NEW YORK INDEPENDENT SYSTEM OPERATOR

Class Year 2023 Facility Studies Preliminary Deliverability Analysis Draft Report

A Report by the New York Independent System Operator Interconnection Projects

May 2024

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Executive Summary

The Class Year Interconnection Facilities Study[1] (Class Year Study or Facilities Study) for Class Year 2023 (CY23) is being performed in accordance with the applicable rules and requirements set forth under Attachments S, X and Z of the NYISO Open Access Transmission Tariff (OATT).[2] One part of the CY23 Study – the SUF Study – identifies the interconnection facilities (*i.e.*, the System Upgrade Facilities (SUFs), the Connecting Transmission Owner Attachment Facilities (CTOAFs), and some Developer Attachment Facilities (DAFs), that would be required under the Minimum Interconnection Standard (MIS) for the reliable interconnection of the group of projects referred to as Class Year 2023 (CY23)[3] For the group of CY23 projects requesting Capacity Resource Interconnection Service (CRIS), the Class Year Study includes a Deliverability evaluation to determine the extent to which each project is deliverable at the requested CRIS MW level – the Class Year Deliverability Study.

As described in more detail in Section 1 of this Report, the purpose of the Deliverability Study is to identify, and cost allocate any System Deliverability Upgrades (SDUs) that may be required for the projects requesting CRIS in Class Year 2023 (CY23 CRIS projects) under the NYISO Deliverability Interconnection Standard (DIS). The DIS is applied only to those Class Year projects electing CRIS. The DIS is designed to ensure that the proposed project (at the requested CRIS MW level) is deliverable throughout the New York Capacity Region where the project is interconnected or will interconnect, and also that the Developer of the project restores the transfer capability of any Other Interfaces degraded by its interconnection, as required under the DIS.

This report summarizes the results of CY23 Preliminary Deliverability Study to be presented to the Interconnection Projects Facilities Study Working Group (IPFS WG[4]), the Transmission Planning Advisory

[1] Capitalized terms not otherwise defined in this report have the meaning set forth in Attachments S and X of the OATT.

[2] Pursuant to the transition rules set forth in OATT Attachment HH, effective May 2, 2024, "[t]he ISO shall complete the Class Year Interconnection Facilities Study for Class Year 2023, including invoicing study costs and reconciling final payments and any deposit refunds, pursuant to the requirements for a Class Year Study set forth in Attachments X and S to the ISO OATT." OATT Attachment HH Section 40.3.1.3.1.

[3] A proposed project became part of the Class Year 2023 SUF Study if satisfied the criteria for inclusion in the Class Year Study, as those criteria are specified in Sections 25.5.9 and 25.6.2.3.1 of Attachment S – (i) Operating Committee approval of the Interconnection System Reliability Impact Study (SRIS) for the project, and (ii) demonstration that a regulatory milestone had been satisfied in accordance, as applicable, or submission of a two-part deposit in lieu of satisfying the regulatory milestone requirement.

[4]To encourage the participation of Market Participants in the study process, at the beginning of each Class Year the NYISO assembles a working group of all interested parties, including Transmission Owners, project developers and their subject matter experts, NYISO staff, etc. The working group is called the Interconnection Projects Facilities Study Working Group.

Subcommittee (TPAS) and the Operating Committee (OC) through meetings and group status reports.

Below in Table 1 and Table 2 is a summary of the projects that comprise CY23 and their respective CRIS requests.

Table 1: Projects Subject to Class Year SUF Study and the Class Year Deliverability Study

QUEUE POS.	PROJECT	ZONE	Point of Interconnection	Requested Summer ERIS MW	Requested Summer CRIS MW	UNIT TYPE	CTO
Q522	NYC Energy	J	Hudson Avenue East 138kV	79.9	79.9	ES	ConEd
Q560	Deer River Wind	E	Black River-Lighthouse Hill 115kV	100	100	W	NM-NG
Q680	Juno Power Express	K	Ruland Rd. 138kV	1200	N/A	DC	LIPA
Q686	Bull Run Solar Energy Center	D	Patnode – Duley 230 kV Line PND1, Ryan-Plattsburg 230 kV Line RYP2	125	125	S	NYPA
Q700	Robinson Grid	J	Gowanus Substation 345kV	300	300	ES	ConEd
Q716	Moraine Solar Energy Center	C	Moraine Substation 115kV	93.5	93.5	S	NYSEG
Q770	KCE NY 8a	G	South Cairo 13.2kV substation	20	20	ES	CHGE
Q774	Tracy Solar Energy Centre	E	Thousand Island - Lyme 115kV	119	119	S	NM-NG
Q777	White Creek Solar	B	Sta 82 - Sta 128 115kV	135	135	S	RG&E
Q785	Erie-Wyoming County Solar	C	High Sheldon - Stolle Road 230 kV	175	175	CSR	NYSEG
Q800	Rich Road Solar Energy Center	E	Moses - Adirondack 230 kV Line #2 (MA2)	240	240	CSR	NYPA
Q822	Whale Square Energy Storage 1	J	Narrows Barge Feeder 23162	58.2	58.2	ES	ConEd
Q825	Setauket Energy Storage	K	Port Jefferson - Terryville 69kV	65.3	65.3	ES	LIPA
Q834	Luyster Creek Energy Storage 2	J	Astoria West Substation 138kV	79	79	ES	ConEd
Q852	Niagara Dolomite Solar	A	Robinson Rd - Stolle Rd 230kV Line 65	180	180	S	NYSEG
Q857	Columbia Solar Energy Center	E	Edic - Fraser 345kV line	350	350	CSR	NYPA
Q858	Genesee Road Solar Energy Center	A	Stolle Rd - Five Mile Rd 345kV	250	250	S	NYSEG
Q859	Ridge View Solar Energy Center	A	Somerset - Dysinger 345kV	350	350	CSR	NYSEG
Q860	Rosalen Solar Energy Center	B	Clay - Pannell 345kV PC2	200	200	S	NYPA
Q866	North Country Wind	D	Moses - Willis 230 kV (MW1)	306.6	306.6	W	NYPA
Q869	Tabletop Solar	F	Clinton - Clinton Tap 115 kV	80	80	S	NM-NG
Q871	Verona Solar Energy Center I	C	Clay - Edic 345 kV	250	250	S	NYPA
Q878	Pirates Island	A	Huntley - Gardenville 115kV	100	100	ES	NM-NG
Q880	Brookside Solar	D	Chateaugay - Willis 115kV	100	100	S	NYSEG
Q882	Riverside Solar	E	Coffeen - Thousands 115 kV (Lyme tap)	100	100	S	NM-NG
Q950	Hemlock Ridge Solar	B	Lockport - Mortimer	200	200	S	NM-NG
Q952	Catskill Grid, LLC	G	North Catskill - Milan 115kV line	100	100	ES	CHGE

QUEUE POS.	PROJECT	ZONE	Point of Interconnection	Requested Summer ERIS MW	Requested Summer CRIS MW	UNIT TYPE	CTO
Q953	Sugar Maple Solar	E	North Carthage - Taylorville #8 and Black River - Taylorville #2 115kV	125	125	S	NM-NG
Q957	Holbrook Energy Storage	K	Holtsville - Patchogue 69kV	76.8	76.8	ES	LIPA
Q967	KCE NY 5	G	Ohioville 115 KV Substation	94	94	ES	CHGE
Q971	East Setauket Energy Storage	K	Holbrook - Miller Place 138kV	125	125	ES	LIPA
Q974	KCE NY 19	G	Sugarloaf - Wisner 69kV	79	79	ES	O&R
Q995	Alabama Solar Park LLC	B	Lockport - Batavia 115kV (Line#112)	130	130	S	NM-NG
Q1007	NYC Energy LLC - Phase 2	J	Hudson Ave 138 kV Substation	220.1	220.1	ES	ConEd
Q1009	Yellow Barn Solar	C	Milliken – Etna 115 kV line #975	160	160	S	NYSEG
Q1012	Suffolk County Storage II	K	Southold 69 kV Substation	76.8	76.8	ES	LIPA
Q1016	EI Steinway 1	J	Mott Haven - Rainey West 345kV, Mott Haven - Rainey East 345kV	1300	1300	OSW	ConEd
Q1017	EI Steinway 2	J	Mott Haven - Rainey West 345kV, Mott Haven - Rainey East 345kV	1300	1300	OSW	ConEd
Q1031	Mill Point Solar	E	Marcy - New Scotland 345kV Line #18	250	250	CSR	NM-NG
Q1036	Mainesburg ESS	C	Mainesburg - Watercure 345kV	130	130	ES	NYSEG
Q1038	ELP Rotterdam Solar	F	Maple Ave - Rotterdam 115kV Line #10	20	20	S	NM-NG
Q1042	Fort Edward Solar Farm (NY53)	F	Mohican - Battenkill 115kV Line #15	100	100	S	NM-NG
Q1068	Buchanan Point BESS	H	Buchanan North Substation 345 kV	300	300	ES	ConEd
Q1077	Rutland Center Solar	E	Middle Rd Substation 115 kV	110	110	S	NM-NG
Q1079	Somerset Solar	A	Kintigh 345 kV	125	125	S	NYSEG
Q1080	Mineral Basin Solar Power	C	Homer City- Mainesburg 345kV	401.6	401.6	S	NYSEG
Q1088	Harvest Hills Solar	C	Wright Avenue – Milliken 115 kV line	200	200	CSR	NYSEG
Q1089	Flat Creek Solar	F	Edic to Princetown 345kV Line 352	200	200	S	NYPA
Q1096	Allegany 2 Solar	C	Andover - Palmiter 115 kV, Line 932	120	100	CSR	NYSEG
Q1103	Thousand Island Solar	E	Coffeen Street - Thousand Island 115 KV	110	110	S	NM-NG
Q1115	Flat Creek Solar 2	F	Edic to Princetown 345kV Line 352	100	100	S	NYPA
Q1117	CLIES 70MW	K	Sills Road 138kV substation.	70	70	ES	LIPA
Q1122	East Fishkill	G	Shenandoah 115kV Substation	205	205	ES	CHGE
Q1123	KCE NY 29	K	Kings 138 kV substation	150	150	ES	LIPA
Q1130	Hoffman Falls Wind	C	Fenner - Cortland 115kV Line #3	72	72	W	NM-NG
Q1136	Honey Ridge Solar	E	Black River 115 kV Substation	125	125	CSR	NM-NG
Q1141	Twinleaf Solar	E	Black River-Taylorville 115kV	75	75	S	NM-NG
Q1148	Agricola Wind	C	Milliken – Wright Ave 115 kV line #973	97	97	W	NYSEG
Q1150	Moss Ridge Solar	E	Corning - Battle Hill 115 kV Line #4	60	60	S	NM-NG

QUEUE POS.	PROJECT	ZONE	Point of Interconnection	Requested Summer ERIS MW	Requested Summer CRIS MW	UNIT TYPE	CTO
Q1151	York Run Solar	A	Falconer – Warren 115 kV line #171	90	90	S	NM-NG
Q1159	Innisfree Storage	K	Port Jefferson - Mt. Sinai 69 kV transmission line	50	50	ES	LIPA
Q1174	NY48 – Diamond Solar	E	Porter - Valley 115kV line #4	60	60	S	NM-NG
Q1178	NY115 – Newport Solar	E	Porter - Deerfield 115 kV Line # 9	130	130	S	NM-NG
Q1180	Union Energy Center, LLC	H	Union Valley - Croton Falls 115 kV line #991	116	116	ES	NYSEG
Q1182	NY128 - Foothills Solar	F	Mayfield-Northville 69kV	40	40	S	NM-NG
Q1183	NY125A - Fort Covington Solar	D	Moses-Willis 230kV (MW1)	250	250	S	NYPA
Q1184	NY125B - Two Rivers Solar	D	Moses - Willis 230 kV (MW2)	200	200	S	NYPA
Q1188	North Seneca Solar Project	C	Hooks Road - Elbridge 115kV	105	105	S	NM-NG
Q1194	Crane Brook Solar Project	C	State St - Clinton Corn 115kV Line	130	130	S	NM-NG
Q1199	El Steinway 1.1	J	Mott Haven - Rainey West 345kV, Mott Haven - Rainey East 345kV	200	200	OSW	ConEd
Q1236	Gravel Road Solar	C	Station 127 (Hook Rd) - Elbridge and Mortimer-Elbridge 115 kV lines	128	128	S	NM-NG
Q1254	Barrett Hempstead Battery Storage	K	Barrett to Long Beach 33 kV circuit No 1(33-224)	40	40	ES	LIPA
Q1255	Holtsville Brookhaven Battery Storage	K	Line 69-849 from West Yaphank to North Bellport	79.9	79.9	ES	LIPA
Q1256	Canal Southampton Battery Storage	K	Canal Substation 138kV	100	100	ES	LIPA
Q1257	Edwards Calverton Battery Storage	K	Edwards Avenue Substation at 138 kV	60	60	ES	LIPA
Q1288	CPNY-X	E and J	Fraser 345 kV and Rainey 345 kV substations	1300	1300	DC	NYSEG and ConEd

***Q785 Erie-Wyoming County Solar Project is a co-located project that is requesting 175 MW CRIS of solar and 0 MW CRIS of BESS (a total of 175 MW CRIS request)**

***Q800 Rich Road Solar Energy Center Project is a co-located project that is requesting 220 MW CRIS of solar and 20 MW CRIS of BESS (a total of 240 MW CRIS request)**

***Q857 Columbia Solar Energy Center Project is a co-located project that is requesting 330 MW CRIS of solar and 20 MW CRIS of BESS (a total of 350 MW CRIS request)**

***Q859 Ridge View Solar Energy Center Project is a co-located project that is requesting 330 MW CRIS of solar and 20 MW CRIS of BESS (a total of 350 MW CRIS request)**

***Q1031 Mill Point Solar Project is a co-located project that is requesting 250 MW CRIS of solar and 0 MW CRIS of BESS (a total of 250 MW CRIS request)**

***Q1088 Harvest Hills Solar Project is a co-located project that is requesting 200 MW CRIS of solar and 0 MW CRIS of BESS (a total of 200 MW CRIS request)**

***Q1096 Allegany 2 Solar Project is a co-located project that is requesting 100 MW CRIS of solar and 0 MW CRIS of BESS (a total of 100 MW CRIS request)**

***Q1136 Honey Ridge Solar Project is a co-located project that is requesting 65 MW CRIS of solar and 60 MW CRIS of BESS (a total of 125 MW CRIS request)**

*** Q912 Intrepid Storage 69 is not included in the deliverability analysis due to infeasibility identified in the Part 1 Study.**

*** Q918 Intrepid Storage 138 is not included in the deliverability analysis due to infeasibility identified in the Part 1 Study.**

*** Q951 Cayuga Grid, LLC is not included in the deliverability analysis due to infeasibility identified in the Part 1 Study.**

Table 2: CRIS-Only Requests – Subject Only to Class Year Deliverability Study

QUEUE POS.	PROJECT	ZONE	Point of Interconnection	Requested Summer ERIS MW	Requested Summer CRIS MW	UNIT TYPE	CTO
Q1061	Teele	E	Alcoa – North Ogdensburg 115 kV	N/A	19.8	S	NM-NG
Q1113	CLIES 20 MW	K	Sills Road 138 kV substation	N/A	20	ES	LIPA
PAM-2020-77593	West Babylon Energy Storage	K	West Babylon 13 kV	N/A	9.9	ES	LIPA

DIS Study Conclusions

Rest of State (ROS) Capacity Region:

All CY23 CRIS Projects in the ROS Capacity Region is deliverable at their requested CRIS levels and thus eligible to receive CRIS for the requested value without the need for any SDUs.

- All CY23 CRIS Projects in the ROS Capacity Region passed the "No-Harm" Highway and the Other Interfaces[5] total transfer limit evaluations.
- All CY23 CRIS Projects in the ROS Capacity Region passed Highway Capacity Deliverability Assessment.
- All CY23 CRIS Projects in the ROS Capacity Region passed ROS Byway tests.

Lower Hudson Valley (LHV) Capacity Region:

All CY23 CRIS projects in the LHV Capacity Region are deliverable at their requested CRIS levels and thus eligible to receive CRIS for the requested value without the need for any SDUs.

- All CY23 CRIS Projects in the LHV Capacity Region passed the "No-Harm" Highway and the Other Interfaces total transfer limit evaluations.
- All CY23 CRIS Projects in the LHV Capacity Region passed Highway Capacity Deliverability Assessment.

[5] The Other Interfaces "no-harm" test also included the testing of the Norwalk-Northport Cable (NNC)

- All CY23 CRIS Projects in the LHV Capacity Region passed ROS Byway tests.

New York City (NYC) Capacity Region

All CY23 CRIS projects in the NYC Capacity Region are deliverable at their requested CRIS levels and thus eligible to receive CRIS for the requested value without the need for any SDUs.

The NYC Byway tests indicate that the projects located in the NYC Capacity Regions are deliverable.

Long Island (LI) Capacity Region

- The deliverability Byway tests in LI indicated that the following CY23 CRIS projects in the LI Capacity Region are not deliverable at their requested CRIS levels and require Byway SDUs:
    - Q825 Setauket Energy Storage
    - Q957 Holbrook Energy Storage
    - Q971 East Setauket Energy Storage
    - Q1012 Suffolk County Storage II
    - Q1117 CLIES 70MW
    - Q1159 Innisfree Storage
    - Q1254 Barrett Hempstead Battery Storage
    - Q1255 Holtsville Brookhaven Battery Storage
    - Q1256 Canal Southampton Battery Storage
    - Q1257 Edwards Calverton Battery Storage
    - Q1123 KCE NY 29
- The Byway SDUs for the above LI projects consist of the following, which are "new" (*i.e.*, not previously identified and cost allocated in a prior Class Year Study and not substantially similar to a System Deliverability Upgrade previously identified and cost allocated in a Class Year Study) and therefore require an Additional SDU Study per Section 25.5.10 of Attachment S if any of the above-listed projects elect to move forward with such Additional SDU Study:
    - Terryville – Q825 POI rebuild;
    - A PAR controlled 138 kV line between Pilgrim 138 kV station - West Bus 138 kV station

with 138 kV underground cable (two cables per phase);

- Reconductoring portion of Holbrook – Holtsville ckt 1&2 lines uprating to 183 MVA STE;
- W.Yaphank to N.Bell Port 69kV rebuild;
- Adding a 2 ohms series reactor to Ocean Ave or Barrett 34.5 kV with associated upgrades to accommodate the SR.

- The high-level non-binding cost estimate for the above-listed SDUs is **$327.7 M (±50%)**, broken down as follows:
  - Terryville – Q825 POI rebuild: **$8,765,680 (±50%)**
  - Adding a PAR controlled 138 kV line between Pilgrim 138 kV station - West Bus 138 kV station with 138 kV underground cable (2 cables per phase): **$294,879,951 (±50%)**
  - Reconductoring portion of Holbrook – Holtsville ckt 1&2 lines uprating to 183 MVA STE: **$4,978,222 (±50%)**
  - W.Yaphank to N.Bell Port 69kV rebuild: **$14,126,452 (±50%)**
  - Adding a 2 ohms series reactor to Ocean Ave or Barrett 34.5 kV with associated upgrades to accommodate the SR: **$5,000,000 (±50%)**
- Further physical feasibility of the applicable SDUs will be confirmed in the Additional SDU Study if any of the projects indicated above elect to move forward with such Additional SDU Study.

1. Deliverability Study Methodology

This section describes the methodology of the Deliverability Study and SDU identification used in the CY23 Facilities Study.

1.1 Overview of Deliverability Study

The Deliverability Study evaluates the deliverability of the proposed capacity associated with the Class Year CRIS Projects. If the Deliverability Study determines that any of the proposed capacity is not fully deliverable, the study identifies the SDUs that would be required to make the proposed capacity fully deliverable, and the amount of the proposed capacity that would be deliverable without SDUs, if any.

Deliverability is broadly defined in the OATT as the ability to deliver the aggregate of NYCA capacity resources to the aggregate of the NYCA load under summer peak load conditions. This is implemented by evaluating the deliverability of proposed Class Year CRIS Projects within each of the four Capacity Regions in New York State: Rest-of-State (ROS – Zones A through F), Lower Hudson Valley (LHV – Zones G, H, I), New York City (NYC – Zone J), and Long Island (LI – Zone K).

The CY23 Deliverability Study uses the base case representation of 2028 summer peak system condition (ATBA-D) and the ATBA-D case with all CY23 CRIS Projects modeled in-service (ATRA-D). All Class Year CRIS Projects will be evaluated on an aggregate Class Year basis; that is, all CY23 CRIS Projects are evaluated as a group. Deliverability will be determined by simulating generation-to-generation shifts within that Capacity Region and between the adjacent Capacity Regions.

1.2 Tariff Sections Regarding the Deliverability Test Methodology

The Deliverability test methodology used to determine the deliverability of resources is contained in the NYISO OATT. The specific sections of the OATT defining the modeling of the system and the test methodology applied to the CY23 Deliverability Study include:

- NYISO OATT, Attachment S, 25.5
- NYISO OATT, Attachment S, 25.7
- NYISO OATT, Attachment S, 25.8
- NYISO OATT, Attachment S, 25.9

1.3 Transfer Limits Assessments of Required for Determination of Deliverability

The CY23 ATBA-Deliverability (ATBA-D) base case is based on the ATBA case for the MIS portion of the CY23 Facilities Study, and further conditioned for deliverability study purposes. The base case

conditioning steps are described in **Section 2.2**.

The transfer limit calculations are performed on the ATBA-D and ATRA-D cases using the linear transfer simulation function of the software TARA. Generation-to-generation shifts are simulated from combinations of zones within the Capacity Region from "upstream" generation of an interface to "downstream" generation of that interface. Simulation of power transfer within each Capacity Region determines the ability of the network to deliver capacity from generation in one (or more) surplus zone(s) to another deficient zone(s) within that Capacity Region.

The facilities monitored in the deliverability analyses are consistent with those in the Installed Reserve Margin analyses and the Comprehensive System Planning Process, and the defined Highway and Byway facilities.

In the actual transfer limit assessment, all transmission facilities within the NYISO are monitored. Contingencies tested in the transfer limit assessment include all "emergency transfer criteria" contingencies defined by the applicable Northeast Power Coordinating Council (NPCC) Criteria and New York State Reliability Council (NYSRC) Reliability Rules.

The concept of First Contingency Incremental Transfer Capability (FCITC) is used in the determination of deliverable capacity across Highway interfaces within the ROS and LHV Capacity Regions. The FCITC measures the amount of generation in the exporting zone that can be increased to load the interface to its transmission limit. It is the additional generation capacity that could be exported from a given zone(s) above the base case dispatch level.

All generators in the exporting zone(s) are uniformly increased (scaled) in proportion to their maximum power limits (Pmax) while all generators in the importing zone(s) are decreased uniformly in proportion to the difference between their initial generation dispatch level (Pgen) and their minimum power limits (Pmin). The FCITC and Highway transmission constraint(s) for the exporting zone(s) are noted for each export/import combination.

The net generation available[6] is compared to the FCITC Highway transmission constraint(s) for the exporting zone(s) transfer. If the net generation available upstream is greater than the calculated FCITC, that amount of generation above the FCITC is considered to be constrained or "bottled" capacity and may not be fully deliverable under all conditions.

If the net generation available upstream is less than the FCITC (that is, the available generation

[6] The "net generation available" in any defined exporting zone is the difference between the sum of the zonal generators' Pmax and the sum of the zonal generators' actual MW output (Pgen).

upstream does not reach the transmission limit), the difference is an indication of the available "transfer capability" to accommodate additional generation resources in the upstream area.

2. Class Year 2023 Deliverability Study Case Modeling and Assumptions

This section of the report describes the assumptions and base case conditioning steps of ATBA-D case for the CY23 Deliverability Study.

2.1 Deliverability Study Assumption Matrix

The Deliverability Study baseline case setup utilizes results from extensive NYISO studies and reports. The sources for the parameters used to create CY23 ATBA-Deliverability (ATBA-D) case is summarized in Table 3.

Table 3: Parameters Established in other NYISO Studies and Reports

#	Parameter	Description	Reference
1	Installed Capacity Requirement	NYCA Installed Capacity Requirement to achieve LOLE less than 0.1 days per year, which is based on the Installed Reserve Margin (IRM) identified by the New York State Reliability Council (NYSRC) and accepted by the Commission	2023 NYSRC IRM report (for the 2023-2024 Capability Year)
2	RNA Emergency Transfer Limits	Emergency transfer limits on ROS interfaces corresponding to RNA study	Transfer limit from the 2023 RNA report used for the Interface limit
3	Locational Capacity Requirements	The Locational Capacity Requirements (LCR) for the NYC (Zone J) and Long Island (Zone K) Capacity Regions and for the G-J Locality	2023 NYISO LCR report (for the 2023-2024 Capability Year; approved by Operating Committee on January 23, 2023)
		Load model	
4	Peak Load Forecast	Study Capability Period peak demand forecast contained in the latest ISO's Load and Capacity Data report (i.e., "Gold Book")	2028 Summer peak load conditions from 2023 Gold Book Table I-3a
5	Impact of Load Forecast Uncertainty	The impact of IRM due to uncertainty relative to forecasting NYCA loads	2023 NYSRC IRM report
		Generator model	
6	Existing CRIS generators, and all projects with Unforced Capacity Deliverability Rights	Existing Capacity Resource Interconnection Service ("CRIS") generators and transmission projects in-service on the date of the latest ISO's Load and Capacity Data report	
7	Planned generation projects or Merchant Transmission Facilities	The project that has accepted either (a) Deliverable MW or (b) a System Deliverability Upgrade cost allocation and provided cash or posted required security pursuant to OATT Attachment S	2023 Gold Book Table III-2, IV-1, IV-2, IV-3, IV-4 and IV-5
8	UCAP Derate Factor (UCDF)	Convert ICAP to Unforced Capacity (UCAP) based on derated generator capacity incorporating availability	2023 NYSRC IRM report and 2023 NYISO LCR report
9	Inactive CRIS	CRIS for units with inactive CRIS are modeled unless the CRIS rights will expire prior to the scheduled completion of the applicable Expedited Deliverability Study, or the CRIS is associated with a Retired facility that cannot transfer such rights prior to CRIS expiration.	CRIS-inactive facilities whose CRIS will expire prior to April 1,2021 are removed
		Transmission model	
10	Existing transmission facilities	Identified as existing in the ISO's Load and Capacity Data report	
11	Firm plans for changes to transmission facilities by TOs	Planned changes of facilities in the latest ISO's Load and Capacity Data report	
12	System Upgrade Facilities and System Deliverability Upgrades	Facilities associated with planned projects identified in (7) above, except that System Deliverability Upgrades will only be modeled if the construction is triggered	2023 Gold Book and updates consistent with CY23 MIS cases

#	Parameter	Description	Reference
		Import/Export model	
13	External System Import/Export	NYCA scheduled imports from HQ/PJM/ISO-NE/IESO	NYISO Tariffs - OATT Section 25, Attachment S
14	Base case direct transfer from ROS to other New York Capacity Regions	Actual flow scheduled from ROS to LHV, NYC, and LI consistent with the IRM and the LCRs	- ROS to NYC: Approximately 3130 MW - LHV to NYC: Approximately 220 MW - ROS to LIPA: Approximately 930 MW

2.2 Developing the CY23 ATBA-Deliverability Study Base Case

The Class Year Facilities Study cases are a five-year look-ahead of the New York Control Area (NYCA) system. The ATBA-D is based on the ATBA MIS case (which originated from the NYISO FERC Form No. 715 2028 Summer case (the FERC Case) and is then further customized as part of the DIS to meet specific Attachment S requirements for the baseline system.

The case conditioning incorporates the parameters listed in Section 2.1:

- Load modeling: load forecast uncertainty is applied to the MW forecasted load. Details are included in Section 2.2.1.
- Generator modeling: only generators with CRIS rights listed in Table III-2 of the 2023 GB and proposed generators with CRIS that accepted their cost allocation in a prior Class Year are modeled in-service. Details are included in Section 2.2.2.
- Import/Export models: pursuant to Attachment S, Section 25.7.8.2, external imports and exports into NYCA are modeled in the cases. Details are included in Section 2.2.3

The transmission system model in the ATBA-D is the same as that in the ATBA MIS study cases. The SDU on Leeds-Hurley Avenue 345-kV line, triggered for construction by CY11 projects, was also modeled in the CY23 ATBA-D.

Load Modeling

The Load forecast used in the ATBA-D is the coincident 2028 Summer firm peak load before reductions for emergency demand response programs in the RNA study. Load Forecast Uncertainty (LFU) is applied to each of the 4 (four) Capacity Regions:

ROS	10.62%
LHV	7.80%
NYC	5.60%
LI	8.20%

NYCA CRIS Modeling

The initial CRIS capability and available capacity resources are determined as follows:

- CRIS (MW) capability of existing generating units, as listed in the 2023 Gold Book and proposed generating units with CRIS that accepted their cost allocation in a prior Class Year are modeled in the ATBA-D.
- CRIS Expiration: Units that are CRIS-inactive for more than 3 years lose their CRIS rights pursuant to Section 25.9.3.1 of Attachment S of the OATT. The CRIS for a facility is modeled in the ATBA-D unless that CRIS will expire prior to the scheduled completion of the Class Year Study or the CRIS is associated with a Retired facility that cannot transfer such rights prior to CRIS expiration. For CY23, CRIS for CRIS-inactive units that have or are scheduled to lose CRIS during the Class Year Study are thus not modeled in the Deliverability case.
    - CRIS updates of existing generators include CRIS increases approved by the NYISO after the release of 2023 Gold Book.
- The Pmax data for each respective resource within the ATBA-D base case and ATRA-D power flow representation is the CRIS value derated by applicable equivalent forced outage rate below. This step incorporates the ICAP/ UCAP translation of different generators resources and Capacity Regions.
- Derates for intermittent resources are applied to the specific type of generation resource:
    - Small hydro 52.59%
    - Large hydro 1.28%
    - Land-based Wind 84.46%
    - Landfill Gas 30.57%
    - Solar 65.61%
    - Offshore Wind 65.00%
- Derates for non-intermittent resources are applied to the aggregate of all remaining generation ("Uniform Capacity"), including Energy Storage resources, within the Capacity Region. These are the ICAP/UCAP translation factors for each Capacity Region consistent with the applicable NYSRC Installed Reserve Margin study:
    - Rest of State 3.32%
    - Lower Hudson Valley (LHV) 10.77%
    - New York City 6.78%

- Long Island 8.15%

- The "derated capacity," or Pmax, is available to supply load and losses within each Capacity Region and adjacent Capacity Region(s). When power transfers are simulated, all generation in the exporting area is uniformly increased in proportion to its Pmax.
- Table 4 and Table 5 summarize the Resource Capacity and Capacity Derates for the CY23 ATBA-D base case

Table 4: CY23 ATBA-D – Summary of Capacity by Resource Type

Zone	DC	Landfill Gas	Large Hydro	Offshore Wind	Small Hydro	Solar	Uniform	Wind	ATBA-D Grand Total CRIS
A	0.0	18.40	2700.00	0.0	3.10	1170.00	747.90	744.00	5383.40
B	0.0	11.20	0.0	0.0	54.80	400.02	716.80	200.10	1382.92
C	0.0	42.50	0.0	0.0	72.20	677.00	5968.00	1384.20	8143.90
D	0.0	6.40	856.00	0.0	59.60	180.00	335.90	1127.40	2565.30
E	0.0	11.20	0.0	0.0	398.10	240.00	196.60	852.20	1698.10
F	0.0	14.10	1165.10	0.0	313.40	630.50	3037.70	0.0	5160.80
ROS	0.00	103.80	4721.10	0.00	901.20	3297.52	11002.90	4307.90	24334.42
G	0.0	0.0	0.0	0.0	74.00	173.23	5038.40	0.0	5285.63
H	0.0	0.0	0.0	0.0	0.0	0.0	1093.90	0.0	1093.90
I	0.0	0.0	0.0	0.0	0.0	0.0	40.00	0.0	40.00
LHV	0.00	0.00	0.00	0.00	74.00	173.23	6172.30	0.00	6419.53
J	1250.00	0.0	0.0	816.00	0.0	0.0	10409.30	0.0	12475.30
K	0.0	0.0	0.0	1060.00	0.0	90.40	5520.60	0.0	6671.00
Grand Total	1250.00	103.80	4721.10	1876.00	975.20	3561.15	33105.10	4307.90	49900.25

Total CRIS Capacity represents the CRIS capacity basis for the ATBA-D case.

Uniform Capacity is the CRIS capacity related with any generator that is not in a technology-specific group.

Table 5: CY23 ATBA-D – Summary of Capacity Derates by Resource Type

Zone	DC	Landfill Gas	Large Hydro	Offshore Wind	Small Hydro	Solar	Uniform	Wind	ATBA-D Grand Total UCAP
A	0.0	12.78	2665.44	0.0	1.47	402.36	723.07	115.62	3920.74
B	0.0	7.78	0.0	0.0	25.98	137.57	693.00	31.10	895.42
C	0.0	29.51	0.0	0.0	34.23	232.82	5769.86	215.10	6281.53
D	0.0	4.44	845.04	0.0	28.26	61.90	324.75	175.20	1439.59
E	0.0	7.78	0.0	0.0	188.74	82.54	190.07	132.43	601.56
F	0.0	9.79	1150.19	0.0	148.58	216.83	2936.85	0.0	4462.24
ROS	0.00	72.07	4660.67	0.00	427.26	1134.02	10637.60	669.45	17601.07
G	0.0	0.0	0.0	0.0	35.08	59.57	4495.76	0.0	4590.42

Zone	DC	Landfill Gas	Large Hydro	Offshore Wind	Small Hydro	Solar	Uniform	Wind	ATBA-D Grand Total UCAP
H	0.0	0.0	0.0	0.0	0.0	0.0	976.09	0.0	976.09
I	0.0	0.0	0.0	0.0	0.0	0.0	35.69	0.0	35.69
LHV	0.00	0.00	0.00	0.00	35.08	59.57	5507.54	0.00	5602.20
J	1250.00	0.0	0.0	285.60	0.0	0.0	9703.55	0.0	11239.15
K	0.0	0.0	0.0	371.00	0.0	31.09	5070.67	0.0	5472.76
Grand Total	1250.00	72.07	4660.67	656.60	462.34	1224.68	30919.37	669.45	39915.17

Each Derate column is the amount of capacity reduction based on the application of the derate factor to the represented capacity.

Uniform Capacity Derate uses the specific ICAP/UCAP translation factor for the Capacity Region; hydro and wind use the technology-specific derate factors.

Total All Capacity Derates is the sum of category derates by zone.

External System Imports Modeling

The initial generation and interchange schedules for the NYCA and the four New York Capacity Regions[7] are determined as follows:

External Generation Source

1. Inter-Area external interchange schedules include the following grandfathered long-term firm power transactions for the CY23 case year (2028):
    a. External CRIS Right: Quebec (via Chateauguay) to NY: 1190 MW
    b. Existing Transmission Capacity for Native Load (ETCNL): PJM to NYSEG: 1080 MW
2. Generating capacity associated with firm export commitments are represented as follows:
    a. NYPA to AMP-Ohio, PA-RECs 183 MW
    b. NYPA to ISO-NE (Vermont) 84 MW
3. External firm capacity import rights:
    a. ISO-NE to NY 0 MW
    b. Ontario (IESO) schedule 0 MW
4. Generator reactive (MVAr) capabilities as determined by appropriate NYISO procedures, NPCC

[7] Schedules representing short-term external ICAP are not modeled in this assessment; deliverability of external ICAP is determined during the annual process of setting import rights.

Criteria and NERC Standards requirements.

5. Wheeling contracts:

   a. ROS to NYC via ABC/JK through PJM 0 MW

   b. ROS to NYC via Lake Success/Valley Stream through LIPA 287 MW

   c. ROS to LIPA via Northport Norwalk Cable through ISO-NE 0 MW

The total external generation resources including items 1 to 5 are summarized in Table 6.

Table 6: Summary of External Generation Resources (MW)

Capacity Regions / External Regions	ROS Import (A-F)	LHV Import (G-I)	NYC Import (J)	LI Import (K)	NYCA
Ontario	0	0	0	0	0
HQ + EDR	1190	0	0	0	1190
PJM	491	343	63	0	897
ISO NE	-84	0	0	0	-84
Total External Generation Source	1598	343	63	0	2003

ROS and LHV Direct MW Transfer

Actual base case interchange schedules between New York Capacity Regions are consistent with the Installed Reserve Margin and the Locational Capacity Requirements:

- ROS (A-F) supply to New York City through LHV (G-I): 2,831 MW
- ROS (A-F) supply to Long Island through LHV (G-I): 492 MW
  (combined with 287 MW wheeling contract)
- LHV (G-I) supply to New York City: 300 MW

Capacity Deliverability Rights (UDR)

The following merchant transmission projects are represented at their respective Unforced Capacity Deliverability Rights (UDR) capacity from the external Area into the respective NYISO Zone.

- Linden VFT to New York City 315 MW
- Cross-Sound Cable to Long Island 330 MW
- Neptune HVDC to Long Island 660 MW

- Hudson Transmission Project to New York City 0 MW
- Cedar Rapids Transmission Project 80 MW

The total import of each Capacity Region is summarized in Table 7. As derived from the external resources, Table 8 and Table 9 detail the NY-PJM scheduled flows.

Table 7: Summary of External Resources into Capacity Regions (MW)

From \ To	ROS Import (A-F)	LHV Import (G-I)	NYC Import (J)	LI Import (K)
Total External Source	1598	343	63	0
ROS direct MW transfer	0	608	2,832	779
LHV direct MW transfer	0	0	300	0
Total UDR	0	0	315	990

Table 8: PJM – New York Scheduled Interchange and Wheels

PJM – New York Scheduled Interchange and Wheels	MW
ETCNL (PJM to ROS)	1080
NYPA Exports (from ROS)	-183
ConEd /PSE&G Wheel:	
ROS to PJM via LHV (ROS to LHV, LHV to PJM via the J&K tie-lines)	0
PJM to NYC (via the ABC tie-lines)	0
Wheel for RECO Load:	
PJM to ROS and LHV (20% PJM to ROS, ROS to LHV, 80% PJM to LHV)	394
LHV to PJM (RECO Load)	-394
PJM to NY Net Interchange Schedule via the AC Tie-lines (1080 – 183)	897
PJM to A-I Net Interchange Schedule (1080 - 183)	897

Table 9: PJM – New York Scheduled Flows

PJM – New York Scheduled Flows	MW
PJM to ROS (A – F):	
46% of PJM to NY Net Interchange (0.46 * 897)	412
20% of RECO Load (0.20 * 410)	78

PJM – New York Scheduled Flows	MW
Total Scheduled Flow to ROS via the Zones A and C tie-lines	490
PJM to LHV (to Zone G):	
32% of PJM to NY Net Interchange via 5018 tie (0.32 * 897)	287
80% of RECO Load via the 5018 tie (0.80 * 410)	315
Total scheduled flow on the 5018 tie	602
J&K ties (0 MW Wheel and 15% of PJM to NY Net Interchange) (0.15 * 897)	134
RECO Load delivered from LHV	-394
Total Scheduled Flow to LHV via the Zone G tie-lines	342
PJM to NYC (to Zone J)	
ABC ties (0 MW Wheel and 7% of PJM to NY Net Interchange, B&C out) (0.07 * 897)	62

2.3 Balancing Generation and Load

This step balances the supply of resources and demand of loads and losses. All CRIS generation within each Capacity Region is placed in-service and scaled proportional to the ratio of its Pmax to the sum of the Pmax in the respective exporting or importing zone(s) or Capacity Region. Actual generation is proportionally scaled (up or down) to match the demand.[8]

Phase Angle Regulators (PARs) controlling external tie lines are set consistent with NYISO Service Tariff, Attachment M-1, NYISO-PJM Joint Operating Agreement and applicable operating procedures and agreements.[9]

The UDRs are converted into proxy generators while the amount of external resources remains the same.

2.4 Creating the CY23 ATRA Deliverability Study Case

All rules applicable to the 2028 power flow representation of transmission system and resource capacity additions in the CY23 ATBA-D base case are also applicable to the CY23 ATRA-D base case for the Deliverability Study.[10]

[8] Demands include load (including load forecast uncertainty), transmission losses, and external schedule commitments

[9] The MW schedules of the PARs are included in Appendix A.

[10] For the purpose of this Study and Report, ATBA-D base case refers to the ATBA baseline power flow network representation without the Class Year CRIS Projects; the ATRA-D base case is the ATBA-D base case with the Class Year CRIS Projects added.

The requested CRIS and resulting UCAP of CY23 CRIS Projects are included in Table 10 and Table 11.

Table 10: CY23 CRIS Projects Subject to Full Class Year Evaluation (ERIS and CRIS)

QUEUE	PROJECT NAME	ZONE	Summer ERIS MW	Summer CRIS MW	EFORd (Derate)	UCAP MW
Full Class Year – ERIS and CRIS						
Q522	NYC Energy	J	79.9	79.9	6.78%	74.5
Q560	Deer River Wind	E	100	100	84.46%	15.5
Q680	Juno Power Express	K	1200	N/A	N/A	N/A
Q686	Bull Run Solar Energy Center	D	125	125	65.61%	43.0
Q700	Robinson Grid	J	300	300	6.78%	279.7
Q716	Moraine Solar Energy Center	C	93.5	93.5	65.61%	32.2
Q770	KCE NY 8a	G	20	20	10.77%	17.8
Q774	Tracy Solar Energy Centre	E	119	119	65.61%	40.9
Q777	White Creek Solar	B	135	135	65.61%	46.4
Q785	Erie-Wyoming County Solar	C	175	175	65.61%/3.32%*	60.2
Q800	Rich Road Solar Energy Center	E	240	240	65.61%/3.32%*	95.0
Q822	Whale Square Energy Storage 1	J	58.2	58.2	6.78%	54.3
Q825	Setauket Energy Storage	K	65.3	65.3	8.15%	60.0
Q834	Luyster Creek Energy Storage 2	J	79	79	6.78%	73.6
Q852	Niagara Dolomite Solar	A	180	180	65.61%	61.9
Q857	Columbia Solar Energy Center	E	350	350	65.61%/3.32%*	132.8
Q858	Genesee Road Solar Energy Center	A	250	250	65.61%	86.0
Q859	Ridge View Solar Energy Center	A	350	350	65.61%/3.32%*	132.8
Q860	Rosalen Solar Energy Center	B	200	200	65.61%	68.8
Q866	North Country Wind	D	306.6	306.6	84.46%	47.6
Q869	Tabletop Solar	F	80	80	65.61%	27.5
Q871	Verona Solar Energy Center I	C	250	250	65.61%	85.8
Q878	Pirates Island	A	100	100	3.32%	96.7
Q880	Brookside Solar	D	100	100	65.61%	34.4
Q882	Riverside Solar	E	100	100	65.61%	34.4
Q950	Hemlock Ridge Solar	B	200	200	65.61%	68.8
Q952	Catskill Grid, LLC	G	100	100	10.77%	89.2
Q953	Sugar Maple Solar	E	125	125	65.61%	43.0
Q957	Holbrook Energy Storage	K	76.8	76.8	8.15%	70.5
Q967	KCE NY 5	G	94	94	10.77%	83.9
Q971	East Setauket Energy Storage	K	125	125	8.15%	114.8
Q974	KCE NY 19	G	79	79	10.77%	70.5
Q995	Alabama Solar Park LLC	B	130	130	65.61%	44.7

QUEUE	PROJECT NAME	ZONE	Summer ERIS MW	Summer CRIS MW	EFORd (Derate)	UCAP MW
Q1007	NYC Energy LLC - Phase 2	J	220.1	220.1	6.78%	205.2
Q1009	Yellow Barn Solar	C	160	160	65.61%	55.0
Q1012	Suffolk County Storage II	K	76.8	76.8	8.15%	70.5
Q1016	EI Steinway 1	J	1300	1300	65.00%	455.0
Q1017	EI Steinway 2	J	1300	1300	65.00%	455.0
Q1031	Mill Point Solar	E	250	250	65.61%/3.32%*	86.0
Q1036	Mainesburg ESS	C	130	130	3.32%	125.7
Q1038	ELP Rotterdam Solar	F	20	20	65.61%	6.9
Q1042	Fort Edward Solar Farm (NY53)	F	100	100	65.61%	34.4
Q1068	Buchanan Point BESS	H	300	300	10.77%	267.7
Q1077	Rutland Center Solar	E	110	110	65.61%	37.8
Q1079	Somerset Solar	A	125	125	65.61%	43.0
Q1080	Mineral Basin Solar Power	C	401.6	401.6	65.61%	138.1
Q1088	Harvest Hills Solar	C	200	200	65.61%/3.32%*	68.8
Q1089	Flat Creek Solar	F	200	200	65.61%	68.8
Q1096	Allegany 2 Solar	C	120	100	65.61%/3.32%*	34.4
Q1103	Thousand Island Solar	E	110	110	65.61%	37.8
Q1115	Flat Creek Solar 2	F	100	100	65.61%	34.4
Q1117	CLIES 70MW	K	70	70	8.15%	64.3
Q1122	East Fishkill	G	205	205	10.77%	182.9
Q1123	KCE NY 29	K	150	150	8.15%	137.8
Q1130	Hoffman Falls Wind	C	72	72	84.46%	11.2
Q1136	Honey Ridge Solar	E	125	125	65.61%/3.32%*	80.4
Q1141	Twinleaf Solar	E	75	75	65.61%	25.8
Q1148	Agricola Wind	C	97	97	84.46%	15.1
Q1150	Moss Ridge Solar	E	60	60	65.61%	20.6
Q1151	York Run Solar	A	90	90	65.61%	31.0
Q1159	Innisfree Storage	K	50	50	8.15%	45.9
Q1174	NY48 – Diamond Solar	E	60	60	65.61%	20.6
Q1178	NY115 – Newport Solar	E	130	130	65.61%	44.7
Q1180	Union Energy Center, LLC	H	116	116	10.77%	103.5
Q1182	NY128 - Foothills Solar	F	40	40	65.61%	13.8
Q1183	NY125A - Fort Covington Solar	D	250	250	65.61%	86.0
Q1184	NY125B - Two Rivers Solar	D	200	200	65.61%	68.8
Q1188	North Seneca Solar Project	C	105	105	65.61%	36.1
Q1194	Crane Brook Solar Project	C	130	130	65.61%	44.8
Q1199	El Steinway 1.1	J	200	200	65.00%	70.0
Q1236	Gravel Road Solar	C	128	128	65.61%	44.0
Q1254	Barrett Hempstead Battery Storage	K	40	40	8.15%	36.7
Q1255	Holtsville Brookhaven Battery Storage	K	79.9	79.9	8.15%	73.4

QUEUE	PROJECT NAME	ZONE	Summer ERIS MW	Summer CRIS MW	EFORd (Derate)	UCAP MW
Q1256	Canal Southampton Battery Storage	K	100	100	8.15%	91.9
Q1257	Edwards Calverton Battery Storage	K	60	60	8.15%	55.1
Q1288	CPNY-X	E and J	1300	1300	NA	1300

***Q785 Erie-Wyoming County Solar Project is a co-located project that is requesting 175 MW CRIS of solar and 0 MW CRIS of BESS (a total of 175 MW CRIS request)**

***Q800 Rich Road Solar Energy Center Project is a co-located project that is requesting 220 MW CRIS of solar and 20 MW CRIS of BESS (a total of 240 MW CRIS request)**

***Q857 Columbia Solar Energy Center Project is a co-located project that is requesting 330 MW CRIS of solar and 20 MW CRIS of BESS (a total of 350 MW CRIS request)**

***Q859 Ridge View Solar Energy Center Project is a co-located project that is requesting 330 MW CRIS of solar and 20 MW CRIS of BESS (a total of 350 MW CRIS request)**

***Q1031 Mill Point Solar Project is a co-located project that is requesting 250 MW CRIS of solar and 0 MW CRIS of BESS (a total of 250 MW CRIS request)**

***Q1088 Harvest Hills Solar Project is a co-located project that is requesting 200 MW CRIS of solar and 0 MW CRIS of BESS (a total of 200 MW CRIS request)**

***Q1096 Allegany 2 Solar Project is a co-located project that is requesting 100 MW CRIS of solar and 0 MW CRIS of BESS (a total of 100 MW CRIS request)**

***Q1136 Honey Ridge Solar Project is a co-located project that is requesting 65 MW CRIS of solar and 60 MW CRIS of BESS (a total of 125 MW CRIS request)**

Table 11: CY23 CRIS-Only Requests – Subject Only to Class Year Deliverability Study

CRIS Only					
QUEUE	PROJECT	ZONE	Summer CRIS MW	EFORd (Derate)	UCAP MW
Q1061	Teele	E	19.8	65.61%	6.8
Q1113	CLIES 20 MW	K	20	8.15%	18.4
PAM-2020-77593	West Babylon Energy Storage	K	9.9	8.15%	9.1

All CY23 CRIS Projects are added to the ATBA-D case and evaluated in each Capacity Region. The level of CRIS requested is derated to calculate the Pmax (UCAP) by applying ICAP to UCAP translation factors (derates). The levelized generation dispatch within each of the affected Capacity Regions is adjusted to reflect the additional capacity represented by the CY23 CRIS Projects.

In the ATRA-D case, the representational values for existing capacity resources (CRIS, ICAP, UCAP, and Pmax) are the same as for the ATBA-D case with the CY23 CRIS Projects added.

Table 12 and Table 13 summarize the Resource Capacity and Capacity Derates for the CY23 ATRA-D base case.

Table 12: CY23 ATRA-D – Summary of Capacity by Resource Type (MW)

Zone	DC	Landfill Gas	Large Hydro	Offshore Wind	Small Hydro	Solar	Uniform	Wind	ATRA-D Grand Total CRIS
A	0.0	18.4	2700.0	0.0	3.1	2145.0	867.9	744.0	6478.4
B	0.0	11.2	0.0	0.0	54.8	1065.0	716.8	200.1	2047.9
C	0.0	42.5	0.0	0.0	72.2	2420.0	6098.0	1553.2	10185.9
D	0.0	6.4	856.0	0.0	59.6	855.0	335.9	1434.0	3546.9
E	0.0	11.2	0.0	0.0	398.1	2013.9	296.6	952.2	3672.0
F	0.0	14.1	1165.1	0.0	313.4	1170.5	3037.7	0.0	5700.8
ROS	0.0	103.8	4721.1	0.0	901.2	9669.4	11352.9	4883.5	31631.9
G	0.0	0.0	0.0	0.0	74.0	173.2	5536.4	0.0	5783.6
H	0.0	0.0	0.0	0.0	0.0	0.0	1509.9	0.0	1509.9
I	0.0	0.0	0.0	0.0	0.0	0.0	40.0	0.0	40.0
LHV	0.0	0.0	0.0	0.0	74.0	173.2	7086.3	0.0	7333.5
J	2550.0	0.0	0.0	3616.0	0.0	0.0	11146.5	0.0	17312.5
K	0.0	0.0	0.0	1060.0	0.0	90.4	6444.3	0.0	7594.7
Grand Total	2550.0	103.8	4721.1	4676.0	975.2	9933.0	36030.0	4883.5	63872.7

Table 13: CY23 ATRA-D – Summary of Capacity Derates by Resource Type (MW)

Zone	DC	Landfill Gas	Large Hydro	Offshore Wind	Small Hydro	Solar	Uniform	Wind	ATRA-D Grand Total UCAP
A	0.0	12.8	2665.4	0.0	1.5	737.7	839.1	115.6	4372.1
B	0.0	7.8	0.0	0.0	26.0	366.3	693.0	31.1	1124.1
C	0.0	29.5	0.0	0.0	34.2	832.2	5895.5	241.4	7032.9
D	0.0	4.4	845.0	0.0	28.3	294.0	324.7	222.8	1719.4
E	0.0	7.8	0.0	0.0	188.7	692.6	286.8	148.0	1323.8
F	0.0	9.8	1150.2	0.0	148.6	402.5	2936.8	0.0	4647.9
ROS	0.0	72.1	4660.7	0.0	427.3	3325.3	10976.0	758.9	20220.2
G	0.0	0.0	0.0	0.0	35.1	59.6	4940.1	0.0	5034.8
H	0.0	0.0	0.0	0.0	0.0	0.0	1347.3	0.0	1347.3
I	0.0	0.0	0.0	0.0	0.0	0.0	35.7	0.0	35.7
LHV	0.0	0.0	0.0	0.0	35.1	59.6	6323.1	0.0	6417.8
J	2550.0	0.0	0.0	1265.6	0.0	0.0	10390.8	0.0	14206.4
K	0.0	0.0	0.0	371.0	0.0	31.1	5919.1	0.0	6321.2
Grand Total	2550.0	72.1	4660.7	1636.6	462.3	3416.0	33609.0	758.9	47165.5

3. Class Year 2023 Deliverability Study Results

In the CY23 Deliverability Study, the following Deliverability tests were performed to evaluate the impact, to the transmission system, from the CY23 CRIS Projects:

1. Highway Deliverability Test for ROS and LHV:
    a. Highway Interface Transfer Capability "No Harm" assessment: results are summarized in Section 3.1.
    b. Highway Interface Capacity Deliverability Assessment: results are summarized in Section 3.2.
2. ROS and LHV Byway Capacity Deliverability Assessment: results are summarized in Section 3.3.
3. Other Interface Transfer Capability "No Harm" assessment: results are summarized in Section 3.4.
4. NYC Byway Capacity Deliverability Assessment: results are summarized in Section 3.5.
5. LI Byway Capacity Deliverability Assessment: results are summarized in Section 3.6 and 3.7.

3.1 Highway Interface Transfer Capability "No Harm" Assessment

Transfer capability for the five ROS and one LHV Highway Interfaces were evaluated from west-to-east and north-to-south by exporting from one (or more) zones in upstate NY to the remaining zone(s) within the ROS and LHV Capacity Region. A summary of these interface transfer limits for the ATBA-D and ATRA-D cases are presented in Table 14. The Table also references the corresponding transfer limits included in the NYCA Transmission System Representation (topology) in the 2023 RNA Study.

Table 14: Highway Interface "No Harm" Study Results

CY23 Highways Interfaces "No Harm" Test								
Interface	Source	Sink	Reference RNA Limit	ATBA-D	Constraint	ATRA-D	Constraint	(ATRA-D) Minus (ATBA-D)
West Central	AB	CDEF	1500	1190.2	(1)	1372	(2)	181.8
Dysinger East	A	BCDEF	2150	2228.1	(3)	2336.8	(4)	108.7
Moses South	D	ABCEF	2650	3704.8	(5)	4352	(6)	647.2
Volney East	ABC	DEF	5650	6327.4	(7)	5654.1*	(8)	-673.3
Total East	ABCDE	F	4260	9517.9	(9)	8925.2	(9)	-592.7
UPNY-ConEd	G	HI	6675	7786.3	(10)	7580.9	(10)	-205.4

* Applicable system adjustments were applied

Notes:

(1)	135861 MORTIMER 115 136213 LAWLER-2 115 1	@ STE	158	MVA L/O	135860 LAWLER-1 115 135861 MORTIMER 115 1	
(2)	146512 Q571POI 115 135861 MORTIMER 115 1	@ STE	153	MVA L/O	135874 SWDN-113 115 146512 Q571POI 115 1	
(3)	135452 LOCKPORT 115 135876 TELRD114 115 1	@ STE	180	MVA L/O	135452 LOCKPORT 115 135851 SHEL-113 115 1	
(4)	147834 NIAG 345 345 148770 DYSINGER 345 1	@ STE	1685	MVA L/O	NIAG - DYSINGER ND2	
(5)	136764 COLTON 115 136771 FLAT RCK 115 1	@ STE	154	MVA L/O	136764 COLTON 115 136775 HIGLEY 115 1	
(6)	136764 COLTON 115 136771 FLAT RCK 115 1	@ STE	154	MVA L/O	147835 ADRON B1 345 147836 ADRON B2 345 1	
(7)	147830 JA FITZP 345 137200 EDIC 345 1	@ STE	1661	MVA L/O	CE13:L/O VOLNEY-MARCY 345 19	
(8)	130757 WATRC345 345 130755 OAKDL345 345 1	@ STE	717	MVA L/O	OAKDLE - CLARKCRNS 345 36	
(9)	137200 EDIC 345 148964 GORDON ROAD 345 1	@ Norm	1331	MVA L/O	Base Case	
(10)	146874 LOVETT345 ST 345 126263 BUCHANAN S 345 1	@ Norm	1793	MVA L/O	Base Case	

Discussion

De Minimus Transfer Limit Degradation for Highway Interface Facilities

Per Section 25.7.8.2.1.14 of Attachment S, for Highway interfaces, the Class Year CRIS Projects, whether or not they are otherwise deliverable, will not be considered deliverable if their aggregate impact degrades the transfer capability of the interface more than the lesser of 25 MW or 2 percent of the transfer capability identified in the ATBA and results in an increase to the NYCA LOLE determined for the ATBA of .01 or more.

ROS Highway Interface Transfer Capability "No Harm" Results:

1. The West Central interface transfer limit increased by 181.8 MW as constrained by Mortimer – Q571 POI Quaker Hill 115 kV line for the loss of Q571 POI Quaker Hill – Sweden 115 kV line 1. Hence, CY23 CRIS Projects pass the Highway Interfaces "no harm" test for West Central Interface.
2. The Dysinger East interface transfer limit increased by 108.7 MW as constrained by Niagara – Dysinger 345 kV line for the loss of Niagara – Dysinger ND2 345 kV ckt. Hence, CY23 CRIS Projects pass the Highway Interfaces "no harm" test for Dysinger East Interface.
3. The Moses-South interface transfer limit increased by 647.2 MW as constrained by Colton – Flat Rock 115 kV line for the loss of Adirondack B1 – Adirondack B2 345 kV line. Hence, CY23 CRIS Projects pass the Highway Interfaces "no harm" test for Moses-South Interface.
4. The Volney East interface transfer limit decreased by more than 25 MW (i.e., by -673.3 MW) as constrained by Watercure – Oakdale 345 kV ckt 1 for the loss of Oakdale – Clark's Corners 345 kV line 36. Though the degradation of the Volney East transfer limit is above the *de minimus* 25 MW, that degradation occurs at transfer limits above the RNA reference limit of 5650 MW.

Hence, CY23 CRIS Projects pass the Highway Interfaces "no harm" test for Volney East Interface.

5. The Total East interface transfer limit decreased by more than 25 MW (i.e., by -592.7 MW) as constrained by Edic – Gordon Rd 345 kV ckt 1 pre-contingency. Though the degradation of the Total East transfer limit is above the *de minimus* 25 MW, that degradation occurs at transfer limits well above the RNA reference limit of 4260 MW. Hence, CY23 CRIS Projects pass the Highway Interfaces "no harm" test for Total East Interface.

LHV Highway Interface Transfer Capability "No Harm" Results:

6. The transfer limit on UPNY-ConEd decreased by more than 25 MW (*i.e.*, by -205.4 MW) as constrained by Lovett - Buchanan S 345 kV ckt 1 pre-contingency. Though the degradation of the UPNY-ConEd transfer limit is above the *de minimus* 25 MW, that degradation occurs at transfer limits well above the RNA reference limit of 6675 MW. Hence, CY23 CRIS Projects pass the Highway Interfaces "no harm" test for UPNY-ConEd Interface.

Conclusion - ROS and LHV Highway Interface "No Harm" Results

When comparing the ATRA-D limits with the ATBA-D limits, no transfer limit violating criteria was observed. All CY23 CRIS Projects in ROS and LHV pass the Highway "No Harm" Test.

3.2 Highway Interface Capacity Deliverability Assessment

The deliverability tests within the ROS and LHV Capacity Region were evaluated from west-to-east and north-to-south by exporting from one (or more) zones in upstate NY to the remaining zone(s) within the ROS and LHV Capacity Region.

Additional Transmission Capacity or Bottled Generation Capacity was calculated by FCITC less the amount of net available capacity. A summary of these interface transfer for the ATBA-D and ATRA-D cases is presented in Table 15.

Table 15: Highway Interface Capacity Deliverability Assessment Results (MW)

CY23 Highways Capacity Deliverability Test							
Capacity Region	Interface	Source	Sink	Net Available Capacity (MW)	FCITC (MW)	Constraint	Deliverable (+) or Bottled (-) Generation Capacity
				A	B		C=B-A
ATBA-D							
ROS	West Central	AB	CDEF	357	2207	(1)	1850
	Dysinger East	A	BCDEF	271	1943	(3)	1672

CY23 Highways Capacity Deliverability Test							
Capacity Region	Interface	Source	Sink	Net Available Capacity (MW)	FCITC (MW)	Constraint	Deliverable (+) or Bottled (-) Generation Capacity
				A	B		C=B-A
ATBA-D							
	Moses South	D	ABCEF	106	2019	(5)	1913
	Volney East	ABC	DEF	813	4140	(7)	3327
	Total East	ABCDE	F	963	5766	(9)	4803
LHV	UPNY-ConEd	G	HI	1784	2644	(10)	861
ATRA-D							
ROS	West Central	AB	CDEF	713	1980	(2)	1267
	Dysinger East	A	BCDEF	540	1795	(4)	1255
	Moses South	D	ABCEF	212	2492	(6)	2280
	Volney East	ABC	DEF	1632	2748	(8)	1116
	Total East	ABCDE	F	1932	5189	(9)	3257
LHV	UPNY-ConEd	G	HI	2443	2671	(10)	228

Net Available Capacity is the remaining CRIS available after consideration of base generator dispatch, capacity derates, and net capacity exports.

FCITC is the incremental transfer limit corresponding to the most limiting FCTTC in the Highway interface analysis calculated by the software TARA.

Additional Transmission Capacity or Bottled Generation Capacity is the available unused transfer capability (+) or the amount of CRIS that is bottled (-) by the interface transfer limit constraint. It is calculated by FCITC (B) less Net Available Capacity (A).

Notes:

(1)	135861 MORTIMER 115 136213 LAWLER-2 115 1	@ STE	158	MVA L/O	135860 LAWLER-1 115 135861 MORTIMER 115 1	
(2)	146512 Q571POI 115 135861 MORTIMER 115 1	@ STE	153	MVA L/O	135874 SWDN-113 115 146512 Q571POI 115 1	
(3)	135452 LOCKPORT 115 135876 TELRD114 115 1	@ STE	180	MVA L/O	135452 LOCKPORT 115 135851 SHEL-113 115 1	
(4)	147834 NIAG 345 345 148770 DYSINGER 345 1	@ STE	1685	MVA L/O	NIAG - DYSINGER ND2	
(5)	136764 COLTON 115 136771 FLAT RCK 115 1	@ STE	154	MVA L/O	136764 COLTON 115 136775 HIGLEY 115 1	
(6)	136764 COLTON 115 136771 FLAT RCK 115 1	@ STE	154	MVA L/O	147835 ADRON B1 345 147836 ADRON B2 345 1	
(7)	147830 JA FITZP 345 137200 EDIC 345 1	@ STE	1661	MVA L/O	CE13:L/O VOLNEY-MARCY 345 19	
(8)	130757 WATRC345 345 130755 OAKDL345 345 1	@ STE	717	MVA L/O	OAKDLE - CLARKCRNS 345 36	
(9)	137200 EDIC 345 148964 GORDON ROAD 345 1	@ Norm	1331	MVA L/O	Base Case	
(10)	146874 LOVETT345 ST 345 126263 BUCHANAN S 345 1	@ Norm	1793	MVA L/O	Base Case	

Conclusion – Highway Interface Capacity Deliverability Assessment

No bottled capacity was identified in ATRA-D case in this assessment. All CY23 CRIS Projects in the ROS and LHV Capacity Regions passed the Highway Interface Capacity Deliverability test.

3.3 ROS and LHV Byway Capacity Deliverability Assessment

Byway assessment was performed for CY23 CRIS Projects in the ROS and LHV Capacity Regions. If the FCITC was greater than the net available capacity at the Point of Interconnection (POI) then the respective project passed the test. Each transfer was from all the generation at each POI into the Capacity Region where the project is located. Table 16 shows the FCITC resulting from the ROS and LHV Byway test.

Table 16: ROS and LHV Byway Capacity Deliverability Assessment Results

Q #	PROJECT	ZONE	Net Available at POI (MW)	ATRA-D FCITC (MW)	Additional Transmission Capacity (+) or Bottled Generation (-)	Constraint
560	Deer River Wind	E	0	-89.1	-89.1	136807 TAYLORVL 115 136758 BREMEN 115 1 @ STE 105 MVA L/O 136807 TAYLORVL 115 146409 Q531_POI 115 1
686	Bull Run Solar Energy Center	D	0	225.4	225.4	148757 Q686_POI 230 147970 RYAN 230 1 @ STE 318 MVA L/O PATNODE – DULEY 230 PD1_tapA
716 *	Moraine Solar Energy Center	C	0	12.7	12.7	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
770	KCE NY 8a	G	0	383.4	383.4	125116 N.CAT 6 69.0 125040 N.CAT. 1 115 5 @ STE 143 MVA L/O 125116 N.CAT 6 69.0 125040 N.CAT. 1 115 4
774	Tracy Solar Energy Centre	E	0	-74.3	-74.3	136807 TAYLORVL 115 136758 BREMEN 115 1 @ STE 105 MVA L/O 136807 TAYLORVL 115 146409 Q531_POI 115 1
777 *	White Creek Solar	B	0	23	23	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
785 *	Erie-Wyoming County Solar	C	0	18	18	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
800	Rich Road Solar Energy Center	E	0	1373.3	1373.3	148600 MNH1230 230 147840 MOSES W 230 1 @ STE 562 MVA L/O 147835 ADRON B1 345 147836 ADRON B2 345 1
852 *	Niagara Dolomite Solar	A	0	23.6	23.6	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
857	Columbia Solar Energy Center	E	0	1664.4	1664.4	148978 Q857_POI 345 135205 FRAEDCSC 345 1 @ STE 1793 MVA L/O 137200 EDIC 345 148978 Q857_POI 345 1
858 *	Genesee Road Solar Energy Center	A	0	13.3	13.3	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
859	Ridge View Solar Energy Center	A	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 2 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 3
860	Rosalen Solar Energy Center	B	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 1 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 2
866	North Country Wind	D	0	1351	1351	148600 MNH1230 230 147840 MOSES W 230 1 @ STE 562 MVA L/O 147835 ADRON B1 345 147836 ADRON B2 345 1
869	Tabletop Solar	F	0	117.7	117.7	145384 Q869_POI 115 137909 TAP T79 115 1 @ STE 145 MVA L/O 137877 CLINTON 115 145384 Q869_POI 115 1
871	Verona Solar Energy Center I	C	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 2 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 3
878 *	Pirates Island	A	0	24.4	24.4	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
880	Brookside Solar	D	0	87.6	87.6	135112 Q880_POI 115 147856 WILL 115 115 1 @ Norm 111 MVA L/O Base Case

Q #	PROJECT	ZONE	Net Available at POI (MW)	ATRA-D FCITC (MW)	Additional Transmission Capacity (+) or Bottled Generation (-)	Constraint
882	Riverside Solar	E	0	-12.4	-12.4	145619 Q1141_POI 115 136807 TAYLORVL 115 1 @ STE 134 MVA L/O 136807 TAYLORVL 115 146308 Q953_POI2 115 1
950	Hemlock Ridge Solar	B	0	148	148	145222 Q950_POI2 115 146512 Q571POI 115 1 @ STE 180 MVA L/O 135873 SWDN-111 115 145221 Q950_POI1 115 1
952	Catskill Grid, LLC	G	0	130.5	130.5	126233 Q0952_POI 115 125040 N.CAT. 1 115 1 @ Norm 129 MVA L/O Base Case
953	Sugar Maple Solar	E	0	-9.7	-9.7	145619 Q1141_POI 115 136807 TAYLORVL 115 1 @ STE 134 MVA L/O 136807 TAYLORVL 115 146308 Q953_POI2 115 1
967	KCE NY 5	G	0	133.8	133.8	126227 Q967SUB_HV 115 125042 OHIOVLE1 115 1 @ Norm 217 MVA L/O Base Case
974	KCE NY 19	G	0	1041.7	1041.7	146808 ST.FORES 69.0 146873 STFORESTAP 138 2 @ Norm 215.6 MVA L/O Base Case
995	Alabama Solar Park LLC	B	0	348.4	348.4	135859 LAPPINS1 115 135866 NLEROYTA 115 1 @ Norm 129 MVA L/O Base Case
1009	Yellow Barn Solar	C	0	164.5	164.5	134076 Q1009_POI 115 130800 ETNA 115 115 2 @ STE 219 MVA L/O 130827 CAYUGA 115 134076 Q1009_POI 115 2
1031	Mill Point Solar Project	E	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 2 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 3
1036 *	Mainesburg ESS	C	0	9.6	9.6	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
1038	ELP Rotterdam Solar	F	0	122.9	122.9	145238 Q1038_POI 115 137532 RTRDM1 115 1 @ Norm 116 MVA L/O Base Case
1042	Fort Edward Solar Farm (NY53)	F	0	234.3	234.3	145024 BRAN_POI 115 137895 SCHAGHTICOKW 115 1 @ STE 237 MVA L/O 137893 MOHICAN 115 145279 Q1042_POI 115 1
1068	Buchanan Point BESS	H	0	453.9	453.9	128606 Q1068_PSUCL0 345 126262 BUCHANAN N 345 1 @ Norm 717 MVA L/O Base Case
1077	Rutland Center Solar	E	0	-81	-81	136807 TAYLORVL 115 136758 BREMEN 115 1 @ STE 105 MVA L/O 136807 TAYLORVL 115 146409 Q531_POI 115 1
1079	Somerset Solar	A	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 2 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 1
1080 *	Mineral Basin Solar Power	C	0	9.6	9.6	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
1088	Harvest Hills Solar	C	0	167.4	167.4	134059 Q1088_POI 115 130827 CAYUGA 115 1 @ Norm 185 MVA L/O Base Case
1089	Flat Creek Solar	F	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 3 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 1
1096 *	Alfred Oaks Solar	C	0	12.3	12.3	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
1103	Thousand Island Solar	E	0	-74.3	-74.3	136807 TAYLORVL 115 136758 BREMEN 115 1 @ STE 105 MVA L/O 136807 TAYLORVL 115 146409 Q531_POI 115 1
1115	Flat Creek Solar 2	F	0	1805.7	1805.7	136700 9M PT 2G 25.0 136155 SCRIBA 345 3 @ STE 475 MVA L/O 136155 SCRIBA 345 136700 9M PT 2G 25.0 1
1122	East Fishkill	G	0	48.7	48.7	126017 Q1122_POI 115 125048 SHENANDO 115 1 @ Norm 225.1 MVA L/O Base Case
1130	Hoffman Falls Wind	C	0	85.4	85.4	146107 Q276POI 115 136184 CORTLAND 115 1 @ STE 154 MVA L/O 136250 WHITMAN 115 136680 FEN-WIND 115 1
1136	Honey Ridge Solar	E	0	-73.5	-73.5	136807 TAYLORVL 115 136758 BREMEN 115 1 @ STE 132 MVA L/O 136807 TAYLORVL 115 146409 Q531_POI 115 1
1141	Twinleaf Solar	E	0	-98.4	-98.4	136216 HTHSE HL 115 136218 MALLORY 115 1 @ STE 108 MVA L/O OS – EL – LFYTE 345 17
1148	Agricola Wind	C	0	167.6	167.6	134169 Q1148_POI 115 130882 WRIGH115 115 1 @ STE 249 MVA L/O 130827 CAYUGA 115 134059 Q1088_POI 115 1
1150	Moss Ridge Solar Project	E	0	-309.3	-309.3	136216 HTHSE HL 115 136218 MALLORY 115 1 @ STE 108 MVA L/O OS – EL – LFYTE 345 17
1151 *	York Run Solar	A	0	15.7	15.7	130836 N.WAV115 115 131018 LOUNS115 115 1 @ STE 143 MVA L/O ST03:L/O WATERCURE-OAKDALE 345 31
1174	NY48 – Diamond Solar Project	E	0	126	126	145661 Q1174_POI 115 137246 VALLEY 115 1 @ STE 145 MVA L/O 137235 PORTER 1 115 145661 Q1174_POI 115 1
1178	NY115 – Newport Solar Project	E	0	83.8	83.8	145612 Q1178_POI 115 137235 PORTER 1 115 1 @ STE 127 MVA L/O 137225 DEERFD-I 115 145612 Q1178_POI 115 1
1180	Union Energy Center, LLC	H	0	141.3	141.3	134186 Q1180_POI 115 131110 CROTN115 115 1 @ STE 239 MVA L/O 131115 UNION115 115 134186 Q1180_POI 115 1

Q #	PROJECT	ZONE	Net Available at POI (MW)	ATRA-D FCITC (MW)	Additional Transmission Capacity (+) or Bottled Generation (-)	Constraint
1182	NY128 – Foothills Solar	F	0	143.6	143.6	137955 VAIL 69 69.0 137912 VAIL 115 115 1 @ Norm 60 MVA L/O Base Case
1183	NY125A – Fort Covington Solar	D	0	1351	1351	148602 MNH3230 230 147840 MOSES W 230 1 @ STE 562 MVA L/O 147835 ADRON B1 345 147836 ADRON B2 345 1
1184	NY125B – Two Rivers Solar	D	0	1351	1351	148600 MNH1230 230 147840 MOSES W 230 1 @ STE 562 MVA L/O 147835 ADRON B1 345 147836 ADRON B2 345 1
1188	North Seneca Solar Project	C	0	73.4	73.4	145670 Q1188 POI 115 130811 HAMLT115 115 1 @ STE 109 MVA L/O 145599 Q1236_POI 115 145670 Q1188 POI 115 1
1194	Crane Brook Solar Project	C	0	36.1	36.1	130855 STATE115 115 130919 STATES34 34.5 1 @ STE 63 MVA L/O 130855 STATE115 115 130882 WRIGH115 115 1
1236	Gravel Road Solar	C	0	166.1	166.1	145599 Q1236_POI 115 145284 Q913_POI 115 1 @ STE 109 MVA L/O 136050 FARMNGTN TP2 115 145599 Q1236_POI 115 1
1061	Teele	E	0	-414.1	-414.1	136216 HTHSE HL 115 136218 MALLORY 115 1 @ STE 108 MVA L/O OS – EL – LFYTE 345 17

*Applicable system adjustments were applied

Table 17 shows the ROS Byway result for Q1288 CPNY-X project. The result indicated Q1288 CPNY-X passed ROS Byway Assessment.

Table 17: ROS Byway Capacity Deliverability Assessment Results for Q1288 CPNY-X

Monitored Facility	Cont Name	Rate Base (MVA)	Rate Cont (MVA)	ATBA-D Base Flow (MW)	ATRA-D Base Flow (MW)	ATBA-D Cont Flow (MW)	ATRA-D Cont Flow (MW)	Delta Cont Flow (MW)	ATBA-D Final DC %Loading	ATRA-D Final DC %Loading	Delta Final DC %Loading
131696 JENN 46 46.0 130817 JENN 115 115 1	131723 SIDNEY46 46.0 130852 SIDNY115 115 1	39	39	-17.8	-20.9	-35.9	-38.6	-2.7	92.1	98.93	6.83
131696 JENN 46 46.0 130817 JENN 115 115 1	130851 SIDNT115 115 130852 SIDNY115 115 1	39	39	-17.8	-20.9	-35.9	-38.6	-2.7	92.17	99	6.83
136238 SOLVAY-B 115 136602 SOLVAY34 34.5 1	136200 GERES LK 115 136270 CRUC TAP 115 1	22	28	10.4	11	25.4	26.5	1.1	90.73	94.63	3.9
136239 SOLVAY-N 115 136602 SOLVAY34 34.5 3	136200 GERES LK 115 136269 SOLVTAP2 115 1	20	26	9.8	10.4	29.5	30.2	0.7	113.37	116.2	2.83
131297 SLEIG234 34.5 131243 SLEIG115 115 1	Base Case	35	67	-32.5	-33.5	-	-	-	92.96	95.75	2.79
136239 SOLVAY-N 115 136602 SOLVAY34 34.5 4	136200 GERES LK 115 136269 SOLVTAP2 115 1	21	27	9.1	9.7	29.3	30	0.7	108.4	111.08	2.68
136169 A/B_LYS9 115 136708 ANH-BSC1 13.2 1	136166 A/B_LY13 115 136173 ANHBS-13 115 1	13	16	5.6	6.2	22.2	22.2	0	138.89	138.89	0
135863 N.LAKE 1 115 136010 NLAKVLE 34.5 1	135849 E.GOLAH 115 135858 GOLAH115 115 1	46	50	13	13	-46.2	-46.2	0	92.48	92.48	0
136169 A/B_LYS9 115 136709 ANH-BSC2 4.16 1	136166 A/B_LY13 115 136173 ANHBS-13 115 1	10	12	5.4	5.8	17.9	17.9	0	148.87	148.86	-0.01
149024 GINNA115 115 149196 S124C913 115 1	149029 S204 911 115 149196 S124C913 115 1	218	261	151	151	237.4	237.4	0	90.96	90.95	-0.01
135597 KTS23 23.0 135499 44KTS153 115 5	135597 KTS23 23.0 135499 44KTS153 115 4	50	57	-39.1	-39.1	-66	-65.9	0.1	115.77	115.69	-0.08
135597 KTS23 23.0 135499 44KTS153 115 4	135597 KTS23 23.0 135499 44KTS153 115 5	50	57	-37.9	-37.9	-65.4	-65.3	0.1	114.71	114.63	-0.08
135597 KTS23 23.0 135499 44KTS153 115 5	135450 GRDNVL1 115 135500 45KTS153 115 1	50	57	-39.1	-39.1	-53.9	-53.8	0.1	94.48	94.4	-0.08
135597 KTS23 23.0 135499 44KTS153 115 4	135450 GRDNVL1 115 135500 45KTS153 115 1	50	57	-37.9	-37.9	-52.2	-52.2	0	91.58	91.5	-0.08
135597 KTS23 23.0 135500 45KTS153 115 2	135450 GRDNVL1 115 135499 44KTS153 115 1	42	52	-16.3	-16.3	-50.2	-50.1	0.1	96.5	96.41	-0.09
149024 GINNA115 115 149196 S124C913 115 1	149024 GINNA115 115 149029 S204 911 115 1	218	261	151	151	241.2	240.9	-0.3	92.41	92.29	-0.12
131070 N.ENDIC1 34.5 130835 N.END115 115 1	131071 N.ENDIC2 34.5 130835 N.END115 115 1	53	56	-24.4	-24.3	-53.1	-53	0.1	94.78	94.62	-0.16
131074 NSIDE234 34.5 131019 NSIDE115 115 1	Base Case	36	44	-34.5	-34.4	-	-	-	95.79	95.58	-0.21
147868 MASS-B 115 147976 MASS-TL 23.0 1	Base Case	18	30	19.1	19.1	-	-	-	106.33	106.11	-0.22
136238 SOLVAY-B 115 136602 SOLVAY34 34.5 1	136200 GERES LK 115 136269 SOLVTAP2 115 1	22	28	10.4	11	-61.4	-61.4	0	219.45	219.14	-0.31
147924 PMLD 2 115 147927 PMLD2-46 46.0 1	147923 PMLD 1 115 147925 PMLD 3 115 1	40	40	15.4	15.5	53	52.9	-0.1	132.5	132.19	-0.31
135858 GOLAH115 115 135978 GOLAH34 34.5 1	135849 E.GOLAH 115 135858 GOLAH115 115 1	34	42.5	10.7	10.6	48	47.9	-0.1	112.99	112.65	-0.34
137902 SCOFIELD 115 137914 WBURG115 115 1	137897 OGN BRK5 115 137904 SPIER 115 1	50	50	43.6	43.4	45.3	45.1	-0.2	90.6	90.2	-0.4
131420 ETNA 234 34.5 130800 ETNA 115 115 1	131413 CODNGTN3 34.5 130787 CODNT115 115 1	64	66	-33.9	-33.6	-78.1	-77.8	0.3	118.38	117.91	-0.47
131413 CODNGTN3 34.5 130787 CODNT115 115 1	131420 ETNA 234 34.5 130800 ETNA 115 115 1	56	67	-44.3	-44.2	-78.1	-77.8	0.3	116.62	116.15	-0.47
136782 LWRNCE-B 115 137153 LAWRENCE 13.2 1	Base Case	10	10	10.4	10.3	-	-	-	103.81	103.3	-0.51

Discussions

ROS and LHV Byway Capacity Deliverability Assessment Results:

1. The ROS and LHV Byway test results show that Q560 Deer River Wind, Q774 Tracy Solar Energy Centre, Q882 Riverside Solar, Q953 Sugar Maple Solar, Q1077 Rutland Center Solar, Q1103 Thousand Island Solar, Q1136 Honey Ridge Solar, Q1141 Twinleaf Solar, Q1150 Moss

Ridge Solar Project, and Q1061 Teele indicated bottled generation MW in the ROS byway tests.

2. The rest of the CY23 CRIS Projects located in the ROS and LHV Capacity Regions passed the ROS and LHV Byway tests and are therefore fully deliverable.

3. National Grid has firm local transmission plans to rebuild two 115kV Black River – North Carthage – Taylorville circuits, 115 kV Taylorville-Bremen-Boonville and 115kV Lighthouse Hill (Tar Hill Station) – Mallory-Clay.

Table 18 shows the ROS Byway results after applying the above mentioned firm local plans, the results now indicate that Q560 Deer River Wind, Q774 Tracy Solar Energy Centre, Q882 Riverside Solar, Q953 Sugar Maple Solar, Q1077 Rutland Center Solar, Q1103 Thousand Island Solar, Q1136 Honey Ridge Solar, Q1141 Twinleaf Solar, Q1150 Moss Ridge Solar Project, Q1061 Teele passed the ROS byway tests.

Table 18: ROS Byway Capacity Deliverability Assessment Results (with the inclusion of firm local transmission plans)

Q #	PROJECT	ZONE	Net Available at POI (MW)	ATRA-D FCITC (MW)	Additional Transmission Capacity (+) or Bottled Generation (-)	Constraint				
560	Deer River Wind	E	0	129.5	129.5	146472 Q560_POI 115 136768 E WTRTWN 115 1	@ STE	116	MVA L/O	136216 HTHSE HL 115 146472 Q560_POI 115 1
774	Tracy Solar Energy Centre	E	0	75.5	75.5	145355 Q774_POI 115 136815 LYMETP 115 1	@ Norm	128	MVA L/O	Base Case
882	Riverside Solar	E	0	94.5	94.5	145097 Q882_P0I 115 136815 LYMETP 115 1	@ STE	119	MVA L/O	136816 LYME 115 145097 Q882_P0I 115 1
953	Sugar Maple Solar	E	0	225.3	225.3	146167 COPEN_POI 115 136282 BABBITS 115 1	@ STE	116	MVA L/O	136216 HTHSE HL 115 146472 Q560_POI 115 1
1077	Rutland Center Solar	E	0	107.4	107.4	146167 COPEN_POI 115 136282 BABBITS 115 1	@ STE	116	MVA L/O	136755 BLACK RV 115 146167 COPEN_POI 115 1
1103	Thousand Island Solar	E	0	42.1	42.1	136815 LYMETP 115 136763 COFFEEN 115 1	@ STE	119	MVA L/O	136776 INDN RIV 115 136815 LYMETP 115 1
1136	Honey Ridge Solar	E	0	79.6	79.6	145458 Q1136_STA 115 136755 BLACK RV 115 1	@ Norm	159	MVA L/O	Base Case
1141	Twinleaf Solar	E	0	296.6	296.6	146167 COPEN_POI 115 136282 BABBITS 115 1	@ STE	145	MVA L/O	136216 HTHSE HL 115 146472 Q560_POI 115 1
1150	Moss Ridge Solar Project	E	0	67.6	67.6	136754 BATTL HL 115 136797 PYRITE-7 115 1	@ STE	69	MVA L/O	136765 DE KALB 115 145478 Q1150_POI 115 1
1061	Teele	E	0	130.9	130.9	136785 MCINTYRE 115 136812 MC ADOO2 115 1	@ STE	75	MVA L/O	136760 BRADY 115 145314 Q1061_POI 115 1

Conclusion – ROS and LHV Byway Capacity Deliverability Assessment

All CY23 CRIS Projects in the ROS and LHV Capacity Regions passed the Byway Capacity Deliverability

Assessment.

3.4 Other Interface Transfer Capability "No Harm" Assessment

The Other Interfaces "No Harm" test determines the impact of the CY23 CRIS Projects on the transfer capability as follows:

- Among the Capacity Regions (by evaluating and comparing the following three interfaces):
  - ROS to LHV;
  - LHV to J;
  - LHV to K; and
- From external Areas into NYCA (by evaluating and comparing the following four interfaces):
  - PJM to NYCA;
  - IESO to NYCA;
  - NE to NYCA;
  - HQ to NYCA; and
  - the Norwalk Harbor to Northport Cable – NNC.

The transfer capabilities between external Areas and NYCA were evaluated for import constraints into NYCA. These transfer simulations were evaluated individually and represent non-simultaneous transfer capabilities. All external Area transfer simulations assumed the PARs between Ontario and Michigan are holding scheduled flow.

The interface transfer limit between a specific external Area and applicable NYCA Capacity Region(s) is a measure of the ability of the transmission system to move capacity from that external Area into the applicable NYCA Capacity Region; that is, how much power may be moved between the external Area and a NYCA Capacity Region. The power transfer between the external Area and NYCA could represent firm capacity and energy, non-firm energy, or emergency assistance in various combinations.

Each external interface was evaluated independently, and the calculated transfer limits were non-simultaneous. Therefore, the individual transfer limits should not be interpreted as an indication that sufficient capacity resources are available within that external Area to support that level of power transfer at all times.

When simulating the import transfer into NYCA from an external area, all generation in the

importing region was uniformly scaled down in proportion to the ratio of each generator's Pmax to the sum of the Pmax of all generators in the importing area.

The result of Other Interface "No Harm" test is summarized in Table 19.

Table 19: Other Interface Transfer Capability "No Harm" Results

Interface	Source	Sink	ATBA-D Transfer Limit	Constraint	ATRA-D Transfer Limit	Constraint	2% of ATBA Transfer Limit	(ATRA-D) Minus (ATBA-D)
UPNY-SENY	ROS	LHV	8870	(1)	8870*	(1)	177	0
LHV to J	GHI	NYC	4130	(2)	4200	(2)	83	71
LHV to K	GHI	K	1328	(3)	1328	(3)	27	0
PJM to NYISO	PJM-Classic	A – G 90% I – J 10%	1173	(4)	1178*	(4)	23	5
IESO-NYISO	Ontario	Central (C) 60% Capital (F) 25% Hudson (G) 5% NYC (J) 10%	2664	(5)	2682	(5)	53	17
ISO-NE to NYISO	NE_SOUTH 50% NE_NORTH 50%	Capital (F) 35% NYC (J) 65%	1763	(6)	1765*	(6)	35	2
HQ to NYISO (MSC-7040)	Hydro-Quebec	NYCA	1500	(8)	1500	(8)	30	0
NNC	New England	NYCA	1723	(7)	1723*	(7)	34	0

*Applicable system adjustments were applied

Notes:

(1)	137451 LEEDS 3 345 128541 VAN_WAGNER 345 2	@ STE	1724	KNICKBKR-PV_Dup1
(2)	126600 REAC71 345 126641 MOTT HAVEN 345 3	@ Norm	785	Base Case
(3)	126266 DUNWOODIE 345 128835 SHORE RD 345 1	@ Norm	690	Base Case
(4)	200676 26E.SAYRE 115 130836 N.WAV115 115 1	@ Norm	176	Base Case
(5)	157063 BECK_#2_PA27 230 147842 NIAGAR2W 230 1	@ STE	558	NIAGARA - BECK_TSA 345 PA301
(6)	115005 NE_E205W_NY 230 137562 EASTOVER RD 230 1	@ STE	560	ALPSBERK393
(7)	120389 NE_690_NY 69.0 125127 SMITHFLD 69.0 1	@ Norm	53	Base Case
(8)	INTERF:HQ-7040-NY	@ Norm	1500	Base Case

Discussion

De Minimus Transfer Limit Degradation for Other Interface Facilities

Per Section 25.7.9.1 of Attachment S, the Class Year CRIS Projects whether or not they are otherwise deliverable across Highways and Byways, will not be considered deliverable if their aggregate impact degrades the transfer capability of any Other Interface more than the lesser of 25 MW or 2 percent of the transfer capability of the Other Interface identified in the ATBA.

Internal:

1. UPNY SENY transfer limit remained unchanged as constrained by Leeds – Van Wagner 345 kV

ckt 2 for loss of Knickerbocker - Pleasant Valley 345kV line. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for UPNY SENY Interface.

2. LHV to J transfer limit increased by 71 MW as constrained by pre-contingency loading Dunwoodie Series Reactor 71 – Mott Haven 345 kV ckt 3. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for LHV to J Interface.
3. LHV to K transfer limit remained unchanged as constrained by pre-contingency loading on the Dunwoodie - Shore Road 345 kV line. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for LHV to K Interface.

External:

4. The transfer limit from PJM into NYISO increased by 5 MW. The binding constraint is the pre-contingency loading on East Sayre – North Waverly 115 kV line. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for PJM to NYISO Interface.
5. The transfer limit from IESO into NYISO increased by 17 MW. The binding constraint is the post-contingency loading on Beck PA27 – Niagara 230 kV line for loss of Niagara- Beck 345 kV line PA301. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for IESO to NYISO Interface.
6. The transfer limit from ISO-NE into NYISO increased by 2 MW. The binding constraint is the post-contingency loading on Bear Swamp (NE_E205W_NY) - Eastover Road 230 kV line for loss of Alps - Berkshire #393 345kV line. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for ISO-NE to NYISO Interface.
7. The transfer limit for Hydro Quebec to NYCA remain unchanged. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for Hydro Quebec to NYCA Interface.
8. The transfer limit through NNC remained unchanged. The binding constraint is the pre-contingency loading on Salisbury (NE_690_NY) - Smithfield 69 kV line 1. Hence, CY23 CRIS Projects pass the Other Interface "no harm" test for NNC Interface.

Conclusion – Other Interface Transfer Capability "No Harm" Results

All CY23 CRIS Projects passed the Other Interface No Harm Tests in the ATRA-D.

3.5 NYC Byway Capacity Deliverability Assessment

The purpose of the NYC Byway Capacity Deliverability Assessment was to identify whether the NYC

CY23 CRIS projects can deliver the power throughout the NYC Capacity Region.

Table 20 shows the FCITC resulting from the NYC Byway Capacity Deliverability Assessment. The NYC Byway transfer limit was evaluated by shifting CRIS generation from the sub-zone where the project is interconnected, to the rest of the CRIS generation in NYC Capacity Region.

Table 20: CY23 NYC Byway Capacity Deliverability Assessment Results

CY23 Project	Exporting zone	Importing zone	CY23 ATRA-D				CY23 ATBA-D				Impact *c-c1	Byway Test Conclusion
			CY23 ATRA-D Net Available Capacity (MW) a	FCITC (Export Limit) (MW) b	Constraint	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c = b-a	CY23 ATBA-D Net Available Capacity (MW) a1	FCITC (Export Limit) (MW) b1	Constraint	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c1 = b1-a1		
Q700	Case 1: Gowanus	Rest of NYC	1576.2	1569.7	(2)	-6.5	822.5	822.5	(1)	0	-6.5	Bottled*
Q822	Case 3: Greenwood, Fox Hills	Rest of NYC	528	528	(3)	0	275.5	275.5	(3)	0	0	Passed
Q834	Case 5: Astoria West, Queensbridge	Rest of NYC	698.9	698.9	(5)	0	364.7	364.7	(4)	0	0	Passed
Q1016_ Q1017_ Q1199_ Q1288	Case 11: Rainey	Rest of NYC	539.2	539.2	(7)	0	281.4	281.4	(6)	0	0	Passed
Q522_Q 1007	Case 12: Hudson Ave East 138 kV	Rest of NYC	133.7	133.7	(7)	0	69.7	69.7	(7)	0	0	Passed

```
(1)          126590 GOWANUS 41SR  345  126645 FARRAGUT EAS  345  1        at 706 MVA Norm L/O Base Case
(2)          126416 FOX HILLS     138  126434 GRENWOOD N    138  1        at 194 MVA Norm L/O Base Case
(3)          126330 GOW 1&3       138  126434 GRENWOOD N    138  2        at 286 MVA Norm L/O Base Case
(4)          126446 HG  5         138  126649 ASTORIA W-S   138  1        at 178 MVA Norm L/O Base Case
(5)          126475 QUENBRDG      138  126649 ASTORIA W-S   138  4        at 404 MVA Norm L/O Base Case
(6)          126644 FARRAGUT WES  345  126842 BCEH S        345  2        at 767 MVA Norm L/O Base Case
(7)          126644 FARRAGUT WES  345  126436 FGT_X10       138  1        at 120 MVA Norm L/O Base Case
```

* The result of Case 1 Gowanus subzone byway test indicated -6.53 MW bottled capacity in the source. The proposed solution is to put currently bypassed Gowanus Series Reactor 41 and 42 in service.

Table 21 presents the byway results of Gowanus subzone with Gowanus Series Reactor 41 and 42 in-

services.

Table 21: NYC Byway Results in Gowanus plus Gowanus SR41 & 42

CY23 ATRA-D with SR41&42 in-service Net Available Capacity (MW) a2	CY23 ATRA-D_SR41&42_ON			Impact *c2-c	Byway Test Conclusion
	Constraint	FCITC (Export Limit) (MW) b2	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c2 = b2-a2		
1576.2	(2)	1576.2	0	0	Passed

The results in Table 21 show that, for all the sub-zones in NYC, the resulting FCITC is greater or equal to the net available capacity from the interconnecting sub-zones in the ATRA-D case.

Hence, Q700 Robinson Grid, Q822 Whale Square Energy Storage 1, Q834 Luyster Creek Energy Storage 2, Q1016 EI Steinway 1, Q1017 EI Steinway 2, Q1199 El Steinway 1.1, Q1288 CPNY-X, Q522 NYC Energy, and Q1007 NYC Energy LLC - Phase 2 are fully deliverable throughout the NYC Capacity Region.

3.6 LI Byway Capacity Deliverability Assessment

The purpose of the LI Byway Deliverability assessment was to identify whether the LI CY23 CRIS Projects can deliver the power throughout the LI Capacity Region.

There is no thermal violation identified in ATBA-D case. With all CY23 LI CRIS Projects modeled in the CY23 ATRA-D case, thermal violations were identified which cannot be mitigated through applicable adjustments. Table 22 summarizes all identified N-0 thermal violations in ATRA-D case.

Table 22: LI Deliverability Assessment – ATRA-D Case Thermal Violations

X--------- FROM BUS ----------X			X---------- TO BUS ---------X			AREA	CKT	Normal Rating	ATBA-D		ATRA-D	
									LOADING	PERCENT	LOADING	PERCENT
129839	TERYVIL	69	130545	Q825POI	69	11	1	120	N/A	N/A	135.5	112.9%

Byway SDU is required to eliminate the N-0 thermal violations identified in ATRA-D case. Table 23 shows the proposed SDU solution to solve N-0 issue in ATRA-D.

Table 23: CY23 LI Byway SDU for N-0 Issue

	CY23 LI Byway SDU for N-0 Thermal Violations
1	Q825 – Terryville Rebuild to 149/177/193 MVA

Table 24 shows the FCITC resulting from the LI Byway Capacity Deliverability Assessment after applying the proposed LI Byway SDU for N-0 issue. The LI Byway transfer limit was evaluated by shifting CRIS generation from the sub-zone where the project is interconnected, to the rest of the CRIS generation in LI Capacity Region.

Table 24: LI Byway Capacity Deliverability Assessment Results with LI Byway SDU for N-0 Issue

CY23 Project	Exporting zone	Importing zone	CY23 ATBA-D			Constraint	CY23 ATRA-D with N-0 SDU Solution			Constraint	Impact *c-c1	Byway Test Conclusion
			CY23 ATBA-D Net Available Capacity (MW) a1	FCITC (Export Limit) (MW) b1	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c1 = b1-a1		CY23 ATRA-D Net Available Capacity (MW) a	FCITC (Export Limit) (MW) b	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c = b-a			
Q825_Q957_Q971_Q1012_Q1113_Q1117_Q1159_Q1255_Q1256_Q1257	Case 1: LI-East	Rest of LI	680.5	680.5	0	(1)	1038.7	469.4*	-569.3	(4)	-569.3	Bottled*
Q1123_PAM-2020-77593	Case 2: LI-Central	Rest of LI	632.0	632.0	0	(2)	968.6	968.6	0	(5)	0	Passed
Q1254	Case 3: LI-West	Rest of LI	291.1	291.1	0	(3)	444.4	444.4**	-	(6)	-	Bottled**

*Unfixable overloading issue identified on 129848 W.Yaphank – 130201 Q1255 POI and 129821 N.BellPt – 130201 Q1255 POI post contingency condition
**Unfixable overloading issue identified on 129970 Barrett2 – 129977 Ocean4T2 post contingency condition

(1)	129546	MALVERN	69.0	129561	W.HEMP 1	69.0	1	at	62	MVA	STE	L/O	VS BUS 1
(2)	128847	NWBRG	345	129310	NEWBRGE	138	2	at	675	MVA	STE	L/O	NEWBRGE 345/138 Bank #1_Dup2
(3)	128924	FRPT-GT2	13.8	129513	FRPRTGTS	69.0	1	at	75	MVA	Norm		Base Case
(4)	129339	KINGS	138	129355	PILGRIM	138	1	at	624	MVA	STE	L/O	138-875_Dup1
(5)	129344	NRTHPT1	138	129355	PILGRIM	138	3	at	192	MVA	Norm		Base Case
(6)	129233	VLY STRM	138	130152	LIOTTA1	138	1	at	358	MVA	STE	L/O	Valley Stream Bus Tie

The results as seen from Table 24, show bottled generation in LI-East. Byway SDUs are required for Q825 Setauket Energy Storage, Q957 Holbrook Energy Storage, Q971 East Setauket Energy Storage, Q1012 Suffolk County Storage II, Q1117 CLIES 70MW, Q1159 Innisfree Storage, Q1123 KCE NY 29, Q1254 Barrett Hempstead Battery Storage, Q1255 Holtsville Brookhaven Battery Storage, Q1256 Canal Southampton Battery Storage, and Q1257 Edwards Calverton Battery Storage to be fully deliverable.

Table 25 summarizes the proposed SDU solutions.

Table 25: CY23 LI Byway SDU for Deliverability Assessment

CY23 LI Byway SDU for Deliverability Assessment	
2	A PAR (392/520/600) MVA plus UG circuit 138 kV (2 cables per phase) between Pilgrim - West Bus 138 kV
3	Reconductoring portion of Holbrook – Holtsville ckt 1&2 lines uprating to 183 MVA STE
4	W.Yaphank - N.Bell Port 69 kV Rebuild to 73 MVA Normal Rating
5	Adding a 2 ohms series reactor to Ocean Ave or Barrett 34.5 kV with associated upgrades to accommodate the SR

Table 26 presents the analysis for CY23 LI CRIS Projects with proposed SDUs for full deliverability.

Table 26: LI Byway Capacity Deliverability Assessment Results plus all CY23 LI Byway SDUs

CY23 Project	Exporting zone	Importing zone	CY23 ATBA-D			Constraint	CY23 ATRA-D with Byway SDUs for N-0 and Deliverability Assessment			Constraint	Impact *c-c1	Byway Test Conclusion
			CY23 ATBA-D Net Available Capacity (MW) a1	FCITC (Export Limit) (MW) b1	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c1 = b1-a1		CY23 ATRA-D Net Available Capacity (MW) a	FCITC (Export Limit) (MW) b	Additional Transmission Capacity (+) or Bottled Generation Capacity (-) *c = b-a			
Q825_Q957_Q971_Q1012_Q1113_Q1117_Q1159_Q1255_Q1256_Q1257	Case 1: LI-East	Rest of LI	680.5	680.5	0	(1)	1038.7	1038.7	0	(4)	0	Passed
Q1123_PAM-2020-77593	Case 2: LI-Central	Rest of LI	632.0	632.0	0	(2)	968.6	968.6	0	(5)	0	Passed
Q1254	Case 3: LI-West	Rest of LI	291.1	291.1	0	(3)	444.4	444.4	0	(6)	0	Passed

```
(1)   129546 MALVERN      69.0  129561 W.HEMP 1     69.0  1   at    62    MVA    STE    L/O   VS BUS 1
(2)   128847 NWBRG         345  129310 NEWBRGE       138  2   at   675    MVA    STE    L/O   NEWBRGE 345/138 Bank #1_Dup2
(3)   128924 FRPT-GT2     13.8  129513 FRPRTGTS     69.0  1   at    75    MVA   Norm          Base Case
(4)   129839 TERYVIL      69.0  130545 Q825 POI     69.0  1   at   149    MVA   Norm          Base Case
(5)   129344 NRTHPT1       138  129355 PILGRIM       138  3   at   192    MVA   Norm          Base Case
(6)   129233 VLY STRM      138  130152 LIOTTA1       138  1   at   358    MVA    STE    L/O   Valley Stream Bus Tie
```

3.7 LI Byway SDU Cost Allocation

The preliminary cost allocation for CY23 LI CRIS Projects whose impact on deliverability degradation is discussed in this section. In this report, the NYISO presents the planning level least-cost solution for full deliverability of CY23 CRIS Projects in LI Capacity Region.

LI Byway SDUs for N-0 Thermal Violations in ATRA-D Case

As N-0 thermal violations were identified in ATRA-D case, distribution factor (DFAX) was calculated for cost allocation of CY23 LI CRIS Projects to LI N-0 thermal violation. DFAX of each individual project per each branch was calculated then each project's contribution was calculated accordingly. Table 27 shows each project's cost allocation for SDUs to fix N-0 issue identified in ATRA-D base case.

LI Byway SDUs for Capacity Deliverability Assessment

Table 27 also provides each project's cost allocation for SDUs to fix issues identified in capacity deliverability assessment per each project's contribution. Individual project impact was calculated for cost allocation of CY23 LI CRIS Projects to each limiting element identified in LI Byway deliverability assessment.

Table 27: LI Byway SDU for N-0 Issue and Capacity Deliverability Assessment - Allocation Percentage

Project	CRIS MW	SDU (1)		SDU (2&3)		SDU (4)		SDU (5)	
		Impact	% Allocation	Impact	% Allocation	Impact	% Allocation	Impact	% Allocation
Q825	65.3	37.0	**62.83%**	24.8	**7.18%**	N/A	N/A	N/A	N/A
Q957	76.8	N/A	N/A	27.7	**8.01%**	N/A	N/A	N/A	N/A
Q971	125	N/A	N/A	53.7	**15.53%**	N/A	N/A	N/A	N/A
Q1012	76.8	N/A	N/A	32.4	**9.39%**	N/A	N/A	N/A	N/A
Q1117	70	N/A	N/A	30.2	**8.74%**	N/A	N/A	N/A	N/A
Q1123	150	N/A	N/A	58.4	**16.89%**	N/A	N/A	N/A	N/A
Q1159	50	21.9	**37.17%**	19.4	**5.63%**	N/A	N/A	N/A	N/A
Q1254	40	N/A	N/A	N/A	N/A	N/A	N/A	11.8	**100.0%**
Q1255	79.9	N/A	N/A	31.0	**8.97%**	73.3	**100.0%**	N/A	N/A
Q1256	100	N/A	N/A	42.4	**12.28%**	N/A	N/A	N/A	N/A
Q1257	60	N/A	N/A	25.6	**7.39%**	N/A	N/A	N/A	N/A
			100%		100%		100%		100%

(1) Q825 – Terryville Rebuild to 149/177/193 MV
(2) A PAR (392/520/600) MVA plus UG circuit (2 cables per phase) between Pilgrim - West Bus 138 kV
(3) Reconductoring portion of Holbrook – Holtsville ckt 1&2 lines uprating to 183 MVA STE
(4) W.Yaphank - N.Bell Port 69 kV Rebuild (41/51/53) to (73/73/73) MVA
(5) Adding a 2 ohms series reactor to Ocean Ave or Barrett 34.5 kV with associated upgrades to accommodate the SR

During the LI Byway Assessment, available deliverable MWs were identified in CY23. Table 28 summarizes each project's deliverable CRIS MW.

Table 28: LI Byway Assessment – Deliverable MW

Queue	CRIS Request MW	Deliverable MW
Q825	65.3	**23**
Q957	76.8	**29.7**
Q971	125	**33.6**

Queue	CRIS Request MW	Deliverable MW
Q1012	76.8	**21.5**
Q1117	70	**18.5**
Q1123	150	**50.6**
Q1159	50	**16.8**
Q1254	40	**0**
Q1255	79.9	**27.1**
Q1256	100	**27.7**
Q1257	60	**16.4**
Q1113	20	**20**
PAM-2020-77593	9.9	**9.9**

The high-level non-binding cost estimate for Terryville – Q825 POI rebuild is **$ 8,765,680 (±50%)**. This SDU is "new" (*i.e.*, not previously identified and cost allocated in a prior Class Year Study and not substantially similar to a System Deliverability Upgrade previously identified and cost allocated in a Class Year Study) and therefore requires an Additional SDU Study per Section 25.5.10 of Attachment S if any of the projects listed above elect to move forward with such Additional SDU Study. Further physical feasibility of these SDUs will be confirmed in the Additional SDU studies if any of the projects indicated above decide to move forward with the Additional SDU Studies.

The high-level non-binding estimated cost for installing a new PAR controlled 138 kV lines between Pilgrim and West Bus with two 138 kV underground cables per phase is **$294,879,951 (±50%)**. This SDU is "new" (*i.e.*, not previously identified and cost allocated in a prior Class Year Study and not substantially similar to a System Deliverability Upgrade previously identified and cost allocated in a Class Year Study) and therefore requires an Additional SDU Study per Section 25.5.10 of Attachment S if any of the projects listed above elect to move forward with such Additional SDU Study. Further physical feasibility of these SDUs will be confirmed in the Additional SDU studies if the projects indicated above decide to move forward with the Additional SDU studies.

The high-level non-binding estimated cost for reconductoring portion of Holbrook – Holtsville ckt 1&2 lines uprating to 183 MVA STE is **$4,978,222 (±50%)**. This SDU is "new" (*i.e.*, not previously identified and cost allocated in a prior Class Year Study and not substantially similar to a System Deliverability Upgrade previously identified and cost allocated in a Class Year Study) and therefore requires an Additional SDU Study per Section 25.5.10 of Attachment S if any of the projects listed above elect to move forward with such Additional SDU Study. Further physical feasibility of these SDUs will be confirmed in the Additional SDU studies if the projects indicated above decide to move forward with

the Additional SDU studies.

The high-level non-binding estimated cost for W.Yaphank to N.Bell Port 69kV rebuild is **$14,126,452 (±50%)**. This SDU is "new" (*i.e.*, not previously identified and cost allocated in a prior Class Year Study and not substantially similar to a System Deliverability Upgrade previously identified and cost allocated in a Class Year Study) and therefore requires an Additional SDU Study per Section 25.5.10 of Attachment S if any of the projects listed above elect to move forward with such Additional SDU Study. Further physical feasibility of these SDUs will be confirmed in the Additional SDU studies if the projects indicated above decide to move forward with the Additional SDU studies.

The high-level non-binding estimated cost for a 2 ohms series reactor to Ocean Ave or Barrett 34.5 kV with associated upgrades to accommodate the SR is **$5,000,000 (±50%)**. This SDU is "new" (*i.e.*, not previously identified and cost allocated in a prior Class Year Study and not substantially similar to a System Deliverability Upgrade previously identified and cost allocated in a Class Year Study) and therefore requires an Additional SDU Study per Section 25.5.10 of Attachment S if any of the projects listed above elect to move forward with such Additional SDU Study. Further physical feasibility of these SDUs will be confirmed in the Additional SDU studies if the projects indicated above decide to move forward with the Additional SDU studies.

4. Conclusions

For the CY23 CRIS Projects located in ROS and LHV Capacity Regions, the "No-Harm" Highway and the Other Interfaces total transfer limit evaluations indicate that all CY23 CRIS Projects passed the tests. These projects also passed the Highway Capacity Deliverability Assessment. The ROS and LHV Byway tests indicates that all CY23 projects located in the ROS and LHV Capacity Regions are deliverable.

For the CY23 CRIS Projects located in the NYC Capacity Region – there are no SDUs required for the projects to be fully deliverable at their requested CRIS MW levels; therefore CY23 projects located in NYC requesting CRIS rights under this study are fully deliverable.

For the CY23 CRIS Projects located in the LI Capacity Region – Q825 Setauket Energy Storage, Q957 Holbrook Energy Storage, Q971 East Setauket Energy Storage, Q1012 Suffolk County Storage II, Q1117 CLIES 70MW, Q1159 Innisfree Storage, Q1254 Barrett Hempstead Battery Storage, Q1255 Holtsville Brookhaven Battery Storage, Q1256 Canal Southampton Battery Storage, Q1257 Edwards Calverton Battery Storage, and Q1123 KCE NY 29. LI Byway SDUs are required for these projects to be fully deliverable. The proposed LI Byway SDUs include: Terryville – Q825 POI rebuild, adding a PAR controlled 138 kV lines between Pilgrim 138 kV station - West Bus 138 kV station with 138 kV underground cable (2 cables per phase), reconductoring portion of Holbrook – Holtsville ckt 1&2 lines uprating to 183 MVA STE, W.Yaphank to N.Bell Port 69kV rebuild, and adding a 2 ohms series reactor to Ocean Ave or Barrett 34.5 kV with associated upgrades to accommodate the SR. Further physical feasibility of the identified new SDUs will be confirmed in the Additional SDU studies if the projects indicated above decide to move forward with the Additional SDU studies.

Appendix A Summary of Phase Angle Regulator Schedules in Deliverability Power Flow Cases

External Tie PAR schedules

Circuit #	Controlled Line	Schedule (MW)
ISO-NE to NYCA		
7/K37	Blissville – Whitehall	25
138-1385	Norwalk Harbor – Northport	0
PV-20	Sandbar – Plattsburgh	0
PJM to NYCA		
5018	Hopatcong – Ramapo	610
B-3402	Hudson – Farragut	0
C-3403	Hudson – Farragut	0
A-2253	Linden – Goethals	63
J3410/69	Waldwick – South Mahwah	-1
K3411/70	Waldwick – South Mahwah	-135
IESO to NYCA		
L33P	St. Lawrence – Moses	0
L34P	St. Lawrence – Moses	0

PAR schedules between Capacity Regions (Inter-Capacity)

Circuit #	Controlled Line	Schedule (MW)
LHV to NYC		
99031	Dunwoodie N – Sherman Creek	85
99032	Dunwoodie N – Sherman Creek	85
99153	Dunwoodie S – E. 179th St.	150
M29	Sprain Brook – Sherman Creek	320
X28	Sprain Brook – Tremont	380
LHV to LI		

Circuit #	Controlled Line	Schedule (MW)
Y49	Sprain Brook – E. Garden City	-636 (128822)
NYC to LI		
903	Jamaica – Lake Success	200
901	Jamaica – Valley Stream	87

PAR schedules inside Capacity Regions (Intra-Capacity)

Circuit #	Controlled Line	Schedule (MW)
ROS		
	Inghams	120
NYC		
18001	Corona – Jamaica	20
18002	Corona – Jamaica	20
21191	Fresh Kills (345/138)	195
21192	Fresh Kills (345/138)	195
42231	Gowanus (345/138)	195
42232	Gowanus (345/138)	155
LI		
	Barrett – Freeport	115
	Pilgrim – Hauppauge	115