

Western NY Public Policy Transmission Planning Report

Dawei Fan

Supervisor, Public Policy and Interregional Planning

Management Committee

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Review Process

- June 30, 2017: Posted Draft Western NY Report
- July 20, 2017: ESPWG/TPAS, presented draft report and supporting documentation
- July 27, 2017: ESPWG/TPAS, presented draft ranking and selection recommendation
- August 8, 2017: ESPWG/TPAS, presented updated schedule
- August 18, 2017: ESPWG/TPAS, presented updated report and supporting documentation
- August 28, 2017: ESPWG/TPAS, presented updated report and released FAQ document
- September 12, 2017: Business Issues Committee (advisory vote)
- September 15, 2017: Operating Committee (for information, not required by Tariff)
- **September 27, 2017: Management Committee (advisory vote)**
- **October 2017: Western NY Report delivered to NYISO Board**

Agenda

- **Public Policy Transmission Planning Process**
- **Western NY Public Policy Transmission Need**
- **Viability and Sufficiency Assessment**
- **Comparative Evaluation for Selection**
- **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 (BPTFs) 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 BPTFs.

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 under the NYISO Tariff

Western NY Public Policy Transmission Need

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Western NY PPTN

- On July 20, 2015, PSC issued an order identifying the Western NY PPTN
- NYISO was required to consider projects that increase the Western NY transmission capability sufficient to:
 - Ensure the full output from Niagara (2,700 MW including Lewiston Pumped Storage)
 - Maintain certain levels of simultaneous imports from Ontario across the Niagara tie lines (i.e., maximize Ontario imports under normal operating conditions and at least 1,000 MW under emergency operating conditions)
 - Maximize transfers out of Zone A to the rest of the state
 - Prevent transmission security violations (thermal, voltage or stability) that would result under normal and emergency operating conditions
 - Maintain reliability of the transmission system with fossil-fueled generation in Western NY out-of-service, as well as in-service

Solicitation for Solutions

- The NYISO established the baseline study cases according to the PSC Order, reviewed the results at multiple ESPWG/TPAS meetings, and made the study cases available to facilitate development of the solutions
- On November 1, 2015, the NYISO issued solicitation for solutions
- On December 31, 2015, developers submitted proposed projects

Proposed Projects

Developer	Project Name	Project ID	Category	Type	Location (County/State)
NRG Dunkirk Power	Dunkirk Gas Addition	OPP02	OPPP	ST	Chautauqua, NY
North America Transmission	Proposal 1	T006	PPTP	AC	Niagara-Erie, NY
North America Transmission	Proposal 2	T007	PPTP	AC	Niagara-Erie, NY, Wyoming, NY
North America Transmission	Proposal 3	T008	PPTP	AC	Niagara-Erie, NY, Wyoming, NY
North America Transmission	Proposal 4	T009	PPTP	AC	Niagara-Erie, NY, Wyoming, NY
ITC New York Development	15NYPP1-1 Western NY AC	T010	PPTP	AC	Niagara-Erie, NY
National Grid	Moderate Power Transfer Solution	T011	PPTP	AC	Niagara-Erie, NY
National Grid	High Power Transfer Solution	T012	PPTP	AC	Niagara-Erie, NY
NYPA/NYSEG	Western NY Energy Link	T013	PPTP	AC	Niagara-Erie, NY, Wyoming, NY
NextEra Energy Transmission New York	Empire State Line Proposal 1	T014	PPTP	AC	Niagara-Erie, NY
NextEra Energy Transmission New York	Empire State Line Proposal 2	T015	PPTP	AC	Niagara-Erie, NY
Exelon Transmission Company	Niagara Area Transmission Expansion	T017	PPTP	AC	Niagara-Erie, NY
PPTP = Public Policy Transmission Project OPPP = Other Public Policy Project		ST = Steam Turbine AC = Alternating Current Transmission			

Viability and Sufficiency Assessment

Viability and Sufficiency Assessment

- **In May 2016, the NYISO determined that the following projects are viable and sufficient**
 - T006: North America Transmission – Proposal #1
 - T007: North America Transmission – Proposal #2
 - T008: North America Transmission – Proposal #3
 - T009: North America Transmission – Proposal #4
 - T011: National Grid – Moderate Power Transfer Solution
 - T012: National Grid – High Power Transfer Solution
 - T013: NYPA/NYSEG – Western NY Energy Link
 - T014: NextEra Energy Transmission New York – Empire State Line #1
 - T015: NextEra Energy Transmission New York – Empire State Line #2
 - T017: Exelon Transmission Company – Niagara Area Transmission Expansion
- **On October 13, 2016, PSC issued an order confirming the Western NY PPTN and requiring certain non-BPTF to be upgraded by National Grid**
- **The NYISO and its independent consultant (SECO) immediately commenced evaluation of each viable and sufficient project**

Comparative Evaluation for Selection

Overview

- Evaluated all metrics required by the OATT
- At the December 7, 2016 and January 24, 2017 ESPWG/TPAS meetings, the NYISO presented assumptions used for selection evaluation
- 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

Evaluation Databases

- **Power flow:** used in metrics such as cost per MW, operability, and expandability
- **Resource adequacy:** used to analyze LOLE and ICAP benefit
- **Production cost:** used in metrics such as cost per MW, production cost savings, emission, LBMP, load payment, and performance
- **SECO databases:** used in metrics such as overnight capital cost, schedules, property rights, and expandability

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 needed for the proposed project

Project ID	Independent Cost Estimate: 2017 \$M
T006	157
T007	278
T008	356
T009	487
T011	177
T012	433
T013	232
T014	181
T014_Alt ROW	219
T015	159
T015_Alt ROW	197
T017	299

Note: On September 15, 2017, the Operating Committee approved the SISs for T006, T014, and T015 with no SUF identified. With the contingency SUF cost removed, the cost estimates for T006, T014, T014_Alt, T015, and T015_Alt each reduce by 5 \$M. This cost update does not affect the recommended ranking and selection.

Cost Per MW: IESO-WNY Transfer Limits

Project ID	Independent Cost Estimate: 2017 \$M	Baseline (2014 RPP)			Scenario (2016 RPP)		
		SR on 77/78	Average Limit: MW	Cost/MW: \$M/MW	SR on 77/78	Average Limit: MW	Cost/MW: \$M/MW
T006	157	Bypassed	500	0.32	In	1,440	0.11
T007	278	Bypassed	897	0.31	In	1,704	0.16
T008	356	Bypassed	1,070	0.33	In	1,796	0.20
T009	487	Bypassed	1,322	0.37	In	1,753	0.28
T011	177	In	464	0.38	In	216	0.82
T012	433	In	1,336	0.32	In	1,431	0.30
T013	232	In	1,381	0.17	In	1,482	0.16
T014	181	Bypassed	921	0.20	In	1,604	0.11
T014_Alt	219	Bypassed	921	0.24	In	1,604	0.14
T015	159	Bypassed	442	0.36	In	1,403	0.11
T015_Alt	197	Bypassed	442	0.45	In	1,403	0.14
T017	299	In	1,364	0.22	In	1,536	0.19

Expandability

Project	Potential Electrical Expandability paths based on transfer limit analysis	Potential Physical Expandability Paths based on substation design	Notes	Ranking
T006	345, 230S	345, 230E	significantly higher transfer limits can be achieved if the proposed Dysinger 345 kV substation can be further expanded	Good
T007	345, 230S, ON-NY	345, 230E	significantly higher transfer limits can be achieved if the proposed Dysinger 345 kV substation can be further expanded	Good
T008	345, 230S, ON-NY	345, 230E	significantly higher transfer limits can be achieved if the proposed Dysinger 345 kV substation can be further expanded	Good
T009	345, 230S, ON-NY, 230E	345, 230E	significantly higher transfer limits can be achieved if the proposed Dysinger 345 kV substation can be further expanded	Good
T011	230S	-	has potential for higher transfer limits, though the current design does not offer readily available options	Fair
T012	230S, 230E, ON-NY	-	has potential for higher transfer limits, though the current design does not offer readily available options	Fair
T013	345, 230S, 230E	345, 230E	significantly higher transfer limits can be achieved and the current design of the Dysinger 345 kV substation already includes a spare bay	Good
T014	345, 230S, 230E	230E	significantly higher transfer limits can be achieved if the Stolle Road substation can be further expanded	Good
T015	345, 230S	230E	significantly higher transfer limits can be achieved if the Stolle Road substation can be further expanded	Good
T017	230S, 230E	345, 230E	has potential for higher transfer limits, though the current design does not offer readily available options	Fair

ONT: Ontario – New York ties; 345: Niagara – Rochester 345 kV path;
 230S: Niagara – Gardenville 230 kV path; and 230E: Niagara – Meyer 230 kV path

Operability

Project	Configuration	Dispatch Flexibility	Controllability	Impact during Construction	Ranking
T006	Enhance 345 kV network connectivity in Western NY	Facilitate significant amount of power transfer, and moderately sensitive to generator dispatches	none	Low	Good
T007	Enhance 345 kV and 230 kV network connectivity in Western NY	Facilitate significant amount of power transfer, and moderately sensitive to generator dispatches	none	Medium	Good
T008	Enhance 345 kV and 230 kV network connectivity in Western NY	Facilitate significant amount of power transfer, and less sensitive to generator dispatches	none	Medium	Good
T009	Enhance 345 kV and 230 kV network connectivity in Western NY	Facilitate significant amount of power transfer, and less sensitive to generator dispatches	none	Medium	Good
T011	adequate; advantageous by separating the two lines 61 and 64 on a common tower	Facilitate small amount of power transfer, and extremely sensitive to generator dispatches	none	High	Fair
T012	Enhance 230 kV network connectivity in Western NY; advantageous by separating lines 61 and 64 on a common tower	Facilitate significant amount of power transfer, and very sensitive to generator dispatches	none	High	Good
T013	Enhance 345 kV and 230 kV network connectivity in Western NY; advantageous Stolle design by separating the 345/115 kV transformers	Facilitate significant amount of power transfer, and moderately sensitive to generator dispatches	Proposed 115 kV PAR at South Perry	High	Good
T014	Enhance 345 kV network connectivity in WNY; advantageous Dysinger design by connecting to Somerset 345 kV substation	Facilitate significant amount of power transfer, and moderately sensitive to generator dispatches	Proposed 345 kV PAR at Dysinger	Low	Excellent
T015	Enhance 345 kV network connectivity in Western NY; advantageous Dysinger design by connecting to Somerset 345 kV substation	Facilitate significant amount of power transfer, and moderately sensitive to generator dispatches	none	Low	Good
T017	Enhance 345 kV network connectivity in Western NY; less advantageous straight bus design at Stolle Road 345 kV substation	Facilitate significant amount of power transfer, and very sensitive to generator dispatches	none	Medium	Fair

Production Cost Change: in 2017 M\$

Project ID	Baseline	2017 Baseline	SR on 77/78 In-service	Historical IESO-MISO Flow Modeled	High Fuel	Low Fuel	High Load	Low Load	National CO2 Removed and SR on 77/78 In-service
T006	(100)	(101)	(209)	(116)					(106)
T007	(139)	(149)	(231)	(193)	(203)	(139)	(159)	(136)	
T008	(175)	(195)	(230)	(261)					
T009	(216)	(241)	(269)	(322)					
T011	3	1	1	(5)					
T012	(55)	(75)	(75)	(172)					
T013	(205)	(229)	(229)	(308)	(296)	(210)	(277)	(185)	(138)
T014	(201)	(207)	(274)	(243)	(239)	(181)	(219)	(192)	(210)
T015	(101)	(99)	(225)	(98)					(108)
T017	(168)	(207)	(207)	(335)	(288)	(172)	(278)	(147)	(127)

System CO₂ Emission Change (in 1000 tons)

Project ID	Baseline	2017 Baseline	SR on 77/78 In-service	Historical IESO-MISO Flow Modeled	High Fuel	Low Fuel	High Load	Low Load	National CO2 Removed and SR on 77/78 In-service
T006	(12,802)	(11,692)	(11,390)	(12,733)					(6,871)
T007	(13,323)	(12,109)	(11,582)	(15,639)	(7,502)	(12,585)	(16,971)	(11,278)	
T008	(12,766)	(11,720)	(11,023)	(19,032)					
T009	(11,874)	(11,373)	(11,061)	(20,967)					
T011	(980)	(378)	(378)	(1,004)					
T012	(3,976)	(2,017)	(2,017)	(6,603)					
T013	(12,564)	(11,305)	(11,305)	(19,182)	(3,541)	(13,647)	(16,732)	(11,056)	(7,505)
T014	(6,059)	(6,473)	(7,362)	(12,050)	(1,202)	(6,452)	(6,049)	(4,860)	(177)
T015	(10,892)	(10,067)	(10,681)	(12,482)					(4,747)
T017	(9,982)	(11,104)	(11,104)	(19,795)	(2,312)	(14,851)	(19,068)	(10,102)	(7,625)

Performance: Energy flow in 2025

Project ID	Niagara Gen + Niagara Ties (GWh)	Dysinger East (GWh)
T006	24,165	5,962
T007	24,191	5,968
T008	24,208	5,852
T009	24,368	5,984
T011	23,089	6,717
T012	23,654	6,802
T013	24,198	6,006
T014	24,309	6,237
T015	24,251	6,070
T017	24,224	6,264

Note: Dysinger East interface only captures the flows from Zone A to Zones B and C; the interface does not capture all flows out of Zone A.

Property Rights

- The NYISO and SECO reviewed, in consultation with the DPS, transmission routing studies provided by developers that may identify routing alternatives and land-use or environmentally sensitive areas, such as wetlands, agriculture, and residential areas.
- Results considered in review of developers' project schedules and cost estimates.

Project ID	Property Rights
T006	Existing ROW
T007	Existing and new ROW
T008	Existing and new ROW
T009	Existing and new ROW
T011	Existing ROW
T012	Existing ROW
T013	Existing ROW
T014	Existing ROW
T014_Alt	New ROW as alternative
T015	Existing ROW
T015_Alt	New ROW as alternative
T017	Existing and new ROW

Project Schedules

Project ID	Independent Minimum Duration Estimate: months	Independent Anticipated Duration Estimate: months
T006	40	43
T007	59	63
T008	65	69
T009	71	75
T011	57	57
T012	60	60
T013	44	55
T014	40	49
T014_Alt	49	53
T015	40	49
T015_Alt	49	53
T017	66	82

Summary of Evaluation

- High-level summary of the relative performance of each project using certain scenarios

Project ID	Independent Capital Cost Estimate: 2017 \$M	Independent Duration Estimate: months	Ontario-NY Transfer Limit: MW (1)	Cost per MW: \$M/MW (1)	Production Cost Savings: 2017 \$M (2)	Production Cost Savings / Cost (2)	System CO2 Emission Reduction: 1000 tons (2)	Performance: Niagara Gen + Niagara Ties in 2025: GWh (2)	Operability	Expandability	Property Rights
T006	157	40	1,440	0.11	209	1.3	11,390	24,165	Good	Good	Existing ROW
T007	278	59	1,704	0.16	231	0.8	11,582	24,191	Good	Good	Existing and new ROW
T008	356	65	1,796	0.20	230	0.6	11,023	24,208	Good	Good	Existing and new ROW
T009	487	71	1,753	0.28	269	0.6	11,061	24,368	Good	Good	Existing and new ROW
T011	177	57	216	0.82	(1)	0.0	378	23,089	Fair	Fair	Existing ROW
T012	433	60	1,431	0.30	75	0.2	2,017	23,654	Good	Fair	Existing ROW
T013	232	44	1,482	0.16	229	1.0	11,305	24,198	Good	Good	Existing ROW
T014	181	40	1,604	0.11	274	1.5	7,362	24,309	Excellent	Good	Existing ROW
T014_Alt	219	49	1,604	0.14	274	1.3	7,362	24,309	Excellent	Good	New ROW as alternative
T015	159	40	1,403	0.11	225	1.4	10,681	24,251	Good	Good	Existing ROW
T015_Alt	197	49	1,403	0.14	225	1.1	10,681	24,251	Good	Good	New ROW as alternative
T017	299	66	1,536	0.19	207	0.7	11,104	24,224	Fair	Fair	Existing and new ROW

Notes:

- Transfer scenario with series reactors on Packard-Huntley lines in-service for all projects
- MAPS scenario 2 with series reactors on Packard-Huntley lines in-service for all projects

Ranking and Selection Recommendation

Ranking and Selection

- Based on consideration of all the evaluation metrics and input from stakeholders
- Initially distinguished the proposed projects into two tiers based on performance relative to cost
- Compared the tiered projects and identified distinguishing factors
- Ranked the ten projects and determined the more efficient or cost effective solution

Ranking

Tier	Ranking	Project ID	Developer	Project Name
1	1	T014	NextEra Energy Transmission New York	Empire State Line Proposal 1
	2	T015	NextEra Energy Transmission New York	Empire State Line Proposal 2
	3	T006	North America Transmission	Proposal 1
	4	T013	NYPA/NYSEG	Western NY Energy Link
2	5	T007	North America Transmission	Proposal 2
	6	T008	North America Transmission	Proposal 3
	7	T017	Exelon Transmission Company	Niagara Area Transmission Expansion
	8	T009	North America Transmission	Proposal 4
	9	T012	National Grid	High Power Transfer Solution
	10	T011	National Grid	Moderate Power Transfer Solution

Recommended Selection

- NYISO staff recommends Empire State Line Proposal 1 (T014), proposed by NextEra Energy Transmission New York, as the more efficient and cost effective solution to satisfy the Western NY Public Policy Transmission Need



Recommended Selection

- **T014 is more efficient and cost effective**
 - The proposed Dysinger substation configuration connects seven 345 kV lines, and reduces the electrical impedance between Niagara and Rochester.
 - The proposed Dysinger – East Stolle Road 345 kV line controlled by a PAR provides additional operational flexibility. The benefits are significant even with PAR bypassed.
 - The independent cost estimate is among the lowest.
 - The cost per MW ratio is among the lowest, and the production cost saving over the cost ratio is the highest across all scenarios.
 - No critical risks identified for siting, procurement, property acquisition, construction and schedule
- **Based on SECO's independent project schedule estimates, the in-service date for T014 is June 2022**

Next Steps

Next Steps

- **October 2017: Western NY Report delivered to NYISO Board**
- **Following the Board approval, the NYISO will tender a Development Agreement to the Developer of the selected project**

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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