

Biennial Report for the Years Ended December 31, 2018 and December 31, 2019



Long Island Power Authority

Project No. 123808

8/31/2020

Biennial Report for the Years Ended December 31, 2018 and December 31, 2019

prepared for

**Long Island Power Authority
Uniondale, New York**

Project No. 123808

8/31/2020

prepared by

**Burns & McDonnell
Kansas City, Missouri**

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August 31, 2020

Thomas Falcone
Chief Executive Officer
Long Island Power Authority
333 Earle Ovington Boulevard, Suite 403
Uniondale, New York 11553

Re: Long Island Power Authority
Biennial Report for the Years Ended December 31, 2018 and December 31, 2019
Project Number 123808

Dear Mr. Falcone:

In compliance with the requirements pursuant to the role of Consulting Engineer and Rate Consultant stated in Section 702(b) of the General Bond Resolution (General Resolution) and Section 7.02 of the General Subordinated Resolution (Subordinated Resolution and together with the General Resolution, the Resolutions), Burns & McDonnell submits this Long Island Power Authority Biennial Report for the two years ended December 31, 2019 (the Report). This Report summarizes our review and assessment of the Long Island Power Authority (LIPA or the Authority) electric system. This report documents the examination of the electric system, the system organization and management, and an assessment of the utility's financial condition. Financial, statistical, and operating data utilized in preparing the Report were provided by the Authority.

In the preparation of the Report, Burns & McDonnell reviewed documents pertaining to the generation system and completed assessments of the transmission and distribution system of the Authority. Assessments involved interviews, observations, and review of annual expenditures from 2018 through 2019 and the year 2020 budget. Burns & McDonnell also reviewed the adequacy of the revenues provided by current retail rates in relation to the requirements of the Resolutions.

Based on its reviews and assessments, it is the opinion of Burns & McDonnell that the electric system is being operated and maintained in a manner that is consistent with current electric utility practices. In addition, the current retail rates have provided sufficient revenues to satisfy the debt service coverage requirement in the Resolutions. Further, it is the opinion of Burns & McDonnell that the balances in the various reserve funds maintained by the Authority are sufficient for their intended purposes.

We appreciate the opportunity to work with the Authority and the cooperation and assistance provided by staff in the preparation of this Report. We will be happy to discuss the Report with you at your convenience.

Sincerely,
Burns & McDonnell

A handwritten signature in blue ink, appearing to read "Adam Young".

Adam Young, PE
Director

A handwritten signature in blue ink, appearing to read "Craig Brown".

Craig Brown
Project Manager

CEB/apc

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**Long Island Power Authority
Biennial Report for the Years Ended
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Project No. 123808**

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LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
CAIDI	Customer Average Interruption Duration Index
CEO	Chief Executive Officer
CL&P	Connecticut Light & Power
COPS	Constant Oil Preservation System
CSC	Shoreham to East Shore - Cross Sound Cable
CSC Agreement	Cross Sound Cable Firm Transmission Capacity Purchase Agreement
DOE	US Department of Energy
DPS	NYS Department of Public Service
EIA	US Energy Information Administration
ELI	Efficiency Long Island
Exelon	Exelon Corporation
GCB	Gas circuit breaker
GENCO	National Grid Generation LLC
IRP	Integrated Resource Plan
kV	Kilovolt
LILCO	Long Island Lighting Company, a wholly owned subsidiary of the Authority, which does business under the name LIPA
LIPA	Long Island Power Authority or Authority
LIPA/LILCO Merger	LIPA's acquisition of LILCO
MSA	Amended & Restated Management Services Agreement
MW	Megawatt
Neptune Cable	Sayreville to Levittown Cable
NGRID	National Grid
NMP	Nine Mile Point
NMP1	Nine Mile Point Generating Station Unit 1
NMP2	Nine Mile Point Generating Station Unit 2
NNC	Northport to Norwalk Harbor Cable
Northport	Northport Electric Generating Station

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
NRC	Nuclear Regulatory Commission
NYPA	New York Power Authority
OSA	Amended & Restated Operations Services Agreement
PILOT	Payment in Lieu of Taxes
PJM	Pennsylvania-New Jersey-Maryland Region
PSC	NYS Public Service Commission
PSEG	Public Service Enterprise Group
PSEG-LI	PSEG Long Island, a PSEG subsidiary dedicated to Long Island operations
REV	Reforming the Energy Vision
RFP	Request for Proposal
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index for Long Interruptions
Service Area	Nassau & Suffolk Counties and the Rockaway Peninsula of Queens County
T&D System	Transmission & Distribution System
The Act	Long Island Power Authority Act
The Authority	Long Island Power Authority or LIPA
The Report	Long Island Power Authority Biennial Report for Two Years Ending December 31, 2017
The Resolutions	Subordinated Resolution, and together with the General Resolution
Trap bags	Temporary sand barriers
UDSA	Utility Debt Securitization Authority
Y-49	East Garden City to Sprain Brook Interconnection
Y-50	Dunwoodie to Shore Road Cable

STATEMENT OF LIMITATIONS

In preparation of the Long Island Power Authority Electric System Biennial Report for the two years ended December 31, 2019, Burns & McDonnell relied upon information provided by the Authority, and its service provider, PSEG Long Island (PSEG-LI), during the reporting period. The information included various analyses, computer-generated information and reports, audited financial statements, and other financial and statistical information, as well as other documents such as operating budgets and current retail electric rate schedules. While Burns & McDonnell has no reason to believe that the information provided, and upon which Burns & McDonnell has relied, is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee its accuracy or completeness.

Estimates and projections prepared by Burns & McDonnell relating to performance and costs are based on Burns & McDonnell's experience, qualifications, and judgment as a professional consultant. Since Burns & McDonnell has no control over weather, cost and availability of labor, material and equipment, labor productivity, contractors' procedures and methods, unavoidable delays, economic conditions, government regulations and laws (including interpretation thereof), competitive bidding, and market conditions or other factors affecting such estimates or projections, Burns & McDonnell does not guarantee the accuracy of its estimates or predictions.

Burns & McDonnell is not acting as a "municipal advisor" for the Long Island Power Authority within the meaning of Section 15B of the Securities Exchange Act of 1934, as amended and do not owe a fiduciary duty to LIPA pursuant to the Securities Exchange Act with respect to the information and material contained in this Study and our communications.

1.0 EXECUTIVE SUMMARY

1.1 Introduction

The Authority owns an electric transmission and distribution system (T&D System) serving most of Nassau and Suffolk Counties and the Rockaway Peninsula of Queens County, including assets, facilities, equipment, and contractual arrangements used to provide the transmission and distribution of electrical capacity and energy to electric customers within the Service Area.

The Authority provides retail electric service to approximately 1.1 million customers. During 2019, the maximum annual peak demand for the Authority reached 5,269 megawatts (MW). Total system electric revenues were \$3.52 billion in 2019.

Table 1-1 provides summary information on annual retail energy sales and total electric revenues during the 2015 through 2019 period.

Table 1-1: Historical Sales and Customers

	2015	2016	2017	2018	2019
Peak Demand (MW)	5,049	5,212	4,945	5,206	5,269
Energy (MWh)					
Residential	9,611,160	9,463,401	9,088,624	9,538,865	9,075,913
Commercial and Industrial	9,730,214	9,581,965	9,401,246	9,515,232	9,249,787
Other	584,264	554,624	557,344	556,139	474,911
Total Sales	19,925,638	19,599,990	19,047,214	19,610,236	18,800,611
Lost and Unaccounted For	1,134,879	1,363,571	1,147,961	1,162,846	1,303,461
Total Energy Requirements	21,060,517	20,963,561	20,195,175	20,773,082	20,104,072
System Load Factor (Percent)	47.6	45.9	46.6	45.6	41.9
Customer					
Residential	1,002,942	1,005,751	1,008,486	1,011,492	1,015,662
Commercial and Industrial	114,648	115,033	115,358	115,445	115,908
Other	5,514	5,608	5,593	5,468	5,618
Total Customers	1,123,104	1,126,392	1,129,437	1,132,405	1,137,189
Total Electric Revenues (\$000)	3,505,209	3,399,101	3,458,320	3,560,065	3,516,355

1.2 Biennial Report

In compliance with the requirements pursuant to the role of Consulting Engineer and Rate Consultant within the provisions of the Section 702(b) of the General Bond Resolution and Section 7.02 of the General Subordinated Resolution (Subordinated Resolution, and together with the General Resolution, the Resolutions), the Authority retained Burns & McDonnell to conduct the efforts required to prepare this Biennial Report (the Report) for the two years ended December 31, 2019.

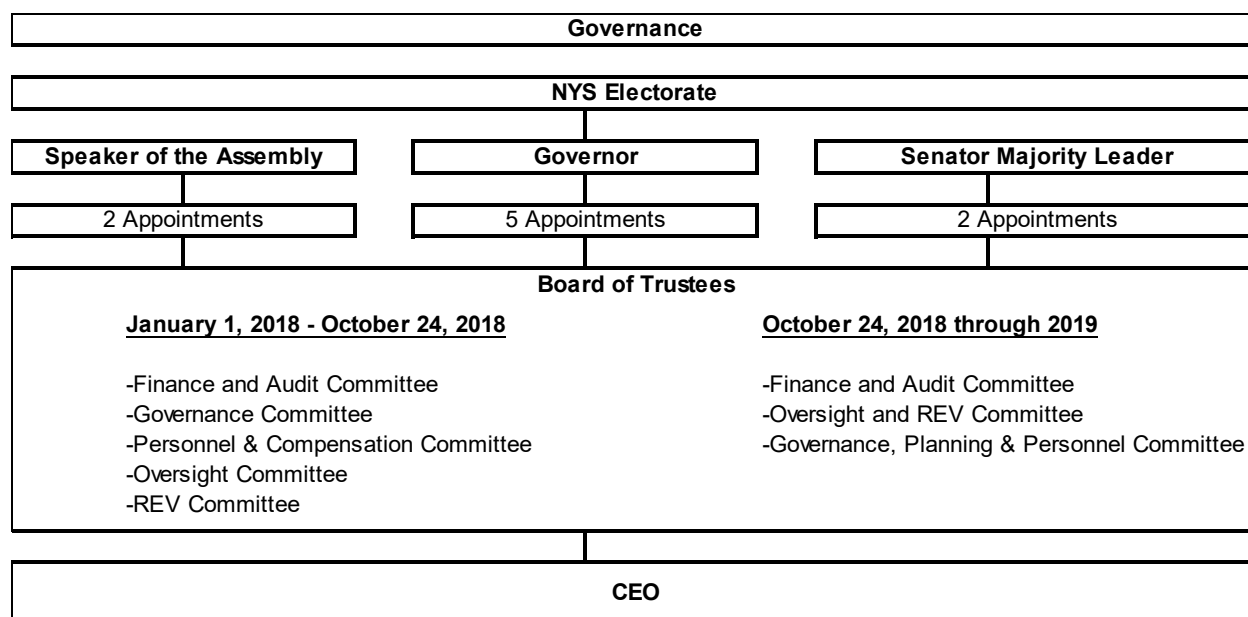
1.3 Organization and Management

1.3.1 Board of Trustees

During the period of this report, the Authority was governed by a nine-member Board of Trustees whose members were required under the Act to be residents of the Service Area. The Board of Trustees assumed many committee roles including finance and audit, governance, oversight, personnel and compensation, and the Reforming the Energy Vision (REV) committees. The CEO of the Authority reports directly to the Trustees. Figure 1-1 displays the organizational structure of the Board of Trustees and the Authority management during the Study Period.

Additional details pertaining to the Board of Trustees are provided in Section 3 of the Report.

Figure 1-1: Trustees Organization During Study Period



1.3.2 LIPA Management

1.3.2.1 Chief Executive Officer

Thomas Falcone is the Chief Executive Officer of the Authority. Mr. Falcone joined the Authority in January 2014 as Chief Financial Officer and became Chief Executive Officer in September 2015.

Additional Authority management details are provided in Section 3 of this Report.

1.4 Organizational Policies

1.4.1 LIPA Reform Act

The LIPA Reform Act in 2013 was enacted in response to concerns related to the organizational relationship between the Authority and its service provider. The LIPA Reform Act was intended to bring accountability and transparency to the delivery of electricity by:

1. Authorizing the reformulation of the relationship between LIPA and PSEG-LI, such that PSEG-LI assumed more responsibility related to operations in the service area; the Authority's role is to oversee the activities of PSEG-LI and to meet its obligations with respect to its bonds and notes and all applicable statutes and contracts.
2. Creating a new Long Island based office in the Department of Public Service (DPS), which is the staff arm of the New York Public Service Commission (PSC) to assist with oversight of core utility operations of PSEG-LI.
3. Authorize the retirement of a portion of the Authority's outstanding debt from the proceeds of Utility Debt Securitization Authority (UDSA) bonds at lower interest rates than existing indebtedness and capping or eliminating certain categories of payments in lieu of taxes (PILOTs), with savings passed on to ratepayers.

1.4.2 Primary Operating Agreement

Through a competitive procurement process, effective January 1, 2014 a wholly-owned subsidiary of PSEG fully dedicated to the Authority's Long Island operations (PSEG-LI) began providing operations, maintenance, and related services for the T&D system under the OSA. The OSA expires December 31, 2025. Additionally, it includes a provision that if PSEG-LI achieves certain levels of performance during the first 10 years, the parties will negotiate in good faith an eight-year extension on substantially similar terms and conditions. Beginning January 1, 2015, PSEG-LI assumed certain power supply management, fuel procurement and related services that have historically been provided pursuant to separate agreements between the Authority and other service providers.

1.5 Electric System Assessment

1.5.1 Nine Mile Point 2 Generating Station

LIPA holds 18 percent ownership in the Nine Mile Point (NMP) Nuclear Power Station 2, located near Scriba, New York on the south shore of Lake Ontario. NMP has two separate nuclear power stations, designated as NMP1 and NMP2. Constellation Energy Nuclear Group (CENG) owns 100 percent of

NMP1, and 82 percent of NMP2. NMP2 consists of a boiling water reactor and General Electric turbine generator and operates under licensing from the Nuclear Regulatory Commission (NRC), set to expire in 2046.

LIPA has entered into an operating agreement with CENG for NMP2, which CENG assigned to its affiliate Exelon Generation (Exelon). As a part of the agreement, LIPA and Exelon each have one representative on a management committee, which meets to discuss plant matters. Final budgets are prepared by Exelon and sent to LIPA for annual approval. LIPA is responsible for its ownership portion of operating costs and capital investments associated with NMP2 each year.

1.5.2 Transmission System

LIPA's transmission system consists of overhead and underground facilities, vehicles, equipment, land parcels, easements, contractual arrangements, and other assets used to provide the transmission and distribution of electric capacity and energy to and within the Service Area. The T&D System includes seven transmission interconnections that link the T&D System to utilities outside the Service Area. These transmission interconnections are owned in part or under contract to LIPA.

1.6 Financial Assessment

1.6.1 Operating Results

Total system energy sales were 19,610 GWh in 2018 and 18,800 GWh in 2019. During the period of this Report, total revenue from sales to electric customers was \$3.56 billion for 2018 and \$3.52 billion for 2019. The decrease in revenue was driven primarily by lower energy sales.

1.6.2 Adequacy of Electric Rates

In order to determine if LIPA has set rates to pay all of its operating costs as they come due, and to meet debt service and rate covenant requirements under the Resolutions, the Authority prepares a Rate Covenant Calculation, which is reviewed by its independent accountants who in turn issues a report thereon which for the years of this Report found that LIPA's rates and charges were set at a level sufficient to meet its Rate Covenant requirements.

1.6.3 Status of Revenue Bonds

At the end of 2019, the Authority had outstanding revenue bonds, general revenue notes, general commercial paper notes, and restructuring bonds issued by UDSA. During 2018, debt increased by \$134 million compared to 2017. During 2019, debt increased by \$375 million compared to 2018 resulting from

the issuance of new general revenue bonds. As of December 31, 2019, LIPA had a total of \$8.172 billion of outstanding debt principal and a total obligation including UDSA bonds. The UDSA bonds are not issued pursuant to the Resolutions and are not obligations of the Authority, LIPA, PSEG-LI, or any of their affiliates.

1.7 Conclusions

Based on statements and information provided, as well as the observations and reviews performed, it is the opinion of Burns & McDonnell that:

1. The Authority and PSEG-LI have provided services adequate for operation, maintenance, and repair of the system during the Study Period, January 1, 2018 to December 31, 2019.
2. The Authority's electric transmission and distribution system and the associated facilities, including the Nine Mile Point 2 Generating Station partially owned by the Authority, are being operated and maintained consistent with accepted electric utility practice in the United States.
3. For the Forecast Period, it is reasonable to expect the Authority and PSEG-LI will continue to provide services adequate for operation, maintenance, and repair of the system consistent with that experienced during the Study Period.
4. The Authority continues to be one of the most reliable overhead electric utilities in New York State based on SAIDI, SAIFI, and CAIDI measurements.
5. LIPA continues to invest in its facilities including storm-hardening program efforts. These investments provide improved system resiliency. Burns & McDonnell observed some of the system upgrades and improvements made throughout the Study period.
6. Revenues for the Study Period are sufficient to cover operation, maintenance, and repair expenses for the system during the Forecast Period. The electric revenues generated by the current electric rates are sufficient to fulfill the debt service coverage requirement defined in the covenants of the Resolutions.
7. The Authority is complying with the provisions of the Resolutions, each as amended by subsequent resolutions.
8. As of the date of this Biennial Report, the system is in good repair and sound operating condition to reliably deliver capacity and energy to the Authority's customers.

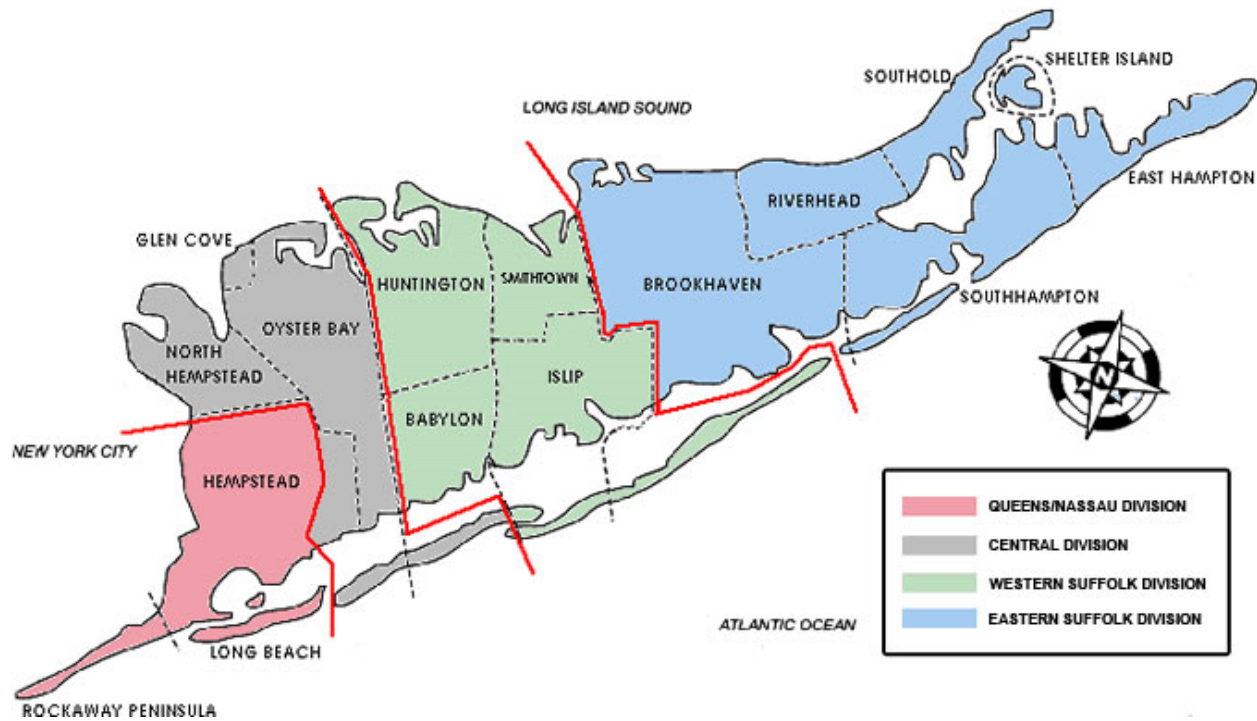
2.0 INTRODUCTION

The Authority is a corporate municipal instrumentality and political subdivision of the State of New York authorized under the Long Island Power Authority Act (the Act). The Authority became retail supplier of electric service in most of Nassau and Suffolk Counties and the Rockaway Peninsula of Queens County (the Service Area) on May 28, 1998 by acquiring the Long Island Lighting Company (LILCO) as a wholly owned subsidiary of the Authority through a merger (LIPA/LILCO Merger). Since the LIPA/LILCO Merger, LILCO has done business under the names LIPA and Power Supply Long Island. Before the LIPA/LILCO Merger, LILCO was a publicly traded, shareholder-owned corporation that, since the early 1900s, was the sole supplier of both retail electric and gas service in the Service Area. LIPA does not provide gas service in the Service Area. For the period prior to the LIPA/LILCO Merger, LILCO is referred to herein as LILCO and, for the subsequent period, is referred to herein as LIPA. Beginning January 1, 2014 through a competitive bidding process a wholly-owned subsidiary of PSEG fully dedicated to the Authority's Long Island operations (PSEG-LI) began providing operations, maintenance, and related services for the T&D system under the OSA. Currently, PSEG-LI is the retail brand for electric service on Long Island.

The Authority, through its wholly-owned subsidiary, LIPA, owns an electric transmission and distribution system serving the Service Area, including assets, facilities, equipment, and contractual arrangements used to provide the transmission and distribution of electrical capacity and energy to electric customers within the Service Area.

2.1 System Description

The Service Area consists of the bulk of Long Island in New York State, and is comprised of Nassau and Suffolk counties and the Rockaway Peninsula of Queens County, an area of approximately 1,230 square miles, excluding areas served by three municipal utilities: the Incorporated Villages of Freeport, Greenport, and Rockville Centre. Suffolk County is the easternmost county within the Service Area and covers an area of approximately 911 square miles, followed by Nassau County with a 287 square mile area, and the Rockaway Peninsula with an area of approximately 32 square miles. The Service Area is bounded by the Atlantic Ocean on the south and east, by the Long Island Sound on the north, and by portions of New York City on the west. Figure 2-1 displays the Service Area for LIPA.

Figure 2-1: Electric System Service Territory

As of December 31, 2019, LIPA served approximately 1.14 million retail electric customers, of whom approximately 89 percent were residential users. During the year ended December 31, 2019, residential customers provided approximately 52.6 percent of LIPA's annual retail electric revenues and commercial customers provided approximately 45 percent of annual retail electric revenues. The remaining balance is revenue from retail sales of public lighting, other public authorities, and miscellaneous others.

Although commercial customers provide a significant portion of annual electric sales revenues, these customers only account for approximately 10 percent of the retail electric customers served by LIPA. In general, individual commercial customers are relatively small. The Service Area contains little traditional "industrial" loads, and customers served under this rate classification are primarily large commercial customers. The single largest customer in the Service Area (the Long Island Rail Road) accounted for less than two percent of total electric sales during the period of this report and less than two percent of total retail electric revenues during the same period. In addition, the ten largest customers in the Service Area accounted for nearly 8% of total sales and 6% of revenue.

Summary information on annual retail energy sales and retail electric revenues within the Service Area during the 2015 through 2019 period can be found in Table 1-1.

2.2 Biennial Report

In compliance with the requirements pursuant to the role of Consulting Engineer and Rate Consultant within the provisions of the Section 702(b) of the General Resolution and Section 7.02 of the Subordinated Resolution, LIPA retained Burns & McDonnell to conduct the efforts required to prepare this Report for the two years ended December 31, 2019.

2.3 Report Covenant

Pursuant to the General Resolution, the Report is to set forth the following:

- i. “The Consulting Engineer’s advice and recommendations as to the proper operation, maintenance, and repair of the System during the ensuing years after the Study Period, and an estimate of the amounts of money necessary for such purposes;
- ii. The Consulting Engineer’s advice and recommendations as to improvements which should be made during the ensuing two years, and an estimate of the amounts of money necessary for such purposes, showing the amount projected to be expended during such years from the proceeds of Bonds and Subordinated Indebtedness issued under or pursuant to the Resolution;
- iii. The Rate Consultant’s recommendation as to any necessary or advisable revisions of rates, fees, rents, charges and surcharges and such other advice and recommendation as it may deem desirable; and
- iv. The Consulting Engineer’s findings as to whether the System has been maintained in good repair and sound operating condition, and its estimate of the amount, if any, required to be expended to place such properties in such condition and the details of such expenditures and the approximate time required therefore.”

2.4 Project Approach

This Report summarizes the reviews and assessments of LIPA. This Report documents Burns & McDonnell’s examination of the electric system organization and management and an assessment of the utility’s financial condition. The source of the financial, statistical, and operating data utilized in preparing the Report is LIPA’s annual financial statements and accounting records, various operations reports, as well as Authority staff.

In the preparation of this Report, Burns & McDonnell completed assessments of the electric generating stations under contract to LIPA and the transmission and distribution system owned by LIPA.

Assessments involved interviews, observations, and review of annual expenditures from 2018 through 2019 and 2020 budgets. The adequacy of the revenues provided by the current retail rates in relation to the requirements of the Resolutions was also reviewed.

Each section of the Report summarizes specific efforts completed while conducting the study. The Report is arranged in the following sections:

- 1.0 Executive Summary
- 2.0 Introduction
- 3.0 Organization and Management
- 4.0 Electric System and Service
- 5.0 Financial Assessment
- 6.0 Conclusions

3.0 ORGANIZATION AND MANAGEMENT

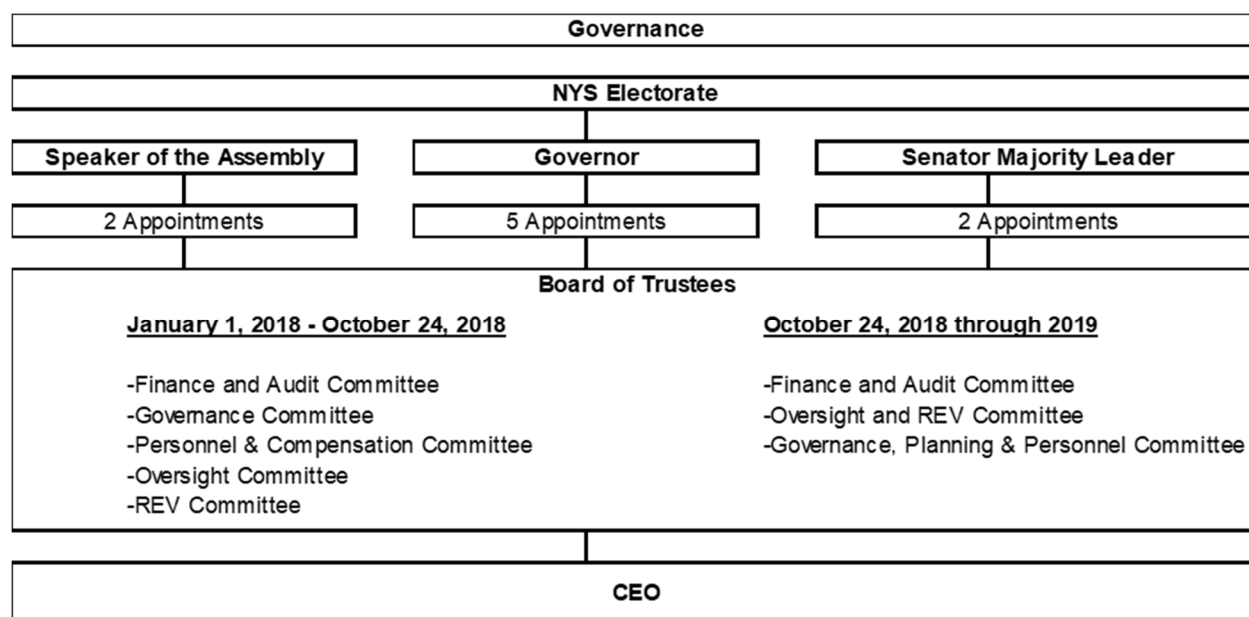
3.1 Authority Structure

Operations, performance, and costs are managed by the Service Provider, PSEG-LI, and overseen by the Authority. The management team includes engineering, legal, financial, accounting, and management professionals. The organization of this management team is described below. Through a competitive procurement process, the Authority selected Public Service Enterprise Group (PSEG) through its wholly owned subsidiary, PSEG-LI, to operate LIPA's T&D System under a twelve-year OSA beginning January 1, 2014.

3.1.1 Board of Trustees

During the period of this Report, the Authority was governed by a nine-member Board of Trustees whose members were required under the Act to be residents of the Service Area and have utility, corporate board, or finance experience. The Governor appointed five of the Trustees. Of the four remaining, two were appointed by the Majority Leader of the New York State Senate, and two were appointed by the Speaker of the New York Assembly. The Chairman of the Trustees was also appointed by the Governor. Each Trustee served for a staggered term of four years. A Trustee whose term expired continued to serve until his or her successor was appointed. Trustees do not receive compensation but are entitled to reimbursement for reasonable expenses in the performance of their duties.

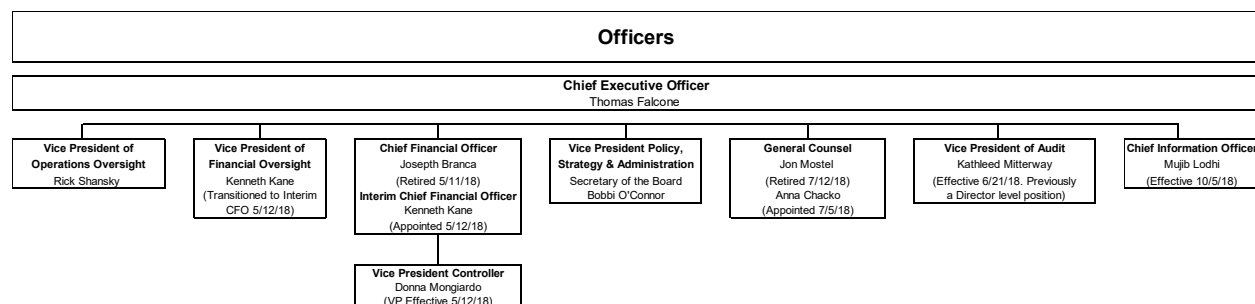
Committees operated by the Board of Trustees during the period covered by this report include: (1) finance and audit, (2) governance, planning and personnel, and (3) oversight and clean energy committees. Figure 3-1 provides the Board of Trustees organization during the biennial study period.

Figure 3-1: Trustees Organization During Study Period

3.1.2 Authority Management

3.1.2.1 Chief Executive Officer

Thomas Falcone is the Chief Executive Officer of the Authority. Mr. Falcone joined the Authority in January 2014 as Chief Financial Officer and became Chief Executive Officer in September 2015. The management structure as of December 31, 2019 is depicted in Figure 3-2.

Figure 3-2: LIPA Organization Chart for Officers 2018 – 2019

3.2 Organizational Policies

3.2.1 LIPA Reform Act

The LIPA Reform Act was intended to bring accountability and transparency to the delivery of electricity by:

1. Authorizing the reformulation of the relationship between LIPA and PSEG-LI, such that PSEG-LI assumes more responsibility related to operations in the service area; the Authority's role is to oversee the activities of PSEG-LI and to meet its obligations with respect to its bonds and notes and all applicable statutes and contracts.
2. Creating a new Long Island based office in the Department of Public Service (DPS), which is the staff arm of the New York Public Service Commission to assist with oversight of core utility operations of PSEG-LI.
3. Authorizing the retirement of a portion of the Authority's outstanding debt from the proceeds of the UDSA bonds at lower interest rates than existing indebtedness and capping or eliminating certain categories of payments in lieu of taxes, with savings passed on to ratepayers. The LIPA Reform Act was amended in 2015 to permit UDSA to issue additional restructuring bonds in an aggregate additional amount not to exceed \$4.5 billion. The proceeds of these restructuring bonds generated total net present value debt service savings of \$492 million by refunding Authority bonds.

3.2.2 Budgeting

For the two-year period ended December 31, 2019, PSEG-LI prepared annual budgets for its costs and submitted such budgets to LIPA for review. The budgeting process takes into consideration historical revenue and expense levels and projects revenues and expenses to be incurred. Estimates are prepared for LIPA and PSEG-LI departments and compiled into a singular document to be presented to LIPA's Board of Trustees for approval. The 2020 Approved Budget was reviewed by Burns & McDonnell in conducting the investigations pertaining to this report.

According to the estimates, the electric revenues generated by the current electric rates are sufficient to fulfill the rate covenant requirement defined in the General Resolution, which states the Authority will establish and maintain System fees, rates, rents, charges and surcharges sufficient in each Fiscal Year so that Revenues reasonably expected to be produced in such Fiscal Year will be at least equal to the sum of:

- (i) 100% of Debt Service, and amounts under all Parity Contract Obligations, payable by the Authority in such Fiscal Year;
- (ii) 100% of the Operating Expenses payable in such Fiscal Year;
- (iii) 100% of the amount necessary to pay all PILOTs payable in such Fiscal Year; and
- (iv) 100% of the amount necessary to pay other Required Deposits, all other payments required pursuant to the Resolution and the Financing Agreement, and all other payments required for the System, for such Fiscal Year.

3.2.3 Audited Financial Statements

In compliance with the requirements pursuant to the General Resolution, LIPA retains an independent accountant, on an annual basis, to audit the Financial Statements prepared by staff. The General Resolution requires the following:

“The Authority shall keep or cause to be kept proper books of record and account (separate from all other records and accounts) in which complete and correct entries shall be made of its transactions under the Resolution and which, together with all other books and papers of the Authority, shall at all reasonable times be subject to the inspection of the Trustee or the representative, duly authorized in writing, of the Holder or Holders of not less than 25% in principal amount of the Bonds then Outstanding. Such books of account are to be audited at least annually by independent certified public accountants experienced in public finance and electric utility accounting selected by the Authority. A copy of each audit report, annual balance sheet and income and expense statement shall be filed with the Trustee and sent to any Owner filing with the Authority a written request therefor.”

LIPA has been successful at meeting its auditing requirements for the period.

3.2.4 Rate Studies

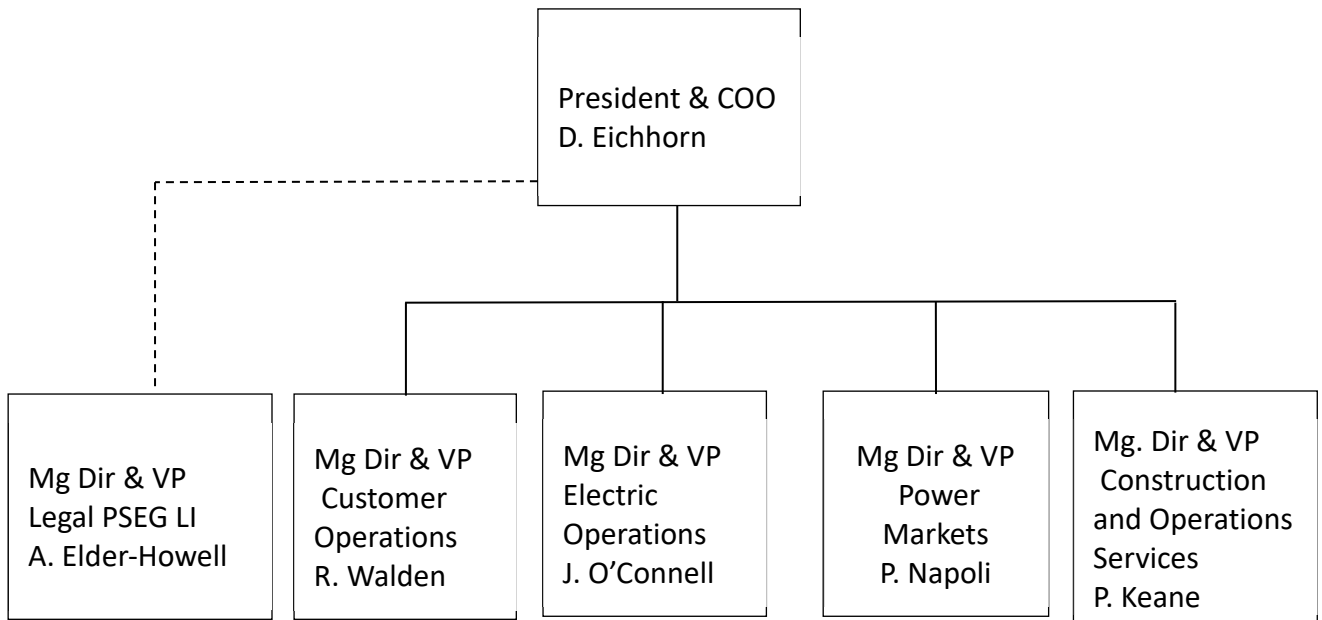
The Authority is empowered to set rates for electric service in the service area without being required by law to obtain approval of the PSC, DPS or any other State regulatory body. However, the Authority agreed in connection with the approval of the LIPA/LILCO Merger by the PACB in 1997 that it would not impose any permanent increase, nor extend or reestablish any portion of a temporary rate increase, in average customer rates over a 12-month period in excess of 2.5 percent without approval of the PSC, following a full evidentiary hearing. Under the LIPA Reform Act, that PACB condition has been superseded by a rate-setting process which provides for DPS review of any future rate proposal that leads to aggregate revenues of the Authority to increase by more than 2.5 percent on an annual basis. LIPA’s utility rate schedule is structured with fixed customer charges for all customer classes, seasonal energy rates for all customer classes except street lighting, and seasonally differentiated demand charges for non-residential customer classes. LIPA’s base rate has not exceeded the 2.5 percent threshold since the three-year plan expired at the end of 2018. As a result, no rate proposal has been submitted to the DPS.

3.2.5 Primary Operating Agreement

Effective January 1, 2014, PSEG-LI, a wholly-owned subsidiary of PSEG fully dedicated to the Authority’s Long Island operations began providing operations, maintenance, and related services for the T&D system under the OSA. The OSA expires December 31, 2025. Additionally, it includes a provision

that if PSEG-LI achieves certain levels of performance based on criteria during the first 10 years, the parties will negotiate in good faith an eight-year extension on substantially similar terms and conditions. Beginning January 1, 2015, an affiliate of PSEG-LI (PSEG ER&T) assumed certain power supply management, fuel procurement and related services that were historically provided pursuant to separate agreements between the Authority and other service providers. PSEG-LI organization is shown below in Figure 3-3.

Figure 3-3: PSEG-LI Organization (2019)



4.0 ELECTRIC SYSTEM AND SERVICE

LIPA's electric system primarily consists of transmission and distribution assets and an 18 percent ownership in the Nine Mile Point 2 Nuclear Power Station. Additionally, the Authority has various power supply contracts, which are described below.

4.1 Nine Mile Point 2 Generating Station

LIPA holds an 18 percent ownership in the Nine Mile Point Nuclear Power Station 2 (NMP2), located near Scriba, New York on the south shore of Lake Ontario. NMP has two separate nuclear power stations, designated as NMP1 and NMP2. Constellation Energy Nuclear Group (CENG) owns 100 percent of NMP1, and 82 percent of NMP2. NMP2 consists of a boiling water reactor and General Electric turbine generator, and operates under licensing from the Nuclear Regulatory Commission, set to expire in 2046.

LIPA has entered into an operating agreement with CENG for NMP2, which CENG assigned to its affiliate Exelon Generation (Exelon). As a part of the agreement, LIPA and Exelon each has representatives on a management committee, which meets to discuss plant matters. Final budgets are prepared by Exelon and sent to LIPA for annual approval. LIPA is responsible for their ownership portion of operating costs and capital investments associated with NMP2 each year.

4.1.1 NMP2 Capital Improvement Program

Exelon has contracted with the Department of Energy (DOE) for disposal of high-level radioactive waste (spent fuel), and despite a court order reaffirming DOE's obligation, the DOE has not forecasted the start of operations of spent fuel repository. NMP reached capacity on total spent fuel storage it could currently hold in May of 2012. For this reason, Exelon built a new dry fuel storage facility to accommodate spent fuel for both NMP1 and NMP2. The authority's net capital investment, excluding nuclear fuel, for NMP2 during the study period was \$540 million in 2018 and \$537 million in 2019. Major projects completed during the 2018 refueling outage included:

- Replaced both reactor recirculation pump motors
- Replaced analog Electro Hydraulic Control (EHC) system with digital EHC system
- Replaced reactor water cleanup pump "A"
- Chemically decontaminated reactor recirculation loops to reduce Collective Radiation Exposure (CRE)

4.1.2 Plant Performance of NMP2

NMP2 performs at favorable capacity factors when compared to industry nuclear averages. Table 4-1 displays comparative capacity factors for years 2013-2019. Generation values within Table 4-1 only reflect 18 percent of total generation from NMP2, capturing only LIPA's 18 percent, partial ownership.

Table 4-1: NMP2 Plant Performance

<u>Year</u>	<u>Annual Net Generation (MWh)</u>	<u>Annual Net Capacity Factor</u>	<u>Three Year Average Net Capacity Factor</u>	<u>Industry Average Net Capacity Factor</u>
2015	1,986,063	97.0	93.3	92.3
2016	1,820,149	88.9	90.6	92.3
2017	1,999,395	97.7	93.8	92.3
2018	1,818,880	88.9	91.1	92.5
2019	2,019,095	98.7	94.5	93.5

Note: Generation values shown are for LIPA's percentage of the plant generation.

4.2 Transmission System

LIPA's transmission system consists of overhead and underground facilities, vehicles, equipment, land parcels, easements, contractual arrangements, and other assets used to provide the transmission of electric capacity and energy to and within the Service Area. The T&D System includes seven transmission interconnections that are owned in part or under contract to LIPA that link the T&D System to utilities outside the Service Area. These transmission interconnections enable delivery of:

1. Capacity and energy produced by NMP2,
2. Additional off-system capacity resources needed to meet the peak demands of the electric customers,
3. Favorably priced energy to supplement or displace generation from on-island generating resources, and
4. Excess generation from on-island generating facilities to off-island purchasers, when conditions merit.

Table 4-2 provides summary information on the transmission interconnections.

Table 4-2: LIPA Interconnections

Name	Off System Terminal Location	Interconnecting Utility	Voltage Level (kV)	AC/DC
Dunwoodie to Shore Road (Y-50)	Westchester County, NY	Con Edison	345	AC
East Garden City to Sprain Brook (Y-49)*	Westchester County, NY	Con Edison	345	AC
Northport to Norwalk Harbor (NNC)	Norwalk, CT	CL&P	138	AC
Shoreham to East Shore (Cross Sound Cable)	New Haven, CT	UI	138	DC
Jamaica to Lake Success	Queens, NY	Con Edison	138	AC
Jamaica to Valley Stream	Queens, NY	Con Edison	138	AC
Sayreville to Levittown (Neptune Cable)	Sayreville, NJ	JCP&L	345	DC

*Cable is owned by NYPA

Four submarine cables installed under Long Island Sound form part of the interconnection between the T&D System and other utility systems in upstate New York and Connecticut:

1. Dunwoodie to Shore Road (Y-50)
2. East Garden City to Sprain Brook (Y-49)
3. Northport to Norwalk Harbor (NNC)
4. Shoreham to East Shore (Cross Sound Cable)

A fifth submarine cable (Sayreville to Levittown, also known as the Neptune Cable) connects LIPA's service area with New Jersey and allows for the purchase of energy and capacity from resources in the Pennsylvania-New Jersey-Maryland region (PJM).

The Dunwoodie to Shore Road line, designated as the Y-50 line and placed in operation in August 1978, is an 18-mile 345-kilovolt (kV) cable jointly owned with Con Edison. This cable is of pipe-type construction in which dielectric fluid is circulated to cool the conductors and maintain the electrical insulation. The cable operates at full capacity with a 653 MW normal rating and a 914 MW emergency rating. Power is wheeled over this cable to the two 138 kV cables to Jamaica for delivery to Con Edison.

The East Garden City to Sprain Brook 345 kV interconnection (Y-49) was installed in 1991 and is approximately 23 miles long. This cable is comprised of a submarine portion and a land-based portion. The submarine portion is constructed of self-contained dielectric fluid-filled cables that operate under high pressure, while the land-based portion is of conventional pipe-type construction. This line is owned entirely by New York Power Authority (NYPA) and is used by LIPA under the terms of a contract with NYPA.

The Northport to Norwalk Harbor cable (NNC) is a double circuit 138 kV submarine cable installed in 2008 to replace an older cable. This line extends approximately 12 miles under the Long Island Sound

from the Northport Electric Generating Station (Northport) in Suffolk County, New York to Norwalk Harbor, Connecticut. LIPA owns that portion of the line from Northport to the New York-Connecticut state boundary, at which point ownership is held by Connecticut Light and Power (CL&P), a wholly-owned subsidiary of Northeast Utilities. The circuit has a normal rating of 450 MW, but, due to constraints in southwest Connecticut, is operated at the prior cable's rating of 286 MW.

The Shoreham to East Shore line (the Cross Sound Cable or CSC) is a 24-mile, +/- 150 kV bi-directional high voltage direct current system utilizing voltage source converter technology with a capability of 330 MW. The Cross Sound Cable is connected between the converter stations installed adjacent to United Illuminating's 345 kV East Shore substation in Connecticut and LIPA's Shoreham 138 kV substation. Construction of this line began in 2000 pursuant to a firm transmission capacity purchase agreement (the CSC Agreement) entered into between LIPA and Cross Sound Cable Company, LLC pursuant to which LIPA agreed to purchase up to 330 MW of transmission capacity. The CSC Agreement, as amended, expires in 2032. The Cross Sound Cable became operational in June 2004.

The Sayreville to Levittown cable (the Neptune Cable) allows LIPA to import power from New Jersey over an undersea high-voltage direct current transmission cable. The Neptune Cable was constructed, and is owned, by Neptune Regional Transmission System, LLC. The Neptune Cable is capable of carrying 660 MW of electricity and runs from Sayreville, New Jersey, under the Atlantic Ocean and connects with LIPA at its Newbridge Road substation in Levittown. The Neptune Cable became operational in July 2007.

The two remaining Service Area transmission interconnections (the Jamaica to Lake Success and the Jamaica to Valley Stream cables) are linked to the Con Edison transmission system in Queens County, New York. LIPA owns these facilities to the border of Nassau and Queens Counties, at which point ownership transfers to Con Edison. These ties are employed primarily for the delivery of power to Con Edison from its portion of energy flowing across Y-50.

The transmission facilities provide for the delivery of capacity and energy from the transmission interconnections and the on-island generating stations to LIPA's electric distribution system. As of December 31, 2019, LIPA reported the transmission system consisted of approximately 1,400 miles of overhead and underground lines, with voltage levels ranging from 23 kV to 345 kV. This transmission system has been constructed following standards similar to those employed by other major electric utilities in the Northeast and includes wood poles, steel poles, and lattice steel towers. Many of the

existing transmission structures support distribution circuits and/or connections for telephone, cable television, or fiber optics.

The transmission system includes transformation equipment at 20 generating sites that is used to step up the generation voltage to transmission voltage levels.

4.2.2 Substation Descriptions

Burns & McDonnell inspected 14 substations across the LIPA system. Inspections were guided by PSEG-LI. The substations visited included:

9A Riverhead	8DR Wildwood	8Q N. Shore Beach	8WF William Floyd
8T Eastport	9AU Suffolk Air	9Z Amagansett	6DL Pilgrim
7DM Central Islip	8KW West Bus	8KD Holtsville DRSS	Holtsville LNG
8C Sills Road	6P Pulaski		

The inspected sample represented a variety of transmission and distribution substations with different voltage levels and ages. Overall, substations were clean and in good operating condition. Based on the substation inspections, Burns & McDonnell has general recommendations regarding substation operating and maintenance:

1. It was noted in previous conversations with PSEG-LI operators that some substations have experienced theft of copper or copper substitutes. Improved security has lessened these thefts. PSEG-LI should continue to be diligent about adding urban grounding for all steel structures and above ground grounding connections. Urban areas grounding is a practice used in the substations located in urban areas where theft is more likely. It is achieved by covering all copper wire with a “U” shaped steel channel all the way from the point of grounding of the structure or the equipment up to the point where the ground wire enters the ground. In addition, the PSEG-LI operators noted the large looped grounding connections to structural supports create tripping hazards especially when performing operations at night and its recommended that these connections be undergrounded with the use of urban grounding.
2. It was noted in several substations that the piling caps had begun to deteriorate and crumble on many footings, as shown in Figure 4-1. While these issues are minor in nature and do not

represent an immediate concern, Burns & McDonnell recommends that PSEG-LI address them before they do become more serious. We did see evidence that improvements are being made to address this issue.

Figure 4-1: Piling Cap Deterioration



3. In general, most of the stations are in clean, working order. However, several stations with aging equipment have oil absorbent pads placed around the base of a transformer or noticeable amounts of oil within the transformer containment pit from recent maintenance performed on the transformer. Burns & McDonnell recommends inspecting stations with aging oil-filled equipment, identify possible leaks and make the necessary repairs. Oil containment pits should be inspected and any standing oil should be disposed of in accordance with PSE&G-LI's Spill Prevention, Control, and Countermeasure (SPCC) plan.
4. It was noted in several substations, that aging equipment that have been removed from service have not been disposed of but rather are being stored at the substation. The equipment includes transformers, oil circuit breakers and disconnect switches. The assumption is that the dielectric fluid has been removed from the equipment but if openings are not tightly sealed rodents could potentially find a way into the equipment and create a home for themselves. Burns & McDonnell recommends that PSEG-LI dispose of this equipment. The storage of equipment that was taken out of service and stored at the substation was observed and noted in the previous report two years ago and we have not seen evidence that improvements are being made to address this issue.

4.2.2.1 9A Riverhead

The 9A Riverhead Substation is in good condition and the site was clean. The station is in the process of being expanded with two additional transmission lines and a new control house. The foundation for the new control house has recently been installed. The older 23 kV equipment is also being replaced in

stages. Spare air core reactors are being staged at the site as shown in the blue wrapped equipment in Figure 4-2.

Figure 4-2: Air Core Reactors in 9A Riverhead Substation



4.2.2.2 8DR Wildwood

The 8DR Wildwood substation is in overall good condition. The site was clean, and the equipment appears to be well maintained. However, some of the steel support structures show signs of aging and oxidation. Figure 4-3 provides evidence of the current site condition.

Figure 4-3: Site Condition in Wildwood Substation

4.2.2.3 8Q N. Shore Beach

The 8Q N. Shore Beach substation is in good overall condition. There is minor gravel grading maintenance work that needs attention. Some areas on the upper tier of the substation have no gravel and leave the workers and substation equipment exposed to dirt, sand, and hard soil. Equipment in the substation appears to be in good condition. Figure 4-4 shows the condition of a transformer located in this substation.

Figure 4-4: Transformer in N. Shore Beach Substation

4.2.2.4 8WF William Floyd

The 8WF William Floyd substation is in overall good condition. There are small signs of wear and fracture of the piling caps that the substation equipment sits on. There are also large areas on ground that the gravel is not distributed over in the substation. Some spare equipment currently not in service is being stored in the substation yard as noted two years ago and this same equipment remains. Recently, one of the transformers underwent some maintenance on the Constant Oil Preservation System (COPS) tank and the mineral oil from this maintenance operation still resides in the oil containment pit under the transformer. Figure 4-5 shows some of the bare ground and an example of equipment being stored.

Figure 4-5: Bare Ground and Spare Equipment Transformer in Substation



4.2.2.5 8T Eastport

Overall, the 8T Eastport substation is functionally acceptable and in suitable condition. Recently, the transmission line circuit 620 was placed underground and additional gravel was added to the station. The substation shows signs of aging equipment as one of the transformers in service was manufactured in 1955, and there are exposed concrete bases that no longer have equipment on them. Figure 4-6 provides a picture of the new terminal position for circuit 620.

Figure 4-6: Undergrounded Circuit 620 in Eastport Substation

4.2.2.6 9AU Suffolk Air

The 9AU Suffolk Air substation is in overall good condition. The site was clean, and the equipment appears to be well maintained. Some equipment foundations show signs of spalling and the main access driveway is in poor condition as evidenced by the pictures shown in Figure 4-7.

Figure 4-7: Transformer and Driveway in Suffolk Air Substation

4.2.2.7 9Z Amagansett

The 9Z Amagansett substation is currently under construction and nearing completion of the East End Conversion Project to upgrade and replace aging equipment due to rapid load growth in the area. The station has a temporary transformer and switchgear supplying local loads. Most of the equipment in the station has been upgraded and is currently de-energized. The testing, commissioning, and energization of equipment is ongoing. Figure 4-8 provides a picture of one of the newly installed but not energized transformers.

Figure 4-8: New Transformer Installation at 9Z Amagansett Substation



4.2.2.8 6DL Pilgrim

The 6DL Pilgrim substation appears to be functionally acceptable and in suitable condition. The substation site was mostly clean and well maintained. There are oil absorbent pads draped around the base of one of the transformers indicating a possible leak or faulty valve. This should be assessed and the appropriate actions taken to remediate the transformer. There is a decommissioned transformer and two sets of Oil Circuit Breakers (OCB) stored on site. Various equipment in this substation shows signs of aging and wear which is expected over time.

Figure 4-9: OCBs Stored Onsite at Pilgrim Substation

4.2.2.9 7DM Central Islip

Overall, the 7DM Central Islip substation appears to be functionally acceptable and in suitable condition. There are signs of aging and wear on various electrical equipment and support steel. Breaker replacements were observed to have been taken place during the 2016 study. It was observed that two decommissioned OCBs were being stored onsite which should be properly disposed of soon. Figure 4-10 shows an example of an aging transformer.

Figure 4-10: Aging Transformer in Central Islip Substation

4.2.2.10 8KW West Bus

The 8KW West Bus substation, built in 2012, is in very good condition, very well maintained, and very clean. This is a much newer substation than most in the system. Equipment for this substation is split between two fenced substation yards with the transformers in one area and breakers and other equipment in the separate area. Figure 4-11 shows some of the steel structure and a breaker in the substation.

Figure 4-11: West Bus Substation



4.2.2.11 8KD Holtsville DRSS

The 8KD Holtsville substation, built in 2013, is in very good condition, well maintained, and clean. The equipment and structures within the substation do not show a lot of weathering. Figure 4-12 is a picture of the substation.

Figure 4-12: Holtsville DRSS Substation



4.2.2.12 8KR Holtsville LNG

The 8KR Holtsville LNG substation appears to be in suitable condition and the site was clean. There are signs of aging and wear on the electrical equipment and steel supports on site. Figure 4-13 shows the switchgear cabinets with a transformer in the background.

Figure 4-13: Holtsville LNG Substation



4.2.2.13 8C Sills Road

The 8C Sills Road substation is functionally acceptable, in suitable condition, and very clean. The facility was built in 2007 and 2008 and has been well maintained as shown in Figure 4-14.

Figure 4-14: Sills Road Substation



4.2.2.14 6P Pulaski

The 6P Pulaski substation was in good condition and clean. During the site inspection it was noticed that a microwave antenna pole is tilted and may have recently been struck by a vehicle inside the station. The pole should be repaired, and equipment tested. Figure 4-15 shows microwave antenna tilting in one direction along with other substation equipment.

Figure 4-15: Pulaski Substation



4.3 Distribution Plant

LIPA reports the distribution system included approximately 14,000 primary circuit miles of overhead and underground line (9,000 miles of overhead line and 5,000 miles of underground line). As of December 31, 2019, there were 152 substations throughout the service area that step down the transmission voltage to distribution levels. A portion of the poles on which LIPA's distribution facilities have been installed are owned by Verizon and used by LIPA pursuant to a joint-use agreement.

4.4 Major Maintenance and Capital Improvements

Capital and deferred expenditures including Nine Mile Point 2 for 2018 and 2019 respectively were \$639.9 million and \$685.8 million. Such expenditures included reliability enhancements, capability expansion, new customer connections, facility replacements and public works. Capital expenditures for 2020 in the approved budget are \$820.4 million. The capital expenditure program provides for a continuation of programs to maintain reliability and quality of electric service, as well as a significant effort in improving system resiliency through a multi-year storm-hardening program.

4.5 Power Supply and Electric Load

LIPA receives power supply from National Grid Generation LLC (GENCO) facilities, the NMP2 facility, the FitzPatrick Nuclear Power Plant, and Independent Power Producers (IPPs) on Long Island and elsewhere. Table 4-3 displays the capacity and energy breakdown between power supplies for LIPA over the previous 5 years. On average, LIPA receives approximately 9 percent of its energy through their proportionate share of NMP2 generation, 22 percent GENCO power, and 69 percent through other IPPs and spot purchases.

Table 4-3: Historical Power Supply

	2015	2016	2017	2018	2019
Peak Demand (MW)	5,049	5,212	4,945	5,206	5,269
Capacity					
Nuclear	224	224	224	233	232
Purchased Capacity					
GENCO	3,686	3,688	3,702	3,691	3,702
Other Purchased	1,909	1,870	1,881	1,838	1,824
Total Capacity	5,819	5,782	5,807	5,762	5,758
Reserve Margin					
MW	770	570	862	556	488
Percent	15.3%	10.9%	17.4%	10.7%	9.3%
Energy (MWh)					
Nuclear	1,986,063	1,813,889	1,947,060	1,822,388	2,021,035
Purchased Energy					
GENCO	5,050,927	4,561,580	3,288,276	4,530,019	3,780,336
Other Purchased	14,023,527	14,588,093	14,960,379	14,420,675	14,302,701
Total Energy	21,060,517	20,963,562	20,195,715	20,773,082	20,104,072
Energy (MWh)					
Nuclear	9.43%	8.65%	9.64%	8.77%	10.05%
Purchased Energy					
GENCO	23.98%	21.76%	16.28%	21.81%	18.80%
Other Purchased	66.59%	69.59%	74.08%	69.42%	71.14%

In 2009, LIPA initiated a 10-year energy efficiency program, Efficiency Long Island (ELI), which planned to reduce demand by 520 MW. Current projections estimate a decline in peak demand of approximately 750 MW by 2030. In addition, the Authority has put in place several renewable energy programs.

4.5.1 Outstanding Power Supply Requests for Proposals

In October 2013, the Board adopted a Solar Feed-In Tariff (“Solar FIT II”) for up to 100 MW and a non-solar Feed-In Tariff (“Other FIT”) for up to 20 MW. The Solar FIT II evaluation has been completed, approximately 82 MW of projects were selected. As of April 7, 2020, 23 projects totaling 32.19 MWs

have executed power purchase agreements out of which 22 projects (30.57 MW) are in operation; 1 project (1.61 MW) is under construction. 10.2 MW of proposals were selected for the non-solar Other FIT of which 3 projects have withdrawn and 3 projects totaling 6.0 MW have executed a power purchase agreement and are under construction as of April 16, 2020.

In December 2015, the Authority issued a Request for Proposals (“RFP”) for Renewable Capacity and Energy (the “2015 Renewable RFP”) and on May 18, 2016, posted for public comment a Feed-in Tariff for Commercial Solar Photovoltaic Renewable Resources for up to 20 MW (“FIT III”) and a Fuel Cell Feed-in Tariff for up to 40 MW (“FIT IV”). Responses to the 2015 Renewable RFP were received on June 22, 2016 and evaluation results were presented to the Board with the selection of two projects at the July 26, 2017 Board meeting. The Long Island Solar Calverton project, a 22.9 MW solar generation was approved by the Office of the NYS Comptroller in June 2020. The Riverhead Solar 2 project, a 36 MW solar project, is currently undergoing the Article 10 process. Upon successful contract negotiations and Article 10 process completion, the Board is expected to act on the Riverhead Solar 2 power purchase agreement.

The Feed-in Tariffs, FIT III and FIT IV, were approved by the Board at the September 21, 2016 Board meeting. As of April 7, 2020, FIT III has a total of 35 projects (total 19.98 MW) comprising of 12 projects completed (7.15 MW), 14 active projects with a PPA totaling 7.25 MWs and nine projects awaiting a PPA (5.58 MW). The FIT III program closed for new applications on February 1, 2020 and is at its capacity with three applications totaling 1.45 MW remaining on waitlist. For FIT IV, three projects totaling 39.8 MW were selected to satisfy the 40 MW requirement. One 7.4 MW FIT IV project has executed a power purchase agreement.

4.5.2 Resource Plan

PSEG-LI conducted an Integrated Resource Plan (“IRP”) that concluded in mid-2017, which analyzed the generation and transmission investments LIPA may need to initiate over 20 years (2016-2035). Decisions on needs identified beyond the next several years will be deferred until after a future IRP study, as changing electric grid conditions could alter future investment. The forecasted need for power plants in 2030 on Long Island has declined by 1,700 megawatts (24%) since 2013, the equivalent of 3-5 large baseload central station power plants. This reduction is primarily due to greater adoption of energy efficiency and rooftop solar and is consistent with state and national trends.

The Governor in his 2019 State of the State Address introduced the Green New Deal plan. That plan was largely incorporated into the Climate Leadership and Community Protection Act (“CLCPA”), which was

signed into law by the Governor on July 18, 2019. On April 8, 2020, the Energy Planning Board amended its State Energy Plan (the “SEP”), which was released in 2015 and coordinates state agencies that impact energy policy in light of the enactment of the CLCPA. As amended, the SEP sets the following clean energy and climate targets for the State to meet: (i) a 40% reduction in greenhouse gas (“GHG”) emissions from 1990 levels by 2030; (ii) 70% of electric generation from renewable energy sources by 2030; (iii) 185 trillion BTU increase in on-site energy savings from 2015 baseline by 2025; (iv) 100% carbon free electricity by 2040; (v) 85% reduction in GHG emissions from 1990 levels by 2050; (vi) 9,000 MW of offshore wind by 2035; (vii) 6,000 MW of distributed solar by 2025; (viii) 3,000 MW of energy storage by 2030; and (ix) 40% goal, and a minimum target of 35%, of overall benefits from investments in clean energy and energy efficiency to be realized by disadvantaged communities. Furthermore, the amended SEP adds a new initiative to establish a sustainable electric generation facility cessation mitigation program, calling on state entities to advance strategies to mitigate the impact of power plant closures on hosting communities.

The full impact of the CLCPA on many segments of the economy will be detailed in regulations over the coming years. The Climate Action Council, provided for under CLCPA, has begun work on the Scoping Plan to accomplish the transition called for in CLCPA. The Scoping Plan is due by January 2023. The Authority’s Chief Executive Officer is a statutory member of the 22-member Climate Action Council. The implementation of CLCPA will fundamentally change the existing generation supply portfolio for the State and Long Island over the next two decades. Pursuant to, among other things, the IRP conducted by PSEG Long Island in 2017, the Authority’s decision to forego new fossil-fuel baseload generation, and its procurement of the State’s first offshore wind farm, LIPA is positioned to address the State’s renewable energy goals through 2024. However, the Authority cannot predict with specificity at this time, the various effects these developments will have on the business, operations and financial condition of the Authority or LIPA.

At its July 26, 2017 meeting, the Board adopted a Policy on Resource Planning, Energy Efficiency and Renewable Energy that requires LIPA to meet its share of the State’s renewable energy goals. The next IRP will provide a resource plan that is consistent with the CLCPA.

As part of the IRP, PSEG-LI reviewed the Caithness II proposal to build a new plant, and the Authority issued feasibility studies of the repowering proposals for both Port Jefferson and E.F. Barrett steam plants. Because of the excess generation capacity reflected in the IRP, Authority staff recommended to the LIPA Board of Trustees that LIPA not contract for new baseload combined cycle power plants or repower existing steam plants. The Brattle Group provided an independent second opinion of PSEG-LI’s

reliability planning criteria and the proposals for certain combined cycle plants (Caithness II and the repowering of the Barrett and Port Jefferson). The DPS also participated in the Brattle Group review and provided a recommendation to LIPA. In May 2020, LIPA issued a Repowering Feasibility Study for the Northport Power Station. The report found no compelling reason to repower the Station to maintain its existing capacity. Moreover, all the repowering scenarios studied would increase customer costs.

The Authority and PSEG-LI are also participating in the development of the State's Offshore Wind Master Plan, which involves efforts to license and procure sufficient offshore wind resources to meet the State's goal of 9,000 MW of such resources by 2035. It is expected that about one third of those resources will likely be interconnected to the LIPA T&D System, studies are underway to examine the need for transmission reinforcements and flexible resources (e.g., peaking plants and energy storage) to enable the reliable and cost-effective integration of offshore wind into the local and regional power grid.

Notwithstanding the adequacy of overall system resources, the existing resources and transmission system on the South Fork of Long Island are not adequate to support anticipated load growth through 2030. To address these deficiencies, an RFP requesting approximately 63 MW of efficiency, direct load control, renewable energy, storage and conventional generation to defer the need for new transmission through 2022 was issued on June 24, 2015 (South Fork RFP). As a result of the South Fork RFP, the Authority entered into two 20-year contracts for 5-megawatt storage batteries, expected to store energy for use to meet peak loads and a 20-year purchase power agreement for a 90 MW windfarm to be installed in Federal waters approximately 30 miles east of Montauk, NY off the coast of Long Island. PSEG-LI also procured approximately 8 MW of demand reduction through programs to be conducted by a contractor. LIPA agreed to purchase an additional 40-megawatts of clean energy from the project—extra energy available from improving turbine technology.

LIPA currently has several contracts to buy energy from waste facilities. Beneficially, these contracts do not contain minimum obligations and LIPA only pays when the energy is delivered.

4.6 System Reliability

LIPA is committed to providing reliable electric service. Three common measurements used to track reliability are the Customer Average Interruption Duration Index (CAIDI), System Average Interruption Duration Index (SAIDI), and the System Average Interruption Frequency Index for Interruptions (SAIFI). CAIDI is measured by dividing the sum of all customer interruption duration in minutes by the total number of customer interruptions. SAIDI is similar to the CAIDI measurement, but the interruption duration is divided by total number of customers served by the system. SAIFI provides an estimate for

expected ratio of customers to be interrupted annually and is calculated by dividing the total number of customers interrupted by the total number of customers served. Over the past 20 years, LIPA's investments in the transmission and distribution system have resulted in LIPA being the most reliable overhead electric utility in New York State based on SAIDI minutes, SAIFI interruptions/year, and CAIDI minutes measurements. Results for these metrics over the previous five years are displayed in Table 4-4.

Table 4-4: Reliability Measurements

	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>5-Year Average</u>
SAIDI (Minutes)	65.70	75.50	65.80	65.20	51.40	59.21
SAIFI (Interruptions/Year)	0.84	1.11	0.95	0.86	0.67	0.81
CAIDI (Minutes)	78.50	68.30	69.30	76.10	76.30	73.43

Beginning in 2016, the Authority and PSEG-LI began several initiatives to improve the reliability and resiliency of the T&D System, including adopting new tree-trimming standards and a new multi-year storm hardening initiative. Since that time, the average outage duration for each customer served has declined from 75.5 minutes in 2016 to 51.4 minutes in 2019 (a 32% decline). The number of customers experiencing multiple sustained outages (4 or more outages per year) has declined from 70,248 in 2016 to 14,477 in 2019 (a 79% decline), while the average number of momentary interruptions experienced by customers has declined from 3.92 in 2016 to 2.41 in 2019 (a 39% decline).

5.0 FINANCIAL ASSESSMENT

The financial results of the electric system for the two-year period ended December 31, 2019 are provided herein.

5.1 Electric Rates

5.1.1 Rate Covenant

Provisions of Electric System General Revenue Bond Resolution, adopted May 13, 1998, as supplemented and amended from time to time, mandates LIPA establish service rates and collect fees sufficient to pay all expenses associated with utility operations including maintaining the appropriate level of reserves as well as maintaining an annual minimum debt service coverage of 100 percent. The debt service coverage minimum has been reduced from 120 to 100 percent, because LIPA has retired, other than from proceeds of Bonds or Subordinated Indebtedness, an amount equal to 25 percent of the Acquisition Debt net of the then outstanding balance of the Promissory Notes. The Rate Covenant provisions of the General Resolution states the following:

“The Authority shall review, or cause the Subsidiary to review, the adequacy of System fees, rates, rents, charges and surcharges at least annually. If such annual or more frequent review, or the report of the Rate Consultant pursuant to Section 702, indicates that the rates, fees, rents, charges and surcharges are, or will be, insufficient to meet the requirements of this Section 701, the Authority shall promptly take, or cause the Subsidiary to take, the necessary action to cure or avoid any such deficiency except as otherwise may be provided by subsection (d) of this Section.”

5.1.2 Regulation

The Authority is operated under the direction of the Board of Trustees. The Authority has the power to determine and alter rates charged without needing approval of the PSC. The Authority agreed that it would not impose any permanent increase, nor extend or reestablish any portion of a temporary rate increase, in average customer rates over a 12 month period in excess of 2.5 percent without a positive recommendation from the PSC, following a full evidentiary hearing. Under the LIPA Reform Act, that Public Authority Control Board (PACB) condition has been superseded by the rate-setting process which provides for DPS review of any future rate proposal that leads to aggregate revenues of the Authority to increase by more than 2.5 percent on an annual basis.

Throughout the study period no rate proposal was submitted to the DPS. However, LIPA provides DPS with the annual budget and rate adjustments.

LIPA's base retail electric rates generally reflect traditional rate designs and include fixed customer charges for all customer classes, seasonal energy rates for all customer classes except street lighting, and seasonally differentiated demand charges for non-residential customer classes (greater than 7 kW). Economic development and load retention incentives are provided to a small number of commercial customers. Miscellaneous service charges, pole attachment charges, and wireless rental rates are also assessed on a monthly basis. In addition to the base delivery service charges, the Authority's charges include a Power Supply Charge, a PILOT payments recovery rider (described below), a rider providing for the recovery of the Suffolk Property Tax Settlement, a Distributed Energy Resources Charge to recover the costs of LIPA's customer-side efficiency and renewable programs (formerly known as the Energy Efficiency and Renewable Resource Charge), a Revenue Decoupling Mechanism (described below), a Delivery Service Adjustment Charge (described below) and the New York State Assessment Charge to recover the cost of the Temporary State Energy and Utility Conservation Assessment and Department of Public Service Assessment (authorized by Public Service Law Section 18-a and the LIPA Reform Act).

The Delivery Service Adjustment provides cost recovery for certain items that can vary significantly due to external factors, which items include, among others: debt service (variances in interest rates, capital expenditures and savings derived from UDSA's financings); and storm expenditures (variances from the amounts budgeted for storm restoration expenses in base rates). The Delivery Service Adjustment is expected to be calculated through the end of September each year, which allows for the bill impact to be known in advance of annual budget approval. Any adjustment would be implemented on the following January 1st and reviewed by DPS.

In addition, the Recommendation affirmed the Authority's use of a "Revenue Decoupling Mechanism." The Authority's Board initially modified its tariff to establish a Revenue Decoupling Mechanism in March 2015 as an "Adjustment to Rates and Charges," which PSEG-LI is authorized to calculate and update each year according to the pre-defined terms of the tariff. All six of the major New York state electric utilities have Revenue Decoupling Mechanisms within their tariffs for delivery service. Mechanically, Revenue Decoupling Mechanisms function by comparing actual revenues with authorized revenues and crediting (or collecting) any differences to (or from) customers in a subsequent period; it is intended to cover all sources of variances in delivery service revenues including, among other things, any net lost revenues attributable to the implementation of energy efficiency or net metering programs, any revenue variances (positive or negative) caused by weather patterns, and revenue variances (positive or negative) that result from changes in economic conditions.

5.2 Financial Results

The total revenue of LIPA for the two-year period ended December 31, 2019 included revenue from charges for electric service, wholesale services, as well as miscellaneous revenues from items such as rents, late payment charges, reconnection fees, etc. LIPA's auditor, KPMG LLP, performs an annual review of the Rate Covenant to determine compliance with the requirement of the General Resolution. The evaluation process of Rate Covenant compliance completed by LIPA's independent auditor include a comparison of all line item amounts presented for the Rate Covenant Calculation, recalculation of mathematical accuracy for both Rate Covenant Calculations and coverage calculations, and a comparison of reported Rate Stabilization Fund balances to accompanying bank statements. For the periods of this review, LIPA calculations of the Rate Covenant, as reviewed by its independent accounting firm, shows that LIPA has complied with its financial obligations under the Resolution.

LIPA customers are billed for electric service based on rate schedules, tariffs, or contracts that reflect the costs to the utility of providing that service. For purposes of designing electric rates, customers with similar load and service characteristics should be placed in the same rate classification. LIPA currently provides electric service to nine residential retail service classes which has been reduced from thirteen classes. This was done through consolidation of several similar classes. Additionally, there are eight commercial customer classes, which has been consolidated from eleven.

5.2.1 Operating Results

Table 5-1 presents a summary of the energy sales, the number of customers, and the average energy usage per customer by class for 2018 and 2019. Total system energy sales were 19,610 GWh in 2018 and 18,800 GWh in 2019.

Table 5-1: Energy Sales and Customers by Class

	<u>2018</u>	<u>2019</u>
Energy Sales (MWh)		
Residential	9,538,865	9,075,913
Commercial and Industrial	9,515,232	9,249,787
Other	<u>556,139</u>	<u>474,911</u>
Total Sales	19,610,236	18,800,611
Customers		
Residential	1,011,492	1,015,662
Commercial and Industrial	115,445	115,908
Other	<u>5,468</u>	<u>5,618</u>
Total Customers	1,132,405	1,137,189
Energy per Customer (MWh/Customer)		
Residential	9.4	8.9
Commercial and Industrial	82.4	79.8
Other	<u>101.7</u>	<u>84.5</u>
Total Sales	17.3	16.5

Annual revenues from sales, revenue per kWh ratios, and average revenue per customer ratios for each customer classification are presented in Table 5-2. During the period of this report, total revenue from sales to electric customers was \$3.560 billion in 2018 and \$3.516 billion in 2019.

Table 5-2: Revenues and Sales Ratios by Class

	2018	2019
Revenue (\$000)		
Residential	\$ 1,910,427	\$ 1,850,891
Commercial and Industrial	1,555,927	1,582,981
Other	93,711	82,483
Total Revenue	<u>\$ 3,560,065</u>	<u>\$ 3,516,355</u>
Energy (MWh)		
Residential	9,538,865	9,075,913
Commercial and Industrial	9,515,232	9,249,787
Other	556,139	474,911
Total Sales	<u>19,610,236</u>	<u>18,800,611</u>
Customer		
Residential	1,011,492	1,015,662
Commercial and Industrial	115,445	115,908
Other	5,468	5,618
Total Customers	<u>1,132,405</u>	<u>1,137,189</u>
Revenue/kWh		
Residential	\$ 0.2003	\$ 0.2039
Commercial and Industrial	0.1635	0.1711
Other	0.1685	0.1737
Total Energy Sales	<u>\$ 0.1815</u>	<u>\$ 0.1870</u>
Revenue/Customer (\$/Customer)		
Residential	\$ 1,889	\$ 1,822
Commercial and Industrial	\$ 13,478	\$ 13,657
Other	\$ 17,138	\$ 14,681

LIPA's largest cost in providing electric service to its customers for each year of the period was the fossil fuels and the wholesale cost of power. LIPA purchased power from a number of different entities during the time of the study. Their largest supplier of power for both 2018 and 2019 was from various Independent Power Producers as shown previously in Table 4-3. The Fuel and Purchased Power costs are adjusted and collected monthly through the Power Supply Charge.

The significance of annual power supply cost and purchased power plus production is illustrated in Table 5-3. The top portion of the table shows net operating revenue as the difference between total revenues generated by the delivery rates and the recovery of power supply costs. The ratios of power supply cost to sales revenues were calculated for 2018 and 2019. As illustrated, LIPA's power supply costs as a percentage of sales revenues were 53 percent in 2018 and 51 percent in 2019.

Table 5-3: Net Revenue Margins and Unaccounted for Energy

	(\$000)	
	2018	2019
Net Revenue Margins		
Sales Revenues	3,560,065	3,516,355
Power Supply	<u>(1,885,600)</u>	<u>(1,799,907)</u>
Net Revenue Margin	1,674,465	1,716,448
Power Supply to Sales Ratio	53%	51%
Unaccounted for Energy (MWh)		
Power Supply	20,773,082	20,104,072
Energy Sales	<u>19,610,236</u>	<u>18,800,611</u>
Unaccounted for Energy Losses	1,162,846	1,303,461
Percentage	5.60%	6.48%

Table 5-3 also illustrates the ratio of the amount of energy purchased and delivered to the electric system to total energy sales. This relationship identifies the level of unaccounted for energy in the system. This unaccounted for energy is primarily attributable to transmission and local system line/transformer losses, and to a much lesser extent may include unmetered or inaccurately metered sales, or even theft, etc. The bottom portion of Table 5-3 presents these comparisons for LIPA for 2018 and 2019. As shown, the percentage ratio of the unaccounted for energy to the total energy purchased was 5.60 percent for 2018 and 6.48 percent for 2019.

Table 5-4 presents a re-creation of LIPA's Statement of Revenues, Expenses, and Changes in Net Assets for 2018 and 2019. As illustrated, the Excess of Revenues Over Expenses generated by LIPA were gains of \$22.7 million and \$24.0 million in 2018 and 2019, respectively.

Table 5-4: Statement of Revenues, Expenses, and Changes in Net Assets

(\$000)

	Actual	
	2018	2019
Electric Revenues	3,560,065	3,516,355
Operating Expenses		
Operations - Power Supply Charge	1,675,640	1,585,662
Operations - Power Supply Charge - Property Tax Related	209,960	214,245
Operations and Maintenance	615,859	623,499
Storm Restoration	90,463	86,549
General and Administrative	28,623	29,038
Depreciation and Amortization	331,860	362,344
Payments In-Lieu of Taxes and Assessments	332,691	336,500
Total Operating Expenses	3,285,096	3,237,837
Operating Income	274,969	278,518
Other Income and Deductions, Net	100,076	109,173
Excess of Revenues Over Expenses Before Interest Expense	375,045	387,691
Interest Expense		
Debt Service Interest Expense	361,283	373,314
Other Interest Expense and Fees	27,131	26,045
Subtotal Interest Expense	388,414	399,359
Other Interest Amortizations	(30,156)	(35,686)
Allowance for Borrowed Funds Used During Construction	(5,875)	-
Net Interest Expense	352,383	363,673
Excess of Revenues Over Expenses	22,662	24,018

5.2.2 Adequacy of Electric Rates

In order to determine if LIPA meets this requirement on an annual basis, LIPA performs a Rate Covenant calculation to ensure that rates are set at a level to meet operating cash needs plus debt service requirements. As shown in the table below, LIPA's coverage indicates that its rates are set at levels adequate to meet its annual obligations. As Table 5-5 illustrates, LIPA generated sufficient cash from operations to satisfy its rate covenant, as it exceeded the required 100 percent. Therefore, the revenues generated by the current electric rates have been sufficient to meet the applicable covenants of the General Resolution. Beginning in 2016, LIPA moved from a net income revenue requirement of \$75

million to a fixed obligation coverage revenue requirement. The target on LIPA's issued debt and capitalized leases was 1.40x in 2018 and 1.45x in 2019. When UDSA's restructuring bonds are included, the coverage ratio target was a minimum of 1.25x. This change was designed to help improve the debt ratings from Standard and Poor's, Moody's, and Fitch Ratings. The Authority has received four credit rating upgrades in aggregate across all three rating agencies since 2013, achieving Moody's, Standard & Poor's, and Fitch bond ratings of A3, A, and A, respectively.

Table 5-5: Rate Covenant Calculation

(\$000)

Cash Flows	2018	2019
Net Cash Provided by Operating Activities	\$ 741,578	\$651,733
Interest Income	23,010	33,684
Grant Proceeds	172,515	143,353
Cash receipts from Interest rate Swaps	35,293	35,832
Revenues per the Resolution	\$ 972,396	\$864,602
Cash Provided by Operating Activities - UDSA	(337,492)	(308,172)
Capital Leases	274,554	256,886
Available for Coverage	<u>\$ 909,458</u>	<u>\$813,316</u>
Senior Lien Debt	\$ 227,910	\$255,635
Coverage on LIPA Senior Lein Debt Service (x)	3.99	3.18
Senior Lien and Subordinated Debt	\$ 228,522	\$255,635
Coverage on Senior Lien and Subordinated Debt (x)	3.98	3.18
Total Debt Service	\$ 228,522	\$255,635
Coverage on Total Debt (x)	3.98	3.18

5.3 Status of Revenue Bonds

At the end of 2019, LIPA had general revenue bonds, general revenue notes, general revenue commercial paper and restructuring bonds. Table 5-6 displays these outstanding debts during the Study Period. During 2018, debt increased by \$134.6 million compared to 2017. During 2019, debt increased by \$375.6 million compared to 2018.

Table 5-6: Outstanding Debt, Balance as of December 31

Outstanding Debt	(\$000)		
	2017	2018	2019
General Revenue Bonds/ Notes	3,214,214	3,597,465	4,046,296
UDSA Restructuring Bonds	4,262,396	4,139,593	4,008,832
General Revenue Notes	12,820	5,000	2,000
General Revenue Commercial Paper Notes	97,500	229,500	290,000
Subordinate Commercial Paper Notes	250,000	-	-
Total Outstanding Debt	7,836,930	7,971,558	8,347,128

Table 5-7 illustrates the debt service schedule for the outstanding bonds and notes for both LIPA and UDSA as of December 31, 2019. The principal and interest and the annual total are shown. As of December 31, 2019, LIPA had a total of \$8.173 billion of outstanding debt principal and a total obligation of \$12.697 billion.

Table 5-7: Debt Service Schedule

(Including UDSA)
(\$000)

Due	Principal [1]	Interest	Net Swap Payments	Total
2020	227,917	345,419	18,848	592,184
2021	279,379	339,103	18,854	637,336
2022	300,741	328,909	18,851	648,501
2023	322,060	317,179	18,851	658,090
2024	343,740	304,283	18,848	666,871
2025-2029	1,938,105	1,294,321	73,526	3,305,952
2030-2034	2,133,140	855,831	(7,102)	2,981,869
2035-2039	1,688,275	442,124	-	2,130,399
2040-2044	717,310	121,459	-	838,769
2044-2049	222,010	15,192	-	237,202
	8,172,677	4,363,820	160,676	12,697,173

[1] Future interest on Capital Appreciation Bonds are included in principal maturities

5.4 FEMA Grants

In 2014, LIPA and FEMA signed a Letter of Undertaking (LOU) under Section 428 the Stafford Act that totaled approximately \$1.4 billion to assist LIPA in funding the costs associated with restoration efforts after Hurricane Sandy and storm hardening efforts designed to mitigate future damage from weather related events. Projects related to storm hardening and damage caused by Superstorm Sandy are eligible for a 90 percent reimbursement through this grant.

As of December 31, 2019, LIPA had received \$1.1 billion under the 428 Grant Agreement, and \$90.3 million under the Community Development Block Grant (CDBG). These funds reimbursed LIPA for funds spent on restoration efforts related to Superstorm Sandy. The remaining dollars will be used to reimburse LIPA for storm hardening and mitigation efforts provided for under the grant. The Authority maintains an account for the unused portion on the grants. As of December 31, 2019, there was approximately \$1.7 million remaining.

6.0 CONCLUSIONS

In the preparation of this Report, Burns & McDonnell completed assessments of the electric generating stations and the transmission and distribution system of the Authority. The investigations included interviews, observations, and reviews of 2018 through 2019 expenditures and 2020 and 2021 budgets. In addition, a review of the adequacy of the revenues generated by the current electric rates in relation to the requirements of the bond covenants was completed.

Based on statements and information provided, as well as the observations and reviews performed, it is the opinion of Burns & McDonnell that:

1. The Authority and PSEG-LI have provided services adequate for operation, maintenance, and repair of the system during the Study Period, January 1, 2018 to December 31, 2019.
2. The Authority's electric transmission and distribution system and the associated facilities, including the Nine Mile Point 2 Generating Station partially owned by the Authority, are being operated and maintained consistent with accepted electric utility practice in the United States.
3. For the Forecast Period, it is reasonable to expect the Authority and PSEG-LI will continue to provide services adequate for operation, maintenance, and repair of the system consistent with that experienced during the Study Period.
4. The Authority continues to be one of the most reliable overhead electric utilities in New York State based on SAIDI, SAIFI, and CAIDI measurements.
5. LIPA continues to invest in its facilities, including storm-hardening program efforts. These investments provide improved system resiliency. Burns & McDonnell observed some of the system upgrades and improvements made throughout the Study period.
6. Revenues for the Study Period are sufficient to cover operation, maintenance, and repair expenses for the system during the Forecast Period. The electric revenues generated by the current electric rates are sufficient to fulfill the debt service coverage requirements defined in the covenants of the Resolutions.
7. The Authority is complying with the provisions of the Resolutions, each as amended by subsequent resolutions.

8. As of the date of this Biennial Report, the system is in good repair and sound operating condition to reliably deliver capacity and energy to the Authority's customers.



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