G-J Impact Analysis
Presented by
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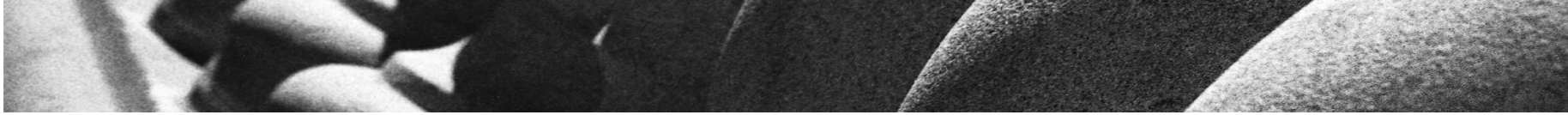
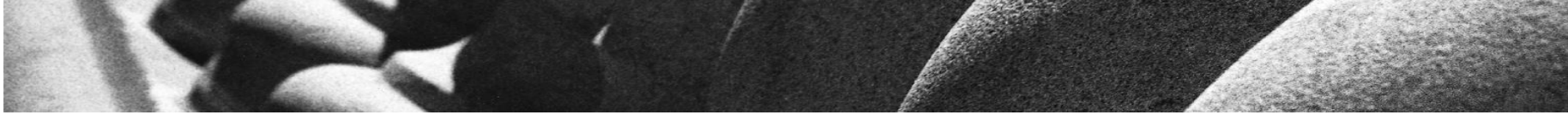
Prepared for New York ISO

January 14, 2016



Topics

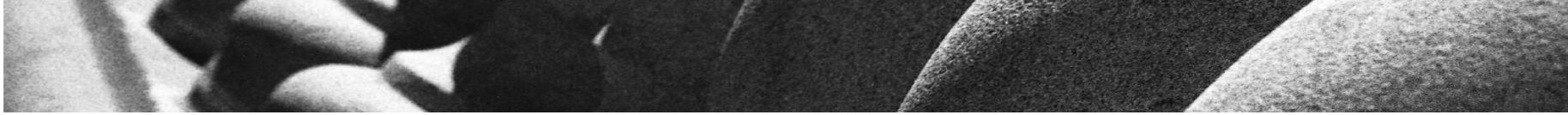
- Introduction
- Increase in Zone K LCR Approach
- Bottled Zone K Approach
- Cost Shift Approach
- Appendices



Introduction

The Unified Methodology for setting LCRs was developed in the context of the initial New York ISO capacity market design.

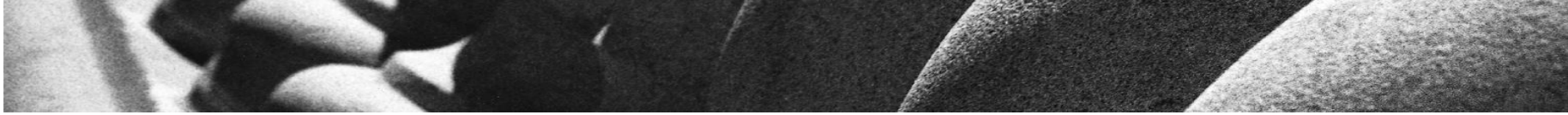
- The Unified Methodology led to some counterintuitive outcomes under the three zone design when capacity shut down in the Zone G, H, I region.
- The introduction of the G-J capacity market zone has corrected some of those anomalies but may introduce new ones as capacity is added in zones G, H and I.
- FTI was asked to evaluate the impact of potential changes in downstate LCR's and capacity market clearing and settlement mechanisms within the context of the Unified Methodology.



Introduction

We examined three potential types of changes in the current design.

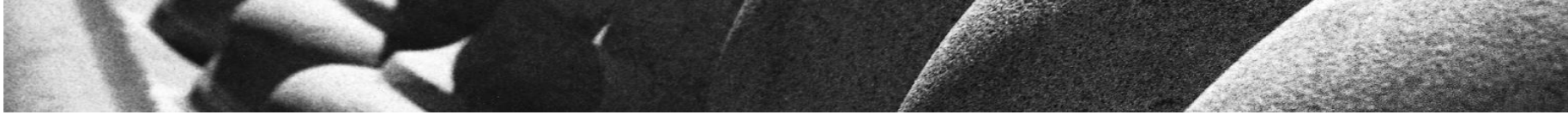
- Increasing the Zone K LCR to shift incremental local capacity requirements from Zones G-J to Zone K;
- Accounting for the capacity value of excess Zone K capacity in clearing the G–J capacity market;
- Shifting the cost responsibility for the existing local capacity requirements.



Introduction

These changes were evaluated with respect to:

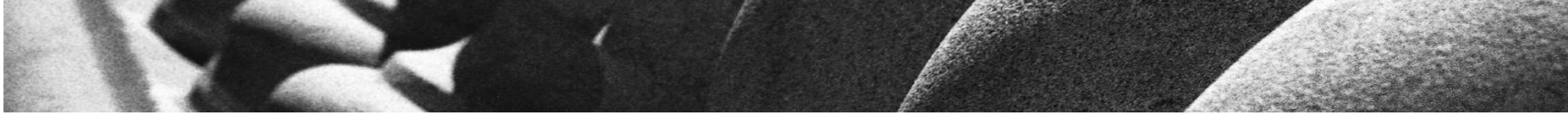
- Production cost savings;
- Total wholesale market capacity payments;
- Regional incidence of capacity payments.



Increase in Zone K LCR — Overview

The FTI team was asked to estimate the impacts of an increase in the Zone K LCR, accompanied by an offsetting reduction in the G-J LCR.

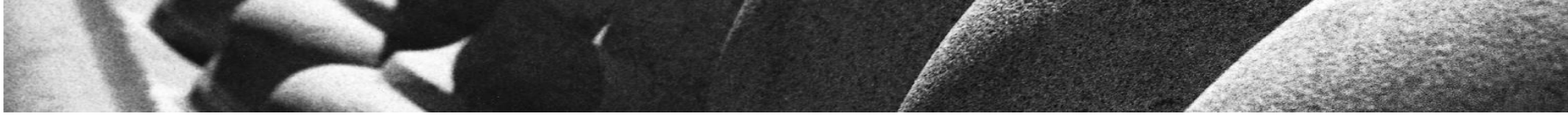
- The Zone K local capacity requirement was increased by 300.21 megawatts of ICAP (a rough estimate of the limit on exports of power from Zone K), 276.71 megawatts UCAP;
- The G-J local capacity requirement was reduced by 359.48 megawatts of ICAP, 338.74 megawatts of UCAP;
- The intent of this change would be to meet the overall New York capacity requirement more efficiently.



Increase in Zone K LCR Production Cost Analysis

One way of analyzing the impact of these changes in NYISO LCRs is from the standpoint of changes in production costs.

- Evaluation of the production cost impact of these changes requires measuring the production cost of capacity, which is not straightforward.
- Two possible approaches are to measure the production cost of Zone K and Zone G, H and I capacity based on net CONE or on average clearing prices in the spot auctions.
- Either approach to measuring production costs leads to the conclusion that such a shift in LCRs would be beneficial from a production cost standpoint.



Increase in Zone K LCR Production Cost Analysis

Net CONE Approach Savings:

338.74 megawatts * $13,170 per month reference price

- 276.71 megawatts * $8,810 per month reference price

= $2,023,391 cost reduction per month

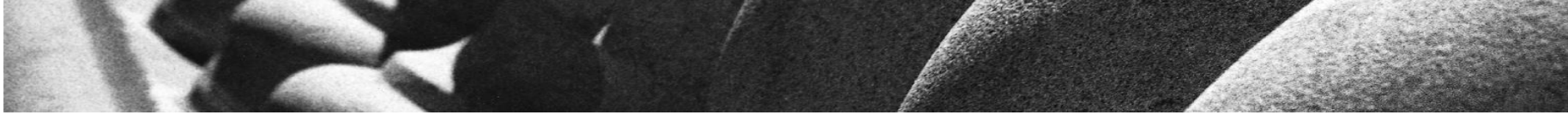
Auction Price Approach Savings:

338.74 megawatts * $6,270 average monthly price [1]

- 276.71 megawatts * $4,200 average monthly price [1]

= $961,718 cost reduction per month

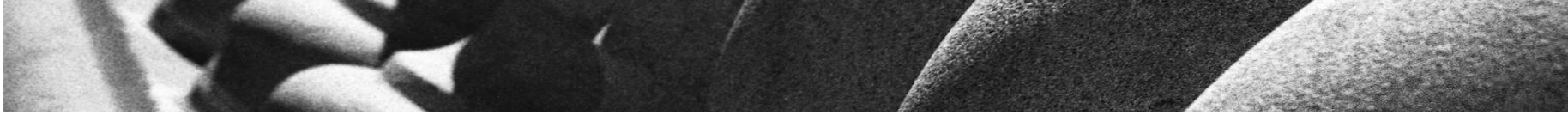
1. January 2015- December 2015 spot auctions



Increase in Zone K LCR Production Cost Analysis

Neither estimated net CONE nor average auction clearing prices is a perfect measure of capacity production costs, but the fact that both point in the same direction reduces concerns about their individual imperfections.

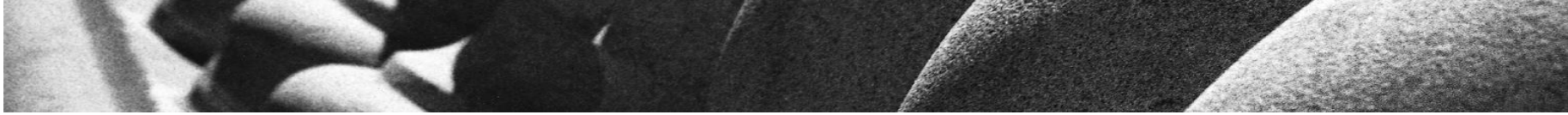
- Both estimated net CONE and average auction prices in Zone K are reduced by the large energy market returns to building new efficient generation in Zone K.
- This is appropriate because it reflects the substantial production cost savings in the energy market from building new efficient capacity in Zone K.



Increase in Zone K LCR Consumer Impact

The FTI team was asked to estimate the short-run consumer impact of changes in NYISO downstate LCRs and other design elements of the capacity market spot auction.

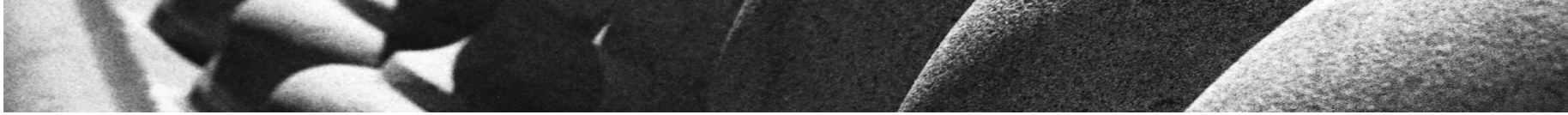
- The analysis required estimation of changes in capacity market prices resulting from the potential design changes.
- Estimates of capacity market price changes were based on actual auction data (capacity cleared and demand curve) May 2015-November 2015.
- Estimates for the December 2014–April 2015 period included adjustments for changes to supply for the December 2015-April 2016 period.
- Adjusted LCRs were developed by NYISO.



Increase in Zone K LCR Consumer Impact

Simulated auction outcomes show that an increase in the Zone K LCR with an offsetting reduction in the G-J LCR would:

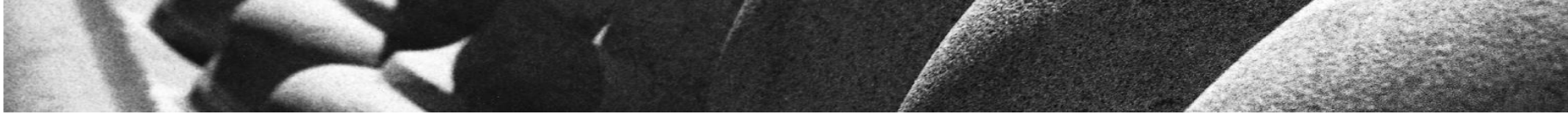
- Raise overall capacity market payments by $69.3 million a year based on the 2015-2016 LCRs.
- Raise overall capacity market payments by $70.5 million a year based on preliminary 2016-2017 LCRs.



Increase in Zone K LCR Consumer Impact

The likely increase in overall rate payer capacity costs is driven by two structural factors that are not likely to change.

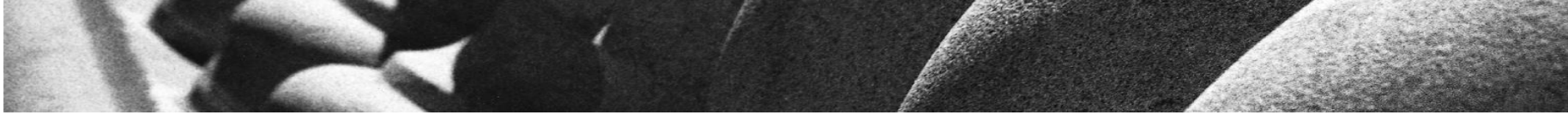
- Zone K load and capacity exceeds Zone GHI load and capacity, so an equal change in capacity prices will have a larger impact on Zone K costs than on GHI costs.
  - May 2015 cleared capacity in GHI was 4,664.60 MW.
  - May 2015 cleared capacity in K was 5,611.20 MW.
- The Zone K demand curve is steeper than the G-J demand curve so a shift of one megawatt of capacity obligation from G-J to Zone K will have a larger impact on the Zone K capacity price.
  - Summer 2015 slope for G–J was $6.30 per MW-month.
  - Summer 2015 slope for Zone K was $9.26 per MW-month.



Increase in Zone K LCR Consumer Impact

The short-run consumer impact evaluation leads to a different conclusion than the production cost evaluation because of the two factors that drive the outcome of the consumer impact analysis.

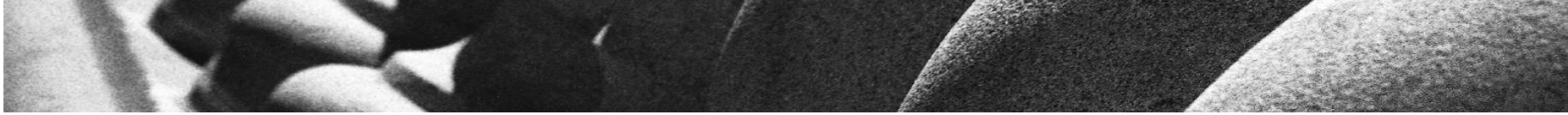
- The short-run consumer impact depends on the relative amount of load buying capacity at the Zone K and versus the G-J price, while the production cost comparison does not.
- The short-run consumer impact depends on the change in the clearing price and hence on the relative slope of the Zone K and G-J demand curves, while the production cost comparison does not.



Increase in Zone K LCR Consumer Impact

FTI evaluated the consumer price and rate impacts of different levels of changes in Zone K and G-J LCRs.

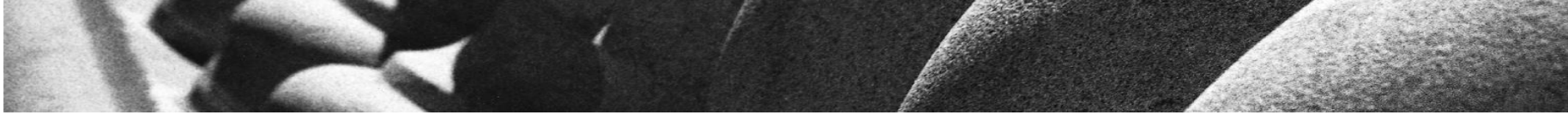
- "Full shift" analyses are based on NYISO's estimates of changes in LCR UCAP requirements under the assumption of 300 MW of ICAP exports from Zone K.
- "Partial shift" analyses were based on one-half of the "full shift" changes to LCR UCAP requirements.
- The partial shift results are not always one-half of the full shift results due to the impacts of price cascading, i.e., floors on the prices in subordinate zones that are set by the prices in larger zones.
  - Zone K costs would increase by $89.8 million to $350.2 million.
  - G-J costs would fall by $69.5 million to $276.2 million.
  - The increase in overall costs would be $20.2 million.



Increase in Zone K LCR Consumer Impact

The potential for such a shift in the Zone K and G–J LCRs to reduce overall consumer costs increases:

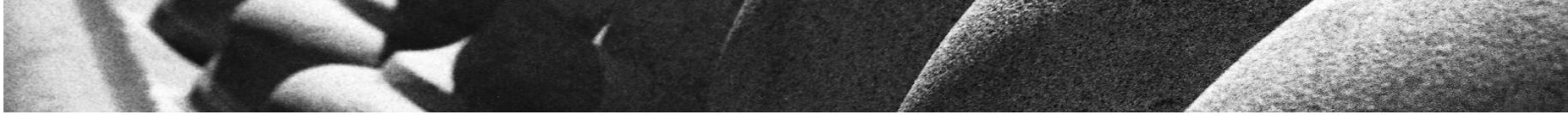
- If, absent the LCR change, the Zone K capacity price set is by the NYCA price, rather than the Zone K demand curve due to cascading; when this occurs, the LCR change will result in a smaller increase in the Zone K capacity price, improving the overall ratepayer impact of the LCR change.
- If, absent the LCR change, the Zone J capacity price would be set by the G-J capacity price, rather than the Zone J demand curve, so that a reduction in the G-J capacity price also reduces the Zone J capacity price, while the Zone J LCR is unchanged.
- If the megawatt reduction in the G-J UCAP requirement is larger than the megawatt increase in the Zone K UCAP requirement.



Increase in Zone K LCR Regional Incidence

Simulated auction outcomes show that an increase in the Zone K LCR with an offsetting reduction in the G–J LCR would:

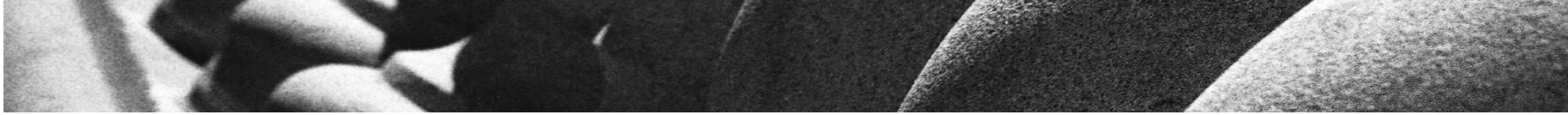
- Reduce capacity market payments by Con Ed and O&R rate payers by much more than it would reduce payments by Central Hudson rate payers.
- Raise Zone K capacity market payments by far more than it would reduce payments by Central Hudson rate payers.
- Full shift
  - Increase Zone K costs by $182.3 million to $442.5 million in annual payments.
  - Reduce G-I costs by $90.7 million to $187.4 million in annual payments.
  - Reduce J costs by $22.4 million to $1,308.7 million in annual payments.



Increase in Zone K LCR Regional Incidence

Simulated auction outcomes show that an increase in the Zone K LCR with an offsetting reduction in the G-J LCR would:

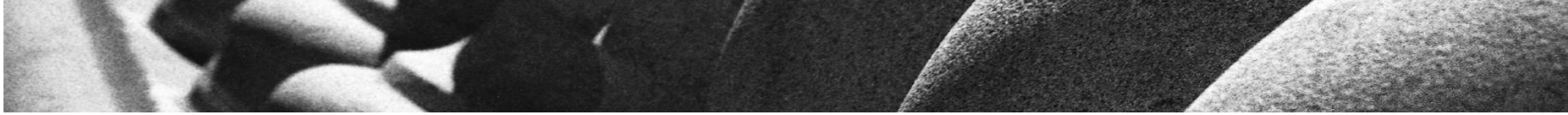
- Reduce capacity market payments by G, H I load by $20,557 per megawatt of GHI peak load over the year;
- Raise Zone K capacity market payments by $32,912 per megawatt of Zone K peak load over the year.
- Reduce capacity market payments by J load by $1875 per megawatt of J peak load over the year.



Increase in Zone K LCR Regional Incidence

Basing the analysis on a preliminary version of the LCRs for 2016-2017 (this analysis was completed before the LCRs were finalized) does not materially change the regional pattern of rate impacts.

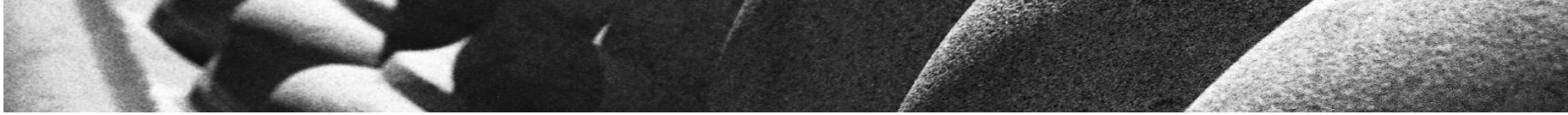
- Zone K costs increase by $179.2 million to $409.3 million or an increase of $32,364 per megawatt of peak load.
- G-I costs fall by $79.1 million or $17,937 per megawatt of peak load and Zone J costs fall by $29.7 million, or $2488 per megawatt of peak load.



Increase in Zone K LCR Consumer Impacts

The price impacts calculated are short-run price impacts with auction prices changing to equilibrate supply and demand while holding cleared capacity supply each month at historic levels, adjusted for changes.

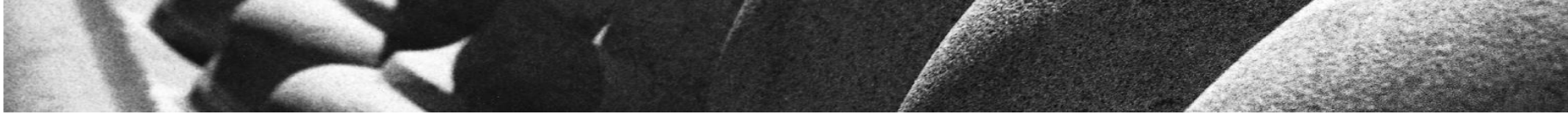
- In the long-run, materially lower G-J capacity prices would likely lead to reductions in GHI capacity, partially offsetting the price impact of the LCR reduction for G-J consumers.
- The short-run rate impact on Zone K consumers would be lower than indicated by these calculations because most of the Zone K capacity is purchased under long-term contracts so its cost to consumers would not vary with changes in spot auction clearing prices. In the long-run, however, Zone K load serving entities would have to contract for more capacity and incur higher costs due to a higher Zone K LCR.



Rate Payer Impact Analysis -- Summary

Scenario	Zone K	Zone J	G-J	Total
2015-2016				
K, G-J - Full	$ 182.3	$ -	$ (113.0)	$ 69.3
K,G-J - Partial	$ 89.8	$ -	$ (69.5)	$ 20.2
2016-2017				
K, G-J - Full	$ 179.3	$ (10.2)	$ (98.6)	$ 70.5
K, G-J - Partial	$ 85.0	$ (10.2)	$ (58.2)	$ 16.5

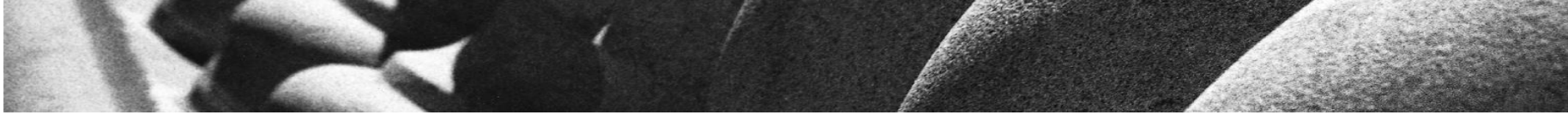
Note: Due to rounding, row total values reported may not sum to total of row values. Positive values reflect an increase in consumer costs.



Bottled Zone K Approach

Overview

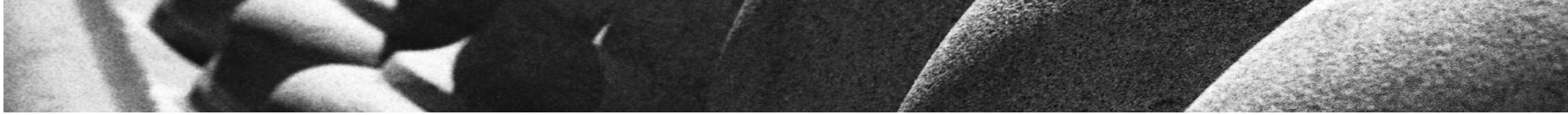
Another approach to adjusting LCRs to address potential anomalies in the capacity market design would be to treat Zone K capacity as within the G-J Zone, but bottled in Zone K by a transfer limit, so that up to a specified number of megawatts of Zone K capacity would count as G-J capacity, with no changes in LCRs.



Bottled Zone K Approach — Overview

This approach would not change LCRs.

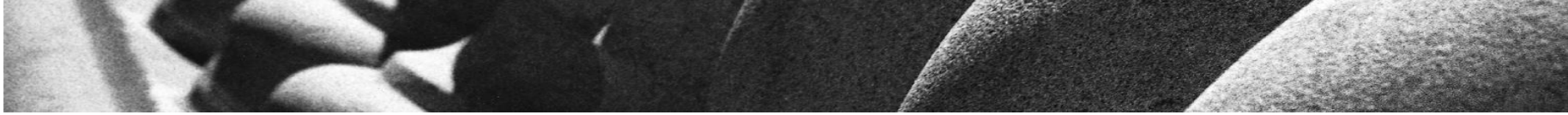
- Some Zone K capacity above the Zone K target would count against the G-J capacity target, i.e. would be included in G-J supply in the spot auction.
- If the excess Zone K supply exceeded the quantity of Zone K capacity allowed to participate in the G-J zone, all Zone K supply would be bottled and settle at the Zone K price.
- If the excess Zone K supply were less than the amount able to participate in the G-J zone, the Zone K clearing price would cascade up to the G-J clearing price.



Bottled Zone K Approach Production Cost Savings

The bottled Zone K approach will always either produce production cost savings relative to the current design (if there were a surplus of Zone K capacity) or have no impact (if the level of Zone K capacity were below the target quantity).

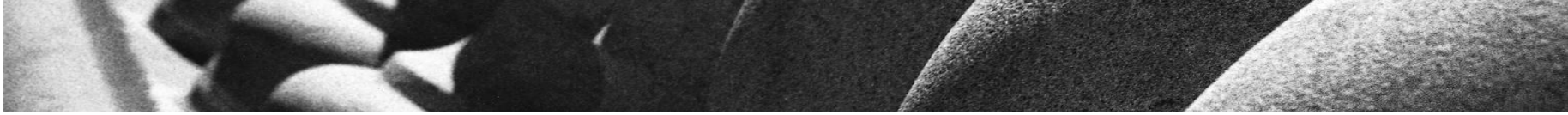
- Because the bottled Zone K approach would be market based, it would send a price signal that would support efficient outcomes regardless of which regions could provide the lowest cost capacity.



Bottled Zone K Approach Consumer Impact

The bottled Zone K approach would have reduced aggregate rate payer costs in every month given the historical excess Zone K supply.

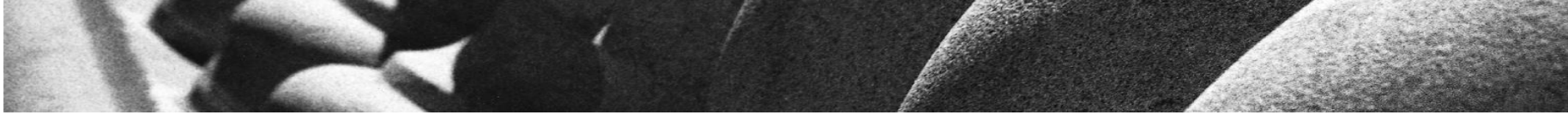
- Overall ratepayer costs would have been reduced by $98.5 million over the 2015-2016 simulated capability year.



Bottled Zone K Approach — Regional Incidence

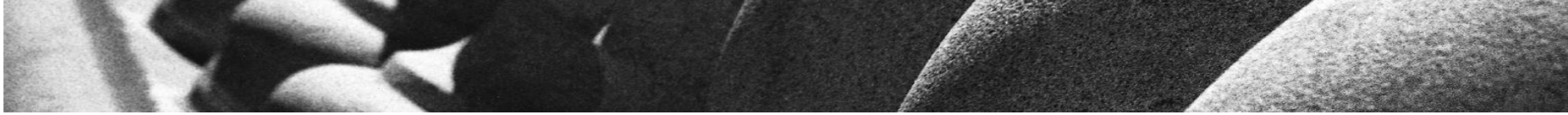
There would be more than one way to allocate capacity market costs to Zone K and G-J consumers under such a design for clearing the Zone K and G–J spot capacity markets.

- One approach would be to simply include the excess Zone K capacity in G-J supply in the spot auction, with the excess Zone K capacity purchased by Zone K load. G–J load would bear no costs for the excess Zone K capacity cleared against the G-J demand curve.
- Another approach would be for G-J load to pay the difference between the G-J spot auction price and the Zone K spot auction price for the excess Zone K capacity, with this payment reducing the capacity market costs of Zone K load.



Bottled Zone K Approach Regional Incidence

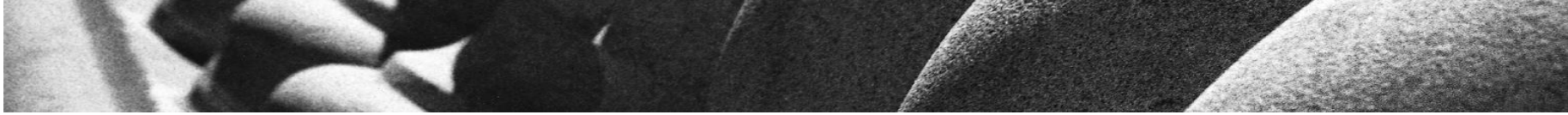
- If the benefit to G-J consumers was shared with Zone K consumers, there would be a benefit to consumers in Zones, G, H, I, J and K.
  - It is estimated that most of the benefit, $77.5 million, or $17,581 per megawatt year of peak load would have flowed to Zone G, H, and I consumers, another $19.5 million would have flowed to Zone J consumers.
  - If the difference between the Zone K and Lower Hudson Valley capacity prices flowed to Zone K consumers, this would have reduced Zone K costs by $1.4 million or $259 per megawatt of peak load.
- If the surplus capacity in Zone K was less than the limit on transfers (300 megawatts in the FTI calculations), the benefit to Zone G-J consumers would be reduced and there would likely be an increased capacity market cost to Zone K consumers.



Cost Allocation

Another consideration in assessments of the long run impact of modifications to LCRs is the impact on cost allocation design.

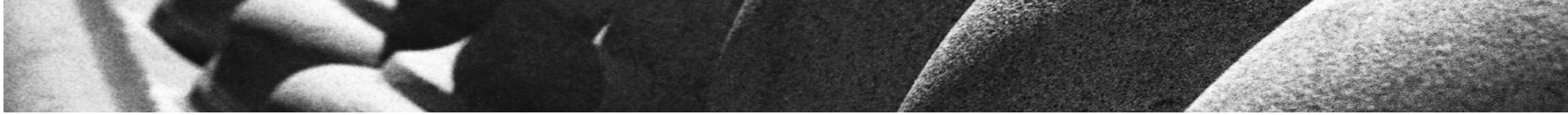
- Under the current design the higher cost of capacity built in J, K or G-J relative to the cost of NYCA capacity is borne by the rate payers within each region.
- If the NYISO shifts LCRs across regions to minimize overall production costs, the current rules that implicitly allocate capacity cost to the rate payers in the region in which the capacity is located may not be appropriate, perhaps requiring changes in the way capacity costs are allocated across regions.



Cost Shift Approach

Another approach to shifting the rate impact of adding capacity in the new G-J Zone would be to shift a portion of the obligation to buy G-J and NYCA capacity between Zone K load and Zone G-J load, while leaving LCRs unchanged.

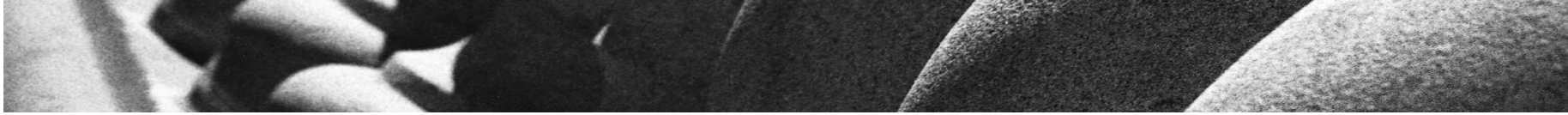
- Under this approach, Zone K load would buy some G–J capacity and less rest of state NYCA capacity, and G-J load would buy less G-J capacity and more rest of state NYCA capacity.
- The effect would be to shift some capacity cost from Zones G-J to Zone K; overall consumer capacity costs would not change.
- For example, Zone K load could be obligated to meet 4% of its capacity market obligation with G–J capacity, i.e. 4% out of the 117% would be met with G-J capacity rather than NYCA capacity.



Cost Shift Approach

In our illustrative calculations, a 4% shift would have:

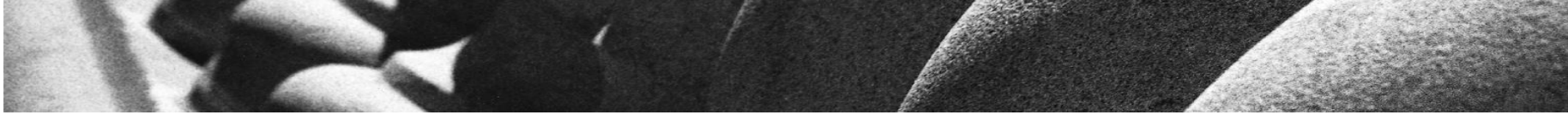
- Increased the capacity costs allocated to Zone K load by $10.5 million (3.3%).
- Reduced the capacity costs allocated to Central Hudson by $2.1 million (2.74%), to Con Ed by $5.5 million (.39%), to NYSEG by $.7 million (.59%) and to O&R by $2.2 million (2.80%), with the benefit allocated to GHI load.
- If the rate benefit were allocated to G-J load, much more of the benefits would have flowed to Con Ed ($8.8 million) and the rate benefits to Central Hudson would have been much lower ($.7 million).



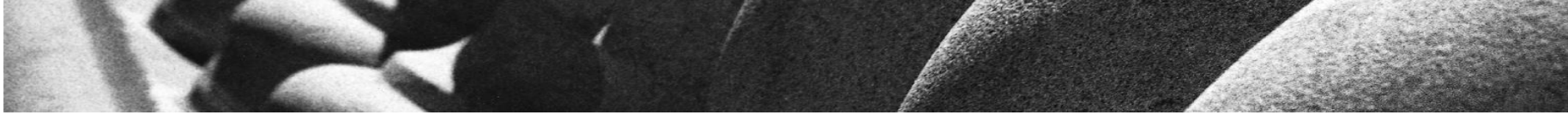
Summary

	Increase Zone K LCR	Bottled Zone K	Cost Shift from GHI to Zone K
Description	Increase Zone K LCR, decrease G-J LCR	Excess capacity cleared in Zone K included in G-J supply up to limit	Zone K allocated portion of G-J cost and less ROS cost; reverse for G-J
Capacity Production Cost Impact	Substantial decrease, based on net CONE or auction price proxy	Decrease or neutral; gives correct price signal	None
Total Consumer Cost Impact	Estimate substantial short-run increase	Estimate substantial short-run decrease	None
Regional Cost Impact	Increase for Zone K greater than decrease for G-J; impact on CH small, relatively	Decrease for G-J and small reduction for Zone K; possibility of increase in K price	Decrease for G-I depends on whether reduction shared with J; increase for Zone K

Note: These alternatives may warrant a different cost allocation construct.



Appendix – General Methodology

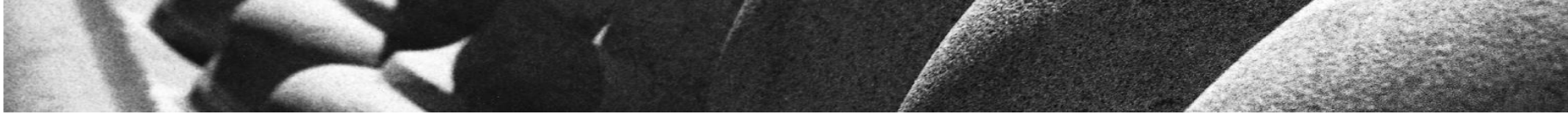


Approach to Capacity Price Estimation

For this study we estimated changes in NYISO capacity prices resulting from hypothetical changes in the demand or supply for capacity in the NYISO spot auctions for each capacity zone for each month of the Summer 2015 and Winter 2015-2016 capability periods.

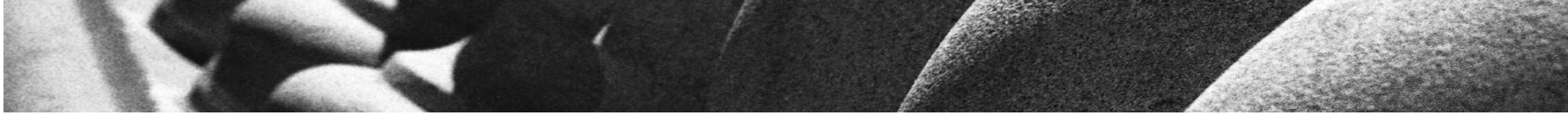
- The focus was on price changes resulting from shifts in the demand curves for Zone K, G-J capacity due to proposed changes in the LCRs for these zones.
- Capacity supply was assumed to be inelastic in the spot auctions; a few model runs explored sensitivity to changes in the assumed quantity of cleared supply.

The estimated capacity prices with the changes in LCRS, are compared to actual spot prices through November 2015; for the remainder of the 2015-2016 winter period, the comparison is to FTI estimates of clearing prices absent the LCR changes.



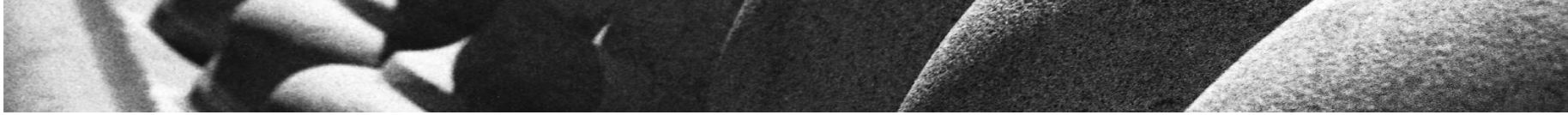
Supply Assumptions

- Summer 2015 months and November 2015 use actual cleared capacity.
- Winter 2015-16 months, other than November 2015, use the actual cleared capacity from the corresponding month in the Winter 2014-15 capability period, with the following adjustments:
    - Previous year's quantity is multiplied by the ratio (1-2015 Derate)/(1-2014 Derate)
    - Additional 161.118 UCAP MW added to J, G-J and NYCA (Astoria)
    - Additional 520 MW UCAP added to G-J and NYCA (general missing capacity)
    - 230 MW UCAP subtracted from NYCA (ROS import reduction)



Appendix – K and G-J Changes

2015-2016 LCRS

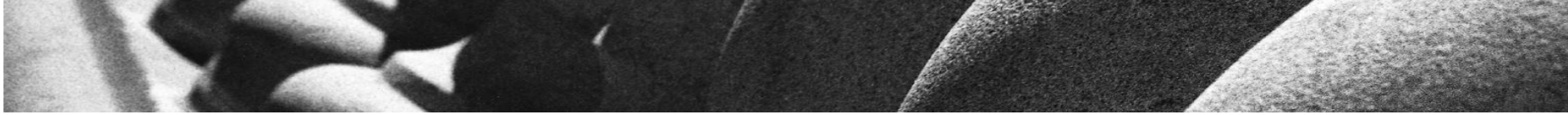


LCRs – Actual and Hypothetical 2015-2016

- The NYISO provided estimates of the 2015-2016 LCR changes resulting from adding 300 MW of Zone K ICAP to the Zone K LCR, representing the availability of Zone K exports to satisfy capacity requirements outside of Zone K.
- The summer UCAP quantities calculated for each region for these LCR changes were held constant through each month of the analysis.

LCRs

Zone	2015/2016 LCR	New LCR (Summer)	Resulting UCAP MW Change	New LCR (Winter)
NYCA	117.00%	117.00%	0.00	117.00%
G-J	90.50%	88.30%	-338.74	88.24%
J	83.50%	83.50%	0.00	83.50%
K	103.50%	108.92%	276.71	108.99%

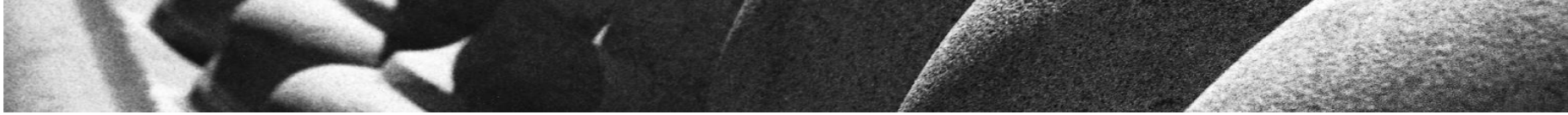


LCR Shift Analysis: K and G-J – Full Shift

Summary Table: Impact of Including 300 MW LI Export in Zone K LCR on Spot Auction Load Payments

Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	New Total Payments by Load $	Difference in Load Payments (positive represents increase)
Summer 2015 Capability Period						
May 2015	J	$16.04	$16.04	$154,399,436	$154,399,436	$0
	K	$5.78	$8.37	$32,432,736	$46,965,744	$14,533,008
	GHIJ	$10.93	$8.68	$50,984,078	$40,488,728	-$10,495,350
	ROS	$4.07	$4.07	$75,505,826	$75,505,826	$0
	State Total					***$4,037,658***
June 2015	J	$15.41	$15.41	$149,130,275	$149,130,275	$0
	K	$5.77	$8.36	$32,381,817	$46,917,156	$14,535,339
	GHIJ	$10.56	$8.31	$49,320,480	$38,811,855	-$10,508,625
	ROS	$4.88	$4.88	$88,512,464	$88,512,464	$0
	State Total					***$4,026,714***
July 2015	J	$15.26	$15.26	$147,864,822	$147,864,822	$0
	K	$5.77	$8.35	$32,385,279	$46,866,045	$14,480,766
	GHIJ	$8.36	$6.06	$41,861,864	$30,344,844	-$11,517,020
	ROS	$3.98	$3.98	$72,359,186	$72,359,186	$0
	State Total					***$2,963,746***
Aug. 2015	J	$15.32	$15.32	$148,377,264	$148,377,264	$0
	K	$5.77	$8.36	$32,380,086	$46,914,648	$14,534,562
	GHIJ	$8.32	$6.02	$41,752,256	$30,210,166	-$11,542,090
	ROS	$3.58	$3.58	$65,690,852	$65,690,852	$0
	State Total					***$2,992,472***
Sept. 2015	J	$15.26	$15.26	$147,864,822	$147,864,822	$0
	K	$5.62	$8.21	$31,633,294	$46,211,627	$14,578,333
	GHIJ	$8.28	$5.97	$41,578,848	$29,978,952	-$11,599,896
	ROS	$3.48	$3.48	$63,935,604	$63,935,604	$0
	State Total					***$2,978,437***
Oct. 2015	J	$15.01	$15.01	$145,751,603	$145,751,603	$0
	K	$5.61	$8.20	$31,582,617	$46,163,540	$14,580,923
	GHIJ	$8.13	$5.82	$40,841,868	$29,237,352	-$11,604,516
	ROS	$2.96	$2.96	$54,979,336	$54,979,336	$0
	State Total					***$2,976,407***
Winter 2015 Capability Period						
Nov. 2015	J	$6.36	$6.36	$63,848,040	$63,848,040	$0
	K	$1.82	$4.68	$10,852,296	$27,905,904	$17,053,608
	GHIJ	$3.46	$0.88	$17,339,444	$4,410,032	-$12,929,412
	ROS	$0.46	$0.46	$8,643,216	$8,643,216	$0
	State Total					***$4,124,196***
Dec. 2015	J	$6.78	$6.78	$67,846,381	$67,846,381	$0
	K	$2.34	$4.52	$13,995,662	$27,034,356	$13,038,694
	GHIJ	$3.51	$2.34	$17,680,268	$11,786,846	-$5,893,423
	ROS	$2.34	$2.34	$42,044,593	$42,044,593	$0
	State Total					***$7,145,271***
Jan. 2016	J	$6.70	$6.70	$67,085,630	$67,085,630	$0
	K	$1.87	$4.73	$11,140,977	$28,180,119	$17,039,141
	GHIJ	$2.49	$1.20	$12,907,555	$6,220,509	-$6,687,047
	ROS	$1.20	$1.20	$21,997,293	$21,997,293	$0
	State Total					***$10,352,095***
Feb. 2016	J	$6.86	$6.86	$68,607,476	$68,607,476	$0
	K	$2.19	$4.45	$13,113,711	$26,646,581	$13,532,870
	GHIJ	$2.95	$2.19	$15,123,604	$11,227,353	-$3,896,250
	ROS	$2.19	$2.19	$39,288,054	$39,288,054	$0
	State Total					***$9,636,620***
Mar. 2016	J	$5.05	$5.05	$51,199,206	$51,199,206	$0
	K	$1.52	$4.39	$9,112,006	$26,316,912	$17,204,906
	GHIJ	$1.63	$0.00	$8,453,533	$0	-$8,453,533
	ROS	$0.00	$0.00	$0	$0	$0
	State Total					***$8,751,374***
April 2016	J	$5.07	$5.07	$51,392,893	$51,392,893	$0
	K	$1.57	$4.44	$9,403,489	$26,593,307	$17,189,818
	GHIJ	$1.52	$0.00	$7,910,154	$0	-$7,910,154
	ROS	$0.00	$0.00	$0	$0	$0
	State Total					***$9,279,664***
May 2015 - April 2016	J			$1,263,367,847	$1,263,367,847	$0
	K			$260,413,970	$442,715,939	$182,301,969
	GHIJ			$345,753,952	$232,716,636	-$113,037,315
	ROS			$532,956,424	$532,956,424	$0
	State Total					***$69,264,653***

Shaded cells indicate months with an increase in rate payer costs. Underlined prices are set by cascading; i.e., they are higher due to a floor price set by a larger region



LCR Shift Analysis: K and G-J - May

TABLE 1: NYISO ICAP and UCAP Calculations
Summer 2015 Demand Curve

Region	Capability Period	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %
NYCA	Summer 2015	33567.30	117.00%	8.54%	39273.74	35919.76	107.01%
G-J	Summer 2015	16340.00	90.50%	5.77%	14787.70	13934.45	85.28%
J	Summer 2015	11929.40	83.50%	6.92%	9961.05	9271.74	77.72%
K	Summer 2015	5539.00	103.50%	7.83%	5732.87	5283.98	95.40%

TABLE 2: Summer 2015 Demand Curve and Results for May 2015 Spot Auction

Region	Capability Period	UCAP Requirement	Demand Curve Zero Crossing %	UCAP at $0	Reference Price ($/UCAP)	Demand Curve Slope (UCAP $/kW-Month per MW)	Demand Curve Kink Point ($/UCAP)	Demand Curve Kink Point (MW)	Δ Zero Crossing Point and MW Cleared	May 2015 Clearing Price ($/kW-Month)	May 2015 Total MW Cleared
NYCA	Summer 2015	35919.76	112.00%	40230.14	$9.87	-$0.00229	$15.08	33644.48	1776.64	$4.07	38453.50
G-J	Summer 2015	13934.45	115.00%	16024.62	$13.17	-$0.00630	$20.40	12787.00	1734.12	$10.93	14290.50
J	Summer 2015	9271.74	118.00%	10940.66	$20.36	-$0.01220	$28.71	8587.29	1314.76	$16.04	9625.90
K	Summer 2015	5283.98	118.00%	6235.10	$8.81	-$0.00926	$23.15	3735.85	623.90	$5.78	5611.20

TABLE 3: NYISO ICAP and UCAP Calculations with New LCR Percentages for LHV and Zone K
Summer 2015

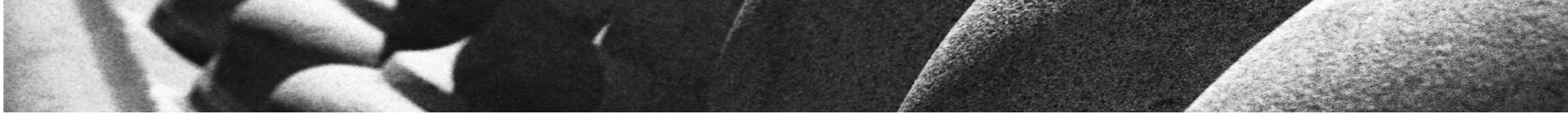
Region	Capability Period	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %	Change in ICAP MW Requirement from New LCR	Change in UCAP MW Requirement from New LCR
NYCA	Summer 2015	33567.30	117.00%	8.54%	39273.74	35919.76	107.01%	0.00	0.00
G-J	Summer 2015	16340.00	88.30%	5.77%	14428.22	13595.71	83.21%	-359.48	-338.74
J	Summer 2015	11929.40	83.50%	6.92%	9961.05	9271.74	77.72%	0.00	0.00
K	Summer 2015	5539.00	108.92%	7.83%	6033.08	5560.69	100.39%	300.21	276.71

TABLE 4: Summer 2015 Demand Curve with New LCR Percentages and Imputed Prices for May 2015 Spot Auction
(Impact of Including 300 MW LI Export in Zone K LCR)
Only LHV LCR Reduced

Region	Capability Period	UCAP Requirement	Demand Curve Zero Crossing %	UCAP at $0	Reference Points ($/UCAP)	Demand Curve Slope (UCAP $/kW-Month per MW)	Demand Curve Kink Point ($/UCAP)	Demand Curve Kink Point (MW)	Δ Zero Crossing Point and MW Cleared	Clearing Price Estimate	Clearing Price Estimate (Rounded)	Clearing Price Estimate (Cascaded)	Total MW Cleared
NYCA	Summer 2015	35919.76	112.00%	40230.14	$9.87	-$0.00229	$15.08	33644.48	1776.64	$4.07	$4.07	$4.07	38453.50
G-J	Summer 2015	13595.71	115.00%	15635.07	$13.17	-$0.00646	$20.40	12476.16	1344.57	$8.68	$8.68	$8.68	14290.50
J	Summer 2015	9271.74	118.00%	10940.66	$20.36	-$0.01220	$28.71	8587.29	1314.76	$16.04	$16.04	$16.04	9625.90
K	Summer 2015	5560.69	118.00%	6561.61	$8.81	-$0.00880	$23.15	3931.49	950.41	$8.37	$8.37	$8.37	5611.20

TABLE 5: Estimated Impact on Load Payments for May 2015 Spot Auction -- All Load Capacity Requirements Valued at Spot Price
(Impact of Including 300 MW LI Export in Zone K LCR)
Only LHV LCR Reduced

Region	Capability Period	Total MW Cleared	Actual 2015 Price $/kw-Month	Total Payments by Load $	New Clearing Price Estimate $/kw-Month	New Total Payments by Load $	Difference in Load Payments (positive represents increase)	% Change in Load Payments	Δ Clearing Price $/kW-Month (new - old)
J	Summer 2015	9625.90	$16.04	$154,399,436.00	$16.04	$154,399,436.00	$0.00	0%	$0.00
K	Summer 2015	5611.20	$5.78	$32,432,736.00	$8.37	$46,965,744.00	$14,533,008.00	45%	$2.59
GHIJ	Summer 2015	4664.60	$10.93	$50,984,078.00	$8.68	$40,488,728.00	-$10,495,350.00	-21%	-$2.25
ROS	Summer 2015	18551.80	$4.07	$75,505,826.00	$4.07	$75,505,826.00	$0.00	0%	$0.00
							$4,037,658.00		



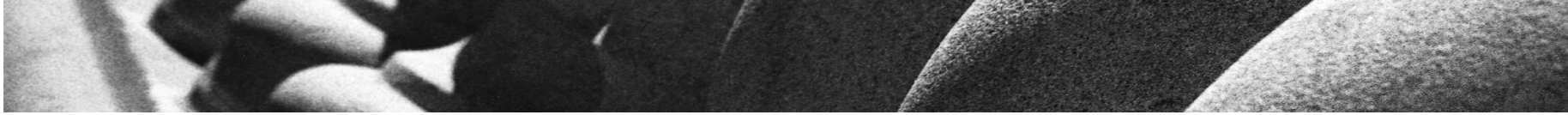
LCR Shift Analysis: K and G-J – Partial Shift

Summary Table: Impact of Including 300 MW LI Export in Zone K LCR on Spot Auction Load Payments

Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	New Total Payments by Load $	Difference in Load Payments (positive represents increase)
Summer 2015 Capability Period						
May 2015	J	$16.04	$16.04	$154,399,436	$154,399,436	$0
	K	$5.78	$7.11	$32,432,736	$39,895,632	$7,462,896
	GHIJ	$10.93	$9.82	$50,984,078	$45,806,372	-$5,177,706
	ROS	$4.07	$4.07	$75,505,826	$75,505,826	$0
	State Total					***$2,285,190***
June 2015	J	$15.41	$15.41	$149,130,275	$149,130,275	$0
	K	$5.77	$7.10	$32,381,817	$39,845,910	$7,464,093
	GHIJ	$10.56	$9.45	$49,320,480	$44,136,225	-$5,184,255
	ROS	$4.88	$4.88	$88,512,464	$88,512,464	$0
	State Total					***$2,279,838***
July 2015	J	$15.26	$15.26	$147,864,822	$147,864,822	$0
	K	$5.77	$7.09	$32,385,279	$39,794,043	$7,408,764
	GHIJ	$8.36	$7.23	$41,861,864	$36,203,502	-$5,658,362
	ROS	$3.98	$3.98	$72,359,186	$72,359,186	$0
	State Total					***$1,750,402***
Aug. 2015	J	$15.32	$15.32	$148,377,264	$148,377,264	$0
	K	$5.77	$7.10	$32,380,086	$39,843,780	$7,463,694
	GHIJ	$8.32	$7.18	$41,752,256	$36,031,394	-$5,720,862
	ROS	$3.58	$3.58	$65,690,852	$65,690,852	$0
	State Total					***$1,742,832***
Sept. 2015	J	$15.26	$15.26	$147,864,822	$147,864,822	$0
	K	$5.62	$6.95	$31,633,294	$39,119,465	$7,486,171
	GHIJ	$8.28	$7.13	$41,578,848	$35,804,008	-$5,774,840
	ROS	$3.48	$3.48	$63,935,604	$63,935,604	$0
	State Total					***$1,711,331***
Oct. 2015	J	$15.01	$15.01	$145,751,603	$145,751,603	$0
	K	$5.61	$6.94	$31,582,617	$39,070,118	$7,487,501
	GHIJ	$8.13	$6.99	$40,841,868	$35,114,964	-$5,726,904
	ROS	$2.96	$2.96	$54,979,336	$54,979,336	$0
	State Total					***$1,760,597***

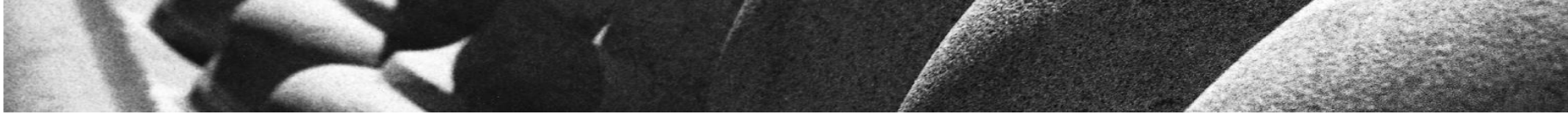
Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	New Total Payments by Load $	Difference in Load Payments (positive represents increase)
Winter 2015 Capability Period						
Nov. 2015	J	$6.36	$6.36	$63,848,040	$63,848,040	$0
	K	$1.82	$3.29	$10,852,296	$19,617,612	$8,765,316
	GHIJ	$3.46	$2.19	$17,339,444	$10,974,966	-$6,364,478
	ROS	$0.46	$0.46	$8,643,216	$8,643,216	$0
	State Total					***$2,400,838***
Dec. 2015	J	$6.78	$6.78	$67,846,381	$67,846,381	$0
	K	$2.34	$3.12	$13,995,662	$18,660,883	$4,665,221
	GHIJ	$3.51	$2.34	$17,680,268	$11,786,846	-$5,893,423
	ROS	$2.34	$2.34	$42,044,593	$42,044,593	$0
	State Total					***-$1,228,202***
Jan. 2016	J	$6.70	$6.70	$67,085,630	$67,085,630	$0
	K	$1.87	$3.34	$11,140,977	$19,898,858	$8,757,880
	GHIJ	$2.49	$1.20	$12,907,555	$6,220,509	-$6,687,047
	ROS	$1.20	$1.20	$21,997,293	$21,997,293	$0
	State Total					***$2,070,834***
Feb. 2016	J	$6.86	$6.86	$68,607,476	$68,607,476	$0
	K	$2.19	$3.06	$13,113,711	$18,323,267	$5,209,556
	GHIJ	$2.95	$2.19	$15,123,604	$11,227,353	-$3,896,250
	ROS	$2.19	$2.19	$39,288,054	$39,288,054	$0
	State Total					***$1,313,306***
Mar. 2016	J	$5.05	$5.05	$51,199,206	$51,199,206	$0
	K	$1.52	$2.99	$9,112,006	$17,924,275	$8,812,269
	GHIJ	$1.63	$0.33	$8,453,533	$1,711,451	-$6,742,081
	ROS	$0.00	$0.00	$0	$0	$0
	State Total					***$2,070,188***
April 2016	J	$5.07	$5.07	$51,392,893	$51,392,893	$0
	K	$1.57	$3.04	$9,403,489	$18,208,030	$8,804,541
	GHIJ	$1.52	$0.23	$7,910,154	$1,196,931	-$6,713,223
	ROS	$0.00	$0.00	$0	$0	$0
	State Total					***$2,091,318***
May 2015 - April 2016	J			$1,263,367,847	$1,263,367,847	$0
	K			$260,413,970	$350,201,872	$89,787,902
	GHIJ			$345,753,952	$276,214,521	-$69,539,431
	ROS			$532,956,424	$532,956,424	$0
	State Total					***$20,248,471***

Shaded cells indicate months with an increase in rate payer costs. Underlined prices are set by cascading; i.e., they are higher due to a floor price set by a larger region



Appendix – Zone K and G-J Changes

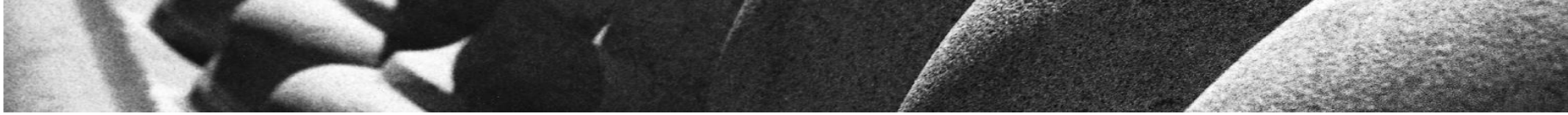
2016-2017 LCRS (PRELIMINARY VERSION)



LCR Shift Analysis: K and G-J – 2016-2017 LCRs

In this analysis the shifts in local UCAP requirements remain at the levels estimated for the summer of 2015, but the preliminary 2016-2017 LCRs were used as the base.

	2015/2016	Preliminary 2016/2017
G-J	90.50%	90.00%
K	103.50%	102.50%
J	83.50%	81.00%
NYCA	117.00%	117.00%



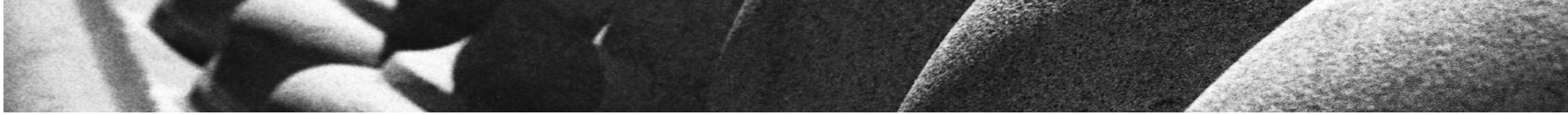
LCR Shift Analysis: K and G-J – Full Shift –2016-2017 LCRs

Summary Table: Impact of Including 300 MW LI Export in Zone K LCR on Spot Auction Load Payments

Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	New Total Payments by Load $	Difference in Load Payments (positive represents increase)
Summer 2015 Capability Period						
May 2015	J	$12.42	$12.42	$119,553,678	$119,553,678	$0
	K	$5.27	$7.91	$29,571,024	$44,384,592	$14,813,568
	GHIJ	$10.43	$8.16	$48,651,778	$38,063,136	-$10,588,642
	ROS	$4.07	$4.07	$75,505,826	$75,505,826	$0
	State Total					***$4,224,926***
June 2015	J	$11.77	$11.77	$113,904,175	$113,904,175	$0
	K	$5.26	$7.90	$29,519,646	$44,335,590	$14,815,944
	GHIJ	$10.06	$7.78	$46,985,230	$36,336,490	-$10,648,740
	ROS	$4.88	$4.88	$88,512,464	$88,512,464	$0
	State Total					***$4,167,204***
July 2015	J	$11.61	$11.61	$112,497,417	$112,497,417	$0
	K	$5.26	$7.89	$29,522,802	$44,284,203	$14,761,401
	GHIJ	$7.85	$5.52	$39,308,090	$27,640,848	-$11,667,242
	ROS	$3.98	$3.98	$72,359,186	$72,359,186	$0
	State Total					***$3,094,159***
Aug. 2015	J	$11.67	$11.67	$113,026,284	$113,026,284	$0
	K	$5.27	$7.90	$29,574,186	$44,333,220	$14,759,034
	GHIJ	$7.81	$5.48	$39,192,923	$27,500,284	-$11,692,639
	ROS	$3.58	$3.58	$65,690,852	$65,690,852	$0
	State Total					***$3,066,395***
Sept. 2015	J	$11.61	$11.61	$112,497,417	$112,497,417	$0
	K	$5.11	$7.75	$28,762,657	$43,622,425	$14,859,768
	GHIJ	$7.76	$5.42	$38,967,616	$27,217,072	-$11,750,544
	ROS	$3.48	$3.48	$63,935,604	$63,935,604	$0
	State Total					***$3,109,224***
Oct. 2015	J	$11.35	$11.35	$110,211,905	$110,211,905	$0
	K	$5.10	$7.74	$28,711,470	$43,573,878	$14,862,408
	GHIJ	$7.62	$5.28	$38,279,832	$26,524,608	-$11,755,224
	ROS	$2.96	$2.96	$54,979,336	$54,979,336	$0
	State Total					***$3,107,184***

Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	New Total Payments by Load $	Difference in Load Payments (positive represents increase)
Winter 2015 Capability Period						
Nov. 2015	J	$2.90	$2.27	$29,113,100	$22,788,530	-$6,324,570
	K	$1.27	$4.18	$7,572,756	$24,924,504	$17,351,748
	GHIJ	$2.90	$0.46	$14,533,060	$2,305,244	-$12,227,816
	ROS	$0.46	$0.46	$8,643,216	$8,643,216	$0
	State Total					***-$1,200,638***
Dec. 2015	J	$2.95	$2.71	$29,520,181	$27,118,539	-$2,401,642
	K	$2.34	$4.02	$13,995,662	$24,043,830	$10,048,168
	GHIJ	$2.95	$2.34	$14,859,485	$11,786,846	-$3,072,639
	ROS	$2.34	$2.34	$42,044,593	$42,044,593	$0
	State Total					***$4,573,887***
Jan. 2016	J	$2.63	$2.63	$26,333,613	$26,333,613	$0
	K	$1.32	$4.23	$7,864,219	$25,201,248	$17,337,029
	GHIJ	$1.92	$1.20	$9,952,814	$6,220,509	-$3,732,305
	ROS	$1.20	$1.20	$21,997,293	$21,997,293	$0
	State Total					***$13,604,723***
Feb. 2016	J	$2.79	$2.79	$27,903,040	$27,903,040	$0
	K	$2.19	$3.95	$13,113,711	$23,652,583	$10,538,872
	GHIJ	$2.38	$2.19	$12,201,416	$11,227,353	-$974,063
	ROS	$2.19	$2.19	$39,288,054	$39,288,054	$0
	State Total					***$9,564,810***
Mar. 2016	J	$1.06	$0.92	$10,746,764	$9,327,380	-$1,419,384
	K	$0.96	$3.89	$5,754,951	$23,319,542	$17,564,591
	GHIJ	$1.06	$0.00	$5,497,389	$0	-$5,497,389
	ROS	$0.00	$0.00	$0	$0	$0
	State Total					***$10,647,817***
April 2016	J	$0.95	$0.94	$9,629,832	$9,528,465	-$101,367
	K	$1.01	$3.94	$6,049,378	$23,598,565	$17,549,187
	GHIJ	$0.95	$0.00	$4,943,846	$0	-$4,943,846
	ROS	$0.00	$0.00	$0	$0	$0
	State Total					***$12,503,974***
May 2015 - April 2016	J			$814,937,406	$804,690,443	-$10,246,962
	K			$230,012,462	$409,274,180	$179,261,717
	GHIJ			$313,373,479	$214,822,389	-$98,551,089
	ROS			$532,956,424	$532,956,424	$0
	State Total					***$70,463,665***

Shaded cells indicate months with an increase in rate payer costs. Underlined prices are set by cascading; i.e., they are higher due to a floor price set by a larger region



LCR Shift Analysis: K and G-J – May – 2016-2017 LCRs

TABLE 1: NYISO ICAP and UCAP Calculations
Summer 2016 Demand Curve

Region	Capability Period	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %
NYCA	Summer 2016	33567.30	117.00%	8.54%	39273.74	35919.76	107.01%
G-J	Summer 2016	16340.00	90.00%	5.77%	14706.00	13857.46	84.81%
J	Summer 2016	11929.40	81.00%	6.92%	9662.81	8994.15	75.39%
K	Summer 2016	5539.00	102.50%	7.83%	5677.48	5232.93	94.47%

TABLE 2: Summer 2016 Demand Curve and Results for May 2015 Spot Auction

Region	Capability Period	UCAP Requirement	Demand Curve Zero Crossing %	UCAP at $0	Reference Price ($/UCAP)	Demand Curve Slope (UCAP $/kW-Month per MW)	Demand Curve Kink Point ($/UCAP)	Demand Curve Kink Point (MW)	Δ Zero Crossing Point and MW Cleared	May 2015 Clearing Price ($/kW-Month)	May 2015 Total MW Cleared
NYCA	Summer 2016	35919.76	112.00%	40230.14	$9.87	-$0.00229	$15.08	33644.48	1776.64	$4.07	38453.50
G-J	Summer 2016	13857.46	115.00%	15936.08	$13.17	-$0.00634	$20.40	12716.35	1645.58	$10.43	14290.50
J	Summer 2016	8994.15	118.00%	10613.09	$20.36	-$0.01258	$28.71	8330.19	987.19	$12.42	9625.90
K	Summer 2016	5232.93	118.00%	6174.86	$8.81	-$0.00935	$23.15	3699.76	563.66	$5.27	5611.20

TABLE 3: NYISO ICAP and UCAP Calculations with New LCR Percentages for LHV and Zone K
Summer 2016

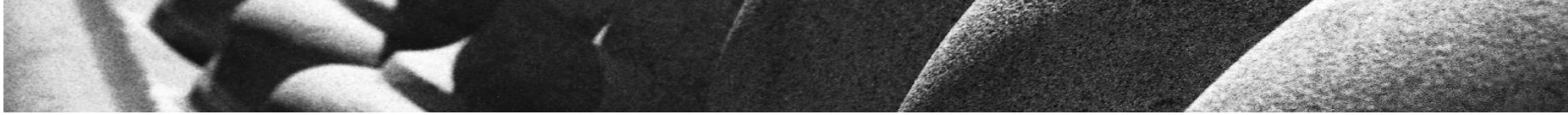
Region	Capability Period	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %	Change in ICAP MW Requirement from New LCR	Change in UCAP MW Requirement from New LCR
NYCA	Summer 2016	33567.30	117.00%	8.54%	39273.74	35919.76	107.01%	0.00	0.00
G-J	Summer 2016	16340.00	87.80%	5.77%	14346.52	13518.73	82.73%	-359.48	-338.74
J	Summer 2016	11929.40	81.00%	6.92%	9662.81	8994.15	75.39%	0.00	0.00
K	Summer 2016	5539.00	107.92%	7.83%	5977.69	5509.64	99.47%	300.21	276.71

TABLE 4: Summer 2016 Demand Curve with New LCR Percentages and Imputed Prices for May 2015 Spot Auction
(Impact of Including 300 MW LI Export in Zone K LCR)
Only LHV LCR Reduced

Region	Capability Period	UCAP Requirement	Demand Curve Zero Crossing %	UCAP at $0	Reference Points ($/UCAP)	Demand Curve Slope (UCAP $/kW-Month per MW)	Demand Curve Kink Point ($/UCAP)	Demand Curve Kink Point (MW)	Δ Zero Crossing Point and MW Cleared	Clearing Price Estimate	Clearing Price Estimate (Rounded)	Clearing Price Estimate (Cascaded)	Total MW Cleared
NYCA	Summer 2016	35919.76	112.00%	40230.14	$9.87	-$0.00229	$15.08	33644.48	1776.64	$4.07	$4.07	$4.07	38453.50
G-J	Summer 2016	13518.73	115.00%	15546.53	$13.17	-$0.00649	$20.40	12405.51	1256.03	$8.16	$8.16	$8.16	14290.50
J	Summer 2016	8994.15	118.00%	10613.09	$20.36	-$0.01258	$28.71	8330.19	987.19	$12.42	$12.42	$12.42	9625.90
K	Summer 2016	5509.64	118.00%	6501.37	$8.81	-$0.00888	$23.15	3895.39	890.17	$7.91	$7.91	$7.91	5611.20

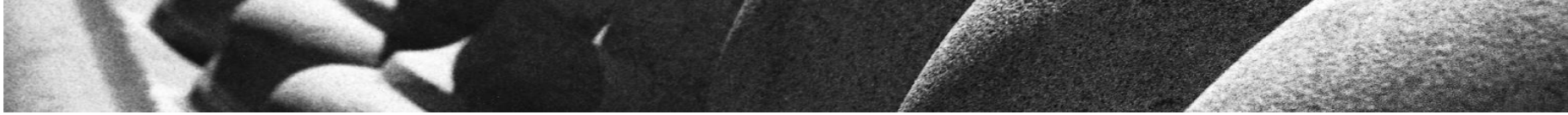
TABLE 5: Estimated Impact on Load Payments for May 2015 Spot Auction -- All Load Capacity Requirements Valued at Spot Price
(Impact of Including 300 MW LI Export in Zone K LCR)
Only LHV LCR Reduced

Region	Capability Period	Total MW Cleared	Actual 2015 Price $/kw-Month	Total Payments by Load $	New Clearing Price Estimate $/kw-Month	New Total Payments by Load $	Difference in Load Payments (positive represents increase)	% Change in Load Payments	Δ Clearing Price $/kW-Month (new - old)
J	Summer 2016	9625.90	$12.42	$119,553,678.00	$12.42	$119,553,678.00	$0.00	0%	$0.00
K	Summer 2016	5611.20	$5.27	$29,571,024.00	$7.91	$44,384,592.00	$14,813,568.00	50%	$2.64
GHIJ	Summer 2016	4664.60	$10.43	$48,651,778.00	$8.16	$38,063,136.00	-$10,588,642.00	-22%	-$2.27
ROS	Summer 2015	18551.80	$4.07	$75,505,826.00	$4.07	$75,505,826.00	$0.00	0%	$0.00
							$4,224,926.00		



Appendix – Bottled K Approach

2015-2016 LCRS



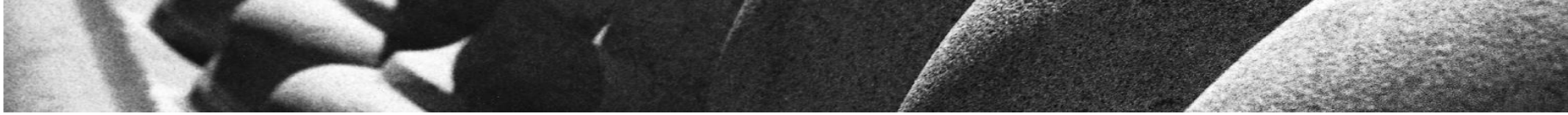
Bottled Zone K Approach

Impact of Additional 300 MW Cleared in Calculating LHV Price

Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	Scenario 1: New Total Payments by Load $	Scenario 1: Difference in Load Payments (positive represents increase)	Scenario 2: New Total Payments by Load $	Scenario 2: Difference in Load Payments (positive represents increase)
Summer 2015 Capability Period								
May 2015	J	$16.04	$16.04	$154,399,436	$154,399,436	$0	$154,399,436	$0
	K	$5.78	$5.78	$32,432,736	$32,432,736	$0	$31,454,736	-$978,000
	GHIJ	$10.93	$9.04	$50,984,078	$42,167,984	-$8,816,094	$43,145,984	-$7,838,094
	ROS	$4.07	$4.07	$75,505,826	$75,505,826	$0	$75,505,826	$0
	State Total					***-$8,816,094***		***-$8,816,094***
June 2015	J	$15.41	$15.41	$149,130,275	$149,130,275	$0	$149,130,275	$0
	K	$5.77	$5.77	$32,381,817	$32,381,817	$0	$31,511,817	-$870,000
	GHIJ	$10.56	$8.67	$49,320,480	$40,493,235	-$8,827,245	$41,363,235	-$7,957,245
	ROS	$4.88	$4.88	$88,512,464	$88,512,464	$0	$88,512,464	$0
	State Total					***-$8,827,245***		***-$8,827,245***
July 2015	J	$15.26	$15.26	$147,864,822	$147,864,822	$0	$147,864,822	$0
	K	$5.77	$5.77	$32,385,279	$32,385,279	$0	$32,175,279	-$210,000
	GHIJ	$8.36	$6.47	$41,861,864	$32,397,878	-$9,463,986	$32,607,878	-$9,253,986
	ROS	$3.98	$3.98	$72,359,186	$72,359,186	$0	$72,359,186	$0
	State Total					***-$9,463,986***		***-$9,463,986***
Aug. 2015	J	$15.32	$15.32	$148,377,264	$148,377,264	$0	$148,377,264	$0
	K	$5.77	$5.77	$32,380,086	$32,380,086	$0	$32,182,086	-$198,000
	GHIJ	$8.32	$6.43	$41,752,256	$32,267,669	-$9,484,587	$32,465,669	-$9,286,587
	ROS	$3.58	$3.58	$65,690,852	$65,690,852	$0	$65,690,852	$0
	State Total					***-$9,484,587***		***-$9,484,587***
Sept. 2015	J	$15.26	$15.26	$147,864,822	$147,864,822	$0	$147,864,822	$0
	K	$5.62	$5.62	$31,633,294	$31,633,294	$0	$31,405,294	-$228,000
	GHIJ	$8.28	$6.38	$41,578,848	$32,037,808	-$9,541,040	$32,265,808	-$9,313,040
	ROS	$3.48	$3.48	$63,935,604	$63,935,604	$0	$63,935,604	$0
	State Total					***-$9,541,040***		***-$9,541,040***
Oct. 2015	J	$15.01	$15.01	$145,751,603	$145,751,603	$0	$145,751,603	$0
	K	$5.61	$5.61	$31,582,617	$31,582,617	$0	$31,393,617	-$189,000
	GHIJ	$8.13	$6.24	$40,841,868	$31,347,264	-$9,494,604	$31,536,264	-$9,305,604
	ROS	$2.96	$2.96	$54,979,336	$54,979,336	$0	$54,979,336	$0
	State Total					***-$9,494,604***		***-$9,494,604***

Period	Region	Clearing Price ($/kW-Month)	LCR Adjusted Clearing Price ($/kW-Month)	Total Payments by Load $	Scenario 1: New Total Payments by Load $	Scenario 1: Difference in Load Payments (positive represents increase)	Scenario 2: New Total Payments by Load $	Scenario 2: Difference in Load Payments (positive represents increase)
Winter 2015 Capability Period								
Nov. 2015	J	$6.36	$6.36	$63,848,040	$63,848,040	$0	$63,848,040	$0
	K	$1.82	$1.82	$10,852,296	$10,852,296	$0	$10,960,296	$108,000
	GHIJ	$3.46	$1.46	$17,339,444	$7,316,644	-$10,022,800	$7,208,644	-$10,130,800
	ROS	$0.46	$0.46	$8,643,216	$8,643,216	$0	$8,643,216	$0
	State Total					***-$10,022,800***		***-$10,022,800***
Dec. 2015	J	$6.78	$6.78	$67,846,381	$67,846,381	$0	$67,846,381	$0
	K	$2.34	$2.34	$13,995,662	$13,995,662	$0	$13,995,662	$0
	GHIJ	$3.51	$2.34	$17,680,268	$11,786,846	-$5,893,423	$11,786,846	-$5,893,423
	ROS	$2.34	$2.34	$42,044,593	$42,044,593	$0	$42,044,593	$0
	State Total					***-$5,893,423***		***-$5,893,423***
Jan. 2016	J	$6.70	$6.70	$67,085,630	$67,085,630	$0	$67,085,630	$0
	K	$1.87	$1.87	$11,140,977	$11,140,977	$0	$11,341,977	$201,000
	GHIJ	$2.49	$1.20	$12,907,555	$6,220,509	-$6,687,047	$6,019,509	-$6,888,047
	ROS	$1.20	$1.20	$21,997,293	$21,997,293	$0	$21,997,293	$0
	State Total					***-$6,687,047***		***-$6,687,047***
Feb. 2016	J	$6.86	$6.86	$68,607,476	$68,607,476	$0	$68,607,476	$0
	K	$2.19	$2.19	$13,113,711	$13,113,711	$0	$13,113,711	$0
	GHIJ	$2.95	$2.19	$15,123,604	$11,227,353	-$3,896,250	$11,227,353	-$3,896,250
	ROS	$2.19	$2.19	$39,288,054	$39,288,054	$0	$39,288,054	$0
	State Total					***-$3,896,250***		***-$3,896,250***
Mar. 2016	J	$5.05	$5.05	$51,199,206	$51,199,206	$0	$51,199,206	$0
	K	$1.52	$1.52	$9,112,006	$9,112,006	$0	$9,568,006	$456,000
	GHIJ	$1.63	$0.00	$8,453,533	$0	-$8,453,533	-$456,000	-$8,909,533
	ROS	$0.00	$0.00	$0	$0	$0	$0	$0
	State Total					***-$8,453,533***		***-$8,453,533***
April 2016	J	$5.07	$5.07	$51,392,893	$51,392,893	$0	$51,392,893	$0
	K	$1.57	$1.57	$9,403,489	$9,403,489	$0	$9,874,489	$471,000
	GHIJ	$1.52	$0.00	$7,910,154	$0	-$7,910,154	-$471,000	-$8,381,154
	ROS	$0.00	$0.00	$0	$0	$0	$0	$0
	State Total					***-$7,910,154***		***-$7,910,154***
May 2015 - April 2016	J			$1,263,367,847	$1,263,367,847	$0	$1,263,367,847	$0
	K			$260,413,970	$260,413,970	$0	$258,976,970	-$1,437,000
	GHIJ			$345,753,952	$247,263,189	-$98,490,762	$248,700,189	-$97,053,762
	ROS			$532,956,424	$532,956,424	$0	$532,956,424	$0
	State Total					***-$98,490,762***		***-$98,490,762***

Shaded cells indicate months with an increase in rate payer costs. Underlined prices are set by cascading; i.e., they are higher due to a floor price set by a larger region



Bottled Zone K Approach

TABLE 1: NYISO ICAP and UCAP Calculations
Summer 2015 Demand Curve

Region	Capability Period	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %
NYCA	Summer 2015	33567.30	117.00%	8.54%	39273.74	35919.76	107.01%
G-J	Summer 2015	16340.00	90.50%	5.77%	14787.70	13934.45	85.28%
J	Summer 2015	11929.40	83.50%	6.92%	9961.05	9271.74	77.72%
K	Summer 2015	5539.00	103.50%	7.83%	5732.87	5283.98	95.40%

TABLE 2: Summer 2015 Demand Curve and Results for May 2015 Spot Auction

Region	Capability Period	UCAP Requirement	Demand Curve Zero Crossing %	UCAP at $0	Reference Price ($/UCAP)	Demand Curve Slope (UCAP $/kW-Month per MW)	Demand Curve Kink Point ($/UCAP)	Demand Curve Kink Point (MW)	Δ Zero Crossing Point and MW Cleared	May 2015 Clearing Price ($/kW-Month)	May 2015 Total MW Cleared	Price Cascaded?
NYCA	Summer 2015	35919.76	112.00%	40230.14	$9.87	-$0.00229	$15.08	33644.48	1776.64	$4.07	38453.50	
G-J	Summer 2015	13934.45	115.00%	16024.62	$13.17	-$0.00630	$20.40	12787.00	1734.12	$10.93	14290.50	NO
J	Summer 2015	9271.74	118.00%	10940.66	$20.36	-$0.01220	$28.71	8587.29	1314.76	$16.04	9625.90	NO
K	Summer 2015	5283.98	118.00%	6235.10	$8.81	-$0.00926	$23.15	3735.85	623.90	$5.78	5611.20	NO

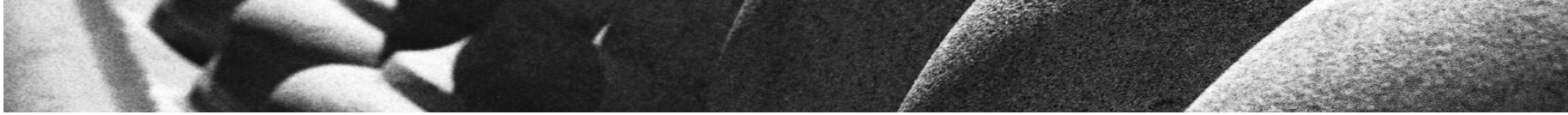
TABLE 3: Zonal Price Calcuations With Additional LHV Cleared MW
May 2015

Region	Capability Period	Forecasted Peak Load MW	Requirement %	Derating Factor %	ICAP MW Requirement	UCAP MW Requirement	UCAP Effective %	May 2015 Excess	May 2015 Total MW Cleared	Change to Cleared MW	Adjusted May 2015 Total MW Cleared	Adjusted Δ Zero Crossing Point and MW Cleared	Adjusted Clearing Price Estimate	Price Cascaded?	Is 300MW constraint binding?
NYCA	Summer 2015	33567.30	117.00%	8.54%	39273.74	35919.76	107.01%	2533.74	38453.50		38453.50	1776.64	$4.07		
G-J	Summer 2015	16340.00	90.50%	5.77%	14787.70	13934.45	85.28%	356.05	14290.50	300.00	14590.50	1434.12	$9.04	NO	YES
J	Summer 2015	11929.40	83.50%	6.92%	9961.05	9271.74	77.72%	354.16	9625.90		9625.90	1314.76	$16.04	NO	
K	Summer 2015	5539.00	103.50%	7.83%	5732.87	5283.98	95.40%	327.22	5611.20		5611.20	623.90	$5.78	NO	

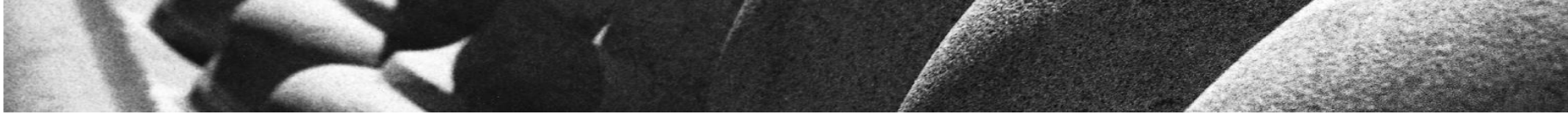
TABLE 5: Estimated Impact on Load Payments for May 2015 Spot Auction -- All Load Capacity Requirements Valued at Spot Price
Impact of Additional 300MW Cleared in Calculating LHV Price

Region	Capability Period	Total MW Cleared	Actual 2015 Price $/kw-Month	Total Payments by Load $	New Clearing Price Estimate $/kw-Month	New Total Payments by Load $ (Scenario 1)	Difference in Load Payments (positive represents increase) (Scenario 1)	Δ Clearing Price $/kW-Month (new - old)	LHV Price - K Price	Load Payments Transferred from LHV to K in Scenario 2	New Total Load Payments $ (Scenario 2)	Difference in Load Payments (positive represents increase) (Scenario 2)
J	Summer 2015	9625.90	$16.04	$154,399,436.00	$16.04	$154,399,436.00	$0.00	$0.00			$154,399,436.00	$0.00
K	Summer 2015	5611.20	$5.78	$32,432,736.00	$5.78	$32,432,736.00	$0.00	$0.00	$3.26	-$978,000.00	$31,454,736.00	-$978,000.00
GHIJ	Summer 2015	4664.60	$10.93	$50,984,078.00	$9.04	$42,167,984.00	-$8,816,094.00	-$1.89	$3.26	$978,000.00	$43,145,984.00	-$7,838,094.00
ROS	Summer 2015	18551.80	$4.07	$75,505,826.00	$4.07	$75,505,826.00	$0.00	$0.00			$75,505,826.00	$0.00
							-$8,816,094.00					-$8,816,094.00

FTI



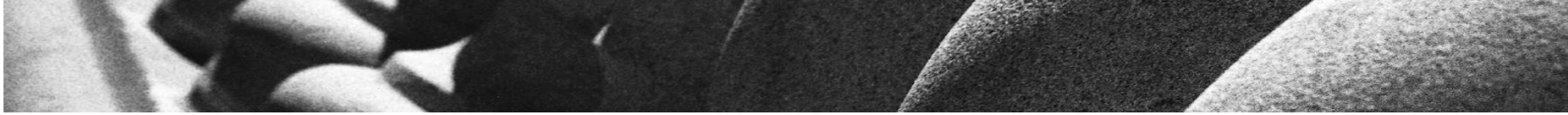
Appendix - Cost Shift Approach



Cost Shift Approach – Benefits to GHI Load

Winter 2015 -2016 Summary of Results : GHI to K Cost Shift

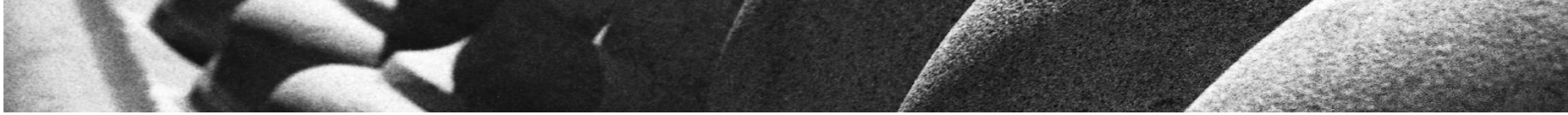
May 2015-April 2016 Summary				
Transmission Owner	**Total Cost of Serving Load**	**Adjusted Total Cost of Serving Load**	**Change in Cost of Serving Load ($) (Adjusted - Unadjusted)**	**Change in Cost of Serving Load (%) (Adjusted - Unadjusted)**
Central Hudson Gas and Electric	$76,826,429.88	$74,722,148.67	-$2,104,281.21	-2.74%
Consolidated Edison of NY	$1,386,758,066.59	$1,381,294,959.71	-$5,463,106.88	-0.39%
Long Island Power Authority	$317,931,789.61	$328,433,597.00	$10,501,807.39	3.30%
New York Power Authority	$10,933,435.01	$10,933,435.01	$0.00	0.00%
New York State Electric and Gas	$120,476,265.48	$119,760,338.46	-$715,927.02	-0.59%
Niagara Mohawk	$230,894,146.49	$230,894,146.49	$0.00	0.00%
Orange and Rockland Utilities	$81,660,254.41	$79,441,762.14	-$2,218,492.27	-2.72%
Rochester Gas and Electric	$53,737,598.18	$53,737,598.18	$0.00	0.00%
	$2,279,217,985.66	$2,279,217,985.66	$0.00	0.00%



Cost Shift Approach – Benefits all GHIJ Load

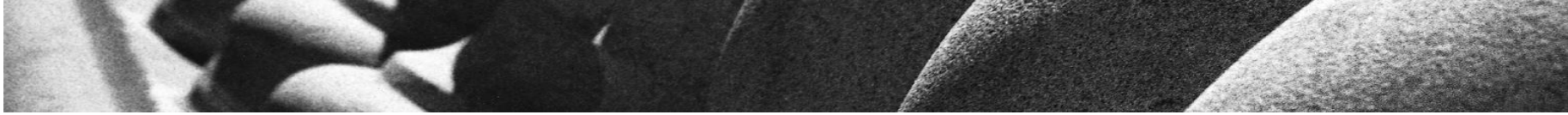
Summary of Results : GHIJ to K Cost Shift

May 2015-April 2016 Summary				
Transmission Owner	**Total Cost of Serving Load**	**Adjusted Total Cost of Serving Load**	**Change in Cost of Serving Load ($) (Adjusted - Unadjusted)**	**Change in Cost of Serving Load (%) (Adjusted - Unadjusted)**
Central Hudson Gas and Electric	$76,826,429.88	$76,120,675.01	-$705,754.88	-0.92%
Consolidated Edison of NY	$1,386,758,066.59	$1,377,946,188.96	-$8,811,877.62	-0.64%
Long Island Power Authority	$317,931,789.61	$328,433,597.00	$10,501,807.39	3.30%
New York Power Authority	$10,933,435.01	$10,933,435.01	$0.00	0.00%
New York State Electric and Gas	$120,476,265.48	$120,236,150.71	-$240,114.76	-0.20%
Niagara Mohawk	$230,894,146.49	$230,894,146.49	$0.00	0.00%
Orange and Rockland Utilities	$81,660,254.41	$80,916,194.29	-$744,060.12	-0.91%
Rochester Gas and Electric	$53,737,598.18	$53,737,598.18	$0.00	0.00%
	$2,279,217,985.66	$2,279,217,985.66	$0.00	0.00%



Cost Shift Detail Approach – May 2015

Transmission Owner	Share of Summer 2015 UCAP Requirement	Cleared MW	Clearing Price	Total Cost of Serving Load	Adjusted Proportion of UCAP Requirement	Adjusted Cleared MW	Adjusted Total Cost of Serving Load	Change in Cost of Serving Load (Adjusted - Unadjusted)
G-J								
Central Hudson Gas and Electric	6.72%	960.37	$10.93	$10,496,812.16	6.60%	943.30	$10,310,302.59	-$186,509.57
Consolidated Edison of NY	83.91%	11990.90	$10.93	$131,060,552.59	82.42%	11777.84	$128,731,841.08	-$2,328,711.51
New York State Electric and Gas	2.29%	326.74	$10.93	$3,571,267.66	2.25%	320.93	$3,507,812.63	-$63,455.04
Orange and Rockland Utilities	7.09%	1012.49	$10.93	$11,066,532.59	6.96%	994.50	$10,869,900.11	-$196,632.48
Long Island Power Authority	0.00%	0.00	$10.93	$0.00	1.78%	253.92	$2,775,308.60	$2,775,308.60
TOTAL	**100.00%**	**14290.50**	**$10.93**	**$156,195,165.00**	**100.00%**	**14290.50**	**$156,195,165.00**	**$0.00**
K								
Long Island Power Authority	100.00%	5565.93	$5.78	$32,171,067.61	100.00%	5565.93	$32,171,067.61	$0.00
TOTAL	**100.00%**	**5565.93**	**$5.78**	**$32,171,067.61**	**100.00%**	**5565.93**	**$32,171,067.61**	**$0.00**
J								
Consolidated Edison of NY	100.00%	9625.90	$16.04	$154,399,436.00	100.00%	9625.90	$154,399,436.00	$0.00
TOTAL	**100.00%**	**9625.90**	**$16.04**	**$154,399,436.00**	**100.00%**	**9625.90**	**$154,399,436.00**	**$0.00**
GHI								
Central Hudson Gas and Electric	20.59%	960.37	$10.93	$10,496,812.16	20.22%	943.30	$10,310,302.59	-$186,509.57
Consolidated Edison of NY	50.70%	2365.00	$10.93	$25,849,465.59	46.13%	2151.94	$23,520,754.08	-$2,328,711.51
New York State Electric and Gas	7.00%	326.74	$10.93	$3,571,267.66	6.88%	320.93	$3,507,812.63	-$63,455.04
Orange and Rockland Utilities	21.71%	1012.49	$10.93	$11,066,532.59	21.32%	994.50	$10,869,900.11	-$196,632.48
Long Island Power Authority	0.00%	0.00	$10.93	$0.00	5.44%	253.92	$2,775,308.60	$2,775,308.60
TOTAL	**100.00%**	**4664.60**	**$10.93**	**$50,984,078.00**	**100.00%**	**4664.60**	**$50,984,078.00**	**$0.00**
ROS								
Central Hudson Gas and Electric	1.51%	280.97	$4.07	$1,143,533.17	1.60%	298.03	$1,212,983.67	$69,450.50
Consolidated Edison of NY	20.49%	3809.87	$4.07	$15,506,157.66	21.63%	4022.92	$16,373,299.09	$867,141.43
Long Island Power Authority	4.20%	781.99	$4.07	$3,182,685.93	2.84%	528.07	$2,149,245.31	-$1,033,440.62
New York Power Authority	2.01%	373.22	$4.07	$1,519,025.11	2.01%	373.22	$1,519,025.11	$0.00
New York State Electric and Gas	17.83%	3315.93	$4.07	$13,495,816.22	17.86%	3321.73	$13,519,444.94	$23,628.73
Niagara Mohawk	42.38%	7881.83	$4.07	$32,079,031.60	42.38%	7881.83	$32,079,031.60	$0.00
Orange and Rockland Utilities	1.71%	318.88	$4.07	$1,297,854.89	1.81%	336.87	$1,371,074.86	$73,219.96
Rochester Gas and Electric	9.86%	1834.39	$4.07	$7,465,975.80	9.86%	1834.39	$7,465,975.80	$0.00
TOTAL	**100.00%**	**18597.07**	**$4.07**	**$75,690,080.38**	**100.00%**	**18597.07**	**$75,690,080.38**	**$0.00**
NYCA								
Central Hudson Gas and Electric	3.23%	1241.33		$11,640,345.33	3.23%	1241.33	$11,523,286.26	-$117,059.07
Consolidated Edison of NY	41.09%	15800.77		$195,755,059.25	41.09%	15800.77	$194,293,489.17	-$1,461,570.08
Long Island Power Authority	16.51%	6347.92		$35,353,753.55	16.51%	6347.92	$37,095,621.52	$1,741,867.98
New York Power Authority	0.97%	373.22		$1,519,025.11	0.97%	373.22	$1,519,025.11	$0.00
New York State Electric and Gas	9.47%	3642.67		$17,067,083.88	9.47%	3642.67	$17,027,257.57	-$39,826.31
Niagara Mohawk	20.50%	7881.83		$32,079,031.60	20.50%	7881.83	$32,079,031.60	$0.00
Orange and Rockland Utilities	3.46%	1331.37		$12,364,387.48	3.46%	1331.37	$12,240,974.96	-$123,412.52
Rochester Gas and Electric	4.77%	1834.39		$7,465,975.80	4.77%	1834.39	$7,465,975.80	$0.00
TOTAL	**100.00%**	**38453.50**	**$4.07**	**$313,244,662.00**	**100.00%**	**38453.50**	**$313,244,662.00**	**$0.00**



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