BURNS McDONNELL

Biennial Report for the Years Ended December 31, 2016 and December 31, 2017

LIPA
Long Island Power Authority

Long Island Power Authority

Project No. 108026

8/31/2018

Biennial Report for the Years Ended December 31, 2016 and December 31, 2017

prepared for

Long Island Power Authority
Uniondale, New York

Project No. 108026

8/31/2018

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

August 31, 2018

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, 2016 and December 31, 2017
Project Number 108026

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, 2017 (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.

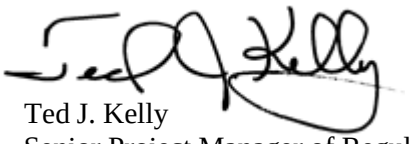
In the preparation of the Report, Burns & McDonnell reviewed documents pertaining to the generation system and completed assessments of the transmission and distribution system of the Authority. Assessments involved interviews, observations, and review of annual expenditures from 2016 through 2017 and the year 2018 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



Ted J. Kelly
Senior Project Manager of Regulatory Services

TJK/apc

INDEX

Long Island Power Authority
Biennial Report for the Years Ended
December 31, 2016 and December 31, 2017
Project No. 108026

Report Index

TABLE OF CONTENTS

Page No.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
CAIDI	Customer Average Interruption Duration Index
CEO	Chief Executive Officer
CL&P	Connecticut Light & Power
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
NRC	Nuclear Regulatory Commission

Abbreviation	Term/Phrase/Name
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, 2017, 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 Engineering Co., Inc. 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 2017, the maximum annual peak demand for the Authority reached 4,945 megawatts (MW). Total system electric revenues were $3.481 billion in 2017.

Table 1-1 provides summary information on annual retail energy sales and total electric revenues during the 2013 through 2017 period.

Table 1-1: Historical Sales and Customers

	2013	2014	2015	2016	2017
Peak Demand (MW)	5,602	4,859	5,049	5,212	4,945
Energy (MWh)					
Residential	9,536,151	9,389,926	9,611,160	9,463,401	9,088,624
Commercial and Industrial	9,800,324	9,700,047	9,730,214	9,581,965	9,401,246
Other	594,617	597,089	584,264	554,624	557,344
Total Sales	19,931,093	19,687,062	19,925,638	19,599,990	19,047,214
Lost and Unaccounted For	1,414,620	1,098,435	1,134,879	1,363,571	1,147,961
Total Energy Requirements	21,345,713	20,785,497	21,060,517	20,963,561	20,195,175
System Load Factor (Percent)	43.5%	48.8%	47.6%	45.9%	46.6%
Customer					
Residential	996,442	999,565	1,002,942	1,005,751	1,008,486
Commercial and Industrial	114,692	114,663	114,648	115,033	115,358
Other	5,149	5,094	5,514	5,608	5,593
Total Customers	1,116,283	1,119,322	1,123,104	1,126,392	1,129,437
Total Electric Revenues ($000)	$3,755,832	$3,613,982	$3,505,209	$ 3,399,101	$ 3,481,613

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, 2017.

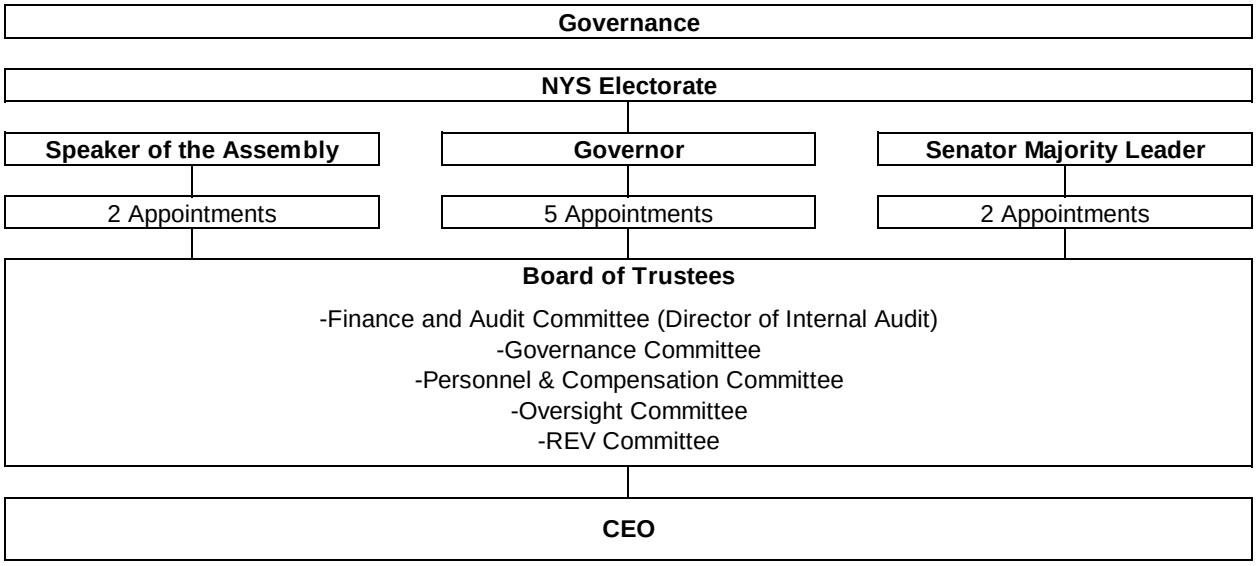
1.3 Organization and Management

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 assumed the role of Chief of Staff in which he performed the day-to-day activities of CEO effective August 31, 2015. On March 21, 2016, Mr. Falcone was appointed CEO. 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 ranged from 19,599 GWh in 2016 to 19,047 GWh in 2017. During the period of this Report, total revenue from sales to electric customers was $3.399 billion for 2016 and $3.481 billion for 2017. The change was driven primarily by variations in the cost of fuel and purchased power.

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 2017, the Authority had outstanding revenue bonds, general revenue notes, subordinate commercial paper notes, a revolving credit facility agreement, and restructuring bonds issued by UDSA. During 2016, debt increased by $78 million compared to 2015. During 2017, debt increased by $109

million compared to 2016 resulting from the issuance of UDSA bonds but was partially offset by a reduction in General Revenue Bonds. As of December 31, 2017 LIPA had a total of $7.837 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, 2016 to December 31, 2017.

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 has been taking steps to meet load growth on the South Fork, such as entering into two 20-year contracts each 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-megawatt windfarm to be installed in Federal waters approximately 30 miles east of Montauk, NY off the coast of Long Island that will be operational by 2022.

5. The Authority continues to be one of the most reliable overhead electric utilities in New York State based on SAIDI, SAIFI, and CAIDI measurements.

6. 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.

7. 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.

8. The Authority is complying with the provisions of the Resolutions, each as amended by subsequent resolutions.

9. 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

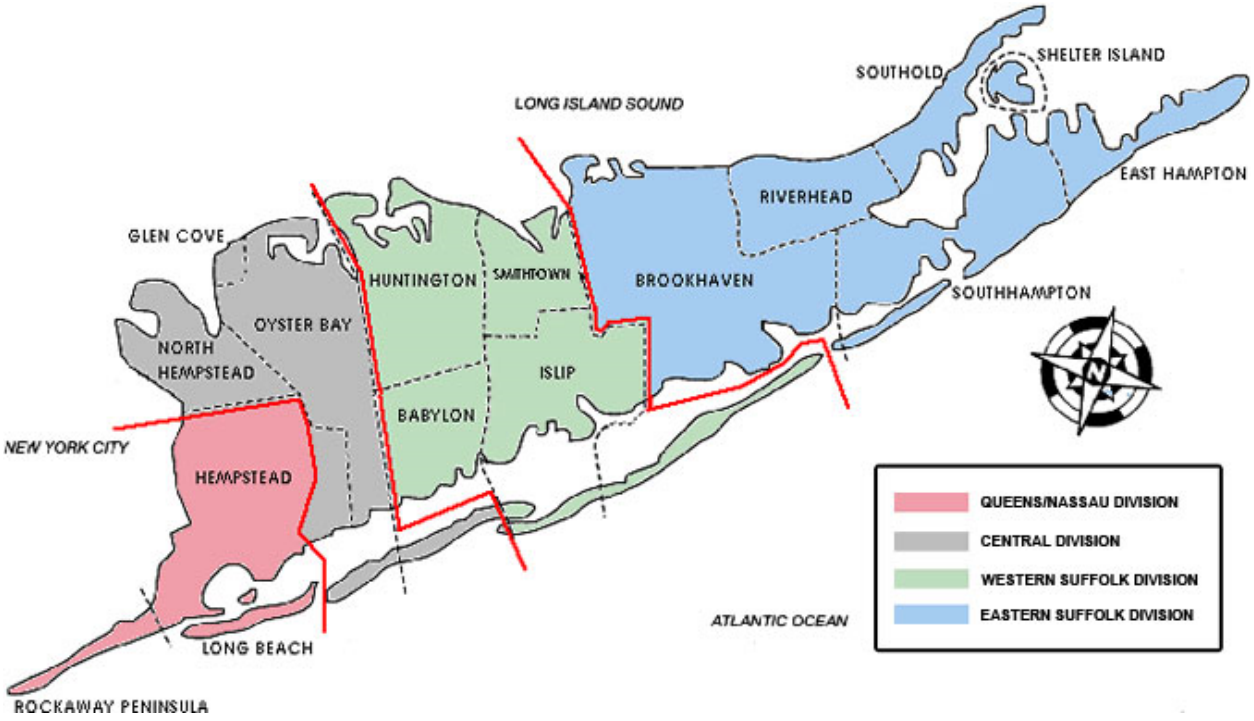
The Authority is a corporate municipal instrumentality and political subdivision of the State of New York authorized under the Long Island Power Authority Act (the Act). The Authority became retail supplier of electric service in most of Nassau and Suffolk Counties and the Rockaway Peninsula of Queens 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 no longer provides 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 utilites: 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, 2017, LIPA served approximately 1.1 million retail electric customers, of whom approximately 89 percent were residential users. During the year ending December 31, 2017, residential customers provided approximately 47.7 percent of LIPA's annual retail electric revenues and commercial customers provided approximately 49.3 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.

Summary information on annual retail energy sales and retail electric revenues within the Service Area during the 2013 through 2017 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, 2017.

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 is 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 2016 through 2017 and 2018 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

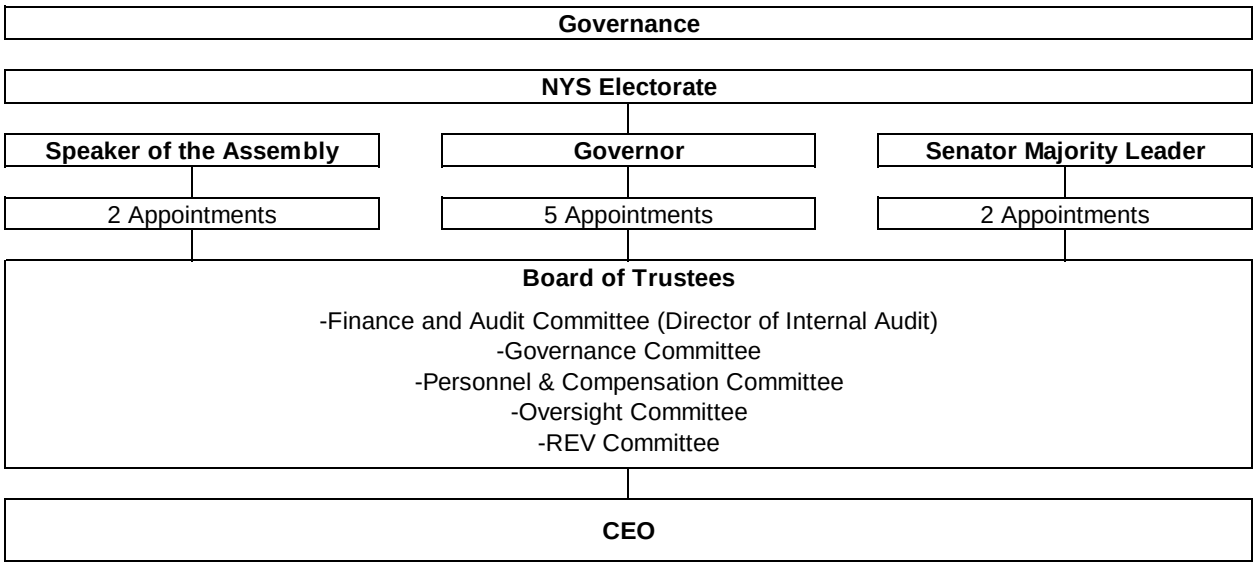
Operations, performance, and costs are managed by the Authority. The management team includes engineering, legal, financial, accounting, and management professionals. The organization of this management team is described below. Through a competitive procurement process, the Authority selected Public Service Electric 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. 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 have changed and now consist of the finance and audit, governance, personnel and compensation, oversight, and REV committees. Figure 3-1 provides the Board of Trustees organization during the biennial study period.

Figure 3-1: Trustees Organization During Study Period

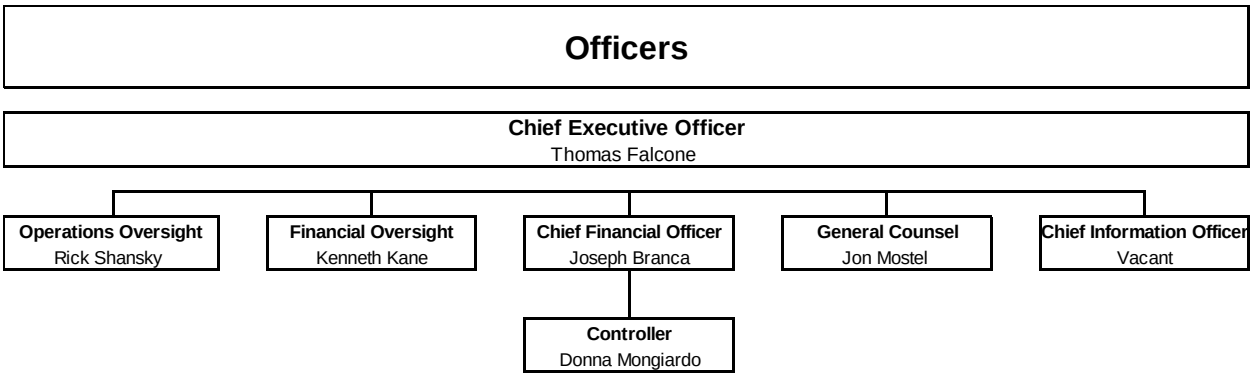


3.1.2 Authority Management

3.1.2.1 Chief Executive Officer

Effective August 31, 2015, Thomas Falcone assumed the role of Chief of Staff in which he performed the day-to-day activities of CEO. On March 21, 2016 Mr. Falcone was appointed CEO. The management structure as of December 31, 2017 is depicted in Figure 3-2.

Figure 3-2: LIPA Management During Study Period



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. Authorize 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, 2017, 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 2018 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 debt service coverage requirement defined in the General Resolution, which states:

"The Authority shall 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) 120% (except, after the Authority shall have retired, other than from proceeds of Bonds or Subordinated Indebtedness, an amount equal to 25% of the

Acquisition Debt net of the then outstanding balance of the Promissory Notes, 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

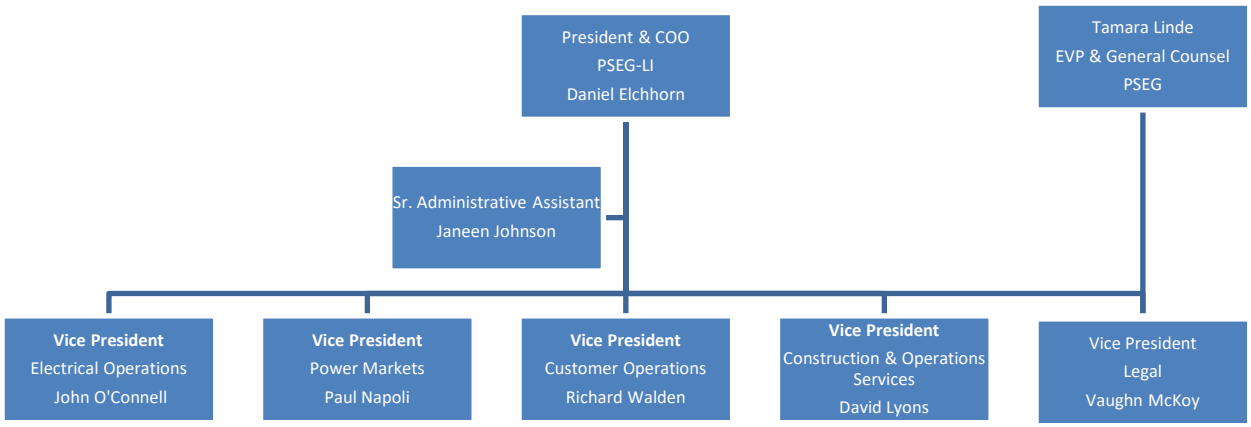
The Authority is empowered to set rates for electric service in the service area without being required by law to obtain approval of the PSC, DPS or any other State regulatory body. However, the Authority agreed in connection with the approval of the LIPA/LILCO Merger by the PACB in 1997 that it would 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 the 2018-2020 rate proposal, as well as 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. On December 16, 2015 a three year rate plan authorized the Authority to set rates designed to adjust revenue requirements for 2016, 2017, 2018. This would result in a cumulative increase of $325.4 million over the three year rate plan.

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 (2017)



4.0 ELECTRIC SYSTEM AND SERVICE

LIPA's electric system primarily consists of transmission and distribution assets and an 18 percent partial 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 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 $558 million in 2016 and $545 million in 2017.

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 2011-2017. 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

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

Year	Annual Net Generation (MWh)	Annual Net Capacity Factor	Three Year Average Net Capacity Factor	Industry Average Net Capacity Factor
2011	1,707,140	92.9	94.6	89.1
2012	1,470,928	81.3	89.6	85.5
2013	1,954,492	95.5	93.2	89.9
2014	1,754,463	85.7	89.5	91.7
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	92.2

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 and distribution 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, 2017, LIPA reported the transmission system consisted of approximately 1,350 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.

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, the gravel in substations has been maintained in fair condition. In some locations, gravel was not spread evenly and left some spots bare or very deep. Deep spots prevents vehicles from driving across those areas without getting stuck. Totally bare areas could lead to puddling and mud pits in the event of heavy rains, as can be seen in Figure 4-2. Burns & McDonnell recommends ensuring that these areas are graded properly to allow proper drainage and passage of vehicles.

Figure 4-2: Bare Ground Spots within Substation

4.2.2.1 9A Riverhead

The 9A Riverhead Substation is in good condition and the site was clean. The process of replacing the older OCBs (Oil Circuit Breakers) with GCBs (Gas Circuit Breakers) which was planned when the substation was visited two years ago has now been completed at this site. Burns & McDonnell noted in the previous report that some of the decommissioned OCBs along with transformers and other decommissioned equipment remained within the substation and replacement equipment such as electrical bushings were seen within the substation in open crates. These materials were removed prior to our current substation inspection.

Figure 4-3: OCB in 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. Figure 4-4 provides evidence of the current site condition.

Figure 4-4: 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 4-5 shows the condition of a transformer located in this substation.

Figure 4-5: 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 is service is being stored in the substation yard. Figure 4.6 shows both some of the bare ground and an example of equipment being stored.

Figure 4-6: Bare Ground and Spare Equipment Transformer in Substation

4.2.2.5 8T Eastport

Overall the 8T Eastport substation is in working and suitable condition. The substation shows signs of aging equipment, poorly graded gravel, and exposed concrete bases that no longer has equipment on it. Large areas of the substation have no gravel covering it leaving substation equipment and workers exposed to dirt, sand, and hard soil. Painted dotted lines on the ground indicate preparation for construction work on the site. Figure 4-7 provides an example of aging equipment.

Figure 4-7: Aging Transformer in 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 in this substation has been replaced in recent years as evidenced by the transformer shown in Figure 4-8.

Figure 4-8: Transformer in Substation

4.2.2.7 9Z Amagansett

Overall the 9Z Amagansett substation appears to be in generally good condition. Some of the equipment in the substation has been replaced recently while other equipment shows significant signs of age. Figure 4-9 provides pictures with evidence of the two extremes.

Figure 4-9: Different Condition of Substation Equipment

4.2.2.8 6DL Pilgrim

The 6DL Pilgrim substation appears to be in suitable and working condition. The substation site was clean and well maintained. During the site visit, PSEG-LI crews were in the process of draining oil from a transformer that had failed, as can be seen in Figure 4-10. Once this effort was complete the transformer was to be removed and a replacement transformer was to be installed. Various equipment in this substation shows signs of aging and wear which is expected over time.

Figure 4-10: Oil Removal Process from Failed Transformer

4.2.2.9 7DM Central Islip

Overall the 7DM Central Islip substation appears to be in suitable and working condition. There are signs of aging and wear on various mechanical and structural equipment. Breaker replacement and other substation upgrades have been completed since the last time the site was visited in completing the 2014 study. Additional breakers and equipment that is to be installed in the substation was on site and waiting for the work to begin. This substation is clear evidence that PSEG-LI is maintaining and upgrading facilities in a prudent manner. Figure 4-11 shows an example of upgraded substation equipment.

Figure 4-11: Upgraded Equipment Installed in Substation

4.2.2.10 8KW West Bus

The 8KW West Bus substation 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, etc. in the separate area. Figure 4-12 shows some of the steel structure and a breaker in the substation.

Figure 4-12: West Bus Substation

4.2.2.11 8KD Holtsville DRSS

The 8KD Holtsville substation is also in very good condition, well maintained, and clean. Equipment does not show a lot of weathering. Figure 4-13 is a picture of the substation

Figure 4-13: Holtsville DRSS Substation

4.2.2.12 8KR Holtsville LNG

The 8KR Holtsville LNG substation appears to be in good condition and the site was clean. There are some signs of aging and wear on the mechanical and infrastructure equipment on site. Figure 4-14 shows the switchgear cabinets with a transformer in the background.

Figure 4-14: Holtsville LNG Substation

4.2.2.13 8C Sills Road

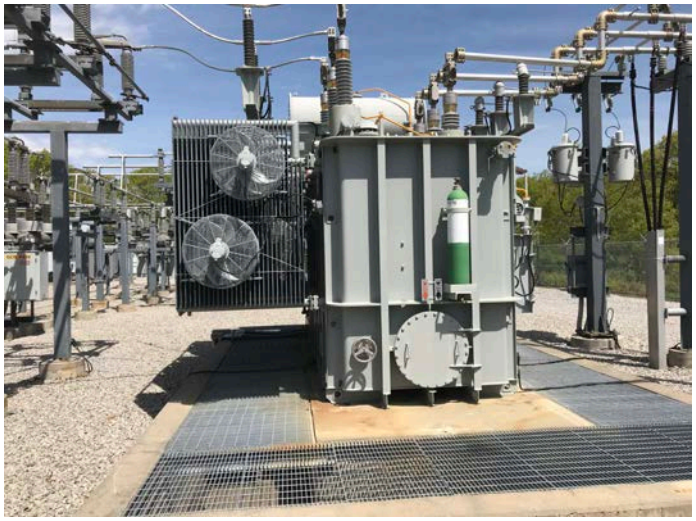
The 8C Sills Road substation is in good working condition and very clean. The facility is newer and is being maintained well. Evidence of equipment upgrades in the control house are shown in Figure 4-15. The Sills Road Substation 8C Entry gate was very difficult to open. Maintenance should be performed on this gate to allow crews needing access to the substation improved and easier access.

Figure 4-15: Sills Road Controls Equipment

4.2.2.14 6P Pulaski

The 6P Pulaski substation was in good condition and clean. Safety cones and painted lines on the ground provided an indication of planned work in the substation. Figure 4-16 shows equipment located in the substation.

Figure 4-16: Pulaski Substation Transformer



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, 2017, there were 178 substations providing service to load via distribution transformers connected to the 138 kV and 69 kV buses. Approximately 43.5 percent 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 2016 and 2017 respectively were planned at approximately $685.1 million and $716.5 million. Such expenditures included reliability enhancements, capability expansion, new customer connections, facility replacements and public works. Capital expenditures for 2018 in the approved budget are approximately $756.7 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, and Independent Power Producers 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 8 percent of its energy through their proportionate share of NMP2 generation, 24 percent GENCO power, and 68 percent through other Independent Power Producers and spot purchases.

Table 4-3: Historical Power Supply

	2013	2014	2015	2016	2017
Peak Demand (MW)	5,602	4,859	5,049	5,212	4,945
Capacity					
Nuclear	224	224	224	224	224
Purchased Capacity					
GENCO	3,679	3,679	3,686	3,688	3,676
Other Purchased	2,111	1,979	1,909	1,870	1,881
Total Capacity	6,014	5,882	5,819	5,782	5,781
Reserve Margin					
MW	412	1,023	770	570	836
Percent	7.4%	21.1%	15.3%	10.9%	16.9%
Energy (MWh)					
Nuclear	1,954,492	1,754,463	1,986,063	1,813,889	1,947,060
Purchased Energy					
GENCO	4,823,499	4,558,391	5,050,927	4,561,580	3,288,276
Other Purchased	14,567,722	14,472,643	14,023,527	14,588,093	14,960,379
Total Energy	21,345,713	20,785,497	21,060,517	20,963,562	20,195,715
Energy (MWh)					
Nuclear	9.16%	8.44%	9.43%	8.65%	9.64%
Purchased Energy					
GENCO	22.60%	21.93%	23.98%	21.76%	16.28%
Other Purchased	68.25%	69.63%	66.59%	69.59%	74.08%

In 2009, LIPA initiated a 10 year energy efficiency program, Efficiency Long Island (ELI), which planned to reduce demand by 520 MW. In addition, the Authority has put in place renewable energy programs.

In October 2013, the Authority issued an RFP for up to 280 MW of new, On-Island, Renewable Capacity and Energy (the "Renewables RFP"). On December 17, 2014, the Board of Trustees adopted the staff recommendation for the Renewables RFP to commence negotiations for 11 photovoltaic contracts totaling 122 MW that would begin operation in late 2016 and beyond. Since then six projects totaling 63 MW gave notice of withdrawing their proposals due to permitting and site location issues. Four contracts have been executed, a 24.9 MW contract with Shoreham Solar Commons, two 2 MW contracts with Kings Park Solar, and a 20 MW contract with sPower, all of which are under development. The Shoreham Solar Commons project began commercial operations on July 1, 2018. Contract negotiations for the remaining projects continue, pending completion of their State Environmental Quality Review Act ("SEQRA") processes.

In June 2012, the Board of Trustees adopted a solar Feed-In Tariff ("Solar FIT I") for up to 50 MW of solar projects connected to the Authority's electric grid. In October 2013, the Board of Trustees adopted a second 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. Solar FIT I awarded approximately 43 MW of projects. As of June 1, 2018, 38.8 MW of these projects are operational or under construction. The Solar FIT II evaluation has been completed and approximately 82 MW of projects were selected. Executed power purchase agreements in the amount of 38.2 MW have been executed, 15.0 MW are under operation, 9.4 MW are under construction, and an additional 8.7 MW (6 projects) are undergoing final evaluation by developers or the power purchase agreements are being finalized. Proposals in the amount of 10.2 MW were selected for the nonsolar Other FIT 2, three projects have withdrawn and three projects totaling 6.0 MW have executed a power purchase agreement.

In December 2015, the Authority issued 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 of Trustees with the selection of two projects at the July 26, 2017 Board meeting. Power purchase agreement negotiations are underway for Riverhead Solar 2, a 36 MW solar project, and Long Island Solar Calverton, a 22.9 MW solar project. Both projects have a projected COD of December 31, 2020. Upon contract negotiations and environmental process completion (SEQRA or Article 10), the Board is expected to act on the power purchase agreements.

The new Feed-In Tariffs, FIT III and FIT IV, were approved by the Board of Trustees at the September 21, 2016 Board meeting. The evaluation of FIT III and FIT IV proposals, received by January 31, 2017, was subsequently presented to the Board of Trustees at the July 26, 2017 Board meeting. For FIT III, twenty-one projects totaling 13.367 MW were initially selected. The program remains open until February 1, 2019 for additional projects up to an aggregate cap of 20 MW. As of June 1, 2018, of the total 37 applications received, 20 have withdrawn. There were 10.1 MW of active FIT III projects with six projects totaling 4.2 MW with executed PPAs. For FIT IV, three projects totaling 39.8 MW were selected to satisfy the 40 MW requirement.

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 State has adopted a 50 percent renewable by 2030 goal, which dictates that each electric utility supply an increasing share of its energy needs each year from renewable generation. 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. As projected in the IRP, LIPA's share could involve the addition of approximately 800 megawatts of new renewable generation by 2030 or the purchase of an equivalent amount of renewable energy certificates (RECs) through NYSERDA's renewable energy program.

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 repowerings of the Barrett and Port Jefferson). The DPS also participated in the Brattle Group review and provided a recommendation to LIPA.

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 2,400 MW of such resources by 2030. As a significant portion of those resources will likely be interconnected to the 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 that will be

operational by 2022. PSEG-LI also procured approximately 8 MW of demand reduction through programs to be conducted by a contractor.

4.6 Power Quality

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 19 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 three years are displayed in Table 4-4.

Table 4-4: Power Quality Measurements

	2013	2014	2015	2016	2017	5-Year Average
SAIDI (Minutes)	47.9	59.1	65.7	75.5	65.8	59.5
SAIFI (Interruptions/Year)	0.71	0.72	0.84	1.10	0.95	0.82
CAIDI (Minutes)	67.6	81.6	78.6	68.4	69.0	72.6

5.0 FINANCIAL ASSESSMENT

The financial results of the electric system for the two-year period ended December 31, 2017 are provided herein.

5.1 Electric Rates

5.1.1 Rates 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 approval of 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 the 2018-2020 rate proposals, as well as any future rate proposal that leads to aggregate revenues of the Authority to increase by more than 2.5 percent on an annual basis.

On January 30, 2015, a three-year rate plan for the period 2016-2018 was submitted by PSEG-LI and the Auhority for review by DPS. On Septemebr 28, 2015, the DPS submitted its rate recommendation to the

Authority's Board (the "Recommendation"). The Recommendation was for the Authority to set rates designed to increase revenues by $30.4 million in 2016, $77.6 million in 2017, and $79 million in 2018, which rates represented a cumulative revenue requirement increase of $325.4 million.

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 seven 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 (referenced in the Tariff as the Fuel and Purchased Power Cost Adjustment Rate or FPPCA), 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 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).

In October 2012, the Power Supply Charge tariff was modified to allow for 100 percent recovery of LIPA's power supply costs and to transition from a quarterly update process to a monthly basis consistent with the other major New York state electric utilities.

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 approximately $50 million per year budgeted for storm 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, 2017 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 2017. Total system energy sales ranged from 19,599 GWh in 2016 to 19,047 GWh in 2017.

Table 5-1: Energy Sales and Customers by Class

	2016	2017
Energy Sales (MWh)		
Residential	9,463,401	9,088,624
Commercial and Industrial	9,581,965	9,401,245
Other	554,624	557,344
Total Sales	19,599,990	19,047,213
Customers		
Residential	1,005,751	1,008,486
Commercial and Industrial	115,033	115,358
Other	5,608	5,593
Total Customers	1,126,392	1,129,437
Energy per Customer (MWh/Customer)		
Residential	9.4	9.0
Commercial and Industrial	83.3	81.5
Other	98.9	99.7
Total Sales	17.4	16.9

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 $3.399 billion in 2016 and $3.481 billion in 2017. The Fuel and Purchased Power costs are adjusted and collected monthly through the Fuel and Purchased Power Cost Adjustment (FPPCA).

Table 5-2: Revenues and Sales Ratios by Class

	2016	2017
Revenue ($000)		
Residential	$ 1,815,921	$ 1,843,735
Commercial and Industrial	1,492,815	1,544,607
Other	90,365	93,271
Total Revenue	$ 3,399,101	$ 3,481,613
Energy (MWh)		
Residential	9,463,401	9,088,624
Commercial and Industrial	9,581,965	9,401,246
Other	554,624	557,344
Total Sales	19,599,990	19,047,214
Customer		
Residential	1,005,751	1,008,486
Commercial and Industrial	115,033	115,358
Other	5,608	5,593
Total Customers	1,126,392	1,129,437
Revenue/kWh		
Residential	$ 0.1919	$ 0.2029
Commercial and Industrial	0.1558	0.1643
Other	0.1629	0.1673
Total Energy Sales	$ 0.1734	$ 0.1828
Revenue/Customer ($/Customer)		
Residential	$ 1,806	$ 1,828
Commercial and Industrial	$ 12,977	$ 13,390
Other	$ 16,114	$ 16,676

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 2016 and 2017 was from various Independent Power Producers as shown previously in Table 4-3.

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 2016 and 2017. As illustrated, LIPA's power supply costs as a percentage of sales revenues were 54 percent in 2016 and 53 percent in 2017.

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

($000)

	2016	2017
Net Revenue Margins		
Sales Revenues	$ 3,399,101	$ 3,481,613
Power Supply	(1,827,809)	(1,842,507)
Net Revenue Margin	$ 1,571,292	$ 1,639,106
Power Supply to Sales Ratio	54%	53%
Unaccounted for Energy (MWh)		
Power Supply	20,963,562	20,195,175
Energy Sales	19,599,991	19,047,214
Unaccounted for Energy Losses	1,363,571	1,147,961
Percentage	6.50%	5.68%

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 2016 and 2017. As shown, the percentage ratio of the unaccounted for energy to the total energy purchased was 6.50 percent for 2016 and 5.68 percent for 2017.

Table 5-4 presents a re-creation of LIPA's Statement of Revenues, Expenses, and Changes in Net Assets for 2016 and 2017. As illustrated, the Excess of Revenues Over Expenses generated by LIPA in 2016 was a loss of $26.4 million. In 2017, LIPA generated excess revenues of $17.1 million. The primary factor contributing to the gain is higher electric revenues, net of power supply charges and related property taxes.

Table 5-4: Historical Operating Results

($000)

	Actual	
	2016	**2017**
Electric Revenues	$ 3,399,101	$ 3,481,613
Operating Expenses		
Operations - Power Supply Charge	$ 1,610,604	$ 1,631,475
Operations - Power Supply Charge - Property Tax Related	217,205	211,112
Operations and Maintenance	572,714	638,944
Storm Restoration	112,337	66,574
General and Administrative	27,582	31,648
Depreciation and Amortization	294,051	308,755
Payments In-Lieu of Taxes and Assessments	328,860	325,609
Total Operating Expenses	$ 3,163,353	$ 3,214,117
Operating Income	$ 235,748	$ 267,496
Other Income and Deductions, Net	$ 87,628	$ 85,697
Excess of Revenues Over Expenses Before Interest Expense	$ 323,376	$ 353,193
Interest Expense		
Debt Service Interest Expense	$ 331,354	$ 342,552
Other Interest Expense and Fees	32,458	25,936
Subtotal Interest Expense	$ 363,812	$ 368,488
Other Interest Amortizations	$ (10,469)	$ (26,513)
Allowance for Borrowed Funds Used During Construction	$ (3,534)	$ (5,904)
Net Interest Expense	$ 349,809	$ 336,071
Excess of Revenues Over Expenses	$ (26,433)	$ 17,122

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 insure 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 targets on LIPA issued debt of 1.20, 1.30, and 1.40 for 2016 through 2018 respectively. When UDSA's restructuring bonds are included, those coverage ratio targets are a minimum of 1.15x, 1.20x, and 1.25x in 2016, 2017, and 2018, respectively. This change is designed to help improve the debt ratings from Standard and Poor's, Moody's, and Fitch Ratings. Moody's upgraded the Authority's ratings from Baa1 to A3 in mid-August.

Table 5-5: Rate Covenant Calculation

($000)

Cash Flows	2016	2017
Net Cash Provided by Operating Activities	$ 625,060	$ 691,919
Interest Income	12,498	25,215
Grant Proceeds	16,841	29,794
Cash receipts from Interest rate Swaps	12,263	25,998
Revenues per the Resolution	$ 666,662	$ 772,926
Cash Provided by Operating Activities - UDSA	(254,698)	(276,849)
Capital Leases	318,530	308,276
Available for Coverage	$ 730,494	$ 804,353
Senior Lien Debt	$ 313,815	$ 466,211
Coverage on LIPA Senior Lein Debt Service (x)	2.33	1.73
Senior Lien and Subordinated Debt	$ 315,230	$ 468,851
Coverage on Senior Lien and Subordinated Debt (x)	2.32	1.72
Total Debt Service	$ 315,230	$ 468,851
Coverage on Total Debt (x)	2.32	1.72

5.3 Status of Revenue Bonds

At the end of 2017, LIPA had general revenue bonds, general revenue notes, and restructuring bonds. Table 5-6 displays these outstanding debts during the Study period. During 2016, debt increased by $78 million compared to 2015. During 2017, debt increased by $109 million compared to 2016.

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

($000)

Outstanding Debt	2015	2016	2017
General Revenue Bonds/ Notes	$ 4,380,595	$ 3,356,972	$ 3,214,214
Subordinated Revenue Bonds	-	-	-
UDSA Restructuring Bonds	2,919,439	3,965,529	4,262,396
General Revenue Notes	-	-	12,820
General Revenue Commercial Paper Notes	50,000	155,625	97,500
Subordinate Commercial Paper Notes	300,000	250,000	250,000
	$ 7,650,034	$ 7,728,126	$ 7,836,930

Table 5-7 illustrates the debt service schedule for the outstanding bonds and notes for both LIPA and UDSA as of December 31, 2017. The principal and interest and the annual total are shown. As of December 31, 2017 LIPA had a total of $7.639 billion of outstanding debt principal and a total obligation of $12.293 billion including $4.262 billion of UDSA bonds.

Table 5-7: Debt Service Schedule

(Including UDSA)
($000)

Due	Principal [1]	Interest	Net Swap Payments	Total
2018	$ 192,683	$ 319,176	$ 16,726	$ 528,585
2019	192,191	317,841	16,726	526,758
2020	225,417	313,216	16,738	555,371
2021	290,879	306,058	16,728	613,665
2022	296,241	295,512	16,726	608,479
2023-2027	1,685,275	1,285,095	83,672	3,054,042
2028-2032	2,057,750	911,392	2,146	2,971,288
2033-2037	1,395,055	510,104	(1,103)	1,904,056
2038-2042	1,037,175	195,476	-	1,232,651
2043-2047	266,460	31,744	-	298,204
	$ 7,639,126	$ 4,485,614	$ 168,359	$ 12,293,099

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, 2017 LIPA had received $1.11 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 any additional restoration charges properly supported by the former service provider and 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, 2017 there was $276 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 2016 through 2017 expenditures and 2018 and 2019 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, 2016 to December 31, 2017.

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 has been taking steps to meet load growth on the South Fork, such as entering into two 20-year contracts each 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-megawatt windfarm to be installed in Federal waters approximately 30 miles east of Montauk, NY off the coast of Long Island that will be operational by 2022.

5. The Authority continues to be one of the most reliable overhead electric utilities in New York State based on SAIDI, SAIFI, and CAIDI measurements.

6. 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.

7. 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.

8. The Authority is complying with the provisions of the Resolutions, each as amended by subsequent resolutions.

9. 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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Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com