STATE OF NEW YORK

PUBLIC SERVICE COMMISSION

CASE 16-G-0058 - Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of KeySpan Gas East Corp. dba Brooklyn Union of L.I. for Gas Service.

Testimony of Richard L. Levitan and Alexander J. Mattfolk

On behalf of the Long Island Power Authority

May 20, 2016

I. Qualifications & Summary

Q Panel, please state your names and occupations, and describe your company.

A Our names are Richard L. Levitan, President of Levitan & Associates, Inc. (LAI) and Alexander J. Mattfolk, Executive Consultant at LAI. Our business address is 100 Summer Street, Suite 3200, Boston, MA 02110.

LAI is a management consulting firm specializing in power market design, pipeline infrastructure, energy procurement analytics, and economics. Since its founding in 1989, LAI has conducted many assignments in New York, New England, and other wholesale gas and electric markets throughout North America. These assignments have encompassed diverse matters pertaining to generation and transmission project evaluations, wholesale energy and capacity price forecasts, retail price impacts, competitive power market design, power plant valuation, bulk power security, power and fuel procurements, contract structures, gas/electric interdependencies, natural gas infrastructure, and risk management. LAI's clients include utilities, generators, Independent System Operators (ISOs), Regional Transmission Organizations (RTOs), end-users, state regulatory commissions, and financial institutions.

Q Please describe your educational background and qualifications.

A I, Richard L. Levitan, have 38 years of experience in the energy industry. Since founding LAI in 1989, I have provided ISOs / RTOs and utilities with a broad range of commercial and strategic advisory services related to wholesale market design, infrastructure adequacy, energy procurement, pricing, and valuation. Since the early 2000's, I advised Long Island Power Authority (LIPA) on many matters pertaining to fuel supply, including interstate pipeline and local distribution service. I provided LIPA's senior management with technical support regarding the commercial agreements governing transportation and imbalance resolution on Long Island, including technical support to LIPA's executive management regarding the March 22, 2007 Omnibus Gas Transportation and Balancing Agreement with KeySpan Gas East Corporation d/b/a KeySpan Energy Delivery Long Island (KEDLI). I served as project manager on LAI's procurement support efforts culminating in contracts for transmission service on Neptune Regional Transmission System and Cross Sound Cable, including the upstream commitments to support LIPA's election of Unforced Deliverability Rights. Elsewhere I have been responsible for wholesale power procurements and contracting activities in Connecticut, New Jersey, Maryland, New York, and California. I served as the LAI officer in charge of the multi-year gas/electric interdependency study funded by the Department of Energy (DOE) for the Eastern Interconnection Planning Collaborative (EIPC).

I conducted long-term resource planning studies for the Maryland Public Service Commission, including the assessment of offshore and onshore wind projects to meet Maryland's RPS requirements. I managed LAI's efforts as Agent for New Jersey's Long-term Capacity Agreement Pilot Program, resulting in contract awards to three projects totaling 2,000 MW. I have testified many times before state and provincial regulatory commissions, at the Federal Energy Regulatory Commission (FERC), and in civil litigations. Prior to forming LAI in 1989, I was a Vice President of Stone & Webster Management Consultants, Inc., and Manager of the Boston office. Prior to joining Stone & Webster, I was an Economist at Pacific Gas & Electric Co. I hold a B.A. degree from Cornell University (Arts & Sciences), and a Master's degree from Harvard University where I specialized in Energy Economics. My resume can be found in Exhibit No. ____(RLL/AJM-1).

I, Alexander J. Mattfolk, have 5 years of experience in the energy industry. I have acted as LIPA's representative in ISO committees and task forces. LAI assisted LIPA with the preparation of positions for proposals and votes in the stakeholder process for NYISO, PJM, and ISO-NE. I also presented a regional survey of imbalance resolution procedures to LIPA and PSEG Energy Resources & Trade (PSEG-ER&T) management. I provided research and analytic support on NYISO's and the other RTOs' behalf for the

EIPC gas-electric study as well as the New York Control Area (NYCA) Pipeline Congestion and Infrastructure Adequacy Assessment report. In Target 1 of the EIPC study, I conducted a review of gas transportation tariffs for electric generation customers in the Eastern Interconnection. This review included gas utilities serving electric generation in New York State. For the NYCA report, I analyzed emissions from dual fuel generation units to determine fuel switching characteristics. In addition to my work on gas/electric interdependencies, I am responsible for electric production simulation analyses using the AURORAxmp platform. Working on behalf of project developers, utilities, and state regulatory commissions, I have been part of the LAI team providing technical support covering wholesale market design, procurement analytics, and economic analysis. I graduated from the Massachusetts Institute of Technology with a B.S. degree in Chemical Engineering. My resume can be found in Exhibit No. ____(RLL/AJM-2).

Q Have you undertaken significant engagements for NYISO, other energy companies in New York, and neighboring RTOs that relate to natural gas infrastructure?

A Yes. LAI has undertaken a number of studies for NYISO pertaining to pipeline and storage infrastructure adequacy to meet the needs of core local distribution company (LDC) load and gas-fired generators. We have performed substantially similar studies for neighboring RTOs as well. As

previously mentioned, LAI completed a landmark, multi-year study for NYISO, PJM, ISO-NE, Midcontinent Independent System Operator, Tennessee Valley Authority, and the Independent Electricity System Operator of Ontario on gas/electric interdependencies. Funded by DOE, this technical assessment of pipeline and storage infrastructure addressed the resiliency of the gas network when gas or electric contingencies were postulated, regional and local deliverability conditions under a broad array of market scenarios, and the economics of liquid fuel versus incremental firm transportation to ensure capacity performance during cold snaps. The studies undertaken for EIPC also included an encyclopedic delineation of all gas transmission and storage infrastructure and gas-fired generation across the Eastern Interconnection.

Over the years, LAI has also conducted many resource planning studies for Consolidated Edison Company of New York (Con Edison), including contract administration of the utility's long term power purchase agreements. We provided the New York Power Authority (NYPA) with wholesale power procurement services that ultimately supported the selection of the Astoria Energy II combined cycle plant in New York City (NYC), including pipeline and local transportation assessment. Initially, we advised NYISO on the establishment of the Demand Curve parameters. Later, we advised all of the other in-City generators in Zone J on the NYISO Demand Curve Reset

parameters, excluding NYPA. We advised the State University Construction Fund on the operational and economic merit of combined heat and power systems at twenty-six universities and colleges. We provided power system engineering and economic / financial modeling support to Cornell University, Rochester Institute of Technology, University of Rochester, and New York University on the design and installation of combined heat and power systems.

Q For whom are you submitting this testimony?

A LAI is submitting this testimony on behalf of LIPA.

Q What services does LIPA receive from KEDLI?

A LIPA has contracted for transportation service for natural gas on the KEDLI distribution system on Long Island to serve generating stations for which it has long term tolling agreements for the purpose of supplying electricity to its customers on Long Island. This natural gas is acquired by LIPA's fuel supply agent PSEG-ER&T.

Q What is the relationship between PSEG-ER&T and LIPA?

A In November 2013 LIPA entered into two long term agreements with PSEG-ER&T, a subsidiary of PSEG, for the express purpose of both acquiring all of the natural gas and fuel oil for the generation plants that LIPA has contracted for under long term tolling agreements and to provide power supply management services for these same generation facilities. LIPA also has

long term transmission service agreements with companies that link neighboring power pools with Long Island; hence, PSEG-ER&T is also responsible for scheduling energy across the cables under contract to LIPA. PSEG-ER&T provides these services as an agent for LIPA pursuant to fee based contracts. All of the cost responsibility for fuel, transportation and power related services are borne by LIPA's ratepayers. For purposes of this testimony any reference to PSEG-ER&T will reflect the actions taken by PSEG-ER&T on behalf of LIPA as its agent in the above noted agreements.

Q What is the purpose of your testimony?

A LAI was retained to review the reasonableness of the KEDLI Service Classification 14 (SC-14) tariff governing gas transportation and imbalance resolution service on Long Island. LAI has reviewed LIPA's Gas Transportation and Balancing Agreements with KEDLI and also compared KEDLI's imbalance resolution procedure with like tariff provisions of other LDCs doing business on the New York Facilities System, elsewhere in New York State, and in the greater Northeast (New Jersey and New England). The main purpose of our testimony is threefold: first, to address the reasonableness of KEDLI's SC-14 tariff, in particular, the imbalance resolution procedure in relation to other LDCs; second, to identify significant problems underlying KEDLI's cashout mechanism, including the distributional consequences on Long Island and across NYCA; and, third, to

recommend desirable structural changes to the SC-14 tariff in order to alleviate the economic and operational pressure attributable to these tariff provisions the cost of which is ultimately borne by LIPA's ratepayers.

Q What are your primary findings and observations?

A We have five primary findings and observations. First, the existing KEDLI tariff governing imbalance resolution, daily tolerances and cashouts is arbitrary and unreasonable. In our view, these unusual tariff provisions undermine economic efficiency objectives, creating potential distortions in wholesale electric energy prices. Second, on days in which gas system conditions are normal, the existing KEDLI tariff incorporates punitive and comparatively severe cost premiums in relation to other LDCs doing business across the New York Facilities System, NYCA, New Jersey and New England. In contrast, KEDLI's regulated affiliates doing business in Massachusetts and Rhode Island have imbalance resolution procedures that are more equitable and comparatively more efficient than those of KEDLI. During cold snaps, in particular, when KEDLI alerts customers that system delivery conditions are badly constrained, the existing KEDLI tariff imposes a heavy penalty if LIPA uses more gas for power generation than is delivered into the system. We recognize the validity of the heavy penalty to protect local gas system integrity during cold snaps or outage contingencies that can materialize from time to time during the non-heating season, but nevertheless

find fault with related attributes of KEDLI's cashout mechanism that go beyond what is necessary to encourage strict scheduling discipline. Third, the existing KEDLI tariff was formulated in the late 1990's before industry restructuring was implemented and prior to the implementation of NYISO's scheduling protocols in the Day Ahead (DA) and Real Time Market (RTM). A fresh look at the KEDLI tariff to meet the needs of gas-fired generators on Long Island is recommended in the broader context of gas/electric interdependencies associated with bulk power security across NYISO as well as gas system integrity on Long Island. Fourth, many components in the SC-14 tariff are based on value of service, not cost of service principles. While value of service has always been a necessary part of rate design, various components in the SC-14 tariff unreasonably impose pancaking costs on LIPA's ratepayers that have little or nothing to do with KEDLI's ability to ensure gas system integrity either during cold snaps or normal operations. Certain components of the SC-14 tariff represent unwarranted transfer payments from LIPA's electric ratepayers to KEDLI's gas customers. And, fifth, LIPA's systematic exposure to high natural gas costs under the SC-14 tariff and Balancing Agreement has the potential to cause unnecessary scheduling of thermal generation on Long Island on oil rather than natural gas, a bad environmental outcome for Long Islanders in particular, and

society at large. In the body of our testimony we will explain the basis for each of the five findings in detail.

Q In addition to these five key findings and observations, are you able to propose recommended changes to the SC-14 tariff to create a more equitable balance between gas and electric ratepayer interests on Long Island?

A Yes. LAI recommends that KEDLI make several changes to its imbalance resolution practices:

- Eliminate the use of an irrelevant pricing index in the cashout calculation and weigh remaining indices according to citygate deliveries for power generation;
- Bring daily balancing charges in line with other LDCs in KEDLI's peer group, including by eliminating the $10 per Dth adder on overpulls greater than 10%; and,
- Review methods to cure or reduce imbalance charge exposure, particularly during mild operating conditions.

In sum, LAI recommends that the Commission take steps to modernize the SC-14 rate, thereby eliminating other components of the tariff that impose unwarranted transfer costs on LIPA's ratepayers.

The basis for each of these recommendations is set forth in detail in our testimony.

Q Please describe how your testimony is organized.

A The testimony is organized in ten sections with nine to follow:

I. Qualifications & Summary

II. How LIPA Uses Natural Gas and Interstate versus Local Transportation Services

III. Delineation of the SC-14 Rate

IV. Gas-Electric Scheduling and Coordination

V. Scheduling Plant Generation on Long Island on Backup Fuel

VI. Market Dynamics Affecting Gas Prices on Long Island

VII. Review of Other LDCs' Imbalance Resolution Procedures

VIII. Illustrative Economic Costs Borne by LIPA's Ratepayers

IX. Value of Service Principles Underlying KEDLI's SC-14 Rate

X. Recommendations and Mitigation Measures

Q Are you sponsoring any exhibits?

A Yes, we are sponsoring the following exhibits:

Exhibit No.	Description
Exhibit No. ____(RLL/AJM-1)	Resume of Richard L. Levitan
Exhibit No. ____(RLL/AJM-2)	Resume of Alexander J. Mattfolk
Exhibit No. ____(RLL/AJM-3)	Price History for Relevant Indices

Exhibit No. ____(RLL/AJM-4)	Day-Ahead Gas and Electric Day Schedules
Exhibit No. ____(RLL/AJM-5)	Pricing Index Locational Definitions
Exhibit No. ____(RLL/AJM-6)	Iroquois Receipts by Pipeline Interconnection
Exhibit No. ____(RLL/AJM-7)	Marcellus Gas Production
Exhibit No. ____(RLL/AJM-8)	Gas Deliveries into the New York Facilities System
Exhibit No. ____(RLL/AJM-9)	References to Balancing Provisions in Other LDCs' Tariffs
Exhibit No. ____(RLL/AJM-10)	Daily Cashout Tariff Rates for Surveyed LDCs
Exhibit No. ____(RLL/AJM-11)	Monthly Cashout Tariff Rates for Surveyed LDCs
Exhibit No. ____(RLL/AJM-12)	OFO and Unauthorized Use Tariff Rates for Surveyed LDCs

Q Were these exhibits prepared by you or under your supervision?

A Yes. All exhibits were prepared by us or under our supervision.

II. How LIPA Uses Natural Gas and Interstate versus Local Transportation Services

Q How much natural gas and oil fired generation is on Long Island?

A According to the 2016 Gold Book, there is 5,704 MW of installed generation on Long Island. About 512 MW is gas-only generation. About 1,395 MW is oil fired generation only. And, about 3,624 MW is dual fuel capable generation. Of the dual fuel generation, 2,300 MW represents gas and residual fuel oil-fired steam turbine generators located at Barrett, Port Jefferson and Northport.

Q Who owns generation on Long Island?

A Most of the generation on Long Island is owned by National Grid Generation, an affiliate of KEDLI, the owner and operator of the gas distribution system on Long Island. National Grid Generation owns the "Legacy Plants," which include all of the steam turbine generators and peakers at Northport, Port Jefferson and Barrett, as well as oil-fired peaking facilities elsewhere on Long Island. Prior to 1998, the Legacy Plants were owned and operated by the Long Island Lighting Company. Most of these units are dual fuel capable, but some are only oil-fired. A number of recent vintage peakers or smaller scale combined cycle plants are owned by Next Era Energy (formerly, FPL Energy), National Grid, Calpine, J-Power and the Village of Freeport. Nearly all of these facilities have entered into long term

tolling contracts to supply electricity to LIPA. A much larger, state-of-the art combined cycle plant is owned by Caithness Energy in Brookhaven and has also entered into a long term contract with LIPA. Finally, NYPA and Calpine own several natural gas-fired merchant plants on Long Island.

Q What is PSEG-ER&T's responsibility to obtain natural gas to fuel generation plants on Long Island?

A PSEG-ER&T is responsible for procuring natural gas for all plants that have tolling agreements with LIPA. Under an agency agreement with LIPA, PSEG-ER&T arranges for gas supply to be delivered on Long Island for delivery by KEDLI on the local distribution system. LIPA pays fees to the contracted generation plants to convert the fuel to electricity. In exchange for these fees, LIPA takes title to the electricity produced by the power plants on Long Island to serve its ratepayers on Long Island. Through these tolling arrangements, the costs of gas used to generate electricity for LIPA's ratepayers, including transportation service, are passed through directly to LIPA's ratepayers. Local transportation service from the terminus of each interstate pipeline to the many plant gates across Long Island is provided by KEDLI. Local transportation to the plants serving LIPA is on an interruptible transportation rate, plus adders for swing, taxes, lost and

unaccounted for gas, imbalance resolution, the Minimum Bill Obligation (MBO), and the Value Added Charge (VAC)[1].

Q Is PSEG-ER&T also responsible for managing the inventory and replenishment of oil at the various dual-fuel capable generation units on Long Island?

A Yes. PSEG-ER&T must obtain and manage the inventory of different oil types at all of the plants in order to ensure performance when operating conditions at the local level do not accommodate local transportation of natural gas to various generation plants on Long Island. The cost of different oil types used at power plants on Long Island is also passed through directly to LIPA's ratepayers.

Q Do the arrangements PSEG-ER&T and LIPA have put in place to bundle natural gas with interstate pipeline services also include local transportation service from the terminus of each pipeline to the generation plant?

A No. PSEG-ER&T's agreements for gas commodity purchases effectively package commodity supply sourced from the Marcellus shale formation, Gulf Coast or Canada with the pipeline transportation services required to deliver

[1] LIPA's transportation and balancing agreements with KEDLI utilize some or all of these components on a plant-by-plant basis.

natural gas on the Transcontinental Pipeline (Transco) at Long Beach or Iroquois Gas Transmission System (Iroquois) at South Commack and Northport. As described above, the last leg of the supply chain at the local level is provided by KEDLI under the interruptible transportation service to all plants under contract with LIPA. The Caithness combined cycle plant in Brookhaven is served by KEDLI under a firm transportation rate.

Q What are balancing pools covering generation assets under LIPA's agreement(s) with KEDLI?

A Balancing pools are groups of generators used to aggregate gas nominations and usage of customer facilities in order to calculate imbalances at the end of the gas day. Within a balancing pool, underpulls at one facility can offset overpulls at another facility. Two pools created in LIPA's Operational Balancing Agreement with KEDLI are used to conduct imbalance resolution under SC-14. Pool A includes the Port Jefferson, EF Barrett, PPL Edgewood, Bayswater Far Rockaway, Calpine Bethpage, Freeport Equus, and Pinelawn generation facilities. Balancing Pool B only covers generation at Northport. Balancing Pool C covers Caithness.

III. <u>Delineation of the SC-14 Rate</u>

Q Does KEDLI have different transportation rates and prices for electric generation?

A Yes. KEDLI's SC-14 tariff offers a fully interruptible service and a 30-day interruptible service. The rate for the 30-day interruptible service is higher than the fully interruptible service.

Q What is imbalance resolution and how does it work in the SC-14 tariff?

A Imbalance resolution provided by KEDLI allows LIPA to sell gas to KEDLI that was scheduled on Transco and/or Iroquois, but not used on any given day. It also allows LIPA to buy gas from KEDLI when LIPA needs more natural gas for purposes of fueling the generating plants than was otherwise scheduled. Overpulls cover daily transactions when LIPA uses more gas than scheduled. Underpulls cover daily transactions when LIPA uses less gas than scheduled. Daily imbalances at each plant are first netted against those of other plants serving LIPA within one of three balancing pools[2]. The sale and purchase of any net imbalances are cashed out each day. Under the SC-14 rate, surplus and deficiency imbalances are sold at a stated percentage of the lowest of, or purchased at a stated percentage of the highest of, the three leading price indices, *i.e.*, TZ6NY, TETCOM3 or IGTSZ2. We will discuss the indices in more depth later in this testimony.

Q Why do cashout charges matter to LIPA?

[2] Most plants are within a single balancing pool that is differentiated by pipeline receipt point (Iroquois or Transco), except for Northport and Caithness, which each comprise their own balancing "pool".

A Demand for electricity is inherently unpredictable and overpulls and underpulls inevitably occur. How KEDLI charges LIPA for imbalances matters because LIPA's ratepayers are adversely affected when charges for gas service are not cost-based, which can cause electric energy prices to be higher than they otherwise should be. Efficient wholesale electric market prices should reflect the underlying costs of producing electricity. Since KEDLI is LIPA's supplier and purchaser of last resort, its pricing must be fair and reasonable.

Q If LIPA's ratepayers are adversely affected by KEDLI's imbalance resolution provisions in the SC-14 rate, why doesn't LIPA reduce or eliminate overpulls and underpulls?

A In our opinion, the timing differences between the gas and electric days make it virtually impossible for gas-fired generators to always meet the tolerance requirements set forth in an LDC's imbalance resolution procedure. PSEG-ER&T on LIPA's behalf faces a related challenge when an Operating Flow Order (OFO) is issued. When this happens, each pool must deliver an amount of gas sufficient to meet its daily burn. In an hourly OFO a ratable amount is required throughout the gas day, but not necessarily requiring all hourly gas burns to be scheduled at $1/24^{th}$ the Maximum Daily Quantity (MDQ) by station. An OFO is an operational mechanism used by pipelines and LDCs throughout North America to protect system integrity. One way

for LIPA to meet the rigid KEDLI tolerance requirements set forth by the LDC's imbalance resolution procedure is to avoid them in total by scheduling generation on oil, not natural gas. Another way for PSEG-ER&T to meet the rigid hourly requirement is to schedule certain steam turbine generators at a fixed set point on natural gas, and schedule certain of the peakers on oil for purposes of load following and operating reserves. Certainly, the intra-day scheduling of gas for power generation causing hourly deviations in the use of natural gas is an industry phenomenon not unique to Long Island. We will address this operational dynamic more fully in Section IV.

Q How does PSEG-ER&T manage the need to balance electric supply and demand in real time?

A During real-time operation, PSEG-ER&T must make difficult decisions with incomplete data which determine whether or not operation will incur imbalances, and how to offer into the RTM the output from these generation units. As Hour-Ahead market bids are due 75 minutes prior to the delivery period, PSEG-ER&T cannot always adjust bids fully or partly to reflect imbalances. PSEG-ER&T endeavors to reflect imbalance resolution costs in its RTM bids, but NYISO can mitigate bids and thus replace bids with the Reference Price. A Reference Price is a "proxy" that is intended to reflect the offer(s) that a Market Participant would submit for a generator if it were

in a competitive market and could not exercise Market Power. The methods used to develop Reference Levels are set forth in Attachment H to the NYISO Market Administration and Control Area Services Tariff. If a mitigated bid for overburned gas is accepted, PSEG-ER&T may apply to be made whole by providing documentation of its gas costs, including imbalance resolution charges under the tariff. But there is no mechanism for generators to recover costs associated with the sale of underburned gas at a loss. Moreover, such relief does not recoup the cost to ratepayers for a sub-optimal dispatch of generation on Long Island. Underburned gas cashed out at a loss is considered a cost of doing business borne by LIPA's ratepayers, but not incorporated in the Zone K energy price, all other things being the same. In addition, to the extent LIPA incurs penalty gas costs for daily and hourly overpulls during OFOs, NYISO's Market Monitor does not permit the inclusion of such costs in total reimbursement to LIPA.

Q How does KEDLI cashout LIPA for overpulls or underpulls?

A Balancing Pools A and B are assessed daily balancing charges as defined in the SC-14 tariff. Some limited flexibility on non-OFO days is permitted by KEDLI among Balancing Pools A, B and C each weekday morning until 9 a.m. of the current gas day for purposes of reducing total imbalance costs. For underpulls, that is, when LIPA delivers more gas than it uses, the surplus gas is purchased by KEDLI at the Daily Gas Purchase Price. In SC-14, this

is defined as the lowest midpoint price among the leading gas prices indices, *i.e.*, TZ6-NY, IGTSZ2, and TETCOM3. For overpulls, that is, when LIPA uses more gas than it delivers, the shortfall is purchased by LIPA at the Daily Gas Sales Price. This is defined as the highest midpoint price among the aforementioned price indices. Depending on the magnitude of the imbalance, significant discounts/premiums may apply for surplus/shortfall gas. In a colloquial sense, KEDLI's cashout mechanism for underpulls and overpulls can be summarized as "heads, KEDLI wins, tails, LIPA loses."

While KEDLI's tariff is evidently designed to protect gas customers from worst case outcomes, NYISO requires LIPA to submit electric bids that reflect actual or reasonably anticipated costs. Notably, KEDLI's pipeline and storage entitlements allow KEDLI to systematically obtain low cost gas to serve its core customers. LIPA's actual costs reflect the value of gas delivered to Long Island rather than the lower cost of gas into-the-pipe in Pennsylvania or the Gulf Coast. In practice, KEDLI's cashout mechanism helps to sustain KEDLI's systematic realization of profits since the price indices of relevance capture "basis," that is, the additional value ascribable to delivery to Long Island.

Q On top of the KEDLI cashout mechanism based on the highest or lowest price index, is there an additional cost borne by LIPA for larger imbalances?

A Yes. For overpulls greater than 10%, KEDLI adds a $10 per Dth charge on top of the cashout premiums.

Q Please define how KEDLI's multiple tier imbalance resolution procedure is used to calculate cash-out payments.

A The imbalance resolution tiers for SC-14, as defined in leaves 190 and 191 of the KEDLI tariff, are listed in Table 1.

Table 1. Balancing Pools A and B Imbalance Resolution Tiers

Tier	Overpulls	Underpulls
Tier 1 (up to 2%)	LIPA pays highest of TETCOM3, IGTSZ2 and TZ6NY	KEDLI pays lowest of TETCOM3, IGTSZ2 and TZ6NY
Tier 2 (2% to 5%)	LIPA pays 125% of highest index	KEDLI pays 75% of lowest index
Tier 3 (5% to 10%)	LIPA pays 135% of highest index	KEDLI pays 65% of lowest index
Tier 4 (10% to 20%)	LIPA pays 140% of highest index plus $10 per Dth	KEDLI pays 60% of lowest index
Tier 5 (greater than 20%)	LIPA pays 150% of highest index plus $10 per Dth	KEDLI pays 50% of lowest index

Each imbalance band is assessed its own imbalance rate; for example, in the case of a 3% underpull, 2% of the imbalance would be credited at 100% of the Daily Gas Purchase Price and 1% of the imbalance would be credited at 75% of the Daily Gas Purchase Price.

Q Do you believe the commercial provisions governing KEDLI's administration of Balancing Pool A and B are fair and efficient?

A No, we do not.

Q Please explain.

A KEDLI's cashout mechanism for imbalance resolution burdens LIPA's ratepayers with the daily difference between IGTSZ2/TZ6NY and TETCOM3, shown on Exhibit No. ____(RLL/AJM-3) pages 3 and 4, for sourcing (overpulls) or sinking (underpulls) natural gas from or to the local system operated by KEDLI. On page 3 of 4, the daily difference between the highest market index and the lowest is shown in absolute nominal terms. Again, on page 4, we zoom in to focus on the frequency of significant differences. Demand conditions across Iroquois Zone 2 will remain tight, thereby sustaining upward pressure on delivered gas prices on Long Island.

Whereas Con Edison's, NYPA's and KEDNY's customers in NYC are benefitted by inexpensive delivered shale gas from new or expanded pipelines into Zone J, delivery capacity into Long Island has largely been the same over ten years, perhaps longer. A number of pipeline expansions to Long Island have been proposed by Spectra Energy, KeySpan Energy, and Iroquois, but no proposed project has been successful. Moreover, Iroquois's interconnect capability with other pipelines linking Marcellus with Iroquois is used fully or near fully throughout the year, forcing Iroquois to supplement

its limited interconnect capability with more expensive gas received at its primary receipt point at Waddington. LIPA's ratepayers will therefore be likely to incur higher wholesale energy costs attributable to the cost of gas delivered at South Commack relative to other leading price indices in PJM, NYC, or the Lower Hudson Valley.

As natural gas is often the marginal fuel for power generation in NYISO, gas prices are a key driver of energy prices. Review of the Market Monitor's 2015 State of the Market Report shows that energy prices on Long Island have been higher than other NYISO zones from 2009 through 2015. Higher costs for delivered gas into Zone K relative to other NYISO zones contribute to this trend. Absent physical flow capability from Tennessee to Iroquois at Wright, it is reasonable to expect the recent historical basis differential between TETCOM3 and IGTSZ2 or TZ6NY to persist and to widen. See Exhibit No. ____(RLL/AJM-3), pages 1 and 2, for the daily price history for these indices. Under KEDLI's imbalance resolution cashouts for underpulls, LIPA's ratepayers pay a significant premium vis-à-vis the basis differential for a pricing point that PSEG-ER&T generally cannot access through the KEDLI system.

Q What other aspects of KEDLI's cashout requirements set forth in the tariff are unfair in terms of the economic burden borne by LIPA's ratepayers?

A Not only is the price index mechanism unreasonable, but KEDLI's tolerance requirements are particularly harsh, especially in contrast to other LDCs doing business in the Northeast.

Q What do you recommend?

A For purposes of fairness and efficiency, we recommend eliminating the TETCOM3 price index for resolving daily cashouts for underpulls. We also recommend modifying the tolerance requirements so that the tier structure is no longer harsh. We recommend eliminating the $10 per Dth adder for imbalances greater than 10%. Other recommendations will be presented in Section X.

IV. Gas-Electric Scheduling and Coordination

Q Please describe NYISO's Day-Ahead scheduling process.

A Generation is scheduled in the DA on the basis of a 24-hour electric day that runs from midnight to midnight, Eastern prevailing time (EPT). Market participants must submit bids by 5:00 a.m. on the prior day. After running the market algorithm, NYISO posts schedules by 11:00 a.m. on that same day.

Q Please describe NYISO's RTM scheduling process.

A On an intraday basis, RTM bids are due 75 minutes prior to the start of each operating hour. Resultant hourly operating schedules and 5-minute schedules are managed based on dispatch signals from the NYISO

Q Please describe the corresponding gas nomination and scheduling process.

A The gas nomination and scheduling process is conducted based on a 24-hour day that runs from 10:00 a.m. to 10:00 a.m. EPT. The schedule for nominating and scheduling gas was recently adjusted following the issuance of FERC Order No. 809. Under the new schedule, Timely cycle gas nominations are due at 2:00 p.m. EPT, and scheduled quantities are announced at 6:00 p.m. EPT. A second nomination opportunity prior to the start of the gas day is the Evening cycle, for which nominations are due by 7:00 p.m. EPT and schedules are issued at 10:00 p.m. EPT.

Three nomination opportunities within the gas day are also available. For the Intraday 1 cycle, nominations are due at 11:00 a.m. EPT, schedules are issued at 2:00 p.m. EPT, and gas flow starts at 3:00 p.m. EPT. For the Intraday 2 cycle, nominations are due at 3:30 p.m. EPT, schedules are issued at 6:30 p.m. EPT, and gas flow starts at 7:00 p.m. EPT. For the Intraday 3 cycle, nominations are due at 8:00 p.m. EPT, schedules are issued at 11:00 p.m. EPT, and gas flow starts at 11:00 p.m. EPT.

Q Are there some exceptions to the gas schedule outlined above?

A Yes. The schedule described in the previous answer is the minimum number of nomination cycles a pipeline must utilize. Pipelines can offer additional nomination opportunities at their discretion.

Q Do the pipelines that directly serve Long Island offer additional nomination cycles?

A Generally, no. Both Iroquois and Transco follow the minimum required schedule and therefore do not offer hourly nomination cycles between the timely cycle and the end of the gas day. Infrequently, PSEG-ER&T is able to purchase post-cycle gas in the morning to the extent there happens to be sufficient liquidity on Transco for delivery on Long Island and permission from KEDLI.

Q You said that the Intraday 2 cycle schedules are issued at 6:30 p.m. EPT and that gas flows start at 7:00 p.m. You also said that the Intraday 3 cycle requires the timely submission of nominations at 8:00 p.m. EPT with schedules issued at 11:00 p.m. EPT. In the context of KEDLI's imbalance resolution mechanism, why is this problematic for PSEG-ER&T?

A Simply put, most traders and creditworthy counterparties doing business with PSEG-ER&T and other market participants power down after normal business hours, about 6:00 p.m. EPT: liquidity dries up. The inclusion of the new Intraday 3 cycle has created additional challenges for LIPA given

KEDLI's strict balancing tiers. Since this new cycle is not scheduled until 11:00 p.m., PSEG-ER&T is not alerted by KEDLI of any supply cuts until 11:30 PM *at the earliest.* Often PSEG-ER&T does not know about supply changes until after midnight. Either way, PSEG-ER&T is not able to contact counterparties to trade out of short/long positions to match the gas required to support scheduled generation. PSEG-ER&T has to wait until the morning to alert the supplier and then to coordinate with KEDLI to restore the gas and balance each Balancing Pool. As a result, PSEG-ER&T usually procures an amount of gas in close approximation with DA and forward real-time estimates. Thus any reduction in electric gas demand from expectations, especially on days with lower nominated volumes, could have a significant impact on balancing tiers and the resultant cashout obligation to KEDLI.

In many months throughout the year, a gas supply cut could have a more significant effect on which tier LIPA ends up in with material adverse economic consequences due to the price spread among the indices used by KEDLI to cash out the underpulls, particularly during the winter. During the heating season, gas prices among the three price indices are often sharply divergent. In the summer, when generator gas burns are comparatively high and gas prices are generally lower and convergent, gas supply cuts could still have a significant negative effect on LIPA's payment obligation to KEDLI under the cashout mechanism while having no discernible effect on the

integrity of KEDLI's system. One way or another, there is no semblance of liquidity through PSEG ER&T network of counterparties overnight. Mitigation measures to obtain small amounts of post cycle gas in the early morning hours are based on a number of counterparties' willingness to provide service, which is unpredictable, expensive and episodic.

Q How does the mismatch between the electric and gas market schedules affect LIPA's fuel scheduling?

A Exhibit No. ____(RLL/AJM-4) illustrates how the gas and electric schedules are misaligned, with each gas day encompassing parts of two electric days and *vice versa*. The end of gas day 1 through the start of gas day 4 is shown in green shading, while the start of electric day 1 through day 3 is shaded below the gas day chronology in blue. The nomination and posting schedule for both gas and electricity are defined throughout the chronology of the DA gas and electric day schedules. The different start times for the gas and electric days have the effect that while the electric schedule for the first 14 hours of the gas day is available before timely cycle nominations are due, the electric schedule for the last ten hours of the gas day is not available until one hour after the gas day has started. As previously explained, *this means that PSEG-ER&T does not know scheduled generation levels for nearly half the gas day at the time the timely cycle nominations are due.* RTM operations additionally complicate PSEG-ER&T's gas scheduling because NYISO may

call on a generator to operate for which gas has not been scheduled and cannot be scheduled on an intraday basis quickly enough, or at all, to avoid balancing charges. KEDLI is always the supplier of last resort as well as the buyer of last resort. This uncertainty affects both the bid price into the electric market, and also the nominated quantities in the gas market.

As shown in Exhibit No. ____(RLL/AJM-4), despite tortured efforts to align the gas and electric day schedules over the last decade, there remains a significant difference in the finalization of gas and electric schedules. In addition to the lack of liquidity associated with the Intraday 2 and 3 Cycles, there are too many variables affecting the scheduling of natural gas for LIPA to avoid significant imbalances throughout the year. Again, because KEDLI is both the seller and buyer of last resort, the reasonableness of how these imbalances are monetized by KEDLI is thus at the heart of this testimony.

Q How does PSEG-ER&T determine its natural gas consumption for the overnight period?

A PSEG-ER&T goes into the overnight hours with sufficient gas purchased to cover gas consumption that has already occurred and expected gas consumption for the balance of the gas day given NYISO's DA awards. And, PSEG-ER&T will line up gas supply for any *known* changes. But a gas supply reserve margin is not lined up for *unknown* changes, *i.e.* weather induced increases in load overnight, outages on non-LIPA generating units,

transmission line outages. Depending on the event, the previously unforecasted gas use can trigger KEDLI's $10 per Dth adder.

Q Can you provide an example how the KEDLI balancing tariff can impact NYISO RTM prices?

A Yes. During the overnight hours, incremental natural gas will usually be consumed by quick start combustion turbines. Depending on plant vintage, the turbine's heat rate may range between 12,000 to 15,000 British Thermal Units (BTU's) per kWh (Higher Heating Value). Heat rate is a measure of the amount of heat required to produce a kWh of electrical output: The lower the heat rate, the more efficient the unit, that is, the less fuel required to produce a kWh, and *vice versa*. If, say, IGTSZ2 is $3.00 per Dth and the estimated *incremental* gas use puts LIPA in KEDLI's Tier 4, the resultant all-in electric bid into the RTM would range between $170 per MWh to $213 per MWh at the 12,000 or 15,000 Btu/kWh heat rate, respectively. Hence, if NYISO clears the unit at this price, the impact of KEDLI's Tier 4 would cause the overnight price to jump as high as $213 / MWh when the higher heat rate characteristic of many of LIPA's peakers is scheduled by NYISO. This spike in overnight prices would be significantly less if KEDLI's balancing provisions were similar to those of other LDCs. For example, the run-up in RTM prices under Con Edison's balancing provision would be $59

per MWh when the same $3.00 gas price assumption and 15,000 Btu per kWh heat rate is used, only 28% of the adverse price effect on Long Island.

V. Scheduling Plant Generation on Long Island on Backup Fuel

Q When does PSEG-ER&T schedule plant generation on oil rather than natural gas?

A PSEG-ER&T schedules plant generation on oil rather than natural gas when oil is in economic merit, that is, the price of oil is lower than the price of natural gas on a Dth-equivalent basis, adjusted for any operational considerations associated with oil use. PSEG-ER&T also schedules generation on oil rather than natural gas when gas supply is curtailed or interrupted due to tight local deliverability conditions. And, PSEG-ER&T schedules generation on oil when anticipated penalty gas exposure during OFOs for non-ratable takes and/or imbalance resolution costs on non-OFO days support the scheduling of oil-fired generation. On non-OFO days PSEG-ER&T schedules generation on oil rather than natural gas when potential imbalance costs exceed the cost of oil. When generation is scheduled on oil, the intra-day cycling capability of generation units on Long Island is unlocked, thus facilitating the tracking of sub-hourly load variations without triggering hourly OFO balancing penalties.

Q What are the environmental consequences of oil versus natural gas use?

A From an environmental perspective, natural gas is a significantly cleaner burning fuel than either residual fuel oil (RFO) or distillate fuel oil (DFO). The combustion of all fossil fuels emits carbon dioxide, a major greenhouse gas. However, burning RFO or DFO rather than natural gas increases carbon dioxide emissions by about 49% and 38%, respectively. Plants burning oil also have a significantly higher emission rate for other priority pollutants relative to natural gas, thereby resulting in greater emissions of sulfur dioxide, nitrous oxides, carbon monoxide and particulate matter.

Q Has LIPA made positive steps to reduce oil use on Long Island?

A Yes. LIPA has added major new HVDC conduits from ISO-NE and PJM to increase imported energy, thus reducing oil and gas use on Long Island. LIPA has added efficient gas-fired combined cycle plants on Long Island, which has also lessened its reliance on RFO and gas- fired steam turbine generators at Northport, Barrett and Port Jefferson, as well as other, older peakers among the Legacy Plants. LIPA has made significant transmission improvements in order to have all four Northport units on gas up to a 5,700 MW peak load. Under the old NYISO IR-5, 3,250 MW was the load threshold before a Northport unit had to run on oil. Clearly, this is a big step in the right direction regarding the displacement of oil-fired generation yielding significant environmental benefits.

Q If the NYPSC were to adopt your recommendations to change KEDLI's imbalance resolution procedures, would oil use be further reduced, with a resulting reduction in emissions?

A Yes. KEDLI's onerous provisions underlying its imbalance resolution mechanism induce PSEG-ER&T to minimize or avoid costly adders for 10% deviations or greater by relying on oil. While LAI has not conducted a technical study of local system deliverability conditions for purposes of this testimony, in our experience there is often sufficient "headroom" on the local distribution system to accommodate the loading and intra-day flexibility needed for certain of these fossil units to burn natural gas instead of oil. KEDLI's costly cashout mechanism for overpulls during normal operations hinders reliance on natural gas.

VI. Market Dynamics Affecting Gas Prices on Long Island

Q What are the natural gas price indices of relevance to LIPA?

A There are two: Transco Zone 6-New York (TZ6NY) and Iroquois Gas Transmission System Zone 2 (IGTSZ2). Another price index of arguable relevance is the Texas Eastern Zone M3 (TETCOM3). TETCOM3 is relevant only insofar as it is explicitly incorporated in the KEDLI imbalance resolution procedure. Geographically, TZ6NY is defined as deliveries into citygates downstream of Linden, NJ. IGTSZ2 is defined as deliveries from

Athens, NY downstream to Hunts Point (in NYC) and South Commack (on Long Island). TETCOM3 is defined as deliveries downstream of one of Texas Eastern's largest compressor stations in Pennsylvania. The locations of these pricing index definitions are shown in Exhibit No. ____(RLL/AJM-5). On Exhibit No. ____(RLL/AJM-5), page 2 of 2, we zoom in to underscore the relevance of TZ6NY and IGTSZ2 for purposes of pricing natural gas for power generation on Long Island. The geographic definitions of both TZ6NY and IGTSZ2 include delivery points on Long Island. Importantly, TETCOM3 is practically irrelevant for pricing natural gas to Long Island.

Q Why is TETCOM3 practically irrelevant?

A For wholesale electricity prices, TETCOM3 is relevant in eastern PJM but of little relevance for wholesale electric prices in Zone K because PSEG-ER&T is not able to obtain a significant portion of the daily gas supply earmarked for power generation on Long Island priced at this index. Dominion South Point (DTI-SP), Tennessee Zone 4 (TNZ4) and TETCOM3 track the value of gas into-the-pipe from the Marcellus shale play, which has largely supplanted gas production from the Gulf of Mexico and western Canada to serve core and non-core loads in PJM and the downstate portion of New York but not Long Island. TZ6NY and IGTSZ2 are the only two indices that track the value of nearly all the natural gas delivered by Transco and Iroquois to Long

Island for use by LIPA. IGTSZ2 covers shipments south of Wright, NY, and therefore reflects volumes flowing from the following sources:

- Iroquois's interconnection with TransCanada at Waddington, which physically flows natural gas from western Canada and, more recently, from other producing basins, including Marcellus,
- Iroquois's interconnection with Dominion Transmission (Dominion) at Brookman Corners / Canajoharie, which currently flows gas by displacement, but will become a physical flow once Dominion's New Market Project is commercialized,
- Iroquois's interconnection with Tennessee Gas Pipeline (Tennessee) at Wright, which currently flows gas by displacement, but will become a physical flow if Iroquois's Wright Interconnection Project is commercialized,
- Iroquois's interconnection with Algonquin Gas Transmission (Algonquin) at Brookfield, which physically flows gas, and
- Iroquois's interconnection with Tennessee at Shelton, CT, which flows gas by displacement.

Q Does Long Island still rely on gas production from Canada for delivery on Iroquois?

A Yes. While gas from western Canada used to represent a significant portion of various LDCs' portfolios throughout New York, reliance on western Canadian gas has been greatly reduced throughout New York State due to production from Marcellus and major pipeline additions. The breakdown of Iroquois's receipts by source is shown in Exhibit No. ____(RLL/AJM-6), which indicates that Iroquois relies on gas delivered through Ontario into the pipeline at the Waddington receipt point for the majority of its supply during the heating season, November through March. LIPA's reliance on Canadian gas or gas sourced in other producing basins flowing through Ontario is therefore proportional based on the share of its supply provided by Iroquois.

Whereas all gas burned at the Northport is transported via Iroquois, gas burned on Long Island at other plants under contract with LIPA is transported via Transco and Iroquois. During the non-heating season, the Waddington receipt point is near fallow, supporting the view that either western Canadian gas is out-of-the-money in regard to power generation on Long Island and Connecticut or gas supplies sourced from other producing basins delivered to Waddington are uneconomic, *or both*. During the non-heating season, Iroquois's primary receipt point is at Brookfield, CT, the interconnect point with Algonquin, not Waddington.

Q Please expand on the point that the geographical definition of the TETCOM3 index does not include Long Island.

A Texas Eastern does not physically deliver gas to Long Island. Texas Eastern's delivery points in New York State are limited to Staten Island and Manhattan. Gas delivered at TETCOM3 can therefore only flow to Long Island across connections between KEDNY's local distribution system and KEDLI's local distribution system. Our understanding is that these intra-LDC flows are constrained, which is borne out by PSEG-ER&T's inability to source a significant amount of gas from Texas Eastern for delivery to LIPA's power plants.

Q If TETCOM3 gas is not deliverable on Long Island, what is the relevance of the pricing point to LIPA?

A Insofar as daily cashouts are oriented around TETCOM3, a pricing point that is almost always lower than TZ6NY or IGTSZ2, LIPA's ratepayers unfairly suffer from the imbalance resolution cost associated with the price difference among three pricing points. PSEG-ER&T sources gas under the TZ6NY and IGTSZ2 price indices. Only a *de minimis* amount of gas priced at TETCOM3 is used for power generation on Long Island, if any. Although PSEG-ER&T is not permitted by KEDLI to source natural gas priced at the TETCOM3 index in any significant way, the index is relevant to LIPA because its ratepayers bear an inappropriate cost burden associated with the asymmetric cashout mechanism set forth in the tariff.

Q What are some the primary market dynamics affecting the price of natural gas delivered to Long Island?

A By far the biggest driver of delivered natural gas prices on Long Island is the prolific production of shale gas in the Marcellus and Utica shale gas formations. Over the last two years, commodity gas prices have decreased greatly due to the massive increase in daily gas production from Marcellus. In Exhibit No. ____(RLL/AJM-7), the growth in gas production from Marcellus is shown. According to DOE-EIA, in the last five years gas production from Marcellus has increased from roughly 3 Bcf/d to about 18 Bcf/d, a six-fold increase. Despite the material reduction in the rig count across Marcellus and the U.S. at large, as of mid-May 2016, current NYMEX gas futures are at or near their lowest level in the last twenty years. Although there have been recent pipeline additions into NYC and the Lower Hudson Valley, no new pipeline capacity has been constructed into Long Island.

Q Does the delay or cancellation of upstream pipeline projects affect gas prices on Long Island?

A Yes. New pipeline project(s) designed to improve liquidity at key pricing points across NYCA would put downward pressure on delivered gas prices to Long Island, thereby promoting price convergence among IGTSZ2, TZ6NY and TETCOM3. Absent improved liquidity at key pricing points across NYCA, these three price indices are divergent, particularly during the

heating season. Unlike NYC and the Lower Hudson Valley, there are no new big pipeline projects specifically designed for Long Island, but upstream improvements on new or existing pipelines have the potential to indirectly serve Long Island by lowering delivered gas prices. According to the New York Public Service Commission's Winter Fuels Outlook: Natural Gas Supply for the 2015/16 Winter Season, there has been a significant basis differential between IGTSZ2 and TETCOM3. This recent price history is shown in Exhibit No. ____(RLL/AJM-3), pages 1-4. On page 1 of 4, the absolute nominal price history is depicted, thus revealing the super-spikes during the Polar Vortex in Q1-2104. On page 2 of 4, we zoom in on the price differentials among the three price indices, thereby ignoring the super-spikes in order to highlight the frequent significant price differences among the three price indices.

Q What do the pricing relationships illustrated on Exhibit No. ____(RLL/AJM-3), pages 1 and 2, mean for LIPA's ratepayers?

A In our opinion, the price differences reflect comparatively tight conditions across Iroquois Zone 2. Whereas TETCOM3 predominantly reflects market dynamics in eastern PJM, IGTSZ2 captures the demand conditions in southern New England and on Long Island. The delivered cost of natural gas on Long Island is the single largest determinant of energy prices on Long Island.

Q Are there other pipeline developments that are generally favorable in terms of increasing deliverability across the New York Facilities System?

A Yes, but the improvements to the delivery capability of the New York Facilities System are targeted in areas that serve NYC not Long Island. Simply put, pipeline developments into New York State do not appreciably improve local delivery conditions on Long Island. But in our experience, there is still plenty of headroom on the KEDLI local distribution system most of the year to accommodate LIPA's requirements. Other, less recent projects primarily affecting NYC are Texas Eastern's NJ-NY Expansion Project and Transco's Northeast Supply Link Project. These projects were commercialized in Q4-2013 and added 800 MDth/d and 200 MDth/d, respectively, of pipeline deliverability in the heart of the NYC market. In December 2014, Transco's Northeast Connector Project was commercialized, adding 100 MDth/d from the Maryland-Pennsylvania border to the Lower New York Bay Lateral. This capacity is contracted by KEDNY for delivery to a new delivery point on the Lower New York Bay Lateral created by the Rockaway Delivery Lateral Project, which was commercialized in May 2015, but is potentially also deliverable to Long Beach on days when the full capacity is not scheduled to Rockaway. The new lateral and delivery point will be able to transport up to 647 MDth/d to KEDNY, but the only new upstream capacity is the 100 MDth/d created by the Northeast Connector

Project. Hence, any incremental capacity above 100 MDth/d flowing on the Rockaway Delivery Lateral is effectively cannibalized from Transco's delivery capability at Long Beach.

Q Are there any bright spots on the horizon that would favorably affect delivery conditions on Long Island?

A Yes. Transco's New York Bay Expansion of 115 MDth/d includes a 65 MDth/d capacity addition on the Lower New York Bay Lateral through an uprate to the Rockaway Delivery Lateral. From a hydraulic standpoint, Transco may also be able to flow the 65 MDth/d increment to Long Beach when it is not scheduled by the contract holder to the Rockaways. The target in-service date is November 2017.

On May 9th, Transco filed a pre-filing request with FERC for the proposed Northeast Supply Enhancement Project, which would add 400 MDth/d of firm capacity from the Maryland-Pennsylvania border to the Rockaway Delivery Lateral tie-in point on the Lower New York Bay Lateral in order to further supply the Rockaway Delivery Lateral.

Q Have total gas volumes delivered to the New York Facilities System, and specifically Long Island, changed in recent years?

A Exhibit No. ____(RLL/AJM-8), page 1, shows total deliveries into the New York Facilities System by Algonquin, Iroquois, Tennessee, Texas Eastern and Transco, based on data reported by pipelines on their respective

electronic bulletin boards. The deliveries show a generally consistent seasonal pattern, although the width and height of the heating season spikes have varied year by year. The most significant change is Texas Eastern's addition of a new gate station in Manhattan. Texas Eastern's new pipeline into NYC has significantly boosted its market share. During the 2012-13 heating season, Texas Eastern's market share averaged about 20%. During the 2015-16 heating season, it increased to about 35%.

Deliveries specifically to Long Island are not as straightforward to report. This is because Transco bundles all New York Facilities System deliveries, with the exception of the new Rockaway delivery meter, into a single reporting point. Thus, we cannot precisely report the deliveries specific to Long Beach nor the percentage of total Long Island gas delivered by Iroquois and Transco. This limitation in Transco deliveries at Long Beach does not, however, undermine our key findings and observations regarding the irrelevance of TETCOM3 to Long Island.

VII. Review of Other LDCs' Imbalance Resolution Procedures

Q Are your criticisms and objections to KEDLI's SC-14 tariff also based on a comparative assessment of other LDCs' non-firm transportation tariffs elsewhere in New York State?

A Yes. In addition to our review of the SC-14 rate, we also compared KEDLI's imbalance resolution procedure to those of other LDCs in New York State, as well as New England and New Jersey. References to the other LDC tariffs that were reviewed are listed in Exhibit No. ____(RLL/AJM-9).

Q What do you find?

A In comparison to other LDCs doing business in New York State, KEDLI's imbalance resolution procedure is by far the most stringent. Many LDCs maintain daily cashout rates in their tariff that allow for monthly balancing. Under monthly balancing, any daily imbalance inside a given "tolerance band" is not cashed out, but is instead carried forward in a cumulative monthly imbalance, thereby giving shippers ample time to reduce adverse financial exposure. Monthly cashouts are used by several LDCs elsewhere in New York and also in New England. Although monthly imbalances are sometimes cashed out at higher rates than daily imbalances, cumulative imbalance resolution gives customers more opportunities to resolve imbalances prior to cashing out.

The daily cashout rates for LDCs operating in New York State are shown in Exhibit No. ____(RLL/AJM-10).

Q How does KEDLI compare to other LDCs?

A KEDLI's imbalance resolution mechanism is by far the harshest among the cohort group of LDCs in New York State. As shown in Exhibit No.

____(RLL/AJM-10), KEDLI's cashout rates are highlighted as the bold purple line. From left to right, overpulls greater than 20% are cashed out at 150% of the highest price index, overpulls greater than 10% and less than or equal to 20% are cashed out at 140% of the highest price index, and so forth. Gas market fundamentals on Long Island make this provision especially onerous for underpulls due to the recent historic and anticipated basis differential among the three price indices, *i.e.*, IGTSZ2, TZ6NY, and TETCOM3.

As previously noted, KEDLI also adds $10 per Dth to the cashout price for overpulls greater than 10%, a rigid tolerance requirement in comparison to other LDCs. Note that KEDLI has a wider bandwidth than all other LDCs for overpulls and underpulls. Moreover, the steeper steps or "pitch" characteristic of the KEDLI procedure show how cashout rates "accelerate" in relation to the tolerances built into the other LDCs' imbalance resolution methods. The tolerance requirements and cashout procedures incorporated in the respective imbalance resolution mechanisms of Con Edison, Rochester Gas & Electric (RG&E), Orange & Rockland Utilities (O&R), and National Fuel Gas Distribution Corporation (NFGDC) are all comparatively lenient compared to that of KEDLI. Central Hudson Gas & Electric (CHG&E) recently added a $2.50/Ccf (hundred cubic feet) cost adder for all overpulls in addition to the normal daily cashouts. Notably, for overpulls 10% or

greater, CHG&E's cost adder is comparatively lenient in relation to KEDLI's.

Q Regarding KEDLI's steep steps supporting a comparatively harsh economic burden for imbalances, how does the 2% deadband tolerance compare to that of other LDCs?

A KEDLI's 2% "deadband," where no discount or premium is applied to cashouts, is shared by Con Edison and NFGDC. O&R and RG&E have larger deadbands ranging from 10% to 20%. Imbalances within the deadband for CHG&E, Con Edison, NFGDC, and O&R are rolled into a cumulative monthly imbalance, which is cashed out at the end of the month. Public Service Electric & Gas (PSE&G) has asymmetric deadbands with a greater tolerance for underdeliveries, *i.e.*, overpulls. What makes KEDLI's balancing tiers an outlier is embedded in Exhibit No. ____(RLL/AJM-10), namely, the interplay between the balancing tiers and the onerous charge for overpulls greater than 10% under the cashout. KEDLI starts with a 25% charge. NFGDC and Con Edison start with a 10% charge. CHG&E starts out with a 5% charge. For O&R and RG&E, the deadband is broad and the monthly balancing charges are lenient. Compounding the economic burden borne by LIPA's ratepayers is the selection of the highest or lowest of the three price indices for overpulls and underpulls, respectively.

Q Why do you say that the economic burden is compounded through the selection of the highest or lowest of the three price indices?

A The economic burden on LIPA's ratepayers is heightened under KEDLI's tier pricing and cashout requirements for Balancing Pools A and B because LIPA cannot utilize inexpensive gas indexed to TETCOM3 for on-island fuel burns. Only TZ6NY and IGTSZ2 are relevant for purposes of pricing the delivered cost of natural gas for electric energy on Long Island. Each of these indices has a direct impact on the hourly location based marginal price (LBMP) on Long Island for the majority of the year. Therefore the marginal cost of producing energy on Long Island is largely determined by day-to-day variances in TZ6NY or IGTSZ2, and, to a lesser extent, by intra-day variances in each index for hourly submissions in NYISO's RTM. However, KEDLI may credit underpulls at a below-market price (TETCOM3) which PSEG-ER&T cannot recover in the wholesale electric market.

Q Does KEDLI's cashout requirements for Balancing Pools A and B undermine the efficiency principles underlying NYISO's Standard Market Design?

A Yes. In our opinion, the social value standard of ratemaking – both electric and gas – should reflect the marginal cost attribute of a competitive price. From an economics perspective, LIPA's incurrence of additional gas balancing costs under KEDLI's cashout mechanism is unwarranted insofar as

the incremental cost burden borne by LIPA's ratepayers has little or nothing to do with the marginal cost of delivering gas or producing electricity on Long Island.

Q Does KEDLI's SC-14 Balancing provision differentiate between overpulls and underpulls in regard to its operation of the local distribution system?

A No. Notwithstanding the need to prevent overpulls during OFOs, we note that the balancing provision does not properly differentiate between overpulls and underpulls from an operational standpoint. In scheduling gas during an OFO, LIPA has incentives to schedule more than may be used to cushion against being caught short to support any hourly deviations from the 1/24th requirement. An underpull variance against the ratable take requirement actually supports system integrity rather than weaken it. In our view, when LIPA delivers more gas into the system than used for electric energy output on an OFO day, the resultant underpull bolsters pressure and flow at South Commack and/or Long Beach. This allows KEDLI to reduce its draw-down of LNG from the Holtsville satellite LNG tank to boost local system pressure from the back-end. The Holtsville LNG tank acts like a bellows, providing KEDLI with increased pressure and flow behind the citygate when operating conditions warrant. KEDLI cannot easily replenish LNG inventory during

the peak heating season and must therefore safeguard working gas inventory through judicious scheduling of the inventory drawdown.

Q Is KEDLI's failure to differentiate between overpulls and underpulls on OFO days detrimental to the LIPA customers?

A Yes. KEDLI must aggressively manage storage withdrawals during cold snaps to safeguard working gas storage inventory in case extreme cold happens in late February through mid-March. Maintaining gas system integrity is paramount during extreme cold or during outage contingencies. Nevertheless, environmental objectives are still important. On OFO days, LIPA's underpulls constitute a positive gas/electric interdependency that reflects the synergistic nature between gas and electric customers on Long Island. While it is reasonable for KEDLI to apply the $100 per Dth penalty charge to volumes that exceed daily or hourly limits, it is <u>not</u> reasonable to cash out the daily imbalance for underpulls around the TETCOM3 index when TZ6NY and/or IGTSZ2 prices may be sky high. This adverse exposure may induce LIPA to switch to oil, and incorporate a bid adder reflecting the financial loss attributable to the difference between TETCOM3 and the relevant index. Higher energy prices do not reflect market efficiency principles when the root cause of the switchover to oil is recognition of adverse financial exposure attributable to either the $100 per Dth penalty or the $10 per Dth adder and punitive cashout mechanism pertaining to the price

spread between TETCOM3 and either TZ6NY or IGTSZ2. When market efficiency principles are upended, LIPA's ratepayers suffer as does society at large. This is because environmental goals are weakened. Moreover, the cashout mechanism results in the apportionment of deadweight costs to LIPA's ratepayers when underpulls are cashed out at the TETCOM3 index. On OFO days, the difference between TETCOM3 and the relevant indices on Long Island can be large.

Q Do other LDCs in New York allow for the netting or pooling of imbalances with other customers in the same or similar rate classes?

A Yes. Some LDCs allow for the netting, pooling or trading of imbalances with other customers in the same or similar rate classes. However, within the high-usage rate classes there may be few other customers to trade with. Other LDCs allow customers to net imbalances within a pool created by a Balancing Agent, which allows individual facilities to offset imbalances in aggregate. As previously mentioned, KEDLI does permit PSEG-ER&T to reduce its imbalance exposure on non-OFO days by netting imbalances between Balancing Pools A and B. While this flexibility lessens LIPA's adverse exposure to costly imbalance charges, it is not sufficient to facilitate reasonable gas/electric alignment in light of the timetable for NYISO RTM bids throughout the electric day.

Q Why is the flexibility you have alluded to not sufficient for purposes of reducing or eliminating LIPA's financial exposure under the SC-14 tariff?

A While KEDLI does allow LIPA to move gas between pools on non-OFO days, KEDLI does not allow the netting of imbalances once the gas day is over and the final plant burns have been calculated. As we understand it, each pool must stand on its own. The deadline to move gas among the pools is 9:00 a.m., one hour before the conclusion of the gas day. Therefore, while this limited flexibility mechanism does lessen LIPA's adverse exposure to imbalance charges, it is not a panacea. It does nothing to shield LIPA from unforeseen events that may occur after the 9:00 a.m. hour.

Q Did LAI review the balancing provisions for KEDLI's regulated affiliates in New England?

A Yes. KEDLI's regulated LDC affiliates do business in Massachusetts and Rhode Island (NGrid-MA and NGrid-RI). NGrid-RI administers cashouts on a monthly basis, with cashouts also applicable for daily imbalances outside a given tolerance. Unlike KEDLI's NYC affiliate, KEDNY, quantities outside the daily tolerance are not "cashed out" and instead apply to the cumulative monthly imbalance. During the off-peak (summer) periods, imbalances outside a 15% tolerance are charged a rate of 10% of the daily index price. During the on-peak (winter) periods, imbalances outside a 10% tolerance are

charged at 50% of the daily index price. Additional charges may apply for daily imbalances incurred during OFOs. Although the interruptible service rates for NGrid-MA state that "the terms of Customer-specific contracts shall establish the provision of such service by the Company," their firm transportation balancing provisions are identical to NGrid-RI. NGrid RI's provisions noted above apply to both firm and interruptible customers, suggesting interruptible customers in Massachusetts may expect similar treatment. In relation to KEDLI, NGrid's regulated affiliates in New England have less harsh imbalance resolution procedures insofar as the tolerances are greater, there is no $10 per Dth adder for imbalances greater than 10%, and no cashout indexed to the highest or lowest of three price indices, one of which is irrelevant in terms of the market price of gas delivered to the LDCs.

Q Did LAI evaluate the imbalance resolution for PSE&G in New Jersey?

A Yes. PSE&G, the gas utility serving core and power loads in New Jersey, maintains different balancing provisions for customers with maximum demand above and below 750 Dth per hour. Daily balancing cashouts apply. PSE&G permits third party suppliers to pool deliveries and usage for large customers. Like KEDLI, PSE&G maintains strict penalties for overpulls during critical periods, but PSE&G does not have highly restrictive daily cashout rates during non-OFO days.

Q Does the PSE&G imbalance resolution procedure incorporate a distinction between critical and non-critical conditions?

A Yes. For non-critical conditions there is a bright-line built into PSE&G's imbalance resolution procedure for customers above and below 750 Dth per hour. While there are some differences in the tiers and the percentage of the daily cashout price used for buying (underpulls) and selling (overpulls), the main difference is what price index or indices to use based on the volume level. For shippers under 750 Dth per hour, PSE&G uses a 50/50 TZ6NY/TETCOM3 weighting. For larger shippers, PSE&G uses a daily cashout price that is a weighted average of the deliveries on the respective pipe. If the customer is moving 75% of its daily volume on Transco then the TZ6NY price has a commensurate weighting, and vice versa. Notably, compared to KEDLI, PSE&G's cashout mechanism does not monetize the spread among leading price indicators of relevance to PSE&G, does not include a $10 per Dth adder for overpulls above 10%, and allows third party sellers serving more than one generation unit to pool gas deliveries. In our view, PSE&G's cashout procedure during non-critical days coupled with its greater tolerances do not represent an economic burden for gas-fired generators at the local level or the third party suppliers who energize them.

Like KEDLI's $100 per Dth penalty gas charge, if PSE&G declares a critical period – in essence, an OFO – PSE&G can cashout overpulls at 10

times the cashout index. However, PSE&G does not have as stringent tolerances in place for underpulls (and does not credit underpulls at an upstream index), so that a shipper is not punished in relation to the mechanics of KEDLI's cashout provision.

Q Did you examine the imbalance resolution procedure elsewhere in the U.S. where there is a gas-fired generation at the local level?

A Yes. We examined the imbalance resolution procedure used by Peoples Natural Gas Co. (Peoples), a large LDC serving core load and gas-fired generation in and around Pittsburgh, PA.

Q What are the highlights of your review of the Peoples' imbalance resolution procedure?

A Peoples' imbalance resolution procedure provides gas-fired generators with comparatively high scheduling flexibility and much lower adverse financial exposure for daily cashouts.[3] Differences between a generator's aggregate daily consumption volume and the daily available volume during non-OFO days is subject to comparatively lenient financial costs in relation to KEDLI. Negative daily imbalances are assessed a fee on the shortfall equal to the DTI-South Point price times 115%, plus taxes. Positive daily imbalances are

[3] Peoples Natural Gas Co., Supplement No. 15 to Gas – PA PUC No. S-2, Effective August 7, 2015.

purchased by Peoples at DTI-South Point times 85%. There is no fee or adder for overruns greater than 10%.

Q What are your primary observations and findings regarding the monthly cashout tariff rates for the LDCs you surveyed?

A Two of the LDCs that practice monthly balancing do not apply cashout premiums or discounts to monthly imbalances, although they do apply different indices. Con Edison credits surplus gas at the lower of the monthly average daily TZ6NY midpoint prices or the TZ6NY First-of-Month Low Range Price and bills shortfalls at the higher of the monthly average of the daily TZ6NY-Midpoint prices or the TZ6NY First-of-Month High Range Price. O&R credits surpluses at the lower of the monthly average of the daily AGT-Citygates and Millennium-East midpoint prices or the average of the AGT-Citygates and Millennium-East First-of-Month Low Range Price and bills shortfalls at the higher of the monthly average of the AGT-Citygates and Millennium-East midpoint prices or the average of the AGT-Citygates, and Millennium-East First-of-Month High Range Price.

NFGDC, CHG&E, and NGrid-RI have premium/discount factors applied to the cashout price, as shown in Exhibit No. ____(RLL/AJM-11). CHG&E credits surplus gas at the average of the daily averages of the Midpoint rates for “Tennessee, zone 0” and “Tennessee, zone 1” (500 and 800 legs) receipt points plus the LDC’s respective weighted average cost of

transportation and fuel losses, and bills shortfalls at the average of the Midpoint rates of the higher of TZ6NY and IGTSZ2 receipt points. NGrid-RI credits surpluses at the average of AGT-Citygates and Tennessee Zone 6 for the month, and bills shortfalls at the highest consecutive seven-day average for those two indices. NFGDC resolves both overpulls and underpulls at the DTI-SP price.

Although the monthly imbalance resolution calculations often include different indices for surpluses and shortfalls or stringent cashout rates, there are more opportunities to cure imbalances. Generators can cure imbalances by overdelivering or underdelivering within the tolerance band. Several LDCs offer opportunities to trade or pool imbalances among like customers. A comparison of cashout rates for the surveyed LDCs which practice monthly balancing is provided in Exhibit No. ____(RLL/AJM-11). In comparison to CHG&E, NGrid-RI's monthly cashout rates are more stringent, but the mechanics of the monthly cashout provision givens generators ample time to manage and mitigate the adverse financial exposure.

VIII. Illustrative Economic Costs Borne by LIPA's Ratepayers

Q Can you provide an example calculation comparing the daily cashout rate impacts of different LDCs' practices?

A Yes. LAI performed a sample calculation of LIPA's imbalance resolution costs under the KEDLI cashout mechanism. We then compared the cost borne by LIPA with the like economic burden under other LDCs' imbalance resolution methods for three different scenarios.

Q What assumptions did you make regarding LIPA's confirmation quantity and daily use underlying the total economic cost payable to KEDLI?

A We developed overpull scenarios for peak winter and summer usage, and an underpull scenario representative of OFO usage levels in the winter. For the winter overpull scenario, we assumed a nomination of 149,500 Dth, based on a simple average of the 10 highest nominations for Pools A and B in the Winter 2015-16. We calculated the charges (after adjusting for the commodity price) expected due to usage of 171,925 Dth, a 15% overpull relative to the nomination. We found that the average sales price during these days was $2.59 per Dth. Results are presented in Table 2.

Table 2. Illustrative Calculation of Daily Imbalance Charges, Winter

LDC	Cashout Premium
KEDLI	**$92,174**
CHG&E*	$57,460
Con Edison*	$10,842
O&R*	$9,854
NFGDC*	$4,918
RG&E	$1,936
Grid RI (On-Peak)*	$1,936
PSE&G (> 750 Dth/hr)	$0

** Further monthly balancing charges may apply*

The KEDLI cashout premium relative to cost of gas is significantly larger than the other estimates. In this example, the premium incurred by the $10 per Dth adder alone ($74,750) is larger than all of the other LDC estimates. While KEDLI's daily cashout premium is 60% higher than that of CHG&E, it is 8.5 times that of Con Edison, its fellow system operator on the New York Facilities System. KEDLI's cashout premium is an order of magnitude higher than the most of the surveyed LDCs.

For the summer overpull scenario, we assumed a nomination of 419,500 Dth, based on a simple average of the 10 highest nominations for Pools A and B in the summer of 2015. We calculated the charges (after adjusting for the commodity price) expected due to usage of 482,425 Dth, a

15% overpull relative to the nomination. The average sales price was $3.14 per Dth. Results are presented in Table 3.

Table 3. Illustrative Calculation of Daily Imbalance Charges, Summer

LDC	Cashout Premium
KEDLI	**$269,025**
CHG&E*	$163,104
Con Edison*	$36,882
O&R*	$33,524
NFGDC*	$16,729
RG&E	$6,586
Grid RI (Off-Peak)*	$0
PSE&G (> 750 Dth/hr)	$0

** Further monthly balancing charges may apply*

The KEDLI cashout premium relative to cost of commodity is significantly larger than the other estimates. The premium incurred by the $10 per Dth adder alone ($209,750) is larger than all of the other LDC estimates. KEDLI's daily cashout premium is about 65% higher than that of CHG&E and 7.3 times that of Con Edison. KEDLI's cash out premium eclipses all other daily premia associated with the surveyed LDCs.

For the winter OFO underpull scenario we looked at the average amount of natural gas nominations and usage during the last 8 winter OFO days which occurred in 2016 at Northport. We found that nominations averaged about 12,090 Dth and usage averaged 8,985 Dth. This equates to

about a 25.7% over-delivery relative to the daily nomination. We considered the commodity value to be $5.04 per Dth, the average of IGTSZ2 prices on those 8 winter OFO days. The gas cost credited to LIPA is $3.32 per Dth, *i.e.*, the average TETCOM3 price. Since KEDLI and CHG&E use upstream indices to credit underpulls, we used the TETCOM3 price to estimate the underpull credit in those LDCs.[4] We compared the calculated underpull credit against the market value of the gas at the IGTSZ2 price. For example, since KEDLI does a full daily cashout the market value would be $15,649 *i.e.*, an imbalance of 3,105 Dth times the IGTSZ2 price. However, KEDLI credits LIPA only $6,559, *i.e.*, the lower TETCOM3 price, adjusted for the applicable discount multipliers that apply over 2%. This equates to a discount of $9,090, about 42% of the market value of the surplus gas. Calculations for the other LDCs follow in Table 4. OFO and unauthorized use penalties for other regional LDCs are shown in Exhibit No. ____(RLL/AJM-12).

[4] CHG&E uses the average Midpoint rate for "Tennessee, zone 0" and "Tennessee, zone 1" (500 and 800 legs) receipt points to credit overdeliveries. For this illustrative calculation we chose to compare the same sales and market prices for all LDCs.

Table 4. Illustrative Calculation of Daily Imbalance Charges, Winter OFO

LDC	Cashout Discount	% Market Value
KEDLI	**$9,090**	41.9%
CHG&E*	$7,261	50.8%
Grid RI (On-Peak)*	$4,778	N/A
O&R*	$3,925	73.4%
NFGDC*	$3,683	76.3%
Con Edison*	$3,659	74.6%
PSE&G (> 750 Dth/hr)	$2,224	85.8%
RG&E	$2,147	86.3%

** Further monthly balancing charges may apply*

The combination of utilizing an upstream gas index and stringent balancing factors yields little compensation for customers that over-deliver into KEDLI and CHG&E.

Other than the imbalances that materialize in Balancing Pool C, all other gas imbalances across the generation units on Long Island are cashed out daily. There are no monthly imbalances.

IX. Value of Service Principles Underlying KEDLI's SC-14 Rate

Q What are the main objectionable tariff provisions contained in the SC-14 rate and OBA that impose unreasonably high costs on LIPA's ratepayers?

A There are five objectionable tariff provisions in the SC-14 rate that constitute wealth transfers from LIPA's ratepayers to KEDLI's gas customers: First,

KEDLI charges an extra $10 per Dth for overpulls 10% or greater than the daily nomination. Second, KEDLI's defined tier structure appears unnecessarily restrictive, with its steep cashout rates imposing an unnecessary economic burden on LIPA's ratepayers. Third, KEDLI uses an irrelevant market index to reimburse LIPA for underpulls. Fourth, during OFOs, LIPA faces a lose-lose situation, one where PSEG-ER&T arranges gas at a loss in order to ensure no overpull related penalty charges. And, fifth, there are a number of other provisions in the SC-14 tariff that are, or may be, arbitrary and unreasonable. Such provisions include the MBO that applies to lower than threshold volumes at the generating plants and the VAC. We find these tariff provisions to be objectionable because they are not based on cost of service principles and because they impose deadweight costs on LIPA's ratepayers. The VAC also increases electric energy prices on Long Island in the DA and RTM.

Q Is the $10 per Dth adder for overpulls by more than 10% reasonable?

A No. As previously discussed, it is not. There are two problems with the $10 per Dth adder. First, it applies at a tolerance level that is far too restrictive in light of the dispatch regime of the thermal plants on Long Island. Second, the charge itself is punitive in light of the 40% or 50% premium for overpulls above the 10% or 20% tolerance requirement, respectively. The cashout mechanism already provides sufficient economic incentive to be in

reasonable accord with the daily confirmation quantities. The $10 per Dth adder may induce PSEG-ER&T to factor in higher potential imbalance resolution costs in submitting DA or RT bids to NYISO, thereby raising energy prices on Long Island, a dynamic that has the potential not only to raise energy prices on Long Island, but also to cascade across NYISO zones. Moreover, to avoid the incurrence of the high adder PSEG-ER&T tends to underpull, thereby ensuring that LIPA's ratepayers are harmed under the TETCOM3 cashout procedure.

Q You say that the Minimum Bill Obligation provision is objectionable. Please explain.

A The MBO represents a value play by KEDLI that shifts the fixed cost of building and operating the local facility system from core load to non-core electric utility customers. It is an artifact of local transportation rate design in the late 1990's on the eve of industry restructuring when the ground rules governing the formation of LIPA were fledgling. From the standpoint of cost causation and cost incurrence, the fixed costs associated with investment in local system deliverability ensures system capability to firm customers throughout the year. The local system has been built and operated to ensure gas grid adequacy to meet core sendout throughout the year. Since LIPA's claim and use of local system capacity is *wholly* subordinate to KEDLI's obligation to core, it stands to reason that LIPA has never been, and is not

now, causally responsible for any fixed costs of ensuring local system capability. The exception to causal responsibility is the cost of stand-alone laterals to connect generation resource additions to the KEDLI system, the cost of which has been wholly allocable to LIPA.

Nevertheless, it would not be right for LIPA to piggyback on KEDLI's core customers for free. What is equitable compensation from LIPA to KEDLI may be in the eye of the beholder – it has been said that what is fair in the name of rate design is "the mother of confusion." The volumetric transportation rate defined under the SC-14 tariff is designed to generate revenue credits to core customers for local transportation infrastructure needed to complete the supply chain from the terminus of each pipeline to the various generation plant gates in each of the balancing pools. The MBO, however, fictionalizes cost responsibility by reclassifying a variable cost to a fixed cost. Most of the plants in Balancing Pools A and B do not have capacity factors that come close to the 50% threshold of each generator's maximum annual usage set forth in the tariff. This results in high annual fixed payments from LIPA to KEDLI. The high annual fixed payment for the fleet of generation plants where the dispatch regime falls well short of the 50% threshold represents an out-of-the-money call option on local deliverability. In our view, the MBO results in cross-subsidization of KEDLI's gas customers and is both arbitrary and unreasonable.

Q Is the MBO provision based on cost of service principles?

A No. It is not. As we understand it, the MBO provision was incorporated in the agreements that established the transportation rate for fully interruptible service in the late 1990's and was more recently applied to the Legacy Plants. Market dynamics on Long Island affecting the dispatch regime of the Legacy Plants, in particular, has fundamentally changed, leaving LIPA with what is in effect a stranded cost liability under the SC-14 rate.

LIPA's incurrence of the MBO is a cost of doing business that is ultimately passed on to LIPA's ratepayers. Inclusion of the MBO is one of many value of service rate components that elevate retail electric rates.

Q Previously, in stating your qualifications you indicated that you performed a multi-year study for NYISO and other RTOs funded by DOE on behalf of the Eastern Interconnection Planning Collaborative. Did you review whether other LDCs in the Eastern Interconnection have an MBO for gas-fired generators under interruptible service?

A Yes. We did not find that any of the studied LDCs outside New York practiced such a rate. The MBO appears unique to New York.

Q You say the Value Added Charge is objectionable. Please explain.

A The VAC is a unitized per-dekatherm rate calculated based on annual changes in spark spreads. The LDC determines VAC by calculating the difference between the hourly spark-spread for the generator during unit

operation in relation to the spark-spread first quantified for a base year operation. This difference is then multiplied by the energy (MWh) produced each hour. Generally, the VAC equals 5% of this amount. To derive VAC, the LDC calculates an annual charge comparing a test year to a base year. A reconciliation charge is incorporated to settle the actual calculated VAC against the estimated Test Year VAC. Finally, if the VAC is negative, it is treated as zero rather than as a credit to the shipper's monthly transportation cost obligation. The VAC is highly variable from year to year based on the dispatch regime of the generation plant. For certain units the VAC has equaled or exceeded the interruptible transportation rate. Designed to indemnify gas customers for the use of KEDLI's local distribution system, VAC serves as a tax on LIPA's customers, some of whom do not receive commensurate benefits because they are not gas customers.

Like the $10 per Dth adder and the MBO, the VAC is not based on cost of service. The VAC, like the other objectionable rate components in the SC-14 rate, supports a wealth transfer from electric to gas customers on Long Island.

Q Do you have other concerns regarding the VAC?

A Yes. Because VAC is levied volumetrically on each Dth transported by KEDLI, LIPA is able to include VAC in its cost based bid in the DA or RTM. Whenever a gas unit sets the energy price in NYISO, energy prices

are higher than they would otherwise be if the VAC were not in effect. Inclusion of VAC raises energy prices throughout NYISO and also creates an economic rent for infra-marginal non-gas resources.

Q Does Con Edison have a VAC in its interruptible transportation tariff covering in-city generators?

A Yes. However, in its current gas rate case before the Commission, Con Edison reports in CPA Interrogatory Response No. 5.2. that the company does not have any power generation customers that are assessed a VAC.[5]

Q Did you find that any other LDCs outside New York across the Eastern Interconnection have a VAC applicable to gas-fired generation?

A No, we did not. The VAC appears unique to New York State.

Q Is the VAC the subject of a Commission proceeding?

A Yes. The Commission has an ongoing proceeding regarding "…the appropriateness of the Value Added Charge…" in case No. 15-G-0469. In a filing dated November 16, 2015, LIPA explained that the original concept behind the VAC was to share generator profits with the affiliated gas utility. That structure no longer applies on Long Island, or indeed anywhere in the state. The VAC is now simply a tax on electricity. We recommend that the

[5] Con Edison Case 16-E-0060; 16-G-0061.

VAC be eliminated from KEDLI's tariff in this proceeding, or as a result of the Commission's case 15-G-0469.

Q Have you estimated the economic harm to LIPA's ratepayers as a result of the unreasonable elements in KEDLI's SC-14 tariff?

A Yes. We conducted an analysis of the period December 2014 through April 2016, which represents the period during which PSEG ER&T has been scheduling LIPA's gas purchases. The cumulative economic harm to LIPA's ratepayers ascribable to KEDLI's imbalance resolution procedure, MBO and VAC totaled $11.4 million, which consists of $2.3 million associated with KEDLI's cashout mechanism, in particular, the financial losses associated with the TETCOM3 pricing point versus IGTSZ2 or TZ6NY; $1.4 million associated with VAC in 2015; and $7.7 million associated with the MBO in 2015. We note that while imbalance resolution costs were evaluated over the 17-month period, December 2014 through April 2016, the economic burden ascribable to VAC and MBO were limited to calendar year 2015.

Q Please explain how you define harm for each component.

A The economic harm associated with KEDLI's cashout mechanism was viewed by comparison to the following more appropriate provisions: first, elimination of the $10 per Dth adder for any underpulls associated with Tiers 4 and 5; second, the use of IGTSZ2 as the cashout price for both underpulls and overpulls for Balancing Pool B; third, a blended cashout price for

Balancing Pool A set at a 50:50 weighting of TZ6NY and IGTSZ2; fourth, elimination of the TETCOM3 index; and, fifth, no other changes to the balancing tier bandwidths or the corresponding cashout percentages.

Q Do you believe the cumulative economic harm borne by LIPA's ratepayers for the study period is a good proxy going forward?

A No. The study period may not be representative of LIPA's adverse financial exposure going forward because PSEG-ER&T was able to typically avoid the $10 adder for imbalances above 10% and the price spread among the three indices was muted relative to 2014. Much milder temperature conditions during the heating season, 2015-16, combined with the favorable effect of new pipeline infrastructure across NYCA put downward pressure on total cashout costs. Also, the VAC is now phasing in for Northport, Port Jefferson and the Barrett units in May 2017, May 2016 and May 2015, respectively. There are no changes on the horizon affecting the administration of the MBO, but there is no "organic" load growth on Long Island that will likely significantly boost capacity factors for on-island generation, thereby reducing the financial onus under the MBO.

X. Recommendations and Mitigation Measures

Q Do you have specific recommendations you believe are reasonable to help modernize KEDLI's SC-14 tariff and the OBA?

A Yes. Our recommendations reflect our experience addressing gas/electric interdependencies across the Eastern Interconnection, NYISO and neighboring RTOs. They are respectful of the actions needed by KEDLI to protect gas grid security during OFOs, while respecting economic and environmental goals of gas and electric ratepayers on Long Island.

Q What are your specific recommendations?

A LAI recommends that KEDLI's SC-14 balancing provisions be updated to reflect prevailing industry approaches observed in tariffs of other surveyed LDCs. KEDLI should be required to conduct a cost of service study that grounds the SC-14 balancing provisions in reality. Specific recommendations to mitigate excessive, unfair and unreasonable balancing exposure under the existing imbalance resolution method include the following:

- Eliminate the $10 per Dth adder for overpulls greater than 10%;
- Eliminate the TETCOM3 index from cashout calculations. Instead, calculate cashouts using a simple 12-month supply-weighted average of the TZ6NY and IGTSZ2 prices for Pool A and the IGTSZ2 index for Pool B;

- Reduce the daily cashout percentage tolerances and rates to match Con Edison's cashout calculation;[6]
- Allow LIPA to move gas amongst the pools on OFO days up until 9 AM EPT.
- All gas over-delivered to KEDLI's system during an OFO should be cashed out at the index proposed above at 100 percent (no tiers).
- Add monthly balancing with a daily imbalance tolerance in Balancing Pools A and B, as allowed under Con Edison's cashout structure, using the aforementioned price indices;
- Seasonalize daily balancing penalties by reducing the discounts and premia in the summer and shoulder seasons to levels that reflect the lower gas demand on KEDLI during those periods;
- Implement intraday trading and monitoring for imbalance resolution; and,
- Eliminate the VAC and MBO charges.

In conclusion, neither LIPA's ratepayers nor society at large should bear the unreasonable costs associated with the distortion in wholesale

[6] Con Edison cashes out imbalances as a percentage of *usage* rather than *nomination*. This is a minor change; KEDLI may still calculate imbalance percentages according to nomination.

energy prices on Long Island associated with the SC-14 rate. Our recommendations will serve to modernize the SC-14 tariff while fostering fairness and efficiency objectives through rate design.

Q Does this conclude your testimony?

A Yes.