2015 Congestion Assessment and Resource Integration Study

CARIS – Phase 1

Appendices B-J

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Appendix B – Congestion Assessment and Resource Integration Study (CARIS) Process

CARIS consists of two phases: Phase 1 (the Study Phase) and Phase 2 (the Project Phase). This two-phase process is described below and explained in full detail in the *Economic Planning Process Manual - Congestion Assessment And Resource Integration Studies Manual.*[1]

B.1. Phase 1 – Study Phase

Phase 1 of the CARIS is depicted in the following diagram:

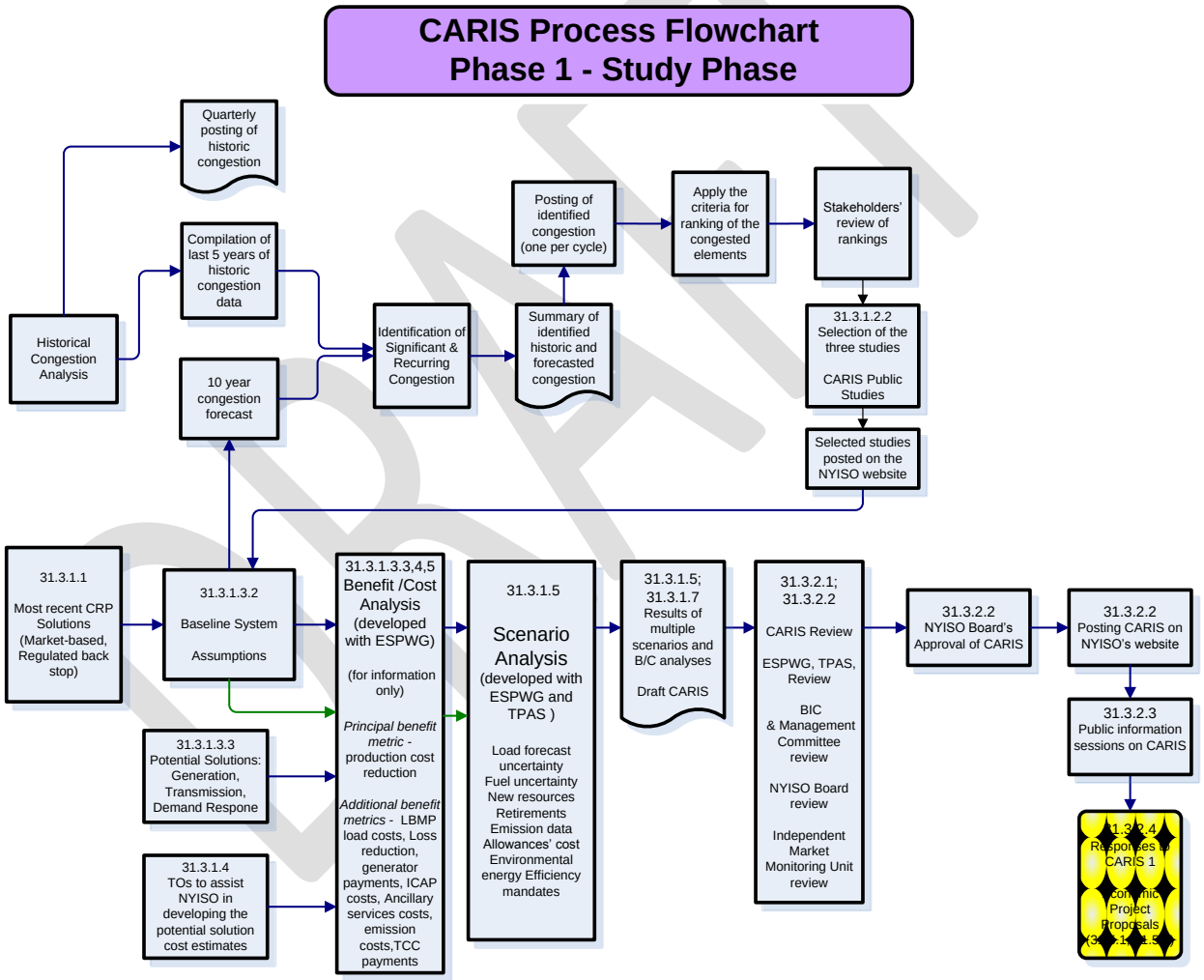

Figure B-1: Phase 1 or Study Phase of the CARIS Process

[1] http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Planning/epp_caris_mnl.pdf

B.2. Phase 2 – Projects Phase

Phase 2 of the CARIS is depicted in the following diagrams:

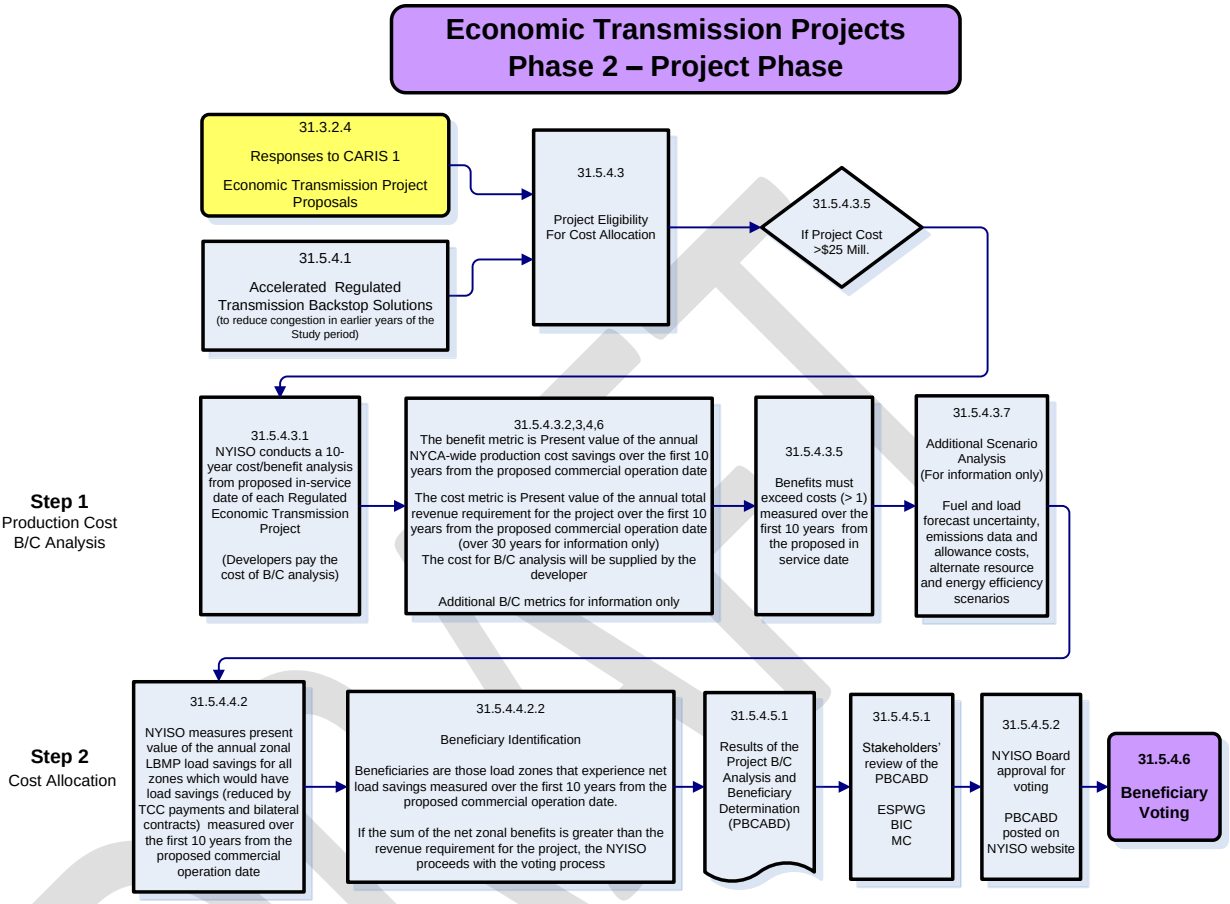

Figure B-2: Phase 2 – Project Phase of the CARIS process

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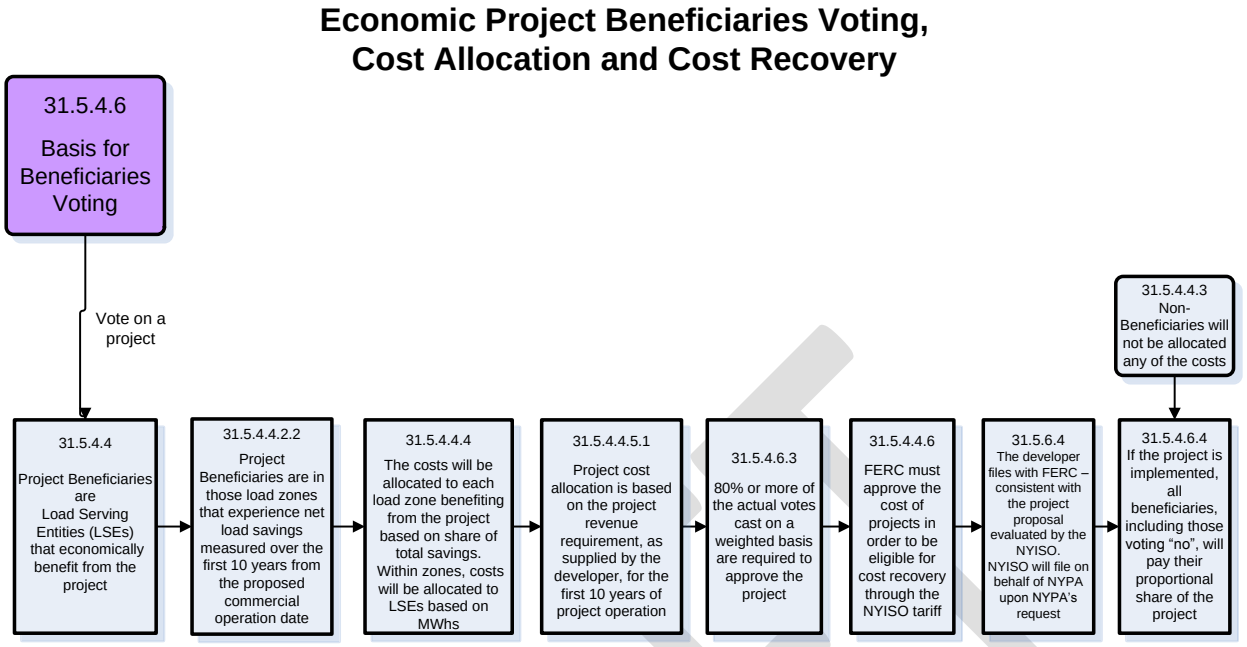

Figure B-3: Voting, Cost Allocation, and Cost Recovery of the CARIS process

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Appendix C – Baseline System Assumptions and Methodology

C.1. CARIS Model - Base Case Modeling Assumptions for 2015-2024

Implementing the CARIS requires understanding and utilizing a significant amount of data. As described in Section 31.3.1 of Attachment Y, the CARIS will align with the Reliability Planning Process, and the Study Period for the CARIS shall be the same ten-year Study Period covered by the most recently approved CRP. The CARIS will assume a reliable system throughout the Study Period, based first upon the solutions identified in the most recently completed and approved CRP.

The data utilized in the base case simulations for 2015 CARIS Phase 1 is largely derived from the 2014 CRP, 2015 Gold Book and CARIS Assumptions Matrix, Table C-1, shown below. Major components of the data include base load flow data, unit heat rates, unit capacities, fuel prices, transmission constraint modeling, load forecasts, load shape, both simulated and actual and scheduled interchange values, O&M cost, and emission costs. The assumptions matrix was developed in conjunction with NYISO stakeholders at ESPWG.

Detailed descriptions of key data used in the 2015 CARIS are listed below. The data was developed based on the NYISO's Tariff requirements and procedures and in collaboration with stakeholders at ESPWG. Key changes from 2013 are noted in red.

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Table C-1: 2013 and 2015 CARIS Base Case Assumptions Matrix Comparison

Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
Peak Load	Based on 2013 Load & Capacity Data Report ("Gold Book") Baseline Forecast of Non-Coincident Peak Demand, including impacts of statewide Energy Efficiency programs (Table 1-2b)	Based on 2015 Load & Capacity Data Report ("Gold Book") Baseline Forecast of Non-Coincident Peak Demand, including Energy Efficiency, Distributed Generation, and Other Behind-the-Meter Impacts (Table I-2b). The impact of Solar PV is captured in the Other Behind-the-Meter Impacts
Load Shape Model Energy Forecast	2002 Load Shape. Energy Forecast Baseline Forecast of Annual Energy, including impacts of statewide Energy Efficiency programs (Table 1-2a)	2002 Load Shape. Energy Forecast Baseline Forecast of Annual Energy, including Energy Efficiency, Distributed Generation, and Other Behind-the-Meter Impacts (Table I-2a). The impact of Solar PV is captured in the Other Behind-the-Meter Impacts
Load Uncertainty Model	Only Base Level Forecast utilized; the impact of energy or peak forecasts may be utilized in scenarios	Only Base Level Forecast utilized; the impact of energy or peak forecasts may be utilized in scenarios
Generating Unit Capacities	Updated to reflect 2013 Gold Book winter and summer DMNC values	Updated to reflect 2015 Gold Book winter and summer DMNC values
New Units	Updated as per 2013 Gold Book (Application of inclusion rules identified in CRPP Manual, Section 4.1 and procedures)	Updated as per 2015 Gold Book (Application of inclusion rules identified in Reliability Planning Process Manual, Section 3.1.1 and procedures)

[2] Significant changes from the 2013 CARIS baseline assumptions and methodology are noted in red.

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Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
Wind Resource Modeling	Units and capacities updated as per 2013 Gold Book. Wind resources are modeled based on unit capacities and synthesized wind shapes developed as part of 2010 Wind Study.	Units and capacities updated as per 2015 Gold Book. Wind resources are modeled based on unit capacities and synthesized wind shapes developed as part of 2010 Wind Study.
Non-NYPA Hydro Capacity Modeling	Updated as per 2013 Gold Book; unit output is modeled consistent with historic levels.	Updated as per 2015 Gold Book; unit output is modeled consistent with historic levels.
Special Case Resources	Not utilized in MAPS production cost modeling; incorporated in ICAP Metric calculation	Not utilized in MAPS production cost modeling; incorporated in ICAP Metric calculation
EDRP Resources	N/A for production cost modeling	N/A for production cost modeling
External Capacity – Purchases and Wheel-Throughs	Flows across schedulable and non-schedulable transmission lines are based on economics.	Flows across schedulable and non-schedulable transmission lines are based on economics.
Retirements	Updated as per 2013 Gold Book (Application of inclusion rules; specific assumptions concerning mothball announcement post-CRP; units with completed studies indicating that the unit is required for reliability are retained in the Base Case; units whose studies are pending are retained in the Base Case; others are excluded from the Base Case)	Updated as per 2015 Gold Book (Application of inclusion rules; specific assumptions concerning mothball announcement post-CRP; units with completed studies indicating that the unit is required for reliability are retained in the Base Case; units whose studies are pending are retained in the Base Case; others are excluded from the Base Case)

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Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
Generator Outages	Scheduled to levelize reserves; as per the maintenance schedules in long term adequacy studies.	Same
Gas Turbines Ambient Derate	Modeling utilizes summer and winter DMNC ratings for all units.	Same.
Environmental Modeling Externalities Allowances	Allowance costs based on projected RGGI costs. SO_2 and NO_x consistent with 2011 CARIS2 Assumptions. SO_2 based on the CAIR price ($2.50 / Ton) escalated until 2016, at which point EPA-forecasted CSAPR prices were assumed to take effect as a proxy for MATS. NO_x based on the CAIR price ($60/Ton) escalated at rate consistent with natural gas price forecast.	Allowance costs based on projected RGGI costs. SO_2 and NO_x Allowance Prices reflect new CSAPR markets. SO_2 based on CSAPR price ($100 / Ton) decreased 10% until 2017, at which point Phase II will increase price by 25% and decrease thereafter at 20% per annum. Annual ($100 / Ton) and Ozone Season NO_x ($125 / Ton) follow same trend as SO_2 Allowance Prices. Detailed allowance costs are provided in the 5/4/15 ESPWG meeting materials.
Commitment and Dispatch Options Operating Reserves	Each Balancing Authority commits to serve its own load, firm transactions, and potential transfers Hurdle rates – flat Operating Reserves as per NYCA requirements.	Same As presented on 5/4/15 to ESPWG. Same

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Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
Fuel Price Forecast	Bases updated to more heavily weight recent trends (2008-0.075, 2009-0.12, 2010-0.175, 2011-0.255, 2012-0.375); a third natural gas region added, encompassing zones F – I. The natural gas price forecast reflects near-term supply infusions into downstate region associated with the Spectra pipeline. Fuel oil and coal price forecasts are developed utilizing the EIA's annual forecast of national delivered prices. Regional bases are derived using EIA Form 923 data. The seasonality for fuel oils is based on analysis of daily prices provided by MMA. Coal has no seasonality.	Annual bases updated to more heavily weight recent trends (2012-0.100, 2013-0.325, 2014-0.575). Seasonality and spikes based on five-year history (2010-2014). Fuel oil and coal price forecasts are developed utilizing the EIA's annual forecast of national delivered prices. Regional bases are derived using EIA Form 923 data. The seasonality for fuel oils is based on an analysis of New York Harbor Ultra-Low Sulfur Diesel (ULSD) prices. Coal has no seasonality. Illustrative fuel costs are presented in the 5/4/15 ESPWG meeting materials.
Cost Curve Development (including heat rates and emission rates)	CO2 Allowance costs based on projected RGGI costs with 2.5% annual growth beyond 2020. Utilizing SO2 and NOx allowance costs developed for 2011 CARIS 2 database. Current values are escalated based on forecasted natural gas price increases. Unit heat rates developed from vendor supplied data and fuel input data matched with MWh data for NYCA.	Unit heat rates (and emission rates) developed from vendor supplied data, USEPA CAMD fuel input and emissions data matched with NYISO production data for NYCA and USEIA production data for non NYCA units.

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Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
Local Reliability Rules	List and develop appropriate nomograms. Fuel burn restrictions, operating restrictions and exceptions, commitment/dispatch limits	Same
Energy Storage Gilboa PSH Lewiston PSH	Scheduling checked to conform to historical operations.	Same
Transmission System Model		
Power Flow Cases	As per CRP.	Same
Interface Limits Monitored/contingency pairs Nomograms Joint, Grouping Unit Sensitive Voltage	Data from the results of internal and external planning studies; vendor-supplied data; operational voltage studies; operational limits; transfer limit analysis for critical interfaces.	Data from the results of internal and external planning studies; vendor-supplied data; operational voltage studies; operational limits; transfer limit analysis for critical interfaces.
New Transmission Capability	Updated as per 2013 Gold Book (Application of base case inclusion rules)	Updated as per 2015 Gold Book (Application of base case inclusion rules)
Internal Controllable Lines (PARs,DC,VFT)	Optimized in simulation.	Same
Neighboring Systems		
Outside World Area Models Fuel Forecast	Power flow data from CRP, "production" data developed by NYISO with vendor and neighbor input. Fuel forecasts developed utilizing same methodology as NYCA fuel forecasts.	Same

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Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
External Capacity And Load Forecast	Neighboring systems modeled consistent with reserve margins in the RNA/CRP analysis. Neighboring systems data reviewed and held at required reserve margin.	Same
System representation in Simulation	HQ modeled as fixed hourly schedule, synchronized with all other external injections. Full Representation/Participation NYISO ISONE IESO PJM Classic & AP,AEP,CE,DLCO, DAY, VP Proxy Bus Injection: HQ-NYISO, HQ-NE-ISO, NB-NEISO, HQ - IESO Transmission Only/Zeroed Out: MECS,FE,SPP, MAR, NIPS,OVEC,TVA, FRCC,SERC,ERCOT,WECC	Same

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Parameter	Modeling for 2013 CARIS Base Cases	Modeling for 2015 CARIS Base Cases[2]
External Controllable Lines (PARs,DC,VFT, Radial lines)	A,B,C and J,K "wheel" Both sets set at 1000 (+/-100) imbalance monitored Ramapo "wheel" modified to reflect updated protocols, tariff and market operations, including NYISO Technical Bulletins and inter-control area operating agreements. Consistent with Technical Bulletin #152, MAPS nomogram schedules 46% (for 2013), 61% (from 2014) respectively of Interchange Schedules across NY-PJM AC ties across Ramapo PARS. These are increases from 40% and reflect the most recent PJM JOA. Norwalk (-200MW, +200MW) L33,34 (-300MW, +300MW) PV20 (0MW, +150MW) Neptune (0MW, +660MW) CSC (0MW, +330MW) CSC and Neptune optimized subject to "cost of use" HTP (0, 660) Linden VFT (-315,315)	Same Ramapo "wheel" reflects current updated protocols, tariff and market operations, including NYISO Technical Bulletins and inter-control area operating agreements. 61% of Interchange Schedules across NY-PJM AC ties flow across Ramapo PARS. In addition, 80% of RECO load is served across Ramapo PARS. Norwalk (-200MW, +200MW) L33,34 (-300MW, +300MW) PV20 (0MW, +150MW) Neptune (0MW, +660MW) CSC (0MW, +330MW) CSC and Neptune optimized subject to "cost of use" HTP (0, 660) Linden VFT (-315,315)

Detailed descriptions of key data used in the 2015 CARIS are listed below. The data was developed based on the NYISO's Tariff requirements and procedures and in collaboration with stakeholders at ESPWG.

1. Base Case Load Forecast

CARIS Base Case load forecasts, from the 2015 Gold Book baseline forecast, are presented in Table C-2 and Table C-3. Table C-2 presents the Annual Zonal Energy in Gigawatt-hours and Table C-3 presents summer non-coincident peak demand in MW.

Table C-2: Annual Zonal Energy (GWh)

Year	A	B	C	D	E	F	G	H	I	J	K
2015	15,789	9,849	16,055	4,620	8,058	11,906	9,826	2,944	6,051	52,918	22,105
2016	15,836	9,838	16,074	4,636	8,077	11,868	9,791	2,932	6,037	52,803	22,078
2017	15,745	9,774	16,015	4,625	8,053	11,757	9,693	2,904	5,995	52,435	21,984
2018	15,690	9,731	15,958	4,627	8,049	11,657	9,608	2,884	5,969	52,208	21,899
2019	15,643	9,699	15,915	5,604	8,051	11,571	9,523	2,866	5,957	52,098	21,870
2020	15,651	9,690	15,913	6,582	8,089	11,532	9,477	2,853	5,940	51,955	21,903
2021	15,581	9,640	15,854	6,584	8,094	11,452	9,401	2,830	5,928	51,847	22,045
2022	15,563	9,613	15,842	6,585	8,117	11,425	9,355	2,818	5,923	51,804	22,283
2023	15,549	9,589	15,837	6,587	8,140	11,412	9,315	2,811	5,923	51,808	22,535
2024	15,578	9,587	15,871	6,588	8,204	11,444	9,299	2,810	5,928	51,845	22,852

Note: Forecast above includes Retail Solar PV. In the MAPS model, Retail Solar PV is modeled explicitly as a distributed resource at the zonal level for the accounting purpose.

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Table C-3: Summer Non-Coincident Peak Demand by Zone (MW)

Year	A	B	C	D	E	F	G	H	I	J	K
2015	2,673	2,073	2,952	606	1,421	2,397	2,281	651	1,494	11,929	5,539
2016	2,670	2,071	2,956	606	1,420	2,401	2,285	654	1,505	12,013	5,506
2017	2,671	2,075	2,964	605	1,428	2,403	2,287	657	1,520	12,136	5,485
2018	2,670	2,078	2,964	605	1,435	2,405	2,289	655	1,533	12,239	5,462
2019	2,669	2,081	2,965	733	1,443	2,407	2,291	653	1,544	12,329	5,470
2020	2,669	2,083	2,964	858	1,453	2,409	2,293	653	1,552	12,386	5,468
2021	2,671	2,087	2,968	860	1,463	2,412	2,295	653	1,561	12,466	5,515
2022	2,675	2,091	2,972	860	1,473	2,414	2,297	651	1,572	12,550	5,567
2023	2,679	2,094	2,977	860	1,483	2,416	2,299	652	1,584	12,640	5,624
2024	2,684	2,096	2,982	858	1,495	2,418	2,301	653	1,594	12,732	5,685

Note: Forecast above includes Retail Solar PV. In the MAPS model, Retail Solar PV is modeled explicitly as distributed resource at the zonal level for the accounting purpose.

2. Power Flow Data

The CARIS uses the network topology, transmission line impedance and ratings as set forth in the assumption matrix.

3. Transmission Model

New York Control Area Model

Figure C-1 below displays the bulk power system for NYCA, which generally consists of facilities 230 kV and above, but also includes certain 138 kV facilities and a small number of 115 kV facilities. The balance of the facilities at 138 kV and below are considered non-bulk or sub-transmission facilities for purposes of this study. The figure also displays key transmission interfaces for New York.

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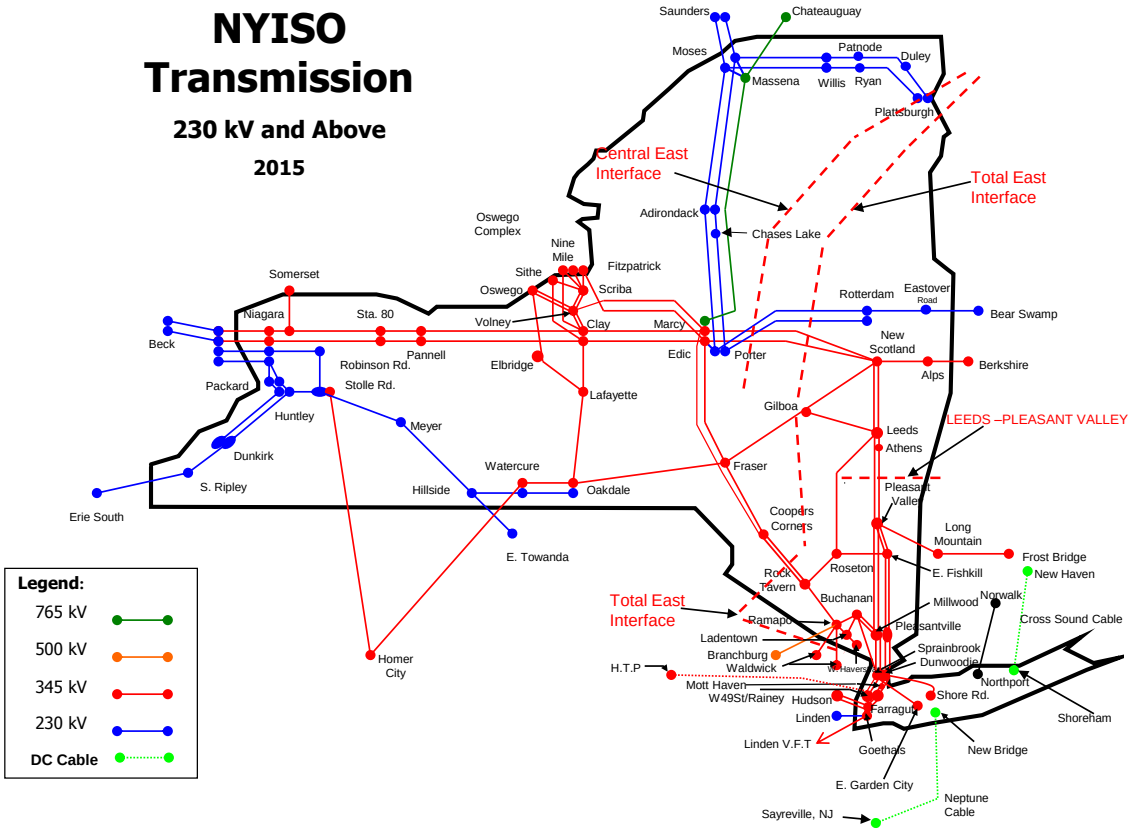

Figure C-1: NYISO 230 kV and above Transmission Map

New York Control Area Changes, Upgrades and Resource Additions

System changes modeled for 2015 and beyond are as follows:

a. Athens Special Protection System (SPS) is assumed to be in service in the base case from the beginning of 2015 through June 2024.

b. The Local Transmission Owner Plan (LTP) projects in 2014 CRP are also included in 2015 CARIS.

c. The Transmission Owner Transmission Solutions (TOTS) are assumed to be in service beginning January 2016.

d. To reflect revised NYISO-PJM Joint Operating Agreement, 61% of AC power interchange between NYISO and PJM flows across Ramapo PARs. In addition, 80% of RECO load is served across Ramapo PARS.

External Area Model

The external areas immediately adjacent to the NYCA are actively modeled, except for Hydro Quebec (HQ). Those areas include ISO-NE, IESO, and PJM. Since HQ is asynchronously tied to the bulk system, proxy buses representing the direct ties from HQ to NYISO, HQ to IESO and HQ to ISO-NE are modeled. The HQ to NYISO capacity modeled is 1310 MW.

Table C-4 lists the aggregate additions, retirements and rerates for the external control areas by fuel source as reported by the external control areas in their planning documents.

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Table C-4: Unit Additions, Retirements and Rerates

System	Year	Source	Additions	Retirements	Rerates
PJM	2015	Coal	-	8,128	-
		Fossil Fuel	2,032	2,334	180
		Hydro	-	-	9
		Landfill Gas/Bio	-	-	-
		Nuclear	-	-	314
		Solar	138	-	171
		Wind	1,302	-	-
	2016	Coal	-	472	-
		Fossil Fuel	5,931	8	186
		Hydro	-	-	-
		Landfill Gas/Bio	19	-	-
		Nuclear	-	-	-
		Solar	88	-	116
		Wind	1,342	-	-
	2017	Coal	-	114	-
		Fossil Fuel	4,163	34	60
		Hydro	-	-	-
		Landfill Gas/Bio	6	-	-
		Nuclear	-	-	-
		Solar	20	-	20
		Wind	100	-	-
	2018	Coal	-	1,204	-
		Fossil Fuel	1,853	-	-
		Hydro	-	-	-
		Landfill Gas/Bio	-	-	-
		Nuclear	-	-	-
		Solar	-	-	43
		Wind	500	-	-
	2019	Coal	-	-	-
		Fossil Fuel	409	-	-
		Hydro	-	-	-
		Landfill Gas/Bio	-	-	-
		Nuclear	-	-	-
		Solar	-	-	-
		Wind	-	-	-
	2024	Coal	-	-	-
		Fossil Fuel	-	-	-
		Hydro	-	-	-
		Landfill Gas/Bio	-	-	-
		Nuclear	1,570	-	-
		Solar	-	-	-
		Wind	-	-	-
IESO	2015	Coal	-	-	-
		Fossil Fuel	280	-	-
		Hydro	19	-	495
		Landfill Gas/Bio	-	-	-
		Nuclear	-	-	-
		Solar	240	-	-
		Wind	843	-	-
ISO-NE	2015	Coal	-	-	-
		Fossil Fuel	-	21	22
		Hydro	-	-	-
		Landfill Gas/Bio	-	3	-
		Nuclear	-	-	-
		Solar	-	-	-
		Wind	181	-	-
	2016	Coal	-	-	-
		Fossil Fuel	-	-	-
		Hydro	-	-	1
		Landfill Gas/Bio	-	19	-
		Nuclear	-	-	-
		Solar	-	-	-
		Wind	185	-	-
	2017	Coal	-	1,100	-
		Fossil Fuel	674	794	-
		Hydro	-	-	-
		Landfill Gas/Bio	-	-	-
		Nuclear	-	-	-
		Solar	-	-	-
		Wind	-	-	-
	2018	Coal	-	144	-
		Fossil Fuel	1,010	-	-
		Hydro	-	-	-
		Landfill Gas/Bio	-	31	-
		Nuclear	-	-	-
		Solar	-	-	-
		Wind	-	-	-

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Table C-5: Control Area Capacity Values

SUMMER-CAP.(MW)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
IESO	**34,542**	**34,542**	**34,542**	**34,542**	**34,542**	**34,542**	**34,542**	**34,542**	**34,542**	**34,542**
Combined Cycle	6,220	6,220	6,220	6,220	6,220	6,220	6,220	6,220	6,220	6,220
Combustion Turbine	458	458	458	458	458	458	458	458	458	458
Conventional Hydro	8,490	8,490	8,490	8,490	8,490	8,490	8,490	8,490	8,490	8,490
Other Steam Turbines	332	332	332	332	332	332	332	332	332	332
Pumped Storage Hydro	175	175	175	175	175	175	175	175	175	175
Solar	240	240	240	240	240	240	240	240	240	240
Steam Turbine (Nuclear)	12,959	12,959	12,959	12,959	12,959	12,959	12,959	12,959	12,959	12,959
Steam Turbine (Oil and Gas)	2,018	2,018	2,018	2,018	2,018	2,018	2,018	2,018	2,018	2,018
Wind	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649	3,649
NYISO	**39,323**	**40,361**	**40,486**	**40,369**	**40,550**	**40,720**	**40,898**	**41,009**	**41,076**	**41,111**
Combined Cycle	8,965	8,965	8,965	8,965	8,965	8,965	8,965	8,965	8,965	8,965
Combustion Turbine	4,832	4,832	4,832	4,832	4,832	4,832	4,832	4,832	4,832	4,832
Conventional Hydro	4,512	4,512	4,512	4,512	4,512	4,512	4,512	4,512	4,512	4,512
Internal Combustion Engine	55	55	55	55	55	55	55	55	55	55
Landfill Gas	101	101	101	101	101	101	101	101	101	101
Other Steam Turbines	374	374	393	393	393	393	393	393	393	393
Pumped Storage Hydro	1,409	1,409	1,409	1,409	1,409	1,409	1,409	1,409	1,409	1,409
Solar	215	444	625	812	993	1,163	1,341	1,452	1,519	1,554
Steam Turbine (Coal)	1,469	1,469	1,394	1,089	1,089	1,089	1,089	1,089	1,089	1,089
Steam Turbine (Nuclear)	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400	5,400
Steam Turbine (Oil and Gas)	10,265	11,074	11,074	11,074	11,074	11,074	11,074	11,074	11,074	11,074
Wind	1,728	1,728	1,728	1,728	1,728	1,728	1,728	1,728	1,728	1,728
PJM	**196,521**	**194,658**	**198,610**	**200,857**	**200,063**	**200,063**	**200,063**	**200,063**	**200,063**	**201,633**
Combined Cycle	28,813	34,834	39,120	40,944	41,353	41,353	41,353	41,353	41,353	41,353
Combustion Turbine	32,204	29,992	29,992	30,021	30,021	30,021	30,021	30,021	30,021	30,021
Conventional Hydro	2,915	2,915	2,915	2,915	2,915	2,915	2,915	2,915	2,915	2,915
Internal Combustion Engine	593	593	585	585	585	585	585	585	585	585
Landfill Gas	406	425	431	431	431	431	431	431	431	431
Other Steam Turbines	3,547	3,547	3,547	3,547	3,547	3,547	3,547	3,547	3,547	3,547
Pumped Storage Hydro	5,182	5,182	5,182	5,182	5,182	5,182	5,182	5,182	5,182	5,182
Solar	1,706	1,909	1,949	1,992	1,992	1,992	1,992	1,992	1,992	1,992
Steam Turbine (Coal)	69,463	61,987	61,515	61,401	60,197	60,197	60,197	60,197	60,197	60,197
Steam Turbine (Nuclear)	34,367	34,681	34,681	34,681	34,681	34,681	34,681	34,681	34,681	36,251
Steam Turbine (Oil and Gas)	8,005	7,931	7,931	7,897	7,897	7,897	7,897	7,897	7,897	7,897
Wind	9,318	10,660	10,760	11,260	11,260	11,260	11,260	11,260	11,260	11,260
ISO-NE	**32,607**	**32,770**	**33,425**	**32,542**	**32,367**	**32,367**	**32,367**	**32,367**	**32,367**	**32,367**
Combined Cycle	12,079	12,079	12,753	13,449	13,449	13,449	13,449	13,449	13,449	13,449
Combustion Turbine	2,812	2,812	2,812	3,096	3,096	3,096	3,096	3,096	3,096	3,096
Conventional Hydro	1,948	1,950	1,950	1,950	1,950	1,950	1,950	1,950	1,950	1,950
Internal Combustion Engine	188	185	185	185	185	185	185	185	185	185
Landfill Gas	84	81	62	62	62	62	62	62	62	62
Other Steam Turbines	1,083	1,083	1,083	1,083	1,052	1,052	1,052	1,052	1,052	1,052
Pumped Storage Hydro	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780	1,780
Solar	10	10	10	10	10	10	10	10	10	10
Steam Turbine (Coal)	2,165	2,165	2,165	1,065	922	922	922	922	922	922
Steam Turbine (Nuclear)	4,081	4,081	4,081	4,081	4,081	4,081	4,081	4,081	4,081	4,081
Steam Turbine (Oil and Gas)	5,534	5,515	5,515	4,750	4,750	4,750	4,750	4,750	4,750	4,750
Wind	845	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030	1,030
Grand Total	**302,992**	**302,330**	**307,062**	**308,309**	**307,521**	**307,691**	**307,869**	**307,980**	**308,047**	**309,652**

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Table C-6: External Area Forecasted Load Values

Year	IESO		ISONE		PJM	
	Peak, MW(*)	Energy, MWh	Peak, MW(*)	Energy, MWh	Peak, MW(*)	Energy, MWh
2015	23,701	139,690,563	26,568	128,174,000	158,811	819,667,330
2016	22,884	136,513,076	26,831	128,648,999	161,275	835,779,340
2017	22,794	133,335,592	26,960	129,211,000	163,164	844,207,633
2018	22,860	133,445,344	27,178	129,341,998	164,479	853,020,526
2019	22,855	133,187,341	27,301	128,786,001	165,883	859,388,386
2020	22,750	133,269,337	27,406	128,282,998	167,559	869,743,010
2021	22,868	134,288,613	27,492	127,905,998	168,860	875,612,978
2022	22,995	134,259,625	27,608	127,719,994	170,439	884,279,670
2023	23,047	134,478,507	27,732	127,660,006	171,940	892,159,615
2024	23,072	135,211,590	27,871	127,685,996	173,150	901,926,274

(*) Control area co-incident peak

Hurdle Rates and Interchange Models

Hurdle rates set the conditions in which economic interchange can be transacted between neighboring markets/control areas. They represent a minimum savings level that needs to be achieved before energy will flow across the interface. Hurdle rates help ensure that the production-cost simulation is reasonably consistent with the historical pattern of internal NYCA generation and imports. Hurdle rates are used to allow the simulation model to reflect inter-regional energy market transaction costs.

Two independent hurdle rates are used in the CARIS, one for the commitment of generation and a separate one for the dispatch of generation. Both commitment and dispatch hurdle rates are held constant throughout the 2015-2024 study period, as discussed with NYISO stakeholders at ESPWG. The hurdle rate values produce results consistent with NYCA historic total import levels.

Only energy transactions associated with granted Unforced Capacity Deliverability Rights (UDRs) or firm withdrawal rights on controllable tie-lines were specifically modeled, namely on the NYISO controllable tie-lines (Neptune, Cross Sound Cable (CSC), Linden VFT, and HTP). The flow on the CSC line was modeled to allow up to 330 MW from ISO-NE to Long Island. The flow on the Linden VFT was modeled to allow up to 315 MW in both directions. The Neptune and HTP flows were modeled to allow up to 660 MW of flow from PJM into Long Island and New York City respectively.

The hourly interchange flow for each interface connecting the NYISO with neighboring control areas was priced at the LBMP of its corresponding proxy bus. The summation of all 8,760 hours determined the annual cost of the energy for each interface. Table C-7 lists the proxy bus location for each interface.

Table C-7: Interchange LBMP Proxy Bus

Interface	Proxy Bus
PJM	Keystone
Ontario	Bruce
Quebec	Chateauguay and Cedars
Neptune	Raritan River
New England	Sandy Pd
Cross Sound Cable	New Haven Harbor
HTP	Bergen
VFT	Linden 138 kV
Northport Norwalk Cable	Norwalk Harbor

4. Production Cost Model

Production cost models require input data to develop cost curves for the resources that the model will commit and dispatch to serve the load subject to the constraints given in the model.

This section discusses how the "production cost input data" is developed. The incremental cost of generation is the product of the incremental heat rate multiplied by the sum of fuel cost, emissions cost, and variable operation and maintenance expenses.

Heat Rates

Fuel costs represent the largest variable expense for fossil fueled generating units. Cost curves are the product of fuel prices and incremental heat rates. Individual unit heat rates are commercially sensitive confidential information and thus are not widely available from generator owners. Unit heat rate input data is based on the U.S. Environmental Protection Agency's (EPA) Clean Air Market Data and, where available, unit production data from the U.S. Energy Information Administration (EIA).

CARIS simulation models employ power points which represent minimum, intermediary, and maximum power levels where generating units can be simulated to operate on a sustained basis. Each power point is tied to a point on the heat rate curve allowing incremental heat rates to be determined for each unit. The power points and incremental heat rates are developed on a Summer/Winter basis.

5. External Areas Fuel Forecasts

Table C-8 shows the regional bases expressed as a multiple of the U.S. national average annual price for each fuel. Figures C-2 through C-5 illustrate forecasted fuel price prices for external areas from which weekly fuel price forecasts were developed.

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Table C-8: External Areas Fuel Forecast Regional Multiplier

	PJM- East	PJM- West	ISONE-North	ISONE-South	IESO
Fuel Oil #2	0.982	1.010	0.980	0.980	-
Fuel Oil #6	0.970	0.850	0.920	0.920	-
Natural Gas	0.872	0.963	1.193	1.173	1.087
Coal	1.250	1.025	1.675	1.675	-

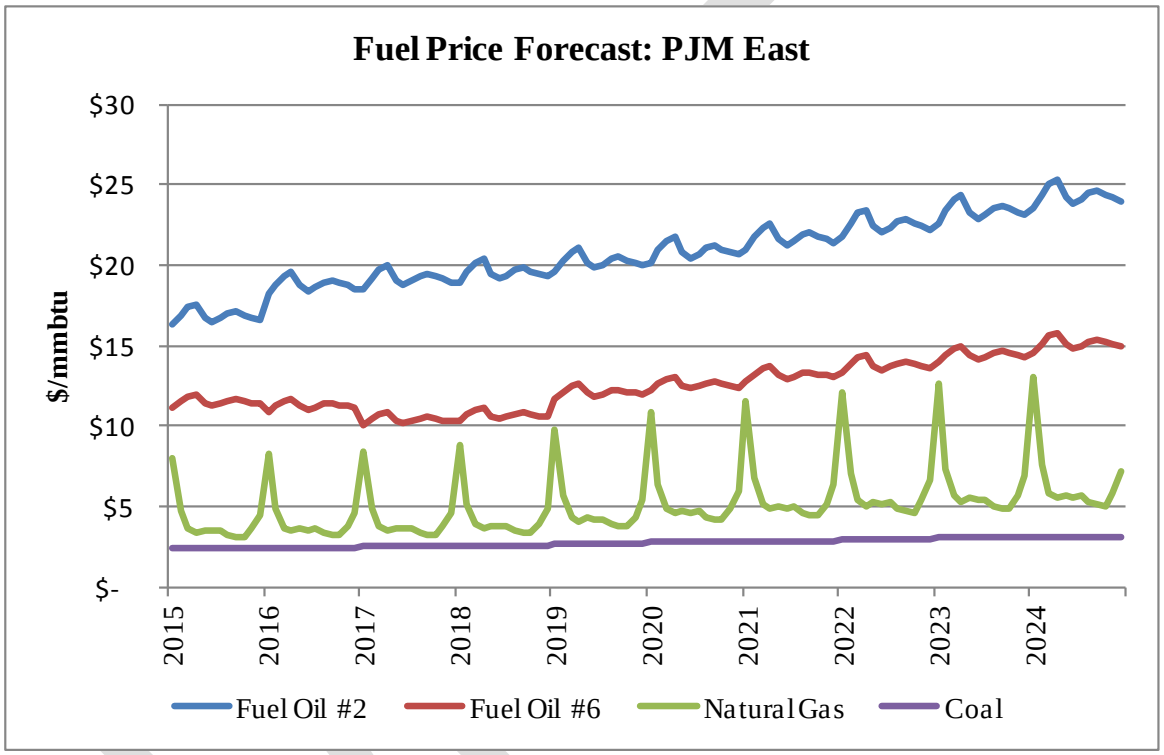

Figure C-2: Forecasted Fuel Prices for PJM East (nominal $)

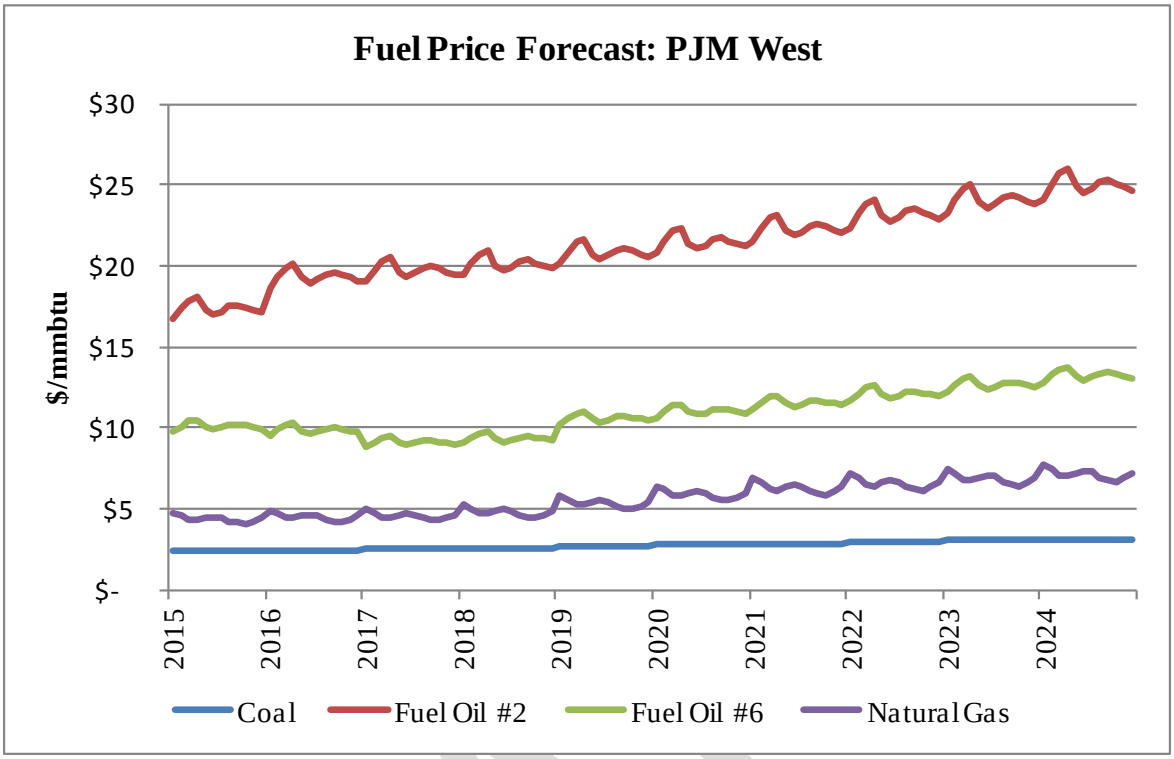

Figure C-3: Forecasted Fuel Prices for PJM West (nominal $)

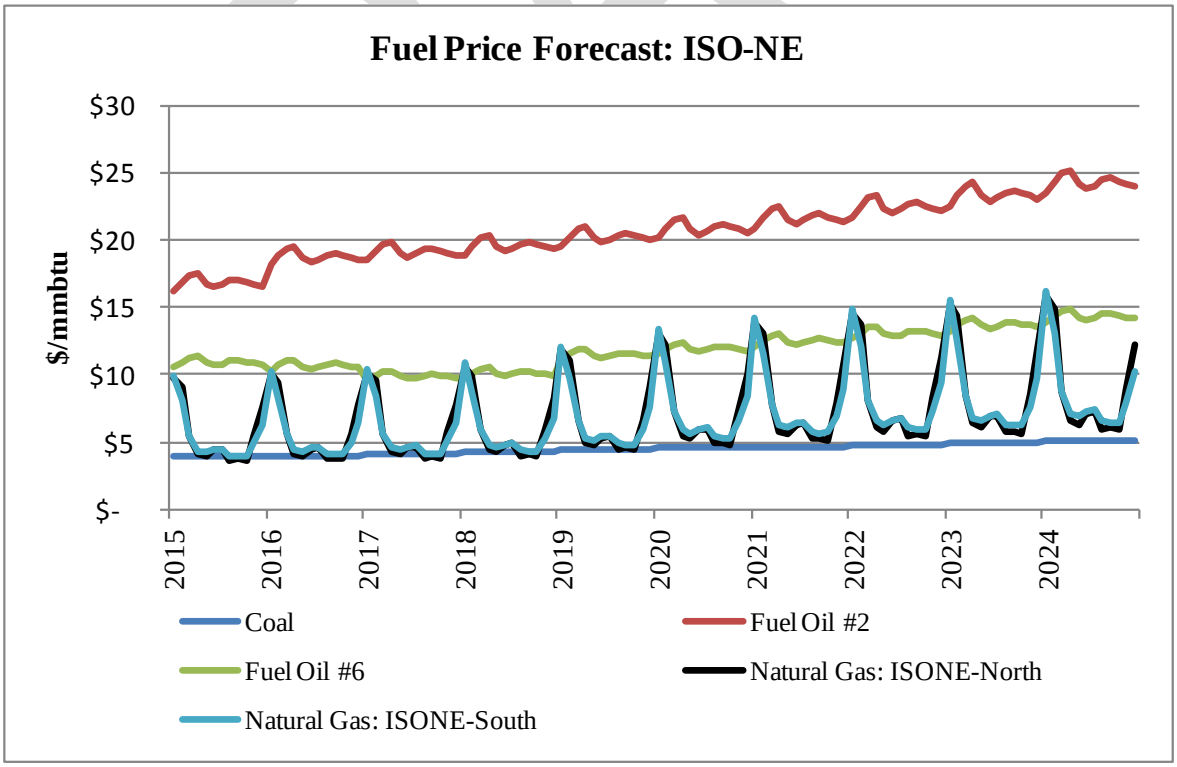

Figure C-4: Forecasted Fuel Prices for ISO-NE (nominal $)

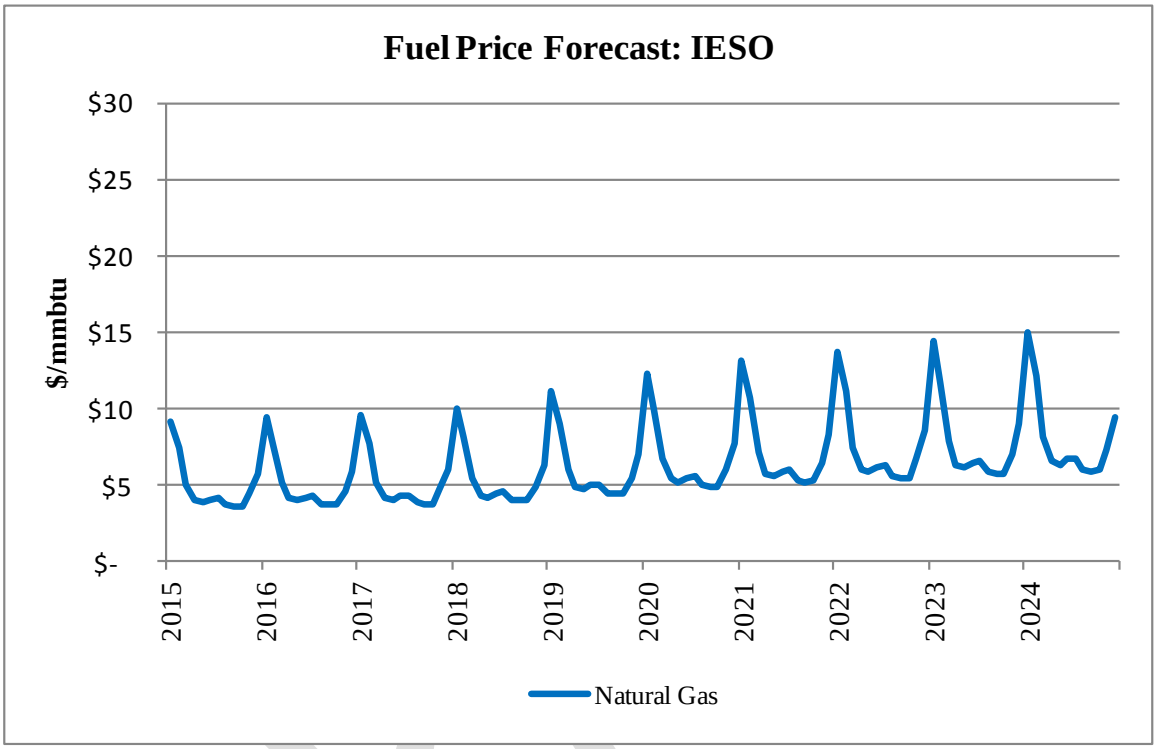

Figure C-5: Forecasted Fuel Prices for IESO (nominal $)

Fuel Switching

Fuel switching capability is widespread within the NYCA. According to date from the 2015 Gold Book, 46% of the 2015 generating capacity in the NYCA – 17,684 MW of generation – has the ability to burn either oil or gas. For such units, the production-cost simulation model selects the economic fuel based on weekly production costs for units with dual-fuel capability.

The New York State Reliability Council (NYSRC) establishes rules for the reliable operation of the New York Bulk Power System. Two of those rules guard against the loss of electric load because of the loss of gas supply. Rule I-R3 states "The New York State bulk power system shall be operated so that the loss of a single gas facility does not result in the loss of electric load within the New York City zone." Rule I-R5 similarly states "The New York State bulk power system shall be operated so that the loss of a single gas facility will not result in the uncontrolled loss of electricity within the Long Island zone."

To satisfy the I-R3 and I-R5 criteria, annual studies are performed by the TOs that update the configurations of the electricity and gas systems and simulate the loss of critical gas supply facilities. The loss of a gas facility may lead to the loss of some generating units. This loss becomes critical because it may result in voltage collapse when load levels are high enough. Therefore, criteria are established whereby certain units that are capable of doing so are required to switch to minimum oil burn levels so that in the event of the worst single gas system contingency these units stay on-line at minimum generation levels and support system voltage.

Some new combined cycle gas turbine units in the New York City and Long Island zones have the ability to "auto-swap" from gas-burn to oil-burn with a limited loss of output that can be quickly recovered. As the generator fleet in these zones has experienced a shift to increased use of combined cycle units with auto-swap capability, the amount of oil used in steam units to satisfy minimum oil burn criteria has decreased.

Minimum oil burn rules have not been explicitly modeled in the production simulations for the 2015 CARIS. Minimum oil burn units are committed and dispatched in the NYISO markets using the cost of the most economic fuel. Any cost incurred from firing oil when it is not economic to do so is recovered outside the market. Consequently, the minimum oil burn program does not affect LBMPs or any derivative metric (Demand Congestion, Load, Payment, etc.) and is more appropriately accounted for outside the GE-MAPS simulation.

Generation Maintenance

NYCA generation maintenance modeling was updated for this CARIS cycle utilizing the latest planned and random outage rates from 2014 CRP process. External control areas (IESO, ISO-NE, and PJM) generation planned and forced outage were developed using the latest NERC class average outage data.

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Appendix D – Overview of CARIS Modeling

D.1. Model Overview (CROS and MAPS)

The NYISO primarily employs two software tools to construct the fifteen-year time-series of congestion and production costs. The NYISO utilizes Congestion Reporting for Off-Line SCUC ("CROS") to develop the five-year historic values and General Electric's Market Analysis and Portfolio Simulation ("MAPS") to construct the ten-year projected values. In each case the software performs a security constrained economic commitment and dispatch and calculates the minimum hourly production cost of supply resources to meet the load.

CROS

CROS software, developed by the NYISO, is an off-line version of the NYISO's day-ahead unit-commitment software ("SCUC"), and was adopted in 2012 as the tool utilized to conduct the NYISO's historic congestion analysis. The results of the historic congestion analysis, expressed as a change in production cost, along with additional metrics such as generator payments, load payments and congestion payments, have been reported on a quarterly basis on the NYISO's website since 2003.

CROS first uses actual submitted generator parameters, hourly bids and network statuses, including transmission outages, to perform a security constrained economic commitment. The software then conducts an unconstrained simulation by removing all transmission constraints (other constraints such as generator ramp rates and minimum run times are still enforced). Unit commitment and dispatch are then recalculated for this unconstrained scenario. The constrained and unconstrained results are compared to derive the change in bid production costs, demand congestion, load payments and generation payments due to system constraints. All calculations represent all market segments such as the energy, start-up, and ancillary services bids for generators, import/export bids, virtual supply/demand bids, and fixed and price-capped demand bids.

MAPS

In conducting the 2015 CARIS analysis and developing projected congestion and production costs (as well as other metrics), the NYISO utilized GE MAPS Version 13.2 as the production cost simulation software. MAPS software mimics the operation of the NYISO Day-Ahead electricity market by simulating SCUC and economic dispatch of the generation and by monitoring transmission system flows under both normal and contingency conditions, including thunder storm alerts. This enables calculation of hourly production costs accounting for the constraints imposed by the transmission system on the economic dispatch of generation.

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MAPS features the following:

- **Detailed representation of the large scale transmission network.** The transmission system is modeled in terms of individual transmission lines, interfaces (group of lines), phase-angle regulators (PARs), and HVDC lines. MAPS software models voltage and stability considerations through operating nomograms that define how voltage and stability limits can change hourly as a function of loads, generation, and flows elsewhere on the system.
- **Detailed generation modeling for thermal, hydro, pumped storage, wind, solar, and other renewables.** Generation system data capabilities include multi-step cost curves based on heat rates, emission costs, fuel costs, and unit cycling capabilities. The generation units, along with chronological hourly load profiles, are assigned to individual buses on the system. Hourly load profiles are adjusted to meet peak and energy forecasts, which are inputs entered into the model on a monthly or annual basis. Information on hourly loads at each bus in the system is required to calculate electrical flows on the transmission system. This parameter is specified by assigning one or a combination of several hourly load profiles to each load bus.

The major difference between the projected MAPS results and historic CROS results is that MAPS does not simulate: (a) virtual bidding; (b) transmission outages; (c) price-capped load; (d) production costs based on mitigated bids; (e) Bid Production Cost Guarantee (BPCG) payments; and (f) co-optimization with ancillary services.

D.2. Modeling Validation

Database Verification

To verify the 2015 CARIS database, the NYISO conducted a data and modeling verification process in conjunction with GE. First, the NYISO Planning Staff reviewed all input data and program parameters. After Staff completed its review, modifications and any necessary corrections, the base cases were sent to GE for further verification.

The following topics were examined as part of data verification:

- Spinning reserves and thermal unit commitment options;
- Generation planned and random outages;
- Transmission interface transfer limits, contingencies and nomograms;
- Commitment and dispatch hurdle rates;
- Generator incremental heat rates, variable O&M, startup costs, installed reserve margin, and emissions rates;
- Fuel price forecasts;

- Modeling of pumped storage and hydro units; and,
- Accuracy of generator size, type and location

GE reviewed all the warnings created by the programs to ensure that the results were not affected. Discrepancies noted by GE were corrected by NYISO as necessary. All of these changes were accomplished before the finalization of the 2015 CARIS base case.

Benchmark Summary

The final 2015 CARIS Phase 1 benchmark results are listed in Table D-1 to D-10 below for the 2013 benchmark year. The results were presented to NYISO stakeholders for discussion at ESPWG.

Table D-1: Zonal Load Payment Summary (Million $ - Nominal)

2013 Zonal Load Payment	Actual	Benchmark
West	636	532
Genesee	391	337
Central	662	566
North	226	211
Mohawk Valley	345	275
Capital	613	577
Hudson Valley	537	465
Millwood	164	143
Dunwoodie	337	299
New York City	2,999	2,597
Long Island	1,668	1,221
NYCA	**8,576**	**7,222**

Table D-2: Zonal Generator Payment Summary (Million $ - Nominal)

2013 Zonal Generation Payment	Actual	Benchmark
West	678	665
Genesee	187	175
Central	1,147	1,098
North	288	276
Mohawk Valley	122	122
Capital	697	655
Hudson Valley	145	84
Millwood	850	817
Dunwoodie	0	-
New York City	1,513	1,126
Long Island	898	599
NYCA	**6526**	**5,617**

Table D-3: Zonal Demand Congestion Summary (Million $ - Nominal)

2013 Zonal Demand Congestion	SCUC	Benchmark
West	45	21
Genesee	11	11
Central	38	25
North	(5)	1
Mohawk Valley	11	12
Capital	143	150
Hudson Valley	112	105
Millwood	30	34
Dunwoodie	62	70
New York City	639	605
Long Island	597	395
NYCA	**1,684**	**1,429**

Table D-4: Top 4 Constraint Congestion Summary (Million $ - Nominal)

2013 Top Four Demand Congestion Constraints	SCUC	Benchmark
CENTRAL EAST	1,089	962
DUNWOODIE TO LONG ISLAND	307	84
LEEDS PLEASANT VALLEY	138	153
GREENWOOD	72	16

Table D-5: Zonal LBMP Summary ($/MWh)

2013 Zonal Average LBMP	Actual	Benchmark
West	38.04	34.14
Genesee	36.60	34.04
Central	37.92	35.42
North	34.09	32.82
Mohawk Valley	38.91	35.82
Capital	47.88	47.44
Hudson Valley	49.19	46.43
Millwood	49.45	47.09
Dunwoodie	49.41	47.08
New York City	52.13	47.73
Long Island	67.64	53.77

Table D-6: Zonal Generation Summary (GWh)

2013 Zonal Generation	Actual	Benchmark
West	17,932	19,412
Genesee	5,282	5,312
Central	31,061	32,875
North	8,683	8,563
Mohawk Valley	3,427	3,704
Capital	14,857	14,870
Hudson Valley	1,778	1,680
Millwood	17,459	17,624
Dunwoodie	-	-
New York City	25,280	22,303
Long Island	11,428	10,711
NYCA	**137,187**	**137,055**

Table D-7: Zonal Load Summary (GWh)

2013 Zonal Load	Actual	Benchmark
West	15,790	15,777
Genesee	9,981	9,763
Central	16,368	16,147
North	6,448	6,468
Mohawk Valley	8,312	7,393
Capital	12,030	11,836
Hudson Valley	9,965	10,045
Millwood	2,986	2,292
Dunwoodie	6,204	6,417
New York City	53,316	54,643
Long Island	22,114	22,539
NYCA	**163,514**	**163,320**

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Table D-8: Import Summary (GWh)

2013 Import Energy	Actual	Benchmark
PJM-NYISO	4,878	4,066
LINDEN VFT	1,277	1,420
NEPTUNE	3,181	2,846
HTP	322	885
ISONE-NYISO	401	1,073
CROSS SOUND CABLE	2,164	1,803
NORTHPORT NORWALKCABLE	887	1,334
IMO-NYISO	7,541	7,425
HQ-NYISO CHAT	9,616	9,472
HQ-NYISO CEDARS	1,110	1,021
TOTAL IMPORT	**31,377**	**31,346**

Table D-9: Export Summary (GWh)

2013 Export Energy	Actual	Benchmark
PJM-NYISO	552	122
LINDEN VFT	97	25
NEPTUNE	1	13
HTP	0	0
ISONE-NYISO	4,601	4,909
CROSS SOUND CABLE	28	0
NORTHPORT NORWALKCABLE	104	262
IMO-NYISO	6	5
HQ-NYISO CHAT	32	29
HQ-NYISO CEDARS	12	12
TOTAL EXPORT	**5,433**	**5,377**

Table D-10: Net Import Summary (GWh)

2013 Net Import Energy	Actual	Benchmark
PJM-NYISO	4,326	3,944
LINDEN VFT	1,180	1,395
NEPTUNE	3,180	2,833
HTP	322	885
ISONE-NYISO	-4,200	-3,837
CROSS SOUND CABLE	2,136	1,803
NORTHPORT NORWALKCABLE	783	1,073
IMO-NYISO	7,534	7,420
HQ-NYISO CHAT	9,585	9,444
HQ-NYISO CEDARS	1,098	1,009
TOTAL NET IMPORT	**25,944**	**25,968**

Appendix E –Detailed Results of 2015 CARIS Phase 1

E.1. Congestion Assessment – Historic and Projected

One of the features of a Locational Based Marginal Price (LBMP) market is the ability to identify grid locations that are difficult to serve with economic generation due to transmission bottlenecks (constraints) and quantify the cost of this congestion. The NYISO calculates and publishes LBMP's with three components:

1. Energy component – marginal electricity cost without the adjusted cost of congestion and losses;
2. Congestion component – the cost of out-of merit generation dispatch relative to an assumed unconstrained reference point at Marcy substation; and
3. Losses component – the cost for supplying the losses from the accessible marginal generators to a specific point on the grid.

E.1.1. Historic Congestion Assessment

The NYISO reports historic congestion results on its website on a quarterly basis. The cost of congestion reported is the sum of the day ahead market LBMP congestion component multiplied by the amount of load being affected (positively or negatively) by congestion (later referred to as "congestion payments"). While this congestion cost is relatively simple to calculate, this value is generally regarded as an over-simplified and deceiving congestion impact metric because:

1. This calculation does not incorporate the effect of any potential market responses from supply and demand when congestion is removed; and

2. The congestion cost is relative to an assumed uncongested reference point. If this reference point is moved, the congestion cost is shifted to the LBMP energy component. The congestion versus energy cost calculation becomes arbitrary depending on the reference point chosen.

To better measure the true cost of transmission congestion, the NYISO developed analytical tools and protocols. The fundamental idea is to calculate what the day-ahead hourly clearing prices would be if there were no transmission constraints, using the same data and calculation approach as the NYISO SCUC. The congestion cost is the difference between the actual SCUC transmission constrained LBMP's, loads, and bids, and the same calculation with all transmission constraints ignored. Annual cost is the sum of daily costs.

The reported numbers are the result of a simulation of the NYCA market using the hourly bids and network status actually used by NYISO to clear the day-ahead market. The simulation performs a security constrained unit commitment for the market "as it was", then removes all transmission constraints. Other constraints such as desired

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net interchange (DNI), generator ramp rates and minimum run times are still enforced. Unit commitment and dispatch are then recalculated for this unconstrained scenario without any changes to the bids actually submitted. The constrained and unconstrained results are compared to derive the cost of congestion. The calculations represent all market segments (*e.g.*, fixed load, virtual load and generation, imports and exports), and actual hour-by-hour network status. The unconstrained case fixes the amount of virtual load and generation at their original MW levels.

Historic Congestion Metrics

To explore the impact of congestion, four congestion metrics were developed: Bid Production Cost metric; Congestion Payment metric; Generator Payment metric; and Load Payment metric. All metrics report the difference between a constrained and an unconstrained value.

1. Change in Bid Production Cost (BPC) – This is the primary congestion impact metric set forth by the Operating Committee. The calculation compares the change in total production cost, based on mitigated bids, with and without transmission constraints limiting the unit commitment and dispatch. This metric measures the economic inefficiency introduced by the existence of transmission bottlenecks, and is considered the *societal cost* of transmission congestion. A positive number indicates that transmission congestion increased the total cost to produce the electricity supply in the NYCA.

Production cost always decrease when constraints are removed. The objective of SCUC is to minimize bid production cost; LBMPs are the result of the commitment and dispatch that result from achieving this objective under generation unit and transmission constrained conditions. Since SCUC does not directly attempt to minimize LBMPs, relieving all or some of the constraints may or may not decrease the market based electricity cost to load. In the LBMP markets, the load in a location pays the marginal price of the supply at that location, not the bid price of the generator. The result of relieving constraints in an LBMP market depends on how much load is affected, where the load is, and the response of supply and demand as those constraints are relieved.

2. Change in Congestion Payments – This calculation, which represents the sum of the LBMP congestion component multiplied by the load affected, does not account for the change in the energy component of the LBMP as constraints are removed. With no simulation truly required to arrive at this congestion impact metric, the congestion cost in an unconstrained market is 0. This is considered to be the *accounting cost* of congestion.

Congestion payments can be hedged with TCCs. The difference between the total congestion payment and the congestion payment associated with TCCs is the unhedged congestion payment reported in the NYISO's quarterly historic congestion analysis reports. For the historic analysis, it was assumed that all

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TCCs are owned by load and are available for hedging the congestion payments. A positive number indicate that congestion increases the cost paid by load.

3. Change in Generation Payments – In addition to the LBMP payments to generation (or other supply sources such as virtual generation, or imports), generators are also paid a BPCG and for Ancillary Services. BPCG compensates generators that are committed for reliability despite the fact their bids are greater than the LBMP at the generator location. This phenomenon can happen if ramp rates, minimum run times or other limits force unit operation, which minimizes overall production cost, even including BPCG payments. A positive number means generation payments went up due to congestion.

4. Change in Load Payments – This metric is the opposite side of the generation payments calculation. The calculation uses simulation to include the local energy cost response when transmission constraints are removed. Whereas the change in production cost measures efficiency, this metric determines how much more New York load actually pays due to congestion and the market design. This is considered the *bill impact*. The load payment congestion impact includes the effect of all market segments that can change when transmission constraints are relieved. These segments are:

- LBMP Components – The LBMP congestion component will equal zero when there are no transmission constraints, and the unconstrained generation will sell more energy at a price that is higher on the generator's incremental cost curve. The unconstrained generator bid price will be lower than the bid price of the out of merit generator dispatched in the transmission limited case. The result is a likely increase in the LBMP energy component as the LBMP congestion component decreases. The LBMP loss component will also change depending on the location and prices of the generation unbottled when constraints are relieved. Ancillary service costs (*e.g.*, reserves) also affect LBMPs, as generators trade-off between selling ancillary services or energy.

- Load payments due to congestion are hedged with TCCs based on the assumption that all TCCs were credited to load. The TCC auction cost is not accounted for since it is part of the Transmission Service Charge (TSC).

- TCC shortfall – In the event of a TCC shortfall (or surplus), the load pays for the imbalance. As transmission constraints are relieved, the imbalance changes. While the shortfall may be compensated for elsewhere in the TSC, from a congestion impact perspective this is considered a load cost. Although the NYISO OATT describes details of the allocation of shortfall by transmission owner, for purposes of this analysis the shortfall is stated for the NYCA only.

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- Rate Schedule 1 imbalances – In accordance with the NYISO OATT, imbalances of energy payments and loss payments are a component of the OATT-defined Rate Schedule 1 payments. Relieving or eliminating transmission constraints affects these payments, and is thus considered a congestion impact in this analysis. Like shortfall, this analysis states the Rate Schedule 1 effect for the NYCA only.

A positive number indicates that congestion increased the load payments.

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Historic Congestion Results

The historic congestion analysis results for a constrained system (base case) are presented in Tables E-1 through E-3.

Table E-1: Historic Congestion Demand$ Congestion (2010-2014) by Zone (nominal $M)

Zonal Demand Congestion ($M)	Historic				
	2010	2011	2012	2013	2014
West	$1	$5	$6	$45	$36
Genesee	$6	$6	$3	$11	$9
Central	$11	$10	$8	$38	$38
North	$1	$0	$0	$5	$3
Mohawk Valley	$5	$5	$3	$11	$12
Capital	$62	$47	$34	$143	$149
Hudson Valley	$73	$78	$39	$112	$95
Millwood	$23	$20	$10	$30	$30
Dunwoodie	$49	$45	$24	$62	$55
NY City	$561	$549	$261	$639	$531
Long Island	$350	$405	$377	$597	$409
NYCA Total	**$1,140**	**$1,170**	**$765**	**$1,693**	**$1,367**

Notes:
Reported values do not deduct TCCs
DAM data include Virtual Bidding & planned Transmission outages.

Table E-2: Historic Generator Payments (2010-2014) by Zone (nominal $M)

Generator Payment ($M)	Historic				
	2010	2011	2012	2013	2014
West	$1,035	$949	$644	$663	$924
Genesee	$335	$292	$203	$275	$388
Central	$1,280	$1,199	$1,076	$1,495	$1,854
North	$407	$373	$288	$348	$447
Mohawk Valley	$110	$128	$89	$122	$181
Capital	$789	$833	$702	$793	$873
Hudson Valley	$207	$249	$179	$269	$326
Millwood	$887	$863	$666	$892	$1,033
Dunwoodie	$11	$13	$14	$32	$34
NY City	$1,312	$1,325	$1,086	$1,332	$1,679
Long Island	$821	$817	$720	$879	$932
NYCA Total	**$7,193**	**$7,040**	**$5,670**	**$7,101**	**$8,670**

Notes: Reported values are exclusive of BPCG and Ancillary Services.

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Table E-3: Historic Load Payments (2010-2014) by Zone (nominal $M)

Load Payment ($M)	Historic				
	2010	2011	2012	2013	2014
West	$628	$661	$593	$675	$873
Genesee	$520	$483	$350	$415	$545
Central	$726	$735	$732	$967	$1,183
North	$183	$233	$200	$223	$243
Mohawk Valley	$313	$307	$238	$300	$395
Capital	$578	$572	$459	$654	$808
Hudson Valley	$630	$716	$515	$619	$656
Millwood	$168	$164	$114	$156	$195
Dunwoodie	$376	$358	$256	$333	$375
NY City	$3,307	$3,160	$2,270	$2,973	$3,358
Long Island	$1,578	$1,593	$1,298	$1,667	$1,712
NYCA Total	**$9,008**	**$8,982**	**$7,026**	**$8,983**	**$10,343**

E.1.2. Metrics Assessment

CARIS Metrics

In conducting the CARIS analysis, seven metrics are used. The primary metric is the production cost metric. Additional metrics that are included in this report are load payments, generator payments, emissions, TCCs, losses, and the ICAP metric. All benefit metrics are determined by measuring the difference (change) between the CARIS base case system value and a system value when the generic solution is added. The discount rate of 6.819% used for the present value analysis is the current weighted average cost of capital for the NYTOs.

1. NYCA Production Cost Metric

NYCA production cost is the total generation cost of producing power to serve NYCA load. The total cost includes the following components:

1. Fuel cost (fuel consumption mmBtu multiplied by fuel cost $/mmBtu);
2. Variable O&M cost (VOM adder $/MWh);
3. Emission cost (emission allowance price multiplied by total allowance);
4. Start-up Costs (number of starts multiplied by start-up cost); and
5. NYCA Imports and Exports evaluated at the solution case proxy bus LBMP values.

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2. Demand$ Congestion Metric

The congestion value (Demand$ Congestion) is calculated as the congestion component of the LBMP paid by NYCA load (sum of the total zonal loads). It is defined as the shadow price of each constrained element multiplied by the load affected and calculated as follows:

Demand$ Congestion by constraint for all areas and all hours = (Shadow Price x (Zone Generation Shift Factor (GSF) x Zone Load)).

Total Demand$ Congestion = Sum of all constraints' Demand Congestion.

3. Generator Payment Metric

This metric measures the change in NYCA generation payments plus net imports. The NYCA generation payments are calculated by measuring only the LBMP payments (energy, congestion, losses). Thus, total generator payments are estimated for this information metric as the sum of the LBMP payments to NYCA generators plus the payments for net imports.

Generator payment by zone represents zonal LBMP based payment to generators located in a zone. The hourly payment to each generator is determined as the hourly generator MW dispatch multiplied by the generator's LBMP or spot price. The annual generator payment for NYCA generators is then the sum of all 8,760 hourly generator payments.

Annual generator LBMP payment = sum of all hours (generator LBMP x generator MW dispatch).

Zonal generator payment = sum of generator payment located in a zone.

4. LBMP Load Payment Metric

The LBMP Load Payment metric is the hourly load-weighted average LBMP price for each zone multiplied by the zonal load. The annual load payment is then the sum of all 8,760 hourly load payments.

Annual Zonal LBMP payment = sum of all hours (zonal LBMP x zonal load).

Zonal LBMP = zonal average load-weighted LMP.

Note: actual consumer payments will be net of any TCC hedges or bilateral contracts.

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5. TCC Payment Metric

The TCC payment metric is calculated differently for Phase 1 than it is calculated for Phase 2 of the CARIS process, as described in the NYISO Tariff. In this CARIS Phase 1, the TCC Payment is calculated as (Demand Congestion Costs + Export Congestion Costs) – (Supply Congestion Costs + Import Congestion Costs). This is not a measure of the Transmission Owners' TCC auction revenues.

6. ICAP Metric

The Installed Capacity (ICAP) savings metric quantifies the potential NYISO ICAP market savings created by a generation, transmission, demand response, or energy efficiency project.

The ICAP savings calculation[3] consists of two steps, which are performed for each NYISO capacity zone[4]. In the first step, the MW impact of a generic solution is determined through Loss of Load Expectation (LOLE) analysis, where LOLE is the resource adequacy criterion. The MW impact is indicative of reduced installed capacity requirement made possible by the congestion mitigation solutions. A transmission solution that enables better utilization of the existing generating resources in the State will allow a lower IRM and lower LCR. Generation solutions, depending on their location in the NYCA, will contribute as an ICAP source and may reduce the IRM and LCR requirements. For DR and EE, the reduced load downstream of congestion will lower both the overall ICAP and the LCR requirements. The ICAP reduction can be larger than the nameplate of the solution. Using year 2024, the ICAP MW impact for each study area resulting from the application of generic solutions is calculated. This represents the potential reduction in ICAP procurement obligations and the associated ICAP costs.

Second, the ICAP cost reduction benefit is translated to a dollar amount through two pricing variations for each of the years of the ten year study period. For Variant 1, the ISO measured the cost impact of a solution for each planning year by: (i) forecasting the cost per megawatt-year of Installed Capacity under the assumption that the solution is not in place, based on the latest available Summer and Winter ICAP Demand Curves and the amount of Installed Capacity available in the NYCA, and (ii) multiplying that forecasted cost per megawatt-year by the sum of the megawatt impact. For Variant 2, the ISO measured the cost impact of a solution for each planning year by: (i) forecasting the cost per megawatt-year of Installed Capacity under the assumption that the solution is in place, based on the latest available Summer and Winter ICAP Demand Curves and the amount of Installed Capacity available in the NYCA; (ii) subtracting that forecasted

[3] Calculations used to determine ICAP savings are described in NYISO OATT Attachment Y Section 31.3.1.3.5.6. Information regarding the determination of the currently published NYISO ICAP demand curve is beyond the scope of this document and can be found in the NYISO Installed Capacity Manual (http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Operations/icap_mnl.pdf)

[4] As of 2013, The NYISO has four separate capacity zones: New York City (NYC), Long Island (LI), Lower Hudson Valley (G-J), and the New York Control Area (NYCA). Capacity demand curves are used to set the clearing price for existing generation capacity in the capacity market auctions. Locational capacity requirements are inherent within each demand curve so as to meet reliability criteria.

cost per megawatt-year from the forecasted cost per megawatt-year of Installed Capacity calculated in Variant 1 (without the solution in place); and (iii) multiplying that difference by fifty percent (50%) of the assumed amount of NYCA Installed Capacity available. The ICAP cost metrics are indicative measures of the additional potential benefits resulting from the implementation of a CARIS solution. The metrics are not precise determinants of future capacity prices and are calculated for the purpose of providing additional information.

The two variants for savings calculations can be better defined and understood through the ICAP Demand Curve diagram below, Figure E-1.

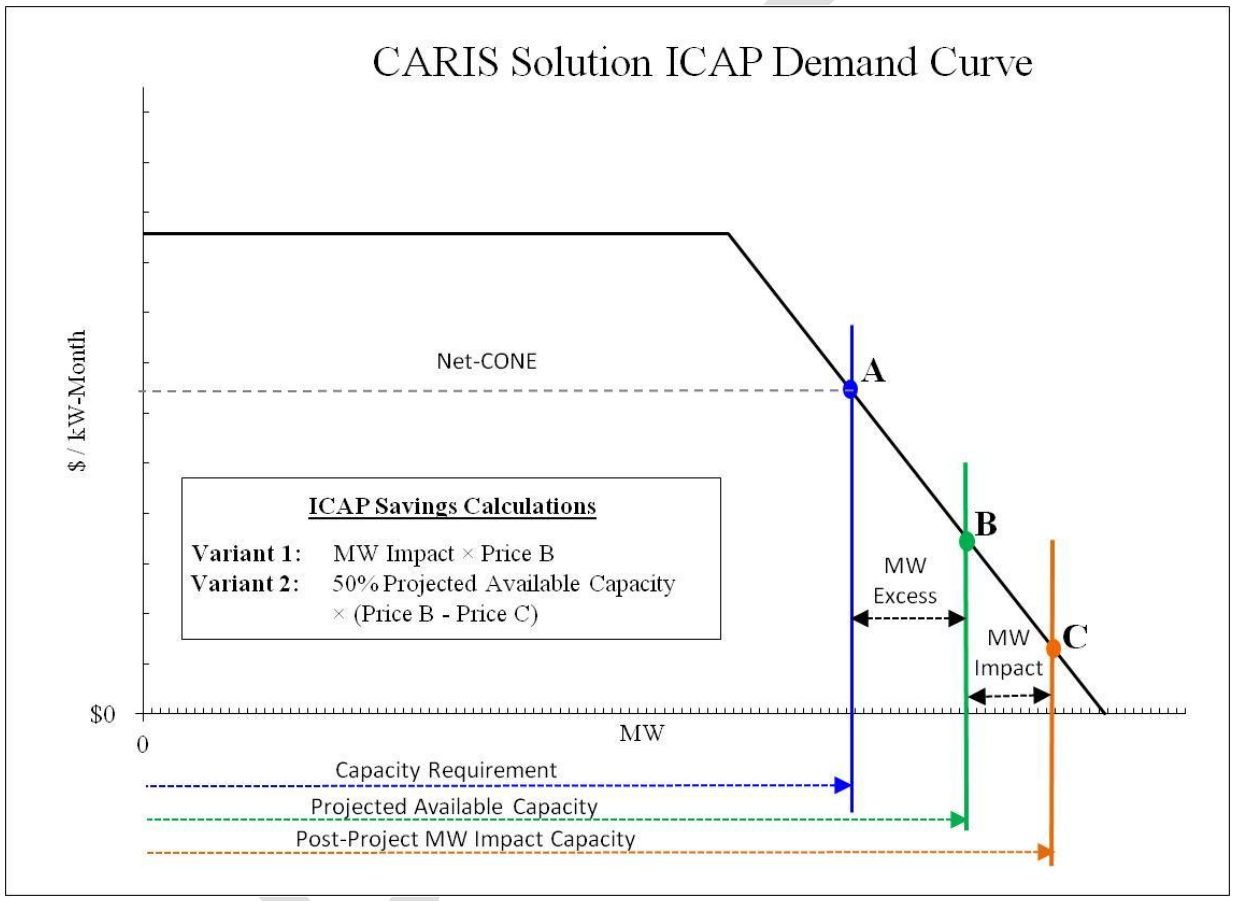

Figure E-1: CARIS ICAP Demand Curve

The MW Impact calculation from the first step described above uses the GE-MARS base case for LOLE calculations, which is based upon the 2014 Comprehensive Reliability Plan (CRP). Updates were made to capacity resources contained in the production cost simulation base case to match the CRP assumptions. A series of project cases were created to simulate transmission, generation, demand response, and energy efficiency projects. Each type of project was modeled with different changes to the MARS topology to accurately represent the effect of the project on the system.

To simulate the three transmission project cases, the following changes to interface transfer limits were made, as indicated in Table E-4.

Table E-4: MARS Interface Modifications for Transmission Solution ICAP Calculations[5]

MARS Interface	Incremental Change		
	Study 1: Central East - New Scotland - Pleasant Valley	Study 2: Central East	Study 3: Western 230kV System
Central East	703	580	-
F to G	1,100	(74)	-
E to G	140	(50)	-
UPNYSENY	1,240	(124)	-
Dysinger East	-	-	296

To simulate the generation project cases, capacity was added downstream of the congested element, as indicated in Table E-5.

Table E-5: MARS Capacity Additions for Generation Solution ICAP Calculations

Study	Generation Bus Location	# Units	Unit Size (MW)	Total Capacity Addition (MW)
Study 1: Central East - New Scotland -	Pleasant Valley	4	330	1320
Study 2: Central East	New Scotland	2	330	660
Study 3: Western 230kV System	Gardenville	2	330	660

Energy efficiency project cases were modeled by reducing the load forecast downstream of the congested element, as indicated in Table E-6.

[5] Unit-dependent nomograms for Dysinger-East and Zone A Group were removed due to modeling of the Western transmission solution.

Table E-6: MARS Load Reductions for Energy Efficiency Solution ICAP Calculations

Zone & Load Reduction Amount (MW)	Study 1: Central East - New Scotland -	Study 2: Central East	Study 3: Western 230kV System
A	-	-	200
B	-	-	200
C	-	-	200
F	200	200	-
G	200	200	-
J	800	200	-

The demand response project cases were created by adding SCRs downstream of the congested element, as indicated in Table E-7.

Table E-7: MARS SCR Capacity Additions for Demand Response Solution ICAP Calculations

Zone & SCR Addition Amount (MW)	Study 1: Central East - New Scotland -	Study 2: Central East	Study 3: Western 230kV System
A	-	-	200
B	-	-	200
C	-	-	200
F	200	200	-
G	200	200	-
J	800	200	-

After the base case and project cases were simulated and LOLE value determined, capacity was removed from each NYISO zone in the each project case, based on the zonal total capacity ratio, until the base case LOLE was reached. The resultant amount of capacity removed is equivalent to the MW Impact of that project case. The MW Impact results for each of the project cases, for the 2024 study year are presented in Table E-8.

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Table E-8: ICAP MW Impact

Study	Solution	Y2024 MW Impact (MW)			
		J	G-J	K	NYCA
Study 1: Central East - New Scotland - Pleasant Valley	Transmission	159	233	93	629
	Generation	348	556	204	1,426
	Energy Efficiency	379	556	222	1,502
	Demand Response	349	513	205	1,386
Study 2: Central East	Transmission	(34)	(50)	(20)	(136)
	Generation	73	107	43	293
	Energy Efficiency	188	276	110	745
	Demand Response	166	243	97	657
Study 3: Western 230kV System	Transmission	-	-	-	-
	Generation	58	85	34	233
	Energy Efficiency	47	69	28	187
	Demand Response	56	82	33	221

The MW Impact calculation under CARIS assumptions and methodology for the Western 230 kV study transmission solution was 0 MW as Dysinger East and Zone A Group were not materially constraining in the 2024 case due to low load growth and the penetration of solar PV installations.

Variant #1 of the ICAP savings calculation can now be determined by simply multiplying the MW Impact values in the table above with the pre-project capacity price of the demand curve for the corresponding study year. The MW Impact values are also used to calculate the post-project capacity price for Variant #2, which is then subtracted from the pre-project price and multiplied by 50% of the projected available capacity for the four capacity zones in that year. The results of these calculations for all 10 years of the CARIS study are contained in Tables E-9 and E-10 below.

The two ICAP cost variants are indicative of a range of the potential benefits to load resulting from the implementation of a CARIS solution. The metrics are not precise determinants of future capacity prices and are calculated for the purpose of providing additional information. The results of the metric calculations are in Table E-9 and Table E-10 below.

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Table E-9: ICAP Costs Savings - Variant 1

CARIS 2015 ICAP Variant #1 Savings (2015 M$)													
Study	**Solution**	**Capacity Zone**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**10-Year Total**
Study 1: Central East - New Scotland - Pleasant Valley	**Transmission**	ROS:	8	9	8	9	11	12	12	13	13	14	**108**
		G-I:	5	4	5	5	5	5	5	5	5	6	**51**
		J:	20	15	17	18	18	18	19	19	19	19	**182**
		K:	4	3	3	3	3	4	4	4	4	4	**36**
		Total:	**37**	**32**	**32**	**35**	**37**	**39**	**40**	**41**	**42**	**43**	**377**
	Generation	ROS:	18	20	17	20	23	25	27	28	29	30	**238**
		G-I:	15	12	13	14	14	14	15	15	15	16	**143**
		J:	44	33	37	39	40	40	41	41	42	42	**399**
		K:	8	7	7	7	7	8	8	9	9	9	**80**
		Total:	**84**	**73**	**74**	**80**	**85**	**88**	**90**	**93**	**95**	**97**	**859**
	Energy Efficiency	ROS:	19	22	19	22	26	28	29	30	32	33	**259**
		G-I:	13	10	11	12	12	12	13	13	13	13	**122**
		J:	48	36	40	42	44	44	44	45	46	46	**434**
		K:	9	8	8	7	8	9	9	9	10	10	**87**
		Total:	**88**	**76**	**77**	**83**	**89**	**92**	**95**	**97**	**100**	**102**	**901**
	Demand Response	ROS:	18	20	17	21	24	26	27	28	29	30	**239**
		G-I:	12	9	10	11	11	11	12	12	12	12	**112**
		J:	44	34	37	39	40	40	41	41	42	43	**400**
		K:	8	8	7	7	7	8	8	9	9	9	**80**
		Total:	**81**	**70**	**71**	**77**	**82**	**85**	**88**	**90**	**92**	**94**	**832**
Study 2: Central East	**Transmission**	ROS:	(2)	(2)	(2)	(2)	(2)	(3)	(3)	(3)	(3)	(3)	**(23)**
		G-I:	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	**(11)**
		J:	(4)	(3)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(4)	**(39)**
		K:	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	**(8)**
		Total:	**(8)**	**(7)**	**(7)**	**(8)**	**(8)**	**(8)**	**(9)**	**(9)**	**(9)**	**(9)**	**(82)**
	Generation	ROS:	4	4	4	4	5	5	6	6	6	7	**51**
		G-I:	2	2	2	2	2	2	2	2	3	3	**23**
		J:	9	7	8	8	8	8	8	9	9	9	**83**
		K:	2	2	1	1	2	2	2	2	2	2	**17**
		Total:	**17**	**15**	**15**	**16**	**17**	**18**	**18**	**19**	**19**	**20**	**174**
	Energy Efficiency	ROS:	10	11	9	11	13	14	14	15	16	16	**128**
		G-I:	6	5	5	6	6	6	6	6	6	7	**60**
		J:	24	18	20	21	22	22	22	22	23	23	**215**
		K:	4	4	4	4	4	4	4	5	5	5	**43**
		Total:	**44**	**38**	**38**	**41**	**44**	**46**	**47**	**48**	**50**	**51**	**447**
	Demand Response	ROS:	8	9	8	10	11	12	13	13	14	14	**113**
		G-I:	6	4	5	5	5	5	5	6	6	6	**53**
		J:	21	16	17	18	19	19	19	20	20	20	**190**
		K:	4	4	3	3	3	4	4	4	4	4	**38**
		Total:	**39**	**33**	**34**	**36**	**39**	**40**	**41**	**43**	**44**	**45**	**394**
Study 3: Western 230kV System	**Transmission**	ROS:	-	-	-	-	-	-	-	-	-	-	**-**
		G-I:	-	-	-	-	-	-	-	-	-	-	**-**
		J:	-	-	-	-	-	-	-	-	-	-	**-**
		K:	-	-	-	-	-	-	-	-	-	-	**-**
		Total:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Generation	ROS:	3	3	3	4	4	4	5	5	5	5	**41**
		G-I:	2	2	2	2	2	2	2	2	2	2	**19**
		J:	7	6	6	6	7	7	7	7	7	7	**66**
		K:	1	1	1	1	1	1	1	1	1	2	**13**
		Total:	**14**	**12**	**12**	**13**	**14**	**14**	**15**	**15**	**15**	**16**	**139**
	Energy Efficiency	ROS:	2	3	2	3	3	3	4	4	4	4	**32**
		G-I:	2	1	1	1	2	2	2	2	2	2	**15**
		J:	6	5	5	5	5	5	6	6	6	6	**54**
		K:	1	1	1	1	1	1	1	1	1	1	**11**
		Total:	**11**	**10**	**10**	**10**	**11**	**11**	**12**	**12**	**12**	**13**	**112**
	Demand Response	ROS:	3	3	3	3	4	4	4	4	5	5	**38**
		G-I:	2	1	2	2	2	2	2	2	2	2	**18**
		J:	7	5	6	6	6	6	7	7	7	7	**64**
		K:	1	1	1	1	1	1	1	1	1	1	**13**
		Total:	**13**	**11**	**11**	**12**	**13**	**14**	**14**	**14**	**15**	**15**	**132**

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Table E-10: ICAP Costs Savings – Variant 2

CARIS 2015 ICAP Variant #2 Savings (2015 M$)													
Study	**Solution**	**Capacity Zone**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**10-Year Total**
Study 1: Central East - New Scotland - Pleasant Valley	**Transmission**	ROS:	149	140	135	128	121	116	110	105	100	95	**1,198**
		G-I:	43	41	39	37	35	33	32	30	29	27	**347**
		J:	112	109	103	98	93	89	84	80	76	72	**917**
		K:	29	35	35	34	34	38	36	34	32	29	**335**
		Total:	**333**	**325**	**313**	**297**	**284**	**275**	**262**	**249**	**236**	**223**	**2,797**
	Generation	ROS:	339	317	306	290	275	262	249	237	226	215	**2,717**
		G-I:	103	98	93	88	84	80	76	72	69	65	**828**
		J:	246	240	227	215	205	195	185	176	167	159	**2,015**
		K:	63	68	70	76	74	77	73	69	64	60	**695**
		Total:	**751**	**723**	**697**	**670**	**638**	**614**	**584**	**554**	**526**	**499**	**6,255**
	Energy Efficiency	ROS:	357	334	323	305	290	276	263	250	238	226	**2,863**
		G-I:	103	98	93	88	84	80	76	72	69	65	**828**
		J:	268	261	247	234	223	212	201	191	182	173	**2,192**
		K:	69	74	76	81	79	82	77	73	68	64	**741**
		Total:	**796**	**766**	**738**	**709**	**675**	**650**	**618**	**587**	**557**	**528**	**6,623**
	Demand Response	ROS:	329	308	298	282	268	255	243	231	220	209	**2,642**
		G-I:	95	90	86	81	77	74	70	67	63	60	**764**
		J:	247	241	228	216	205	196	186	177	168	159	**2,023**
		K:	64	68	71	75	73	76	72	68	63	59	**688**
		Total:	**735**	**708**	**682**	**654**	**623**	**600**	**571**	**542**	**514**	**488**	**6,117**
Study 2: Central East	**Transmission**	ROS:	(32)	(30)	(29)	(28)	(26)	(25)	(24)	(23)	(22)	(21)	**(260)**
		G-I:	(9)	(9)	(8)	(8)	(8)	(7)	(7)	(7)	(6)	(6)	**(75)**
		J:	(24)	(24)	(22)	(21)	(20)	(19)	(18)	(17)	(16)	(16)	**(199)**
		K:	(6)	(8)	(8)	(7)	(9)	(8)	(8)	(7)	(7)	(7)	**(75)**
		Total:	**(72)**	**(71)**	**(68)**	**(64)**	**(63)**	**(60)**	**(57)**	**(54)**	**(51)**	**(49)**	**(608)**
	Generation	ROS:	70	65	63	60	57	54	51	49	46	44	**558**
		G-I:	20	19	18	17	16	15	15	14	13	13	**159**
		J:	51	50	47	45	43	41	39	37	35	33	**420**
		K:	13	17	16	16	17	17	17	16	15	14	**158**
		Total:	**154**	**151**	**144**	**137**	**132**	**127**	**121**	**115**	**109**	**104**	**1,295**
	Energy Efficiency	ROS:	177	166	160	151	144	137	130	124	118	112	**1,420**
		G-I:	51	48	46	44	42	40	38	36	34	32	**411**
		J:	133	129	123	116	110	105	100	95	90	86	**1,087**
		K:	34	40	42	40	40	44	42	39	36	34	**392**
		Total:	**395**	**384**	**371**	**352**	**336**	**326**	**310**	**294**	**279**	**264**	**3,310**
	Demand Response	ROS:	156	146	141	134	127	121	115	109	104	99	**1,253**
		G-I:	45	43	41	39	37	35	33	32	30	29	**362**
		J:	117	114	108	103	97	93	88	84	80	76	**959**
		K:	30	36	37	35	35	39	37	35	33	30	**349**
		Total:	**348**	**339**	**327**	**310**	**296**	**288**	**274**	**260**	**247**	**233**	**2,923**
Study 3: Western 230kV System	**Transmission**	ROS:	-	-	-	-	-	-	-	-	-	-	**-**
		G-I:	-	-	-	-	-	-	-	-	-	-	**-**
		J:	-	-	-	-	-	-	-	-	-	-	**-**
		K:	-	-	-	-	-	-	-	-	-	-	**-**
		Total:	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Generation	ROS:	55	52	50	47	45	43	41	39	37	35	**444**
		G-I:	16	15	14	13	13	12	12	11	10	10	**126**
		J:	41	40	38	36	34	32	31	29	28	26	**335**
		K:	11	14	13	12	14	14	13	13	12	11	**126**
		Total:	**122**	**120**	**115**	**109**	**105**	**101**	**96**	**92**	**87**	**83**	**1,031**
	Energy Efficiency	ROS:	45	42	40	38	36	34	33	31	30	28	**357**
		G-I:	13	12	12	11	10	10	9	9	9	8	**103**
		J:	33	33	31	29	28	26	25	24	23	22	**273**
		K:	9	11	11	10	11	11	11	10	10	9	**102**
		Total:	**99**	**97**	**93**	**88**	**86**	**82**	**78**	**74**	**71**	**67**	**836**
	Demand Response	ROS:	52	49	47	45	43	41	39	37	35	33	**421**
		G-I:	15	14	14	13	12	12	11	11	10	10	**122**
		J:	39	38	36	34	33	31	30	28	27	25	**322**
		K:	10	13	12	12	13	13	13	12	11	11	**120**
		Total:	**117**	**115**	**110**	**104**	**101**	**97**	**92**	**87**	**83**	**79**	**985**

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CARIS Base Case Metrics Results

When comparing historic CROS values of congestion and other metrics with the projected CARIS values, it is important to note that there are significant differences in assumptions used by these tools. MAPS, unlike CROS, did not simulate the following: (a) virtual bidding; (b) transmission outages; (c) fixed load and price-capped load; (d) production costs based on mitigated bids;(e) BPCG payments; and (f) co-optimization with ancillary services.

The detailed projected CARIS base case results are presented in Tables E-11 through E-24. Table E-11 below presents the summation of the NYCA zonal base case results for the ten-year study period (except for NYCA-wide production costs).

Table E-11: Projected CARIS Base Case Results 2015-2024 (nominal $M)

Base Case Summary	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
NYCA-Wide Production Cost ($M)	3,525.60	3,730.87	3,722.76	3,862.53	4,176.51	4,984.23	5,256.19	5,570.42	5,767.55	6,097.27
NYCA Demand Congestion ($M)	941.15	827.88	951.35	909.44	1,039.77	809.26	851.09	846.26	927.17	1,024.91
Load LBMP Payment ($M)	6,667.92	7,096.93	7,226.24	7,565.55	8,291.77	9,758.79	10,350.24	10,929.00	11,415.27	12,021.33
Generator LBMP Payment ($M)	5,402.36	5,619.50	5,640.49	5,827.13	6,381.73	7,896.40	8,405.68	8,864.50	9,301.13	9,750.24
Load Payment Losses ($M)	-120.89	-68.54	-56.97	-75.56	-86.02	-108.56	-96.54	-110.55	-101.91	-125.05
SO2 Costs ($M)	1.53	1.18	0.99	0.56	0.70	0.79	0.69	0.61	0.53	0.41
SO2 Emission (Short Tons)	16,866.66	13,520.46	9,333.99	6,851.42	9,508.64	12,212.98	12,751.90	13,403.42	13,944.93	13,675.67
CO2 Costs ($M)	178.34	236.05	276.32	275.26	293.26	475.18	503.85	545.01	574.13	609.78
CO2 Emission (Short Tons)	33,297.17	31,764.19	29,543.55	28,382.46	28,775.51	32,640.88	32,322.56	33,148.55	32,987.96	33,294.51
NOX Costs ($M)	1.94	1.79	2.03	1.59	1.50	1.50	1.28	1.12	0.91	0.75
NOX Emission (Short Tons)	20,844.53	19,914.76	18,385.32	18,134.61	19,339.14	21,647.25	21,652.52	22,290.90	22,353.48	22,583.79
NYCA Avg. LBMP ($/MWh)	39.87	42.41	43.21	45.42	49.49	58.09	61.52	64.87	67.43	70.49

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Table E-12: Projected Production Costs (2015-2024) by Zone (nominal $M)

Production Cost (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	189	202	205	212	267	393	414	446	468	478
Genesee	42	39	40	44	42	50	52	52	53	59
Central	432	428	415	405	437	514	558	568	592	615
North	31	27	25	26	26	39	41	45	39	50
Mohawk Valley	26	29	25	28	29	39	38	41	37	42
Capital	579	591	597	604	627	813	830	898	924	963
Hudson Valley	26	26	23	21	21	35	40	37	44	44
Millwood	108	111	115	117	119	124	126	130	132	136
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	1,113	1,168	1,165	1,184	1,294	1,510	1,599	1,683	1,759	1,856
Long Island	454	467	458	462	494	604	639	668	710	749
NYCA Total	**3,001**	**3,088**	**3,068**	**3,102**	**3,355**	**4,121**	**4,335**	**4,568**	**4,757**	**4,993**
NYCA Imports	899	1,023	1,068	1,176	1,298	1,358	1,444	1,518	1,594	1,684
NYCA Exports	374	380	413	415	477	495	523	516	583	580
NYCA + Imports - Exports	**3,526**	**3,731**	**3,723**	**3,863**	**4,177**	**4,984**	**5,256**	**5,570**	**5,768**	**6,097**
Total IESO	946	942	953	971	1,020	1,135	1,183	1,232	1,256	1,293
Total PJM	17,156	18,254	18,759	19,665	21,088	28,527	30,451	32,315	33,705	34,832
Total ISONE	3,056	3,208	3,319	3,510	3,786	4,248	4,542	4,713	4,935	5,148
Total System	24,159	25,493	26,100	27,248	29,250	38,032	40,511	42,828	44,653	46,266

Table E-13: Projected Load Payments (2015-2024) by Zone (nominal $M)

Load Payment ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	533	587	593	627	671	813	859	902	937	981
Genesee	342	366	366	387	418	510	536	567	587	613
Central	577	625	628	667	722	877	925	980	1,016	1,065
North	156	169	169	180	238	345	365	387	402	421
Mohawk Valley	268	289	291	310	337	412	437	465	484	510
Capital	554	594	608	636	701	797	841	881	918	956
Hudson Valley	427	449	458	477	520	601	633	664	690	722
Millwood	127	133	136	141	154	178	188	198	206	216
Dunwoodie	265	277	283	294	322	373	395	416	435	458
NY City	2,359	2,487	2,546	2,648	2,901	3,354	3,556	3,744	3,920	4,132
Long Island	1,058	1,120	1,149	1,199	1,306	1,500	1,614	1,724	1,822	1,946
NYCA Total	6,668	7,097	7,226	7,566	8,292	9,759	10,350	10,929	11,415	12,021

Table E-14: Projected Generator Payments (2015-2024) by Zone (nominal $M)

Generator Payment ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	627	666	666	708	798	1,070	1,140	1,222	1,272	1,324
Genesee	180	178	179	206	204	256	290	285	295	335
Central	1,168	1,201	1,218	1,225	1,375	1,654	1,821	1,860	2,000	2,026
North	309	328	326	347	375	470	496	528	540	575
Mohawk Valley	130	141	137	150	162	208	217	232	235	251
Capital	651	677	685	702	741	963	984	1,065	1,094	1,138
Hudson Valley	40	41	45	47	52	74	82	83	92	97
Millwood	730	769	779	810	895	1,038	1,089	1,143	1,201	1,257
Dunwoodie	0	0	1	1	2	3	5	6	7	8
NY City	1,079	1,115	1,109	1,125	1,232	1,485	1,568	1,682	1,759	1,878
Long Island	488	502	495	507	544	675	713	758	805	862
NYCA Total	5,402	5,620	5,640	5,827	6,382	7,896	8,406	8,864	9,301	9,750

Table E-15: Projected Generator GWh (2015-2024)

Generation (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	18,401	18,318	18,144	18,192	19,008	20,807	20,904	21,172	21,271	21,187
Genesee	5,369	4,944	4,919	5,352	4,912	5,037	5,399	4,996	4,997	5,442
Central	32,836	31,253	31,599	30,018	31,162	30,900	32,134	30,950	32,074	31,003
North	9,078	8,952	8,876	8,886	8,812	8,997	8,984	9,010	8,892	9,024
Mohawk Valley	3,712	3,752	3,666	3,719	3,714	3,867	3,809	3,847	3,756	3,809
Capital	14,544	14,133	13,778	13,333	12,720	14,725	14,232	14,615	14,388	14,515
Hudson Valley	799	826	903	895	934	1,102	1,147	1,117	1,187	1,163
Millwood	17,149	17,220	17,167	17,190	17,188	17,272	17,226	17,248	17,243	17,303
Dunwoodie	4	10	17	28	40	53	75	89	98	103
NY City	24,378	23,925	23,010	22,327	22,293	23,403	23,327	23,836	23,847	24,075
Long Island	10,308	10,128	9,565	9,388	9,104	10,002	9,909	10,141	10,081	10,223
NYCA Total	**136,580**	**133,461**	**131,642**	**129,326**	**129,886**	**136,166**	**137,146**	**137,021**	**137,833**	**137,847**
Total IESO	157,344	157,626	156,015	155,925	155,789	156,289	156,489	156,489	156,430	156,796
Total PJM	815,213	831,713	840,865	851,030	856,865	858,561	864,076	871,708	879,464	889,122
Total ISONE	109,104	109,613	109,427	109,888	109,024	110,539	109,978	110,475	110,105	110,679
Total HQ *	24,576	24,638	24,674	24,622	24,585	24,643	24,581	24,691	24,674	24,659
Total System	1,242,818	1,257,051	1,262,624	1,270,791	1,276,149	1,286,198	1,292,270	1,300,384	1,308,505	1,319,103

Table E-16: Projected Loss Payments (2015-2024) by Zone (nominal $M)

Loss Costs ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(64.0)	(68.3)	(68.5)	(75.4)	(84.2)	(98.8)	(104.1)	(111.5)	(114.6)	(120.1)
Genesee	(22.6)	(25.3)	(25.4)	(28.0)	(31.3)	(38.5)	(42.0)	(43.7)	(45.5)	(48.0)
Central	(11.7)	(12.7)	(11.7)	(12.0)	(14.2)	(16.8)	(18.6)	(19.2)	(20.0)	(20.9)
North	(9.0)	(10.0)	(10.3)	(11.0)	(12.4)	(15.5)	(16.0)	(17.3)	(17.4)	(18.3)
Mohawk Valley	(0.3)	0.2	0.4	0.4	0.6	0.8	1.1	1.1	1.4	1.3
Capital	5.8	9.3	9.7	10.3	12.1	11.2	13.5	12.6	14.0	13.4
Hudson Valley	(1.7)	2.6	3.3	2.2	2.4	2.8	4.4	3.9	4.9	3.4
Millwood	(0.4)	0.8	1.0	0.7	0.7	0.8	1.3	1.2	1.5	1.0
Dunwoodie	(1.6)	1.1	1.7	1.0	1.0	1.2	2.3	2.0	2.6	1.7
NY City	(18.5)	17.8	23.3	18.2	19.0	24.9	36.0	34.5	41.1	33.3
Long Island	3.4	16.0	19.4	18.0	20.1	19.6	25.6	25.8	30.2	28.1
NYCA Total	**(120.9)**	**(68.5)**	**(57.0)**	**(75.6)**	**(86.0)**	**(108.6)**	**(96.5)**	**(110.5)**	**(101.9)**	**(125.0)**

Table E-17: Projected SO_2 Emission Costs (2015-2024) by Zone (nominal $M)

SO_2 Emissions Costs ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.8	0.6	0.6	0.5	0.7	0.8	0.7	0.6	0.5	0.4
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.7	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**1.5**	**1.2**	**1.0**	**0.6**	**0.7**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**

Table E-18: Projected SO_2 Emission Tons (2015-2024) by Zone

SO_2 Emissions (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	8,017	6,692	5,090	5,115	7,803	10,445	10,999	11,604	12,154	11,955
Genesee	0	0	0	0	0	0	0	0	0	0
Central	7,326	5,304	2,729	162	162	168	227	182	208	169
North	2	2	1	1	1	2	2	2	1	2
Mohawk Valley	9	9	9	9	9	9	9	9	9	9
Capital	334	334	333	332	330	335	333	334	334	334
Hudson Valley	228	211	226	227	212	224	251	244	217	254
Millwood	337	338	337	337	336	338	337	336	336	337
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	99	110	89	137	129	153	148	152	130	147
Long Island	514	521	520	532	526	539	447	540	555	468
NYCA Total	**16,867**	**13,520**	**9,334**	**6,851**	**9,509**	**12,213**	**12,752**	**13,403**	**13,945**	**13,676**

Table E-19: Projected CO_2 Emission Costs (2015-2024) by Zone (nominal $M)

CO_2 Emissions Costs ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	23.4	30.1	33.9	35.3	47.8	85.8	93.9	103.6	112.2	116.4
Genesee	0.8	1.0	1.2	1.3	1.2	2.3	2.2	2.4	2.5	2.8
Central	25.2	31.8	33.3	29.7	30.6	46.8	50.7	53.8	55.7	59.8
North	2.4	2.8	3.2	3.3	3.0	5.4	5.8	6.3	5.6	7.2
Mohawk Valley	1.4	2.1	2.1	2.4	2.3	4.2	4.0	4.5	3.9	4.5
Capital	33.0	44.4	54.2	53.9	53.4	83.2	85.3	92.4	96.4	103.0
Hudson Valley	1.9	2.5	2.4	2.0	2.1	4.2	4.7	4.5	5.6	5.5
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	60.4	81.7	99.7	100.6	105.7	173.0	183.1	197.1	207.5	220.1
Long Island	29.8	39.6	46.4	46.8	47.2	70.2	74.2	80.3	84.7	90.4
NYCA Total	**178.3**	**236.0**	**276.3**	**275.3**	**293.3**	**475.2**	**503.8**	**545.0**	**574.1**	**609.8**

Table E-20: Projected CO_2 Emission 1000 Tons (2015-2024) by Zone

CO_2 Emissions (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	4,070	3,750	3,348	3,368	4,351	5,850	5,982	6,252	6,399	6,301
Genesee	142	127	119	122	109	160	138	145	144	151
Central	4,385	3,961	3,287	2,840	2,785	3,196	3,230	3,248	3,177	3,242
North	421	351	311	315	273	372	368	383	320	387
Mohawk Valley	245	261	209	226	214	283	255	271	222	244
Capital	5,746	5,541	5,359	5,145	4,859	5,670	5,434	5,578	5,498	5,573
Hudson Valley	324	310	234	190	187	288	301	274	317	298
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	12,765	12,512	12,085	11,709	11,696	12,031	11,883	12,141	12,073	12,189
Long Island	5,198	4,951	4,591	4,469	4,301	4,792	4,732	4,856	4,839	4,910
NYCA Total	**33,297**	**31,764**	**29,544**	**28,382**	**28,776**	**32,641**	**32,323**	**33,149**	**32,988**	**33,295**

Table E-21: Projected NOx Emission Costs (2015-2024) by Zone (nominal $M)

NO_X Emissions Costs ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.6	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.4	0.3
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Hudson Valley	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.7	0.6	0.8	0.6	0.5	0.5	0.4	0.3	0.3	0.2
Long Island	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1
NYCA Total	**1.9**	**1.8**	**2.0**	**1.6**	**1.5**	**1.5**	**1.3**	**1.1**	**0.9**	**0.7**

Table E-22: Projected NOx in Tons (2015-2024) by Zone

NO_X Emissions (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	5,437	4,891	3,960	4,080	5,410	6,749	6,966	7,283	7,473	7,435
Genesee	310	301	294	299	290	321	310	308	311	318
Central	2,407	2,339	2,224	2,155	2,154	2,283	2,304	2,301	2,259	2,313
North	179	165	156	157	148	170	169	172	160	172
Mohawk Valley	311	322	293	298	293	334	317	328	299	312
Capital	1,109	1,103	1,089	1,079	1,065	1,112	1,094	1,104	1,097	1,104
Hudson Valley	495	503	458	422	421	476	497	480	520	502
Millwood	1,315	1,320	1,315	1,315	1,315	1,319	1,315	1,314	1,315	1,318
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	4,035	3,880	3,724	3,539	3,567	3,966	3,838	4,080	3,988	4,118
Long Island	5,246	5,091	4,874	4,790	4,675	4,916	4,843	4,920	4,931	4,990
NYCA Total	**20,845**	**19,915**	**18,385**	**18,135**	**19,339**	**21,647**	**21,653**	**22,291**	**22,353**	**22,584**

Table E-23: Projected System Congestion Rents (nominal $M)

Congestion Rent (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
NYCA Total	544.1	573.0	656.8	678.3	759.8	641.4	648.1	668.6	695.2	749.1

Table E-24: Projected Zonal LBMP $/MWh (2015-2024) by Zone

AVERAGE LBMP ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	34.19	37.25	37.81	40.02	42.88	51.79	54.91	57.71	59.96	62.65
Genesee	34.52	36.97	37.21	39.39	42.66	51.82	54.70	58.04	60.11	62.85
Central	36.55	39.25	39.62	42.08	45.59	55.10	58.22	61.68	63.93	66.93
North	34.13	36.84	36.94	39.33	42.97	52.86	56.01	59.34	61.59	64.50
Mohawk Valley	37.14	39.85	40.17	42.66	46.29	56.06	59.35	62.86	65.21	68.26
Capital	44.89	47.71	48.99	51.14	56.25	63.40	66.98	70.17	72.93	75.73
Hudson Valley	42.67	44.94	46.04	48.07	52.57	60.59	64.11	67.42	70.14	73.24
Millwood	42.96	45.14	46.31	48.31	52.83	60.79	64.32	67.63	70.40	73.64
Dunwoodie	42.81	44.99	46.15	48.15	52.65	60.63	64.15	67.47	70.23	73.47
NY City	42.93	45.35	46.58	48.58	53.12	61.19	64.74	68.05	70.90	74.18
Long Island	45.79	48.20	49.54	51.90	56.58	64.75	69.25	73.16	76.29	79.97
Average	39.87	42.41	43.21	45.42	49.49	58.09	61.52	64.87	67.43	70.49

E.2. Selection of Three Studies

The process for selecting the three CARIS studies occurs in two steps, as described below.

In Step 1, the top five congested elements for the fifteen-year period (both historic (5 years) and projected (10 years)) are ranked in descending order based on the calculated present value of demand congestion for further assessment. (The discount rate to be used for the present value analysis shall be the current weighted average cost of capital for the NY Transmission Owners, which was 6.819% for 2015 CARIS cycle.) The top congested elements are then iteratively relieved independently by relaxing their limits. This is to determine if any of the congested elements need to be grouped with other elements, depending on whether new electrically adjacent elements appear as limiting with significant congestion when a primary element is relieved.

In Step 2, the assessed element groupings are then ranked based upon the highest change in production cost as shown with the top 3 groupings selected to be studied.

Note that the procedure provides that if future system changes (*e.g.*, generation, transmission, energy efficiency or demand side additions) produce a significant declining trend in congestion over an identified congested element in later years of the study period, such element shall be excluded from the rankings. Elements with significant increasing trend in congestion could also be evaluated in addition to the top 5 elements. As a result, the Western 230 kV system was included in the relaxation and grouping process.

The study selection procedures provide the NYISO with flexibility for grouping, assessing and recommending the three studies provided that the grouping process for each CARIS is reviewed with ESPWG. It is expected that the three groupings/elements with the most production cost savings will be selected as the three studies. The production cost savings based on modifying an existing element's limit will be different than that achieved when applying a transmission solution since an impedance value for a line is not being introduced.

Tables E-25-A and E-25-B show the demand congestion for the base case and the relaxation cases over the 10-year study period.

Table E-25-A: Central and Eastern Demand Congestion: Base and Relaxation Cases

Demand Congestion (2015 $M)	Base Case	10 YEAR RELAXATION							
		CENTRAL EAST (CE)	DUNWOODIE TO LONG ISLAND (I2K)	LEEDS PLEASANT VALLEY (LPV)	GREENWOOD (GWD)	NEW SCOTLAND LEEDS (NSL)	CE + NSL + LPV	NSL + LPV	CE + NSL
CENTRAL EAST	$ 4,954	$ -	$ 4,957	$ 5,030	$ 4,941	$ 4,966	$ -	$ 5,045	$ -
DUNWOODIE TO LONG ISLAND	$ 428	$ 493	$ -	$ 443	$ 428	$ 428	$ 510	$ 444	$ 493
LEEDS PLEASANT VALLEY	$ 398	$ 427	$ 427	$ -	$ 361	$ 409	$ -	$ -	$ 438
GREENWOOD	$ 187	$ 207	$ 182	$ 191	$ -	$ 187	$ 212	$ 191	$ 207
NEW SCOTLAND LEEDS	$ 10	$ 22	$ 11	$ 42	$ 11	$ -	$ -	$ -	$ -

Table E-25-B: Western Demand Congestion: Base and Relaxation Cases

Demand Congestion (2015 $M)	Base Case	10 YEAR RELAXATION						
		PH	PH+NP	PH+NP+SG	PH+NP+HG	PH+NP+SG+ HG	PH+NP+SG+ HG+NR	PH+NP+SG+ HG+NR+NNR
PACKARD HUNTLEY (PH)	$ 294	$ -	$ -	$ -	$ -	$ -	$ -	$ -
NIAGARA PACKARD (NP)	$ 1	$ 224	$ -	$ -	$ -	$ -	$ -	$ -
STOLLE RD GARDENVILLE (SG)	$ 45	$ 91	$ 165	$ -	$ 186	$ -	$ -	$ -
HUNTLEY GARDENVILLE (HG)	$ 35	$ 33	$ 87	$ 98	$ -	$ -	$ -	$ -
NIAGARA ROBNSNRD (NR)	$ -	$ -	$ 11	$ 14	$ 41	$ 51	$ -	$ -
NIAGARA NEWROCH (NNR)	$ 0	$ 0	$ 0	$ 0	$ 1	$ 1	$ 1	$ -

Figures E-2-A and E-2-B show the change in production cost when the top congested elements are relieved. The NYISO presented the ranking and grouping analysis to ESPWG stakeholders and recommended three studies based upon the highest production cost savings: Central East-New Scotland-Pleasant Valley, Central East, and West. The recommendation was based upon these groupings meeting the NYISO's grouping and ranking guidelines. Central East – New Scotland grouping was dropped because its production cost saving is only marginally higher than that of Central East itself. Similarly, the remaining ranked elements showed only a marginal increase in production cost savings and were not recommended for this CARIS. After discussion with ESPWG, the NYISO selected the three recommended studies for the 2015 CARIS Phase 1.

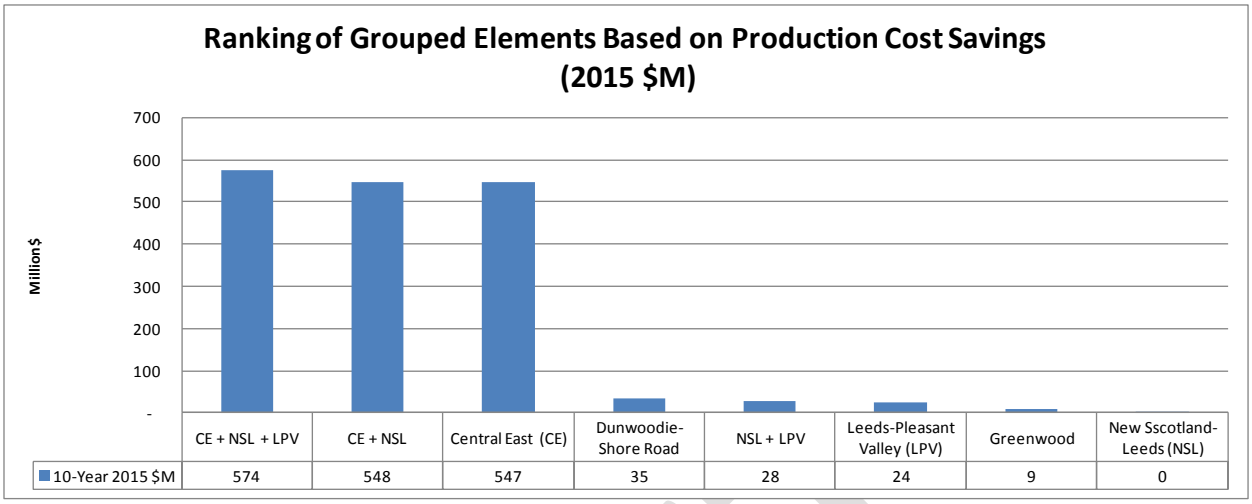

Figure E-2-A: Central and Eastern Production Cost Savings Due to Relaxation

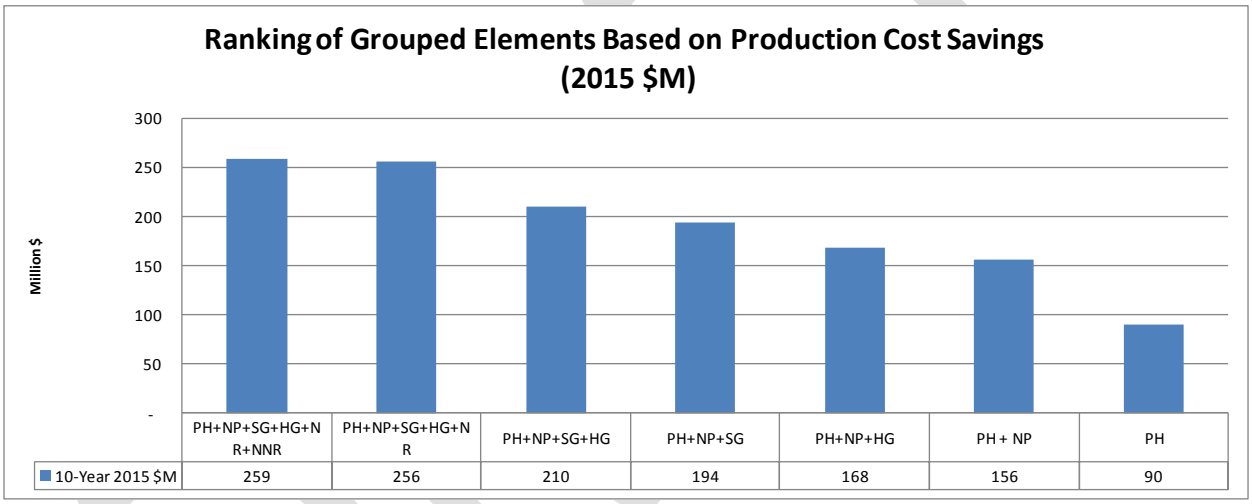

Figure E-2-B: Western Production Cost Savings Due to Relaxation

E.3 Generic Solutions

The NYISO developed generic solutions for each of the three studies. The generic solutions are each added to the base case in order to determine the impact on congestion for the grouped elements in each study. It is assumed that each of the generic solutions is installed in the first study year (2015). This assumption allows for the calculation of the full ten-year production cost and additional metrics resulting from the generic solution. The transfer limits were adjusted as necessary in the generic solution cases.

For each study, transmission solution in 1986 MVA block sizes for 345 kV and 566 MVA block sizes for 230 kV, generation solution in 330MW block sizes, energy efficiency in 200MW block sizes and demand response in 200MW block sizes were implemented after considering whether a majority of the congestion on the grouped elements being studied could be relieved and whether diminishing returns could be realized from implementing additional blocks.

Note:

- Other solutions may exist which will better alleviate the congestion on the studied elements.
- No engineering, physical feasibility study, routing study or siting study has been completed for the generic solutions. Therefore, it is unknown if the generic solutions can be physically constructed as proposed.

Study1: Central East-New Scotland-Pleasant Valley

- Transmission: 345 kV line from Edic to New Scotland to Pleasant Valley, 150 Miles
- Generation: 1320 MW Plant at Pleasant Valley
- Demand Response : 200 MW in Zone F; 200 MW in Zone G; 800 MW in Zone J
- Energy Efficiency : 200 MW in Zone F; 200 MW in Zone G; 800 MW in Zone J

Table E-26 below presents the change in the number of congested hours by constraints after the generic solution has been applied. Negative values indicate a reduction in congested hours. Detailed results for all CARIS metrics, representing the change between the base case values and the values after the three generic solutions have been applied, are presented in Attachment H.

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Table E-26: Change in Number of Congested Hours
(Solution Case – Base Case)

Study	Solution	Constraint	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Study #1: CE-NS-PV	Transmission	CENTRAL EAST	(1493)	(1496)	(1623)	(1717)	(1656)	(1084)	(1167)	(1024)	(1097)	(881)
		DUNWOODIE TO LONG ISLAND	399	210	149	132	176	153	135	83	98	118
		LEEDS PLEASANT VALLEY	(745)	(465)	(528)	(393)	(346)	(288)	(303)	(286)	(285)	(705)
		GREENWOOD	(28)	53	51	67	107	127	114	95	72	114
		NEW SCOTLAND LEEDS	(137)	(17)	(29)	(7)	(9)	(9)	(11)	(17)	(13)	(6)
		PACKARD HUNTLEY	10	102	247	139	178	87	92	102	128	52
		DUNWOODIE MOTTHAVEN	3	1	1	6	3	0	3	3	2	0
		RAINEY VERNON	60	214	133	264	199	220	148	124	204	138
		E179THST HELLGT ASTORIAE	(64)	73	(44)	27	59	97	53	28	41	(2)
		EGRDNCTY 138 VALLYSTR 138	(73)	40	15	57	81	78	10	18	71	4
	Generation	CENTRAL EAST	(20)	83	57	14	53	16	18	(47)	(11)	38
		DUNWOODIE TO LONG ISLAND	260	186	148	241	87	94	178	111	179	210
		LEEDS PLEASANT VALLEY	(507)	(387)	(364)	(305)	(263)	(233)	(258)	(235)	(244)	(478)
		GREENWOOD	(20)	133	20	3	(28)	3	19	5	15	35
		NEW SCOTLAND LEEDS	(71)	(9)	(17)	0	(1)	(2)	0	(10)	(9)	0
		PACKARD HUNTLEY	142	46	(18)	65	91	(63)	(105)	34	39	(3)
		DUNWOODIE MOTTHAVEN	1	1	3	13	7	0	2	4	5	3
		RAINEY VERNON	113	357	192	191	234	428	228	163	280	292
		E179THST HELLGT ASTORIAE	139	(139)	(143)	40	(81)	3	(98)	(75)	(144)	(3)
		EGRDNCTY 138 VALLYSTR 138	(150)	(21)	(78)	255	11	291	(130)	22	(151)	3
	Demand Response	CENTRAL EAST	16	1	(27)	(7)	(2)	(3)	(2)	(6)	(11)	(1)
		DUNWOODIE TO LONG ISLAND	(1)	25	7	19	17	5	15	6	(2)	5
		LEEDS PLEASANT VALLEY	(1)	(26)	0	(18)	16	(1)	(17)	(23)	(14)	(7)
		GREENWOOD	0	1	0	0	0	0	0	2	0	(1)
		NEW SCOTLAND LEEDS	(12)	0	(2)	(3)	0	1	0	3	1	0
		PACKARD HUNTLEY	1	(1)	21	(4)	7	22	42	0	(18)	(2)
		DUNWOODIE MOTTHAVEN	0	0	0	(1)	0	0	0	0	0	0
		RAINEY VERNON	27	(13)	(23)	(4)	(10)	(7)	(8)	(5)	(8)	10
		E179THST HELLGT ASTORIAE	(2)	33	23	14	30	47	34	17	18	15
		EGRDNCTY 138 VALLYSTR 138	2	2	(12)	(1)	(16)	(7)	(11)	(8)	10	3
	Energy Efficiency	CENTRAL EAST	(55)	(46)	(119)	(171)	(83)	(111)	(178)	(150)	(184)	(179)
		DUNWOODIE TO LONG ISLAND	183	299	247	286	299	182	160	151	149	158
		LEEDS PLEASANT VALLEY	(205)	(163)	(98)	(115)	(56)	(83)	(83)	(77)	(115)	(123)
		GREENWOOD	(424)	(151)	(44)	(8)	51	27	38	(10)	(24)	32
		NEW SCOTLAND LEEDS	(24)	(7)	(6)	(5)	(1)	(2)	(8)	(7)	(2)	0
		PACKARD HUNTLEY	166	99	93	57	178	(28)	(16)	5	(43)	(76)
		DUNWOODIE MOTTHAVEN	0	0	0	(1)	0	0	0	0	0	0
		RAINEY VERNON	(145)	(139)	(99)	(230)	(148)	(176)	(202)	(193)	(166)	(273)
		E179THST HELLGT ASTORIAE	54	(129)	(80)	(61)	31	(10)	(42)	(58)	(11)	(18)
		EGRDNCTY 138 VALLYSTR 138	8	77	55	41	75	88	(24)	(6)	71	8

Study 2: Central East

- Transmission: 345 kV line from Edic to New Scotland, 85 Miles
- Generation: 660 MW Plant at New Scotland
- Demand Response : 200 MW in Zone F; 200 MW in Zone G; 200 MW in Zone J
- Energy Efficiency : 200 MW in Zone F; 200 MW in Zone G; 200 MW in Zone J

Table E-27 below presents the change in the number of congested hours by constraints after the generic solution has been applied. Negative values indicate a reduction in congested hours. Detailed results for all CARIS metrics, representing the change between the base case values and the values after the three generic solutions have been applied, are presented in Attachment H.

Table E-27: Change in Number of Congested Hours
(Solution Case – Base Case)

Solution	Constraint	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Transmission	CENTRAL EAST	(1551)	(1550)	(1685)	(1778)	(1656)	(1133)	(1207)	(1103)	(1127)	(935)
	DUNWOODIE TO LONG ISLAND	106	43	10	64	121	6	25	(33)	(13)	(45)
	LEEDS PLEASANT VALLEY	255	186	232	228	144	193	151	175	127	125
	GREENWOOD	(49)	51	70	68	134	111	101	91	79	112
	NEW SCOTLAND LEEDS	348	105	120	151	115	68	106	104	116	67
	PACKARD HUNTLEY	46	15	223	155	190	72	87	134	92	39
	DUNWOODIE MOTTHAVEN	0	0	0	0	1	0	0	0	0	0
	RAINEY VERNON	(6)	80	60	136	135	173	118	83	158	108
	E179THST HELLGT ASTORIAE	(29)	118	44	113	95	121	93	101	57	62
	EGRDNCTY 138 VALLYSTR 138	69	7	(33)	38	59	109	24	(18)	44	3
Generation	CENTRAL EAST	(169)	(108)	(124)	(206)	(97)	(74)	(57)	(146)	(153)	(101)
	DUNWOODIE TO LONG ISLAND	(167)	(76)	(78)	10	(67)	(67)	25	(89)	(3)	56
	LEEDS PLEASANT VALLEY	300	293	224	124	215	146	210	182	207	259
	GREENWOOD	12	104	(5)	(10)	10	11	(8)	5	4	17
	NEW SCOTLAND LEEDS	326	97	40	15	35	63	48	91	49	60
	PACKARD HUNTLEY	20	98	(20)	(67)	61	39	(98)	25	52	15
	DUNWOODIE MOTTHAVEN	0	0	0	0	0	0	0	0	0	0
	RAINEY VERNON	34	40	186	137	25	316	133	(4)	26	(8)
	E179THST HELLGT ASTORIAE	97	114	(8)	122	(18)	213	6	15	38	167
	EGRDNCTY 138 VALLYSTR 138	(13)	142	115	188	(125)	(130)	(269)	(191)	(361)	(243)
Demand Response	CENTRAL EAST	6	(6)	(31)	(12)	(2)	5	(6)	(4)	(11)	3
	DUNWOODIE TO LONG ISLAND	0	19	(1)	8	6	3	11	0	(2)	(3)
	LEEDS PLEASANT VALLEY	5	(8)	3	(13)	27	0	(8)	(8)	(1)	4
	GREENWOOD	0	0	0	0	0	0	0	2	0	(1)
	NEW SCOTLAND LEEDS	(12)	0	(2)	(3)	0	1	0	0	0	0
	PACKARD HUNTLEY	(6)	(2)	12	0	5	(5)	2	(1)	1	2
	DUNWOODIE MOTTHAVEN	0	0	0	0	0	0	0	0	0	0
	RAINEY VERNON	11	(2)	(4)	(4)	(12)	(5)	2	(3)	(1)	7
	E179THST HELLGT ASTORIAE	(3)	3	14	(4)	9	14	(7)	11	10	12
	EGRDNCTY 138 VALLYSTR 138	1	1	(1)	(2)	(8)	2	7	(6)	12	0
Energy Efficiency	CENTRAL EAST	(57)	(69)	(132)	(166)	(92)	(96)	(99)	(85)	(129)	(116)
	DUNWOODIE TO LONG ISLAND	130	181	136	151	146	116	77	98	66	56
	LEEDS PLEASANT VALLEY	(11)	(8)	1	(29)	10	(15)	(19)	(41)	(19)	(32)
	GREENWOOD	(112)	(44)	10	13	55	35	56	14	36	55
	NEW SCOTLAND LEEDS	(25)	(5)	(4)	3	(7)	4	(5)	(8)	0	1
	PACKARD HUNTLEY	60	1	93	99	22	(76)	(27)	(25)	42	(5)
	DUNWOODIE MOTTHAVEN	0	0	0	0	0	0	0	0	0	1
	RAINEY VERNON	(56)	25	201	27	65	105	84	67	76	43
	E179THST HELLGT ASTORIAE	(7)	(72)	22	(7)	(19)	(2)	(47)	(58)	(9)	8
	EGRDNCTY 138 VALLYSTR 138	56	23	19	(15)	41	72	(3)	(8)	49	0

Study 3: West

- Transmission: 230 kV line from Niagara to Gardenville, 35 Miles
- Generation: 660 MW Plant at Gardenville
- Demand Response : 200 MW in Zone A; 200 MW in Zone B, 200 MW in Zone C
- Energy Efficiency : 200 MW in Zone A; 200 MW in Zone B, 200 MW in Zone C

Figure E-3 below highlights part of Zone A transmission system 230kV and above along with the proposed transmission line solution from Niagara to Gardenville in green.

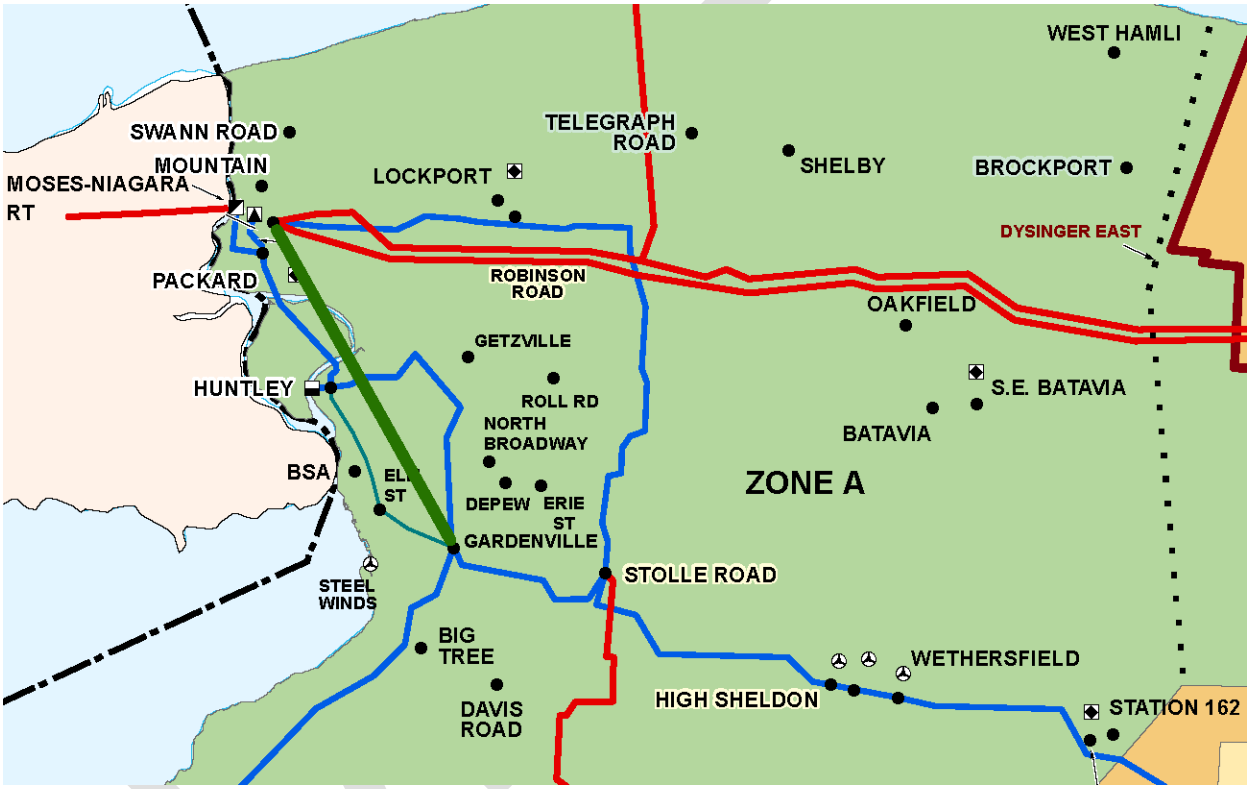

Figure E-3: Zone A 230 kV and above Transmission Map

Table E-28 below presents the change in the number of congested hours by constraint after the generic solution has been applied. Negative values indicate a reduction in congested hours. Detailed results for all CARIS metrics, representing the change between the base case values and the values after the three generic solutions have been applied, are presented in Attachment H.

Table E-28: Change in Number of Congested Hours (Solution Case – Base Case)

Solution	Constraint	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Transmission	CENTRAL EAST	(128)	(200)	(416)	(327)	(227)	(151)	(154)	(109)	(149)	(79)
	DUNWOODIE TO LONG ISLAND	(29)	(79)	(91)	(79)	(29)	(107)	(37)	(94)	(43)	(90)
	LEEDS PLEASANT VALLEY	(13)	(9)	(19)	(19)	(41)	55	(3)	(7)	(8)	(60)
	GREENWOOD	12	(10)	6	(14)	19	(20)	(8)	(23)	(9)	8
	NEW SCOTLAND LEEDS	19	(7)	(9)	(2)	(7)	(4)	(7)	(8)	(5)	(4)
	PACKARD HUNTLEY	(2863)	(3812)	(3801)	(3789)	(3899)	(3911)	(3838)	(3746)	(3939)	(3711)
	DUNWOODIE MOTTHAVEN	0	0	0	0	0	0	0	0	0	0
	RAINEY VERNON	(2)	(12)	(93)	(42)	(62)	(33)	7	(46)	(48)	(80)
	E179THST HELLGT ASTORIAE	38	22	(40)	(19)	(116)	28	(1)	19	25	(34)
	EGRDNCTY 138 VALLYSTR 138	3	13	64	(39)	11	50	1	(21)	21	4
Generation	CENTRAL EAST	696	617	543	538	534	392	406	357	373	377
	DUNWOODIE TO LONG ISLAND	(12)	57	21	207	157	41	100	16	91	1
	LEEDS PLEASANT VALLEY	199	45	11	(40)	55	69	50	25	45	82
	GREENWOOD	33	54	16	51	73	17	21	(5)	1	(8)
	NEW SCOTLAND LEEDS	18	(2)	5	9	(8)	1	7	1	1	(1)
	PACKARD HUNTLEY	(2393)	(2595)	(2155)	(2430)	(2180)	(2398)	(2621)	(2510)	(2660)	(2548)
	DUNWOODIE MOTTHAVEN	0	0	0	(1)	0	0	0	0	0	0
	RAINEY VERNON	63	183	281	313	172	423	277	128	118	71
	E179THST HELLGT ASTORIAE	53	129	30	128	(35)	219	32	30	31	196
	EGRDNCTY 138 VALLYSTR 138	(30)	92	134	202	(111)	(63)	(208)	(147)	(367)	(256)
Demand Response	CENTRAL EAST	7	(1)	12	(6)	18	7	(3)	11	9	4
	DUNWOODIE TO LONG ISLAND	(10)	9	3	1	(7)	(4)	10	6	(3)	(3)
	LEEDS PLEASANT VALLEY	18	17	22	(7)	6	(1)	6	4	(2)	8
	GREENWOOD	(1)	0	1	(1)	1	0	0	2	0	(1)
	NEW SCOTLAND LEEDS	(5)	0	(1)	0	0	0	0	1	0	0
	PACKARD HUNTLEY	13	36	30	31	35	(2)	37	6	(14)	10
	DUNWOODIE MOTTHAVEN	0	0	0	0	0	0	0	0	0	0
	RAINEY VERNON	4	4	17	0	2	(2)	(2)	2	3	3
	E179THST HELLGT ASTORIAE	1	4	18	(8)	(2)	3	(6)	(3)	10	2
	EGRDNCTY 138 VALLYSTR 138	5	0	4	7	(2)	5	11	(9)	6	4
Energy Efficiency	CENTRAL EAST	533	570	538	505	513	366	327	279	348	347
	DUNWOODIE TO LONG ISLAND	(26)	62	68	137	105	37	4	58	67	37
	LEEDS PLEASANT VALLEY	121	12	31	13	22	84	30	49	16	66
	GREENWOOD	27	(26)	28	34	28	23	11	8	4	26
	NEW SCOTLAND LEEDS	2	1	(4)	3	1	0	3	5	0	(2)
	PACKARD HUNTLEY	(398)	(362)	(410)	(278)	(227)	(459)	(434)	(415)	(280)	(277)
	DUNWOODIE MOTTHAVEN	0	0	0	0	0	0	0	0	0	0
	RAINEY VERNON	28	246	240	228	256	273	145	169	98	167
	E179THST HELLGT ASTORIAE	14	(6)	36	47	(24)	41	16	(13)	81	21
	EGRDNCTY 138 VALLYSTR 138	6	58	48	48	32	4	36	37	67	25

E.4. Benefit/Cost Analysis

The NYISO defines generic solutions to alleviate congestion for each resource type (generation, transmission, demand response, and energy efficiency), as required by the Tariff, Attachment Y, Section 31.3.1.3.3. The costs of each solution must be estimated to report B/C ratios in CARIS Phase 1 for each generic solution. The NYISO, in consultation with its stakeholders, estimates a high, mid and low cost for each solution type in CARIS Phase 1. This establishes a broader range of costs in order to provide more useful information to developers and other interested parties. The NYISO bases the costs upon data from publicly available sources,

The Generic Solution Cost Matrix should not be utilized for purposes outside of the CARIS generic solution process. No assessment was made concerning the actual feasibility of any generic solution proposed. These estimates should not be assumed as reflective or predictive of actual projects or imply that specific facilities can necessarily be built for these generic solution estimates.

Transmission cost estimates are based on cost estimates for specific projects submitted for consideration in the New York State PSC's AC Transmission proceeding.[6] The NYISO analyzed the cost data presented for the various proposed projects and developed low, mid and high cost estimates for total project costs on a per-mile basis for new 345 kV transmission facilities. The NYISO reduced the 345 kV costs by 30% to develop its estimate of the 230 kV construction costs for the West study.[7]

Generation costs estimates were based on available NYISO consultant estimates for developing new combined cycle units in Zones F and G provided as part of the 2013 Demand-Curve Reset process[8]. These cost estimates were escalated from $2013 to $2015 using producer price indices.[9]

Energy-efficiency and Demand-Response cost estimates were derived from the New York State Department of Public Service Final Generic Environmental Impact Statement for REV (14-M-0101) and Clean Energy Fund (14-M-0094).[10]

The generic solutions cost matrix and assumptions for all four types of solutions are presented in Table E-29 through Table E-32 below.

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[6] 12-T-0502-Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades; 13-E-0488 –In the Matter of Alternating Current Transmission Upgrades-Comparative Proceeding

[7] Black and Veatch, *Capital Costs for Transmission and Substations*, February 2014, prepared for Western Electricity Coordinating Council, page 2-3. Accessed September 1, 2015 at https://www.wecc.biz/Reliability/2014_TEPPC_Transmission_CapCost_Report_B+V.pdf.

[8] Independent Study to Establish Parameters of the ICAP Demand Curve for the New York Independent System Operator, August 2, 2013, NERA

[9] United States Department of Labor, Bureau of Labor Statistics (BLS), Producer Price Index Industry Data for "Turbine and turbine generator set units manufacturing". Accessed August 17, 2015 at http://data.bls.gov/pdq/SurveyOutputServlet.

[10] *Final Generic Environmental Impact Statement In CASE 14-M-0101 - Reforming the Energy Vision and CASE 14-M-0094 - Clean Energy Fund,* New York State Department of Public Service, page 4-7.

Table E-29: Transmission Cost Matrix

Base Case Modeling Assumptions for 2015-2024 CARIS Phase 1
Generic Transmission Cost Matrix
Order of Magnitude Unit Prices

(Estimates should not be assumed reflective or predictive of actual project costs)

Cost Range	Zone	Transmission			
		Line System Voltage (kV)	Block Capacity (MVA)	Construction Type	Transmission Cost ($M/Mile)
High	Zones E - G	345	1986	Overhead	5.30
Mid	Zones E - G	345	1986	Overhead	4.50
Low	Zones E - G	345	1986	Overhead	3.70
High	Zone A	230	566	Overhead	3.80
Mid	Zone A	230	566	Overhead	3.20
Low	Zone A	230	566	Overhead	2.60

Assumptions:

1. ***Estimates herein should not be utilized for purposes outside of the CARIS process. Also, these estimates should not be assumed as reflective or predictive of actual projects or imply that facilities can necessarily be built for these generic solution order of magnitude estimates. Estimate ranges were identified after Transmission Owner input and discussions at the ESPWG.***

2. Lines constructed will be comprised of single circuit AC overhead construction.

3. The transmission line will be interconnected into an existing 345kV substation for Zones F and G and 230kV for Zone A.

4. The line can be permitted and constructed utilizing the shortest distance between the two selected substations.

5. The control house at the existing substations selected as the interconnection point has sufficient space for installing the new protection and communication equipment for the new line terminal.

6. Estimates include costs for material, construction labor, engineering labor, permits, testing and commissioning. The estimates do not include Allowance of Funds During Construction (AFDC).

7. The cost per mile includes a range to account for the variable land and permitting costs associated with a project such as utilizing an existing ROW, expanding an existing ROW or obtaining new ROW.

8. Total per-mile construction costs include substation line terminal costs.

Table E-30: Generation Cost Matrix

Base Case Modeling Assumptions for 2015-2024 CARIS Phase 1
Generic Generation Cost Matrix
Order of Magnitude Unit Costs
(Estimates should not be assumed reflective or predictive of actual project costs)

Cost Range	Plant Location	Plant Block Size Capacity (MW)	Plant Cost per Block Size* ($M)
High	Zones A and F	330	$551
Mid	Zones A and F	330	$441
Low	Zones A and F	330	$331
High	Zone G	330	$610
Mid	Zone G	330	$488
Low	Zone G	330	$366

Assumptions:

1. ***Estimates herein should not be utilized for purposes outside of the CARIS process. Also, these estimates should not be assumed as reflective or predictive of actual projects or imply that facilities can necessarily be built for these generic solution order of magnitude estimates. Estimate ranges were identified based upon NYISO filings at FERC and Consultant estimates.***

2. It is assumed that the plants located in Zones A and F will be gas combined cycle type. Configured as a 1 x 1 x1 Siemens SGT6-5000F(5), total generation 330MW.

3. It is assumed that the plant located in Zone G will be gas combined cycle type. Configured as a 1 x 1 x1 Siemens SGT6-5000F(5) with selective catalytic reduction (SCRs), total generation 330MW.

Table E-31: Generator Cost per Unit - 2015 Price Level

GENERATOR COST PER UNIT - 2013 Demand Curve Reset Cost Estimates ($M)[1]

Zone	Size	Combined Cycle	EPC Costs	Non-EPC Costs	Total	Unit Cost $/kW
Zone F (Capital)	330 MW	1 x 1 x 1 SGT6-5000F(5)	$363	$77	$441	$1,335
Zone G (Hudson Valley - Dutchess)	330 MW	1 x 1 x 1 SGT6-5000F(5)	$398	$89	$472	$1,478

[1] Escalated by 3.2%

Table E-32: Demand Response and Energy Efficiency Cost Matrix

Base Case Modeling Assumptions for 2015-2024 CARIS Phase 1
Generic Demand Response Cost Matrix
Order of Magnitude Unit Costs

(Estimates should not be assumed reflective or predictive of actual project costs)

Cost Range	Zone	Portfolio Type	Per-Unit ($M/MW)
High	Zones A-J	Demand Response	$0.77
Mid	Zones A-J	Demand Response	$0.62
Low	Zones A-J	Demand Response	$0.49
High	Zones A-J	Energy Efficiency	$2.10
Mid	Zones A-J	Energy Efficiency	$1.92
Low	Zones A-J	Energy Efficiency	$1.74

Note:Estimates herein should not be utilized for purposes outside of the CARIS process. Also, these estimates should not be assumed as reflective or predictive of actual projects or imply that facilities can necessarily be built.

Tables E-33 through E-36 present overnight installation costs for the generic solutions associated with each study. No verification was conducted to determine if the generic solution can be built within the generic cost estimate ranges. The generic solutions analysis is performed to provide a rough estimate of the benefit to cost opportunity based upon the assumptions contained in this report.

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Table E-33: Generic Solution Costs for Each Study ($M)

Generic Solution Cost Summary ($M)			
Studies	Study 1: Central East-New Scotland-Pleasant Valley	Study 2: Central East	Study 3: Niagara-Gardenville
Transmission			
Substation Terminals	Edic to New Scotland to Pleasant Valley	Edic to New Scotland	Niagara to Gardenville
Miles	150	85	35
High	900	510	150
Mid	675	383	113
Low	480	272	80
Generation			
Substation Terminal	Pleasant Valley	New Scotland	Gardenville
# of 330 MW Blocks	4	2	2
High	2,439	1,102	1,102
Mid	1,951	881	881
Low	1,464	661	661
DR			
Zone	F , G and J	F ,G and J	A, B, and C
# of 200 MW Blocks	6	3	3
High	924	462	462
Mid	744	372	372
Low	588	294	294
EE			
Zone	F , G and J	F , G and J	A, B, and C
# of 200 MW Blocks	6	3	3
High	2,520	1,260	1,260
Mid	2,304	1,152	1,152
Low	2,088	1,044	1,044

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Table E-34: Generic Solutions for Study 1: Central East to New Scotland to Pleasant Valley

Generic Solution
Study 1: Central East-New Scotland-Pleasant Valley

(Estimates should not be assumed reflective or predictive of actual project costs)

Transmission Solution: Edic to New Scotland to Pleasant Valley

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High			
Transmission Line (Miles)	150	$6	$900
Total High Transmission Solution Cost			***$900***
Mid			
Transmission Line (Miles)	150	$4.50	$675
Total Mid Transmission Solution Cost			***$675***
Low			
Transmission Line (Miles)	150	$3.20	$480.00
Total Low Transmission Solution Cost			***$480***

Generation Solution: Pleasant Valley

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High			
Plant in Zone G (330 MW Blocks)	4	$610	$2,439
Total High Generation Solution Cost			***$2,439***
Mid			
Plant in Zone G (330 MW Blocks)	4	$488	$1,951
Total Mid Generation Solution Cost			***$1,951***
Low			
Plant in Zone G (330 MW Blocks)	4	$366	$1,464
Total Low Generation Solution Cost			***$1,464***

Demand Response Solution: Zones F, G and J

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High	(# 200 Blocks)		
Zone F	1	$154	$154
Zone G	1	$154	$154
Zone J	4	$154	$616
Total High Demand Response Solution Costs			***$924***
Mid	(# 200 Blocks)		
Zone F	1	$124	$124
Zone G	1	$124	$124
Zone J	4	$124	$496
Total Mid Demand Response Solution Costs			***$744***
Low	(# 200 Blocks)		
Zone F	1	$98	$98
Zone G	1	$98	$98
Zone J	4	$98	$392
Total Low Demand Response Solution Costs			***$588***

Energy Efficiency Solution: Zones F, G and J

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High	(# 200 Blocks)		
Zone F	1	$420	$420
Zone G	1	$420	$420
Zone J	4	$420	$1,680
Total High Energy Efficiency Solution Costs			***$2,520***
Mid	(# 200 Blocks)		
Zone F	1	$384	$384
Zone G	1	$384	$384
Zone J	4	$384	$1,536
Total Mid Energy Efficiency Solution Costs			***$2,304***
Low	(# 200 Blocks)		
Zone F	1	$348	$348
Zone G	1	$348	$348
Zone J	4	$348	$1,392
Total Low Energy Efficiency Solution Costs			***$2,088***

Table E-35: Generic Solutions for Study 2: Central East

Generic Solution
Study 2: Central East

(Estimates should not be assumed reflective or predictive of actual project costs)

Transmission Solution: Edic to New Scotland

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High			
Transmission Line (Miles)	85	$6	$510
Total High Transmission Solution Cost			***$510***
Mid			
Transmission Line (Miles)	85	$4.50	$383
Total Mid Transmission Solution Cost			***$383***
Low			
Transmission Line (Miles)	85	$3.20	$272.00
Total Low Transmission Solution Cost			***$272***

Generation Solution: New Scotland

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High			
Plant in Zone G (330 MW Blocks)	2	$551	$1,102
Total High Generation Solution Cost			***$1,102***
Mid			
Plant in Zone G (330 MW Blocks)	2	$441	$881
Total Mid Generation Solution Cost			***$881***
Low			
Plant in Zone G (330 MW Blocks)	2	$331	$661
Total Low Generation Solution Cost			***$661***

Demand Response Solution: Zones F, G and J

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High	(# 200 Blocks)		
Zone F	1	$154	$154
Zone G	1	$154	$154
Zone J	1	$154	$154
Total High Demand Response Solution Costs			***$462***
Mid	(# 200 Blocks)		
Zone F	1	$124	$124
Zone G	1	$124	$124
Zone J	1	$124	$124
Total Mid Demand Response Solution Costs			***$372***
Low	(# 200 Blocks)		
Zone F	1	$98	$98
Zone G	1	$98	$98
Zone J	1	$98	$98
Total Low Demand Response Solution Costs			***$294***

Energy Efficiency Solution: Zones F, G and J

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High	(# 200 Blocks)		
Zone F	1	$420	$420
Zone G	1	$420	$420
Zone J	1	$420	$420
Total High Energy Efficiency Solution Costs			***$1,260***
Mid	(# 200 Blocks)		
Zone F	1	$384	$384
Zone G	1	$384	$384
Zone J	1	$384	$384
Total Mid Energy Efficiency Solution Costs			***$1,152***
Low	(# 200 Blocks)		
Zone F	1	$348	$348
Zone G	1	$348	$348
Zone J	1	$348	$348
Total Low Energy Efficiency Solution Costs			***$1,044***

Table E-34: Generic Solutions for Study 3: West

Generic Solution
Study 3: West

(Estimates should not be assumed reflective or predictive of actual project costs)

Transmission Solution: Niagara - Gardenville

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High			
Transmission Line (Miles)	35	$4	$150
Total High Transmission Solution Cost			***$150***
Mid			
Transmission Line (Miles)	35	$3.21	$113
Total Mid Transmission Solution Cost			***$113***
Low			
Transmission Line (Miles)	35	$2	$80
Total Low Transmission Solution Cost			***$80***

Generation Solution: Gardenville

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High			
Plant in Zone A (330 MW Blocks)	2	$551	$1,102
Total High Generation Solution Cost			***$1,102***
Mid			
Plant in Zone A (330 MW Blocks)	2	$441	$882
Total Mid Generation Solution Cost			***$882***
Low			
Plant in Zone A (330 MW Blocks)	2	$331	$662
Total Low Generation Solution Cost			***$662***

Demand Response Solution: Zones A, B and C

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High	(# 200 Blocks)		
Zone A	1	$154	$154
Zone B	1	$154	$154
Zone C	1	$154	$154
Total High Demand Response Solution Costs			***$462***
Mid	(# 200 Blocks)		
Zone A	1	$124	$124
Zone B	1	$124	$124
Zone C	1	$124	$124
Total Mid Demand Response Solution Costs			***$372***
Low	(# 200 Blocks)		
Zone A	1	$98	$98
Zone B	1	$98	$98
Zone C	1	$98	$98
Total Low Demand Response Solution Costs			***$294***

Energy Efficiency Solution: Zones A, B and C

Cost Range	Quantity	Unit Pricing ($M)	Total ($M)
High	(# 200 Blocks)		
Zone A	1	$420	$420
Zone B	1	$420	$420
Zone C	1	$420	$420
Total High Energy Efficiency Solution Costs			***$1,260***
Mid	(# 200 Blocks)		
Zone A	1	$384	$384
Zone B	1	$384	$384
Zone C	1	$384	$384
Total Mid Energy Efficiency Solution Costs			***$1,152***
Low	(# 200 Blocks)		
Zone A	1	$348	$348
Zone B	1	$348	$348
Zone C	1	$348	$348
Total Low Energy Efficiency Solution Costs			***$1,044***

Appendix F – Economic Planning Process Manual - Congestion Assessment and Resource Integration Studies (link)

http://www.nyiso.com/public/webdocs/markets_operations/documents/Manuals_and_Guides/Manuals/Planning/epp_caris_mnl.pdf

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Appendix G - 2014 RNA and CRP Reports (link)

The 2014 RNA and CRP reports can be found through the following links:

http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2014%20RNA_final_09162014.pdf

http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2014CRP_Final_20150721.pdf

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Appendix H - Generic Solution Results – Additional Details

Tables below present the CARIS metrics results for each of the three studies. The CARIS metrics are calculated as the change between the base case values and the change case values after each of the respective generic solutions have been added to the base case. The values are expressed in nominal $M and are calculated as Solution minus base case. Negative values are shown in red and with brackets (except for tables showing percentage changes) and represent a reduction in costs/payments.

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H.1. Study 1: Central East - New Scotland - Pleasant Valley (CE-NS-PV)

Generic Transmission Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(9)	(9)	(9)	(9)	(10)	(8)	(8)	(7)	(9)	(9)
Genesee	(3)	(3)	(3)	(3)	(3)	(2)	(2)	(3)	(3)	(2)
Central	(7)	(7)	(7)	(7)	(9)	(6)	(6)	(6)	(6)	(6)
North	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(3)	(2)	(2)	(2)	(3)	(2)	(2)	(2)	(2)	(2)
Capital	(43)	(49)	(54)	(54)	(65)	(44)	(43)	(42)	(46)	(43)
Hudson Valley	(31)	(27)	(32)	(31)	(35)	(25)	(23)	(24)	(26)	(32)
Millwood	(10)	(9)	(10)	(10)	(11)	(8)	(7)	(8)	(8)	(10)
Dunwoodie	(20)	(17)	(20)	(19)	(22)	(15)	(15)	(15)	(17)	(21)
NY City	(173)	(151)	(178)	(171)	(198)	(136)	(131)	(133)	(152)	(184)
Long Island	(69)	(56)	(68)	(70)	(78)	(51)	(48)	(49)	(59)	(70)
NYCA Total	**(367)**	**(330)**	**(384)**	**(377)**	**(434)**	**(297)**	**(285)**	**(288)**	**(328)**	**(379)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	30	19	13	13	7	18	18	13	21	23
Genesee	1	1	1	1	1	2	2	1	2	2
Central	43	49	46	47	53	50	59	49	56	56
North	5	5	6	8	9	10	11	7	10	10
Mohawk Valley	6	6	6	6	6	6	9	7	9	9
Capital	(51)	(56)	(75)	(73)	(73)	(67)	(81)	(75)	(95)	(80)
Hudson Valley	(4)	(2)	(2)	(4)	(1)	(1)	(4)	(3)	(7)	(9)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(29)	(25)	(22)	(24)	(28)	(35)	(26)	(24)	(31)	(36)
Long Island	(4)	(4)	(4)	(7)	(8)	(9)	(6)	(7)	(9)	(8)
NYCA Total	**(3)**	**(7)**	**(31)**	**(32)**	**(33)**	**(25)**	**(18)**	**(31)**	**(44)**	**(32)**
NYCA Imports	(9)	(11)	0	(1)	(0)	(6)	0	2	7	1
NYCA Exports	17	8	2	2	13	11	25	22	14	22
NYCA + Imports - Exports	**(30)**	**(25)**	**(33)**	**(35)**	**(46)**	**(42)**	**(42)**	**(51)**	**(50)**	**(53)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	797	436	294	325	190	328	293	278	338	383
Genesee	25	18	14	9	21	25	28	17	30	27
Central	1,142	1,167	1,076	1,065	1,122	939	991	776	876	836
North	121	113	118	162	168	164	158	100	132	123
Mohawk Valley	126	125	122	128	121	100	132	108	132	117
Capital	(984)	(1,014)	(1,393)	(1,201)	(1,104)	(884)	(1,039)	(844)	(1,040)	(875)
Hudson Valley	(71)	(30)	(31)	(49)	(9)	(17)	(40)	(41)	(76)	(81)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(657)	(504)	(414)	(454)	(482)	(521)	(365)	(319)	(424)	(423)
Long Island	(71)	(68)	(73)	(122)	(112)	(112)	(69)	(91)	(96)	(73)
NYCA Total	**430**	**243**	**(287)**	**(135)**	**(86)**	**21**	**89**	**(15)**	**(127)**	**33**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(125)	(149)	10	101	(5)	(66)	(55)	(70)	(55)	(60)
LINDEN VFT	(109)	(88)	(22)	(58)	(44)	(94)	(62)	(58)	(51)	(88)
NEPTUNE	(159)	(116)	(113)	(45)	(54)	(59)	(38)	(31)	6	(29)
HTP	(284)	(278)	(280)	(358)	(319)	(245)	(203)	(181)	(178)	(219)
ISONE - NYISO	(379)	(176)	(34)	(58)	(212)	(253)	(384)	(368)	(260)	(331)
CROSS SOUND CABLE	35	42	42	45	54	46	28	34	23	2
NORTHPORT NORWALK	112	97	95	98	83	97	56	66	47	73
IESO - NYISO	785	630	763	603	763	757	771	810	793	823
HQ - NYISO CHAT	(5)	(12)	(12)	(12)	(11)	(12)	(12)	(12)	(12)	(12)
HQ - NYISO CEDARS	0	0	0	(0)	(0)	(0)	(0)	0	(0)	(0)
TOTAL	**(132)**	**(49)**	**448**	**316**	**254**	**171**	**100**	**190**	**310**	**159**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	62	43	46	47	47	39	38	41	48	55
Genesee	11	9	11	10	12	7	8	7	9	9
Central	112	104	114	110	125	97	107	99	112	113
North	25	22	27	28	31	23	24	21	26	25
Mohawk Valley	14	13	15	15	17	12	15	14	17	16
Capital	(50)	(68)	(86)	(85)	(89)	(82)	(93)	(84)	(102)	(77)
Hudson Valley	(5)	(2)	(2)	(4)	(1)	(2)	(4)	(4)	(7)	(10)
Millwood	(11)	(13)	(11)	(11)	(15)	(15)	(12)	(11)	(12)	(18)
Dunwoodie	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(46)	(41)	(38)	(38)	(46)	(52)	(42)	(39)	(47)	(64)
Long Island	(9)	(8)	(8)	(12)	(13)	(14)	(9)	(10)	(13)	(16)
NYCA Total	103	58	67	61	67	13	31	34	30	34

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	23	19	26	24	27	13	14	15	17	17
Genesee	18	15	20	19	21	11	11	12	14	15
Central	31	25	32	31	34	19	20	21	24	25
North	11	10	12	11	15	11	11	11	13	12
Mohawk Valley	20	17	21	20	22	16	17	18	19	19
Capital	(10)	(21)	(20)	(21)	(28)	(21)	(19)	(17)	(17)	(14)
Hudson Valley	(5)	(6)	(5)	(5)	(7)	(7)	(6)	(5)	(5)	(9)
Millwood	(2)	(2)	(2)	(2)	(3)	(3)	(2)	(2)	(2)	(4)
Dunwoodie	(4)	(5)	(5)	(4)	(6)	(5)	(5)	(4)	(5)	(8)
NY City	(37)	(39)	(39)	(35)	(47)	(46)	(40)	(37)	(40)	(64)
Long Island	(10)	(8)	(8)	(12)	(14)	(12)	(8)	(7)	(10)	(17)
NYCA Total	35	5	31	25	16	(24)	(7)	5	8	(28)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1.50	1.25	1.67	1.56	1.74	0.86	0.90	0.97	1.05	1.00
Genesee	1.83	1.57	1.99	1.89	2.09	1.09	1.14	1.19	1.36	1.33
Central	1.87	1.54	1.99	1.89	2.09	1.12	1.19	1.24	1.42	1.36
North	2.36	2.04	2.49	2.38	2.65	1.54	1.60	1.66	1.85	1.77
Mohawk Valley	2.07	1.79	2.24	2.15	2.37	1.35	1.42	1.48	1.66	1.58
Capital	(1.03)	(1.76)	(1.70)	(1.79)	(2.31)	(1.76)	(1.57)	(1.49)	(1.49)	(1.35)
Hudson Valley	(0.51)	(0.66)	(0.59)	(0.59)	(0.83)	(0.79)	(0.66)	(0.62)	(0.63)	(0.94)
Millwood	(0.64)	(0.75)	(0.71)	(0.69)	(0.93)	(0.86)	(0.73)	(0.70)	(0.73)	(1.07)
Dunwoodie	(0.63)	(0.72)	(0.68)	(0.65)	(0.89)	(0.83)	(0.70)	(0.67)	(0.70)	(1.05)
NY City	(0.60)	(0.69)	(0.64)	(0.62)	(0.87)	(0.80)	(0.68)	(0.64)	(0.69)	(0.98)
Long Island	(0.37)	(0.35)	(0.35)	(0.51)	(0.57)	(0.51)	(0.31)	(0.28)	(0.34)	(0.58)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1,669	810	495	546	292	623	586	523	633	617
Genesee	0	0	0	0	0	0	0	0	0	0
Central	1,023	967	575	68	2	3	5	48	20	40
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	(2)	(1)	(2)	(2)	(2)	(1)	(2)	(1)	(2)	(1)
Hudson Valley	(14)	(0)	(3)	(2)	(0)	(3)	(12)	20	(3)	(31)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(2)	(5)	(2)	(4)	(4)	(3)	(4)	(1)	(2)	(5)
Long Island	(3)	(9)	(1)	(5)	(7)	0	(1)	5	(2)	(7)
NYCA Total	**2,671**	**1,761**	**1,063**	**601**	**281**	**620**	**574**	**594**	**645**	**613**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.2	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.3**	**0.2**	**0.1**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	851	449	379	369	184	318	285	254	343	297
Genesee	7	5	5	2	4	7	8	5	9	8
Central	138	125	98	99	81	73	121	74	84	61
North	12	11	12	16	18	16	16	10	13	13
Mohawk Valley	40	36	36	40	36	31	37	32	38	34
Capital	(18)	(20)	(26)	(23)	(23)	(19)	(19)	(16)	(19)	(16)
Hudson Valley	(29)	(17)	(25)	(22)	0	(7)	(29)	(17)	(43)	(51)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(167)	(140)	(131)	(108)	(109)	(104)	(80)	(56)	(81)	(99)
Long Island	(21)	(28)	(11)	(38)	(27)	(35)	(27)	(30)	(42)	(36)
NYCA Total	**812**	**422**	**337**	**335**	**164**	**282**	**311**	**256**	**302**	**210**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	(0.0)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	767	396	263	278	142	299	277	233	308	322
Genesee	14	11	9	6	11	13	15	9	16	13
Central	627	635	542	484	492	405	442	346	386	363
North	65	63	68	90	94	89	88	55	74	66
Mohawk Valley	69	67	66	69	65	53	71	56	69	63
Capital	(410)	(425)	(580)	(510)	(480)	(376)	(436)	(354)	(447)	(374)
Hudson Valley	(47)	(19)	(21)	(32)	(8)	(11)	(30)	(25)	(53)	(60)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(334)	(255)	(218)	(227)	(242)	(255)	(184)	(159)	(206)	(211)
Long Island	(41)	(36)	(36)	(71)	(62)	(66)	(43)	(53)	(59)	(45)
NYCA Total	**710**	**438**	**93**	**88**	**13**	**151**	**199**	**109**	**89**	**137**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	4.4	3.2	2.7	2.9	1.6	4.4	4.3	3.9	5.4	6.0
Genesee	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
Central	3.6	5.1	5.5	5.1	5.4	5.9	6.9	5.7	6.8	6.7
North	0.4	0.5	0.7	0.9	1.0	1.3	1.4	0.9	1.3	1.2
Mohawk Valley	0.4	0.5	0.7	0.7	0.7	0.8	1.1	0.9	1.2	1.2
Capital	(2.4)	(3.4)	(5.9)	(5.3)	(5.3)	(5.5)	(6.8)	(5.9)	(7.8)	(6.9)
Hudson Valley	(0.3)	(0.2)	(0.2)	(0.3)	(0.1)	(0.2)	(0.5)	(0.4)	(0.9)	(1.1)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(1.4)	(1.3)	(1.2)	(1.5)	(1.6)	(3.6)	(2.8)	(2.6)	(3.5)	(3.8)
Long Island	(0.2)	(0.3)	(0.3)	(0.7)	(0.7)	(1.0)	(0.7)	(0.9)	(1.0)	(0.8)
NYCA Total	**4.6**	**4.3**	**1.9**	**1.8**	**1.2**	**2.4**	**3.3**	**1.8**	**1.7**	**2.7**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(5.8)	(4.3)	(5.2)	(5.3)	(5.6)	(3.8)	(4.1)	(4.5)	(5.1)	(4.6)
Genesee	(3.0)	(2.4)	(2.6)	(2.8)	(2.9)	(2.4)	(2.6)	(2.6)	(3.1)	(2.8)
Central	(1.9)	(2.0)	(2.0)	(1.9)	(1.9)	(1.6)	(2.0)	(1.8)	(2.1)	(1.9)
North	(0.7)	(0.6)	(0.8)	(0.9)	(1.0)	(0.8)	(0.8)	(0.7)	(0.9)	(0.8)
Mohawk Valley	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.3
Capital	2.4	1.8	2.1	2.1	2.0	2.0	2.3	2.1	2.8	2.5
Hudson Valley	1.2	0.6	0.3	0.6	0.5	0.8	0.5	0.6	0.6	0.9
Millwood	0.4	0.2	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.3
Dunwoodie	0.8	0.4	0.2	0.4	0.4	0.6	0.4	0.4	0.4	0.7
NY City	7.0	3.4	1.5	3.2	2.9	4.8	2.9	3.0	3.2	5.4
Long Island	4.2	2.3	1.8	2.7	2.7	3.1	2.5	2.8	2.8	3.9
NYCA Total	**4.8**	**(0.6)**	**(4.6)**	**(1.5)**	**(2.6)**	**3.2**	**(0.5)**	**(0.4)**	**(1.1)**	**4.0**

Generic Generation Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	(1)	(0)	0	(1)	(0)	(0)	1	1	(0)
Genesee	(0)	0	0	0	0	0	0	0	0	0
Central	(1)	(0)	0	0	(0)	0	0	(0)	(0)	(0)
North	(0)	0	0	0	(0)	0	0	0	0	(0)
Mohawk Valley	(0)	(0)	0	(0)	(0)	0	(0)	(0)	(0)	(0)
Capital	(4)	(2)	4	2	(1)	2	1	1	(0)	(2)
Hudson Valley	(7)	(3)	(2)	(2)	(3)	(1)	(2)	(2)	(4)	(10)
Millwood	(2)	(1)	(1)	(1)	(1)	(0)	(1)	(1)	(1)	(3)
Dunwoodie	(5)	(3)	(2)	(2)	(2)	(1)	(1)	(2)	(3)	(7)
NY City	(45)	(20)	(14)	(11)	(19)	(5)	(12)	(12)	(25)	(61)
Long Island	(11)	1	3	5	(0)	8	0	5	(1)	(9)
NYCA Total	**(77)**	**(30)**	**(12)**	**(8)**	**(29)**	**4**	**(15)**	**(10)**	**(34)**	**(93)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(6)	(3)	(1)	(8)	(5)	(8)	(5)	(18)	(11)	(14)
Genesee	(1)	1	(0)	(0)	0	(1)	(1)	(0)	(1)	(1)
Central	(3)	4	(6)	(0)	(3)	(2)	(15)	(8)	(7)	(5)
North	(3)	(1)	(2)	(2)	1	(1)	(2)	(3)	(2)	(2)
Mohawk Valley	0	(1)	(0)	(0)	0	(2)	(1)	(3)	2	1
Capital	1	(9)	(14)	(16)	(11)	(30)	(17)	(22)	(31)	(21)
Hudson Valley	103	93	78	82	80	137	122	154	152	158
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(40)	(45)	(27)	(19)	(21)	(46)	(43)	(27)	(42)	(56)
Long Island	(8)	(7)	(3)	(6)	(5)	(7)	(2)	(6)	(6)	(8)
NYCA Total	**44**	**31**	**25**	**29**	**37**	**40**	**36**	**68**	**54**	**53**
NYCA Imports	(11)	(12)	(12)	(19)	(12)	(37)	(27)	(30)	(41)	(39)
NYCA Exports	49	35	20	19	33	27	38	53	30	53
NYCA + Imports - Exports	**(16)**	**(16)**	**(7)**	**(9)**	**(9)**	**(24)**	**(29)**	**(15)**	**(17)**	**(40)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(62)	(53)	(51)	(150)	(97)	(74)	(45)	(227)	(127)	(154)
Genesee	(20)	12	(3)	(5)	6	(17)	(16)	(1)	(13)	(13)
Central	(5)	124	(138)	57	(14)	34	(148)	(93)	(108)	(1)
North	(65)	(39)	(40)	(52)	15	(25)	(38)	(39)	(34)	(39)
Mohawk Valley	6	(21)	(7)	(12)	1	(40)	(29)	(52)	33	17
Capital	(168)	(370)	(212)	(244)	(192)	(424)	(373)	(325)	(394)	(358)
Hudson Valley	2,657	2,306	1,847	1,793	1,601	2,470	2,124	2,516	2,358	2,349
Millwood	0	(0)	0	(0)	0	0	(0)	0	(0)	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(941)	(850)	(614)	(396)	(447)	(738)	(539)	(572)	(630)	(530)
Long Island	(170)	(132)	(62)	(148)	(85)	(84)	(31)	(91)	(54)	(115)
NYCA Total	**1,232**	**976**	**721**	**843**	**788**	**1,103**	**904**	**1,117**	**1,030**	**1,156**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(298)	(202)	(115)	(105)	(11)	(195)	(122)	(144)	(135)	(124)
LINDEN VFT	(56)	(53)	(36)	(79)	(56)	(47)	(26)	(53)	(33)	(75)
NEPTUNE	6	(0)	1	(20)	(24)	(11)	(36)	(25)	(1)	15
HTP	(79)	(38)	(81)	(134)	(101)	(65)	(43)	(44)	(45)	(70)
ISONE - NYISO	(923)	(782)	(515)	(590)	(685)	(640)	(615)	(800)	(661)	(868)
CROSS SOUND CABLE	35	49	5	34	55	31	18	54	3	13
NORTHPORT NORWALK	54	39	5	57	26	25	17	31	3	28
IESO - NYISO	20	2	(7)	(22)	(3)	(211)	(122)	(177)	(188)	(107)
HQ - NYISO CHAT	1	0	1	1	1	1	0	1	1	1
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(1,240)**	**(985)**	**(743)**	**(859)**	**(799)**	**(1,113)**	**(929)**	**(1,155)**	**(1,057)**	**(1,186)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	(6)	(6)	(9)	(5)	(13)	(5)	(18)	(10)	(7)
Genesee	(0)	(0)	(1)	(1)	0	(3)	(1)	(2)	(1)	(0)
Central	2	(4)	(12)	(3)	(4)	(11)	(17)	(17)	(12)	(2)
North	(1)	(3)	(4)	(3)	0	(5)	(3)	(6)	(3)	(2)
Mohawk Valley	1	(2)	(1)	(1)	(0)	(5)	(2)	(4)	2	1
Capital	0	(15)	(13)	(15)	(11)	(38)	(18)	(27)	(34)	(19)
Hudson Valley	111	99	84	88	85	150	135	169	166	174
Millwood	(10)	(9)	(7)	(6)	(7)	(11)	(5)	(10)	(10)	(13)
Dunwoodie	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(58)	(46)	(46)	(31)	(36)	(66)	(49)	(56)	(63)	(74)
Long Island	(12)	(9)	(6)	(10)	(8)	(11)	(5)	(10)	(7)	(14)
NYCA Total	34	5	(10)	8	15	(12)	30	21	28	43

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	(4)	(4)	(2)	(2)	(7)	(2)	(3)	0	1
Genesee	2	(2)	(2)	(2)	(0)	(5)	(1)	(3)	(1)	1
Central	2	(4)	(4)	(3)	(1)	(8)	(2)	(6)	(2)	(0)
North	1	(1)	(1)	(1)	(0)	(3)	(0)	(2)	(1)	(0)
Mohawk Valley	0	(2)	(2)	(1)	(1)	(4)	(1)	(3)	(1)	(1)
Capital	(2)	(5)	0	(0)	(2)	(5)	(1)	(3)	(1)	(1)
Hudson Valley	(6)	(6)	(5)	(4)	(4)	(7)	(4)	(7)	(6)	(10)
Millwood	(2)	(2)	(2)	(1)	(1)	(2)	(1)	(2)	(2)	(3)
Dunwoodie	(5)	(4)	(4)	(3)	(3)	(5)	(3)	(5)	(4)	(7)
NY City	(35)	(34)	(29)	(24)	(25)	(40)	(23)	(39)	(38)	(57)
Long Island	(6)	(5)	(3)	(0)	(2)	(6)	(4)	(5)	(6)	(7)
NYCA Total	(49)	(69)	(55)	(42)	(42)	(92)	(42)	(79)	(64)	(85)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.10	(0.22)	(0.21)	(0.11)	(0.10)	(0.40)	(0.09)	(0.22)	0.02	0.01
Genesee	0.08	(0.18)	(0.18)	(0.14)	(0.05)	(0.43)	(0.08)	(0.30)	(0.09)	0.00
Central	0.07	(0.22)	(0.22)	(0.16)	(0.08)	(0.47)	(0.08)	(0.36)	(0.14)	(0.07)
North	0.13	(0.16)	(0.23)	(0.14)	(0.06)	(0.45)	(0.07)	(0.33)	(0.11)	(0.02)
Mohawk Valley	0.04	(0.22)	(0.26)	(0.18)	(0.09)	(0.49)	(0.09)	(0.39)	(0.16)	(0.10)
Capital	(0.17)	(0.34)	0.00	(0.07)	(0.15)	(0.33)	(0.06)	(0.29)	(0.12)	(0.14)
Hudson Valley	(0.48)	(0.48)	(0.36)	(0.32)	(0.33)	(0.58)	(0.28)	(0.58)	(0.47)	(0.76)
Millwood	(0.56)	(0.53)	(0.43)	(0.37)	(0.39)	(0.61)	(0.31)	(0.64)	(0.54)	(0.83)
Dunwoodie	(0.56)	(0.52)	(0.43)	(0.36)	(0.38)	(0.60)	(0.30)	(0.62)	(0.53)	(0.82)
NY City	(0.48)	(0.45)	(0.35)	(0.32)	(0.31)	(0.54)	(0.28)	(0.55)	(0.47)	(0.74)
Long Island	(0.16)	(0.13)	(0.05)	0.03	(0.04)	(0.20)	(0.13)	(0.21)	(0.24)	(0.23)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(288)	(105)	(34)	(161)	(88)	(69)	147	(235)	(221)	(344)
Genesee	(0)	0	0	(0)	0	(0)	(0)	0	(0)	(0)
Central	(402)	281	(182)	(19)	(19)	(23)	(82)	(37)	(62)	(19)
North	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	0	(0)	0	(0)	(0)	(0)	(0)	(0)	0	0
Capital	(0)	(1)	(0)	(1)	(0)	(1)	(1)	(1)	(1)	(1)
Hudson Valley	(11)	5	(10)	(11)	4	(2)	(29)	(26)	3	(31)
Millwood	0	(0)	0	0	0	0	(0)	0	(0)	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(3)	(6)	20	(2)	4	(3)	5	(4)	9	(35)
Long Island	1	1	4	10	3	6	(0)	(4)	(1)	(4)
NYCA Total	**(703)**	**175**	**(201)**	**(184)**	**(96)**	**(92)**	**41**	**(307)**	**(274)**	**(434)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(144)	(67)	(26)	(143)	(63)	(50)	39	(165)	(89)	(181)
Genesee	(8)	4	1	(3)	(0)	(4)	(10)	6	(4)	(5)
Central	(23)	(10)	(47)	(17)	(38)	(57)	(79)	(71)	(35)	(58)
North	(9)	(4)	(3)	(6)	2	(4)	(4)	(5)	(4)	(4)
Mohawk Valley	2	(8)	(3)	(0)	(0)	(13)	(11)	(10)	8	5
Capital	(8)	(13)	(8)	(9)	(7)	(16)	(14)	(12)	(11)	(14)
Hudson Valley	1	(26)	(12)	16	0	(28)	(8)	(12)	(19)	(19)
Millwood	0	(1)	1	(0)	0	0	(0)	1	(0)	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(367)	(316)	(299)	(152)	(178)	(291)	(200)	(271)	(258)	(255)
Long Island	(78)	(73)	(47)	(57)	(40)	(37)	(45)	(35)	(24)	(46)
NYCA Total	**(634)**	**(514)**	**(444)**	**(371)**	**(324)**	**(500)**	**(333)**	**(575)**	**(437)**	**(576)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Long Island	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.0)**	**(0.1)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(129)	(66)	(35)	(135)	(81)	(82)	(17)	(209)	(141)	(179)
Genesee	(10)	7	(1)	(2)	4	(8)	(9)	0	(6)	(6)
Central	(54)	89	(101)	16	(23)	(13)	(98)	(70)	(58)	(22)
North	(35)	(20)	(21)	(26)	10	(12)	(20)	(22)	(16)	(21)
Mohawk Valley	4	(10)	(4)	(5)	1	(20)	(14)	(28)	18	9
Capital	(74)	(161)	(98)	(121)	(86)	(181)	(163)	(137)	(167)	(164)
Hudson Valley	1,171	1,016	824	802	717	1,071	927	1,109	1,042	1,035
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(539)	(473)	(367)	(224)	(265)	(419)	(299)	(338)	(370)	(314)
Long Island	(112)	(85)	(42)	(85)	(60)	(54)	(24)	(54)	(35)	(65)
NYCA Total	**222**	**296**	**156**	**219**	**216**	**283**	**282**	**251**	**266**	**274**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.7)	(0.5)	(0.3)	(1.4)	(0.9)	(1.2)	(0.3)	(3.5)	(2.5)	(3.3)
Genesee	(0.1)	0.1	(0.0)	(0.0)	0.0	(0.1)	(0.1)	0.0	(0.1)	(0.1)
Central	(0.3)	0.7	(1.0)	0.2	(0.3)	(0.2)	(1.5)	(1.2)	(1.0)	(0.4)
North	(0.2)	(0.2)	(0.2)	(0.3)	0.1	(0.2)	(0.3)	(0.4)	(0.3)	(0.4)
Mohawk Valley	0.0	(0.1)	(0.0)	(0.1)	0.0	(0.3)	(0.2)	(0.5)	0.3	0.2
Capital	(0.4)	(1.3)	(1.0)	(1.3)	(0.9)	(2.7)	(2.6)	(2.3)	(2.9)	(3.0)
Hudson Valley	6.7	8.1	8.3	8.4	7.9	15.7	14.6	18.4	18.3	19.1
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(2.6)	(3.0)	(3.0)	(1.8)	(2.2)	(5.8)	(4.5)	(5.3)	(6.3)	(5.3)
Long Island	(0.6)	(0.7)	(0.4)	(0.9)	(0.6)	(0.8)	(0.4)	(0.9)	(0.6)	(1.2)
NYCA Total	**1.8**	**3.2**	**2.3**	**2.9**	**3.0**	**4.5**	**4.6**	**4.5**	**4.9**	**5.5**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.6	1.1	0.8	0.4	1.6	0.3	1.8	1.0	0.8
Genesee	0.1	0.2	0.5	0.3	0.1	0.6	0.2	0.7	0.4	0.4
Central	0.1	(0.0)	0.3	0.1	0.0	0.3	0.1	0.3	0.1	0.1
North	0.1	0.2	0.1	0.2	0.0	0.3	0.2	0.3	0.2	0.1
Mohawk Valley	(0.0)	(0.0)	(0.1)	(0.0)	(0.0)	0.0	0.1	(0.0)	(0.1)	(0.1)
Capital	(0.0)	0.2	0.1	0.3	0.3	0.6	0.1	0.3	1.0	0.8
Hudson Valley	(0.2)	(0.3)	(0.5)	(0.4)	(0.4)	(0.6)	(0.8)	(1.0)	(0.9)	(0.7)
Millwood	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.2)	(0.2)	(0.3)	(0.3)	(0.2)
Dunwoodie	(0.1)	(0.1)	(0.3)	(0.2)	(0.2)	(0.3)	(0.5)	(0.6)	(0.5)	(0.4)
NY City	1.0	0.3	(1.4)	(1.2)	(0.8)	(1.4)	(2.7)	(3.6)	(2.9)	(1.5)
Long Island	0.7	0.1	(0.7)	(0.4)	(0.1)	(0.8)	(1.1)	(1.4)	(1.1)	(0.1)
NYCA Total	**1.7**	**1.0**	**(1.0)**	**(0.7)**	**(0.8)**	**(0.1)**	**(4.5)**	**(3.4)**	**(3.2)**	**(0.6)**

Generic DR Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	(0)	0	(0)	(0)	0	0	(0)	(0)	0
Genesee	(0)	0	(0)	0	(0)	0	0	0	0	(0)
Central	0	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)
North	(0)	0	0	0	0	(0)	0	0	0	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)
Capital	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Hudson Valley	(1)	(1)	(1)	(1)	(1)	(0)	(1)	(1)	(1)	(3)
Millwood	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
Dunwoodie	(1)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(1)	(3)
NY City	(17)	(12)	(18)	(8)	(8)	(5)	(8)	(9)	(17)	(36)
Long Island	(5)	(1)	(2)	(1)	(2)	(0)	(1)	(0)	(7)	(11)
NYCA Total	**(26)**	**(14)**	**(23)**	**(11)**	**(11)**	**(6)**	**(10)**	**(11)**	**(27)**	**(54)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	0	(3)	0	(1)	(1)	(1)	(0)	(0)	(0)
Genesee	0	0	0	(0)	(0)	(0)	0	(0)	(0)	(0)
Central	0	(0)	0	0	1	0	(1)	0	(0)	1
North	0	(0)	0	(0)	0	0	(0)	(0)	0	0
Mohawk Valley	0	0	0	0	(0)	(0)	0	0	0	0
Capital	1	0	(0)	(0)	0	0	(0)	(1)	0	0
Hudson Valley	(1)	(2)	(1)	(1)	(0)	(3)	(2)	(5)	(5)	(2)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(2)	(2)	(2)	(2)	(6)	(5)	(6)	(2)	(3)	(6)
Long Island	0	(0)	0	(0)	(0)	0	0	(0)	(0)	(1)
NYCA Total	**(2)**	**(4)**	**(5)**	**(4)**	**(7)**	**(8)**	**(9)**	**(8)**	**(8)**	**(7)**
NYCA Imports	(2)	(2)	(2)	(3)	(2)	(3)	(2)	(2)	(2)	(4)
NYCA Exports	4	3	2	2	1	1	0	3	3	3
NYCA + Imports - Exports	**(8)**	**(8)**	**(9)**	**(8)**	**(10)**	**(11)**	**(12)**	**(12)**	**(13)**	**(14)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	8	2	(47)	2	(4)	(12)	(11)	(2)	(8)	0
Genesee	0	0	(0)	(1)	(1)	(0)	(0)	(1)	(0)	(1)
Central	11	(3)	1	8	10	0	(7)	3	(1)	3
North	0	(2)	(0)	(2)	2	2	(0)	(2)	1	0
Mohawk Valley	1	1	0	(0)	(0)	(1)	0	1	0	(0)
Capital	45	34	30	26	31	27	20	25	33	33
Hudson Valley	(3)	(15)	5	4	15	(14)	4	(30)	(31)	7
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	51	61	62	40	(7)	30	6	58	50	26
Long Island	4	(6)	2	(3)	0	3	2	0	2	(2)
NYCA Total	**117**	**73**	**52**	**73**	**46**	**35**	**14**	**52**	**47**	**67**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(6)	(15)	(13)	(12)	(10)	(8)	2	(10)	(10)	(19)
LINDEN VFT	(1)	(7)	1	(6)	(2)	(2)	0	(2)	(4)	(5)
NEPTUNE	(5)	(2)	(7)	(3)	(1)	(3)	(4)	(2)	(1)	(0)
HTP	(10)	(9)	(24)	(8)	(12)	(9)	(7)	(8)	(9)	(15)
ISONE - NYISO	(110)	(56)	(27)	(40)	(28)	(13)	(9)	(22)	(17)	(22)
CROSS SOUND CABLE	4	3	3	0	(1)	(1)	0	(0)	(3)	(0)
NORTHPORT NORWALK	(2)	1	0	0	(2)	(3)	(2)	1	(1)	(1)
IESO - NYISO	10	9	6	(8)	11	(4)	2	(11)	(6)	(8)
HQ - NYISO CHAT	(0)	0	0	0	1	0	0	0	0	0
HQ - NYISO CEDARS	(0)	0	0	0	0	0	0	0	0	0
TOTAL	**(120)**	**(77)**	**(61)**	**(76)**	**(45)**	**(42)**	**(18)**	**(55)**	**(51)**	**(70)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	(0)	(1)	(0)	(0)	(1)	(0)	(1)	(0)	0
Genesee	0	(0)	0	(0)	0	(0)	0	(0)	0	0
Central	2	(1)	1	0	1	(1)	(1)	(1)	(0)	0
North	1	(0)	0	(0)	0	(0)	0	(0)	0	0
Mohawk Valley	0	(0)	0	(0)	(0)	(0)	(0)	(0)	0	0
Capital	4	1	1	0	2	1	2	0	2	4
Hudson Valley	(1)	(1)	(0)	(0)	1	(1)	(0)	(3)	(4)	(1)
Millwood	(1)	(1)	(1)	(1)	(1)	(1)	(0)	(1)	(1)	(3)
Dunwoodie	0	0	0	0	0	0	(0)	(0)	(0)	(0)
NY City	(1)	(2)	(3)	(2)	(3)	(1)	(3)	(0)	(1)	(13)
Long Island	(2)	(1)	(1)	(2)	(1)	(1)	(1)	(1)	(4)	(7)
NYCA Total	4	(6)	(3)	(6)	(1)	(5)	(3)	(8)	(8)	(20)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	(0)	1	(0)	0	(0)	0	(1)	0	0
Genesee	1	(0)	0	(0)	0	(0)	0	(0)	0	0
Central	1	(0)	1	(1)	0	(1)	(0)	(1)	0	0
North	0	(0)	0	(0)	0	(0)	0	(0)	0	0
Mohawk Valley	0	(0)	0	(0)	0	(0)	(0)	(0)	0	(0)
Capital	1	(0)	(0)	(1)	(0)	(1)	(0)	(1)	(0)	(0)
Hudson Valley	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(3)
Millwood	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
Dunwoodie	(1)	(1)	(1)	(1)	(0)	(0)	(0)	(1)	(1)	(3)
NY City	(13)	(13)	(16)	(11)	(7)	(8)	(9)	(12)	(16)	(35)
Long Island	(3)	(1)	(1)	(2)	(1)	(1)	(1)	(2)	(6)	(11)
NYCA Total	(12)	(18)	(18)	(17)	(10)	(13)	(11)	(19)	(25)	(52)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.04	(0.02)	0.04	(0.02)	0.01	(0.01)	0.01	(0.02)	0.01	0.02
Genesee	0.04	(0.01)	0.03	(0.02)	0.01	(0.02)	0.01	(0.02)	0.01	0.01
Central	0.05	(0.02)	0.03	(0.03)	0.00	(0.02)	0.00	(0.03)	0.01	0.01
North	0.05	(0.01)	0.03	(0.02)	0.00	(0.02)	0.00	(0.02)	0.01	0.01
Mohawk Valley	0.04	(0.02)	0.03	(0.03)	0.00	(0.03)	0.00	(0.03)	0.01	0.00
Capital	0.05	(0.02)	(0.01)	(0.03)	(0.01)	(0.03)	(0.01)	(0.04)	(0.01)	(0.01)
Hudson Valley	(0.03)	(0.05)	(0.05)	(0.06)	(0.03)	(0.04)	(0.03)	(0.05)	(0.06)	(0.15)
Millwood	(0.05)	(0.06)	(0.06)	(0.07)	(0.04)	(0.04)	(0.03)	(0.06)	(0.08)	(0.23)
Dunwoodie	(0.05)	(0.06)	(0.06)	(0.07)	(0.04)	(0.04)	(0.03)	(0.06)	(0.08)	(0.24)
NY City	(0.12)	(0.13)	(0.16)	(0.11)	(0.07)	(0.08)	(0.08)	(0.11)	(0.14)	(0.32)
Long Island	(0.06)	(0.02)	(0.02)	(0.05)	(0.03)	(0.03)	(0.02)	(0.03)	(0.14)	(0.22)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	18	2	(133)	5	(4)	(33)	(31)	(1)	(28)	(13)
Genesee	0	0	0	0	0	0	0	0	0	0
Central	6	1	(2)	0	0	(3)	0	0	0	16
North	0	(0)	0	0	0	0	0	(0)	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	0	0	0	(0)	0	0	(0)	(0)	0	0
Hudson Valley	(16)	(0)	(0)	(0)	(0)	(6)	(9)	(3)	(4)	(26)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(2)	(1)	(2)	(1)	(2)	(4)	(1)	(1)	(1)	(3)
Long Island	(0)	0	0	(0)	1	0	0	0	(1)	(4)
NYCA Total	**6**	**2**	**(138)**	**4**	**(5)**	**(45)**	**(40)**	**(5)**	**(33)**	**(29)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	7	(0)	(70)	3	(1)	(9)	(8)	(1)	(16)	(8)
Genesee	0	0	0	(1)	(0)	(0)	0	(0)	(0)	(0)
Central	5	0	2	10	7	4	(5)	(1)	0	3
North	(0)	(0)	(0)	(0)	0	0	(0)	(0)	0	0
Mohawk Valley	0	0	0	(0)	(0)	(0)	0	0	0	(0)
Capital	0	0	(0)	(1)	(0)	(1)	0	(0)	(1)	(1)
Hudson Valley	(12)	(31)	(8)	(9)	(1)	(13)	(10)	(27)	(47)	(12)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(23)	(49)	(52)	(45)	(56)	(52)	(41)	(44)	(30)	(44)
Long Island	(1)	(9)	(6)	(11)	(8)	(8)	(6)	(14)	(18)	(30)
NYCA Total	**(24)**	**(90)**	**(133)**	**(53)**	**(60)**	**(79)**	**(70)**	**(87)**	**(111)**	**(92)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	10	0	(55)	3	(6)	(14)	(14)	(1)	(9)	(4)
Genesee	0	0	0	(1)	(0)	(0)	(0)	(0)	(0)	(0)
Central	6	(1)	2	6	6	2	(5)	1	(0)	4
North	0	(1)	0	(1)	1	1	(0)	(1)	1	0
Mohawk Valley	1	0	0	(0)	(0)	(0)	0	1	0	0
Capital	5	0	(0)	(3)	1	(0)	(1)	(3)	0	0
Hudson Valley	(18)	(27)	(11)	(14)	(4)	(23)	(13)	(38)	(42)	(12)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(22)	(17)	(17)	(25)	(65)	(39)	(57)	(19)	(24)	(38)
Long Island	2	(5)	0	(3)	(1)	1	1	(1)	(0)	(3)
NYCA Total	**(16)**	**(48)**	**(81)**	**(37)**	**(68)**	**(72)**	**(88)**	**(62)**	**(74)**	**(52)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.0	(0.6)	0.0	(0.1)	(0.2)	(0.2)	(0.0)	(0.2)	(0.1)
Genesee	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	(0.0)
Central	0.0	0.0	0.0	0.1	0.1	0.0	(0.1)	0.0	0.0	0.1
North	0.0	(0.0)	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	(0.0)	0.0	0.0	(0.0)	(0.1)	0.0	0.0
Hudson Valley	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(0.3)	(0.2)	(0.6)	(0.7)	(0.2)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.1)	(0.1)	(0.1)	(0.2)	(0.7)	(0.6)	(0.9)	(0.3)	(0.4)	(0.7)
Long Island	0.0	(0.0)	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	(0.0)
NYCA Total	**(0.1)**	**(0.3)**	**(0.8)**	**(0.3)**	**(0.7)**	**(1.0)**	**(1.4)**	**(1.0)**	**(1.3)**	**(0.9)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.2)	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.0	0.1
Genesee	(0.1)	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Central	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Hudson Valley	0.0	(0.0)	(0.1)	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)
Millwood	0.0	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0
Dunwoodie	0.0	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.0
NY City	(0.1)	(0.3)	(0.4)	(0.3)	(0.0)	(0.4)	(0.4)	(0.6)	(0.3)	(0.2)
Long Island	0.2	(0.0)	(0.1)	(0.1)	0.1	(0.1)	(0.1)	(0.1)	(0.0)	0.1
NYCA Total	**(0.2)**	**(0.4)**	**(0.5)**	**(0.4)**	**0.0**	**(0.4)**	**(0.6)**	**(0.8)**	**(0.5)**	**(0.2)**

Generic EE Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	(1)	(0)	(1)	(1)	(2)	(2)	(1)	(1)	(0)
Genesee	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)
Central	(1)	(1)	(1)	(1)	(2)	(1)	(1)	(1)	(1)	(1)
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(1)	(1)
Capital	(14)	(15)	(16)	(15)	(21)	(15)	(15)	(14)	(16)	(15)
Hudson Valley	(11)	(10)	(11)	(9)	(12)	(9)	(9)	(9)	(11)	(12)
Millwood	(2)	(2)	(2)	(1)	(2)	(2)	(2)	(2)	(2)	(3)
Dunwoodie	(4)	(3)	(4)	(3)	(4)	(3)	(3)	(3)	(5)	(6)
NY City	(75)	(64)	(74)	(61)	(80)	(66)	(67)	(66)	(83)	(102)
Long Island	(5)	2	(0)	2	(4)	(0)	3	2	(4)	(9)
NYCA Total	**(114)**	**(94)**	**(108)**	**(91)**	**(126)**	**(100)**	**(96)**	**(94)**	**(125)**	**(149)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2)	(4)	(1)	(4)	(7)	(3)	(13)	(11)	(11)	(7)
Genesee	(0)	(0)	(1)	(0)	(0)	(1)	(1)	(1)	(1)	(1)
Central	(5)	1	(4)	(1)	1	(4)	(4)	(10)	(2)	(3)
North	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(3)	(2)	(2)
Mohawk Valley	(0)	(0)	(1)	(0)	(0)	(1)	(1)	(1)	(1)	(1)
Capital	(60)	(62)	(64)	(65)	(65)	(81)	(87)	(86)	(93)	(93)
Hudson Valley	(7)	(5)	(3)	(5)	(3)	(6)	(7)	(10)	(8)	(8)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(82)	(86)	(94)	(92)	(104)	(120)	(117)	(120)	(135)	(137)
Long Island	(4)	(7)	(4)	(6)	(6)	(6)	(4)	(7)	(8)	(7)
NYCA Total	**(161)**	**(164)**	**(171)**	**(175)**	**(185)**	**(224)**	**(235)**	**(249)**	**(261)**	**(259)**
NYCA Imports	(27)	(35)	(37)	(41)	(45)	(53)	(46)	(48)	(57)	(59)
NYCA Exports	50	46	40	41	51	41	57	58	46	58
NYCA + Imports - Exports	**(238)**	**(246)**	**(248)**	**(258)**	**(281)**	**(319)**	**(338)**	**(354)**	**(364)**	**(377)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(21)	(91)	(58)	(90)	(158)	(71)	(232)	(162)	(167)	(106)
Genesee	(8)	(7)	(14)	(10)	(6)	(15)	(13)	(16)	(16)	(18)
Central	(147)	(46)	(100)	(55)	10	(85)	(83)	(159)	(64)	(62)
North	(26)	(21)	(29)	(33)	(17)	(24)	(24)	(44)	(35)	(40)
Mohawk Valley	(8)	(10)	(17)	(10)	(6)	(20)	(15)	(20)	(14)	(19)
Capital	(1,382)	(1,317)	(1,319)	(1,246)	(1,115)	(1,327)	(1,358)	(1,234)	(1,314)	(1,245)
Hudson Valley	(128)	(98)	(49)	(78)	(46)	(81)	(89)	(115)	(105)	(81)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1,761)	(1,702)	(1,839)	(1,743)	(1,786)	(1,787)	(1,602)	(1,605)	(1,727)	(1,658)
Long Island	(83)	(139)	(68)	(108)	(102)	(83)	(56)	(89)	(93)	(78)
NYCA Total	**(3,564)**	**(3,430)**	**(3,493)**	**(3,373)**	**(3,224)**	**(3,493)**	**(3,472)**	**(3,443)**	**(3,536)**	**(3,308)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(501)	(500)	(360)	(410)	(471)	(333)	(308)	(264)	(266)	(283)
LINDEN VFT	(87)	(139)	(122)	(132)	(137)	(118)	(80)	(100)	(90)	(114)
NEPTUNE	(48)	(78)	(75)	(70)	(100)	(91)	(67)	(72)	(43)	(34)
HTP	(154)	(212)	(266)	(266)	(296)	(181)	(145)	(149)	(167)	(156)
ISONE - NYISO	(1,018)	(1,018)	(912)	(950)	(1,005)	(804)	(885)	(937)	(773)	(862)
CROSS SOUND CABLE	34	67	26	28	51	50	39	56	38	22
NORTHPORT NORWALK	28	59	42	50	58	59	32	53	36	35
IESO - NYISO	(80)	(109)	(127)	(98)	(51)	(227)	(226)	(213)	(237)	(308)
HQ - NYISO CHAT	0	1	1	1	2	0	1	1	1	1
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(1,825)**	**(1,931)**	**(1,793)**	**(1,847)**	**(1,949)**	**(1,643)**	**(1,639)**	**(1,625)**	**(1,501)**	**(1,698)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(4)	(10)	(8)	(9)	(10)	(12)	(20)	(16)	(15)	(14)
Genesee	(2)	(2)	(2)	(2)	(1)	(3)	(3)	(3)	(2)	(3)
Central	(15)	(18)	(16)	(14)	(9)	(17)	(19)	(22)	(14)	(18)
North	(3)	(5)	(4)	(4)	(3)	(5)	(5)	(6)	(4)	(6)
Mohawk Valley	(1)	(2)	(2)	(2)	(1)	(3)	(2)	(3)	(2)	(3)
Capital	(67)	(75)	(76)	(76)	(77)	(98)	(102)	(100)	(108)	(108)
Hudson Valley	(8)	(6)	(4)	(6)	(4)	(7)	(8)	(11)	(10)	(11)
Millwood	(15)	(18)	(16)	(15)	(17)	(18)	(17)	(16)	(18)	(22)
Dunwoodie	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(102)	(109)	(116)	(112)	(125)	(145)	(142)	(147)	(162)	(177)
Long Island	(10)	(12)	(8)	(10)	(11)	(12)	(8)	(12)	(14)	(18)
NYCA Total	(225)	(256)	(252)	(250)	(257)	(319)	(325)	(335)	(351)	(380)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(3)	(7)	(5)	(6)	(3)	(7)	(6)	(6)	(5)	(6)
Genesee	(2)	(4)	(3)	(4)	(2)	(4)	(4)	(4)	(3)	(4)
Central	(4)	(8)	(6)	(7)	(5)	(8)	(8)	(8)	(6)	(9)
North	(1)	(2)	(2)	(2)	(1)	(3)	(3)	(2)	(2)	(3)
Mohawk Valley	(2)	(4)	(3)	(3)	(2)	(4)	(4)	(4)	(3)	(5)
Capital	(54)	(62)	(61)	(63)	(70)	(77)	(79)	(81)	(85)	(89)
Hudson Valley	(45)	(48)	(48)	(49)	(53)	(60)	(63)	(65)	(67)	(73)
Millwood	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(4)
Dunwoodie	(6)	(7)	(6)	(6)	(6)	(7)	(6)	(6)	(7)	(10)
NY City	(220)	(234)	(237)	(234)	(255)	(289)	(301)	(310)	(326)	(363)
Long Island	(10)	(10)	(9)	(8)	(10)	(12)	(9)	(10)	(13)	(21)
NYCA Total	(350)	(389)	(383)	(383)	(411)	(474)	(485)	(498)	(521)	(586)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.23)	(0.43)	(0.31)	(0.40)	(0.24)	(0.47)	(0.42)	(0.40)	(0.32)	(0.39)
Genesee	(0.27)	(0.46)	(0.37)	(0.36)	(0.27)	(0.43)	(0.38)	(0.39)	(0.30)	(0.45)
Central	(0.30)	(0.53)	(0.42)	(0.42)	(0.34)	(0.50)	(0.48)	(0.47)	(0.39)	(0.56)
North	(0.22)	(0.43)	(0.33)	(0.33)	(0.22)	(0.40)	(0.39)	(0.37)	(0.28)	(0.46)
Mohawk Valley	(0.32)	(0.54)	(0.43)	(0.43)	(0.35)	(0.51)	(0.50)	(0.49)	(0.41)	(0.59)
Capital	(0.79)	(1.15)	(1.04)	(1.00)	(1.23)	(1.23)	(1.15)	(1.13)	(1.19)	(1.30)
Hudson Valley	(0.83)	(1.03)	(0.95)	(0.89)	(1.00)	(1.04)	(1.02)	(1.01)	(1.06)	(1.28)
Millwood	(0.85)	(1.03)	(0.95)	(0.88)	(0.99)	(1.03)	(1.00)	(0.99)	(1.05)	(1.34)
Dunwoodie	(0.86)	(1.03)	(0.95)	(0.88)	(0.99)	(1.03)	(1.00)	(0.99)	(1.05)	(1.35)
NY City	(1.08)	(1.23)	(1.21)	(1.11)	(1.25)	(1.31)	(1.33)	(1.31)	(1.40)	(1.73)
Long Island	(0.40)	(0.40)	(0.38)	(0.34)	(0.43)	(0.50)	(0.35)	(0.39)	(0.41)	(0.68)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(102)	(56)	17	(153)	(254)	(31)	(404)	(197)	(224)	(131)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	(461)	70	(166)	18	(1)	(4)	63	(0)	26	15
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Hudson Valley	(17)	10	(3)	(16)	(0)	(7)	(10)	(3)	20	(25)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(7)	(3)	(9)	(23)	(18)	(23)	(24)	(16)	(17)	(20)
Long Island	(3)	(8)	(4)	(5)	(7)	(2)	(3)	(3)	(3)	(7)
NYCA Total	**(592)**	**11**	**(166)**	**(180)**	**(282)**	**(70)**	**(380)**	**(222)**	**(201)**	**(170)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.0)	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.1)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(34)	(41)	52	(103)	(135)	(35)	(231)	(131)	(113)	(72)
Genesee	(2)	(2)	(4)	(4)	(2)	(4)	(4)	(4)	(5)	(5)
Central	(24)	(1)	(27)	(20)	(6)	(24)	(23)	(42)	(12)	(21)
North	(2)	(2)	(3)	(3)	(1)	(3)	(2)	(4)	(4)	(4)
Mohawk Valley	(2)	(2)	(6)	(2)	(2)	(6)	(5)	(6)	(4)	(5)
Capital	(29)	(29)	(28)	(27)	(25)	(30)	(27)	(27)	(27)	(27)
Hudson Valley	(58)	(66)	(36)	(40)	(20)	(44)	(47)	(68)	(81)	(59)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(436)	(409)	(458)	(417)	(410)	(478)	(397)	(439)	(431)	(453)
Long Island	(26)	(53)	(17)	(44)	(34)	(29)	(18)	(40)	(55)	(41)
NYCA Total	**(614)**	**(604)**	**(526)**	**(659)**	**(635)**	**(650)**	**(754)**	**(761)**	**(732)**	**(688)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	(0.0)	0.0	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Long Island	(0.0)	(0.0)	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.1)**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(50)	(65)	(15)	(83)	(142)	(47)	(214)	(141)	(143)	(84)
Genesee	(3)	(3)	(7)	(4)	(3)	(7)	(6)	(8)	(8)	(9)
Central	(114)	5	(69)	(20)	1	(43)	(43)	(77)	(27)	(31)
North	(12)	(9)	(13)	(17)	(8)	(12)	(12)	(24)	(18)	(21)
Mohawk Valley	(3)	(3)	(8)	(5)	(3)	(9)	(7)	(10)	(7)	(9)
Capital	(564)	(552)	(548)	(522)	(474)	(545)	(551)	(511)	(540)	(515)
Hudson Valley	(87)	(64)	(35)	(54)	(31)	(55)	(61)	(81)	(72)	(61)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(893)	(848)	(925)	(877)	(910)	(925)	(833)	(830)	(883)	(870)
Long Island	(47)	(81)	(38)	(66)	(60)	(48)	(33)	(53)	(58)	(47)
NYCA Total	**(1,771)**	**(1,619)**	**(1,658)**	**(1,648)**	**(1,630)**	**(1,691)**	**(1,759)**	**(1,734)**	**(1,757)**	**(1,647)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.3)	(0.5)	(0.2)	(0.9)	(1.6)	(0.7)	(3.4)	(2.3)	(2.5)	(1.5)
Genesee	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)
Central	(0.6)	0.0	(0.7)	(0.2)	0.0	(0.6)	(0.7)	(1.3)	(0.5)	(0.6)
North	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	(0.2)	(0.2)	(0.4)	(0.3)	(0.4)
Mohawk Valley	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)	(0.1)	(0.1)	(0.2)	(0.1)	(0.2)
Capital	(3.2)	(4.4)	(5.6)	(5.5)	(5.2)	(8.0)	(8.7)	(8.5)	(9.5)	(9.5)
Hudson Valley	(0.5)	(0.5)	(0.4)	(0.6)	(0.3)	(0.8)	(0.9)	(1.3)	(1.3)	(1.1)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(4.3)	(5.4)	(7.4)	(7.1)	(7.8)	(12.8)	(12.3)	(13.0)	(14.7)	(15.0)
Long Island	(0.3)	(0.6)	(0.4)	(0.7)	(0.6)	(0.7)	(0.5)	(0.9)	(1.0)	(0.8)
NYCA Total	**(9.4)**	**(11.6)**	**(14.8)**	**(15.2)**	**(15.7)**	**(24.0)**	**(26.9)**	**(28.0)**	**(29.9)**	**(29.3)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.6	1.5	1.3	1.1	1.3	1.5	1.8	1.4	1.6	2.0
Genesee	0.3	0.6	0.5	0.5	0.5	0.6	0.9	0.7	0.7	0.8
Central	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4
North	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Mohawk Valley	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Capital	(1.4)	(2.0)	(1.9)	(2.0)	(2.2)	(2.5)	(2.7)	(2.7)	(2.8)	(3.0)
Hudson Valley	(0.5)	(0.9)	(1.0)	(0.9)	(1.0)	(1.1)	(1.5)	(1.5)	(1.5)	(1.4)
Millwood	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Dunwoodie	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(0.6)	(0.5)	(0.5)	(0.5)
NY City	(3.0)	(6.0)	(6.3)	(6.2)	(6.1)	(7.6)	(10.1)	(9.8)	(9.9)	(9.7)
Long Island	(0.5)	(0.7)	(0.9)	(0.8)	(0.6)	(0.9)	(1.6)	(1.3)	(1.1)	(1.2)
NYCA Total	**(4.6)**	**(7.6)**	**(8.5)**	**(8.5)**	**(8.3)**	**(10.2)**	**(13.5)**	**(13.5)**	**(13.3)**	**(12.5)**

H.2. Study 2: Central (CE)

Generic Transmission Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(7)	(8)	(9)	(8)	(9)	(7)	(7)	(7)	(8)	(7)
Genesee	(3)	(3)	(3)	(3)	(4)	(3)	(3)	(3)	(2)	(2)
Central	(6)	(6)	(7)	(7)	(8)	(6)	(6)	(6)	(5)	(5)
North	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(2)	(2)	(2)	(2)	(3)	(2)	(2)	(2)	(2)	(2)
Capital	(42)	(48)	(53)	(53)	(63)	(46)	(45)	(45)	(45)	(43)
Hudson Valley	(20)	(24)	(26)	(26)	(31)	(22)	(21)	(21)	(21)	(20)
Millwood	(6)	(8)	(8)	(8)	(10)	(7)	(7)	(7)	(7)	(6)
Dunwoodie	(12)	(14)	(16)	(16)	(19)	(13)	(13)	(13)	(13)	(13)
NY City	(107)	(127)	(138)	(139)	(171)	(118)	(114)	(116)	(114)	(111)
Long Island	(45)	(48)	(55)	(58)	(68)	(44)	(42)	(45)	(45)	(46)
NYCA Total	**(251)**	**(289)**	**(316)**	**(319)**	**(386)**	**(269)**	**(260)**	**(265)**	**(263)**	**(257)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	21	10	15	12	3	14	16	13	14	10
Genesee	1	1	0	0	1	1	2	1	2	2
Central	35	43	41	40	48	45	53	38	52	47
North	3	5	5	6	8	8	8	6	7	8
Mohawk Valley	4	5	5	5	5	5	7	6	8	7
Capital	(55)	(55)	(69)	(65)	(71)	(60)	(66)	(68)	(91)	(78)
Hudson Valley	2	1	1	(1)	0	0	1	(0)	(1)	(1)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(9)	(16)	(12)	(15)	(21)	(24)	(20)	(15)	(22)	(22)
Long Island	1	(1)	(2)	(5)	(6)	(8)	(4)	(4)	(6)	(4)
NYCA Total	**3**	**(7)**	**(16)**	**(22)**	**(33)**	**(19)**	**(4)**	**(24)**	**(36)**	**(34)**
NYCA Imports	(10)	(12)	(6)	(4)	3	(8)	(7)	1	6	1
NYCA Exports	16	3	3	3	13	12	25	25	11	11
NYCA + Imports - Exports	**(22)**	**(23)**	**(25)**	**(29)**	**(43)**	**(39)**	**(36)**	**(48)**	**(42)**	**(44)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	570	272	305	290	120	273	261	275	215	182
Genesee	13	16	8	6	15	18	25	14	24	20
Central	947	1,042	951	921	1,006	838	890	623	812	728
North	76	100	93	133	138	128	124	81	94	98
Mohawk Valley	93	112	104	107	100	83	108	93	112	95
Capital	(1,141)	(1,082)	(1,350)	(1,116)	(1,094)	(840)	(905)	(860)	(1,076)	(913)
Hudson Valley	36	10	12	(14)	8	(1)	4	(7)	(15)	(12)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(213)	(326)	(220)	(292)	(374)	(365)	(283)	(200)	(293)	(258)
Long Island	31	(7)	(35)	(92)	(92)	(96)	(50)	(32)	(54)	(33)
NYCA Total	**412**	**136**	**(132)**	**(57)**	**(173)**	**38**	**175**	**(12)**	**(181)**	**(93)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(112)	(186)	(84)	(15)	14	(121)	(144)	(97)	(75)	(99)
LINDEN VFT	(66)	(65)	(32)	(43)	(44)	(83)	(56)	(44)	(51)	(57)
NEPTUNE	(168)	(149)	(142)	(96)	(72)	(49)	(72)	(72)	(43)	(52)
HTP	(210)	(242)	(241)	(333)	(222)	(218)	(196)	(131)	(134)	(162)
ISONE - NYISO	(349)	(54)	(35)	(34)	(191)	(204)	(357)	(332)	(171)	(121)
CROSS SOUND CABLE	76	69	83	81	69	64	55	46	52	34
NORTHPORT NORWALK	79	83	90	103	80	88	65	49	49	61
IESO - NYISO	487	485	554	468	594	574	622	661	631	563
HQ - NYISO CHAT	(2)	(6)	(7)	(7)	(6)	(7)	(7)	(7)	(7)	(6)
HQ - NYISO CEDARS	0	0	0	(0)	(0)	(0)	(0)	0	(0)	(0)
TOTAL	**(265)**	**(65)**	**187**	**125**	**222**	**45**	**(90)**	**72**	**251**	**162**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	43	34	40	40	38	32	31	37	33	30
Genesee	8	8	9	9	10	6	7	7	7	6
Central	88	92	99	95	113	86	94	84	97	87
North	19	20	23	23	28	19	20	19	20	19
Mohawk Valley	11	12	13	13	15	11	13	13	14	12
Capital	(69)	(73)	(90)	(87)	(93)	(84)	(89)	(89)	(112)	(99)
Hudson Valley	2	0	1	(1)	(0)	(1)	(0)	(1)	(1)	(1)
Millwood	(4)	(11)	(8)	(9)	(13)	(14)	(13)	(10)	(11)	(14)
Dunwoodie	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(12)	(26)	(19)	(26)	(35)	(37)	(34)	(25)	(33)	(36)
Long Island	0	(3)	(4)	(9)	(10)	(11)	(7)	(5)	(9)	(8)
NYCA Total	86	53	63	48	52	7	20	29	6	(5)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	18	18	22	21	25	12	12	14	13	11
Genesee	13	14	17	16	19	10	9	11	11	9
Central	23	22	27	26	31	16	16	19	19	16
North	9	9	10	10	14	10	10	11	11	9
Mohawk Valley	16	15	17	17	20	13	14	15	15	14
Capital	(19)	(25)	(25)	(26)	(31)	(28)	(27)	(25)	(25)	(27)
Hudson Valley	(2)	(6)	(5)	(5)	(7)	(8)	(8)	(6)	(6)	(7)
Millwood	(1)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Dunwoodie	(1)	(3)	(3)	(3)	(4)	(5)	(4)	(3)	(3)	(4)
NY City	(10)	(28)	(23)	(26)	(37)	(39)	(38)	(29)	(29)	(37)
Long Island	(3)	(6)	(6)	(10)	(11)	(10)	(9)	(7)	(8)	(13)
NYCA Total	42	9	31	18	14	(31)	(28)	(1)	(6)	(32)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1.19	1.17	1.40	1.36	1.60	0.75	0.76	0.89	0.81	0.69
Genesee	1.43	1.45	1.73	1.66	1.91	0.98	0.98	1.11	1.10	0.92
Central	1.47	1.42	1.72	1.66	1.92	1.00	1.02	1.18	1.15	0.94
North	1.93	1.89	2.21	2.13	2.47	1.42	1.44	1.61	1.57	1.34
Mohawk Valley	1.68	1.66	1.98	1.91	2.19	1.23	1.25	1.42	1.38	1.17
Capital	(1.39)	(1.86)	(1.84)	(1.90)	(2.34)	(2.00)	(1.88)	(1.73)	(1.72)	(1.83)
Hudson Valley	(0.27)	(0.58)	(0.46)	(0.51)	(0.76)	(0.80)	(0.73)	(0.59)	(0.59)	(0.73)
Millwood	(0.27)	(0.61)	(0.50)	(0.54)	(0.81)	(0.82)	(0.76)	(0.60)	(0.61)	(0.78)
Dunwoodie	(0.25)	(0.58)	(0.47)	(0.51)	(0.78)	(0.79)	(0.73)	(0.58)	(0.59)	(0.75)
NY City	(0.27)	(0.57)	(0.46)	(0.50)	(0.76)	(0.76)	(0.69)	(0.56)	(0.57)	(0.72)
Long Island	(0.17)	(0.26)	(0.28)	(0.41)	(0.49)	(0.46)	(0.39)	(0.29)	(0.31)	(0.53)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1,195	490	601	560	210	534	533	518	393	256
Genesee	0	0	0	0	0	0	0	0	0	0
Central	874	905	405	48	2	2	21	20	21	16
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	(2)	(2)	(2)	(2)	(2)	(1)	(1)	(1)	(2)	(2)
Hudson Valley	1	0	(1)	1	0	(1)	(3)	7	(1)	2
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(0)	(3)	(1)	(1)	(3)	(1)	(2)	(0)	(1)	(2)
Long Island	(4)	(6)	1	(3)	(6)	(4)	(2)	(2)	(4)	(5)
NYCA Total	**2,064**	**1,385**	**1,004**	**603**	**202**	**529**	**546**	**542**	**407**	**266**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.2**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	603	232	386	343	133	257	255	258	194	108
Genesee	3	4	2	1	3	5	6	4	7	6
Central	50	84	73	79	69	48	69	35	53	31
North	8	10	10	13	15	13	12	8	9	10
Mohawk Valley	31	32	31	34	30	25	31	27	32	29
Capital	(25)	(23)	(28)	(24)	(25)	(21)	(19)	(19)	(22)	(20)
Hudson Valley	14	2	2	(10)	8	0	(0)	0	(11)	(6)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	26	(15)	(6)	(39)	(59)	(31)	(28)	(4)	(21)	(14)
Long Island	23	6	4	(19)	(13)	(27)	(11)	(5)	(11)	(1)
NYCA Total	**731**	**333**	**474**	**379**	**160**	**270**	**314**	**304**	**231**	**142**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	537	229	297	263	91	245	246	230	195	132
Genesee	7	9	5	4	8	10	13	7	13	10
Central	501	565	463	421	442	356	386	270	351	305
North	40	56	54	74	78	70	68	44	53	52
Mohawk Valley	51	61	56	58	54	45	57	48	59	52
Capital	(484)	(455)	(567)	(472)	(483)	(367)	(379)	(365)	(464)	(399)
Hudson Valley	25	11	9	(6)	5	1	4	(2)	(7)	(8)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(74)	(143)	(95)	(135)	(177)	(161)	(127)	(86)	(126)	(110)
Long Island	25	5	(13)	(50)	(51)	(55)	(28)	(17)	(31)	(16)
NYCA Total	**627**	**339**	**209**	**158**	**(32)**	**142**	**240**	**129**	**45**	**19**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	3.1	1.8	3.0	2.8	1.0	3.6	3.9	3.8	3.4	2.4
Genesee	0.0	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.2	0.2
Central	2.9	4.5	4.7	4.4	4.9	5.2	6.1	4.5	6.2	5.6
North	0.2	0.4	0.5	0.8	0.9	1.0	1.1	0.7	0.9	1.0
Mohawk Valley	0.3	0.5	0.6	0.6	0.6	0.7	0.9	0.8	1.0	1.0
Capital	(2.8)	(3.7)	(5.7)	(4.9)	(5.3)	(5.4)	(5.9)	(6.1)	(8.1)	(7.4)
Hudson Valley	0.1	0.1	0.1	(0.1)	0.1	0.0	0.1	(0.0)	(0.1)	(0.2)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.2)	(0.5)	(0.3)	(0.6)	(1.0)	(2.3)	(1.9)	(1.5)	(2.1)	(2.0)
Long Island	0.1	0.0	(0.1)	(0.5)	(0.6)	(0.8)	(0.4)	(0.3)	(0.5)	(0.3)
NYCA Total	**3.8**	**3.3**	**2.8**	**2.5**	**0.6**	**2.1**	**3.9**	**2.1**	**0.9**	**0.4**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(4.8)	(4.3)	(5.0)	(5.1)	(5.8)	(4.1)	(4.3)	(5.2)	(4.7)	(3.8)
Genesee	(2.3)	(2.1)	(2.3)	(2.5)	(2.8)	(2.2)	(2.4)	(2.6)	(2.5)	(2.0)
Central	(1.7)	(1.8)	(1.9)	(1.8)	(1.9)	(1.6)	(1.9)	(1.8)	(1.9)	(1.6)
North	(0.5)	(0.6)	(0.7)	(0.8)	(1.0)	(0.7)	(0.7)	(0.7)	(0.8)	(0.7)
Mohawk Valley	0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1
Capital	1.9	1.2	1.5	1.5	1.5	1.2	1.4	1.5	1.7	1.4
Hudson Valley	0.5	0.2	0.0	0.2	0.1	0.5	0.3	0.2	0.2	0.2
Millwood	0.2	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Dunwoodie	0.3	0.2	(0.0)	0.1	0.1	0.4	0.2	0.1	0.1	0.2
NY City	2.0	1.6	0.1	1.4	0.6	3.4	2.2	0.9	1.2	1.3
Long Island	1.8	1.4	0.9	1.7	1.6	2.3	1.9	1.6	1.6	1.4
NYCA Total	**(2.8)**	**(4.1)**	**(7.5)**	**(5.0)**	**(7.5)**	**(0.5)**	**(3.0)**	**(5.8)**	**(4.9)**	**(3.4)**

Generic Generation Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	2	(1)	(0)	1	(0)	(1)	1	1	0
Genesee	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)
Central	(1)	0	(0)	0	(0)	(1)	(0)	(1)	(0)	(1)
North	(0)	0	0	0	(0)	(0)	(0)	(0)	0	0
Mohawk Valley	(0)	0	0	0	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(8)	(0)	(2)	(0)	(5)	(7)	(3)	(5)	(5)	(7)
Hudson Valley	1	3	2	1	(1)	(2)	1	(0)	(0)	2
Millwood	1	1	1	1	(0)	(0)	0	(0)	0	1
Dunwoodie	2	2	1	1	(0)	(1)	1	0	0	2
NY City	14	21	14	12	0	(4)	5	5	5	24
Long Island	5	11	6	4	(1)	4	3	0	1	12
NYCA Total	**14**	**40**	**21**	**19**	**(7)**	**(11)**	**4**	**0**	**2**	**34**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	3	(1)	3	(9)	(8)	(7)	(2)	(11)	(13)	(10)
Genesee	(0)	0	(1)	(0)	(1)	(2)	(0)	(0)	(1)	(2)
Central	(4)	1	(3)	(5)	(2)	(2)	(16)	(7)	(7)	(12)
North	(3)	(2)	(2)	(0)	1	(1)	(2)	1	(0)	0
Mohawk Valley	1	(0)	(0)	(1)	(0)	(1)	(1)	(2)	1	1
Capital	55	37	35	35	38	65	62	69	69	90
Hudson Valley	(1)	(1)	(1)	(3)	(4)	(5)	(3)	(7)	(2)	(3)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(14)	(10)	(8)	(7)	(7)	(16)	(20)	(6)	(19)	(16)
Long Island	(1)	(2)	1	(2)	(0)	1	(0)	(1)	0	(1)
NYCA Total	**36**	**21**	**23**	**7**	**18**	**33**	**17**	**36**	**28**	**47**
NYCA Imports	(7)	(6)	(6)	(4)	(0)	(21)	(13)	(9)	(18)	(19)
NYCA Exports	30	18	15	11	24	22	24	33	12	38
NYCA + Imports - Exports	**(1)**	**(3)**	**2**	**(7)**	**(7)**	**(10)**	**(20)**	**(6)**	**(2)**	**(10)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	111	16	60	(137)	(151)	(79)	(23)	(153)	(177)	(112)
Genesee	(10)	1	(16)	(9)	(23)	(37)	0	(4)	(12)	(32)
Central	(66)	(9)	(35)	(117)	(5)	39	(179)	(32)	(124)	(82)
North	(70)	(37)	(53)	(19)	15	(13)	(43)	14	(4)	(9)
Mohawk Valley	21	(8)	(9)	(12)	(6)	(18)	(27)	(30)	14	14
Capital	1,177	862	735	806	750	1,056	889	999	1,018	1,157
Hudson Valley	(26)	(21)	(21)	(41)	(48)	(56)	(24)	(70)	(16)	(21)
Millwood	0	0	0	(0)	0	0	(0)	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(295)	(225)	(225)	(53)	(142)	(229)	(79)	(186)	(306)	(112)
Long Island	(4)	(46)	28	(62)	(2)	23	(11)	8	14	(18)
NYCA Total	**839**	**533**	**464**	**356**	**389**	**687**	**503**	**545**	**406**	**784**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(151)	(124)	(62)	(27)	61	(84)	(33)	(28)	(37)	(26)
LINDEN VFT	(2)	10	(13)	(16)	(18)	(37)	(3)	(0)	(18)	(38)
NEPTUNE	(5)	29	14	27	(32)	(36)	(38)	(21)	(15)	(1)
HTP	(17)	(8)	(12)	(16)	13	(66)	(9)	(5)	(11)	(10)
ISONE - NYISO	(565)	(412)	(291)	(328)	(460)	(413)	(415)	(509)	(257)	(539)
CROSS SOUND CABLE	68	39	9	25	50	17	45	39	4	20
NORTHPORT NORWALK	8	16	(24)	15	12	11	19	14	2	6
IESO - NYISO	(144)	(60)	(74)	(33)	(15)	(67)	(58)	(32)	(75)	(192)
HQ - NYISO CHAT	1	1	1	0	1	1	1	1	1	1
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(805)**	**(510)**	**(452)**	**(352)**	**(388)**	**(674)**	**(491)**	**(540)**	**(406)**	**(778)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1)	(8)	(4)	(7)	(8)	(10)	(5)	(11)	(13)	(19)
Genesee	(2)	(2)	(2)	(1)	(1)	(3)	(1)	(1)	(1)	(4)
Central	(10)	(16)	(12)	(10)	(2)	(6)	(18)	(8)	(12)	(26)
North	(4)	(5)	(4)	(2)	0	(2)	(4)	(0)	(1)	(5)
Mohawk Valley	0	(2)	(1)	(2)	(1)	(2)	(2)	(2)	(0)	(2)
Capital	38	28	24	31	33	53	54	64	61	65
Hudson Valley	(1)	(1)	(1)	(3)	(3)	(5)	(3)	(6)	(2)	(2)
Millwood	(1)	(2)	(2)	(1)	(1)	(6)	(2)	(2)	(1)	(6)
Dunwoodie	0	0	0	0	0	(0)	(0)	(0)	(0)	(0)
NY City	(10)	(12)	(13)	(6)	(9)	(22)	(14)	(12)	(21)	(15)
Long Island	0	(2)	1	(2)	(1)	(2)	(2)	(1)	(0)	(1)
NYCA Total	10	(23)	(14)	(2)	7	(5)	4	21	10	(14)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2)	(5)	(4)	(2)	1	(2)	(3)	1	1	(7)
Genesee	(3)	(5)	(3)	(1)	(1)	(2)	(2)	(1)	(1)	(6)
Central	(4)	(7)	(5)	(3)	(1)	(5)	(3)	(2)	(2)	(10)
North	(1)	(2)	(1)	(1)	(0)	(1)	(1)	(0)	(0)	(3)
Mohawk Valley	(2)	(3)	(2)	(1)	(0)	(2)	(1)	(1)	(1)	(4)
Capital	(11)	(7)	(6)	(2)	(5)	(11)	(6)	(6)	(6)	(15)
Hudson Valley	(1)	(2)	(2)	(1)	(1)	(4)	(2)	(1)	(2)	(4)
Millwood	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(1)
Dunwoodie	0	(1)	(1)	(0)	(0)	(2)	(1)	(0)	(1)	(2)
NY City	1	(6)	(5)	1	(3)	(19)	(10)	(1)	(3)	(14)
Long Island	(1)	(1)	(2)	(0)	(3)	(3)	(3)	(3)	(2)	(4)
NYCA Total	(23)	(40)	(33)	(10)	(14)	(52)	(32)	(14)	(16)	(70)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.13)	(0.26)	(0.25)	(0.12)	0.06	(0.12)	(0.14)	0.04	0.10	(0.38)
Genesee	(0.21)	(0.40)	(0.24)	(0.10)	(0.04)	(0.18)	(0.12)	(0.06)	(0.05)	(0.47)
Central	(0.22)	(0.41)	(0.26)	(0.13)	(0.05)	(0.23)	(0.15)	(0.08)	(0.08)	(0.54)
North	(0.13)	(0.39)	(0.23)	(0.12)	(0.02)	(0.17)	(0.11)	(0.05)	(0.07)	(0.50)
Mohawk Valley	(0.20)	(0.41)	(0.27)	(0.13)	(0.05)	(0.22)	(0.15)	(0.07)	(0.09)	(0.55)
Capital	(0.78)	(0.44)	(0.39)	(0.13)	(0.36)	(0.73)	(0.36)	(0.40)	(0.41)	(1.03)
Hudson Valley	(0.14)	(0.22)	(0.15)	(0.05)	(0.13)	(0.37)	(0.13)	(0.13)	(0.14)	(0.45)
Millwood	(0.06)	(0.16)	(0.10)	(0.02)	(0.09)	(0.34)	(0.10)	(0.09)	(0.10)	(0.37)
Dunwoodie	(0.04)	(0.16)	(0.09)	(0.01)	(0.09)	(0.33)	(0.09)	(0.08)	(0.09)	(0.35)
NY City	(0.03)	(0.14)	(0.09)	0.03	(0.07)	(0.29)	(0.12)	(0.04)	(0.06)	(0.31)
Long Island	(0.05)	(0.03)	(0.09)	0.01	(0.12)	(0.09)	(0.10)	(0.10)	(0.12)	(0.21)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	251	57	23	(285)	(446)	(136)	(46)	(401)	(386)	(190)
Genesee	(0)	0	(0)	(0)	(0)	(0)	(0)	0	(0)	(0)
Central	(203)	513	(88)	(0)	(19)	(22)	(64)	(37)	(45)	(23)
North	(0)	(0)	(0)	(0)	0	(0)	(0)	0	(0)	(0)
Mohawk Valley	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0	0
Capital	3	2	2	2	2	3	3	3	3	3
Hudson Valley	5	(1)	(14)	(15)	(0)	(2)	(25)	(32)	(3)	5
Millwood	0	(0)	0	0	0	0	(0)	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	2	1	1	6	(0)	3	1	9	(13)
Long Island	1	(3)	(2)	2	(3)	0	(1)	(3)	3	(3)
NYCA Total	**56**	**571**	**(78)**	**(294)**	**(459)**	**(157)**	**(131)**	**(469)**	**(420)**	**(220)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	0.0	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.1	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.1**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	98	40	35	(210)	(201)	(87)	(62)	(200)	(178)	(101)
Genesee	(2)	(0)	(4)	(2)	(10)	(15)	(4)	1	(6)	(13)
Central	(62)	(18)	(36)	(47)	(32)	(48)	(63)	(51)	(43)	(90)
North	(9)	(4)	(4)	(1)	3	(3)	(5)	1	(1)	(1)
Mohawk Valley	9	(2)	(2)	(5)	(3)	(5)	(11)	(12)	7	7
Capital	23	17	15	19	15	22	18	23	23	24
Hudson Valley	(10)	(3)	(14)	(22)	(27)	(22)	(10)	(35)	(13)	(8)
Millwood	1	0	1	(0)	1	0	(0)	1	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(59)	(92)	(51)	(29)	(57)	(76)	(59)	(84)	(103)	(94)
Long Island	8	(23)	12	4	(4)	(5)	(10)	(3)	11	(16)
NYCA Total	**(4)**	**(85)**	**(49)**	**(293)**	**(316)**	**(237)**	**(205)**	**(359)**	**(304)**	**(292)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.0)	(0.0)	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	0.0
Long Island	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	93	(0)	45	(154)	(184)	(90)	(34)	(188)	(191)	(121)
Genesee	(5)	0	(8)	(5)	(13)	(18)	(1)	(2)	(7)	(17)
Central	(70)	54	(42)	(61)	(21)	(3)	(107)	(32)	(70)	(70)
North	(37)	(20)	(28)	(8)	9	(8)	(22)	7	(2)	(5)
Mohawk Valley	10	(5)	(5)	(5)	(3)	(9)	(14)	(16)	7	7
Capital	533	396	335	360	340	478	416	460	470	526
Hudson Valley	(18)	(11)	(15)	(28)	(34)	(42)	(21)	(51)	(12)	(19)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(147)	(120)	(122)	(34)	(96)	(121)	(74)	(110)	(173)	(77)
Long Island	1	(31)	17	(29)	(6)	13	(5)	7	8	(9)
NYCA Total	**360**	**263**	**177**	**36**	**(7)**	**199**	**139**	**76**	**29**	**215**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.5	0.0	0.5	(1.6)	(2.0)	(1.3)	(0.5)	(3.1)	(3.4)	(2.2)
Genesee	(0.0)	0.0	(0.1)	(0.1)	(0.1)	(0.3)	(0.0)	(0.0)	(0.1)	(0.3)
Central	(0.4)	0.4	(0.4)	(0.6)	(0.2)	(0.1)	(1.7)	(0.5)	(1.2)	(1.3)
North	(0.2)	(0.2)	(0.3)	(0.1)	0.1	(0.1)	(0.3)	0.1	(0.0)	(0.1)
Mohawk Valley	0.1	(0.0)	(0.1)	(0.1)	(0.0)	(0.1)	(0.2)	(0.3)	0.1	0.1
Capital	3.1	3.2	3.4	3.8	3.7	7.0	6.5	7.6	8.2	9.7
Hudson Valley	(0.1)	(0.1)	(0.2)	(0.3)	(0.4)	(0.6)	(0.3)	(0.8)	(0.2)	(0.3)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.8)	(0.7)	(0.9)	(0.2)	(0.7)	(1.7)	(1.1)	(1.8)	(3.1)	(1.2)
Long Island	0.0	(0.2)	0.2	(0.3)	(0.1)	0.2	(0.1)	0.1	0.2	(0.2)
NYCA Total	**2.1**	**2.3**	**2.1**	**0.5**	**0.2**	**3.0**	**2.3**	**1.3**	**0.5**	**4.2**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.7	1.4	1.1	0.9	0.7	1.6	1.0	1.0	1.8	2.7
Genesee	0.2	0.5	0.5	0.5	0.4	0.7	0.6	0.6	0.9	1.2
Central	0.3	0.2	0.3	0.3	0.2	0.5	0.4	0.4	0.4	0.7
North	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.3
Mohawk Valley	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Capital	(0.2)	(0.0)	(0.1)	0.2	0.2	(0.1)	(0.0)	0.4	0.2	(0.3)
Hudson Valley	0.4	0.2	0.1	0.1	0.2	0.5	0.1	0.4	0.3	0.2
Millwood	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.1	0.1	0.1
Dunwoodie	0.3	0.2	0.1	0.1	0.2	0.4	0.1	0.3	0.3	0.2
NY City	3.2	1.8	1.4	0.9	1.9	3.8	1.4	3.1	3.3	2.3
Long Island	1.3	0.7	0.4	0.4	0.9	1.5	0.7	1.5	1.4	1.0
NYCA Total	**6.5**	**5.2**	**4.1**	**3.5**	**4.9**	**9.3**	**4.7**	**7.9**	**9.1**	**8.5**

Generic DR Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	(0)	(0)	(0)	(0)	0	0	0	(0)	0
Genesee	(0)	0	(0)	0	(0)	0	0	0	(0)	(0)
Central	0	(0)	(0)	(0)	(0)	0	0	0	(0)	0
North	(0)	0	0	0	0	0	0	0	0	0
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	0	0	(0)	(0)	(0)
Capital	(0)	(0)	(0)	(0)	(0)	0	(0)	0	(0)	0
Hudson Valley	(1)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(1)	(1)
Millwood	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Dunwoodie	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
NY City	(6)	(4)	(7)	(4)	(2)	(0)	(5)	(4)	(8)	(11)
Long Island	(3)	0	(1)	(1)	(0)	0	(0)	(1)	(3)	(4)
NYCA Total	**(10)**	**(5)**	**(10)**	**(5)**	**(3)**	**(0)**	**(5)**	**(6)**	**(12)**	**(17)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	0	(2)	0	(1)	0	0	(0)	0	0
Genesee	0	0	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)
Central	0	(0)	0	(0)	0	0	(1)	0	(0)	1
North	0	(0)	(0)	0	0	0	(0)	(0)	(0)	(0)
Mohawk Valley	0	0	(0)	(0)	(0)	(0)	0	0	0	0
Capital	0	(0)	(0)	(0)	0	0	(0)	(0)	(0)	0
Hudson Valley	(0)	0	(1)	(1)	(0)	(1)	(1)	(2)	(3)	(2)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(0)	(1)	(1)	(1)	(3)	(1)	(1)	(2)	(1)	(4)
Long Island	(0)	(0)	0	(0)	0	(0)	(0)	(0)	(0)	(0)
NYCA Total	**0**	**(1)**	**(3)**	**(2)**	**(3)**	**(2)**	**(2)**	**(4)**	**(4)**	**(5)**
NYCA Imports	(1)	(1)	(1)	(2)	(1)	(2)	(2)	(1)	(2)	(1)
NYCA Exports	3	2	1	1	2	2	2	1	1	1
NYCA + Imports - Exports	**(4)**	**(4)**	**(5)**	**(4)**	**(5)**	**(5)**	**(6)**	**(6)**	**(6)**	**(7)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	1	(33)	2	6	2	1	(3)	2	3
Genesee	(0)	0	(1)	(1)	(1)	(1)	(0)	(0)	(0)	(0)
Central	7	(3)	(1)	(6)	3	0	(7)	2	(0)	9
North	0	(2)	(2)	0	2	0	(0)	(2)	(1)	(0)
Mohawk Valley	1	1	(0)	(0)	(1)	(1)	0	0	0	0
Capital	37	26	27	28	28	26	19	22	25	21
Hudson Valley	17	23	6	8	21	4	12	(5)	(9)	2
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	18	10	16	11	(22)	16	13	5	9	(21)
Long Island	0	(7)	2	(2)	2	(1)	(1)	(0)	1	2
NYCA Total	**81**	**49**	**13**	**41**	**39**	**46**	**37**	**20**	**27**	**14**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	2	(11)	(8)	(3)	(3)	(13)	(3)	1	(3)	2
LINDEN VFT	(1)	(3)	(0)	(4)	(3)	(3)	0	(0)	(1)	(3)
NEPTUNE	(5)	(0)	(5)	(2)	0	0	(3)	2	(2)	0
HTP	1	(7)	(13)	(1)	(1)	(7)	(6)	2	(6)	(0)
ISONE - NYISO	(94)	(35)	(9)	(29)	(28)	(20)	(28)	(18)	(10)	(8)
CROSS SOUND CABLE	6	3	2	1	(2)	0	2	(2)	1	(0)
NORTHPORT NORWALK	1	1	0	1	(1)	(1)	(1)	1	(0)	(1)
IESO - NYISO	8	1	12	(7)	(0)	(8)	0	(7)	(7)	(5)
HQ - NYISO CHAT	(0)	0	0	0	1	0	0	0	0	0
HQ - NYISO CEDARS	(0)	0	0	0	0	0	0	0	0	0
TOTAL	**(82)**	**(51)**	**(19)**	**(44)**	**(36)**	**(50)**	**(39)**	**(22)**	**(29)**	**(14)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	(0)	(1)	0	0	(1)	(1)	(0)	0	1
Genesee	0	(0)	0	(0)	(0)	(0)	(0)	(0)	0	0
Central	1	(1)	1	(0)	0	(1)	(2)	(0)	(0)	1
North	0	(0)	0	0	0	(0)	(0)	(0)	(0)	0
Mohawk Valley	0	(0)	0	(0)	(0)	(0)	(0)	0	0	0
Capital	3	1	1	1	1	1	1	1	2	3
Hudson Valley	1	1	0	1	2	0	1	(0)	(1)	0
Millwood	(0)	(1)	(0)	(0)	(0)	(1)	(1)	(0)	(1)	(0)
Dunwoodie	0	0	0	0	0	0	(0)	0	0	0
NY City	(0)	(2)	(1)	(1)	(2)	(1)	(2)	(2)	(2)	(5)
Long Island	(1)	(1)	(0)	(1)	(0)	(1)	(1)	(1)	(1)	(1)
NYCA Total	5	(3)	1	(0)	1	(4)	(5)	(3)	(3)	(2)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	(0)	0	(0)	0	(0)	(0)	(0)	(0)	1
Genesee	0	(0)	0	0	0	(0)	(0)	(0)	0	0
Central	1	(0)	1	(0)	0	(1)	(0)	(0)	0	0
North	0	(0)	0	(0)	0	(0)	(0)	(0)	0	0
Mohawk Valley	0	(0)	0	(0)	0	(0)	(0)	(0)	(0)	0
Capital	1	(0)	(0)	(0)	(0)	(1)	(1)	(0)	(0)	0
Hudson Valley	(0)	(1)	(0)	(0)	(0)	(1)	(1)	(0)	(1)	(0)
Millwood	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Dunwoodie	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
NY City	(3)	(6)	(5)	(4)	(2)	(3)	(7)	(5)	(7)	(9)
Long Island	(1)	(1)	(0)	(1)	(0)	(1)	(1)	(1)	(2)	(3)
NYCA Total	(2)	(9)	(4)	(6)	(3)	(9)	(12)	(7)	(11)	(11)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.02	(0.02)	0.03	0.00	0.00	(0.02)	(0.02)	0.00	0.00	0.03
Genesee	0.03	(0.01)	0.03	0.00	0.00	(0.03)	(0.02)	0.00	0.00	0.02
Central	0.03	(0.02)	0.03	0.00	0.00	(0.03)	(0.02)	(0.01)	0.00	0.02
North	0.03	(0.01)	0.03	0.00	0.00	(0.03)	(0.02)	(0.01)	0.00	0.02
Mohawk Valley	0.03	(0.02)	0.03	0.00	0.00	(0.03)	(0.02)	(0.01)	0.00	0.02
Capital	0.03	(0.02)	0.00	(0.01)	(0.02)	(0.04)	(0.03)	(0.01)	(0.01)	0.02
Hudson Valley	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.03)	(0.04)	(0.02)	(0.03)	(0.02)
Millwood	(0.01)	(0.04)	(0.02)	(0.02)	(0.01)	(0.03)	(0.04)	(0.02)	(0.04)	(0.04)
Dunwoodie	(0.02)	(0.04)	(0.02)	(0.02)	(0.01)	(0.03)	(0.04)	(0.02)	(0.04)	(0.04)
NY City	(0.03)	(0.06)	(0.05)	(0.04)	(0.02)	(0.03)	(0.07)	(0.05)	(0.07)	(0.08)
Long Island	(0.02)	(0.01)	0.00	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	6	2	(96)	4	18	3	(1)	(1)	1	(11)
Genesee	0	0	0	0	0	0	0	0	0	0
Central	3	0	3	(0)	0	(1)	(0)	0	0	18
North	0	(0)	0	0	0	0	0	(0)	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	0	0	0	0	0	(0)	(0)	(0)	0	(0)
Hudson Valley	(7)	0	(0)	(0)	0	(4)	(7)	(1)	(2)	(13)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	(1)	(1)	(0)	(1)	(1)	(0)	(1)	(1)	(1)
Long Island	(0)	0	0	(0)	1	(0)	0	0	(0)	(3)
NYCA Total	**1**	**2**	**(94)**	**3**	**18**	**(2)**	**(8)**	**(3)**	**(2)**	**(10)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	3	(0)	(61)	3	11	1	(0)	(1)	1	(7)
Genesee	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	2	0	1	(4)	0	4	(5)	(0)	(0)	8
North	0	(0)	(0)	0	0	0	(0)	(0)	(0)	(0)
Mohawk Valley	0	0	(0)	(0)	(0)	(0)	0	0	0	0
Capital	(0)	(0)	0	(1)	0	(0)	(0)	(0)	(0)	0
Hudson Valley	0	0	(8)	(2)	(1)	(4)	(3)	(16)	(26)	(18)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(2)	(25)	(19)	(10)	(17)	(14)	(13)	(26)	(12)	(16)
Long Island	(3)	(6)	(2)	(3)	0	(6)	(5)	(5)	(7)	(9)
NYCA Total	**(0)**	**(30)**	**(89)**	**(18)**	**(6)**	**(19)**	**(26)**	**(49)**	**(43)**	**(42)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	4	1	(41)	2	4	1	(0)	(1)	1	(3)
Genesee	0	0	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)
Central	2	(1)	1	(3)	1	2	(5)	1	(0)	9
North	0	(1)	(1)	0	1	0	(0)	(1)	(0)	(0)
Mohawk Valley	0	0	(0)	(0)	(0)	(0)	0	0	0	0
Capital	3	(1)	(0)	(1)	2	0	(1)	(3)	(0)	(1)
Hudson Valley	(2)	2	(10)	(8)	(1)	(11)	(5)	(19)	(23)	(16)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	(9)	(6)	(5)	(32)	(5)	(6)	(13)	(8)	(27)
Long Island	(0)	(5)	1	(2)	1	(1)	(1)	(1)	0	1
NYCA Total	**6**	**(13)**	**(56)**	**(18)**	**(23)**	**(12)**	**(18)**	**(35)**	**(31)**	**(37)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.4)	0.0	0.1	0.0	0.0	(0.0)	0.0	(0.1)
Genesee	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	(0.0)	0.0	(0.0)	0.0	0.0	(0.1)	0.0	0.0	0.2
North	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0	(0.0)	(0.0)	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0
Capital	0.0	(0.0)	0.0	(0.0)	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)
Hudson Valley	(0.0)	0.0	(0.1)	(0.1)	(0.0)	(0.2)	(0.1)	(0.3)	(0.4)	(0.3)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.0)	(0.1)	(0.0)	(0.0)	(0.4)	(0.1)	(0.1)	(0.2)	(0.1)	(0.5)
Long Island	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	0.0
NYCA Total	**0.0**	**(0.1)**	**(0.5)**	**(0.2)**	**(0.3)**	**(0.2)**	**(0.2)**	**(0.6)**	**(0.5)**	**(0.7)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	(0.0)
Genesee	(0.1)	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Central	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0
Capital	0.0	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)
Hudson Valley	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	0.0	0.0
Millwood	0.0	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0
Dunwoodie	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0	(0.0)	0.0	0.0	0.0
NY City	0.0	(0.1)	(0.2)	(0.1)	0.2	(0.1)	(0.2)	(0.1)	0.1	0.4
Long Island	0.1	0.0	(0.0)	0.0	0.1	0.0	(0.1)	0.0	0.1	0.2
NYCA Total	**(0.1)**	**(0.1)**	**(0.2)**	**(0.2)**	**0.2**	**(0.0)**	**(0.4)**	**(0.2)**	**0.1**	**0.5**

Generic EE Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	(1)	0	(0)	(1)	(1)	(1)	(0)	(1)	(0)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	(1)	(1)	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(12)	(12)	(12)	(13)	(19)	(11)	(12)	(11)	(14)	(13)
Hudson Valley	(9)	(7)	(8)	(8)	(11)	(7)	(7)	(7)	(9)	(9)
Millwood	(1)	(1)	(1)	(1)	(2)	(1)	(1)	(1)	(1)	(1)
Dunwoodie	(2)	(2)	(1)	(2)	(3)	(1)	(2)	(2)	(3)	(3)
NY City	(27)	(24)	(24)	(24)	(39)	(22)	(29)	(25)	(38)	(41)
Long Island	(3)	2	1	0	(5)	0	0	(1)	(2)	(4)
NYCA Total	**(55)**	**(46)**	**(45)**	**(48)**	**(81)**	**(44)**	**(54)**	**(47)**	**(70)**	**(73)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2)	2	2	(1)	(1)	(1)	(1)	(5)	(8)	(10)
Genesee	0	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(0)
Central	(3)	(0)	(3)	1	2	(2)	(5)	(6)	2	(2)
North	(1)	(1)	(1)	(1)	(0)	(1)	(1)	(2)	(1)	(1)
Mohawk Valley	(0)	(0)	(0)	0	0	(0)	(0)	(1)	(0)	(0)
Capital	(37)	(41)	(45)	(40)	(42)	(53)	(57)	(55)	(60)	(59)
Hudson Valley	(3)	(4)	(1)	(2)	(1)	(4)	(3)	(6)	(4)	(5)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(32)	(33)	(37)	(36)	(44)	(44)	(43)	(43)	(52)	(54)
Long Island	(3)	(4)	(1)	(4)	(3)	(3)	(1)	(3)	(4)	(4)
NYCA Total	**(81)**	**(81)**	**(88)**	**(81)**	**(89)**	**(108)**	**(112)**	**(122)**	**(127)**	**(136)**
NYCA Imports	(12)	(18)	(18)	(23)	(25)	(30)	(29)	(25)	(34)	(28)
NYCA Exports	29	26	19	23	28	25	31	32	23	32
NYCA + Imports - Exports	**(122)**	**(125)**	**(126)**	**(127)**	**(142)**	**(163)**	**(172)**	**(179)**	**(185)**	**(195)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(27)	64	5	(17)	(51)	(26)	15	(68)	(97)	(154)
Genesee	(1)	(4)	(9)	(5)	(3)	(9)	(5)	(8)	(10)	(5)
Central	(51)	(40)	(72)	7	44	(33)	(75)	(101)	11	(37)
North	(28)	(21)	(20)	(17)	(7)	(14)	(18)	(31)	(13)	(15)
Mohawk Valley	(5)	(6)	(9)	0	(1)	(7)	(4)	(11)	(3)	(7)
Capital	(839)	(845)	(887)	(775)	(740)	(835)	(860)	(779)	(839)	(801)
Hudson Valley	(62)	(66)	(30)	(39)	(17)	(58)	(46)	(77)	(51)	(51)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(732)	(685)	(759)	(704)	(752)	(682)	(610)	(617)	(692)	(664)
Long Island	(63)	(66)	(25)	(60)	(47)	(35)	(14)	(45)	(52)	(35)
NYCA Total	**(1,807)**	**(1,670)**	**(1,806)**	**(1,610)**	**(1,573)**	**(1,698)**	**(1,617)**	**(1,737)**	**(1,745)**	**(1,768)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(220)	(221)	(166)	(226)	(252)	(144)	(172)	(113)	(142)	(143)
LINDEN VFT	(43)	(73)	(62)	(62)	(75)	(67)	(43)	(47)	(49)	(53)
NEPTUNE	(8)	(56)	(40)	(40)	(54)	(44)	(37)	(14)	(11)	(13)
HTP	(76)	(95)	(124)	(158)	(170)	(113)	(85)	(70)	(107)	(87)
ISONE - NYISO	(613)	(610)	(447)	(515)	(543)	(469)	(503)	(534)	(439)	(448)
CROSS SOUND CABLE	22	35	16	15	26	23	18	15	15	14
NORTHPORT NORWALK	19	43	11	31	36	29	17	19	17	16
IESO - NYISO	4	(52)	(54)	(66)	(7)	(113)	(154)	(87)	(91)	(71)
HQ - NYISO CHAT	0	0	0	1	1	0	0	0	0	1
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(916)**	**(1,029)**	**(867)**	**(1,021)**	**(1,038)**	**(899)**	**(960)**	**(829)**	**(806)**	**(784)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2)	(1)	(4)	(3)	(3)	(6)	(3)	(6)	(7)	(10)
Genesee	(0)	(1)	(1)	(1)	(0)	(1)	(1)	(1)	(1)	(1)
Central	(7)	(10)	(11)	(6)	1	(9)	(12)	(11)	(3)	(7)
North	(2)	(3)	(3)	(2)	(0)	(3)	(3)	(3)	(1)	(2)
Mohawk Valley	(1)	(1)	(1)	(1)	0	(1)	(1)	(1)	(0)	(1)
Capital	(43)	(49)	(53)	(49)	(51)	(62)	(67)	(62)	(71)	(68)
Hudson Valley	(3)	(4)	(2)	(3)	(1)	(5)	(4)	(7)	(5)	(6)
Millwood	(6)	(9)	(8)	(8)	(9)	(8)	(8)	(6)	(9)	(10)
Dunwoodie	0	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(40)	(44)	(46)	(45)	(53)	(54)	(56)	(53)	(64)	(70)
Long Island	(6)	(5)	(4)	(5)	(5)	(6)	(4)	(5)	(6)	(7)
NYCA Total	(110)	(127)	(131)	(122)	(120)	(155)	(159)	(155)	(168)	(183)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1)	(4)	(3)	(3)	(1)	(4)	(4)	(1)	(2)	(1)
Genesee	(1)	(2)	(2)	(2)	(0)	(2)	(2)	(1)	(1)	(1)
Central	(2)	(4)	(4)	(4)	(1)	(4)	(4)	(2)	(2)	(3)
North	(0)	(1)	(1)	(1)	0	(1)	(1)	(1)	(1)	(1)
Mohawk Valley	(1)	(2)	(2)	(2)	(0)	(2)	(2)	(1)	(1)	(2)
Capital	(51)	(57)	(56)	(58)	(65)	(71)	(75)	(76)	(81)	(83)
Hudson Valley	(41)	(44)	(43)	(45)	(49)	(55)	(58)	(59)	(63)	(66)
Millwood	(1)	(2)	(1)	(1)	(1)	(1)	(2)	(1)	(2)	(2)
Dunwoodie	(2)	(3)	(3)	(3)	(3)	(3)	(3)	(2)	(3)	(4)
NY City	(65)	(73)	(71)	(72)	(78)	(84)	(92)	(87)	(98)	(107)
Long Island	(5)	(3)	(4)	(3)	(5)	(6)	(5)	(3)	(4)	(8)
NYCA Total	(171)	(195)	(190)	(192)	(202)	(235)	(247)	(235)	(257)	(276)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.07)	(0.26)	(0.17)	(0.16)	(0.04)	(0.26)	(0.24)	(0.10)	(0.13)	(0.09)
Genesee	(0.11)	(0.23)	(0.23)	(0.19)	(0.02)	(0.22)	(0.19)	(0.12)	(0.10)	(0.11)
Central	(0.12)	(0.27)	(0.25)	(0.22)	(0.05)	(0.26)	(0.22)	(0.15)	(0.15)	(0.18)
North	(0.06)	(0.21)	(0.21)	(0.16)	0.03	(0.20)	(0.17)	(0.10)	(0.08)	(0.13)
Mohawk Valley	(0.13)	(0.27)	(0.27)	(0.22)	(0.06)	(0.26)	(0.24)	(0.16)	(0.17)	(0.21)
Capital	(0.49)	(0.69)	(0.61)	(0.63)	(0.83)	(0.73)	(0.75)	(0.64)	(0.81)	(0.81)
Hudson Valley	(0.40)	(0.53)	(0.48)	(0.47)	(0.54)	(0.52)	(0.54)	(0.44)	(0.57)	(0.61)
Millwood	(0.37)	(0.50)	(0.45)	(0.44)	(0.51)	(0.48)	(0.50)	(0.39)	(0.53)	(0.59)
Dunwoodie	(0.37)	(0.49)	(0.44)	(0.44)	(0.50)	(0.47)	(0.49)	(0.39)	(0.52)	(0.58)
NY City	(0.43)	(0.55)	(0.52)	(0.50)	(0.57)	(0.54)	(0.59)	(0.49)	(0.61)	(0.69)
Long Island	(0.20)	(0.16)	(0.18)	(0.16)	(0.21)	(0.23)	(0.17)	(0.14)	(0.14)	(0.26)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(94)	224	137	49	(45)	56	143	(70)	(163)	(423)
Genesee	0	0	(0)	0	0	(0)	0	(0)	(0)	0
Central	(90)	51	(129)	18	(1)	(1)	26	(0)	18	42
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	0	(0)	(0)	0	(0)	(0)	(0)
Capital	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Hudson Valley	(8)	(0)	13	0	16	(5)	(10)	(1)	18	(17)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(3)	(3)	(2)	(5)	(1)	(5)	(5)	(4)	(11)	(8)
Long Island	(2)	(5)	(3)	(8)	(4)	(0)	(2)	(4)	(0)	(5)
NYCA Total	**(198)**	**266**	**15**	**54**	**(36)**	**41**	**150**	**(82)**	**(140)**	**(412)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**(0.0)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(54)	97	89	33	(32)	4	56	(48)	(81)	(246)
Genesee	(0)	(1)	(3)	(2)	(1)	(2)	(1)	(2)	(3)	(1)
Central	(33)	(5)	(21)	(4)	(9)	(4)	(20)	(17)	1	(32)
North	(3)	(2)	(2)	(2)	(0)	(1)	(2)	(3)	(2)	(2)
Mohawk Valley	(1)	(2)	(2)	1	0	(2)	(2)	(3)	(0)	(2)
Capital	(19)	(19)	(19)	(17)	(16)	(18)	(17)	(17)	(17)	(18)
Hudson Valley	(34)	(40)	(20)	(16)	(5)	(29)	(32)	(47)	(38)	(30)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(159)	(159)	(166)	(141)	(144)	(198)	(161)	(158)	(177)	(162)
Long Island	(13)	(26)	(5)	(23)	(17)	(17)	(6)	(22)	(26)	(18)
NYCA Total	**(315)**	**(157)**	**(149)**	**(171)**	**(224)**	**(268)**	**(185)**	**(318)**	**(344)**	**(511)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(43)	79	39	3	(33)	0	32	(60)	(93)	(177)
Genesee	1	(1)	(4)	(2)	(2)	(4)	(2)	(4)	(5)	(2)
Central	(42)	0	(52)	9	13	(16)	(41)	(48)	9	(23)
North	(13)	(10)	(10)	(8)	(4)	(7)	(10)	(17)	(6)	(8)
Mohawk Valley	(2)	(3)	(4)	1	(0)	(3)	(2)	(6)	(1)	(3)
Capital	(346)	(355)	(373)	(319)	(310)	(350)	(355)	(322)	(342)	(331)
Hudson Valley	(42)	(43)	(20)	(24)	(12)	(41)	(31)	(54)	(33)	(37)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(365)	(341)	(375)	(341)	(382)	(349)	(317)	(310)	(352)	(348)
Long Island	(34)	(39)	(13)	(36)	(28)	(21)	(8)	(26)	(32)	(21)
NYCA Total	**(886)**	**(714)**	**(811)**	**(718)**	**(759)**	**(791)**	**(734)**	**(848)**	**(855)**	**(951)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.2)	0.6	0.4	0.0	(0.4)	0.0	0.5	(1.0)	(1.6)	(3.3)
Genesee	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.0)
Central	(0.2)	0.0	(0.5)	0.1	0.1	(0.2)	(0.6)	(0.8)	0.2	(0.4)
North	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.3)	(0.1)	(0.2)
Mohawk Valley	(0.0)	(0.0)	(0.0)	0.0	0.0	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)
Capital	(2.0)	(2.8)	(3.8)	(3.3)	(3.4)	(5.1)	(5.6)	(5.3)	(6.0)	(6.1)
Hudson Valley	(0.2)	(0.3)	(0.2)	(0.3)	(0.1)	(0.6)	(0.5)	(0.9)	(0.6)	(0.7)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(1.7)	(2.2)	(3.0)	(2.8)	(3.2)	(4.8)	(4.6)	(4.9)	(5.9)	(6.1)
Long Island	(0.2)	(0.3)	(0.1)	(0.4)	(0.3)	(0.3)	(0.1)	(0.4)	(0.6)	(0.4)
NYCA Total	**(4.7)**	**(5.1)**	**(7.4)**	**(6.8)**	**(7.4)**	**(11.3)**	**(11.2)**	**(13.8)**	**(14.7)**	**(17.2)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.4	0.7	0.9	0.8	0.5	0.9	0.8	0.6	0.9	1.3
Genesee	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.7
Central	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.4
North	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1
Mohawk Valley	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)
Capital	(1.6)	(2.2)	(2.2)	(2.3)	(2.5)	(2.8)	(3.0)	(3.1)	(3.2)	(3.4)
Hudson Valley	(0.2)	(0.6)	(0.7)	(0.6)	(0.6)	(0.7)	(1.0)	(1.0)	(1.0)	(1.0)
Millwood	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)
Dunwoodie	(0.0)	(0.0)	(0.0)	0.0	0.1	0.0	(0.1)	(0.0)	0.0	(0.1)
NY City	(0.1)	(0.7)	(0.8)	(0.4)	0.0	(0.5)	(1.6)	(1.4)	(0.6)	(1.4)
Long Island	0.3	0.2	0.1	0.3	0.5	0.4	0.0	0.3	0.7	0.2
NYCA Total	**(1.0)**	**(2.0)**	**(2.1)**	**(1.6)**	**(1.5)**	**(2.1)**	**(4.2)**	**(4.0)**	**(2.4)**	**(3.3)**

H.3. Study 3: West

Generic Transmission Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(15)	(25)	(29)	(30)	(30)	(33)	(37)	(33)	(38)	(38)
Genesee	1	2	1	2	1	0	0	0	(0)	0
Central	(2)	(2)	(3)	(3)	(3)	(2)	(1)	(1)	(2)	(1)
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	(0)	(0)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(1)	(1)	(8)	(6)	(3)	(2)	0	1	(2)	2
Hudson Valley	(0)	(1)	(4)	(3)	(2)	(1)	1	0	(1)	0
Millwood	(0)	(0)	(1)	(1)	(1)	(0)	0	(0)	(0)	0
Dunwoodie	(0)	(0)	(3)	(2)	(1)	(0)	0	0	(1)	(0)
NY City	(1)	(2)	(24)	(14)	(10)	(2)	5	1	(6)	1
Long Island	(1)	1	(10)	(5)	(3)	(0)	1	(3)	(5)	(0)
NYCA Total	**(18)**	**(29)**	**(81)**	**(61)**	**(51)**	**(41)**	**(30)**	**(36)**	**(55)**	**(36)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(14)	(28)	(51)	(53)	(49)	(77)	(80)	(86)	(86)	(81)
Genesee	0	1	1	1	1	0	0	(0)	0	0
Central	11	20	22	30	27	23	23	18	26	23
North	1	2	3	4	4	5	4	4	4	5
Mohawk Valley	1	1	3	4	3	3	3	3	4	3
Capital	(5)	2	(9)	(6)	(6)	5	5	4	6	(0)
Hudson Valley	(0)	3	(0)	(1)	(0)	(0)	1	(3)	(1)	(2)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(3)	(4)	5	3	7	2	4	11	3	1
Long Island	2	(0)	(2)	(0)	1	(0)	(0)	2	(1)	0
NYCA Total	**(7)**	**(4)**	**(27)**	**(18)**	**(12)**	**(40)**	**(39)**	**(49)**	**(46)**	**(51)**
NYCA Imports	1	(1)	0	(1)	(5)	2	4	13	9	15
NYCA Exports	8	10	(3)	4	6	(3)	(5)	2	(6)	(3)
NYCA + Imports - Exports	**(14)**	**(15)**	**(24)**	**(23)**	**(23)**	**(35)**	**(30)**	**(38)**	**(32)**	**(33)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(216)	(467)	(918)	(882)	(771)	(1,110)	(1,152)	(1,162)	(1,128)	(1,006)
Genesee	7	19	15	19	16	5	2	(6)	2	1
Central	326	492	573	684	583	422	419	323	427	336
North	28	36	62	81	86	81	72	52	53	65
Mohawk Valley	31	32	75	75	66	46	54	38	57	40
Capital	(109)	30	(191)	(139)	(100)	112	96	58	99	15
Hudson Valley	(6)	42	(4)	(9)	2	(2)	10	(22)	(23)	(16)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(68)	(66)	135	75	161	34	61	171	37	25
Long Island	38	(5)	(18)	(2)	13	(0)	(9)	22	(9)	2
NYCA Total	**32**	**113**	**(271)**	**(98)**	**55**	**(412)**	**(446)**	**(526)**	**(484)**	**(539)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(258)	(330)	(243)	(324)	(386)	(95)	(72)	(70)	(40)	(46)
LINDEN VFT	(0)	5	16	27	23	(5)	1	8	(0)	2
NEPTUNE	(9)	24	14	53	32	17	29	15	7	49
HTP	(22)	23	12	70	56	(38)	(53)	13	(18)	11
ISONE - NYISO	(93)	(177)	53	(60)	(110)	(12)	11	(66)	78	73
CROSS SOUND CABLE	(8)	4	7	(21)	(22)	(0)	(1)	(0)	1	(22)
NORTHPORT NORWALK	(6)	(12)	13	(9)	(6)	4	(8)	(16)	14	(15)
IESO - NYISO	379	360	378	358	346	498	492	581	395	442
HQ - NYISO CHAT	2	2	2	2	3	2	2	2	2	2
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(16)**	**(99)**	**252**	**97**	**(65)**	**372**	**401**	**465**	**439**	**497**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1)	(14)	(26)	(28)	(27)	(56)	(66)	(62)	(65)	(61)
Genesee	1	1	3	3	3	1	1	2	2	2
Central	13	17	33	35	31	29	26	30	33	28
North	1	1	6	5	6	5	4	5	5	5
Mohawk Valley	1	1	4	4	3	3	3	3	4	3
Capital	(4)	(1)	(12)	(10)	(6)	3	5	7	6	4
Hudson Valley	(0)	2	(0)	(1)	(0)	(0)	1	(2)	(2)	(1)
Millwood	1	(2)	(1)	(1)	(1)	(1)	(1)	3	0	1
Dunwoodie	0	0	0	0	0	(0)	(0)	0	(0)	0
NY City	(1)	(7)	4	2	7	2	5	16	5	2
Long Island	2	(1)	(2)	(0)	1	0	(0)	3	(1)	1
NYCA Total	13	(3)	10	10	16	(14)	(24)	6	(12)	(18)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(12)	(24)	(20)	(24)	(24)	(27)	(33)	(25)	(30)	(32)
Genesee	2	1	5	4	3	2	1	4	3	2
Central	(1)	(4)	3	0	(1)	(1)	(2)	2	1	(1)
North	0	(0)	2	1	1	0	(0)	1	1	0
Mohawk Valley	0	(1)	2	1	1	0	(1)	2	1	0
Capital	0	(2)	(3)	(3)	(1)	(2)	(1)	3	(0)	3
Hudson Valley	0	(1)	(1)	(1)	(0)	(0)	(0)	2	0	1
Millwood	0	(0)	(0)	(0)	(0)	(0)	(0)	1	0	0
Dunwoodie	0	(1)	(0)	(0)	(0)	(0)	(0)	1	0	0
NY City	2	(8)	(4)	(3)	(2)	(2)	(0)	9	1	3
Long Island	1	(1)	(1)	0	1	(0)	(1)	2	(1)	1
NYCA Total	(7)	(42)	(17)	(23)	(24)	(30)	(37)	1	(24)	(23)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.83)	(1.47)	(1.25)	(1.44)	(1.50)	(1.68)	(2.07)	(1.57)	(1.87)	(1.98)
Genesee	0.21	0.14	0.59	0.49	0.39	0.24	0.14	0.41	0.32	0.24
Central	(0.04)	(0.20)	0.22	0.07	0.01	(0.04)	(0.10)	0.17	0.07	(0.02)
North	0.02	(0.09)	0.37	0.22	0.16	0.05	(0.06)	0.22	0.14	0.02
Mohawk Valley	0.01	(0.12)	0.31	0.17	0.10	0.01	(0.08)	0.21	0.10	0.01
Capital	(0.01)	(0.17)	(0.18)	(0.16)	(0.10)	(0.14)	(0.04)	0.22	(0.04)	0.19
Hudson Valley	0.01	(0.12)	(0.03)	(0.03)	(0.04)	(0.04)	(0.02)	0.18	0.01	0.09
Millwood	0.02	(0.12)	(0.05)	(0.03)	(0.05)	(0.04)	(0.02)	0.17	0.00	0.06
Dunwoodie	0.02	(0.12)	(0.04)	(0.03)	(0.05)	(0.04)	(0.02)	0.17	0.00	0.06
NY City	0.01	(0.11)	(0.03)	(0.01)	(0.04)	(0.02)	0.00	0.16	0.01	0.07
Long Island	0.02	(0.04)	(0.04)	0.03	0.04	(0.01)	(0.04)	0.07	(0.07)	0.04

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(644)	(712)	(1,069)	(923)	(873)	(926)	(1,022)	(1,157)	(1,175)	(1,047)
Genesee	0	0	0	0	0	0	0	0	0	0
Central	(2)	549	111	20	1	19	21	(18)	1	(1)
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	(0)	0	(0)	(0)	(0)	0	0	0	0	0
Hudson Valley	1	0	(1)	1	0	(0)	(4)	(27)	(1)	0
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(0)	(0)	0	0	(0)	(0)	0	1	0	(1)
Long Island	2	(1)	1	2	(1)	2	(1)	(3)	(1)	(1)
NYCA Total	**(644)**	**(164)**	**(958)**	**(899)**	**(874)**	**(905)**	**(1,006)**	**(1,204)**	**(1,175)**	**(1,049)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.0)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(33)	(52)	(151)	(178)	(129)	(188)	(305)	(387)	(360)	(320)
Genesee	4	7	6	6	5	4	3	0	2	2
Central	32	48	34	74	42	49	46	35	44	51
North	2	3	6	8	8	8	7	5	5	6
Mohawk Valley	11	9	22	24	22	16	16	10	16	11
Capital	(2)	1	(3)	(0)	(1)	3	3	2	3	2
Hudson Valley	(3)	23	(5)	(2)	3	(1)	6	(18)	(19)	(13)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(8)	(22)	0	(6)	20	(12)	6	39	22	13
Long Island	15	(1)	2	(0)	2	(0)	(1)	14	3	(0)
NYCA Total	**19**	**16**	**(89)**	**(75)**	**(29)**	**(122)**	**(218)**	**(299)**	**(282)**	**(248)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(265)	(447)	(798)	(763)	(679)	(888)	(923)	(961)	(935)	(841)
Genesee	4	11	8	10	9	3	1	(3)	1	0
Central	147	286	261	323	258	186	180	141	186	157
North	16	20	35	45	48	44	40	29	30	35
Mohawk Valley	17	17	39	41	35	24	28	20	31	21
Capital	(54)	9	(83)	(63)	(48)	44	37	21	39	3
Hudson Valley	(6)	30	(4)	(5)	(1)	(1)	7	(18)	(15)	(13)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(37)	(37)	50	28	69	13	32	88	26	13
Long Island	24	(2)	(9)	1	8	1	(6)	14	(5)	2
NYCA Total	**(154)**	**(114)**	**(499)**	**(382)**	**(301)**	**(574)**	**(604)**	**(669)**	**(642)**	**(622)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1.5)	(3.6)	(8.1)	(8.0)	(7.5)	(13.0)	(14.5)	(15.9)	(16.4)	(15.6)
Genesee	0.0	0.1	0.1	0.1	0.1	0.0	0.0	(0.1)	0.0	0.0
Central	0.8	2.3	2.6	3.4	2.8	2.7	2.8	2.3	3.3	2.9
North	0.1	0.2	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.6
Mohawk Valley	0.1	0.1	0.4	0.4	0.4	0.4	0.4	0.3	0.5	0.4
Capital	(0.3)	0.1	(0.8)	(0.7)	(0.5)	0.6	0.6	0.3	0.7	0.1
Hudson Valley	(0.0)	0.2	(0.0)	(0.1)	(0.0)	(0.0)	0.1	(0.3)	(0.3)	(0.2)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.2)	(0.2)	0.6	0.1	0.6	0.1	0.5	1.3	0.4	0.2
Long Island	0.1	(0.0)	(0.1)	0.0	0.1	0.0	(0.1)	0.2	(0.1)	0.0
NYCA Total	**(0.9)**	**(0.8)**	**(5.0)**	**(4.2)**	**(3.5)**	**(8.5)**	**(9.5)**	**(11.3)**	**(11.3)**	**(11.6)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	1.1	1.4	1.6	1.9	3.4	3.9	3.0	3.7	3.4
Genesee	0.3	0.6	0.7	0.7	0.9	1.6	1.8	1.7	1.8	1.8
Central	(0.1)	(0.3)	(0.3)	(0.2)	(0.2)	0.2	0.2	0.3	0.3	0.2
North	(0.0)	0.1	(0.1)	(0.1)	(0.1)	(0.0)	0.0	(0.1)	(0.0)	(0.1)
Mohawk Valley	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Capital	0.2	0.1	0.4	0.4	0.4	(0.2)	(0.2)	(0.1)	(0.1)	(0.0)
Hudson Valley	0.1	0.2	0.1	0.2	0.1	0.0	(0.1)	(0.2)	0.0	(0.0)
Millwood	0.0	0.1	0.0	0.1	0.0	0.0	(0.0)	(0.1)	0.0	0.0
Dunwoodie	0.1	0.1	0.1	0.1	0.1	0.0	(0.0)	(0.2)	0.0	(0.0)
NY City	0.5	1.4	0.7	1.4	0.7	0.1	(0.4)	(1.7)	0.2	(0.2)
Long Island	0.2	0.6	0.3	0.6	0.3	(0.1)	(0.2)	(0.6)	(0.1)	(0.2)
NYCA Total	**1.1**	**3.9**	**3.3**	**4.8**	**3.9**	**5.0**	**5.0**	**2.0**	**5.7**	**4.9**

Generic Generation Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(11)	(16)	(17)	(19)	(17)	(21)	(26)	(22)	(26)	(27)
Genesee	2	3	3	3	3	2	2	2	2	2
Central	1	0	0	1	0	(0)	0	0	0	(0)
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	1	0	0	1	1	0	0	1	0	0
Capital	11	14	14	18	16	10	13	15	12	10
Hudson Valley	9	9	8	10	9	6	8	8	7	7
Millwood	3	3	3	3	3	2	2	3	2	2
Dunwoodie	6	6	5	6	6	4	5	5	5	5
NY City	56	51	48	62	51	36	44	50	45	45
Long Island	24	28	24	30	26	21	23	19	19	22
NYCA Total	**103**	**98**	**89**	**115**	**97**	**58**	**71**	**81**	**67**	**65**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	96	93	73	79	85	97	109	102	117	121
Genesee	(2)	(1)	(2)	(2)	(2)	(4)	(3)	(4)	(4)	(5)
Central	(17)	(13)	(8)	(9)	(9)	(10)	(28)	(18)	(26)	(23)
North	(6)	(3)	(2)	(2)	1	(1)	(4)	(1)	(1)	(2)
Mohawk Valley	(1)	(2)	(1)	(2)	(1)	(3)	(3)	(4)	(1)	(1)
Capital	1	(13)	(10)	(12)	(7)	(14)	(21)	(26)	(13)	(14)
Hudson Valley	(4)	(2)	(3)	(1)	(3)	(4)	(2)	(8)	(3)	(4)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(27)	(26)	(26)	(23)	(18)	(38)	(43)	(26)	(43)	(37)
Long Island	1	(2)	1	(4)	1	(2)	(1)	(2)	(4)	1
NYCA Total	**42**	**30**	**22**	**25**	**46**	**21**	**3**	**14**	**22**	**34**
NYCA Imports	(16)	(22)	(23)	(27)	(33)	(34)	(25)	(23)	(33)	(36)
NYCA Exports	38	25	14	15	27	20	22	25	18	39
NYCA + Imports - Exports	**(12)**	**(17)**	**(15)**	**(18)**	**(14)**	**(33)**	**(44)**	**(34)**	**(29)**	**(41)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	3,023	2,918	2,384	2,410	2,323	2,520	2,553	2,396	2,533	2,531
Genesee	(53)	(29)	(41)	(35)	(38)	(82)	(55)	(65)	(70)	(84)
Central	(414)	(336)	(177)	(241)	(162)	(147)	(401)	(281)	(458)	(285)
North	(144)	(66)	(55)	(38)	19	(22)	(77)	(9)	(18)	(35)
Mohawk Valley	(27)	(39)	(28)	(32)	(20)	(49)	(60)	(66)	(17)	(15)
Capital	(209)	(379)	(274)	(203)	(85)	(315)	(428)	(426)	(239)	(345)
Hudson Valley	(67)	(41)	(44)	(6)	(36)	(47)	(9)	(76)	(33)	(34)
Millwood	0	0	0	(0)	0	0	(0)	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(660)	(626)	(657)	(389)	(385)	(623)	(451)	(512)	(672)	(462)
Long Island	39	(40)	33	(94)	10	(22)	(22)	(6)	(38)	4
NYCA Total	**1,488**	**1,364**	**1,142**	**1,371**	**1,624**	**1,214**	**1,050**	**955**	**989**	**1,276**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(488)	(500)	(422)	(557)	(578)	(329)	(299)	(267)	(312)	(315)
LINDEN VFT	(26)	(35)	(30)	(70)	(95)	(52)	(12)	(23)	(10)	(35)
NEPTUNE	15	44	82	62	(61)	7	(1)	2	42	34
HTP	2	(17)	(13)	(41)	(9)	(69)	(27)	(32)	(31)	(33)
ISONE - NYISO	(539)	(550)	(363)	(497)	(606)	(452)	(433)	(442)	(346)	(552)
CROSS SOUND CABLE	4	10	(51)	(2)	29	22	24	16	(13)	(8)
NORTHPORT NORWALK	(22)	(11)	(49)	3	(2)	3	(1)	7	5	(13)
IESO - NYISO	(244)	(94)	(119)	(81)	(112)	(145)	(113)	(41)	(132)	(173)
HQ - NYISO CHAT	(2)	(2)	(1)	(2)	(1)	(2)	(2)	(2)	(2)	(2)
HQ - NYISO CEDARS	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
TOTAL	**(1,299)**	**(1,156)**	**(967)**	**(1,185)**	**(1,436)**	**(1,018)**	**(863)**	**(781)**	**(799)**	**(1,095)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	79	79	63	65	70	89	94	100	107	109
Genesee	(7)	(7)	(7)	(7)	(7)	(9)	(8)	(8)	(9)	(11)
Central	(49)	(51)	(42)	(46)	(44)	(39)	(54)	(41)	(56)	(52)
North	(15)	(14)	(12)	(13)	(10)	(11)	(13)	(8)	(9)	(12)
Mohawk Valley	(5)	(6)	(5)	(7)	(6)	(7)	(8)	(7)	(5)	(6)
Capital	(3)	(16)	(12)	(12)	(6)	(21)	(24)	(22)	(15)	(24)
Hudson Valley	(3)	(2)	(3)	(1)	(3)	(4)	(2)	(7)	(3)	(4)
Millwood	(1)	(6)	(5)	(5)	(5)	(7)	(4)	0	(2)	(5)
Dunwoodie	0	0	(0)	(0)	(0)	(0)	(0)	0	(0)	(0)
NY City	(24)	(32)	(33)	(26)	(26)	(44)	(38)	(29)	(46)	(39)
Long Island	3	(3)	1	(4)	(1)	(5)	(2)	(1)	(4)	(0)
NYCA Total	(25)	(57)	(55)	(57)	(37)	(58)	(58)	(21)	(44)	(45)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(34)	(42)	(40)	(46)	(42)	(46)	(52)	(45)	(51)	(55)
Genesee	(10)	(12)	(10)	(12)	(11)	(12)	(11)	(9)	(11)	(12)
Central	(17)	(21)	(19)	(22)	(21)	(20)	(19)	(15)	(17)	(21)
North	(5)	(6)	(5)	(6)	(7)	(7)	(7)	(6)	(7)	(8)
Mohawk Valley	(7)	(9)	(8)	(9)	(9)	(8)	(8)	(6)	(7)	(8)
Capital	(2)	(1)	(1)	2	0	(4)	(1)	4	(0)	(5)
Hudson Valley	(1)	(4)	(3)	(3)	(3)	(5)	(3)	0	(2)	(5)
Millwood	(0)	(1)	(1)	(1)	(1)	(1)	(1)	0	(0)	(1)
Dunwoodie	(0)	(2)	(2)	(2)	(2)	(3)	(1)	0	(1)	(2)
NY City	1	(17)	(14)	(11)	(15)	(22)	(15)	5	(7)	(17)
Long Island	0	(1)	(3)	(1)	(2)	(4)	(2)	0	(3)	(5)
NYCA Total	(76)	(118)	(107)	(111)	(112)	(132)	(120)	(72)	(107)	(138)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2.13)	(2.62)	(2.50)	(2.80)	(2.60)	(2.86)	(3.21)	(2.78)	(3.11)	(3.34)
Genesee	(1.05)	(1.19)	(1.04)	(1.16)	(1.12)	(1.12)	(1.09)	(0.89)	(1.02)	(1.18)
Central	(1.10)	(1.33)	(1.20)	(1.34)	(1.29)	(1.18)	(1.10)	(0.90)	(1.02)	(1.21)
North	(1.10)	(1.30)	(1.18)	(1.33)	(1.28)	(1.13)	(1.06)	(0.89)	(0.99)	(1.14)
Mohawk Valley	(1.02)	(1.25)	(1.13)	(1.26)	(1.21)	(1.07)	(1.00)	(0.78)	(0.90)	(1.08)
Capital	(0.12)	(0.08)	(0.01)	0.15	0.03	(0.27)	0.05	0.32	0.05	(0.25)
Hudson Valley	(0.14)	(0.38)	(0.30)	(0.28)	(0.32)	(0.43)	(0.22)	0.02	(0.18)	(0.39)
Millwood	(0.07)	(0.34)	(0.26)	(0.25)	(0.29)	(0.39)	(0.18)	0.05	(0.14)	(0.33)
Dunwoodie	(0.06)	(0.35)	(0.26)	(0.25)	(0.29)	(0.39)	(0.19)	0.04	(0.14)	(0.33)
NY City	(0.05)	(0.31)	(0.25)	(0.19)	(0.27)	(0.36)	(0.20)	0.08	(0.08)	(0.27)
Long Island	(0.02)	(0.04)	(0.14)	(0.01)	(0.08)	(0.14)	(0.03)	0.02	(0.13)	(0.19)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1,156)	(1,341)	(1,525)	(1,398)	(1,814)	(1,722)	(1,281)	(2,039)	(1,656)	(1,799)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	(362)	(392)	(217)	(1)	(19)	(20)	(63)	(19)	(28)	(21)
North	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(0)	(1)	(0)	(0)	0	(1)	(1)	(1)	(1)	(1)
Hudson Valley	(0)	(1)	(14)	(15)	(0)	(2)	(27)	(31)	(1)	(1)
Millwood	0	(0)	0	0	0	0	(0)	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(2)	2	3	2	5	(1)	4	(1)	9	(12)
Long Island	2	(2)	9	10	1	3	0	(2)	3	(2)
NYCA Total	**(1,519)**	**(1,735)**	**(1,746)**	**(1,402)**	**(1,828)**	**(1,743)**	**(1,368)**	**(2,093)**	**(1,674)**	**(1,837)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.2)**	**(0.2)**	**(0.2)**	**(0.2)**	**(0.2)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(288)	(419)	(507)	(568)	(630)	(540)	(448)	(823)	(575)	(683)
Genesee	(15)	(8)	(9)	(10)	(13)	(26)	(19)	(14)	(21)	(28)
Central	(79)	(35)	(30)	(15)	(42)	(48)	(57)	(37)	(47)	(74)
North	(17)	(7)	(4)	(2)	3	(3)	(8)	(1)	(3)	(4)
Mohawk Valley	(5)	(10)	(7)	(11)	(7)	(12)	(19)	(23)	(3)	(3)
Capital	(10)	(11)	(8)	(5)	(4)	(7)	(11)	(9)	(7)	(11)
Hudson Valley	(37)	(31)	(24)	(2)	(19)	(23)	2	(47)	(28)	(23)
Millwood	1	0	1	(0)	1	0	(0)	1	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(89)	(126)	(97)	(83)	(92)	(115)	(98)	(105)	(140)	(108)
Long Island	20	(18)	27	(5)	(4)	(11)	(11)	(8)	(7)	(8)
NYCA Total	**(519)**	**(664)**	**(659)**	**(700)**	**(808)**	**(786)**	**(670)**	**(1,067)**	**(830)**	**(939)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.1)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.0	(0.0)	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.1)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1,016	846	517	545	435	459	586	326	489	456
Genesee	(27)	(14)	(21)	(18)	(20)	(40)	(28)	(32)	(36)	(43)
Central	(232)	(184)	(101)	(98)	(80)	(79)	(197)	(124)	(202)	(150)
North	(77)	(36)	(28)	(18)	12	(11)	(40)	(4)	(9)	(19)
Mohawk Valley	(14)	(20)	(14)	(15)	(10)	(25)	(30)	(33)	(8)	(7)
Capital	(91)	(164)	(120)	(92)	(37)	(122)	(169)	(171)	(91)	(138)
Hudson Valley	(46)	(29)	(32)	(8)	(25)	(37)	(11)	(59)	(26)	(28)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(306)	(295)	(319)	(203)	(209)	(296)	(242)	(250)	(332)	(220)
Long Island	28	(27)	24	(48)	4	(14)	(14)	(3)	(25)	6
NYCA Total	**251**	**78**	**(94)**	**45**	**69**	**(165)**	**(144)**	**(350)**	**(239)**	**(143)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	5.8	6.8	5.2	5.7	4.8	6.7	9.2	5.4	8.6	8.4
Genesee	(0.2)	(0.1)	(0.2)	(0.2)	(0.2)	(0.6)	(0.4)	(0.5)	(0.6)	(0.8)
Central	(1.3)	(1.5)	(1.0)	(1.0)	(0.9)	(1.1)	(3.1)	(2.0)	(3.5)	(2.8)
North	(0.4)	(0.3)	(0.3)	(0.2)	0.1	(0.2)	(0.6)	(0.1)	(0.2)	(0.3)
Mohawk Valley	(0.1)	(0.2)	(0.1)	(0.2)	(0.1)	(0.4)	(0.5)	(0.5)	(0.1)	(0.1)
Capital	(0.5)	(1.3)	(1.2)	(1.0)	(0.4)	(1.8)	(2.7)	(2.8)	(1.6)	(2.5)
Hudson Valley	(0.3)	(0.2)	(0.3)	(0.1)	(0.3)	(0.5)	(0.2)	(1.0)	(0.4)	(0.5)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(1.6)	(1.9)	(2.5)	(1.4)	(1.6)	(4.3)	(3.7)	(4.2)	(5.8)	(4.0)
Long Island	0.2	(0.2)	0.2	(0.5)	0.1	(0.2)	(0.2)	(0.1)	(0.4)	0.1
NYCA Total	**1.6**	**1.1**	**(0.2)**	**1.2**	**1.5**	**(2.3)**	**(2.2)**	**(5.8)**	**(4.2)**	**(2.5)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(5.8)	(5.7)	(4.3)	(4.4)	(4.7)	(7.4)	(8.6)	(9.5)	(9.6)	(9.8)
Genesee	(1.4)	(1.4)	(0.9)	(0.9)	(1.0)	(1.7)	(2.1)	(2.1)	(2.3)	(2.2)
Central	(0.5)	(0.8)	(0.6)	(0.7)	(0.6)	(0.9)	(1.1)	(1.1)	(1.1)	(1.3)
North	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.0	0.1	0.2
Mohawk Valley	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Capital	0.3	0.6	0.4	0.6	0.5	0.8	0.8	1.2	1.1	1.1
Hudson Valley	0.8	0.7	0.6	0.5	0.7	1.1	0.7	0.8	1.0	1.0
Millwood	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3
Dunwoodie	0.5	0.5	0.4	0.4	0.5	0.7	0.5	0.6	0.7	0.7
NY City	5.1	4.5	3.5	3.3	4.2	6.8	4.4	5.0	6.8	6.3
Long Island	1.8	1.6	1.1	1.2	1.4	2.8	1.8	2.1	2.8	2.7
NYCA Total	**1.4**	**0.6**	**0.6**	**0.5**	**1.5**	**2.7**	**(3.1)**	**(2.7)**	**(0.2)**	**(1.1)**

Generic DR Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	0	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Genesee	(0)	0	(0)	0	0	0	0	0	0	0
Central	0	(0)	0	0	0	(0)	0	0	0	0
North	0	0	0	0	0	(0)	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	0	0	0	0	1	0	0	1	1	0
Hudson Valley	0	0	1	0	1	0	0	0	1	1
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	1	0	0	0	0	0	0	1
NY City	3	3	5	2	4	1	2	3	4	11
Long Island	2	2	2	1	2	1	1	1	2	6
NYCA Total	**6**	**6**	**9**	**4**	**7**	**2**	**3**	**6**	**8**	**20**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1)	(1)	1	(1)	(1)	(0)	(1)	0	(0)	(1)
Genesee	(0)	(0)	0	(0)	(0)	(0)	0	0	(0)	(0)
Central	0	(0)	0	(0)	(0)	(1)	(1)	0	0	0
North	0	(0)	(0)	0	0	0	0	(0)	0	(0)
Mohawk Valley	(0)	0	(0)	(0)	0	(0)	0	0	0	(0)
Capital	0	(0)	(0)	(0)	(0)	1	(0)	(1)	(0)	(0)
Hudson Valley	(0)	0	(0)	(0)	0	(0)	0	(1)	(1)	0
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(0)	(1)	(1)	(0)	(0)	(1)	0	(1)	(0)	(1)
Long Island	(0)	(0)	(0)	(0)	0	(0)	0	(0)	0	0
NYCA Total	**(1)**	**(2)**	**(0)**	**(2)**	**(1)**	**(1)**	**(2)**	**(3)**	**(2)**	**(1)**
NYCA Imports	(1)	(1)	(1)	(1)	(1)	(2)	(2)	(1)	(2)	(2)
NYCA Exports	1	0	1	0	1	1	1	2	1	2
NYCA + Imports - Exports	**(3)**	**(3)**	**(2)**	**(4)**	**(3)**	**(4)**	**(5)**	**(5)**	**(4)**	**(5)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(3)	8	31	6	7	19	4	19	6	14
Genesee	20	20	20	20	20	20	20	20	19	19
Central	25	17	20	15	20	9	10	24	20	22
North	0	(1)	(2)	0	(0)	(1)	0	(1)	1	(1)
Mohawk Valley	(0)	0	(1)	(0)	(0)	(1)	0	0	0	(0)
Capital	9	2	(1)	4	2	12	0	1	6	5
Hudson Valley	(9)	1	(2)	(5)	(0)	(0)	1	(11)	(15)	2
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(2)	(18)	(12)	(4)	(8)	(12)	1	(12)	(5)	(12)
Long Island	(1)	(10)	(1)	(2)	1	1	1	(0)	4	1
NYCA Total	**37**	**19**	**52**	**33**	**42**	**47**	**37**	**40**	**37**	**50**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	5	(12)	(7)	(8)	(5)	(14)	(5)	(9)	(4)	(5)
LINDEN VFT	1	(5)	(3)	(4)	(1)	1	(2)	(3)	(2)	(1)
NEPTUNE	3	(4)	(1)	1	2	(0)	(4)	(1)	(2)	(1)
HTP	2	(2)	2	1	2	(4)	(2)	3	0	(1)
ISONE - NYISO	(33)	5	(20)	(5)	(13)	(18)	(21)	(6)	(12)	(24)
CROSS SOUND CABLE	1	10	4	(1)	(1)	1	1	1	(2)	0
NORTHPORT NORWALK	0	2	1	0	(1)	(1)	(1)	1	(1)	(0)
IESO - NYISO	(15)	(13)	(26)	(16)	(23)	(12)	(3)	(22)	(13)	(15)
HQ - NYISO CHAT	0	0	0	0	1	0	0	0	0	0
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(36)**	**(17)**	**(49)**	**(32)**	**(38)**	**(47)**	**(36)**	**(37)**	**(35)**	**(47)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2)	(1)	(1)	(0)	(0)	(1)	(1)	(0)	(1)	(2)
Genesee	1	1	1	1	1	1	1	1	1	1
Central	(0)	(1)	(2)	(0)	(0)	(1)	(0)	1	0	(1)
North	(0)	(1)	(1)	(0)	(0)	(1)	(0)	(1)	(0)	(1)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
Capital	(1)	(2)	(2)	(1)	(1)	(1)	(1)	(2)	(1)	(3)
Hudson Valley	(1)	(0)	(0)	(0)	0	(0)	(0)	(1)	(2)	0
Millwood	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	(2)	(1)	(1)	(1)	(3)	(1)	(2)	(1)	(1)
Long Island	(0)	(1)	(0)	(0)	0	(1)	(0)	(1)	0	1
NYCA Total	(4)	(6)	(7)	(2)	(1)	(7)	(4)	(5)	(4)	(8)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	(1)	(1)	(1)	(1)	(2)	(1)	(1)	(1)	(2)
Genesee	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)
Central	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(3)
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
Mohawk Valley	(0)	(0)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
Capital	(1)	(1)	(1)	(0)	(0)	(1)	(1)	(1)	(0)	(2)
Hudson Valley	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)	(0)	(0)
Millwood	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	0
Dunwoodie	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	0
NY City	(1)	(1)	(1)	(0)	(0)	(3)	(2)	(2)	(1)	1
Long Island	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(1)	0	1
NYCA Total	(5)	(7)	(7)	(4)	(3)	(12)	(6)	(8)	(6)	(8)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.02)	(0.04)	(0.04)	(0.05)	(0.04)	(0.08)	(0.05)	(0.06)	(0.06)	(0.11)
Genesee	(0.06)	(0.06)	(0.07)	(0.04)	(0.04)	(0.06)	(0.04)	(0.06)	(0.06)	(0.11)
Central	(0.05)	(0.06)	(0.07)	(0.03)	(0.04)	(0.06)	(0.04)	(0.06)	(0.05)	(0.11)
North	(0.04)	(0.05)	(0.06)	(0.03)	(0.03)	(0.05)	(0.03)	(0.05)	(0.05)	(0.09)
Mohawk Valley	(0.04)	(0.05)	(0.06)	(0.03)	(0.04)	(0.05)	(0.03)	(0.05)	(0.05)	(0.10)
Capital	(0.04)	(0.05)	(0.05)	(0.02)	(0.01)	(0.05)	(0.02)	(0.02)	(0.01)	(0.08)
Hudson Valley	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)	(0.04)	(0.02)	(0.02)	(0.02)	(0.02)
Millwood	(0.01)	(0.02)	(0.01)	(0.01)	0.00	(0.04)	(0.02)	(0.02)	(0.01)	0.00
Dunwoodie	(0.01)	(0.02)	(0.01)	(0.01)	0.00	(0.04)	(0.02)	(0.02)	(0.01)	0.00
NY City	(0.01)	(0.02)	(0.01)	0.00	0.00	(0.03)	(0.02)	(0.01)	(0.01)	0.01
Long Island	0.00	(0.01)	(0.01)	0.00	0.00	(0.03)	0.00	(0.01)	0.00	0.02

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(61)	(34)	43	(39)	(36)	(0)	(36)	(1)	(33)	(20)
Genesee	0	0	0	0	0	0	0	0	0	0
Central	(2)	(2)	0	(0)	0	(2)	(0)	0	0	(2)
North	0	0	(0)	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	0	0	(0)	0	(0)	0	0	(0)	0	(0)
Hudson Valley	(1)	0	(0)	(0)	0	(2)	(4)	(2)	(2)	3
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	0	(0)	0	0	(0)	0	0	(0)	(0)	0
Long Island	(0)	0	(0)	0	1	0	0	0	0	(0)
NYCA Total	**(64)**	**(36)**	**43**	**(39)**	**(36)**	**(5)**	**(40)**	**(3)**	**(35)**	**(18)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(20)	(12)	48	(11)	(11)	(1)	(12)	(1)	(19)	(13)
Genesee	(0)	(0)	0	(0)	(0)	(0)	0	(0)	(0)	(0)
Central	2	(0)	1	(4)	(1)	(7)	(5)	(0)	(1)	(1)
North	0	(0)	(0)	0	0	(0)	0	(0)	0	(0)
Mohawk Valley	0	0	0	(0)	(0)	(0)	0	0	0	0
Capital	0	(1)	(0)	(0)	0	0	(1)	(0)	(0)	(1)
Hudson Valley	(3)	1	(0)	(0)	(0)	0	(1)	(3)	(15)	1
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	1	(11)	(7)	(7)	(4)	(12)	(3)	(16)	(6)	(7)
Long Island	(3)	(6)	(1)	1	3	(7)	(2)	(6)	(3)	2
NYCA Total	**(23)**	**(28)**	**40**	**(22)**	**(14)**	**(27)**	**(23)**	**(26)**	**(43)**	**(20)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(25)	(15)	19	(16)	(16)	(2)	(18)	1	(12)	(10)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	2	(1)	0	(4)	(0)	(7)	(6)	2	0	1
North	0	(1)	(1)	0	0	0	0	(0)	1	(0)
Mohawk Valley	(0)	0	(0)	(0)	(0)	(0)	0	0	0	(0)
Capital	1	(2)	(2)	(2)	(1)	4	(1)	(3)	(1)	(1)
Hudson Valley	(6)	1	(2)	(3)	(0)	(0)	0	(8)	(12)	1
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	(11)	(7)	(3)	(5)	(8)	(0)	(9)	(4)	(7)
Long Island	(1)	(7)	(1)	(1)	1	(0)	0	(1)	2	1
NYCA Total	**(30)**	**(35)**	**6**	**(29)**	**(21)**	**(15)**	**(24)**	**(19)**	**(25)**	**(16)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	(0.1)	0.2	(0.2)	(0.2)	(0.0)	(0.3)	0.0	(0.2)	(0.2)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	(0.0)	0.0	(0.0)	0.0	(0.1)	(0.1)	0.0	0.0	0.0
North	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0
Capital	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.1	(0.0)	(0.1)	(0.0)	(0.0)
Hudson Valley	(0.0)	0.0	(0.0)	(0.0)	0.0	0.0	0.0	(0.1)	(0.2)	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	(0.1)	(0.1)	(0.0)	(0.1)	(0.1)	0.0	(0.1)	(0.1)	(0.1)
Long Island	0.0	(0.1)	0.0	(0.0)	0.0	0.0	0.0	(0.0)	0.1	0.0
NYCA Total	**(0.2)**	**(0.3)**	**0.1**	**(0.3)**	**(0.2)**	**(0.2)**	**(0.4)**	**(0.3)**	**(0.4)**	**(0.3)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	0.0	(0.0)	0.0	(0.1)	(0.0)	(0.1)	(0.0)	0.1
Genesee	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
Central	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Mohawk Valley	0.0	(0.0)	(0.0)	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Capital	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0
NY City	0.2	0.2	0.1	0.2	0.1	0.4	0.3	0.4	0.4	0.2
Long Island	0.1	0.1	0.0	0.1	0.0	0.2	0.1	0.2	0.1	0.1
NYCA Total	**0.2**	**0.2**	**0.1**	**0.0**	**0.0**	**0.4**	**0.2**	**0.4**	**0.2**	**0.1**

Generic EE Solution

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(3)	(5)	(6)	(5)	(5)	(7)	(9)	(8)	(7)	(7)
Genesee	1	1	1	1	1	0	1	1	1	1
Central	1	0	1	1	1	(0)	0	0	0	0
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	1	1	1	1	1	0	1	1	1	1
Capital	14	14	18	19	19	9	11	13	13	14
Hudson Valley	10	8	10	11	10	6	7	8	7	9
Millwood	3	3	3	3	3	2	2	2	2	3
Dunwoodie	7	5	6	7	6	4	4	5	5	6
NY City	58	47	57	63	59	35	41	46	45	59
Long Island	25	26	28	32	28	20	21	24	24	31
NYCA Total	**117**	**101**	**119**	**133**	**123**	**70**	**79**	**91**	**92**	**117**

DRAFT

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(25)	(25)	(25)	(23)	(34)	(29)	(33)	(38)	(34)	(42)
Genesee	(1)	(1)	(1)	(1)	(2)	(2)	(2)	(2)	(2)	(3)
Central	(28)	(28)	(28)	(25)	(24)	(28)	(38)	(31)	(29)	(32)
North	(3)	(2)	(2)	(3)	(3)	(3)	(4)	(4)	(2)	(4)
Mohawk Valley	(2)	(2)	(2)	(2)	(3)	(3)	(3)	(4)	(3)	(3)
Capital	(7)	(2)	(0)	3	4	(1)	(8)	(5)	(10)	(17)
Hudson Valley	(2)	(1)	(1)	(0)	(1)	(2)	(0)	(2)	(2)	(2)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(15)	(15)	(22)	(20)	(22)	(28)	(17)	(25)	(29)	(26)
Long Island	(1)	(3)	(2)	(1)	(2)	(2)	0	(3)	(3)	(2)
NYCA Total	**(85)**	**(78)**	**(84)**	**(72)**	**(87)**	**(98)**	**(105)**	**(114)**	**(116)**	**(131)**
NYCA Imports	(9)	(22)	(21)	(30)	(29)	(37)	(35)	(33)	(42)	(34)
NYCA Exports	12	13	7	11	12	16	16	19	12	19
NYCA + Imports - Exports	**(106)**	**(113)**	**(112)**	**(113)**	**(128)**	**(151)**	**(156)**	**(166)**	**(170)**	**(184)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(672)	(568)	(560)	(496)	(686)	(511)	(570)	(637)	(526)	(599)
Genesee	(33)	(21)	(31)	(33)	(32)	(37)	(41)	(37)	(39)	(45)
Central	(752)	(686)	(698)	(594)	(526)	(509)	(639)	(524)	(491)	(488)
North	(80)	(50)	(48)	(57)	(48)	(52)	(62)	(61)	(36)	(65)
Mohawk Valley	(49)	(40)	(51)	(47)	(56)	(53)	(54)	(62)	(49)	(41)
Capital	(249)	(155)	(110)	(38)	22	(151)	(238)	(222)	(283)	(345)
Hudson Valley	(43)	(21)	(14)	(9)	(9)	(23)	(17)	(29)	(25)	(16)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(381)	(377)	(489)	(437)	(440)	(457)	(281)	(374)	(432)	(358)
Long Island	(5)	(49)	(42)	(22)	(42)	(30)	4	(38)	(37)	(21)
NYCA Total	**(2,265)**	**(1,967)**	**(2,043)**	**(1,734)**	**(1,816)**	**(1,823)**	**(1,900)**	**(1,985)**	**(1,917)**	**(1,978)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(190)	(341)	(317)	(386)	(434)	(286)	(235)	(209)	(197)	(245)
LINDEN VFT	(1)	(46)	(23)	(74)	(59)	(31)	(14)	(29)	(39)	(21)
NEPTUNE	50	18	47	(21)	(19)	(14)	14	19	28	29
HTP	22	(40)	(21)	(59)	(21)	(54)	(50)	(18)	(36)	(6)
ISONE - NYISO	(211)	(266)	(175)	(237)	(234)	(331)	(290)	(340)	(230)	(262)
CROSS SOUND CABLE	5	28	5	13	22	32	9	15	(8)	2
NORTHPORT NORWALK	(24)	2	(11)	(6)	26	13	(14)	(3)	9	(5)
IESO - NYISO	(397)	(391)	(446)	(442)	(412)	(453)	(458)	(377)	(515)	(433)
HQ - NYISO CHAT	0	(0)	(0)	0	1	(0)	0	(0)	(0)	0
HQ - NYISO CEDARS	0	0	0	0	0	0	0	0	0	0
TOTAL	**(746)**	**(1,036)**	**(941)**	**(1,212)**	**(1,130)**	**(1,125)**	**(1,038)**	**(942)**	**(987)**	**(940)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(44)	(43)	(45)	(47)	(54)	(54)	(56)	(65)	(61)	(70)
Genesee	(8)	(7)	(8)	(10)	(9)	(9)	(9)	(9)	(10)	(11)
Central	(64)	(68)	(67)	(70)	(67)	(62)	(71)	(65)	(70)	(72)
North	(14)	(14)	(14)	(16)	(15)	(13)	(13)	(14)	(13)	(16)
Mohawk Valley	(7)	(7)	(7)	(8)	(8)	(8)	(7)	(9)	(8)	(9)
Capital	(11)	(6)	(2)	(1)	4	(11)	(13)	(12)	(16)	(27)
Hudson Valley	(2)	(1)	(1)	(1)	(1)	(2)	(2)	(3)	(3)	(2)
Millwood	(3)	(8)	(6)	(8)	(7)	(9)	(5)	(5)	(6)	(6)
Dunwoodie	0	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(16)	(24)	(27)	(28)	(30)	(38)	(24)	(32)	(38)	(36)
Long Island	(1)	(4)	(3)	(2)	(4)	(5)	(1)	(4)	(5)	(4)
NYCA Total	(169)	(181)	(181)	(190)	(190)	(211)	(200)	(217)	(230)	(254)

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(58)	(66)	(67)	(72)	(72)	(83)	(87)	(90)	(93)	(98)
Genesee	(45)	(48)	(48)	(52)	(53)	(62)	(62)	(67)	(69)	(73)
Central	(56)	(62)	(62)	(68)	(70)	(78)	(78)	(84)	(87)	(93)
North	(6)	(6)	(7)	(7)	(8)	(8)	(7)	(7)	(8)	(9)
Mohawk Valley	(8)	(10)	(10)	(11)	(11)	(9)	(8)	(8)	(9)	(11)
Capital	(1)	(3)	(0)	(1)	(0)	(6)	(2)	(2)	(3)	(4)
Hudson Valley	(2)	(5)	(4)	(4)	(4)	(6)	(3)	(3)	(4)	(5)
Millwood	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Dunwoodie	(1)	(3)	(2)	(3)	(2)	(3)	(2)	(2)	(2)	(2)
NY City	(6)	(22)	(16)	(20)	(17)	(26)	(15)	(15)	(19)	(19)
Long Island	(2)	(3)	(3)	(3)	(4)	(6)	(3)	(2)	(4)	(3)
NYCA Total	(186)	(227)	(219)	(242)	(243)	(287)	(266)	(281)	(301)	(318)

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1.31)	(1.56)	(1.60)	(1.75)	(1.60)	(1.62)	(1.61)	(1.65)	(1.65)	(1.76)
Genesee	(1.32)	(1.43)	(1.47)	(1.67)	(1.57)	(1.45)	(1.30)	(1.41)	(1.52)	(1.64)
Central	(1.22)	(1.35)	(1.42)	(1.61)	(1.51)	(1.32)	(1.16)	(1.25)	(1.35)	(1.50)
North	(1.22)	(1.33)	(1.41)	(1.58)	(1.48)	(1.17)	(1.03)	(1.10)	(1.21)	(1.33)
Mohawk Valley	(1.15)	(1.30)	(1.36)	(1.54)	(1.44)	(1.18)	(1.03)	(1.10)	(1.21)	(1.34)
Capital	(0.05)	(0.19)	0.01	(0.08)	(0.02)	(0.40)	(0.09)	(0.11)	(0.17)	(0.22)
Hudson Valley	(0.20)	(0.46)	(0.36)	(0.47)	(0.40)	(0.52)	(0.30)	(0.31)	(0.40)	(0.42)
Millwood	(0.15)	(0.42)	(0.32)	(0.43)	(0.36)	(0.48)	(0.27)	(0.27)	(0.37)	(0.36)
Dunwoodie	(0.15)	(0.42)	(0.33)	(0.44)	(0.37)	(0.48)	(0.27)	(0.27)	(0.37)	(0.36)
NY City	(0.14)	(0.41)	(0.30)	(0.39)	(0.34)	(0.44)	(0.24)	(0.24)	(0.32)	(0.31)
Long Island	(0.12)	(0.16)	(0.17)	(0.16)	(0.20)	(0.25)	(0.10)	(0.05)	(0.19)	(0.13)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1,369)	(931)	(834)	(630)	(1,063)	(588)	(768)	(929)	(676)	(908)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	(1,086)	(1,119)	(421)	17	(2)	15	62	17	17	13
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(0)	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	(1)
Hudson Valley	5	11	(0)	(0)	(0)	(2)	(6)	(2)	(2)	(2)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	(1)	(1)	(1)	(2)	(0)	1	(1)	(2)	(1)
Long Island	2	0	2	1	1	0	(0)	(0)	(5)	(1)
NYCA Total	**(2,449)**	**(2,039)**	**(1,255)**	**(613)**	**(1,065)**	**(575)**	**(711)**	**(916)**	**(669)**	**(901)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.1)	(0.1)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.1)	(0.1)	(0.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.3)**	**(0.2)**	**(0.2)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_x Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(704)	(511)	(479)	(361)	(586)	(353)	(433)	(514)	(318)	(488)
Genesee	(11)	(7)	(9)	(10)	(10)	(10)	(12)	(10)	(11)	(14)
Central	(116)	(106)	(92)	(76)	(76)	(59)	(93)	(59)	(49)	(74)
North	(9)	(6)	(6)	(6)	(6)	(5)	(6)	(6)	(4)	(7)
Mohawk Valley	(16)	(13)	(16)	(15)	(18)	(15)	(16)	(19)	(15)	(12)
Capital	(6)	(5)	(3)	(1)	(0)	(4)	(4)	(4)	(7)	(9)
Hudson Valley	(25)	(14)	(7)	(6)	(3)	(16)	(12)	(15)	(19)	(10)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(52)	(58)	(67)	(65)	(69)	(102)	(52)	(83)	(75)	(66)
Long Island	(0)	(16)	(10)	(1)	(14)	(14)	0	(17)	(16)	(9)
NYCA Total	**(940)**	**(735)**	**(689)**	**(541)**	**(783)**	**(579)**	**(629)**	**(726)**	**(513)**	**(690)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.0)**	**(0.1)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(642)	(510)	(482)	(398)	(596)	(407)	(470)	(540)	(428)	(523)
Genesee	(16)	(10)	(16)	(16)	(17)	(18)	(21)	(19)	(19)	(23)
Central	(466)	(434)	(365)	(261)	(242)	(231)	(297)	(231)	(210)	(224)
North	(42)	(26)	(24)	(30)	(26)	(28)	(33)	(33)	(18)	(34)
Mohawk Valley	(25)	(19)	(27)	(24)	(29)	(26)	(28)	(32)	(25)	(21)
Capital	(81)	(48)	(35)	(3)	16	(44)	(79)	(68)	(94)	(127)
Hudson Valley	(30)	(12)	(9)	(4)	(9)	(17)	(8)	(19)	(17)	(12)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(186)	(180)	(240)	(214)	(214)	(230)	(136)	(193)	(207)	(177)
Long Island	(2)	(27)	(23)	(13)	(26)	(16)	3	(23)	(23)	(14)
NYCA Total	**(1,490)**	**(1,264)**	**(1,221)**	**(962)**	**(1,142)**	**(1,018)**	**(1,070)**	**(1,156)**	**(1,043)**	**(1,154)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(3.7)	(4.1)	(4.9)	(4.2)	(6.6)	(6.0)	(7.4)	(8.9)	(7.5)	(9.7)
Genesee	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)
Central	(2.7)	(3.5)	(3.7)	(2.7)	(2.7)	(3.4)	(4.7)	(3.8)	(3.7)	(4.1)
North	(0.2)	(0.2)	(0.3)	(0.3)	(0.3)	(0.4)	(0.5)	(0.6)	(0.3)	(0.6)
Mohawk Valley	(0.1)	(0.2)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(0.5)	(0.4)	(0.4)
Capital	(0.5)	(0.4)	(0.4)	(0.0)	0.2	(0.6)	(1.2)	(1.1)	(1.6)	(2.3)
Hudson Valley	(0.2)	(0.1)	(0.1)	(0.0)	(0.1)	(0.3)	(0.1)	(0.3)	(0.3)	(0.2)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.9)	(1.0)	(1.8)	(1.8)	(1.8)	(3.3)	(2.1)	(3.1)	(3.5)	(3.2)
Long Island	(0.0)	(0.2)	(0.2)	(0.2)	(0.3)	(0.2)	0.1	(0.4)	(0.4)	(0.3)
NYCA Total	**(8.4)**	**(9.7)**	**(11.7)**	**(9.6)**	**(12.0)**	**(14.8)**	**(16.7)**	**(19.0)**	**(18.2)**	**(21.2)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	4.5	4.8	5.2	5.8	6.6	5.6	5.6	5.9	6.4	7.1
Genesee	0.6	0.7	0.9	1.0	1.4	0.7	0.9	0.9	0.9	1.3
Central	(0.2)	(0.2)	(0.3)	(0.5)	(0.5)	(1.0)	(1.1)	(1.2)	(1.2)	(1.3)
North	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.7
Mohawk Valley	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)
Capital	0.3	0.1	0.0	0.1	0.0	0.7	0.7	0.9	1.0	1.0
Hudson Valley	0.6	0.6	0.6	0.7	0.8	1.2	0.9	1.1	1.2	1.1
Millwood	0.2	0.2	0.2	0.2	0.2	0.4	0.3	0.3	0.4	0.3
Dunwoodie	0.4	0.4	0.4	0.5	0.6	0.8	0.6	0.8	0.9	0.8
NY City	4.3	4.0	3.7	4.7	5.2	7.7	5.8	7.5	8.2	7.1
Long Island	1.4	1.3	1.1	1.4	1.6	2.9	2.2	3.0	3.1	2.6
NYCA Total	**12.6**	**12.6**	**12.2**	**14.5**	**16.6**	**19.4**	**16.3**	**19.8**	**21.4**	**20.6**

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Appendix I - Scenario Case Results – Additional Details

I.1. Case 1: Higher Load Forecast

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	0	0	0	0	(1)	(1)	0	0	0
Genesee	0	(0)	0	0	(0)	(0)	0	(0)	(0)	0
Central	(0)	0	0	0	(0)	(0)	0	0	(0)	0
North	0	0	0	(0)	(0)	0	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	0	0	0	(0)	(0)	0	0	0	0
Capital	(0)	0	1	0	(1)	(2)	1	1	(1)	1
Hudson Valley	(0)	0	1	0	(0)	(0)	1	2	1	3
Millwood	(0)	0	0	0	(0)	(0)	0	1	0	1
Dunwoodie	(0)	0	1	1	0	0	1	2	2	4
NY City	(0)	4	9	9	9	18	25	35	36	62
Long Island	(0)	4	7	5	3	3	5	9	5	20
NYCA Total	**(1)**	**9**	**20**	**16**	**12**	**19**	**33**	**50**	**42**	**92**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	3	6	(1)	1	5	4	1	5	5
Genesee	0	0	0	0	0	0	0	0	1	1
Central	0	0	1	1	4	4	5	4	12	7
North	0	(0)	0	0	1	1	2	1	2	2
Mohawk Valley	(0)	(0)	0	1	0	1	1	1	1	1
Capital	0	2	3	4	8	19	20	27	28	31
Hudson Valley	(0)	(0)	1	1	(1)	2	2	0	1	3
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	0	6	7	14	17	35	42	50	55	79
Long Island	0	2	4	6	6	7	9	9	10	17
NYCA Total	**1**	**14**	**22**	**27**	**38**	**74**	**83**	**94**	**116**	**146**
NYCA Imports	(1)	3	5	9	15	18	22	29	33	47
NYCA Exports	(0)	(2)	(4)	(3)	(4)	(9)	(11)	(16)	(19)	(21)
NYCA + Imports - Exports	**(0)**	**18**	**31**	**39**	**57**	**101**	**116**	**138**	**168**	**213**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	87	79	4	8	63	89	17	88	98
Genesee	1	2	3	1	3	5	9	6	12	12
Central	2	4	28	37	87	60	86	70	175	142
North	1	(0)	3	4	24	22	26	15	33	25
Mohawk Valley	(1)	(2)	4	13	7	17	9	12	16	19
Capital	5	47	54	118	147	320	331	395	395	461
Hudson Valley	(0)	2	13	16	(9)	24	18	9	12	35
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	8	108	139	256	279	509	551	649	672	925
Long Island	1	44	64	89	98	94	108	113	117	181
NYCA Total	**18**	**291**	**389**	**539**	**645**	**1,114**	**1,227**	**1,287**	**1,520**	**1,898**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(3)	(1)	10	32	111	66	68	105	105	129
LINDEN VFT	(3)	(0)	(2)	9	29	25	26	25	26	58
NEPTUNE	(2)	34	38	65	52	53	80	79	89	134
HTP	(4)	6	15	33	58	32	46	51	69	88
ISONE - NYISO	(0)	41	65	50	72	166	166	238	342	340
CROSS SOUND CABLE	(1)	23	32	28	23	24	16	19	24	32
NORTHPORT NORWALK	1	14	27	27	25	31	17	9	15	38
IESO - NYISO	(5)	(13)	5	21	26	124	143	244	140	196
HQ - NYISO CHAT	0	0	(0)	0	1	(0)	(0)	(0)	(0)	0
HQ - NYISO CEDARS	0	0	0	0	(0)	0	(0)	0	0	0
TOTAL	**(17)**	**104**	**190**	**264**	**396**	**522**	**561**	**769**	**810**	**1,015**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	3	2	2	3	6	7	7	13	15
Genesee	0	(0)	(0)	1	1	1	1	2	2	3
Central	1	(1)	0	4	8	11	11	14	23	21
North	0	(0)	(0)	1	2	3	3	4	6	5
Mohawk Valley	0	(0)	0	1	1	2	1	2	3	3
Capital	0	2	3	7	9	20	23	33	32	39
Hudson Valley	(0)	0	1	1	(0)	2	2	2	2	5
Millwood	0	0	1	2	2	3	5	9	8	13
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	1	7	9	19	21	41	52	67	72	107
Long Island	0	3	6	8	8	10	12	16	16	30
NYCA Total	**3**	**14**	**21**	**46**	**55**	**98**	**118**	**156**	**177**	**242**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	0	0	3	4	3	3	7	8	8
Genesee	0	0	1	2	3	5	5	6	7	8
Central	0	0	0	3	3	5	7	10	11	13
North	0	0	(0)	1	1	2	1	2	2	4
Mohawk Valley	0	1	1	2	3	5	6	9	13	18
Capital	0	0	1	2	2	2	5	8	7	10
Hudson Valley	0	1	1	2	2	3	5	8	8	11
Millwood	0	(0)	0	0	0	1	1	2	2	3
Dunwoodie	0	1	2	3	5	8	11	14	16	22
NY City	1	11	19	33	47	92	110	146	167	221
Long Island	0	8	14	17	16	19	23	32	31	57
NYCA Total	**2**	**23**	**39**	**69**	**87**	**146**	**176**	**245**	**270**	**376**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.01	0.00	(0.01)	0.11	0.15	0.12	0.11	0.32	0.36	0.39
Genesee	0.02	(0.02)	(0.02)	0.11	0.14	0.17	0.18	0.34	0.35	0.45
Central	0.02	(0.02)	(0.02)	0.11	0.14	0.17	0.21	0.38	0.38	0.48
North	0.02	(0.01)	(0.03)	0.11	0.14	0.18	0.18	0.34	0.36	0.45
Mohawk Valley	0.02	(0.01)	(0.02)	0.12	0.15	0.20	0.23	0.41	0.44	0.57
Capital	0.01	(0.02)	0.04	0.10	0.05	0.05	0.20	0.40	0.23	0.50
Hudson Valley	0.01	0.00	0.05	0.12	0.11	0.16	0.27	0.50	0.42	0.67
Millwood	0.01	0.01	0.06	0.12	0.12	0.18	0.29	0.52	0.44	0.79
Dunwoodie	0.01	0.01	0.07	0.13	0.13	0.19	0.30	0.54	0.47	0.82
NY City	0.01	0.02	0.09	0.17	0.20	0.36	0.47	0.72	0.73	1.06
Long Island	0.01	0.09	0.18	0.23	0.20	0.25	0.32	0.56	0.41	0.89

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	195	191	(71)	(37)	68	191	(34)	107	17
Genesee	0	0	0	0	0	0	0	0	0	0
Central	5	(14)	(41)	0	(0)	19	(8)	1	19	(1)
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	0	0	0	0	0	1	1	1	1	1
Hudson Valley	(0)	0	(0)	3	(0)	4	(0)	7	8	14
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	0	(1)	1	4	1	6	9	12	7	14
Long Island	0	(0)	1	(5)	(2)	2	0	11	5	13
NYCA Total	**6**	**180**	**151**	**(68)**	**(39)**	**99**	**193**	**(3)**	**147**	**57**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**0.0**	**(0.0)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	116	125	(28)	(13)	31	88	(28)	75	2
Genesee	0	1	1	0	1	2	3	2	3	4
Central	1	9	(2)	4	4	26	16	3	42	10
North	0	(0)	0	0	2	2	3	1	3	3
Mohawk Valley	0	(1)	1	4	3	5	3	3	5	6
Capital	0	1	1	2	3	7	7	8	10	11
Hudson Valley	(0)	3	4	12	(6)	13	7	13	6	12
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	4	26	43	72	91	139	172	211	204	297
Long Island	0	17	20	24	34	25	32	40	63	72
NYCA Total	**6**	**172**	**193**	**90**	**119**	**249**	**331**	**253**	**411**	**416**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	87	97	(16)	0	57	85	2	73	54
Genesee	0	1	2	1	2	2	4	3	5	6
Central	1	4	3	17	36	33	42	28	90	59
North	0	(1)	3	2	13	11	14	7	19	12
Mohawk Valley	(0)	(2)	2	7	3	9	5	6	8	10
Capital	2	21	25	40	60	128	134	163	163	184
Hudson Valley	(0)	2	8	11	(7)	17	12	5	8	21
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	4	56	72	134	145	268	289	342	348	496
Long Island	1	27	35	50	56	53	63	69	72	108
NYCA Total	**9**	**196**	**247**	**245**	**307**	**578**	**649**	**624**	**787**	**951**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.7	1.0	(0.2)	0.0	0.8	1.3	0.0	1.3	1.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
Central	0.0	0.0	0.0	0.2	0.4	0.5	0.7	0.4	1.6	1.1
North	0.0	(0.0)	0.0	0.0	0.1	0.2	0.2	0.1	0.3	0.2
Mohawk Valley	0.0	(0.0)	0.0	0.1	0.0	0.1	0.1	0.1	0.2	0.2
Capital	0.0	0.2	0.3	0.4	0.7	1.9	2.1	2.7	2.9	3.4
Hudson Valley	0.0	0.0	0.1	0.1	(0.1)	0.3	0.2	0.1	0.2	0.4
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.3	0.6	1.0	1.3	3.7	4.2	5.2	5.6	8.4
Long Island	0.0	0.2	0.3	0.5	0.6	0.8	1.0	1.1	1.2	2.0
NYCA Total	**0.0**	**1.5**	**2.4**	**2.2**	**3.1**	**8.3**	**9.9**	**9.9**	**13.2**	**16.8**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.2)	0.0	(0.3)	(0.4)	(0.7)	(0.8)	(1.1)	(1.0)	(1.6)
Genesee	(0.0)	(0.1)	(0.0)	(0.1)	(0.2)	(0.3)	(0.3)	(0.3)	(0.4)	(0.6)
Central	(0.0)	(0.0)	0.0	0.0	(0.0)	(0.1)	(0.0)	(0.0)	(0.1)	(0.1)
North	0.0	0.0	0.0	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)
Mohawk Valley	0.0	0.0	0.1	0.0	0.1	0.2	0.2	0.3	0.5	0.7
Capital	0.0	(0.0)	(0.1)	(0.0)	0.1	(0.1)	(0.1)	(0.2)	(0.2)	(0.3)
Hudson Valley	0.0	0.1	0.1	0.0	0.1	0.3	0.3	0.3	0.5	0.3
Millwood	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1
Dunwoodie	0.0	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.5
NY City	(0.0)	0.6	0.7	0.6	1.6	3.4	4.0	4.5	6.5	5.7
Long Island	0.0	0.4	0.6	0.6	0.8	1.3	1.4	1.4	1.9	2.1
NYCA Total	**(0.1)**	**0.8**	**1.4**	**0.9**	**2.2**	**4.2**	**4.9**	**5.2**	**8.2**	**6.6**

I.2. Case 2: Lower Load Forecast

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	0	(1)	(0)	(0)	0	(1)	(0)	(1)	0
Genesee	0	0	0	0	(0)	0	0	0	(0)	0
Central	(0)	0	(0)	0	(0)	0	0	(0)	(0)	(0)
North	0	0	0	0	(0)	0	(0)	(0)	(0)	0
Mohawk Valley	(0)	0	(0)	0	(0)	0	(0)	(0)	(0)	(0)
Capital	(0)	1	(0)	1	(3)	1	1	(0)	(2)	0
Hudson Valley	(0)	1	(1)	0	(2)	0	(0)	(1)	(3)	(2)
Millwood	(0)	0	(0)	0	(0)	0	(0)	(0)	(1)	(1)
Dunwoodie	(0)	0	(1)	(0)	(2)	(0)	(1)	(1)	(3)	(3)
NY City	(0)	2	(11)	(8)	(23)	(10)	(20)	(23)	(40)	(51)
Long Island	(0)	1	(2)	(0)	(5)	(2)	(3)	(7)	(13)	(15)
NYCA Total	**(1)**	**6**	**(16)**	**(6)**	**(36)**	**(10)**	**(25)**	**(32)**	**(63)**	**(72)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	2	(1)	(1)	(3)	2	(2)	(5)	(9)	(6)
Genesee	0	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(0)
Central	0	0	(3)	(2)	1	(2)	(5)	(10)	(3)	(9)
North	0	(0)	(0)	(0)	(0)	(0)	(0)	(2)	(1)	(1)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(0)
Capital	0	(2)	(6)	(9)	(8)	(11)	(21)	(20)	(27)	(29)
Hudson Valley	(0)	(0)	(1)	(1)	0	(2)	(1)	(5)	(1)	(5)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	0	(7)	(14)	(20)	(28)	(31)	(38)	(48)	(54)	(62)
Long Island	0	(3)	(3)	(4)	(4)	(5)	(8)	(10)	(14)	(11)
NYCA Total	**1**	**(10)**	**(27)**	**(36)**	**(44)**	**(49)**	**(75)**	**(102)**	**(110)**	**(123)**
NYCA Imports	(1)	(5)	(7)	(11)	(14)	(20)	(27)	(24)	(39)	(33)
NYCA Exports	(0)	2	3	7	15	10	13	15	16	22
NYCA + Imports - Exports	**(0)**	**(16)**	**(38)**	**(54)**	**(73)**	**(80)**	**(116)**	**(142)**	**(165)**	**(178)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	48	(30)	(26)	(88)	58	(39)	(74)	(138)	(96)
Genesee	1	(0)	(3)	(6)	(3)	(5)	(3)	(10)	(6)	(5)
Central	2	3	(56)	(29)	3	(43)	(81)	(147)	(67)	(133)
North	1	(3)	(3)	(10)	(4)	(6)	(4)	(24)	(13)	(15)
Mohawk Valley	(1)	(3)	(6)	(4)	(3)	(6)	(9)	(16)	(12)	(7)
Capital	5	(54)	(123)	(184)	(160)	(179)	(326)	(297)	(409)	(401)
Hudson Valley	(0)	(1)	(13)	(11)	(4)	(30)	(16)	(62)	(28)	(43)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	8	(132)	(262)	(375)	(453)	(450)	(511)	(634)	(684)	(726)
Long Island	1	(48)	(63)	(73)	(71)	(64)	(109)	(127)	(157)	(121)
NYCA Total	**18**	**(189)**	**(560)**	**(718)**	**(782)**	**(725)**	**(1,098)**	**(1,391)**	**(1,514)**	**(1,546)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(3)	(36)	(53)	(59)	(133)	(98)	(97)	(71)	(151)	(94)
LINDEN VFT	(3)	(14)	(12)	(39)	(29)	(17)	(24)	(39)	(31)	(40)
NEPTUNE	(2)	(24)	(21)	(48)	(42)	(42)	(87)	(84)	(65)	(79)
HTP	(4)	(14)	(29)	(75)	(48)	(46)	(47)	(37)	(80)	(61)
ISONE - NYISO	(0)	(47)	(86)	(129)	(279)	(190)	(258)	(256)	(282)	(330)
CROSS SOUND CABLE	(1)	1	(12)	(4)	(22)	(23)	(36)	(24)	(41)	(29)
NORTHPORT NORWALK	1	(4)	(13)	2	(15)	(15)	(25)	(16)	(27)	(14)
IESO - NYISO	(5)	(38)	(30)	(39)	(30)	(126)	(132)	(119)	(118)	(131)
HQ - NYISO CHAT	0	0	0	0	1	0	0	0	0	0
HQ - NYISO CEDARS	0	0	(0)	0	(0)	0	(0)	(0)	(0)	(0)
TOTAL	**(17)**	**(176)**	**(257)**	**(390)**	**(597)**	**(558)**	**(705)**	**(646)**	**(795)**	**(778)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	(0)	(2)	(4)	(6)	(3)	(5)	(7)	(11)	(8)
Genesee	0	(1)	(0)	(1)	(1)	(2)	(1)	(1)	(1)	(1)
Central	1	(3)	(4)	(7)	(4)	(10)	(11)	(15)	(9)	(14)
North	0	(1)	(1)	(2)	(1)	(3)	(2)	(3)	(2)	(3)
Mohawk Valley	0	(1)	(0)	(1)	(1)	(1)	(1)	(2)	(1)	(1)
Capital	0	(3)	(7)	(10)	(12)	(15)	(23)	(22)	(31)	(30)
Hudson Valley	(0)	(0)	(1)	(1)	(0)	(3)	(2)	(5)	(3)	(5)
Millwood	0	(1)	(2)	(3)	(5)	(4)	(4)	(4)	(7)	(7)
Dunwoodie	0	0	0	0	(0)	(0)	(0)	(0)	(0)	(0)
NY City	1	(8)	(16)	(24)	(34)	(37)	(46)	(57)	(68)	(80)
Long Island	0	(3)	(4)	(6)	(7)	(8)	(11)	(14)	(20)	(20)
NYCA Total	**3**	**(20)**	**(38)**	**(58)**	**(70)**	**(86)**	**(107)**	**(130)**	**(153)**	**(169)**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	(2)	(2)	(4)	(2)	(5)	(5)	(4)	(4)	(4)
Genesee	0	(2)	(1)	(3)	(2)	(4)	(4)	(5)	(5)	(4)
Central	0	(2)	(2)	(5)	(4)	(7)	(6)	(6)	(7)	(8)
North	0	(0)	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(0)
Mohawk Valley	0	(1)	(2)	(3)	(3)	(5)	(8)	(9)	(12)	(13)
Capital	0	(1)	(2)	(2)	(5)	(4)	(4)	(5)	(7)	(6)
Hudson Valley	0	(1)	(2)	(2)	(4)	(4)	(4)	(5)	(7)	(7)
Millwood	0	(0)	(0)	(0)	(1)	(1)	(1)	(1)	(2)	(2)
Dunwoodie	0	(2)	(4)	(5)	(7)	(8)	(10)	(12)	(15)	(17)
NY City	1	(13)	(36)	(53)	(74)	(78)	(103)	(119)	(151)	(172)
Long Island	0	(4)	(8)	(10)	(15)	(17)	(25)	(29)	(37)	(38)
NYCA Total	**2**	**(28)**	**(58)**	**(88)**	**(118)**	**(134)**	**(170)**	**(196)**	**(247)**	**(271)**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.01	(0.08)	(0.09)	(0.18)	(0.10)	(0.24)	(0.22)	(0.17)	(0.15)	(0.15)
Genesee	0.02	(0.12)	(0.06)	(0.17)	(0.12)	(0.26)	(0.18)	(0.18)	(0.14)	(0.18)
Central	0.02	(0.11)	(0.08)	(0.19)	(0.14)	(0.26)	(0.19)	(0.19)	(0.18)	(0.22)
North	0.02	(0.12)	(0.07)	(0.19)	(0.11)	(0.24)	(0.18)	(0.17)	(0.14)	(0.19)
Mohawk Valley	0.02	(0.12)	(0.08)	(0.21)	(0.15)	(0.28)	(0.23)	(0.23)	(0.23)	(0.29)
Capital	0.01	(0.01)	(0.06)	(0.07)	(0.27)	(0.15)	(0.10)	(0.15)	(0.24)	(0.12)
Hudson Valley	0.01	(0.05)	(0.11)	(0.15)	(0.26)	(0.22)	(0.21)	(0.24)	(0.36)	(0.35)
Millwood	0.01	(0.05)	(0.12)	(0.16)	(0.26)	(0.22)	(0.22)	(0.25)	(0.40)	(0.44)
Dunwoodie	0.01	(0.05)	(0.12)	(0.16)	(0.27)	(0.23)	(0.24)	(0.27)	(0.41)	(0.47)
NY City	0.01	(0.07)	(0.17)	(0.24)	(0.38)	(0.33)	(0.40)	(0.43)	(0.60)	(0.72)
Long Island	0.01	(0.04)	(0.10)	(0.18)	(0.27)	(0.29)	(0.25)	(0.38)	(0.47)	(0.52)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	130	(61)	(41)	(140)	234	15	(68)	(195)	(239)
Genesee	0	0	0	0	0	0	0	(0)	0	0
Central	5	94	(71)	(0)	(1)	(1)	27	(0)	45	(4)
North	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	0	0	(0)	(0)	0	(0)	(0)	(0)	(0)	(0)
Capital	0	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(1)	(1)
Hudson Valley	(0)	(0)	1	1	16	(4)	(5)	(1)	22	(18)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	0	(1)	0	(3)	(0)	(6)	(3)	(6)	(12)	(10)
Long Island	0	(3)	(0)	(3)	(5)	(0)	(1)	(6)	(3)	(6)
NYCA Total	**6**	**220**	**(132)**	**(46)**	**(130)**	**222**	**32**	**(82)**	**(143)**	**(278)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	0.0	(0.0)	0.0	0.0	0.0	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**0.0**	**(0.0)**	**0.0**	**0.0**	**0.0**	**(0.0)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	84	(27)	(27)	(71)	125	(7)	(43)	(119)	(139)
Genesee	0	(0)	(1)	(2)	(1)	(1)	(1)	(3)	(2)	(1)
Central	1	4	0	(2)	2	(4)	(6)	(24)	1	(33)
North	0	(0)	(0)	(1)	(0)	(1)	(0)	(2)	(1)	(2)
Mohawk Valley	0	(1)	(1)	(0)	(1)	(2)	(3)	(5)	(4)	(2)
Capital	0	(1)	(2)	(4)	(3)	(4)	(6)	(6)	(8)	(8)
Hudson Valley	(0)	(1)	(8)	(3)	(1)	(15)	(14)	(38)	(28)	(26)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	4	(29)	(67)	(94)	(108)	(160)	(143)	(180)	(208)	(224)
Long Island	0	(16)	(16)	(24)	(20)	(20)	(39)	(44)	(70)	(46)
NYCA Total	**6**	**41**	**(123)**	**(158)**	**(203)**	**(80)**	**(219)**	**(346)**	**(438)**	**(481)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	0.0	(0.0)	0.0	0.0	0.0	(0.0)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	54	(24)	(21)	(75)	81	(17)	(61)	(116)	(99)
Genesee	0	(0)	(2)	(3)	(1)	(2)	(1)	(5)	(3)	(2)
Central	1	17	(35)	(13)	2	(19)	(35)	(71)	(23)	(66)
North	0	(1)	(1)	(5)	(2)	(3)	(2)	(13)	(7)	(8)
Mohawk Valley	(0)	(1)	(3)	(2)	(2)	(3)	(4)	(8)	(6)	(3)
Capital	2	(21)	(51)	(77)	(66)	(73)	(132)	(117)	(160)	(165)
Hudson Valley	(0)	(1)	(9)	(7)	(2)	(20)	(7)	(44)	(18)	(32)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	4	(65)	(134)	(185)	(239)	(242)	(270)	(332)	(364)	(394)
Long Island	1	(28)	(35)	(41)	(40)	(37)	(64)	(75)	(95)	(71)
NYCA Total	**9**	**(47)**	**(295)**	**(354)**	**(424)**	**(318)**	**(531)**	**(726)**	**(791)**	**(841)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.4	(0.2)	(0.2)	(0.8)	1.2	(0.3)	(1.0)	(2.0)	(1.8)
Genesee	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.0)
Central	0.0	0.1	(0.4)	(0.1)	0.0	(0.3)	(0.5)	(1.2)	(0.4)	(1.2)
North	0.0	(0.0)	(0.0)	(0.1)	(0.0)	(0.0)	(0.0)	(0.2)	(0.1)	(0.2)
Mohawk Valley	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)
Capital	0.0	(0.2)	(0.5)	(0.8)	(0.7)	(1.1)	(2.1)	(1.9)	(2.8)	(3.1)
Hudson Valley	0.0	(0.0)	(0.1)	(0.1)	(0.0)	(0.3)	(0.1)	(0.7)	(0.3)	(0.6)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	(0.5)	(1.0)	(1.7)	(2.0)	(3.3)	(4.0)	(5.3)	(5.9)	(6.7)
Long Island	0.0	(0.2)	(0.3)	(0.4)	(0.4)	(0.5)	(1.0)	(1.2)	(1.6)	(1.3)
NYCA Total	**0.0**	**(0.3)**	**(2.7)**	**(3.5)**	**(4.1)**	**(4.4)**	**(8.1)**	**(11.7)**	**(13.4)**	**(15.0)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	0.3	0.3	0.6	0.5	0.5	0.6	0.6	0.9	0.8
Genesee	(0.0)	0.0	0.1	0.2	0.2	0.1	0.2	0.2	0.4	0.4
Central	(0.0)	(0.0)	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	0.0
North	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mohawk Valley	0.0	(0.0)	(0.0)	(0.1)	(0.1)	(0.2)	(0.3)	(0.3)	(0.5)	(0.5)
Capital	0.0	(0.0)	0.0	0.1	0.1	0.1	0.2	0.1	0.3	0.3
Hudson Valley	0.0	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.3)	(0.3)	(0.3)	(0.4)
Millwood	0.0	(0.0)	(0.0)	(0.1)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)
Dunwoodie	0.0	(0.0)	(0.1)	(0.2)	(0.2)	(0.2)	(0.3)	(0.3)	(0.4)	(0.4)
NY City	(0.0)	(0.2)	(1.2)	(1.8)	(2.0)	(2.1)	(3.9)	(4.1)	(4.7)	(5.6)
Long Island	0.0	(0.2)	(0.4)	(0.6)	(0.6)	(0.6)	(1.5)	(1.5)	(1.6)	(1.9)
NYCA Total	**(0.1)**	**(0.1)**	**(1.4)**	**(1.9)**	**(2.2)**	**(2.4)**	**(5.3)**	**(5.7)**	**(6.0)**	**(7.4)**

I.3. Case 3: Athens SPS Out of Service

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.47	1.00	0.13	0.00	0.20	0.06	0.33	0.33	0.51	0.07
Genesee	(0.07)	(0.09)	(0.03)	0.00	0.07	(0.02)	(0.07)	(0.07)	(0.06)	(0.02)
Central	(0.04)	0.06	0.01	(0.01)	0.12	(0.12)	0.07	0.13	0.11	0.01
North	0.01	(0.01)	(0.01)	0.00	(0.01)	0.02	0.01	0.00	0.00	0.00
Mohawk Valley	0.12	0.09	0.08	0.06	0.10	0.03	0.07	0.07	0.10	0.01
Capital	(0.38)	(0.51)	(0.83)	(0.47)	0.01	(0.45)	(0.18)	(0.35)	(0.14)	(0.06)
Hudson Valley	3.21	2.33	2.12	1.73	1.66	1.47	1.68	1.65	2.20	0.19
Millwood	1.14	0.85	0.77	0.64	0.58	0.55	0.60	0.60	0.77	0.06
Dunwoodie	2.61	1.89	1.76	1.45	1.32	1.23	1.39	1.40	1.80	0.16
NY City	22.06	16.23	15.20	12.49	11.53	10.39	12.19	11.92	15.58	1.23
Long Island	7.00	5.22	4.70	4.04	3.34	2.97	3.26	2.94	3.89	0.13
NYCA Total	**36.13**	**27.06**	**23.90**	**19.93**	**18.92**	**16.13**	**19.35**	**18.62**	**24.76**	**1.78**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.86	(0.79)	(0.13)	0.21	0.28	(3.63)	(0.12)	(0.53)	(1.04)	(0.14)
Genesee	(0.03)	(0.02)	(0.07)	(0.05)	0.00	(0.05)	0.09	(0.07)	0.04	(0.01)
Central	(2.44)	(0.97)	(1.62)	(0.32)	(0.31)	1.06	(1.09)	(0.68)	(0.94)	(1.29)
North	(0.26)	(0.02)	(0.11)	(0.37)	0.22	(0.14)	0.15	0.12	(0.05)	(0.01)
Mohawk Valley	(0.05)	(0.10)	(0.14)	0.07	(0.06)	0.06	(0.07)	0.00	(0.08)	0.07
Capital	(8.13)	(4.51)	(7.95)	(6.27)	(6.52)	(7.58)	(8.23)	(9.04)	(11.21)	(1.84)
Hudson Valley	2.46	0.03	2.24	0.57	0.09	(0.56)	0.99	1.32	(0.09)	0.00
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	6.57	5.87	7.23	3.45	3.53	7.91	6.21	5.26	7.21	0.95
Long Island	1.56	0.42	0.32	0.67	0.99	0.45	0.35	0.34	0.23	0.11
NYCA Total	**0.54**	**(0.09)**	**(0.23)**	**(2.04)**	**(1.78)**	**(2.48)**	**(1.72)**	**(3.28)**	**(5.93)**	**(2.16)**
NYCA Imports	2.21	1.60	2.76	3.63	3.57	1.43	3.32	4.07	4.84	1.67
NYCA Exports	(0.27)	(0.02)	0.31	(0.01)	0.52	(2.54)	(0.27)	(0.80)	(3.18)	(0.66)
NYCA + Imports - Exports	**3.01**	**1.53**	**2.24**	**1.61**	**1.28**	**1.48**	**1.87**	**1.60**	**2.11**	**0.16**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	5.29	(14.62)	(7.81)	(0.37)	2.90	(51.46)	(9.55)	(11.29)	(15.62)	(1.41)
Genesee	(0.79)	(0.41)	(1.35)	(0.79)	0.10	(1.09)	1.94	(0.57)	0.84	(0.18)
Central	(54.64)	(22.60)	(32.49)	(3.21)	(7.40)	5.33	(17.07)	(9.31)	(13.49)	(12.11)
North	(5.61)	(0.52)	(3.25)	(7.24)	4.53	(2.45)	3.15	1.73	(0.71)	(0.14)
Mohawk Valley	(1.09)	(2.49)	(3.02)	1.62	(1.30)	1.07	(0.35)	(0.05)	(0.73)	1.00
Capital	(205.74)	(103.16)	(180.56)	(134.42)	(126.92)	(133.65)	(139.50)	(137.52)	(172.11)	(26.75)
Hudson Valley	44.90	(1.50)	33.90	8.70	1.49	(8.04)	12.22	14.02	0.62	0.05
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	145.55	117.77	143.08	63.23	62.07	121.49	88.58	73.21	96.90	10.94
Long Island	33.16	7.54	4.49	11.21	15.70	5.63	4.30	3.24	1.73	1.03
NYCA Total	**(38.97)**	**(19.99)**	**(47.01)**	**(61.27)**	**(48.83)**	**(63.17)**	**(56.28)**	**(66.54)**	**(102.57)**	**(27.57)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	25.83	(2.54)	(4.48)	1.38	4.82	12.27	3.29	4.04	10.17	(1.43)
LINDEN VFT	17.55	14.81	6.20	17.12	14.20	2.43	11.59	11.64	8.04	4.12
NEPTUNE	10.49	0.20	(4.26)	(3.47)	(2.09)	7.45	7.73	7.96	8.23	0.51
HTP	29.17	26.80	44.72	50.76	50.94	15.22	24.18	18.50	23.59	5.62
ISONE - NYISO	15.40	7.06	13.03	20.21	8.24	50.17	36.11	27.51	72.82	19.09
CROSS SOUND CABLE	13.29	15.24	23.04	15.91	5.25	4.34	4.69	6.42	5.58	(0.94)
NORTHPORT NORWALK	(8.39)	0.34	1.30	(1.09)	(3.45)	(2.05)	(1.57)	(2.31)	(2.38)	(0.72)
IESO - NYISO	(74.69)	(49.13)	(42.47)	(45.27)	(34.97)	(35.08)	(35.63)	(15.36)	(31.73)	(0.25)
HQ - NYISO CHAT	0.00	(0.01)	0.01	0.04	(0.30)	0.08	(0.05)	0.02	(0.03)	(0.02)
HQ - NYISO CEDARS	0.01	0.00	0.00	0.01	(0.02)	0.02	(0.01)	0.01	0.00	(0.01)
TOTAL	**28.66**	**12.77**	**37.09**	**55.60**	**42.62**	**54.85**	**50.33**	**58.43**	**94.29**	**25.97**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(3.40)	(3.48)	(2.73)	(1.67)	(1.05)	(3.76)	(2.40)	(2.15)	(2.69)	0.06
Genesee	(0.77)	(0.55)	(0.50)	(0.38)	(0.19)	(0.21)	(0.25)	(0.32)	(0.22)	0.03
Central	(7.02)	(5.33)	(5.20)	(2.80)	(1.83)	0.20	(3.58)	(3.08)	(3.29)	(1.03)
North	(1.59)	(1.09)	(0.95)	(0.95)	(0.25)	(0.58)	(0.53)	(0.38)	(0.64)	0.06
Mohawk Valley	(0.58)	(0.56)	(0.47)	(0.22)	(0.27)	(0.16)	(0.32)	(0.24)	(0.34)	0.10
Capital	(13.75)	(9.31)	(12.76)	(9.82)	(8.61)	(11.03)	(11.86)	(12.98)	(14.98)	(2.07)
Hudson Valley	2.73	0.21	2.39	0.68	0.19	(0.21)	1.14	1.36	0.34	0.03
Millwood	2.44	1.32	1.26	1.29	1.47	1.14	1.23	1.32	1.84	0.51
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
NY City	11.83	8.91	10.29	6.48	7.16	10.93	9.35	8.36	12.13	1.64
Long Island	2.74	1.14	0.88	1.54	1.76	1.19	0.82	0.51	1.20	0.20
NYCA Total	**(7.37)**	**(8.74)**	**(7.79)**	**(5.85)**	**(1.62)**	**(2.49)**	**(6.39)**	**(7.59)**	**(6.64)**	**(0.47)**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1.77)	(0.77)	(1.29)	(1.09)	(0.65)	(0.50)	(0.63)	(0.43)	(0.47)	0.18
Genesee	(1.73)	(1.47)	(1.15)	(0.81)	(0.55)	(0.47)	(0.77)	(0.70)	(0.78)	0.08
Central	(2.60)	(2.09)	(1.71)	(1.31)	(0.86)	(0.95)	(1.08)	(0.92)	(1.09)	0.20
North	(0.57)	(0.44)	(0.34)	(0.26)	(0.26)	(0.25)	(0.38)	(0.29)	(0.37)	0.07
Mohawk Valley	(0.99)	(0.81)	(0.65)	(0.49)	(0.32)	(0.33)	(0.45)	(0.37)	(0.42)	0.10
Capital	(2.54)	(2.38)	(2.31)	(1.54)	(0.78)	(1.23)	(1.18)	(1.28)	(1.15)	0.09
Hudson Valley	1.05	0.52	0.59	0.62	0.86	0.72	0.64	0.65	1.15	0.26
Millwood	0.53	0.35	0.35	0.33	0.36	0.33	0.32	0.34	0.49	0.09
Dunwoodie	1.25	0.77	0.80	0.74	0.80	0.73	0.70	0.75	1.09	0.20
NY City	9.80	5.73	6.25	5.80	6.56	5.46	5.69	5.58	8.74	1.55
Long Island	1.49	0.59	0.82	1.20	1.23	0.91	0.58	0.26	1.02	0.27
NYCA Total	**3.92**	**(0.00)**	**1.36**	**3.19**	**6.39**	**4.42**	**3.44**	**3.59**	**8.21**	**3.09**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.10)	(0.04)	(0.07)	(0.06)	(0.04)	(0.03)	(0.03)	(0.02)	(0.02)	0.03
Genesee	(0.13)	(0.11)	(0.08)	(0.06)	(0.04)	(0.03)	(0.06)	(0.04)	(0.06)	0.02
Central	(0.13)	(0.10)	(0.08)	(0.07)	(0.04)	(0.05)	(0.06)	(0.04)	(0.05)	0.03
North	(0.13)	(0.10)	(0.07)	(0.06)	(0.05)	(0.04)	(0.06)	(0.04)	(0.06)	0.02
Mohawk Valley	(0.12)	(0.10)	(0.07)	(0.06)	(0.04)	(0.04)	(0.05)	(0.04)	(0.05)	0.03
Capital	(0.16)	(0.14)	(0.13)	(0.09)	(0.04)	(0.07)	(0.07)	(0.07)	(0.06)	0.02
Hudson Valley	0.08	0.03	0.04	0.04	0.06	0.05	0.05	0.05	0.08	0.06
Millwood	0.14	0.08	0.09	0.08	0.09	0.08	0.08	0.09	0.12	0.07
Dunwoodie	0.14	0.08	0.09	0.08	0.09	0.08	0.08	0.09	0.12	0.07
NY City	0.12	0.07	0.08	0.07	0.08	0.06	0.07	0.07	0.10	0.06
Long Island	0.04	0.01	0.02	0.03	0.03	0.02	0.01	0.01	0.02	0.03

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	52.76	(35.03)	3.30	32.95	13.77	(109.17)	(5.63)	(23.80)	(17.40)	(1.58)
Genesee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central	(116.91)	(13.27)	(22.46)	(0.01)	(0.02)	17.33	(0.05)	(0.03)	(0.05)	(0.02)
North	(0.01)	0.00	(0.01)	(0.02)	0.01	(0.01)	0.01	0.00	0.00	0.00
Mohawk Valley	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital	(0.37)	(0.19)	(0.34)	(0.26)	(0.25)	(0.25)	(0.25)	(0.27)	(0.32)	(0.05)
Hudson Valley	13.55	0.51	2.27	1.31	0.01	1.59	0.19	3.84	2.34	0.00
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	0.80	1.27	0.65	0.35	1.08	1.08	0.87	0.86	0.60	0.22
Long Island	0.13	0.06	0.12	0.22	0.48	0.49	0.04	(0.64)	0.10	(0.03)
NYCA Total	**(50.05)**	**(46.65)**	**(16.47)**	**34.54**	**15.08**	**(88.94)**	**(4.82)**	**(20.04)**	**(14.73)**	**(1.46)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.01	0.00	0.00	0.00	0.00	(0.01)	0.00	0.00	0.00	0.00
Genesee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central	(0.01)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mohawk Valley	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hudson Valley	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long Island	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NYCA Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**(0.01)**	**0.00**	**0.00**	**0.00**	**0.00**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	25.56	(16.01)	(5.53)	2.80	0.05	(60.61)	(2.33)	(10.92)	(10.88)	(0.81)
Genesee	(0.02)	(0.24)	(0.43)	(0.50)	0.04	(0.45)	1.01	(0.58)	0.05	(0.08)
Central	(26.75)	(12.41)	(18.83)	(1.76)	(0.67)	14.22	(7.07)	(6.00)	(7.24)	(0.67)
North	(0.54)	0.00	(0.30)	(0.64)	0.40	(0.27)	0.41	0.15	(0.06)	0.00
Mohawk Valley	(0.04)	(0.70)	(0.95)	0.54	(0.37)	0.15	(0.21)	0.16	(0.41)	0.35
Capital	(5.94)	(3.68)	(5.14)	(3.90)	(2.99)	(4.28)	(3.97)	(2.63)	(4.63)	(0.51)
Hudson Valley	32.15	0.93	23.61	3.13	0.50	(0.10)	5.48	9.53	1.43	0.02
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	66.72	55.42	58.36	29.80	29.43	50.32	41.38	24.91	38.50	2.63
Long Island	10.77	7.09	7.02	8.32	12.45	1.24	2.25	(0.38)	7.66	0.25
NYCA Total	**101.91**	**30.40**	**57.81**	**37.79**	**38.84**	**0.22**	**36.95**	**14.24**	**24.42**	**1.18**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.01	0.00	0.00	0.00	0.00	(0.01)	0.00	0.00	0.00	0.00
Genesee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central	(0.01)	0.00	(0.01)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
North	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mohawk Valley	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hudson Valley	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00
Long Island	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NYCA Total	**0.02**	**0.01**	**0.01**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	17.28	(16.75)	(2.44)	7.22	5.19	(54.47)	(5.46)	(10.07)	(12.76)	(1.76)
Genesee	(0.37)	(0.29)	(0.80)	(0.53)	0.03	(0.48)	0.83	(0.44)	0.33	(0.09)
Central	(45.10)	(14.84)	(23.53)	(3.35)	(2.86)	10.80	(9.59)	(5.95)	(8.11)	(5.84)
North	(3.27)	(0.26)	(1.37)	(4.07)	2.36	(1.35)	1.59	1.03	(0.40)	(0.08)
Mohawk Valley	(0.69)	(1.21)	(1.76)	0.86	(0.67)	0.59	(0.66)	(0.02)	(0.69)	0.53
Capital	(90.14)	(46.47)	(79.62)	(59.97)	(56.91)	(59.85)	(59.93)	(59.39)	(74.94)	(11.52)
Hudson Valley	32.49	0.14	25.82	5.94	0.85	(4.69)	8.28	10.82	(0.48)	0.03
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	81.99	73.23	85.49	36.33	35.35	74.03	52.84	41.82	55.88	5.87
Long Island	20.54	5.40	3.72	7.28	9.92	3.51	3.13	2.60	1.96	0.59
NYCA Total	**12.73**	**(1.05)**	**5.51**	**(10.29)**	**(6.74)**	**(31.91)**	**(8.97)**	**(19.60)**	**(39.21)**	**(12.27)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.10	(0.13)	(0.02)	0.08	0.06	(0.80)	(0.09)	(0.17)	(0.22)	(0.03)
Genesee	0.00	0.00	(0.01)	(0.01)	0.00	(0.01)	0.01	(0.01)	0.01	0.00
Central	(0.26)	(0.12)	(0.24)	(0.03)	(0.03)	0.16	(0.15)	(0.10)	(0.14)	(0.11)
North	(0.02)	0.00	(0.01)	(0.04)	0.03	(0.02)	0.02	0.02	(0.01)	0.00
Mohawk Valley	0.00	(0.01)	(0.02)	0.01	(0.01)	0.01	(0.01)	0.00	(0.01)	0.01
Capital	(0.52)	(0.37)	(0.81)	(0.63)	(0.63)	(0.88)	(0.94)	(0.98)	(1.31)	(0.21)
Hudson Valley	0.19	0.00	0.26	0.06	0.01	(0.07)	0.13	0.18	(0.01)	0.00
Millwood	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dunwoodie	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NY City	0.34	0.53	0.75	0.30	0.29	1.07	0.82	0.67	0.97	0.10
Long Island	0.12	0.04	0.03	0.07	0.11	0.05	0.04	0.04	0.02	0.01
NYCA Total	**(0.05)**	**(0.06)**	**(0.07)**	**(0.19)**	**(0.17)**	**(0.49)**	**(0.17)**	**(0.35)**	**(0.70)**	**(0.23)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.18	0.26	0.18	0.12	0.04	0.22	0.11	0.17	0.14	(0.07)
Genesee	0.08	0.11	0.08	0.06	0.03	0.13	0.05	0.08	0.07	(0.02)
Central	0.05	0.04	0.03	0.00	(0.01)	0.02	0.01	0.01	0.00	0.01
North	0.05	0.04	0.03	0.03	0.01	0.02	0.01	0.02	0.02	(0.01)
Mohawk Valley	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	0.00
Capital	0.00	(0.05)	(0.02)	0.00	0.03	(0.05)	0.00	(0.01)	0.02	0.00
Hudson Valley	(0.20)	(0.16)	(0.20)	(0.13)	(0.10)	(0.11)	(0.16)	(0.18)	(0.18)	(0.04)
Millwood	(0.06)	(0.05)	(0.06)	(0.04)	(0.03)	(0.04)	(0.05)	(0.06)	(0.06)	(0.01)
Dunwoodie	(0.14)	(0.12)	(0.14)	(0.10)	(0.08)	(0.10)	(0.12)	(0.14)	(0.15)	(0.03)
NY City	(1.44)	(1.25)	(1.52)	(1.04)	(0.89)	(1.18)	(1.38)	(1.59)	(1.66)	(0.29)
Long Island	(0.67)	(0.55)	(0.63)	(0.45)	(0.39)	(0.47)	(0.53)	(0.65)	(0.69)	(0.11)
NYCA Total	**(2.16)**	**(1.74)**	**(2.26)**	**(1.56)**	**(1.40)**	**(1.57)**	**(2.07)**	**(2.36)**	**(2.50)**	**(0.57)**

I.4. Case 4: High Solar Penetration

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	0	(0)	(0)	(0)	(1)	(2)	(0)	(1)	(0)
Genesee	(0)	0	(0)	0	(0)	(0)	0	(0)	(0)	0
Central	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)
North	0	0	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(1)	0	(2)	(0)	(2)	(1)	(1)	(2)	(3)	(2)
Hudson Valley	(0)	0	(1)	(0)	(1)	(1)	(0)	(1)	(2)	(1)
Millwood	(0)	0	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(0)
Dunwoodie	(0)	0	(1)	(0)	(1)	(0)	(0)	(1)	(1)	(1)
NY City	(3)	1	(8)	(3)	(8)	(6)	(7)	(13)	(16)	(13)
Long Island	(3)	(1)	(5)	(2)	(4)	(2)	(0)	(4)	(6)	(3)
NYCA Total	**(8)**	**1**	**(18)**	**(6)**	**(17)**	**(12)**	**(10)**	**(23)**	**(31)**	**(21)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1	(0)	(0)	(3)	(4)	(3)	(2)	(3)	(9)	(4)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)
Central	(1)	0	(1)	(1)	(3)	(3)	(1)	(7)	(2)	(3)
North	(0)	0	(0)	(1)	(0)	(0)	(0)	(2)	(1)	(1)
Mohawk Valley	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)	(1)	(1)
Capital	(2)	(3)	(4)	(6)	(7)	(12)	(18)	(15)	(20)	(25)
Hudson Valley	1	(0)	(0)	(0)	(0)	(2)	(1)	(3)	(1)	(1)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1)	(4)	(5)	(7)	(10)	(16)	(16)	(24)	(26)	(25)
Long Island	(1)	(3)	(4)	(5)	(4)	(5)	(4)	(7)	(8)	(6)
NYCA Total	**(4)**	**(11)**	**(15)**	**(23)**	**(28)**	**(41)**	**(43)**	**(61)**	**(69)**	**(67)**
NYCA Imports	(1)	(6)	(7)	(9)	(11)	(18)	(23)	(18)	(25)	(26)
NYCA Exports	3	2	2	5	11	9	14	16	11	18
NYCA + Imports - Exports	**(7)**	**(19)**	**(24)**	**(37)**	**(50)**	**(68)**	**(79)**	**(95)**	**(105)**	**(111)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	38	42	(17)	3	(12)	31	68	47	(11)	47
Genesee	4	7	8	11	18	14	20	18	17	15
Central	(12)	29	22	31	13	34	49	(0)	52	35
North	0	4	(3)	(6)	5	(1)	(0)	(18)	(9)	(4)
Mohawk Valley	6	12	19	32	35	42	49	48	44	50
Capital	10	23	29	43	77	66	(1)	79	25	(14)
Hudson Valley	41	43	67	92	115	114	125	125	140	148
Millwood	4	9	14	20	26	34	42	47	51	52
Dunwoodie	2	5	8	14	20	27	38	44	49	51
NY City	(7)	(32)	(34)	(37)	(8)	(13)	90	30	61	129
Long Island	(1)	62	88	89	115	99	119	83	75	91
NYCA Total	**86**	**204**	**200**	**292**	**404**	**447**	**598**	**503**	**492**	**601**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(9)	(37)	(48)	(55)	(72)	(80)	(94)	(88)	(65)	(108)
LINDEN VFT	(1)	(10)	(11)	(19)	(10)	(32)	(18)	(27)	(28)	(36)
NEPTUNE	(10)	(28)	(32)	(48)	(45)	(68)	(80)	(65)	(59)	(62)
HTP	2	(15)	(20)	(36)	(24)	(35)	(43)	(29)	(52)	(46)
ISONE - NYISO	(71)	(64)	(36)	(78)	(190)	(165)	(249)	(272)	(198)	(264)
CROSS SOUND CABLE	8	(17)	(27)	(28)	(38)	(21)	(16)	(23)	(13)	(19)
NORTHPORT NORWALK	2	(17)	(29)	(15)	(27)	(9)	(17)	3	(8)	(15)
IESO - NYISO	(10)	(15)	(5)	(21)	(10)	(45)	(90)	(20)	(89)	(69)
HQ - NYISO CHAT	0	(0)	0	0	1	0	0	0	0	(0)
HQ - NYISO CEDARS	(0)	0	0	0	0	0	0	0	0	0
TOTAL	**(88)**	**(204)**	**(209)**	**(300)**	**(415)**	**(457)**	**(606)**	**(521)**	**(513)**	**(620)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	(0)	0	(1)	(1)	(1)	(1)	(0)	(3)	(3)
Genesee	0	(0)	0	0	1	0	0	1	0	(1)
Central	0	(2)	1	(1)	(1)	(2)	(3)	(6)	(1)	(5)
North	0	(1)	0	(1)	(0)	(1)	(2)	(2)	(1)	(3)
Mohawk Valley	0	0	1	1	2	2	2	3	2	2
Capital	(0)	0	(0)	2	3	1	(4)	3	(2)	(6)
Hudson Valley	2	2	3	4	6	7	8	8	9	10
Millwood	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(2)	(3)
Dunwoodie	0	0	0	1	1	2	2	3	3	4
NY City	(1)	(3)	(3)	(4)	(4)	(5)	(1)	(4)	(3)	(3)
Long Island	(1)	2	3	3	5	4	6	4	1	3
NYCA Total	**3**	**(3)**	**5**	**4**	**10**	**6**	**7**	**8**	**4**	**(5)**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	(1)	(0)	(2)	(1)	(3)	(4)	(2)	(3)	(4)
Genesee	0	(1)	0	(1)	(0)	(1)	(2)	(1)	(1)	(3)
Central	0	(2)	0	(1)	(1)	(2)	(4)	(2)	(3)	(5)
North	0	(1)	0	(0)	(0)	(1)	(1)	(1)	(1)	(2)
Mohawk Valley	0	(1)	0	(1)	(0)	(1)	(2)	(1)	(1)	(3)
Capital	(1)	(1)	(2)	(1)	(3)	(4)	(4)	(4)	(5)	(6)
Hudson Valley	(0)	(1)	(1)	(1)	(2)	(2)	(3)	(2)	(3)	(4)
Millwood	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(1)	(1)	(1)
Dunwoodie	(0)	(1)	(1)	(1)	(1)	(1)	(2)	(2)	(2)	(3)
NY City	(2)	(5)	(5)	(7)	(9)	(13)	(18)	(19)	(24)	(31)
Long Island	(2)	(3)	(4)	(4)	(4)	(6)	(5)	(6)	(10)	(11)
NYCA Total	**(4)**	**(16)**	**(12)**	**(19)**	**(22)**	**(35)**	**(45)**	**(41)**	**(55)**	**(74)**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.02)	(0.08)	(0.01)	(0.10)	(0.05)	(0.17)	(0.27)	(0.11)	(0.17)	(0.29)
Genesee	0.01	(0.11)	0.01	(0.07)	(0.04)	(0.12)	(0.19)	(0.12)	(0.13)	(0.30)
Central	0.01	(0.11)	(0.01)	(0.09)	(0.06)	(0.15)	(0.21)	(0.13)	(0.17)	(0.34)
North	0.02	(0.11)	0.02	(0.07)	(0.03)	(0.12)	(0.18)	(0.08)	(0.12)	(0.30)
Mohawk Valley	0.01	(0.12)	(0.01)	(0.09)	(0.07)	(0.15)	(0.22)	(0.14)	(0.18)	(0.35)
Capital	(0.05)	(0.10)	(0.15)	(0.10)	(0.24)	(0.27)	(0.30)	(0.31)	(0.42)	(0.49)
Hudson Valley	(0.04)	(0.10)	(0.10)	(0.10)	(0.17)	(0.20)	(0.24)	(0.25)	(0.33)	(0.42)
Millwood	(0.04)	(0.09)	(0.10)	(0.10)	(0.17)	(0.19)	(0.24)	(0.26)	(0.34)	(0.44)
Dunwoodie	(0.04)	(0.09)	(0.10)	(0.10)	(0.16)	(0.19)	(0.23)	(0.25)	(0.32)	(0.43)
NY City	(0.04)	(0.09)	(0.10)	(0.11)	(0.18)	(0.21)	(0.28)	(0.30)	(0.39)	(0.48)
Long Island	(0.08)	(0.12)	(0.16)	(0.16)	(0.19)	(0.23)	(0.21)	(0.24)	(0.36)	(0.39)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	65	28	(92)	(138)	(180)	(66)	74	(10)	(184)	(122)
Genesee	0	0	0	0	0	(0)	0	(0)	(0)	(0)
Central	(44)	108	30	(0)	(1)	(1)	45	(19)	(0)	35
North	0	0	(0)	(0)	0	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	0	(0)	0	(0)	(0)	0	(0)	(0)	(0)
Capital	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)
Hudson Valley	5	(0)	0	(0)	17	(2)	(6)	(27)	(1)	(4)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(0)	(0)	(0)	(1)	(2)	(2)	(2)	0	(3)	(4)
Long Island	0	(3)	(1)	1	(1)	(2)	(1)	(4)	(3)	(0)
NYCA Total	**27**	**133**	**(63)**	**(138)**	**(168)**	**(73)**	**109**	**(60)**	**(191)**	**(96)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	(0.0)	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**0.0**	**0.0**	**(0.0)**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	24	23	(57)	(69)	(99)	(50)	21	(6)	(89)	(76)
Genesee	(0)	(1)	(1)	(1)	(0)	(2)	(1)	(2)	(3)	(3)
Central	(1)	(2)	0	(6)	(12)	(2)	11	(26)	(11)	(10)
North	(0)	0	(1)	(1)	0	(0)	(0)	(2)	(1)	(1)
Mohawk Valley	(1)	(1)	(1)	0	(1)	(1)	(2)	(2)	(4)	(3)
Capital	(1)	(2)	(3)	(3)	(3)	(5)	(6)	(6)	(7)	(8)
Hudson Valley	3	(5)	(6)	(1)	(2)	(7)	(16)	(15)	(20)	(7)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	2	(14)	(14)	(30)	(22)	(69)	(50)	(81)	(78)	(63)
Long Island	(6)	(19)	(18)	(24)	(14)	(23)	(13)	(29)	(35)	(20)
NYCA Total	**20**	**(19)**	**(100)**	**(136)**	**(152)**	**(158)**	**(57)**	**(171)**	**(248)**	**(190)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.0	0.0	(0.0)	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.0**	**(0.0)**	**(0.0)**	**(0.0)**	**(0.0)**	**0.0**	**(0.0)**	**(0.0)**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	28	9	(43)	(59)	(84)	(43)	(0)	(29)	(110)	(57)
Genesee	(0)	(0)	(2)	(2)	(1)	(4)	(2)	(4)	(5)	(6)
Central	(17)	15	(4)	(11)	(29)	(21)	(10)	(51)	(20)	(28)
North	(1)	1	(3)	(5)	0	(3)	(2)	(13)	(7)	(5)
Mohawk Valley	(2)	(2)	(2)	0	(2)	(3)	(2)	(4)	(7)	(5)
Capital	(21)	(26)	(40)	(55)	(63)	(83)	(118)	(97)	(118)	(145)
Hudson Valley	7	(5)	(4)	(3)	(3)	(14)	(14)	(20)	(14)	(9)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(12)	(38)	(55)	(78)	(95)	(128)	(120)	(179)	(184)	(160)
Long Island	(10)	(37)	(39)	(46)	(31)	(39)	(28)	(50)	(54)	(43)
NYCA Total	**(28)**	**(84)**	**(192)**	**(259)**	**(307)**	**(339)**	**(295)**	**(448)**	**(518)**	**(458)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.2	0.1	(0.4)	(0.6)	(0.9)	(0.6)	0.0	(0.5)	(1.9)	(1.1)
Genesee	0.0	0.0	(0.0)	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)
Central	(0.1)	0.1	(0.0)	(0.1)	(0.3)	(0.3)	(0.2)	(0.8)	(0.3)	(0.5)
North	(0.0)	0.0	(0.0)	(0.1)	0.0	(0.0)	(0.0)	(0.2)	(0.1)	(0.1)
Mohawk Valley	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)
Capital	(0.1)	(0.2)	(0.4)	(0.6)	(0.7)	(1.2)	(1.9)	(1.6)	(2.1)	(2.7)
Hudson Valley	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.2)	(0.2)	(0.3)	(0.2)	(0.2)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.1)	(0.2)	(0.3)	(0.6)	(0.8)	(1.8)	(1.8)	(2.9)	(3.1)	(2.8)
Long Island	(0.1)	(0.3)	(0.4)	(0.5)	(0.3)	(0.6)	(0.4)	(0.8)	(0.9)	(0.8)
NYCA Total	**(0.2)**	**(0.6)**	**(1.7)**	**(2.5)**	**(3.1)**	**(4.9)**	**(4.5)**	**(7.3)**	**(9.0)**	**(8.3)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	0.2	(0.0)	0.2	0.1	0.3	0.4	0.0	0.5	0.6
Genesee	(0.1)	0.0	0.0	0.1	0.0	0.1	0.1	(0.1)	0.2	0.2
Central	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)
North	(0.0)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Mohawk Valley	(0.0)	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)
Capital	(0.0)	(0.1)	(0.2)	(0.3)	(0.3)	(0.6)	(0.6)	(0.7)	(0.8)	(0.8)
Hudson Valley	0.0	0.0	0.0	(0.0)	(0.1)	0.0	(0.0)	(0.0)	(0.1)	(0.1)
Millwood	0.0	0.0	0.0	0.0	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	(0.0)	0.0
NY City	0.1	0.2	0.2	0.3	0.1	0.6	0.1	0.3	(0.1)	(0.0)
Long Island	0.1	(0.1)	(0.1)	(0.2)	(0.2)	(0.1)	(0.2)	(0.0)	(0.3)	(0.2)
NYCA Total	**(0.1)**	**0.2**	**(0.2)**	**0.0**	**(0.6)**	**0.1**	**(0.4)**	**(0.7)**	**(0.8)**	**(0.5)**

I.5. Case 5: Higher Natural Gas Prices

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	1	0	(1)	1	1	(1)	0	(2)	(1)
Genesee	0	1	0	1	0	0	1	1	1	1
Central	0	1	1	2	2	2	2	4	3	5
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	1	1	1	1	1	1	2
Capital	1	8	9	11	10	11	14	23	21	34
Hudson Valley	1	5	5	6	6	6	8	12	12	19
Millwood	0	1	2	2	2	2	2	4	4	6
Dunwoodie	0	3	3	4	3	4	5	8	8	12
NY City	4	26	32	35	33	33	44	71	72	114
Long Island	1	13	13	17	17	15	21	37	40	63
NYCA Total	**7**	**59**	**68**	**76**	**74**	**74**	**96**	**160**	**159**	**257**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	5	10	12	18	19	13	20	24	19	45
Genesee	0	0	0	(0)	(0)	0	0	(1)	(1)	(1)
Central	(1)	9	7	(2)	0	(1)	(4)	(2)	7	9
North	(0)	(0)	(0)	0	(0)	0	(1)	(0)	1	1
Mohawk Valley	0	(0)	(1)	(1)	(1)	(0)	(1)	(1)	(1)	1
Capital	3	5	11	12	20	13	24	46	62	64
Hudson Valley	(0)	(1)	(1)	(0)	2	(3)	(3)	(6)	(3)	(3)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	6	26	43	50	57	49	69	104	145	197
Long Island	1	5	8	12	18	16	17	27	37	58
NYCA Total	**14**	**54**	**78**	**89**	**116**	**87**	**122**	**191**	**267**	**370**
NYCA Imports	5	13	25	40	32	28	43	78	83	129
NYCA Exports	(0)	6	7	10	17	7	19	22	15	31
NYCA + Imports - Exports	**20**	**60**	**97**	**120**	**131**	**107**	**146**	**247**	**335**	**469**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	104	218	98	259	353	224	291	334	199	605
Genesee	1	(6)	(9)	(20)	(18)	(7)	(11)	(29)	(37)	(45)
Central	(82)	34	(60)	(343)	(292)	(258)	(374)	(534)	(546)	(691)
North	(5)	(15)	(24)	(26)	(24)	(18)	(42)	(50)	(37)	(75)
Mohawk Valley	(3)	(14)	(36)	(33)	(33)	(24)	(36)	(57)	(46)	(45)
Capital	(39)	(212)	(270)	(395)	(240)	(294)	(257)	(396)	(452)	(847)
Hudson Valley	(9)	(29)	(27)	(16)	8	(53)	(50)	(79)	(69)	(79)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(60)	(27)	(14)	(104)	(83)	(46)	(55)	(249)	(184)	(294)
Long Island	(35)	(117)	(177)	(170)	(89)	(79)	(175)	(279)	(335)	(371)
NYCA Total	**(130)**	**(168)**	**(518)**	**(846)**	**(420)**	**(556)**	**(710)**	**(1,340)**	**(1,508)**	**(1,840)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	49	74	175	352	335	223	230	354	369	503
LINDEN VFT	15	49	148	170	147	67	69	131	130	222
NEPTUNE	25	123	271	287	227	155	221	346	374	542
HTP	25	88	139	260	188	69	80	184	178	346
ISONE - NYISO	(0)	(127)	(194)	(194)	(336)	(288)	(480)	(595)	(540)	(581)
CROSS SOUND CABLE	9	6	(36)	(48)	(36)	(38)	(6)	(17)	(45)	(85)
NORTHPORT NORWALK	(0)	(8)	(46)	(54)	(72)	(39)	(46)	(58)	(35)	(79)
IESO - NYISO	14	(25)	58	72	(21)	414	648	1,007	1,068	989
HQ - NYISO CHAT	(0)	(1)	(1)	(2)	(0)	(1)	(2)	(2)	(3)	(4)
HQ - NYISO CEDARS	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(1)	(1)
TOTAL	**135**	**179**	**514**	**844**	**430**	**562**	**715**	**1,348**	**1,496**	**1,851**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	8	19	23	37	48	37	52	84	104	155
Genesee	1	3	5	8	8	6	10	16	21	29
Central	6	22	40	37	46	33	47	83	129	158
North	2	5	10	13	15	12	16	29	41	52
Mohawk Valley	1	2	3	5	6	4	6	11	16	22
Capital	4	8	16	18	26	18	32	58	72	80
Hudson Valley	(0)	(1)	0	1	3	(1)	0	(1)	2	3
Millwood	6	19	31	39	43	35	50	85	110	146
Dunwoodie	0	0	0	0	0	0	0	0	1	1
NY City	6	28	45	49	56	48	68	107	148	199
Long Island	2	8	12	16	22	18	21	37	50	73
NYCA Total	**35**	**113**	**185**	**223**	**275**	**211**	**302**	**508**	**693**	**918**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	3	9	17	20	26	19	25	47	64	83
Genesee	3	6	12	16	18	13	19	33	46	59
Central	5	11	21	28	32	25	36	62	84	109
North	1	3	6	7	10	9	13	23	32	41
Mohawk Valley	2	5	10	13	15	12	17	29	40	52
Capital	5	17	26	34	37	31	42	72	89	122
Hudson Valley	3	11	18	23	26	21	29	50	63	85
Millwood	1	3	6	7	8	6	9	15	19	26
Dunwoodie	2	7	11	14	16	13	18	31	40	54
NY City	20	62	102	129	143	115	163	279	359	484
Long Island	8	29	44	58	65	51	73	128	168	229
NYCA Total	**52**	**162**	**272**	**350**	**395**	**315**	**445**	**769**	**1,003**	**1,344**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.20	0.57	1.07	1.31	1.63	1.21	1.61	2.98	4.05	5.20
Genesee	0.25	0.61	1.19	1.58	1.78	1.32	1.91	3.36	4.64	5.93
Central	0.28	0.67	1.33	1.78	2.02	1.54	2.23	3.87	5.22	6.76
North	0.26	0.59	1.22	1.62	1.89	1.41	2.05	3.58	4.89	6.31
Mohawk Valley	0.29	0.69	1.36	1.82	2.08	1.57	2.27	3.95	5.33	6.92
Capital	0.38	1.30	2.07	2.69	2.88	2.37	3.31	5.66	6.99	9.54
Hudson Valley	0.34	1.10	1.83	2.34	2.56	2.06	2.92	5.01	6.38	8.57
Millwood	0.34	1.11	1.85	2.36	2.58	2.07	2.95	5.05	6.42	8.63
Dunwoodie	0.34	1.11	1.84	2.35	2.57	2.06	2.93	5.02	6.39	8.59
NY City	0.35	1.11	1.84	2.37	2.59	2.06	2.93	5.06	6.45	8.61
Long Island	0.33	1.23	1.87	2.50	2.76	2.20	3.13	5.44	7.00	9.39

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	300	715	775	1,352	1,575	1,066	1,263	1,852	1,702	2,805
Genesee	0	0	(0)	(0)	(0)	0	(0)	(0)	(0)	(0)
Central	(72)	1,342	1,165	44	70	24	56	62	101	42
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	(0)	(0)	(0)	(1)	(0)	(1)	(1)	(1)	(1)	(1)
Hudson Valley	(1)	11	(14)	6	21	(3)	16	(28)	(1)	1
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	36	5	4	5	13	29	58	120	82	137
Long Island	4	6	13	19	9	71	133	281	242	202
NYCA Total	**266**	**2,078**	**1,943**	**1,426**	**1,688**	**1,187**	**1,525**	**2,287**	**2,125**	**3,185**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.0**	**0.2**	**0.3**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	151	336	418	664	703	456	508	693	578	1,024
Genesee	1	(2)	(3)	(6)	(6)	(1)	(3)	(7)	(10)	(15)
Central	(12)	19	(1)	(27)	(40)	(18)	(59)	(42)	(33)	(66)
North	(1)	(2)	(2)	(3)	(3)	(2)	(4)	(5)	(4)	(8)
Mohawk Valley	(0)	(4)	(10)	(9)	(9)	(7)	(10)	(17)	(15)	(16)
Capital	(1)	(4)	(6)	(9)	(6)	(7)	(6)	(10)	(11)	(21)
Hudson Valley	(6)	(16)	(18)	(0)	1	(25)	(24)	(52)	(50)	(47)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(3)	(42)	(44)	(82)	(59)	(80)	(53)	(181)	(133)	(143)
Long Island	(19)	(69)	(83)	(77)	(50)	(21)	(53)	(89)	(111)	(107)
NYCA Total	**110**	**217**	**251**	**451**	**531**	**293**	**295**	**290**	**211**	**602**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	(0.0)	(0.0)	0.0	(0.0)	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)
Long Island	0.0	(0.0)	(0.0)	(0.0)	(0.0)	0.0	(0.0)	(0.0)	(0.0)	(0.0)
NYCA Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	126	266	238	418	489	319	404	527	424	858
Genesee	1	(3)	(4)	(10)	(10)	(4)	(5)	(15)	(18)	(23)
Central	(45)	179	94	(149)	(132)	(115)	(175)	(231)	(224)	(293)
North	(3)	(8)	(13)	(14)	(13)	(10)	(22)	(26)	(18)	(40)
Mohawk Valley	(2)	(7)	(20)	(17)	(17)	(12)	(18)	(29)	(23)	(22)
Capital	(20)	(85)	(114)	(170)	(106)	(125)	(105)	(157)	(180)	(351)
Hudson Valley	(7)	(19)	(21)	(10)	5	(38)	(35)	(61)	(50)	(57)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(27)	(36)	(24)	(81)	(73)	(8)	(2)	(128)	(86)	(134)
Long Island	(23)	(74)	(107)	(105)	(57)	(37)	(92)	(152)	(185)	(205)
NYCA Total	**1**	**214**	**29**	**(138)**	**84**	**(30)**	**(50)**	**(272)**	**(362)**	**(267)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.7	2.1	2.4	4.4	5.4	4.7	6.3	8.7	7.4	15.9
Genesee	0.0	(0.0)	(0.0)	(0.1)	(0.1)	(0.1)	(0.1)	(0.3)	(0.3)	(0.4)
Central	(0.3)	1.4	0.9	(1.6)	(1.5)	(1.7)	(2.7)	(3.8)	(3.9)	(5.4)
North	(0.0)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.3)	(0.4)	(0.3)	(0.7)
Mohawk Valley	(0.0)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.3)	(0.5)	(0.4)	(0.4)
Capital	(0.1)	(0.7)	(1.2)	(1.8)	(1.2)	(1.8)	(1.6)	(2.6)	(3.2)	(6.5)
Hudson Valley	(0.0)	(0.2)	(0.2)	(0.1)	0.1	(0.6)	(0.6)	(1.0)	(0.9)	(1.0)
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.1)	(0.3)	(0.3)	(0.5)	(0.3)	(0.0)	0.2	(1.8)	(1.2)	(2.0)
Long Island	(0.1)	(0.6)	(1.1)	(1.1)	(0.6)	(0.5)	(1.4)	(2.5)	(3.3)	(3.8)
NYCA Total	**0.0**	**1.7**	**0.2**	**(1.1)**	**1.4**	**(0.3)**	**(0.6)**	**(4.2)**	**(6.0)**	**(4.4)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.9)	(1.9)	(3.8)	(5.7)	(6.4)	(5.1)	(7.4)	(12.4)	(15.0)	(21.4)
Genesee	(0.3)	(0.8)	(1.4)	(2.2)	(2.5)	(2.0)	(2.8)	(4.6)	(5.5)	(7.9)
Central	(0.2)	(0.6)	(0.9)	(0.8)	(1.1)	(0.8)	(1.0)	(1.8)	(2.1)	(3.2)
North	(0.1)	(0.2)	(0.3)	(0.5)	(0.6)	(0.5)	(0.7)	(1.2)	(1.7)	(2.2)
Mohawk Valley	(0.0)	(0.0)	(0.0)	0.0	0.1	0.1	0.1	0.1	0.2	0.2
Capital	0.1	0.4	0.7	1.0	1.1	0.9	1.1	1.8	2.2	3.5
Hudson Valley	0.0	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.4	0.3
Millwood	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1
Dunwoodie	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.2	0.1
NY City	0.1	0.6	0.8	0.1	1.1	0.8	0.4	1.0	2.1	0.8
Long Island	0.1	0.6	1.4	1.3	1.6	1.2	1.6	2.9	4.0	4.4
NYCA Total	**(1.2)**	**(1.7)**	**(3.4)**	**(6.5)**	**(6.3)**	**(5.2)**	**(8.5)**	**(13.7)**	**(15.0)**	**(25.1)**

I.6. Case 6: Lower Natural Gas Prices

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	0	0	(0)	0	2	1	1	1	2
Genesee	(0)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Central	(1)	(2)	(2)	(3)	(4)	(6)	(7)	(7)	(7)	(6)
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(1)	(1)	(1)	(1)	(2)	(2)	(2)	(2)	(2)
Capital	(5)	(11)	(17)	(22)	(28)	(38)	(40)	(39)	(42)	(35)
Hudson Valley	(4)	(6)	(10)	(12)	(16)	(21)	(22)	(21)	(23)	(21)
Millwood	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(7)	(7)
Dunwoodie	(2)	(4)	(6)	(8)	(10)	(13)	(14)	(13)	(15)	(14)
NY City	(21)	(35)	(57)	(72)	(95)	(122)	(130)	(127)	(139)	(131)
Long Island	(10)	(14)	(27)	(34)	(47)	(65)	(69)	(70)	(79)	(76)
NYCA Total	**(44)**	**(74)**	**(123)**	**(157)**	**(206)**	**(274)**	**(291)**	**(286)**	**(315)**	**(290)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(5)	(22)	(10)	(15)	(51)	(66)	(76)	(94)	(80)	(70)
Genesee	0	0	(0)	0	0	(0)	(0)	(0)	0	(0)
Central	(2)	(10)	(9)	(5)	(2)	(6)	(9)	(9)	(8)	(8)
North	(0)	(0)	(0)	(1)	2	4	2	(1)	3	1
Mohawk Valley	1	0	(0)	1	1	0	1	1	2	1
Capital	(6)	(12)	(20)	(29)	(39)	(49)	(48)	(57)	(49)	(50)
Hudson Valley	1	3	1	(1)	1	4	6	7	9	5
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(17)	(41)	(61)	(83)	(122)	(159)	(185)	(186)	(192)	(187)
Long Island	(2)	(8)	(10)	(18)	(30)	(43)	(45)	(51)	(51)	(44)
NYCA Total	**(31)**	**(89)**	**(109)**	**(152)**	**(240)**	**(315)**	**(353)**	**(391)**	**(366)**	**(351)**
NYCA Imports	(12)	(25)	(38)	(65)	(79)	(139)	(143)	(120)	(130)	(133)
NYCA Exports	(4)	(11)	(15)	(19)	(27)	(39)	(34)	(20)	(23)	(20)
NYCA + Imports - Exports	**(40)**	**(103)**	**(132)**	**(197)**	**(292)**	**(414)**	**(462)**	**(491)**	**(473)**	**(464)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(156)	(421)	(38)	(63)	(733)	(817)	(983)	(1,248)	(1,050)	(867)
Genesee	10	18	12	25	27	40	38	34	44	38
Central	61	28	117	382	636	823	880	820	795	762
North	9	19	24	28	100	178	142	81	127	114
Mohawk Valley	24	27	14	51	64	80	87	93	97	78
Capital	91	313	292	500	747	1,213	1,290	1,258	1,237	1,122
Hudson Valley	16	70	33	17	46	133	172	167	183	117
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	15	78	(36)	118	160	397	292	438	298	304
Long Island	138	237	287	369	414	546	647	538	542	580
NYCA Total	**208**	**368**	**704**	**1,427**	**1,460**	**2,593**	**2,563**	**2,180**	**2,273**	**2,247**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(113)	(263)	(239)	(450)	(598)	(902)	(948)	(882)	(910)	(779)
LINDEN VFT	(48)	(101)	(155)	(295)	(332)	(272)	(230)	(214)	(198)	(217)
NEPTUNE	(110)	(306)	(419)	(563)	(670)	(655)	(832)	(635)	(603)	(615)
HTP	(79)	(121)	(222)	(388)	(507)	(401)	(387)	(337)	(330)	(326)
ISONE - NYISO	144	353	341	456	613	1,555	1,587	1,456	1,440	1,162
CROSS SOUND CABLE	(13)	32	43	69	92	11	82	63	40	13
NORTHPORT NORWALK	(5)	50	76	76	130	137	146	100	72	79
IESO - NYISO	4	(37)	(137)	(332)	(220)	(2,114)	(2,059)	(1,841)	(1,871)	(1,637)
HQ - NYISO CHAT	1	2	1	3	5	4	4	4	4	4
HQ - NYISO CEDARS	0	0	0	0	1	1	1	1	1	1
TOTAL	**(219)**	**(392)**	**(710)**	**(1,425)**	**(1,488)**	**(2,637)**	**(2,637)**	**(2,285)**	**(2,354)**	**(2,317)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(11)	(33)	(25)	(43)	(90)	(116)	(140)	(161)	(149)	(140)
Genesee	(1)	(5)	(6)	(13)	(16)	(20)	(26)	(25)	(23)	(25)
Central	(11)	(39)	(45)	(70)	(97)	(115)	(140)	(139)	(138)	(133)
North	(3)	(10)	(11)	(22)	(29)	(36)	(43)	(47)	(41)	(43)
Mohawk Valley	(0)	(3)	(4)	(8)	(11)	(15)	(17)	(18)	(15)	(17)
Capital	(7)	(17)	(25)	(41)	(51)	(63)	(64)	(69)	(63)	(60)
Hudson Valley	0	2	(1)	(3)	(3)	(1)	0	1	2	(0)
Millwood	(12)	(32)	(41)	(67)	(94)	(124)	(137)	(139)	(138)	(135)
Dunwoodie	0	(0)	(0)	(0)	(0)	(0)	(1)	(1)	(1)	(1)
NY City	(18)	(43)	(60)	(88)	(124)	(154)	(177)	(178)	(183)	(179)
Long Island	(3)	(11)	(15)	(29)	(42)	(57)	(57)	(64)	(64)	(58)
NYCA Total	**(67)**	**(191)**	**(236)**	**(383)**	**(557)**	**(700)**	**(800)**	**(839)**	**(812)**	**(791)**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(4)	(15)	(19)	(35)	(48)	(60)	(70)	(71)	(68)	(68)
Genesee	(3)	(11)	(14)	(25)	(35)	(44)	(50)	(51)	(49)	(49)
Central	(6)	(20)	(25)	(45)	(64)	(85)	(96)	(99)	(95)	(95)
North	(2)	(5)	(6)	(12)	(21)	(32)	(37)	(37)	(36)	(36)
Mohawk Valley	(3)	(9)	(12)	(21)	(30)	(40)	(46)	(47)	(45)	(46)
Capital	(10)	(27)	(35)	(57)	(79)	(106)	(118)	(119)	(118)	(111)
Hudson Valley	(7)	(19)	(24)	(39)	(55)	(72)	(80)	(82)	(80)	(77)
Millwood	(2)	(6)	(7)	(12)	(16)	(22)	(24)	(25)	(24)	(24)
Dunwoodie	(5)	(12)	(15)	(24)	(34)	(45)	(50)	(51)	(51)	(50)
NY City	(41)	(105)	(136)	(220)	(311)	(401)	(450)	(461)	(456)	(445)
Long Island	(19)	(45)	(62)	(100)	(141)	(189)	(211)	(220)	(222)	(220)
NYCA Total	**(102)**	**(273)**	**(355)**	**(589)**	**(834)**	**(1,096)**	**(1,232)**	**(1,262)**	**(1,244)**	**(1,219)**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.26)	(0.94)	(1.21)	(2.23)	(3.06)	(3.85)	(4.49)	(4.52)	(4.33)	(4.33)
Genesee	(0.34)	(1.11)	(1.43)	(2.53)	(3.54)	(4.53)	(5.11)	(5.22)	(4.99)	(5.05)
Central	(0.38)	(1.26)	(1.60)	(2.88)	(4.07)	(5.36)	(6.07)	(6.22)	(5.96)	(5.96)
North	(0.33)	(1.15)	(1.41)	(2.56)	(3.72)	(4.94)	(5.63)	(5.75)	(5.49)	(5.54)
Mohawk Valley	(0.41)	(1.31)	(1.62)	(2.92)	(4.16)	(5.45)	(6.19)	(6.35)	(6.09)	(6.08)
Capital	(0.81)	(2.14)	(2.84)	(4.55)	(6.29)	(8.31)	(9.21)	(9.36)	(9.21)	(8.73)
Hudson Valley	(0.72)	(1.85)	(2.45)	(3.97)	(5.54)	(7.20)	(8.03)	(8.21)	(8.06)	(7.79)
Millwood	(0.74)	(1.87)	(2.48)	(4.01)	(5.60)	(7.26)	(8.11)	(8.28)	(8.14)	(7.92)
Dunwoodie	(0.73)	(1.86)	(2.47)	(3.98)	(5.57)	(7.22)	(8.06)	(8.24)	(8.09)	(7.88)
NY City	(0.73)	(1.88)	(2.48)	(4.02)	(5.63)	(7.26)	(8.11)	(8.30)	(8.15)	(7.93)
Long Island	(0.82)	(1.92)	(2.68)	(4.30)	(6.06)	(8.08)	(9.03)	(9.27)	(9.31)	(9.03)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(510)	(1,435)	(861)	(1,430)	(3,322)	(3,819)	(4,421)	(5,119)	(4,604)	(3,919)
Genesee	0	0	0	0	0	0	0	0	0	0
Central	(550)	(1,620)	(823)	1	27	(15)	(41)	4	(40)	(20)
North	0	0	0	0	0	0	0	0	0	0
Mohawk Valley	0	0	0	0	0	0	0	0	0	0
Capital	0	1	1	1	1	2	2	2	2	2
Hudson Valley	(1)	1	(13)	(14)	1	22	(6)	(5)	6	22
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	0	(32)	(2)	(9)	(36)	(34)	(16)	(32)	(25)	(16)
Long Island	(2)	(11)	(1)	(20)	(25)	(27)	(7)	(29)	(38)	(8)
NYCA Total	**(1,062)**	**(3,096)**	**(1,700)**	**(1,472)**	**(3,354)**	**(3,870)**	**(4,488)**	**(5,178)**	**(4,698)**	**(3,938)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.1)	(0.1)	(0.1)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.2)	(0.1)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.1)	(0.2)	(0.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.3)**	**(0.2)**	**(0.2)**	**(0.3)**	**(0.3)**	**(0.3)**	**(0.3)**	**(0.2)**	**(0.1)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(237)	(793)	(364)	(702)	(1,685)	(1,805)	(2,146)	(2,530)	(2,143)	(1,737)
Genesee	3	5	3	7	8	14	11	10	13	12
Central	15	29	25	42	76	145	140	128	131	143
North	1	2	3	3	10	18	14	9	13	12
Mohawk Valley	7	8	4	17	21	25	24	26	28	23
Capital	2	9	8	11	18	30	33	31	35	29
Hudson Valley	6	41	9	5	22	74	97	77	89	50
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	18	59	82	152	189	418	397	475	347	329
Long Island	67	89	136	155	189	233	269	220	225	227
NYCA Total	**(119)**	**(551)**	**(93)**	**(310)**	**(1,152)**	**(849)**	**(1,160)**	**(1,555)**	**(1,261)**	**(912)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.1)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**(0.1)**	**(0.0)**	**(0.0)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(185)	(538)	(199)	(329)	(1,077)	(1,210)	(1,421)	(1,715)	(1,477)	(1,235)
Genesee	6	10	6	13	13	20	18	17	21	18
Central	(28)	(153)	(35)	172	288	384	400	381	371	355
North	5	10	15	16	55	95	76	43	69	58
Mohawk Valley	13	14	7	25	32	40	44	47	50	41
Capital	39	135	129	213	312	488	534	521	526	456
Hudson Valley	11	50	21	12	33	94	114	110	121	79
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	18	63	13	116	151	313	248	335	226	225
Long Island	86	150	180	224	256	344	400	334	336	362
NYCA Total	**(35)**	**(259)**	**136**	**461**	**61**	**568**	**414**	**73**	**243**	**361**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1.1)	(4.3)	(2.0)	(3.5)	(11.8)	(17.7)	(22.3)	(28.4)	(25.9)	(22.8)
Genesee	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.3
Central	(0.2)	(1.2)	(0.4)	1.8	3.2	5.6	6.2	6.3	6.5	6.5
North	0.0	0.1	0.2	0.2	0.6	1.4	1.2	0.7	1.2	1.1
Mohawk Valley	0.1	0.1	0.1	0.3	0.4	0.6	0.7	0.8	0.9	0.8
Capital	0.2	1.1	1.3	2.2	3.4	7.2	8.4	8.6	9.2	8.4
Hudson Valley	0.1	0.4	0.2	0.1	0.4	1.4	1.8	1.8	2.1	1.5
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.1	0.5	(0.0)	0.8	1.0	4.1	3.4	4.7	3.1	3.2
Long Island	0.5	1.2	1.8	2.3	2.8	5.0	6.3	5.5	5.9	6.6
NYCA Total	**(0.2)**	**(2.1)**	**1.2**	**4.4**	**0.0**	**7.8**	**6.0**	**0.2**	**3.3**	**5.7**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1.6	4.5	4.4	8.3	13.3	18.8	21.1	22.5	21.3	20.4
Genesee	0.6	1.8	1.6	3.0	5.2	7.3	8.6	9.4	8.8	8.2
Central	0.4	1.1	0.9	1.1	2.0	3.1	3.6	3.7	3.4	3.1
North	0.1	0.4	0.4	0.8	1.2	1.4	1.7	1.9	1.7	1.7
Mohawk Valley	0.0	0.0	0.0	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.3)	(0.2)
Capital	(0.3)	(1.0)	(0.8)	(1.4)	(2.4)	(3.7)	(4.3)	(4.3)	(4.1)	(3.6)
Hudson Valley	(0.1)	(0.4)	(0.2)	(0.2)	(0.5)	(0.4)	(0.7)	(1.0)	(0.8)	(0.4)
Millwood	(0.0)	(0.1)	(0.1)	(0.1)	(0.2)	(0.1)	(0.2)	(0.3)	(0.2)	(0.1)
Dunwoodie	(0.0)	(0.3)	(0.1)	(0.1)	(0.3)	(0.2)	(0.4)	(0.6)	(0.4)	(0.2)
NY City	(0.3)	(2.3)	(0.6)	(1.0)	(2.4)	(1.9)	(3.8)	(6.2)	(4.2)	(2.4)
Long Island	(0.6)	(2.0)	(1.5)	(2.3)	(3.9)	(4.5)	(6.2)	(6.9)	(6.3)	(5.7)
NYCA Total	**1.4**	**1.8**	**4.1**	**8.1**	**11.9**	**19.8**	**19.4**	**18.0**	**18.9**	**20.7**

I.7. Case 7: Higher CO2 Emissions Cost

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0)	1	1	3	3	1	(0)	2	2	1
Genesee	(0)	0	(0)	(0)	(0)	(1)	(1)	(1)	(0)	(1)
Central	(0)	0	0	1	0	(3)	(3)	(3)	(4)	(4)
North	0	0	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	0	(0)	0	0	(1)	(1)	(1)	(1)	(1)
Capital	(1)	1	(0)	2	2	(17)	(18)	(19)	(22)	(25)
Hudson Valley	(1)	1	(1)	1	1	(9)	(10)	(11)	(13)	(15)
Millwood	(0)	0	(0)	0	0	(3)	(3)	(3)	(4)	(5)
Dunwoodie	(0)	0	(1)	1	1	(6)	(6)	(7)	(8)	(10)
NY City	(4)	4	(5)	7	6	(55)	(60)	(64)	(80)	(96)
Long Island	(2)	1	(2)	2	4	(20)	(19)	(26)	(35)	(39)
NYCA Total	**(9)**	**8**	**(8)**	**17**	**18**	**(114)**	**(121)**	**(133)**	**(165)**	**(194)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(2)	(4)	(6)	(21)	(65)	6	4	2	(4)	17
Genesee	0	0	(0)	(1)	(1)	1	1	1	2	2
Central	(2)	(2)	(1)	(2)	(1)	35	47	48	57	72
North	(0)	0	0	0	2	6	5	3	6	7
Mohawk Valley	0	0	(0)	0	(1)	3	4	4	5	6
Capital	1	0	1	(2)	8	67	75	90	106	130
Hudson Valley	1	(0)	(0)	(2)	(3)	1	5	4	3	5
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	3	10	11	31	43	93	116	141	172	192
Long Island	1	1	(2)	1	5	33	41	45	55	68
NYCA Total	**1**	**5**	**3**	**4**	**(13)**	**246**	**298**	**338**	**401**	**498**
NYCA Imports	4	10	21	70	149	(52)	(57)	(39)	(62)	(88)
NYCA Exports	(1)	(2)	(2)	5	30	(22)	(16)	(8)	(20)	(4)
NYCA + Imports - Exports	**6**	**17**	**26**	**69**	**105**	**215**	**258**	**308**	**359**	**414**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(72)	(158)	(220)	(621)	(1,628)	(490)	(630)	(823)	(1,011)	(815)
Genesee	1	(1)	(8)	(24)	(31)	(0)	4	2	6	4
Central	(71)	(119)	(101)	(296)	(400)	271	357	317	380	468
North	(11)	(2)	(11)	(17)	(1)	56	32	3	40	29
Mohawk Valley	0	(2)	(12)	(20)	(41)	13	24	24	38	30
Capital	4	(50)	(119)	(414)	(375)	564	532	647	738	920
Hudson Valley	9	(8)	(11)	(37)	(51)	(3)	20	20	(2)	16
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	3	59	(23)	(81)	(339)	413	527	605	793	790
Long Island	(15)	(51)	(150)	(297)	(385)	89	117	63	94	163
NYCA Total	**(151)**	**(331)**	**(653)**	**(1,807)**	**(3,252)**	**912**	**983**	**858**	**1,074**	**1,605**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	68	85	162	708	1,576	(272)	(400)	(399)	(403)	(623)
LINDEN VFT	8	43	104	269	497	(105)	(80)	(103)	(90)	(139)
NEPTUNE	6	91	203	449	756	(231)	(284)	(254)	(245)	(303)
HTP	24	57	96	382	826	(139)	(132)	(104)	(122)	(191)
ISONE - NYISO	(10)	24	16	(122)	(660)	717	731	916	979	900
CROSS SOUND CABLE	2	(14)	(18)	(61)	(131)	63	69	94	64	57
NORTHPORT NORWALK	3	(12)	(21)	(47)	(143)	92	105	105	90	98
IESO - NYISO	38	39	84	146	344	(1,083)	(1,052)	(1,195)	(1,441)	(1,481)
HQ - NYISO CHAT	(0)	(0)	(0)	(1)	0	2	3	3	3	4
HQ - NYISO CEDARS	0	0	(0)	(0)	(0)	0	0	1	1	1
TOTAL	**137**	**313**	**627**	**1,723**	**3,067**	**(955)**	**(1,039)**	**(937)**	**(1,164)**	**(1,677)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0	(1)	(1)	(6)	(35)	58	62	70	83	109
Genesee	1	1	2	6	10	19	24	27	33	39
Central	3	5	12	27	53	134	164	188	233	257
North	1	2	4	10	19	37	41	48	60	67
Mohawk Valley	1	1	1	4	6	16	19	23	28	31
Capital	2	2	2	1	11	74	83	106	127	154
Hudson Valley	1	(0)	(0)	(1)	(1)	4	6	8	7	10
Millwood	2	6	7	23	37	51	62	77	94	103
Dunwoodie	0	0	0	0	0	0	0	0	1	1
NY City	3	11	9	29	35	100	122	154	193	212
Long Island	0	1	(3)	(0)	2	38	48	52	64	79
NYCA Total	**13**	**28**	**34**	**94**	**137**	**531**	**630**	**754**	**924**	**1,061**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2	5	8	21	36	61	70	88	105	116
Genesee	2	3	5	12	21	38	44	54	65	72
Central	3	5	8	21	35	60	70	86	103	115
North	1	1	2	6	12	25	29	36	43	48
Mohawk Valley	1	2	4	10	16	28	33	41	49	55
Capital	2	5	6	19	29	32	39	50	62	69
Hudson Valley	1	3	4	14	21	30	35	44	53	59
Millwood	0	1	1	4	6	9	10	13	16	17
Dunwoodie	1	2	3	8	13	18	22	28	33	37
NY City	6	19	22	73	115	161	193	242	293	324
Long Island	2	7	10	32	54	70	87	105	125	142
NYCA Total	**21**	**53**	**72**	**219**	**359**	**531**	**632**	**786**	**947**	**1,054**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.15	0.34	0.50	1.37	2.30	3.92	4.51	5.70	6.78	7.48
Genesee	0.17	0.30	0.49	1.27	2.26	3.85	4.52	5.55	6.70	7.36
Central	0.18	0.31	0.51	1.35	2.26	3.77	4.43	5.43	6.52	7.24
North	0.17	0.28	0.48	1.26	2.17	3.82	4.46	5.48	6.56	7.30
Mohawk Valley	0.17	0.31	0.51	1.36	2.29	3.85	4.51	5.54	6.64	7.38
Capital	0.12	0.37	0.48	1.54	2.41	2.62	3.26	4.10	5.01	5.55
Hudson Valley	0.11	0.34	0.44	1.38	2.19	3.05	3.65	4.55	5.50	6.08
Millwood	0.11	0.34	0.44	1.38	2.19	3.02	3.61	4.51	5.45	5.97
Dunwoodie	0.11	0.34	0.43	1.37	2.17	3.02	3.62	4.51	5.45	5.98
NY City	0.11	0.34	0.43	1.36	2.15	3.01	3.61	4.49	5.40	5.95
Long Island	0.10	0.32	0.43	1.42	2.31	3.05	3.76	4.48	5.28	5.94

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(171)	(317)	(391)	(975)	(3,211)	(1,652)	(1,996)	(2,528)	(3,125)	(2,706)
Genesee	0	0	0	(0)	(0)	0	0	0	0	0
Central	(267)	(535)	(522)	(1)	(2)	20	19	19	21	62
North	(0)	(0)	(0)	(0)	0	0	0	0	0	0
Mohawk Valley	0	0	(0)	(0)	(0)	0	0	0	0	0
Capital	0	(0)	(0)	(1)	(1)	1	1	1	1	2
Hudson Valley	(0)	(0)	(0)	0	(0)	3	(6)	1	3	1
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(0)	(0)	(0)	(2)	(5)	(0)	(3)	(0)	(2)	(4)
Long Island	(0)	(3)	0	(2)	(9)	(7)	(1)	(5)	(15)	(5)
NYCA Total	**(438)**	**(855)**	**(914)**	**(980)**	**(3,227)**	**(1,635)**	**(1,984)**	**(2,512)**	**(3,116)**	**(2,651)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.0)	(0.1)	(0.1)	(0.3)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	(0.1)	(0.1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.3)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(82)	(163)	(209)	(546)	(1,779)	(816)	(1,031)	(1,261)	(1,551)	(1,315)
Genesee	0	(0)	(2)	(7)	(8)	1	1	0	2	1
Central	(11)	(6)	(2)	(33)	(43)	46	70	34	32	76
North	(1)	(0)	(1)	(2)	(0)	6	3	1	4	3
Mohawk Valley	1	(0)	(3)	(6)	(11)	6	6	7	9	9
Capital	(0)	(0)	(2)	(8)	(10)	12	15	16	21	24
Hudson Valley	4	(6)	(8)	(18)	(28)	(7)	2	7	(7)	(3)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(3)	19	(2)	(32)	(22)	208	267	343	436	500
Long Island	(2)	(14)	(32)	(76)	(95)	33	46	24	47	73
NYCA Total	**(94)**	**(170)**	**(261)**	**(728)**	**(1,996)**	**(512)**	**(621)**	**(829)**	**(1,007)**	**(632)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.0)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	(0.0)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.0)**	**(0.0)**	**(0.1)**	**(0.1)**	**(0.3)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(74)	(148)	(199)	(556)	(1,571)	(603)	(751)	(954)	(1,180)	(973)
Genesee	1	(1)	(4)	(11)	(16)	0	2	0	2	1
Central	(62)	(107)	(101)	(126)	(170)	129	174	146	170	223
North	(6)	(1)	(5)	(8)	0	30	17	0	21	14
Mohawk Valley	0	(0)	(6)	(9)	(20)	8	13	13	20	18
Capital	1	(23)	(47)	(174)	(164)	227	228	260	303	366
Hudson Valley	7	(5)	(8)	(26)	(37)	(3)	16	15	1	8
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	3	40	1	(6)	(85)	196	256	301	401	415
Long Island	(7)	(29)	(79)	(159)	(205)	53	72	38	58	102
NYCA Total	**(138)**	**(273)**	**(449)**	**(1,076)**	**(2,266)**	**36**	**28**	**(180)**	**(205)**	**174**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.6	1.4	1.7	4.2	(0.1)	22.0	25.4	28.8	30.7	42.1
Genesee	0.0	0.1	0.1	0.3	0.4	0.9	1.0	1.2	1.5	1.7
Central	0.7	1.9	2.8	8.4	14.3	21.4	26.8	30.9	35.8	43.0
North	0.1	0.2	0.3	1.0	1.7	2.8	3.0	3.2	3.7	4.8
Mohawk Valley	0.1	0.2	0.2	0.7	1.0	1.8	2.1	2.6	2.7	3.3
Capital	1.4	3.7	5.8	15.9	27.3	38.0	43.8	53.5	62.4	73.8
Hudson Valley	0.1	0.2	0.2	0.3	0.5	1.6	2.5	2.7	3.1	3.6
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	2.5	6.9	10.7	29.9	50.4	71.3	86.2	103.9	122.8	140.8
Long Island	1.3	3.3	4.6	13.7	23.0	29.2	35.1	41.7	49.0	58.0
NYCA Total	**6.8**	**17.9**	**26.4**	**74.4**	**118.6**	**189.1**	**226.0**	**268.5**	**311.6**	**371.1**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.3)	(0.4)	(0.7)	(2.3)	(2.5)	(1.9)	(1.6)	(2.3)	(2.5)	(3.3)
Genesee	(0.0)	(0.0)	(0.1)	(0.5)	0.1	(0.7)	(0.6)	(0.6)	(0.6)	(1.3)
Central	0.0	0.1	0.0	(0.4)	(0.5)	(0.4)	(0.5)	(0.6)	(0.7)	(1.0)
North	(0.0)	(0.1)	(0.1)	(0.4)	(0.6)	(1.0)	(1.1)	(1.3)	(1.6)	(1.8)
Mohawk Valley	0.0	0.0	0.0	0.0	(0.0)	0.0	0.0	0.1	0.1	0.1
Capital	(0.0)	0.0	0.1	0.5	0.7	(0.6)	(0.5)	(0.9)	(0.9)	(1.0)
Hudson Valley	(0.1)	(0.1)	(0.1)	(0.4)	(1.1)	0.1	(0.0)	(0.2)	(0.2)	0.1
Millwood	(0.0)	(0.0)	(0.0)	(0.1)	(0.3)	0.0	(0.0)	(0.1)	(0.1)	(0.0)
Dunwoodie	(0.1)	(0.1)	(0.1)	(0.3)	(0.8)	(0.0)	(0.1)	(0.2)	(0.2)	(0.1)
NY City	(0.6)	(1.0)	(0.9)	(3.0)	(8.1)	1.2	0.5	(0.3)	(0.0)	1.9
Long Island	(0.2)	(0.1)	0.2	0.3	(0.5)	0.2	(0.2)	(0.3)	(0.1)	0.4
NYCA Total	**(1.4)**	**(1.7)**	**(1.7)**	**(6.7)**	**(13.9)**	**(3.2)**	**(4.1)**	**(6.9)**	**(6.9)**	**(6.0)**

I.8. Case 8: Double Natural Gas Prices Differential

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	11	10	9	11	12	10	10	10	9	11
Genesee	6	5	5	5	5	5	5	5	5	6
Central	12	10	11	11	11	10	11	12	12	13
North	0	1	1	1	1	1	1	1	1	1
Mohawk Valley	5	4	4	4	4	4	4	5	4	5
Capital	83	79	83	86	87	81	88	97	94	103
Hudson Valley	45	42	43	45	46	43	46	49	47	52
Millwood	13	12	13	13	13	13	14	15	14	16
Dunwoodie	27	25	26	27	28	26	28	30	29	32
NY City	239	225	232	240	245	229	247	265	257	282
Long Island	90	93	91	100	103	94	95	106	106	114
NYCA Total	**532**	**506**	**518**	**544**	**555**	**514**	**550**	**596**	**580**	**633**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	11	20	4	8	(0)	29	35	32	32	35
Genesee	1	1	1	0	0	2	2	2	2	3
Central	4	5	(3)	1	(2)	(2)	(4)	(3)	(2)	2
North	1	6	3	3	2	10	7	9	10	11
Mohawk Valley	0	1	0	(0)	(1)	1	2	2	2	2
Capital	(176)	(161)	(152)	(154)	(152)	(207)	(181)	(188)	(214)	(227)
Hudson Valley	17	17	13	7	6	6	18	10	19	12
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	241	222	223	227	219	285	267	308	285	313
Long Island	95	92	87	87	94	113	104	109	121	124
NYCA Total	**194**	**203**	**177**	**178**	**166**	**236**	**252**	**281**	**256**	**274**
NYCA Imports	7	11	38	60	78	28	41	34	37	40
NYCA Exports	148	152	156	184	201	201	225	242	219	241
NYCA + Imports - Exports	**53**	**63**	**59**	**54**	**43**	**64**	**67**	**74**	**74**	**73**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	256	471	56	129	22	555	666	580	546	546
Genesee	24	39	23	7	8	35	37	41	40	44
Central	18	22	(179)	(126)	(146)	(123)	(142)	(109)	(114)	(13)
North	56	147	70	69	44	209	141	166	169	175
Mohawk Valley	11	27	8	(8)	(19)	27	52	39	34	42
Capital	(5,326)	(4,968)	(4,620)	(4,478)	(4,115)	(4,801)	(4,283)	(4,279)	(4,420)	(4,486)
Hudson Valley	303	302	223	104	86	103	214	134	214	125
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	5,174	4,560	4,529	4,284	3,781	4,313	3,761	4,138	3,715	3,864
Long Island	1,853	1,645	1,485	1,417	1,389	1,503	1,261	1,262	1,327	1,344
NYCA Total	**2,369**	**2,245**	**1,594**	**1,399**	**1,048**	**1,821**	**1,708**	**1,972**	**1,511**	**1,640**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	1,210	864	1,150	1,348	1,545	1,093	983	968	1,071	1,096
LINDEN VFT	317	437	465	463	523	420	441	378	406	406
NEPTUNE	466	563	637	660	615	736	682	629	680	663
HTP	677	765	888	1,082	1,202	738	716	690	807	804
ISONE - NYISO	(2,676)	(2,632)	(2,609)	(2,904)	(2,930)	(3,030)	(3,014)	(3,290)	(2,856)	(3,059)
CROSS SOUND CABLE	(781)	(759)	(736)	(691)	(673)	(786)	(776)	(747)	(806)	(808)
NORTHPORT NORWALK	(1,229)	(1,156)	(1,172)	(1,167)	(1,164)	(1,188)	(1,059)	(984)	(1,101)	(1,026)
IESO - NYISO	(445)	(409)	(356)	(309)	(304)	131	254	323	216	226
HQ - NYISO CHAT	(4)	(4)	(3)	(4)	(2)	(5)	(5)	(5)	(5)	(5)
HQ - NYISO CEDARS	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
TOTAL	**(2,465)**	**(2,331)**	**(1,739)**	**(1,522)**	**(1,188)**	**(1,891)**	**(1,779)**	**(2,039)**	**(1,590)**	**(1,705)**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	4	14	0	3	2	38	46	49	52	50
Genesee	(1)	1	(0)	(0)	0	4	5	6	6	7
Central	(13)	(6)	(11)	(10)	(8)	15	13	17	25	26
North	(5)	1	(2)	(2)	(2)	13	10	13	16	15
Mohawk Valley	(4)	(2)	(2)	(3)	(3)	1	3	3	4	3
Capital	(182)	(176)	(165)	(169)	(168)	(235)	(206)	(210)	(236)	(249)
Hudson Valley	15	17	13	8	8	9	20	13	21	15
Millwood	57	57	58	57	61	71	78	85	87	90
Dunwoodie	0	0	0	0	0	0	0	1	1	1
NY City	316	301	303	310	309	384	375	429	407	443
Long Island	121	121	116	120	130	153	145	153	171	175
NYCA Total	**308**	**328**	**310**	**313**	**329**	**454**	**490**	**561**	**554**	**576**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(4)	(0)	(2)	0	3	9	9	11	14	12
Genesee	(3)	(2)	(1)	(1)	0	5	6	8	10	8
Central	(2)	1	1	1	3	14	16	19	21	19
North	(4)	(3)	(3)	(3)	(3)	1	1	2	3	2
Mohawk Valley	(2)	(0)	(1)	(0)	1	6	7	8	10	9
Capital	77	76	80	83	86	90	99	110	110	117
Hudson Valley	35	35	36	37	39	44	48	52	53	55
Millwood	10	10	11	11	11	13	14	16	16	16
Dunwoodie	20	21	21	22	24	26	29	32	32	34
NY City	175	179	184	190	198	220	244	269	271	283
Long Island	65	75	73	82	85	93	97	111	116	119
NYCA Total	**366**	**391**	**399**	**421**	**447**	**521**	**570**	**639**	**657**	**675**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.22)	0.01	(0.11)	0.01	0.16	0.62	0.60	0.74	0.90	0.81
Genesee	(0.31)	(0.12)	(0.08)	(0.12)	0.01	0.62	0.65	0.85	1.03	0.90
Central	(0.14)	0.08	0.05	0.05	0.18	0.91	0.99	1.19	1.35	1.25
North	(0.87)	(0.58)	(0.64)	(0.64)	(0.50)	0.24	0.28	0.43	0.62	0.46
Mohawk Valley	(0.19)	(0.02)	(0.06)	(0.05)	0.09	0.86	0.93	1.14	1.32	1.20
Capital	5.84	5.77	6.08	6.24	6.37	6.80	7.50	8.29	8.20	8.70
Hudson Valley	3.38	3.37	3.51	3.58	3.72	4.24	4.70	5.14	5.14	5.35
Millwood	3.36	3.41	3.54	3.61	3.76	4.28	4.75	5.18	5.18	5.37
Dunwoodie	3.28	3.32	3.45	3.52	3.66	4.17	4.64	5.06	5.05	5.24
NY City	3.09	3.12	3.23	3.28	3.38	3.87	4.31	4.69	4.67	4.82
Long Island	2.92	3.31	3.20	3.58	3.69	4.12	4.30	4.90	4.98	5.00

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	478	956	22	132	(127)	931	1,129	865	701	697
Genesee	0	0	0	0	0	0	0	0	0	0
Central	203	1,052	366	190	110	101	175	141	103	75
North	0	0	0	0	0	1	0	0	0	0
Mohawk Valley	0	0	0	0	(0)	0	0	0	0	0
Capital	(8)	(8)	(7)	(7)	(6)	(7)	(7)	(7)	(7)	(7)
Hudson Valley	(7)	1	13	53	25	2	65	(7)	39	29
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	20	15	17	15	20	23	27	34	21	19
Long Island	2	(5)	16	41	23	52	55	40	71	44
NYCA Total	**687**	**2,011**	**426**	**425**	**45**	**1,102**	**1,444**	**1,065**	**929**	**856**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.1	0.0	0.0	(0.0)	0.1	0.1	0.0	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.1**	**0.2**	**0.1**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	303	560	73	107	(34)	533	598	468	400	388
Genesee	5	12	6	2	1	10	11	11	12	14
Central	195	171	105	126	97	106	142	111	151	143
North	5	13	4	4	2	19	14	15	16	17
Mohawk Valley	(2)	3	1	(7)	(7)	4	15	8	9	9
Capital	(117)	(111)	(103)	(100)	(95)	(109)	(97)	(97)	(98)	(103)
Hudson Valley	253	246	177	104	86	131	201	136	189	118
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	1,402	1,193	1,139	1,057	926	1,260	1,039	1,208	1,048	1,105
Long Island	606	516	439	387	356	432	359	335	405	406
NYCA Total	**2,651**	**2,602**	**1,840**	**1,681**	**1,332**	**2,385**	**2,282**	**2,194**	**2,132**	**2,098**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Long Island	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
NYCA Total	**0.4**	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	240	474	64	116	(19)	504	588	495	449	450
Genesee	11	18	12	3	3	15	17	20	19	21
Central	112	208	15	20	(6)	(3)	8	5	20	53
North	25	75	36	35	22	102	70	81	86	90
Mohawk Valley	5	12	5	(2)	(9)	9	23	17	15	21
Capital	(2,242)	(2,095)	(1,944)	(1,893)	(1,743)	(1,964)	(1,739)	(1,727)	(1,795)	(1,852)
Hudson Valley	200	197	144	70	52	59	131	77	131	72
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	2,717	2,376	2,327	2,198	1,935	2,271	1,960	2,173	1,935	2,028
Long Island	1,090	963	855	809	785	877	729	733	772	788
NYCA Total	**2,159**	**2,228**	**1,513**	**1,357**	**1,021**	**1,871**	**1,788**	**1,875**	**1,633**	**1,672**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	1.4	3.8	0.6	1.2	(0.2)	7.4	9.2	8.2	7.9	8.3
Genesee	0.1	0.2	0.1	0.0	0.0	0.2	0.3	0.3	0.3	0.4
Central	0.6	1.7	0.1	0.2	(0.1)	(0.1)	0.1	0.1	0.3	0.9
North	0.1	0.6	0.4	0.4	0.3	1.5	1.1	1.4	1.5	1.7
Mohawk Valley	0.0	0.1	0.1	(0.0)	(0.1)	0.1	0.4	0.3	0.3	0.4
Capital	(12.9)	(16.8)	(19.7)	(19.8)	(19.1)	(28.8)	(27.3)	(28.6)	(31.5)	(34.2)
Hudson Valley	1.1	1.6	1.5	0.7	0.6	0.9	2.1	1.3	2.3	1.3
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	12.2	14.3	17.5	16.4	14.8	32.0	29.4	34.2	32.1	35.6
Long Island	6.3	7.7	8.6	8.4	8.6	12.8	11.4	12.1	13.4	14.4
NYCA Total	**9.0**	**13.1**	**9.2**	**7.6**	**4.7**	**26.1**	**26.6**	**29.1**	**26.6**	**28.8**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(1.8)	(2.8)	(2.0)	(2.5)	(2.6)	(6.4)	(7.4)	(7.9)	(8.1)	(8.4)
Genesee	(0.6)	(1.1)	(0.4)	(0.6)	(0.6)	(2.2)	(2.7)	(2.7)	(2.8)	(2.9)
Central	(1.1)	(1.4)	(1.1)	(1.3)	(1.4)	(2.1)	(2.4)	(2.5)	(2.7)	(2.9)
North	0.2	(0.1)	0.1	0.1	0.1	(0.7)	(0.6)	(0.7)	(0.8)	(0.8)
Mohawk Valley	(0.3)	(0.4)	(0.3)	(0.3)	(0.3)	(0.4)	(0.5)	(0.5)	(0.6)	(0.6)
Capital	3.8	3.8	3.5	3.9	4.0	5.5	5.7	6.2	6.6	7.1
Hudson Valley	(2.3)	(2.0)	(2.3)	(2.3)	(2.5)	(2.7)	(2.4)	(2.8)	(2.9)	(3.0)
Millwood	(0.8)	(0.7)	(0.8)	(0.8)	(0.8)	(0.9)	(0.8)	(1.0)	(1.0)	(1.0)
Dunwoodie	(1.9)	(1.7)	(1.8)	(1.8)	(2.0)	(2.3)	(2.1)	(2.4)	(2.4)	(2.6)
NY City	(22.3)	(20.8)	(22.0)	(22.7)	(24.6)	(28.7)	(26.7)	(30.5)	(30.7)	(32.8)
Long Island	(8.9)	(8.1)	(8.1)	(8.0)	(8.7)	(9.9)	(8.9)	(10.0)	(10.6)	(11.3)
NYCA Total	**(36.1)**	**(35.2)**	**(35.2)**	**(36.4)**	**(39.3)**	**(50.8)**	**(48.8)**	**(54.8)**	**(55.8)**	**(59.2)**

I.9. Case 9: Half Natural Gas Prices Differential

PROJECTED DEMAND CONGESTION CHANGE BY ZONE ($M)

Demand Congestion Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(7)	(8)	(9)	(10)	(9)	(7)	(10)	(9)	(10)	(9)
Genesee	(4)	(3)	(4)	(3)	(4)	(3)	(3)	(3)	(3)	(3)
Central	(8)	(7)	(8)	(8)	(9)	(7)	(8)	(8)	(8)	(7)
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(3)	(3)	(3)	(3)	(3)	(2)	(3)	(3)	(3)	(3)
Capital	(51)	(55)	(63)	(60)	(66)	(52)	(58)	(57)	(60)	(55)
Hudson Valley	(26)	(28)	(32)	(31)	(34)	(26)	(29)	(28)	(30)	(28)
Millwood	(8)	(9)	(10)	(9)	(11)	(8)	(9)	(9)	(9)	(9)
Dunwoodie	(16)	(17)	(20)	(19)	(21)	(16)	(18)	(17)	(19)	(17)
NY City	(136)	(143)	(166)	(156)	(176)	(132)	(148)	(144)	(153)	(142)
Long Island	(43)	(40)	(56)	(59)	(71)	(46)	(53)	(49)	(52)	(52)
NYCA Total	**(302)**	**(313)**	**(372)**	**(358)**	**(404)**	**(300)**	**(340)**	**(327)**	**(348)**	**(324)**

PROJECTED PRODUCTION COST CHANGE ($M)

Production Cost Change (M$)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(7)	(20)	(10)	(11)	(26)	(26)	(36)	(52)	(49)	(44)
Genesee	(1)	(1)	(1)	(2)	(1)	(3)	(4)	(4)	(4)	(5)
Central	(9)	(5)	(2)	0	1	(8)	(7)	(10)	(6)	(10)
North	(6)	(6)	(5)	(7)	(4)	(7)	(10)	(11)	(8)	(11)
Mohawk Valley	(1)	(2)	(2)	(1)	(2)	(5)	(3)	(5)	(3)	(4)
Capital	82	106	105	120	132	133	162	159	163	161
Hudson Valley	2	(1)	4	1	3	4	1	3	3	6
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(140)	(141)	(152)	(155)	(162)	(182)	(184)	(195)	(195)	(194)
Long Island	(42)	(42)	(42)	(46)	(51)	(48)	(48)	(45)	(56)	(55)
NYCA Total	**(123)**	**(112)**	**(106)**	**(102)**	**(109)**	**(144)**	**(129)**	**(161)**	**(155)**	**(156)**
NYCA Imports	(34)	(50)	(55)	(63)	(86)	(76)	(80)	(65)	(77)	(72)
NYCA Exports	(92)	(103)	(106)	(114)	(138)	(144)	(128)	(140)	(150)	(146)
NYCA + Imports - Exports	**(64)**	**(59)**	**(55)**	**(51)**	**(57)**	**(76)**	**(81)**	**(87)**	**(82)**	**(82)**

PROJECTED NYCA GENERATION CHANGE (GWh)

Generation Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(158)	(434)	(262)	(258)	(494)	(487)	(647)	(858)	(816)	(713)
Genesee	(37)	(31)	(37)	(43)	(22)	(70)	(71)	(75)	(74)	(75)
Central	(267)	(173)	(97)	(73)	(18)	(185)	(175)	(201)	(135)	(178)
North	(158)	(135)	(129)	(154)	(81)	(123)	(168)	(180)	(127)	(165)
Mohawk Valley	(44)	(67)	(46)	(33)	(36)	(107)	(62)	(91)	(53)	(65)
Capital	3,546	3,764	3,675	3,914	3,877	3,832	4,006	3,967	3,844	3,788
Hudson Valley	67	(17)	57	20	60	63	29	51	50	77
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(3,458)	(3,293)	(3,462)	(3,364)	(3,188)	(3,105)	(2,993)	(3,058)	(2,909)	(2,752)
Long Island	(829)	(786)	(747)	(796)	(776)	(637)	(617)	(588)	(654)	(625)
NYCA Total	**(1,337)**	**(1,172)**	**(1,048)**	**(788)**	**(677)**	**(818)**	**(699)**	**(1,032)**	**(874)**	**(707)**

PROJECTED NET IMPORTS CHANGE (GWh)

NET IMPORTS Change (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
PJM - NYISO	(1,377)	(1,425)	(1,325)	(1,340)	(1,610)	(1,178)	(1,238)	(1,093)	(1,049)	(1,040)
LINDEN VFT	(380)	(408)	(411)	(448)	(465)	(420)	(375)	(377)	(406)	(401)
NEPTUNE	(420)	(533)	(558)	(623)	(627)	(578)	(590)	(510)	(464)	(452)
HTP	(706)	(709)	(780)	(865)	(1,035)	(765)	(756)	(714)	(742)	(704)
ISONE - NYISO	2,896	2,888	2,651	2,680	2,912	3,273	2,872	3,077	3,058	2,927
CROSS SOUND CABLE	634	640	615	622	626	661	646	602	664	593
NORTHPORT NORWALK	571	610	628	704	683	566	563	498	464	485
IESO - NYISO	202	183	308	147	265	(670)	(385)	(437)	(623)	(675)
HQ - NYISO CHAT	4	4	4	4	5	4	5	5	4	5
HQ - NYISO CEDARS	1	1	1	1	1	1	1	1	1	1
TOTAL	**1,426**	**1,251**	**1,132**	**883**	**754**	**894**	**743**	**1,052**	**908**	**739**

PROJECTED GENERATOR PAYMENTS CHANGE ($M)

Generator Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(9)	(23)	(11)	(14)	(20)	(37)	(45)	(57)	(57)	(53)
Genesee	(3)	(3)	(1)	(3)	(1)	(7)	(7)	(8)	(8)	(9)
Central	(16)	(20)	(5)	(9)	(3)	(38)	(36)	(35)	(34)	(43)
North	(5)	(7)	(2)	(6)	(2)	(13)	(14)	(16)	(13)	(18)
Mohawk Valley	(1)	(3)	(0)	(1)	(0)	(8)	(5)	(7)	(5)	(7)
Capital	79	97	93	110	126	140	167	170	171	179
Hudson Valley	2	(2)	2	(1)	2	2	(0)	1	1	4
Millwood	(43)	(51)	(48)	(49)	(53)	(59)	(60)	(59)	(63)	(63)
Dunwoodie	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
NY City	(181)	(194)	(202)	(207)	(218)	(237)	(243)	(255)	(258)	(256)
Long Island	(57)	(57)	(58)	(65)	(73)	(70)	(71)	(68)	(78)	(78)
NYCA Total	**(234)**	**(263)**	**(234)**	**(243)**	**(241)**	**(327)**	**(316)**	**(334)**	**(343)**	**(344)**

PROJECTED LOAD PAYMENTS CHANGE ($M)

Load Payment Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(4)	(8)	(3)	(7)	(2)	(13)	(13)	(12)	(13)	(15)
Genesee	(3)	(4)	(1)	(2)	(0)	(9)	(7)	(6)	(7)	(8)
Central	(6)	(10)	(4)	(7)	(4)	(18)	(16)	(16)	(18)	(20)
North	1	(0)	2	1	2	(5)	(4)	(4)	(4)	(6)
Mohawk Valley	(3)	(4)	(1)	(3)	(2)	(9)	(8)	(8)	(8)	(10)
Capital	(54)	(62)	(63)	(64)	(67)	(68)	(72)	(71)	(75)	(72)
Hudson Valley	(25)	(30)	(29)	(30)	(31)	(33)	(35)	(34)	(36)	(35)
Millwood	(8)	(9)	(9)	(9)	(10)	(10)	(11)	(10)	(11)	(11)
Dunwoodie	(15)	(18)	(17)	(18)	(19)	(20)	(21)	(20)	(22)	(21)
NY City	(124)	(147)	(142)	(144)	(151)	(159)	(168)	(163)	(173)	(169)
Long Island	(40)	(44)	(48)	(55)	(64)	(61)	(65)	(62)	(66)	(69)
NYCA Total	**(282)**	**(338)**	**(315)**	**(337)**	**(348)**	**(404)**	**(420)**	**(407)**	**(433)**	**(434)**

PROJECTED LBMPS CHANGE ($/MWh)

LBMP Change ($/MWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.28)	(0.52)	(0.21)	(0.45)	(0.12)	(0.85)	(0.88)	(0.80)	(0.85)	(0.98)
Genesee	(0.25)	(0.44)	(0.06)	(0.24)	(0.08)	(0.90)	(0.75)	(0.72)	(0.75)	(0.91)
Central	(0.39)	(0.64)	(0.24)	(0.46)	(0.29)	(1.18)	(1.06)	(1.07)	(1.15)	(1.31)
North	0.10	(0.15)	0.31	0.09	0.24	(0.77)	(0.58)	(0.59)	(0.66)	(0.86)
Mohawk Valley	(0.37)	(0.58)	(0.15)	(0.38)	(0.24)	(1.18)	(1.06)	(1.06)	(1.15)	(1.32)
Capital	(4.30)	(4.84)	(4.92)	(4.95)	(5.20)	(5.30)	(5.61)	(5.62)	(5.85)	(5.69)
Hudson Valley	(2.60)	(3.01)	(2.93)	(2.99)	(3.14)	(3.41)	(3.56)	(3.51)	(3.72)	(3.66)
Millwood	(2.57)	(3.02)	(2.96)	(3.02)	(3.18)	(3.43)	(3.58)	(3.53)	(3.75)	(3.70)
Dunwoodie	(2.51)	(2.96)	(2.89)	(2.94)	(3.10)	(3.35)	(3.50)	(3.45)	(3.66)	(3.62)
NY City	(2.36)	(2.72)	(2.62)	(2.65)	(2.78)	(3.03)	(3.15)	(3.10)	(3.26)	(3.25)
Long Island	(1.84)	(2.04)	(2.23)	(2.55)	(2.92)	(2.89)	(3.04)	(2.88)	(3.03)	(3.17)

PROJECTED SO2 EMISSIONS CHANGE (Tons)

SO_2 Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(58)	(564)	(252)	(260)	(825)	(442)	(751)	(1,332)	(1,201)	(1,068)
Genesee	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Central	(826)	(616)	(254)	45	(1)	16	18	(1)	(0)	14
North	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Mohawk Valley	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
Capital	6	7	7	7	7	7	7	7	7	7
Hudson Valley	(4)	13	3	(13)	3	6	(1)	(28)	2	15
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(8)	(5)	(8)	(10)	(10)	(10)	(10)	(13)	(16)	(10)
Long Island	(9)	(13)	(8)	(12)	(14)	(10)	(5)	(12)	(18)	(7)
NYCA Total	**(899)**	**(1,178)**	**(513)**	**(243)**	**(841)**	**(432)**	**(742)**	**(1,379)**	**(1,225)**	**(1,050)**

PROJECTED SO2 EMISSION COSTS CHANGE ($M)

SO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.1)	(0.0)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.1)	(0.1)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Long Island	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NYCA Total	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**	**(0.1)**	**(0.0)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**

PROJECTED NOx EMISSIONS CHANGE (Tons)

NO_X Emissions Change (Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(111)	(411)	(193)	(212)	(491)	(295)	(496)	(802)	(718)	(627)
Genesee	(15)	(12)	(11)	(16)	(9)	(22)	(25)	(23)	(25)	(26)
Central	(99)	(64)	(53)	(28)	(37)	(62)	(81)	(90)	(66)	(75)
North	(15)	(12)	(11)	(14)	(6)	(12)	(17)	(18)	(13)	(16)
Mohawk Valley	(11)	(23)	(14)	(7)	(10)	(31)	(21)	(27)	(17)	(22)
Capital	77	85	81	85	87	84	88	86	87	84
Hudson Valley	(3)	(54)	(16)	(17)	2	1	(20)	(32)	(26)	(6)
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(385)	(376)	(344)	(304)	(299)	(403)	(307)	(382)	(309)	(313)
Long Island	(220)	(215)	(152)	(163)	(154)	(125)	(112)	(120)	(139)	(122)
NYCA Total	**(782)**	**(1,082)**	**(713)**	**(676)**	**(917)**	**(865)**	**(991)**	**(1,407)**	**(1,225)**	**(1,123)**

PROJECTED NOx EMISSION COSTS CHANGE ($M)

NO_X Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.0)	(0.1)	(0.1)	(0.0)	(0.1)	(0.0)	(0.1)	(0.1)	(0.1)	(0.0)
Genesee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Central	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
North	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mohawk Valley	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Capital	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hudson Valley	0.0	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(0.1)	(0.1)	(0.1)	(0.1)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Long Island	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	0.0
NYCA Total	**(0.1)**	**(0.2)**	**(0.2)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.1)**	**(0.0)**

PROJECTED CO2 EMISSIONS CHANGE (1000 Tons)

CO_2 Emissions Change (1000 Tons)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(105)	(364)	(186)	(193)	(456)	(346)	(498)	(740)	(676)	(589)
Genesee	(19)	(14)	(18)	(22)	(11)	(34)	(36)	(37)	(37)	(38)
Central	(226)	(148)	(82)	(23)	(8)	(97)	(95)	(110)	(70)	(93)
North	(84)	(73)	(69)	(86)	(45)	(66)	(91)	(97)	(68)	(91)
Mohawk Valley	(20)	(32)	(22)	(17)	(18)	(52)	(30)	(45)	(27)	(32)
Capital	1,443	1,570	1,534	1,644	1,631	1,561	1,651	1,639	1,590	1,546
Hudson Valley	41	(4)	40	17	39	43	18	30	31	50
Millwood	0	0	0	0	0	0	0	0	0	0
Dunwoodie	0	0	0	0	0	0	0	0	0	0
NY City	(1,559)	(1,481)	(1,553)	(1,511)	(1,450)	(1,427)	(1,354)	(1,402)	(1,310)	(1,252)
Long Island	(455)	(438)	(393)	(423)	(414)	(340)	(326)	(315)	(348)	(331)
NYCA Total	**(982)**	**(984)**	**(750)**	**(614)**	**(733)**	**(757)**	**(761)**	**(1,078)**	**(915)**	**(830)**

PROJECTED CO2 EMISSION COSTS CHANGE ($M)

CO_2 Emissions Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	(0.6)	(2.9)	(1.9)	(2.0)	(5.0)	(5.1)	(7.8)	(12.3)	(11.9)	(10.9)
Genesee	(0.1)	(0.1)	(0.2)	(0.2)	(0.1)	(0.5)	(0.6)	(0.6)	(0.7)	(0.7)
Central	(1.3)	(1.2)	(0.8)	(0.2)	(0.1)	(1.4)	(1.5)	(1.8)	(1.2)	(1.7)
North	(0.5)	(0.6)	(0.7)	(0.9)	(0.5)	(1.0)	(1.4)	(1.6)	(1.2)	(1.7)
Mohawk Valley	(0.1)	(0.3)	(0.2)	(0.2)	(0.2)	(0.8)	(0.5)	(0.7)	(0.5)	(0.6)
Capital	8.3	12.6	15.5	17.2	17.9	22.9	25.9	27.2	27.9	28.6
Hudson Valley	0.2	(0.0)	0.4	0.2	0.4	0.6	0.3	0.5	0.5	0.9
Millwood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dunwoodie	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NY City	(7.1)	(8.7)	(10.9)	(10.8)	(10.9)	(20.6)	(20.9)	(22.8)	(22.5)	(22.7)
Long Island	(2.6)	(3.5)	(4.0)	(4.4)	(4.5)	(5.0)	(5.1)	(5.2)	(6.1)	(6.1)
NYCA Total	**(3.7)**	**(4.7)**	**(2.8)**	**(1.4)**	**(3.0)**	**(10.7)**	**(11.6)**	**(17.4)**	**(15.6)**	**(14.9)**

PROJECTED DEMAND LOSS PAYMENT CHANGE ($M)

Loss Costs Change ($M)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
West	2.9	4.0	2.5	3.7	4.3	7.8	7.9	8.3	9.1	9.6
Genesee	1.0	1.5	0.9	1.3	1.5	2.8	3.1	3.5	3.7	3.8
Central	1.3	1.5	1.2	1.3	1.5	2.4	2.4	2.7	2.7	2.9
North	0.2	0.3	0.1	0.3	0.2	0.6	0.8	0.8	0.7	0.9
Mohawk Valley	0.3	0.4	0.3	0.3	0.3	0.5	0.4	0.5	0.4	0.5
Capital	(3.3)	(3.7)	(3.0)	(3.6)	(3.7)	(5.5)	(5.7)	(6.1)	(5.9)	(6.4)
Hudson Valley	1.3	1.2	1.3	1.4	1.4	1.6	1.4	1.4	1.5	1.5
Millwood	0.5	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.6	0.6
Dunwoodie	1.0	1.0	1.1	1.2	1.3	1.4	1.3	1.3	1.4	1.4
NY City	13.1	13.1	13.4	14.7	16.0	17.9	17.3	17.7	18.7	18.7
Long Island	4.0	3.7	4.3	4.5	4.7	4.4	4.3	4.0	4.8	4.4
NYCA Total	**22.2**	**23.5**	**22.4**	**25.5**	**28.0**	**34.4**	**33.8**	**34.8**	**37.6**	**37.8**