier 1 RECs to meet its share of the State Clean Energy Standard for 2020. LIPA's REC requirement for 2020 equates to about 2.8% of the total energy supplied, whereas LIPA's Tier 1-eligible (facilities that began operation since 2015) solar contracts supply about 1.7% of the load. Accordingly, LIPA has established a Clean Energy Compliance Fund to invest in future clean energy projects or REC purchases through NYSERDA, or alternatively LIPA procurements, in a manner consistent with the NYSERDA Alternative Compliance Payment fund.
- LIPA plans to meet a major portion of its future Tier 1 and 2 REC and OREC (offshore wind REC) targets by participating in NYSERDA's annual REC procurements. In April 2021, the Board approved a long-term REC Purchase Agreement with NYSERDA that will be used to procure Tier 1 RECs and ORECs. A separate agreement for Tier 2 RECS is currently being finalized between the parties.
- In 2020, residential and commercial energy efficiency programs resulted in 1.20 million MMBtu of energy savings (55.6 MW of incremental demand savings and 338,843 MWh), which is approximately 116% of the goal of 1.04 million MMBtu of energy savings.
- Long Island continues to have the most robust rooftop solar market in the State with more than 58,000 photovoltaic systems installed. In 2020, customer-side installed capacity increased 47 MW (AC) with incremental annualized energy savings of 68,000 MWh.
- As of year-end 2020, there is also approximately 4 MW of behind-the-meter customer storage installed, virtually all in conjunction with photovoltaic installations.
- Value of Distributed Resources ("VDER") was instituted for demand-metered customers.
- Deployed Dynamic Load Management ("DLM") program throughout the summer in 2020, in coincidence with both the New York State and Long Island peak days resulting in an estimated savings of $2.5 million as an offset against 2021 capacity costs. The commercial program was deployed nine times and the residential program was deployed four times last

summer.

Wholesale Market Policy

"Minimizing cost by representing the interests of Long Island electric customers in the New York and regional wholesale markets and their respective stakeholder processes, including direct engagement with Federal and State regulatory authorities."

- LIPA has maintained ongoing opposition at the Federal Energy Regulatory Commission ("FERC") to significant increases in PJM rates for transmission service associated with LIPA's power purchases via the Neptune cable. Opposition is occurring along two paths.
    - LIPA has challenged PJM's export charges for energy scheduled over the cable. Settlement negotiations are in progress. In the absence of a settlement, a hearing at FERC will likely run through Spring 2022.
    - In December 2020, LIPA and Neptune filed a complaint at FERC regarding the methodology for cost allocation for PJM regional transmission upgrades, which also has increased the level of charges to Neptune/LIPA. The complaint is pending before FERC. While there is no formal deadline for FERC action, we anticipate an initial decision by the end of 2021.
- LIPA has been engaged with the NYISO in assessing long-term market structure issues associated with CLCPA implementation, including renewable curtailment, transmission buildout, need for flexible generation capacity, reserve and regulation requirements. LIPA is working with NYISO and other market participants to revise Buyer Side Mitigation rules that prevent State-sponsored resources from participating in the NYISO capacity market.
- LIPA is engaged with the Public Service Commission ("PSC") to establish a fair cost allocation for transmission upgrades associated with Offshore Wind. The PSC's March 2021 order called for 25 percent of the cost of upgrades to be distributed statewide on a load-share basis, while 75 percent would be allocated to project beneficiaries. However, the upgrades are being undertaken to avoid curtailment of Offshore Wind procured by NYSERDA to achieve statewide climate goals.
- LIPA worked cooperatively with other market participants on market rules for Energy Storage, Solar, and Offshore Wind. The NYISO now requires large-scale solar projects to be dispatchable. LIPA is working with on-Island solar generators to become compliant.

Annual Review of the Policy

LIPA Staff has reviewed the Policy and recommends no changes at this time.

Recommendation

Based upon the foregoing, I recommend approval of the above requested action by adoption of a resolution in the form attached hereto.

Attachments

Exhibit "A" Resolution

Exhibit "A"

RESOLUTION APPROVING THE REPORT TO THE BOARD OF TRUSTEES ON THE BOARD POLICY ON RESOURCE PLANNING AND CLEAN ENERGY

WHEREAS, the Resource Planning and Clean Energy Policy (the "Policy") was originally approved by Resolution No. 1372, dated July 26, 2017; and

WHEREAS, the Policy was last amended by Resolution No. 1551, dated July 22, 2020; and

WHEREAS, the Board has conducted an annual review of the Policy and affirms that the Policy has been complied with.

NOW, THEREFORE, BE IT RESOLVED, that consistent with the accompanying memorandum, the Board hereby finds that LIPA has complied with the Resource Planning and Clean Energy Policy for the period since the last annual review and approves the annual report to the Board.

Dated: June 23, 2021