

Draft Electric Resource Plan 2009 – 2018 Technical Workshop

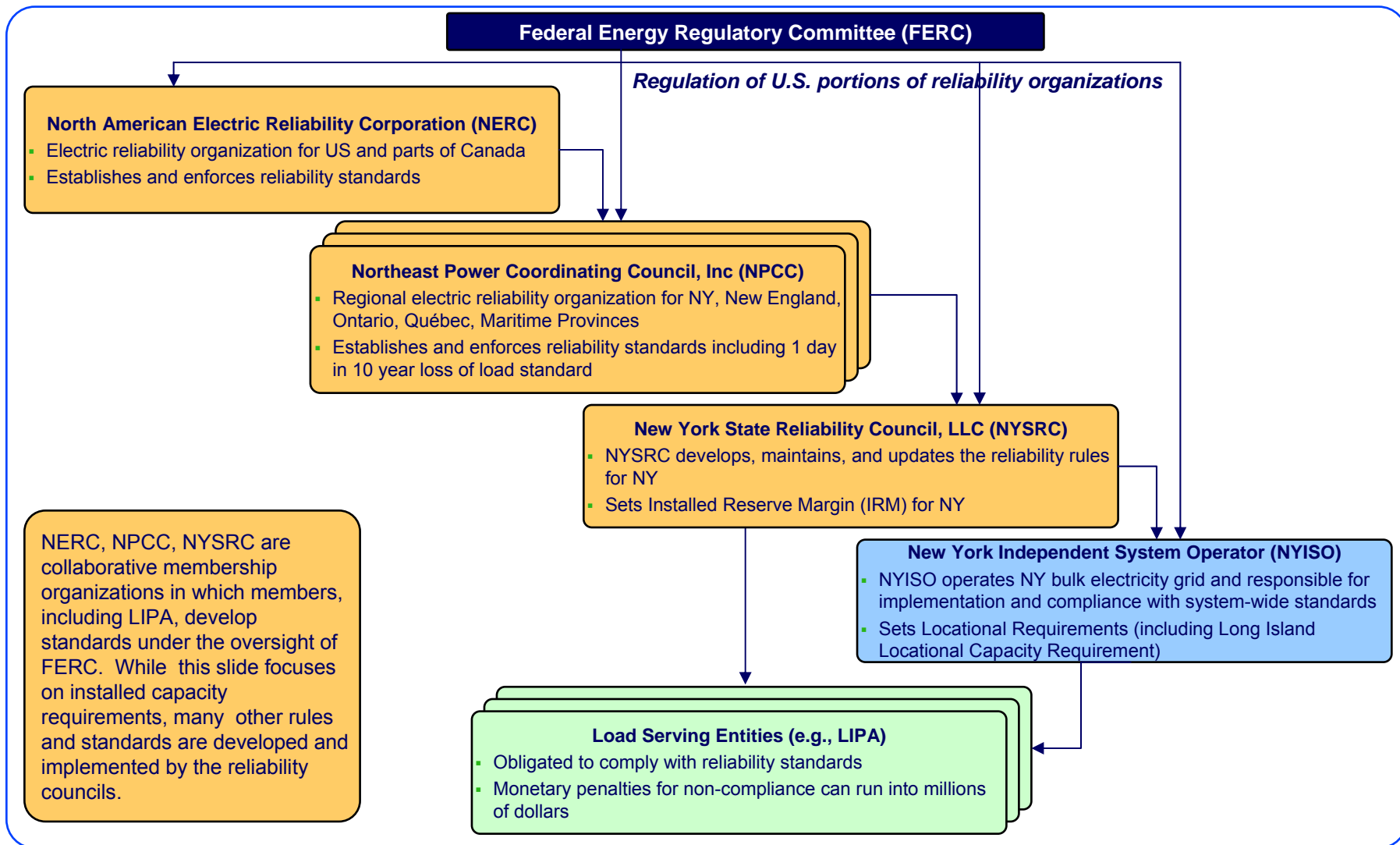


Needs Analysis

June 15, 2009

Needs Analysis

How Need Is Determined



- LIPA Statewide Installed Reserve Margin (IRM) Requirement
 - ▶ Determines how much total capacity LIPA must have
 - ▶ Set annually one year out by New York State Reliability Council
 - ▶ Calculated by NYSRC using a probability model
 - ▶ Statewide, there must be at least enough capacity to meet the combined projected load of all utilities plus the Reserve (IRM)
 - ▶ Currently IRM is 16.5% for May 2009 to April 2010*
 - ▶ IRM requirement is allocated to each load serving entity in proportion to peak load
 - Approximately 800 MW of margin is required for LIPA

- Zone K Locational Capacity Reserve (LI LCR) Requirement
 - ▶ Zone K (Suffolk, Nassau and Far Rockaway) must be able to serve the specified percentage of its load from resources qualified as Long Island resources.
 - ▶ Set annually one year out by New York Independent System Operator
 - ▶ Calculated by NYISO using a probability model
 - ▶ Currently 97.5% for May 2009 to April 2010

* Subject to FERC review and approval

Major Sources of Uncertainty

- Load growth
- Long Island Choice program
- Success of energy efficiency programs
- Success of new resources coming on line
- Changing NYSRC and NYISO IRM and LI LCR requirements
- Reliability fluctuations of existing generating fleet

Methodology

- Use estimated probability distributions for each source of uncertainty
- Use a statistical model of supply, demand, markets and resources to develop a probability distribution of need for capacity
- Plan to a specified uncertainty

LIPA Planning Approach to Uncertainty

- LIPA NYSRC IRM Standard
 - ▶ Plan to meet standard expected value of need
 - ▶ If a shortfall is projected, evaluate projected condition of spot and bi-lateral capacity markets
 - ▶ Purchase capacity in both markets to minimize LIPA's cost

- Zone K NYISO LI LCR Standard
 - ▶ Plan to exceed NYISO standard with a 80% probability of success
 - ▶ Use LIPA and other Long Island market resources to meet requirements
 - ▶ Take corrective action by contracting for long term and short term shortfalls

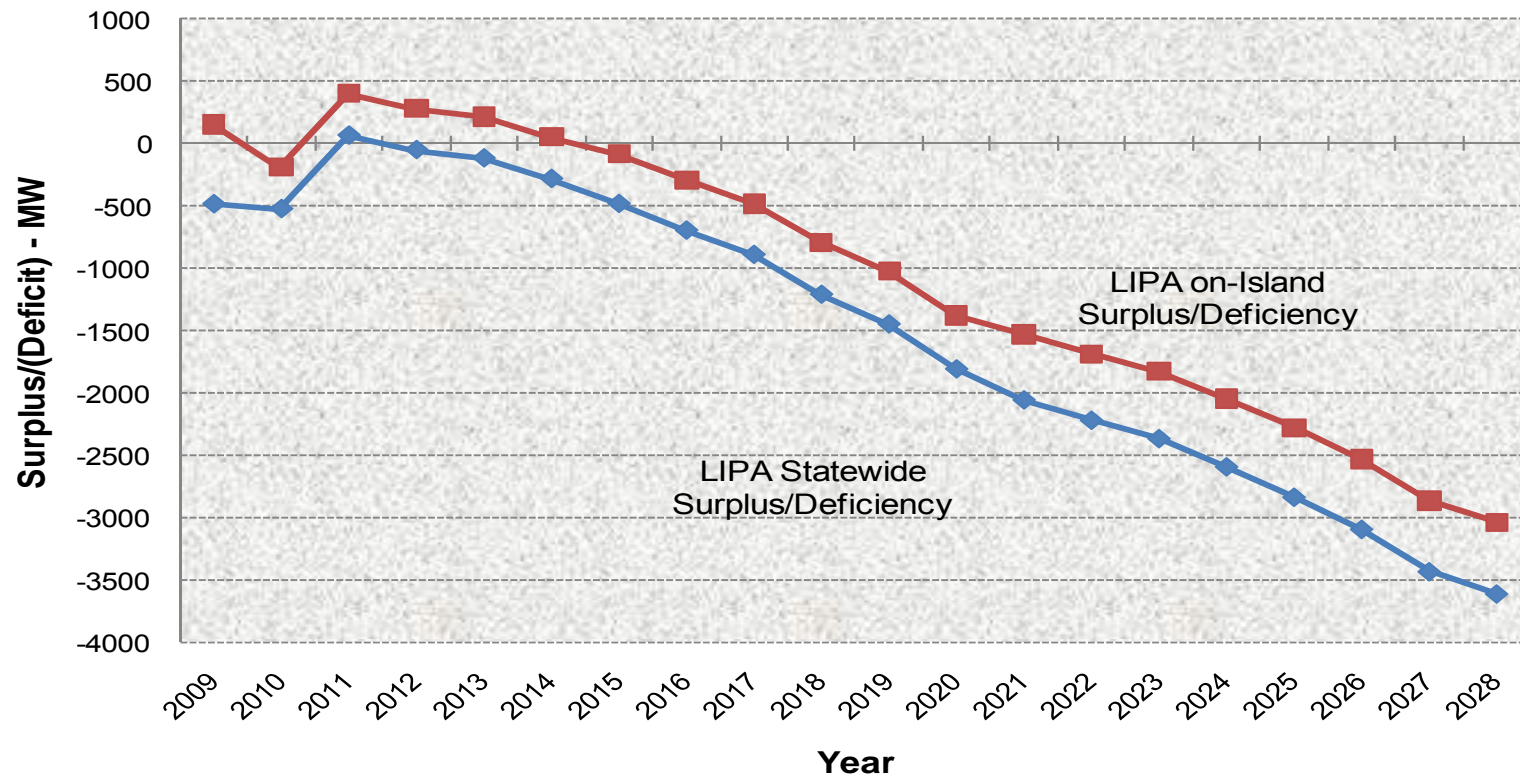
Deterministic Needs Assessment

NYISO LIPA ICAP Requirements



- ▶ NYISO ICAP Reserve Margin Requirements for LIPA
- ▶ NYISO “Zone K” Locational ICAP Requirements for LIPA

Exhibit 7-2 LIPA ICAP Resource Requirement Position

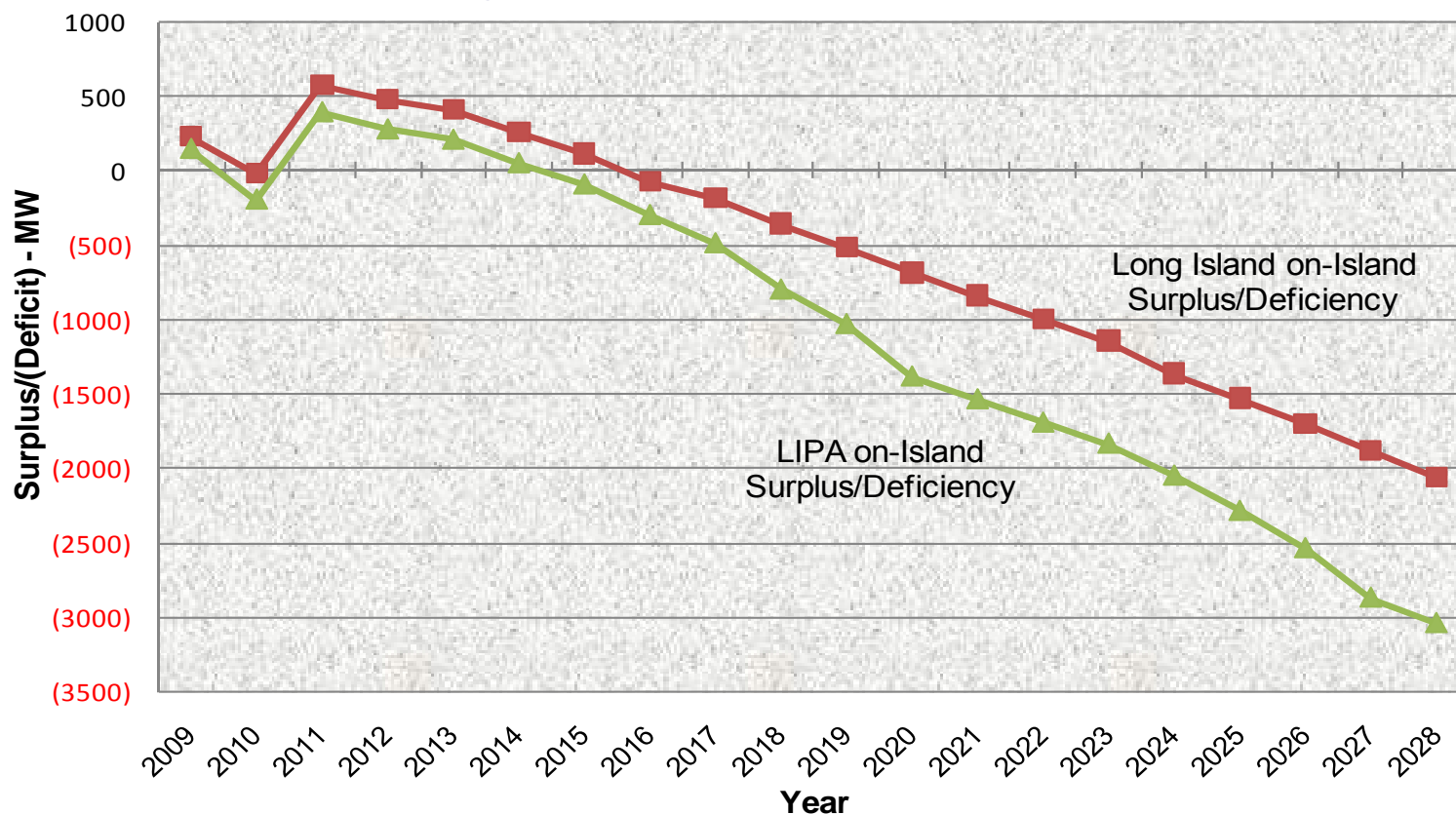


Deterministic Needs Assessment

Long Island Resource Requirements

- ▶ **NYISO “Zone K” Locational ICAP Requirements for Long Island**
- ▶ **NYISO “Zone K” Locational ICAP Requirements for LIPA**

Exhibit 7-4 Long Island ICAP Resource Requirement Position



Needs Analysis

Probabilistic Needs Assessment

Exhibit 7-7 Tornado Diagram – Reference Need Case

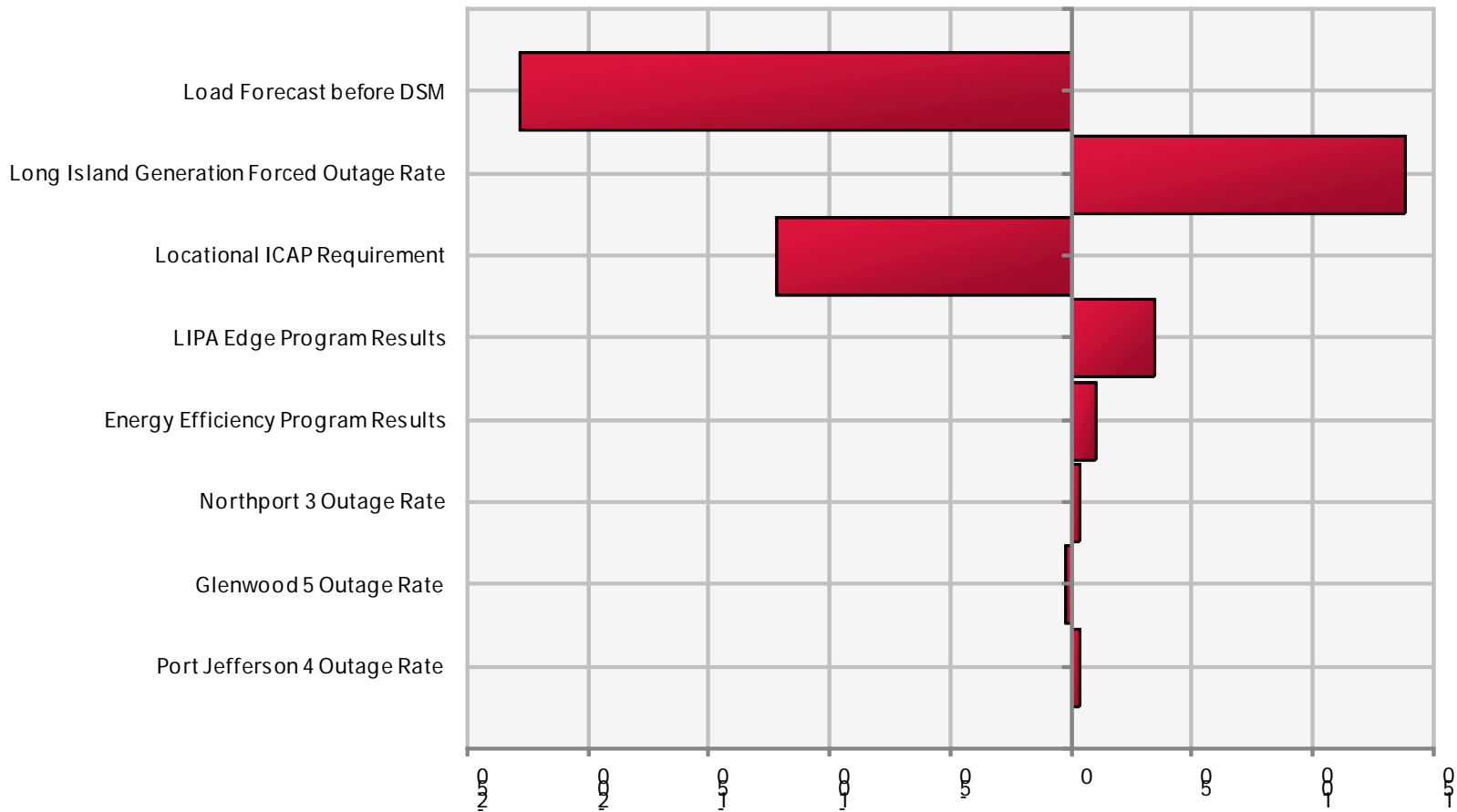
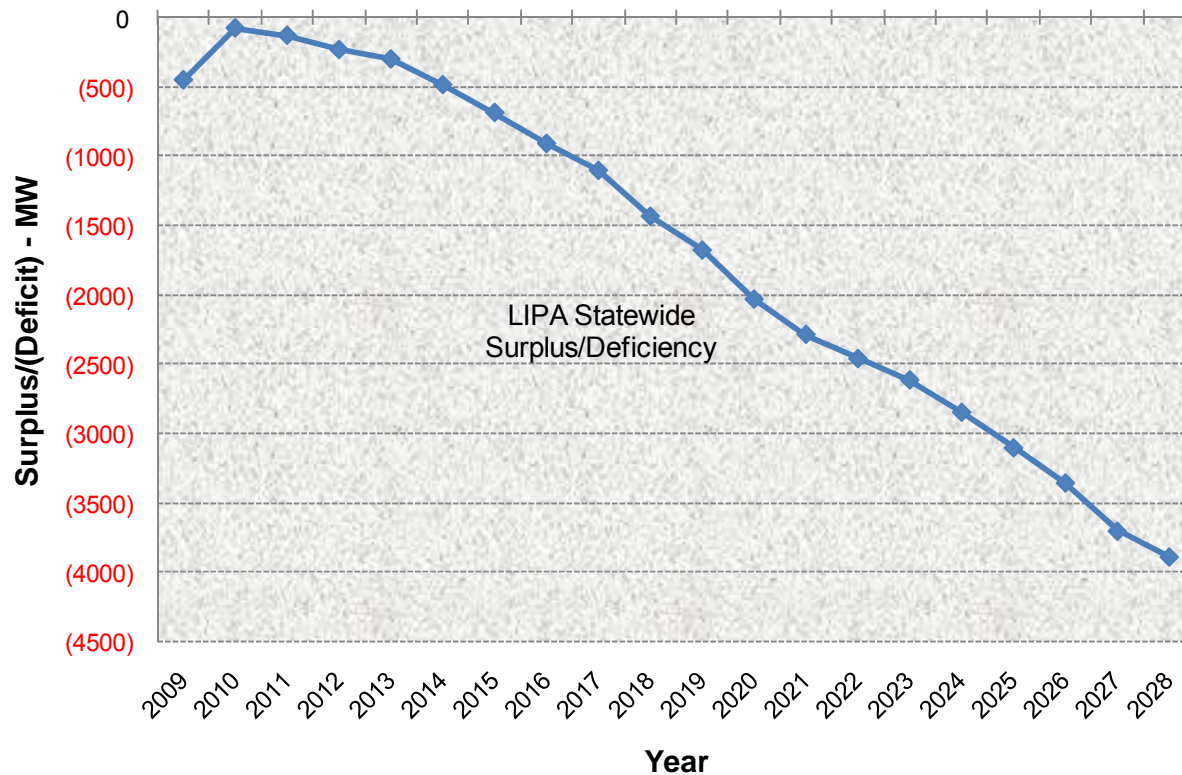


Exhibit 7-8 Probability Table – LIPA Statewide ICAP Resource Requirement

Year>>	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
95%	(833)	(506)	(557)	(638)	(732)	(909)	(1108)	(1314)	(1557)	(1892)	(2150)	(2576)	(2799)	(2997)	(3134)	(3389)	(3649)	(3895)	(4264)	(4499)
90%	(756)	(421)	(455)	(559)	(628)	(827)	(1031)	(1235)	(1467)	(1793)	(2041)	(2417)	(2674)	(2884)	(3019)	(3278)	(3536)	(3807)	(4145)	(4353)
85%	(706)	(362)	(381)	(508)	(571)	(738)	(958)	(1174)	(1389)	(1725)	(1989)	(2359)	(2596)	(2776)	(2945)	(3196)	(3440)	(3713)	(4048)	(4260)
80%	(650)	(308)	(313)	(451)	(530)	(691)	(920)	(1128)	(1334)	(1668)	(1917)	(2293)	(2540)	(2727)	(2891)	(3121)	(3375)	(3644)	(4006)	(4195)
75%	(609)	(247)	(286)	(408)	(484)	(640)	(870)	(1095)	(1286)	(1615)	(1875)	(2237)	(2510)	(2672)	(2833)	(3075)	(3321)	(3584)	(3949)	(4122)
70%	(575)	(198)	(243)	(372)	(450)	(612)	(834)	(1035)	(1250)	(1573)	(1826)	(2201)	(2446)	(2619)	(2791)	(3003)	(3274)	(3540)	(3900)	(4074)
65%	(535)	(161)	(205)	(320)	(403)	(575)	(783)	(1011)	(1210)	(1535)	(1783)	(2160)	(2396)	(2571)	(2747)	(2976)	(3234)	(3482)	(3859)	(4028)
60%	(508)	(140)	(177)	(296)	(367)	(533)	(752)	(982)	(1169)	(1493)	(1757)	(2113)	(2366)	(2532)	(2691)	(2936)	(3189)	(3437)	(3796)	(3976)
55%	(476)	(107)	(151)	(263)	(339)	(510)	(710)	(933)	(1138)	(1461)	(1722)	(2089)	(2325)	(2501)	(2650)	(2886)	(3141)	(3400)	(3759)	(3933)
50%	(448)	(75)	(128)	(230)	(298)	(483)	(684)	(907)	(1102)	(1432)	(1677)	(2030)	(2285)	(2460)	(2614)	(2847)	(3104)	(3357)	(3705)	(3891)
45%	(412)	(35)	(87)	(203)	(262)	(445)	(644)	(882)	(1071)	(1389)	(1646)	(1998)	(2248)	(2429)	(2557)	(2803)	(3059)	(3321)	(3653)	(3847)
40%	(369)	0	(51)	(173)	(240)	(410)	(610)	(848)	(1029)	(1356)	(1604)	(1958)	(2215)	(2393)	(2519)	(2763)	(3002)	(3297)	(3611)	(3797)
35%	(341)	30	(23)	(141)	(210)	(371)	(578)	(808)	(992)	(1315)	(1552)	(1915)	(2172)	(2343)	(2483)	(2722)	(2967)	(3249)	(3579)	(3761)
30%	(290)	69	0	(106)	(173)	(340)	(536)	(766)	(956)	(1281)	(1516)	(1875)	(2119)	(2298)	(2445)	(2687)	(2931)	(3180)	(3528)	(3707)
25%	(254)	109	43	(73)	(132)	(304)	(503)	(720)	(895)	(1235)	(1463)	(1824)	(2077)	(2241)	(2401)	(2635)	(2870)	(3112)	(3453)	(3651)
20%	(213)	145	82	(26)	(89)	(263)	(447)	(672)	(865)	(1170)	(1424)	(1768)	(2025)	(2177)	(2346)	(2553)	(2792)	(3061)	(3387)	(3588)
15%	(157)	219	134	24	(37)	(214)	(383)	(621)	(797)	(1128)	(1354)	(1710)	(1981)	(2105)	(2267)	(2494)	(2723)	(3003)	(3323)	(3513)
10%	(77)	271	193	97	26	(146)	(336)	(544)	(724)	(1057)	(1257)	(1641)	(1922)	(2033)	(2193)	(2418)	(2642)	(2910)	(3255)	(3420)
5%	1	333	282	166	134	(19)	(216)	(429)	(639)	(967)	(1165)	(1535)	(1786)	(1944)	(2061)	(2270)	(2532)	(2770)	(3120)	(3284)

Exhibit 7-9 LIPA Statewide ICAP Resource Requirement – 50% Confidence Level



	Initial Year of Need
LIPA Statewide	2009

Exhibit 7-10 Probability Table – Long Island On-Island ICAP Resource Requirements (MW)

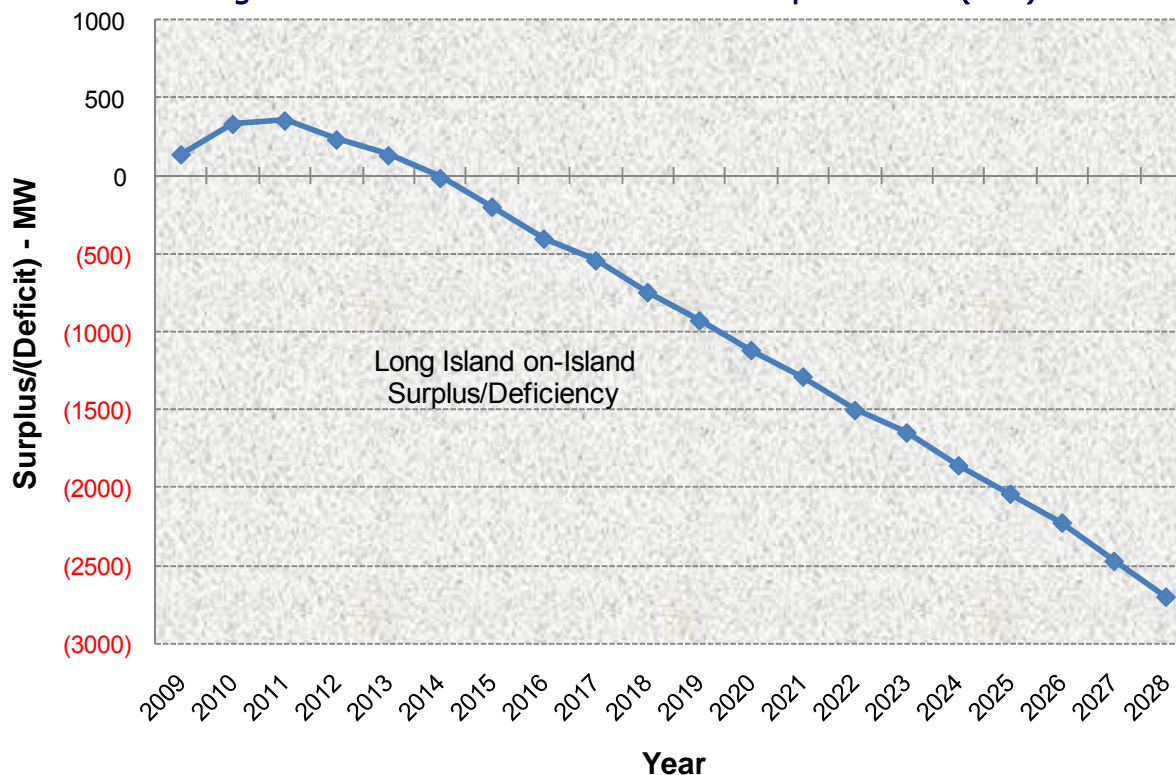
Year>>	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
95%	(28)	71	89	(12)	(158)	(309)	(464)	(763)	(879)	(1075)	(1341)	(1531)	(1823)	(1939)	(2066)	(2352)	(2617)	(2785)	(3049)	(3376)
90%	41	194	207	99	0	(166)	(356)	(585)	(734)	(943)	(1163)	(1337)	(1547)	(1709)	(1849)	(2149)	(2347)	(2548)	(2812)	(3063)
85%	101	281	280	172	67	(83)	(251)	(471)	(612)	(841)	(1042)	(1203)	(1366)	(1609)	(1730)	(1978)	(2196)	(2387)	(2654)	(2870)
80%	139	334	356	234	132	(14)	(198)	(403)	(543)	(747)	(928)	(1119)	(1289)	(1505)	(1648)	(1859)	(2042)	(2227)	(2474)	(2703)
75%	179	377	397	296	189	38	(126)	(350)	(482)	(693)	(849)	(1005)	(1171)	(1409)	(1552)	(1761)	(1950)	(2150)	(2319)	(2519)
70%	209	432	437	340	240	71	(80)	(272)	(403)	(606)	(776)	(952)	(1093)	(1294)	(1458)	(1640)	(1826)	(2035)	(2162)	(2399)
65%	241	460	472	379	287	100	(17)	(221)	(313)	(535)	(697)	(880)	(1031)	(1190)	(1377)	(1580)	(1746)	(1946)	(2072)	(2290)
60%	269	495	505	412	336	156	23	(159)	(253)	(449)	(619)	(818)	(965)	(1102)	(1285)	(1515)	(1646)	(1865)	(1998)	(2201)
55%	301	524	542	448	375	201	64	(103)	(209)	(388)	(564)	(757)	(890)	(1041)	(1217)	(1437)	(1581)	(1775)	(1907)	(2102)
50%	331	553	579	491	414	255	110	(56)	(151)	(334)	(491)	(683)	(841)	(967)	(1123)	(1357)	(1493)	(1704)	(1840)	(2017)
45%	362	577	613	533	448	311	169	(10)	(115)	(289)	(428)	(609)	(767)	(878)	(1047)	(1301)	(1433)	(1622)	(1764)	(1956)
40%	387	623	643	572	481	354	213	33	(77)	(209)	(371)	(548)	(702)	(816)	(989)	(1193)	(1363)	(1552)	(1682)	(1855)
35%	420	656	677	606	544	410	266	87	(40)	(146)	(304)	(476)	(639)	(768)	(908)	(1119)	(1285)	(1456)	(1616)	(1774)
30%	451	704	721	645	601	456	307	153	28	(99)	(232)	(415)	(562)	(689)	(822)	(1057)	(1185)	(1387)	(1523)	(1645)
25%	500	751	762	673	637	506	362	197	88	(32)	(179)	(335)	(474)	(615)	(738)	(973)	(1099)	(1250)	(1456)	(1545)
20%	538	804	806	710	692	559	420	243	155	32	(117)	(229)	(406)	(541)	(661)	(882)	(997)	(1144)	(1338)	(1421)
15%	585	858	852	753	749	623	517	316	246	103	(33)	(102)	(263)	(444)	(544)	(712)	(879)	(1012)	(1232)	(1290)
10%	645	907	919	820	837	705	590	483	355	210	105	(19)	(151)	(305)	(377)	(581)	(748)	(817)	(1044)	(1095)
5%	747	966	1020	961	947	815	714	606	511	359	291	95	59	(93)	(177)	(366)	(507)	(635)	(851)	(917)

Probabilistic Needs Assessment

L.I. On-Island ICAP Resource Requirement



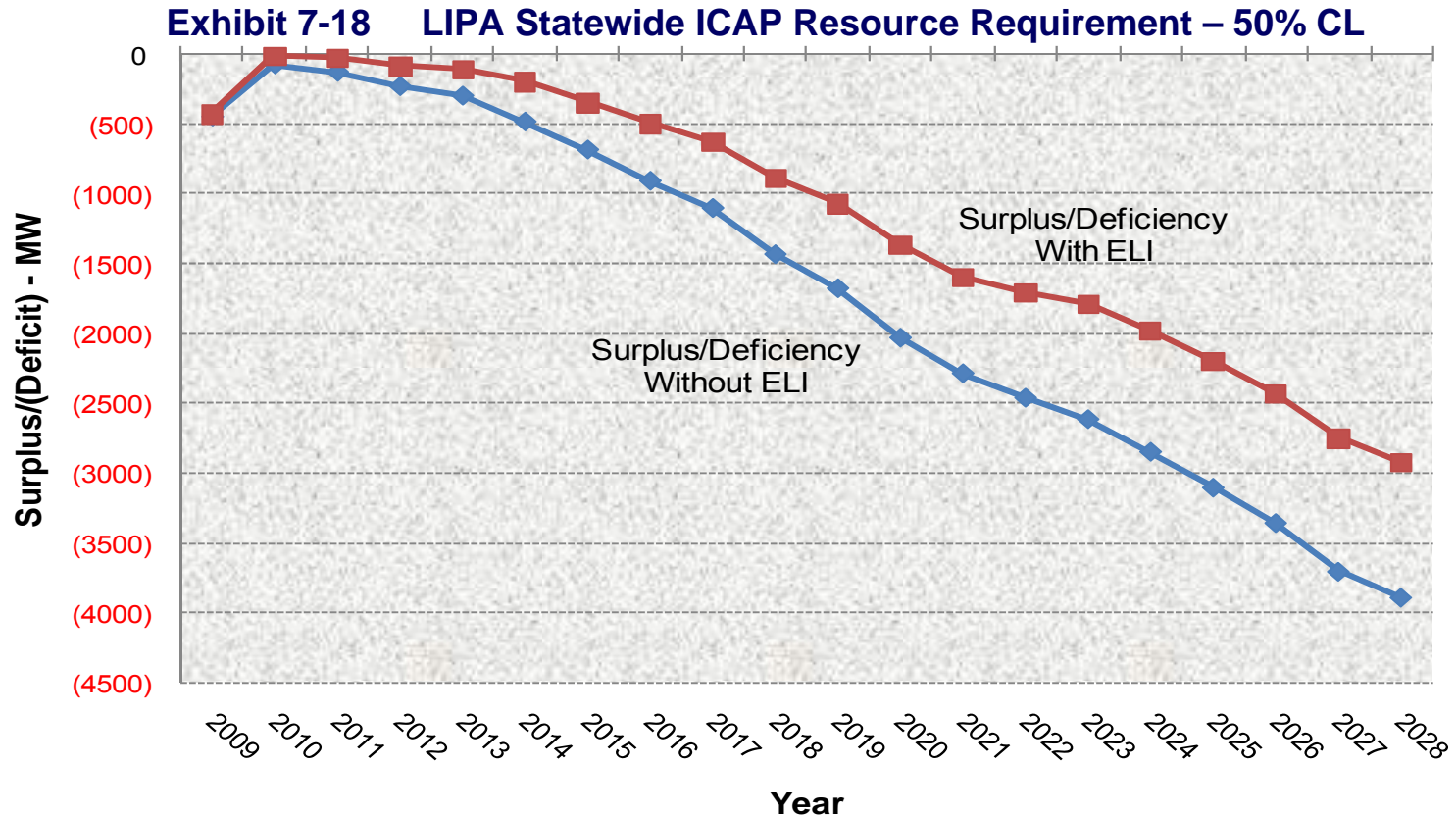
Exhibit 7-11 Long Island On-Island ICAP Resource Requirements (MW) - 80% Confidence



	Initial Year of Need
Long Island On-Island	2014

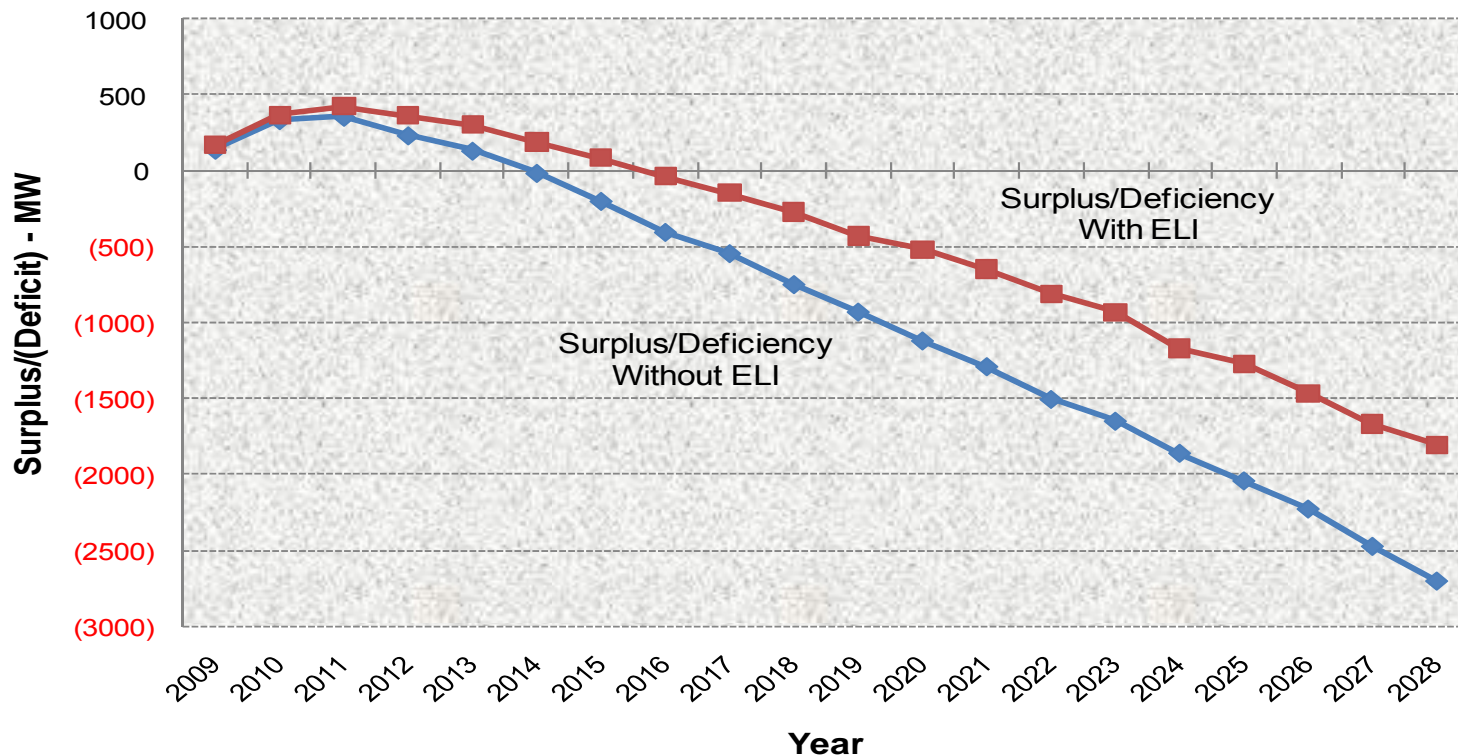
ELI Sensitivity Analysis

LIPA Statewide ICAP Resource Requirement



LIPA Statewide	Initial Year of Need
With ELI	2009
Without ELI	2009

Exhibit 7-20 Long Island On-Island ICAP Resource Requirement – 80% CL



L.I. On-Island	Initial Year of Need
With ELI	2016
Without ELI	2014

- **NYISO Long Island On-Island Need**
 - ▶ Driving criteria for this resource plan
 - ▶ LIPA has a need to obtain on-Island resources
- **Effects of Efficiency Long Island**
 - ▶ Significantly reduces the need for additional resources on Long Island
 - Initial year of need is deferred from 2014 to 2016
 - Overall resource need is reduced nearly 900 MW by 2028
- **LIPA has a growing need to procure capacity on a statewide basis**
 - ▶ LIPA's total resource position grows increasingly deficient in both the reference need case and the probabilistic assessment case assumptions

End of Presentation

Discussion

Target Completion Time **12:15 pm**

- Discussion on Needs Analysis
- Process Check

Next Up

- Opening Remarks
- Overview of Workshop Format
- Overview of Electric Resource Plan
- *Break*
- Review of Modeling System and Assumptions
- Energy Efficiency
- Need Analysis
- *Lunch*
- **Technology Screening**
- **Alternative Plan Analysis**
- *Break*
- **Action Plan**
- **Policy Input**
- **Input on Workshop Approach**