AC Transmission Public Policy Transmission Planning Report

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Management Committee

June 26, 2018

NEW YORK INDEPENDENT SYSTEM OPERATOR

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Review Process

- March 30, 2018: Posted draft SECO report and preliminary evaluation results
- April 5, 2018: ESPWG/TPAS, summary of the review schedule
- April 6, 2018: Reviewed results with all developers in the same meeting
- April 19, 2018: Reviewed results with all developers in the same meeting
- April 30, 2018: ESPWG/TPAS
- May 10, 2018: ESPWG/TPAS
- May 22, 2018: ESPWG/TPAS
- June 1, 2018: ESPWG/TPAS
- June 14, 2018: ESPWG/TPAS
- June 20, 2018: Business Issue Committee (advisory vote)
- June 21, 2018: Operating Committee (for information, not required by Tariff)
- June 26, 2018: Special Management Committee (advisory vote)
- July 2018: Board review of the report

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Topics

- Public Policy Transmission Planning Process
- AC Transmission Public Policy Transmission Need
- Viability and Sufficiency Assessment
- Comparative Evaluation
- Ranking and Selection Recommendation
- Next Steps

Public Policy Transmission Planning Process

Overview

- Section 31.4 of Attachment Y of the NYISO Open Access Transmission Tariff (OATT) describes the planning process that the NYISO, and all interested parties, shall follow to consider needs for new transmission projects on the Bulk Power Transmission Facilities (BPTF) that are driven by Public Policy Requirements.
- A Public Policy Requirement is a federal or New York State statute or regulation, including a New York State Public Service Commission (PSC) order adopting a rule or regulation subject to and in accordance with the State Administrative Procedure Act, any successor statute, or any duly enacted law or regulation passed by a local governmental entity in New York State, that may relate to transmission planning on the BPTF.

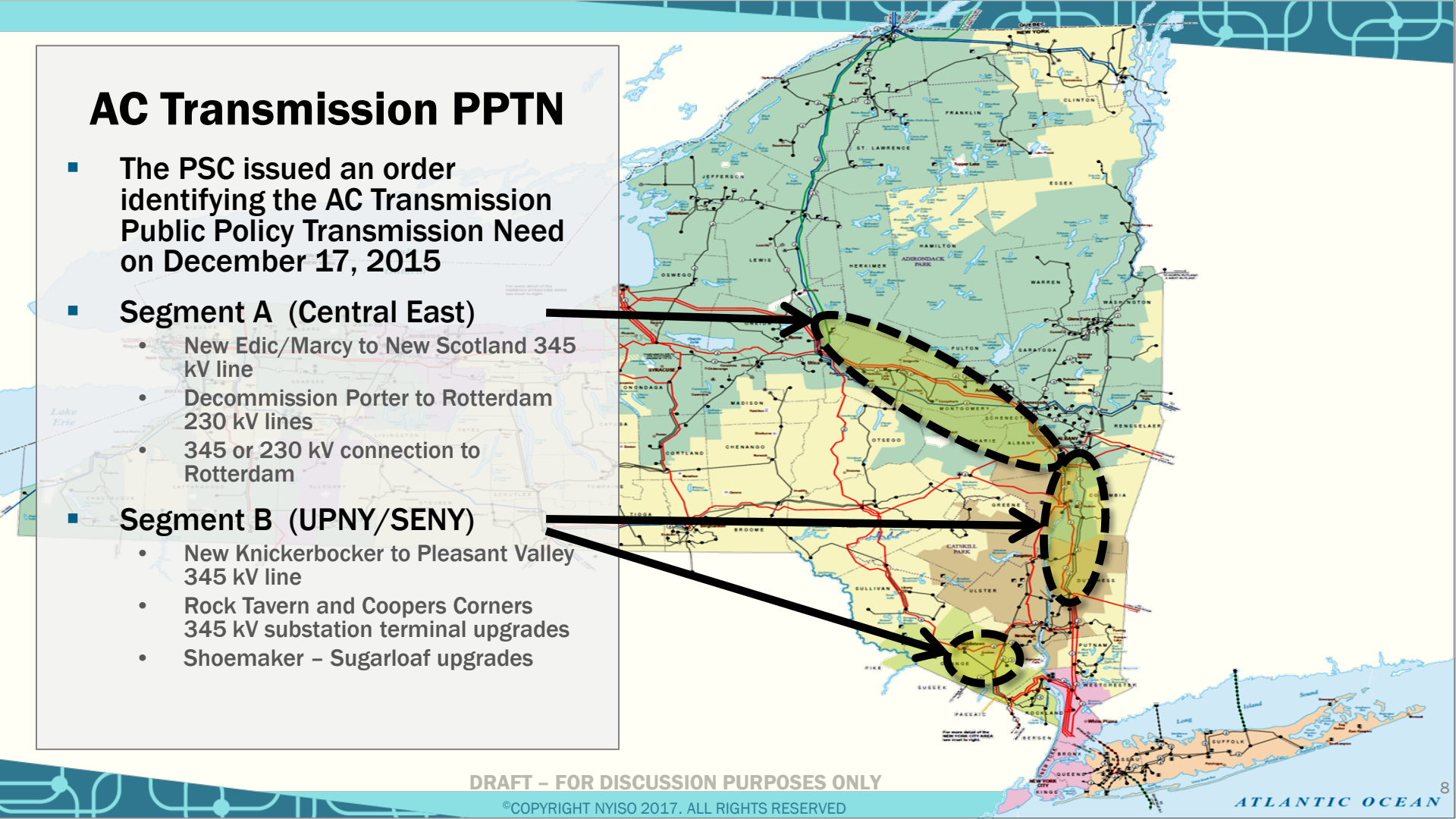
Public Policy Planning Process

- **Phase I: Identify Needs and Assess Solutions**
  - NYISO solicits transmission needs driven by Public Policy Requirements
  - PSC identifies transmission needs and defines additional evaluation criteria
  - NYISO solicits solutions (transmission, generation, or EE/DR)
  - NYISO performs Viability and Sufficiency Assessment (VSA)
  - PSC reviews assessment and confirms continued transmission need
- **Phase II: Transmission Evaluation and Selection**
  - NYISO staff evaluates viable and sufficient transmission solutions and recommends the more efficient or cost-effective solution
  - Stakeholder review and advisory votes at BIC and MC
  - NYISO Board may select a transmission solution for purposes of cost allocation and recovery under the NYISO OATT

AC Transmission Public Policy Transmission Need

AC Transmission PPTN

- The PSC issued an order identifying the AC Transmission Public Policy Transmission Need on December 17, 2015
- Segment A (Central East)
  - New Edic/Marcy to New Scotland 345 kV line
  - Decommission Porter to Rotterdam 230 kV lines
  - 345 or 230 kV connection to Rotterdam
- Segment B (UPNY/SENY)
  - New Knickerbocker to Pleasant Valley 345 kV line
  - Rock Tavern and Coopers Corners 345 kV substation terminal upgrades
  - Shoemaker – Sugarloaf upgrades



Solicitation for Solutions

- The NYISO established the power flow study cases, reviewed the sufficiency and evaluation criteria at the February 5, 2016 ESPWG/TPAS meeting, and made the study cases available to facilitate development of the solutions
- On February 29, 2016, the NYISO issued a solicitation for solutions
- On April 29, 2016, developers submitted 16 project proposals

Viability and Sufficiency Assessment

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Viability and Sufficiency Assessment

- In October 2016, the NYISO determined that 13 projects are viable and sufficient

Segment	Project ID	Developer Name	Project Name
A	T018	National Grid / Transco	New York Energy Solution Seg. A
	T021	NextEra Energy Transmission New York	Enterprise Line: Segment A
	T025	North America Transmission / NYPA	Segment A + 765 kV
	T026	North America Transmission / NYPA	Segment A Base
	T027	North America Transmission / NYPA	Segment A Double Circuits
	T028	North America Transmission / NYPA	Segment A Enhanced
	T031	ITC New York Development	16NYPP1-1A AC Transmission
B	T019	National Grid / Transco	New York Energy Solution Seg. B
	T022	NextEra Energy Transmission New York	Enterprise Line: Segment B
	T023	NextEra Energy Transmission New York	Enterprise Line: Segment B-Alt
	T029	North America Transmission / NYPA	Segment B Base
	T030	North America Transmission / NYPA	Segment B Enhanced
	T032	ITC New York Development	16NYPP1-1B AC Transmission

- On January 24, 2017, PSC issued an order confirming the AC Transmission PPTN

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Viable and Sufficient Projects

- All Segment A projects propose a new single-circuit 345 kV line from Edic to New Scotland except that
  - T025 proposes a single-circuit 345 kV line from Edic to New Scotland and conversion of the Marcy – Knickerbocker line to 765 kV operation
  - T027 proposes a double-circuit 345 kV line from Edic to New Scotland
- All Segment B projects are electrically similar proposing Knickerbocker to Pleasant Valley 345 kV line except that T019 includes 50% series compensation

Comparative Evaluation for Selection

Overview

- At the November 7, 2017 ESPWG/TPAS meeting, the NYISO presented assumptions used for selection evaluation and also solicited comments
- The evaluation of Public Policy Transmission Projects differs from other planning processes because it can give varying levels of consideration to the baseline and the scenarios

Databases for Comparative Evaluation

- Power flow: used in metrics such as transfer limits, cost per MW, and operability
- Resource adequacy: used to maintain enough resources for MAPS database and to analyze ICAP benefits
- Production cost: used in metrics such as production cost savings, emissions, LBMP, load payment, and performance
- SECO databases: used in metrics such as overnight capital cost, schedules, property rights, and expandability

PSC Criteria

- Section 31.4.8.1.8 of Attachment Y: The NYISO shall apply any criteria specified by the Public Policy Requirement or provided by the NYPSC and perform the analyses requested by the NYPSC, to the extent compliance with such criteria and analyses is feasible.
- The evaluation and selection considered the NYPSC criteria, which were also referenced in and appended to the February 29, 2016 solicitation letter.

Independent Overnight Cost Estimates

- SECO developed the independent cost estimates considering material and labor cost by equipment, engineering and design work, permitting, site acquisition, procurement and construction work, and commissioning
- Common upgrades for Shoemaker – Sugarloaf lines and Rock Tavern/Coopers Corners 345 kV substation terminals not included in the cost estimates
- SECO estimated that 5% synergy savings can be applied when combining Segment A and Segment B projects from the same developers
- The independent cost estimates include all the preliminary costs of the Network Upgrade Facilities identified or likely will be identified in the System Impact Studies.

Segment	Project ID	Independent Cost Estimate: 2018 $M (w/ 30% contingency rate)	Independent Cost Estimate: 2018 $M (w/o 30% contingency rate)
A	T018	520	400
	T021	498	383
	T025	863	664
	T026	491	377
	T027	750	577
	T028	514	395
	T031	570	438
B	T019	479	369
	T022	373	287
	T023	424	326
	T029	422	324
	T030	441	339
	T032	536	412

Cost Per MW

Project ID	Segment A Independent Cost Estimate: 2018 $M	Segment B Independent Cost Estimate: 2018 $M	Cost/MW: incremental Central East Voltage Limit (N-1)		Cost/MW: incremental UPNY/SENY thermal Limit (N-1 NTC)					
					Roseton at 100%		Roseton at 85%		Optimized Transfer	
			Inc. MW	$M /MW	Inc. MW	$M /MW	Inc. MW	$M /MW	Inc. MW	$M /MW
T018+T019	494	455	425	1.16	1,600	0.28	1,675	0.27	1975	0.23
T021+T022	473	354	350	1.35	1,200	0.29	1,525	0.23	1500	0.23
T021+T023	473	403	350	1.35	1,200	0.34	1,475	0.27	1450	0.27
T025+T019	863	479	1,300	0.66	1,050	0.46	1,000	0.48	1150	0.41
T025+T029	820	401	1,125	0.73	1,825	0.22	2,125	0.19	2225	0.18
T025+T030	820	419	1,200	0.68	1,925	0.22	2,275	0.18	2325	0.18
T026+T029	466	401	275	1.69	1,150	0.35	1,400	0.29	1400	0.29
T026+T030	466	419	275	1.69	1,200	0.35	1,525	0.27	1525	0.27
T027+T019	750	479	875	0.86	1,750	0.27	1,875	0.26	2100	0.23
T027+T029	712	401	825	0.86	1,350	0.30	1,325	0.30	1325	0.30
T027+T030	712	419	825	0.86	1,400	0.30	1,475	0.28	1450	0.28
T028+T029	488	401	400	1.22	1,175	0.34	1,425	0.28	1425	0.28
T028+T030	488	419	325	1.50	1,250	0.33	1,575	0.27	1550	0.27
T031+T032	542	509	400	1.35	1,225	0.42	1,500	0.34	1475	0.35

Operability

Segment	Project ID	Substation and Transmission Configuration	Operability under Maintenance		Ranking
			UPNY/SENY N-1-1	Central East N-1-1	
A	T018	Breaker-and-a-half 345 kV Rotterdam substation, foundations and structures beyond NESC standard	N/A	Low	Good
	T021	Breaker-and-a-half 345 kV Princetown substation	N/A	Low	Good
	T025	Breaker-and-a-half 345 kV Rotterdam substation, ring-bus 345 kV Princetown substation	N/A	Low	Good
	T026	Breaker-and-a-half 345 kV Rotterdam substation	N/A	Low	Good
	T027	Breaker-and-a-half 345 kV Rotterdam substation, breaker-and-a-half 345 kV Princetown substation	N/A	Highest	Excellent
	T028	Breaker-and-a-half 345 kV Rotterdam substation, ring-bus 345 kV Princetown substation	N/A	Low	Good
	T031	Breaker-and-a-half Princetown substation looping in all 345 kV lines, straight-bus at Rotterdam substation, no bus reconfiguration at New Scotland, new tower contingency created south of Princetown	N/A	Low	Good
B	T019	Ring bus at Knickerbocker 345 kV substation, foundations and structures beyond NESC standard	-	N/A	Good
	T022	Ring bus at Knickerbocker 345 kV substation	-	N/A	Good
	T023	Ring bus at Knickerbocker 345 kV substation	-	N/A	Good
	T029	Ring bus at Knickerbocker 345 kV substation	Improved N-1-1 performance due to Middletown upgrades proposed	N/A	Excellent
	T030	Ring bus at Knickerbocker 345 kV substation	Improved N-1-1 performance due to Middletown upgrades proposed	N/A	Excellent
	T032	Ring bus at Knickerbocker 345 kV substation	-	N/A	Good

Expandability

- **Expandability considers the impact of the proposed projects on future system expansion**
  - With the retirement of existing Porter-Rotterdam 230 kV lines and addition of Segment A projects, addition of another circuit is still possible from Edic/Porter to Princetown Junction within the existing ROW
  - T027 with its double-circuit design tends to maximize the Central East transfer capability using existing ROW

Property Rights: Segment A

Project ID	Summary of Property Rights Acquisition	Substation Property Requirements					Ranking
		Substation	County	Owner		EMF Mitigation (Area in acres)	
				Incumbent Utility (Acres)	Non-Utility (Acres)		
T018	• NGrid completed routing study • Project ROW is fee-owned by, or under the control (via easement or permit) of, NGrid. • NGrid will transfer ownership of all assets to Transco.	Rotterdam Substation (Extension)	Schenectady	2.6	0	24	Good
T021	• NextEra has an option to purchase property for the proposed Princetown Substation. • Would use existing ROW, owned by the incumbent utility. • Has a well-documented plan to obtain property and site control	Princetown Substation (New)	Schenectady	0	24	24	Good
T025	• NAT/NYPA would use existing ROW, owned by the incumbent utility. • Does not yet possess the required ROWs. • Has a well-documented plan to obtain property and site control • NYPA to lead negotiations with the NYTO's in negotiating and obtaining easements.	Knickerbocker Substation (New)	Rensselaer	30	0	243	Fair
		Princetown Substation (New)	Schenectady	3	0		
		Rotterdam Substation (New)	Schenectady	7.5	0		
T026	Same as T025	Rotterdam Substation (New)	Schenectady	7.5	0	24	Good
T027	Same as T025	Edic Substation (Extension)	Oneida	1.3	0	16	Good
		Princetown Substation (New)	Schenectady	3	0		
		Rotterdam Substation (New)	Schenectady	7.5	0		
T028	Same as T025	Princetown Substation (New)	Schenectady	3	0	24	Good
		Rotterdam Substation (New)	Schenectady	7.5	0		
T031	• ITC would use existing ROW, owned by the incumbent utility. • Would likely require additional property to construct the proposed Princetown Substation. • Has a well-documented plan to obtain property and site control.	Princetown Substation (New)	Schenectady	5.5	2.6	24	Fair
		Rotterdam Substation (Extension)	Schenectady	2.5	0		

Property Rights: Segment B

Project ID	Summary of Property Rights Acquisition	Substation Property Requirements					Ranking
		Substation	County	Owner		EMF Mitigation (Area in acres)	
				Incumbent Utility (Acres)	Non-Utility (Acres)		
T019	• NGrid completed routing study • Project ROW is fee-owned by, or under the control (via easement or permit) of, NGrid. • NGrid will transfer ownership of all assets to Transco.	Knickerbocker Substation (New)	Rensselaer	14	0	0	Good
		Churchtown Substation (Extension)	Columbia	11.4	0		
		Pleasant Valley Substation (Extension)	Dutches	1.4	0		
T022	• NextEra have an option to purchase property for the proposed Princetown Substation. • Would use existing ROW, owned by the incumbent utility. • Has a well-documented plan to obtain property and site control	Knickerbocker Substation (New)	Rensselaer	14	0	0	Good
		Churchtown Substation (Extension)	Columbia	5.5	0		
T023	Same as T022	Knickerbocker Substation (New)	Rensselaer	14	0	0	Good
		Churchtown Substation (Extension)	Columbia	5.5	0		
T029	• NAT/NYPA would use existing ROW, owned by the incumbent utility. • Does not yet possess the required ROWs. • Has a well-documented plan to obtain property and site control • NYPA to lead negotiations with the NYTO's in negotiating and obtaining easements.	Knickerbocker Substation (New)	Rensselaer	14	0	0	Good
		Churchtown Substation (Extension)	Columbia	11.4	0		
T030	Same as T029	Knickerbocker Substation (New)	Rensselaer	14	0	0	Good
		Churchtown Substation (Extension)	Columbia	11.4	0		
T032	• ITC would use existing ROW, owned by the incumbent utility. • Would likely require additional property to construct the proposed Princetown Substation. • Has a well-documented plan to obtain property and site control.	Knickerbocker Substation (New)	Rensselaer	20	0	0	Good
		Churchtown Substation (Extension)	Columbia	0.3	0		

Project Schedule

- The independent duration estimates include the anticipated time for Article VII application preparation, Article VII approval, procurement, and construction
- Independent minimum duration estimates are the reasonable best case
- Independent duration estimates consider 4 more months to account for minor siting, permitting, and construction delays

Segment	Project ID	Independent Minimum Duration Estimate: Months	Independent Duration Estimate: Months
A	T018	48	52
	T021	48	52
	T026	48	52
	T028	48	52
	T027	51	55
	T025	50	54
	T031	48	52
B	T019	45	49
	T022	43	47
	T023	45	49
	T029	45	49
	T030	45	49
	T032	47	51

20-Year Production Cost Change: in 2018 M$

Project ID	Baseline	National CO2 Removed	High Natural Gas	Low Natural Gas	CES + Retirement w/o National CO2
		Based off Baseline			
T018+T019	(236)	(268)	(391)	(182)	(830)
T021+T022	(199)	(223)	(329)	(159)	(714)
T021+T023	(196)				(707)
T025+T019	(513)	(555)			(1,492)
T025+T029	(437)	(517)	(815)	(343)	(1,417)
T025+T030	(457)				(1,461)
T026+T029	(190)				(626)
T026+T030	(195)				(615)
T027+T019	(368)				(1,179)
T027+T029	(331)	(373)	(603)	(255)	(1,129)
T027+T030	(337)				(1,108)
T028+T029	(221)				(840)
T028+T030	(205)				(704)
T031+T032	(206)	(242)	(336)	(168)	(570)

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Performance

CES + Retirement w/o National CO2: 20-year Incremental Energy (GWh)

Project ID	CENTRAL EAST	UPNY-SENY
T018+T019	52,543	34,444
T021+T022	46,260	32,657
T021+T023	45,841	32,024
T025+T019	149,696	57,394
T025+T029	128,379	46,939
T025+T030	134,174	49,003
T026+T029	38,377	22,467
T026+T030	38,812	23,187
T027+T019	104,019	47,535
T027+T029	96,623	36,942
T027+T030	96,878	38,166
T028+T029	49,548	25,394
T028+T030	44,079	24,472
T031+T032	46,711	26,718

Risks

Segment	Project ID	Risks			Risk Level
		Overall Visual Impact	Easement Needed to Mitigate EMF (Acres)	Other Risks Including Siting	
A	T018	Medium structure height increase	24	-	Medium
	T021	High structure height increase, more structures, less impact to agriculture due to monopoles	24	-	Medium
	T025	Low structure height increase	243	Potential mitigation for clearance and corona issues, hardware replacement for insulation, siting and permitting risks	High
	T026	Low structure height increase	24	-	High
	T027	High structure height increase, 6 miles of lattice tower removed, less impact to agriculture due to monopoles	16	-	Medium
	T028	Low structure height increase	24	-	Medium
	T031	Low structure height increase, more structures, more impact to agriculture, 20 miles of lattice tower removed	24	Property acquisition for Princetown substation	Medium
B	T019	Medium structure height increase	0	Risks due to 50% series compensation	High
	T022	Medium structure height increase	0	-	Medium
	T023	High structure height increase	0	-	High
	T029	Low structure height increase	0	-	Low
	T030	Low structure height increase	0	-	Low
	T032	Low structure height increase, more structures, more impact to agriculture, two-pole configuration with triple circuits	0	Operation and maintenance complexity due to triple-circuit design	High

ICAP Benefits

- The NYISO utilized a methodology to capture the long-term impact on capacity procurement costs that mirrors the methodology recently approved by the NYISO's Management Committee and Board to optimize locational capacity requirements.
- The net present value of the capacity procurement savings ranges from $550M to $850M for all combinations of Tier 1 and Tier 2 projects over the 20-year study period.
- Given the ranges of benefits developed and the precision of the estimates, the NYISO did not deem it prudent to use the ICAP benefit as a factor in differentiating projects but rather as a means to demonstrate the overall potential value of the selecting projects to satisfy the AC Transmission Needs.

Ranking and Selection Recommendation

Ranking Process

- **Step 1: Tiered Ranking**
  - Individual projects in each segment were analyzed and compared
  - Major performance and risk differences were identified as distinguishing factors
  - Projects were divided into three tiers in each segment

- **Step 2: Individual Ranking**
  - Combinations of Segment A and Segment B projects were compared considering all the evaluation metrics
  - Synergies between projects were considered
    - Cost savings for Segment A and Segment B projects proposed by the same developers
    - Improved system efficiency or cost effectiveness due to combined electrical characteristics regardless of whether the projects are proposed by the same developers or not
  - The combination results were then used to inform the numerical ranking in each Segment

Tiered Ranking: Segment A

Project ID	Independent Cost Estimate: 2018 $M	Independent Duration Estimate: Months	Incremental Central East Voltage Transfer Limit	Operability	Propriety Rights	Expandability	PSC Criterion: Replacement of Aging Infrastructure	Risks			Tiered Ranking
								Overall Visual Impact	Easement Needed to Mitigate EMF (acres)	Other Risks Including Siting	
T018	520	52	Low	Breaker-and-a-half 345 kV Rotterdam substation, foundations and structures beyond NESC standard, low N-1-1 performance	-	-	-	Medium structure height increase	24	-	2
T021	498	52	Low	Breaker-and-a-half 345 kV Princetown substation, low N-1-1 performance	Non-utility property needed for Princetown substation, but with an option to purchase	Property available to expand the Princetown substation	No upgrades at Rotterdam substation	High structure height increase, more structures, less impact to agriculture due to monopoles	24	-	2
T025	863	54	Highest	Breaker-and-a-half 345 kV Rotterdam substation, ring-bus 345 kV Princetown substation, low N-1-1 performance	-	-	-	Low structure height increase	243	Potential mitigation for clearance and corona issues, hardware replacement for insulation, siting, and permitting risks, and risk to system operations due to contingency size	3
T026	491	52	Lowest	Breaker-and-a-half 345 kV Rotterdam substation, low N-1-1 performance	-	-	-	Low structure height increase	24	-	3
T027	750	55	High	breaker-and-a-half 345 kV Rotterdam substation, breaker-and-a-half 345 kV Princetown substation, best N-1-1 performance	-	All projects allow one more 345 kV line to be added within existing ROW, but double-circuit design tends to maximize the Central East transfer capability	More replacement due to double-circuit design, rebuild of Edic - New Scotland 345 kV line #14 for 6.3 miles, terminal upgrades at Marcy and Edic 345 kV substations	High structure height increase, 6 miles of lattice tower removed, less impact to agriculture due to monopoles	16	-	1
T028	514	52	Low	breaker-and-a-half 345 kV Rotterdam substation, ring-bus 345 kV Princetown substation, low N-1-1 performance	-	-	-	Low structure height increase	24	-	2
T031	570	52	Low	Breaker-and-a-half Princetown substation looping in all 345 kV lines, straight-bus at Rotterdam substation, no bus reconfiguration at New Scotland, new tower contingency created south of Princetown, low N-1-1 performance	Non-utility property needed for Princetown substation	-	Rebuild of Edic - New Scotland 345 kV line #14 for 20 miles	Low structure height increase, more structures, more impact to agriculture, 20 miles of lattice tower removed	24	Property acquisition for Princetown substation	2

Tiered Ranking: Segment B

Project ID	Independent Cost Estimate: 2018 $M	Independent Duration Estimate: Months	Incremental UPNY/SENY Thermal Transfer Limit	Operability	Proprietary Rights	Expandability	PSC Criterion: Replacement of Aging Infrastructure	Risks		Tiered Ranking
								Overall Visual Impact	Other Risks Including Siting	
T019	479	49	Higher with series compensation, but similar to others if bypassed	Foundations and structures beyond NESC standard	-	-	Churchtown 115 kV substation rebuild, terminal upgrades at New Scotland and Roseton substations	Medium structure height increase	Risks of SSR, voltage rise mitigation, relay coordination due to 50% series compensation	3
T022	373	47	-		-	-	Less 115 kV upgrades between Churchtown and Pleasant Valley	Medium structure height increase	-	2
T023	424	49	-		-	-		High structure height increase	-	3
T029	422	49	-	Improved N-1-1 performance due to Middletown upgrades	-	-	Middletown upgrades, Churchtown 115 kV substation rebuild	Low structure height increase, reduced height for more than 50% of the structures	-	1
T030	441	49	-	Improved N-1-1 performance due to Middletown upgrades	-	-	Middletown upgrades, Churchtown 115 kV substation rebuild	Low structure height increase, reduced height for more than 50% of the structures	-	1
T032	536	51	-	-	-	Transformers could be added to connect the Knickerbocker 345kV and 115 kV switching stations	-	Low structure height increase, more structures, more impact to agriculture, two-pole configuration with triple circuits	Operation and maintenance complexity due to triple-circuit design	3

Summary of Combination Evaluation for Tier 1 and 2 Projects

Project ID	Independent Cost Estimate: 2018 $M (1)	Independent Duration Estimate: Months (2)	UPNY/SENY Incremental Thermal Transfer Limit: MW (3)	Central East Incremental Voltage Transfer Limit: MW	UPNY/SENY Cost/MW: $M/MW (3)	Central East Cost/MW: $M/MW	Baseline Production Cost Savings: 2018 $M	Baseline Production Cost Savings /Capital Cost	CES Production Cost Savings: 2018 $M	CES Production Cost Savings /Capital Cost	System CO2 Emission Reduction: 1000 tons (4)	Performance: 20-Year Incremental Flow on UPNY/SENY + Central East: GWh (4)	Operability		Expandability		Property Rights		PSC Criterion: Aging Infrastructure		Tiered Ranking	
													Seg A	Seg B	Seg A	Seg B	Seg A	Seg B	Seg A	Seg B	Seg A	Seg B
T018+T022	893	52	1,519	425	0.25	1.22	236	0.26	830	0.93	4,686	86,987	Good	Good	Good	Good	Good	Good	Good	Fair	2	2
T018+T029	942	52	1,401	425	0.30	1.22	236	0.25	830	0.88	4,686	86,987	Good	Excellent	Good	Good	Good	Good	Good	Good	2	1
T018+T030	961	52	1,535	425	0.29	1.22	236	0.25	830	0.86	4,686	86,987	Good	Excellent	Good	Good	Good	Good	Good	Good	2	1
T021+T022	827	52	1,519	350	0.23	1.35	199	0.24	714	0.86	7,298	78,917	Good	Good	Good	Good	Good	Good	Good	Fair	2	2
T021+T029	919	52	1,401	350	0.30	1.42	196	0.21	707	0.77	8,235	77,865	Good	Excellent	Good	Good	Good	Good	Good	Good	2	1
T021+T030	938	52	1,535	350	0.29	1.42	196	0.21	707	0.75	8,235	77,865	Good	Excellent	Good	Good	Good	Good	Good	Good	2	1
T027+T022	1123	55	1,326	825	0.28	0.91	331	0.29	1129	1.01	9,429	133,565	Excellent	Good	Excellent	Good	Good	Good	Excellent	Fair	1	2
T027+T029	1113	55	1,326	825	0.30	0.86	331	0.30	1129	1.01	9,429	133,565	Excellent	Excellent	Excellent	Good	Good	Good	Excellent	Good	1	1
T027+T030	1131	55	1,470	825	0.28	0.86	337	0.30	1108	0.98	10,184	135,044	Excellent	Excellent	Excellent	Good	Good	Good	Excellent	Good	1	1
T028+T022	887	52	1,519	400	0.25	1.28	221	0.25	840	0.95	4,056	74,942	Good	Good	Good	Good	Good	Good	Good	Fair	2	2
T028+T029	889	52	1,427	400	0.28	1.22	221	0.25	840	0.94	4,056	74,942	Good	Excellent	Good	Good	Good	Good	Good	Good	2	1
T028+T030	907	52	1,569	325	0.27	1.50	205	0.23	704	0.78	5,901	68,551	Good	Excellent	Good	Good	Good	Good	Good	Good	2	1
T031+T022	943	52	1,519	400	0.25	1.43	206	0.22	570	0.60	8,814	73,429	Good	Good	Good	Good	Fair	Good	Excellent	Fair	2	2
T031+T029	992	52	1,427	400	0.30	1.43	206	0.21	570	0.57	8,814	73,429	Good	Excellent	Good	Good	Fair	Good	Excellent	Good	2	1
T031+T030	1011	52	1,569	400	0.28	1.43	206	0.20	570	0.56	8,814	73,429	Good	Excellent	Good	Good	Fair	Good	Excellent	Good	2	1

Notes:

1. With 30% contingency rate, with 5% synergy if from same developers, and without cost for Rock Tavern and Shoemaker-Sugarloaf upgrades
2. Max of Segment A and Segment B
3. UPNY-SENY N-1 optimized thermal transfer
4. CES + Retirement w/o National CO2

Individual Ranking

Segment	Ranking	Project ID	Developer Name	Project Name
A	1	T027	North America Transmission / NYPA	Segment A Double Circuits
	2	T028	North America Transmission / NYPA	Segment A Enhanced
	3	T018	National Grid / Transco	New York Energy Solution Seg. A
	4	T021	NextEra Energy Transmission New York	Enterprise Line: Segment A
	5	T031	ITC New York Development	16NYPP1-1A AC Transmission
	6	T026	North America Transmission / NYPA	Segment A Base
	7	T025	North America Transmission / NYPA	Segment A + 765 kV
B	1	T029	North America Transmission / NYPA	Segment B Base
	2	T030	North America Transmission / NYPA	Segment B Enhanced
	3	T022	NextEra Energy Transmission New York	Enterprise Line: Segment B
	4	T019	National Grid / Transco	New York Energy Solution Seg. B
	5	T023	NextEra Energy Transmission New York	Enterprise Line: Segment B-Alt
	6	T032	ITC New York Development	16NYPP1-1B AC Transmission

Selection Recommendation

- **Based on consideration of all the evaluation metrics for efficiency or cost effectiveness, together with input from stakeholders and DPS, the NYISO staff recommends selecting T027 for Segment A and T029 for Segment B as the more efficient or cost effective transmission solution to satisfy the AC Transmission Public Policy Transmission Need.**
  - The benefits provided by the double-circuit design in T027 warrant the higher cost. These benefits include significant increase in Central East voltage transfer capability, increased production cost savings, and excellent operability and expandability. T027 also requires the least easement to mitigate the EMF violations compared with other Segment A projects. Furthermore, T027 has the most aging infrastructure replacement.
  - T029 provides similar UPNY-SENY transfer incremental and production cost savings with the second lowest cost. T029 also demonstrates excellent operability. More importantly, T029 poses the lowest siting risk due to the low structure height increase and more than 50% of its new structures with reduced height.
  - T027 and T029 are proposed by the same developer, which would result in cost savings when developing two projects simultaneously.
  - Combining the production cost savings and ICAP savings for T027+T029, the savings over capital cost ratio is 0.8 to 1.1 for the baseline, and 1.5 to 1.8 for the CES + Retirement scenario. Moreover, the projects would also result in cost savings from avoided refurbishment costs estimated to be $839 million (2015 $).

In-Service Date

- Based on the project schedule evaluated by SECO, the in-service date for the selected projects is April 2023 assuming the Developers will start preparing the Article VII application immediately following the approval of this report by the NYISO Board.

Next Steps

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Next Steps

- The written comments submitted to the MC will be provided to the Board unless revised comments are submitted. *Parties do not have to resubmit their comments after the MC.*
- If you wish to revise your written comments submitted to the MC, please submit revised comments to PublicPolicyPlanningMailbox@nyiso.com by close of business (5:00 p.m. EST) June 28, 2018.
- Written comments and the results of the advisory votes will be submitted to the Board and posted by the NYISO.
- An advisory vote of the MC is not an action appealable to the Board. As in WNY, the NYISO will conduct an appeal-like process for Market Participants and interested parties to be heard directly by the Board on the AC Transmission Public Policy Transmission Planning Report.
- Parties wishing to be heard directly by the Board on July 16, 2018 should submit requests to PublicPolicyPlanningMailbox@nyiso.com by close of business (5:00 p.m. EST) June 28, 2018.
- Following the Board approval, the NYISO will tender Development Agreements to the Developers of the selected projects.

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Questions?

We are here to help. Let us know if we can add anything.

NEW YORK INDEPENDENT SYSTEM OPERATOR

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system

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