

Long Island PPTN: Project Recommendation

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May 11, 2023

Agenda

- **Summary of Key Findings**
- **Recommendation**
- **Next Steps**

Key Findings

Evaluation Metrics

- **The NYISO considered all metrics for each project**
- **Key metrics for distinction among the top-tier projects were:**
 - Capital Cost Estimates and Voluntary Cost Cap
 - Production Cost & Performance for Policy Scenarios with & without the Barret – Valley Stream Constraint
 - Capacity Benefits – Avoided Cost
 - Property Rights, Routing, and Potential Construction Delays
 - Operability
- **Results presented in this presentation focus on the top-tier projects; however, results for other projects are included in the draft report**

Capital Cost Estimates

Project	Cost Cap	Developer Cost Cap (\$M)	Independent Estimate of Included Capital Costs (\$M)	Independent Estimate of Excluded Capital Costs (\$M)	Total Cost Estimates (\$M)
T035 – LS Power	Hard Cap	\$3,074	\$5,920	\$78	\$3,152
T036 – NextEra Core 1	50/50 Soft	\$5,882	\$3,230	\$1,137	\$7,019
T040 – NextEra Core 5	50/50 Soft	\$5,898	\$3,610	\$1,086	\$6,984
T048 – Propel Base 2	20/80 Soft	\$1,687	\$1,966	\$211	\$2,121
T049 – Propel Base 3	20/80 Soft	\$2,131	\$2,642	\$295	\$2,835
T051 – Propel Alt 5	20/80 Soft	\$2,554	\$2,902	\$430	\$3,262
T052 – Propel Alt 6	20/80 Soft	\$3,953	\$4,071	\$658	\$4,705

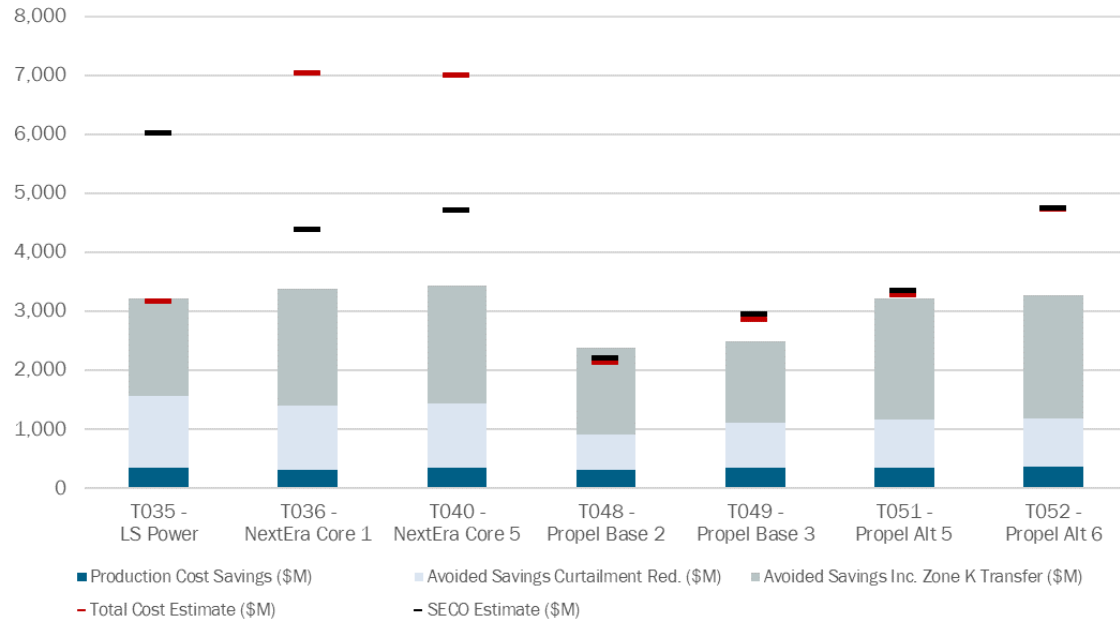
Qualitative Evaluation of Cost Cap

	Cost Cap %	Qualitative Criterion I	Qualitative Criterion II	Qualitative Criterion III
T035 - LS Power	100	Excellent	Good	Poor
T036 - NextEra Core 1	50	Fair	Fair	Poor
T040 - NextEra Core 5	50	Fair	Fair	Poor
T048 - Propel Base 2	20	Poor	Fair	Excellent
T049 - Propel Base 3	20	Poor	Fair	Good
T051 - Propel Alt 5	20	Poor	Poor	Excellent
T052 - Propel Alt 6	20	Poor	Poor	Good

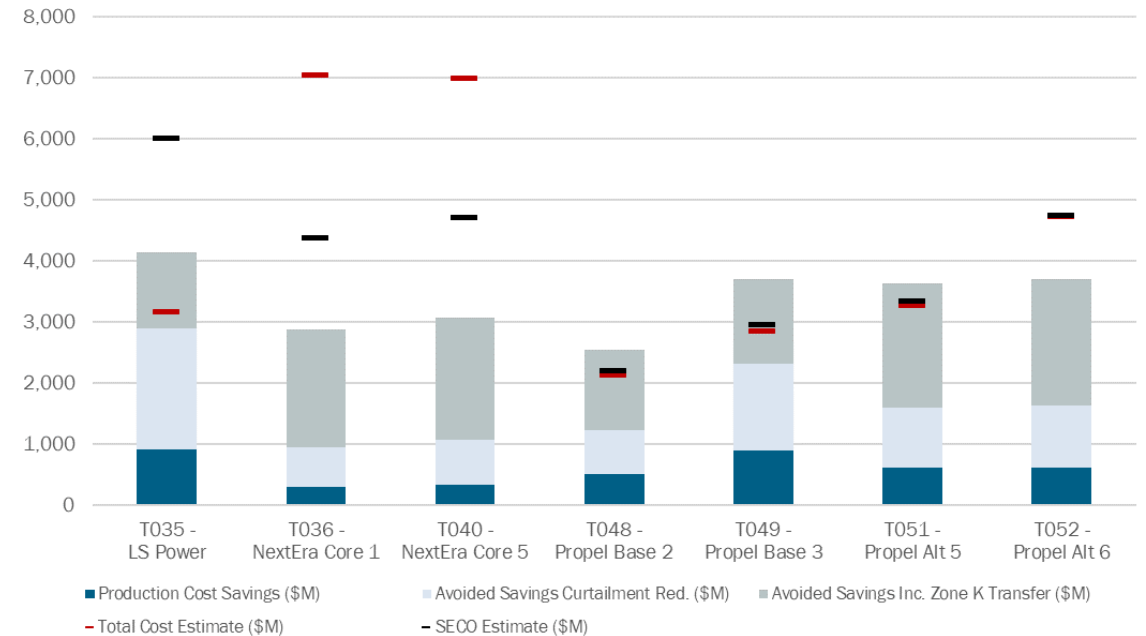
- Criterion I: Cost Containment Incentive
- Criterion II: Consumer Risk, Exposure & Uncertainty
- Criterion III: Expected Costs vs Developer's Cap

Summary of Project Cost Estimates vs. Economic Benefits (Production Cost & Avoided Cost Savings)

Policy Case



Policy Case + Barret - VS Constraint



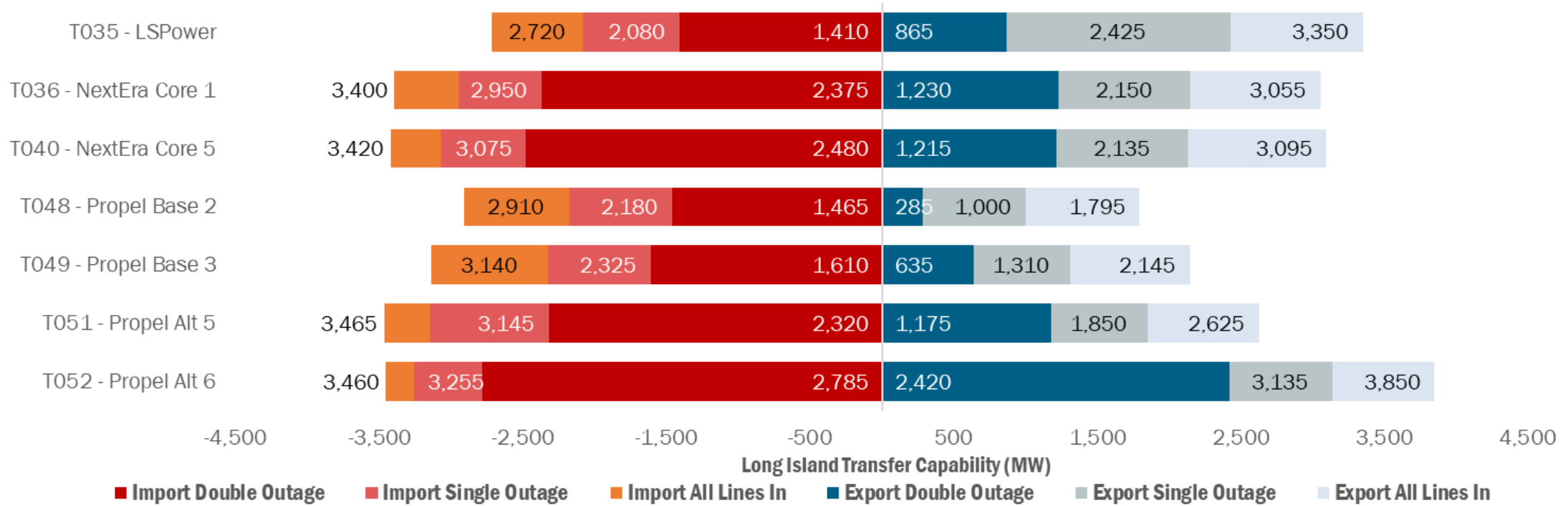
Relative Construction, Permitting, Schedule Risks

Probability Risk Will Occur	Very High				T043, T044
	High			T037, T038, T041	T039, T042
	Medium		T053	T036, T040	
	Low		T035, T047, T048, T049, T051, T052		
		Low	Medium	High	Very High
Cost and Schedule Risk					

Notable Construction, Permitting, & Schedule Risks

- **LS Power T035:**
 - HVDC equipment procurement
 - Northgate substation
- **Nextera T036 & T040:**
 - Connection to existing substations
 - Submarine landing sites
- **Propel T048:**
 - Connection to existing Tremont substation
- **Propel T049 & T051:**
 - Connection to existing Tremont and East Garden City substations
- **Propel T052:**
 - Connection to existing Tremont and East Garden City substations
 - Property rights for proposed Eastern Queens substation

Operability Range – Barrett-VS Scenario



Operability - Transmission Operations for the Future Grid

- In the NYISO's 2019 Report on "Reliability and Market Considerations for a Grid in Transition," the NYISO identified potential reliability concerns when operating under future high levels of intermittent generation with system and locational demand requirements that may be difficult to forecast in real-time operations.
- AC lines connecting Long Island to the rest of NYCA respond naturally to the impacts of Long Island net-load forecasting errors and variability while HVDC transmission lines would not similarly respond
- 100 MW of transmission constraint margin is used for the existing 345 kV AC lines connecting Long Island to the rest of NYCA. The margin is expected to increase to a level of 600 MW with 3,000 MW of offshore wind connected to long Island and up to 1,000 MW with 6,000 MW

Illustrative Example Under Outage Conditions

Project	600 MW Variability Future Grid (3,000 MW Offshore Wind)	1,000 MW Variability Future Grid (6,000 MW Offshore Wind)
Pre-Project	200	-600
Projects with no additional 345 kV AC tie-line	200	-600
Projects with 1 additional 345 kV AC tie-line	1,600	800
Projects with 2 additional 345 kV AC tie-line	3,000	2,200
Projects with 3 additional 345 kV AC tie-line	4,400	3,600

- Pre-Project condition with only the existing 345 kV lines connecting Long Island to the rest of NYCA: 600 MW deficiency when managing variability of 1000 MW: $[-600 \text{ MW} = (700 \text{ Import Capability MW} - 1000 \text{ MW Variability}) + (700 \text{ MW Export Capability} - 1000 \text{ MW Variability})]$
- Each additional 345 kV AC line of 700 MW capacity connecting Long Island to the rest of NYCA would result in a 1400 MW increase in 345 kV AC operating range $[1400 \text{ MW} = (700 \text{ MW Import Capability}) + (700 \text{ MW Export Capability})]$

Summary of Operability Findings: HVAC vs HVDC

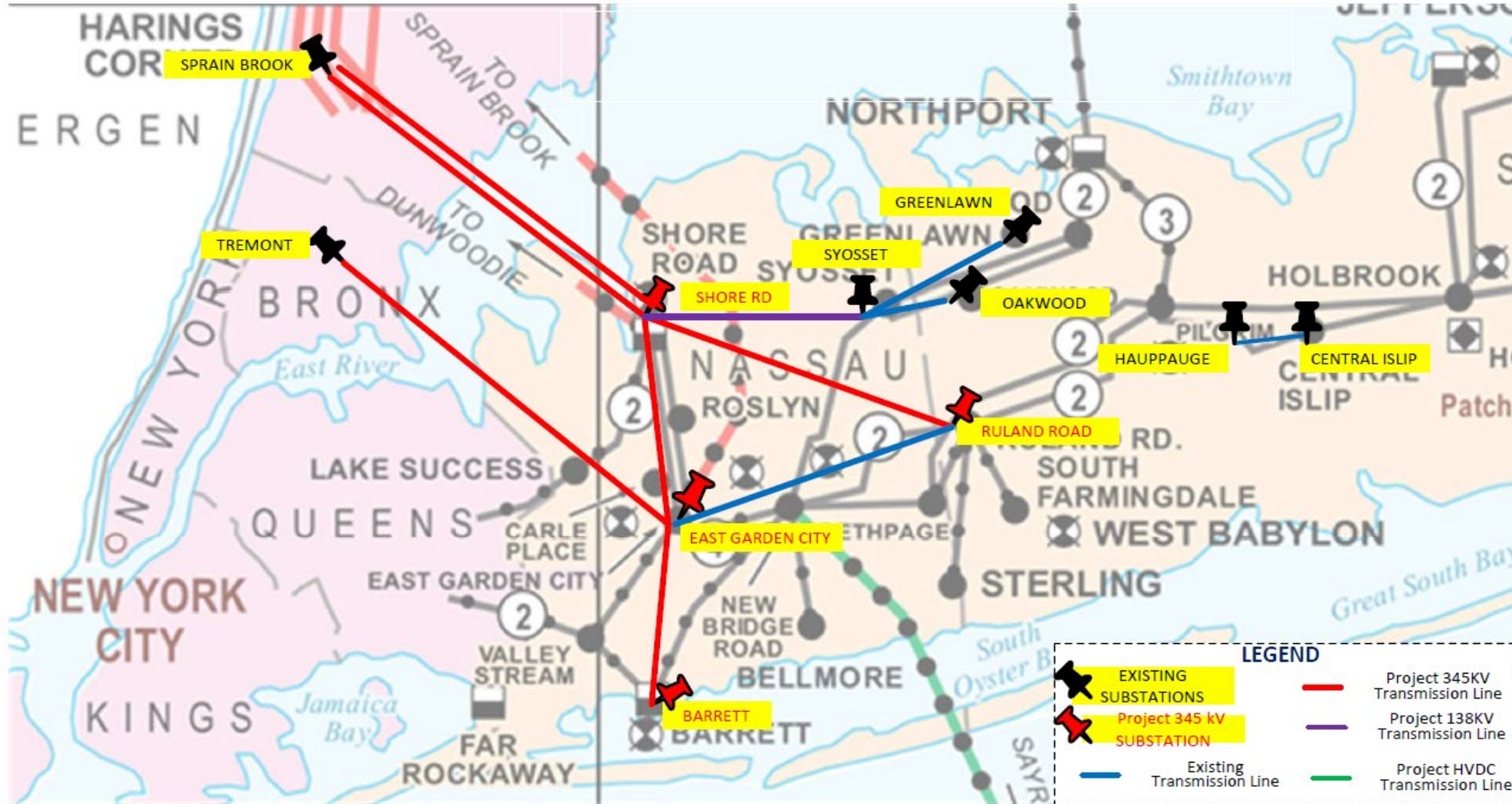
- All of the proposed projects that include one or more 345 kV AC lines connecting Long Island to the rest of NYCA would accommodate the variability associated with 6,000 MW of offshore wind connected to Long Island under line outage conditions
- Given that the LS Power T035 does not include any additional 345 kV AC tie lines, it is expected that the proposal could accommodate the variability of 3,000 MW of Long Island offshore wind but would not accommodate the variability of 6,000 MW of offshore wind assuming one of the existing 345 kV AC transmission lines is out of service. This represents a significant limitation for the future operability of the LS Power T035, assuming offshore wind expansion greater than 3,000 MW
- This comparison of HVDC vs. HVAC is uniquely applicable to Long Island and the Long Island PPTN given the significant amount of offshore wind power expected to connect to Long Island compared to the existing, smaller HVAC connections between Long Island and the rest of NYCA

Project Recommendation

Ranking of Top-Tier Projects

- 1. T051 – Propel Alternate Solution 5**
- 2. T049 – Propel Base Solution 3**
- 3. T052 – Propel Alternate Solution 6**
- 4. T035 – LS Power**
- 5. T048 – Propel Base Solution 2**
- 6. T040 – NextEra Core 5**
- 7. T036 – Next Era Core 1**

T051 - Propel Alternate 5



Recommended Selection

(#1) T051 – Propel Alternate Solution 5

- The total calculated cost estimate is \$3,262M with a 20/80 soft Cost Cap of \$2,554M (SECO estimate for Included Capital Costs is \$2,902M)
- The project adds three new AC tie lines and a 345 kV backbone across western/central Long Island, and partially addresses congestion from Empire Wind 2
- The project provides effective operability under a variety of outage conditions, with low cost per MW for transfer capability, expandability, and operability range
- The project has relatively low procurement, permitting, and construction risks compared to other projects, reducing the potential for increases to project cost and schedule

Comparison of T051 - Propel Alternate Solution 5 and T049 - Propel Base Solution 3

- The smaller, lower-cost design of T049 relative to T051 results in significantly less operability under outage conditions and higher cost per MW, with less ability to enable expansion of the Long Island resource mix in the future.
- While T049 fully relieves the Barret – Valley Stream congestion, T051’s additional Long Island tie line offers comparatively higher benefits
 - Constructing tie lines between NYISO zones requires a higher degree of efforts than expanding local transmission expansion, and
 - If appropriate, the additional transmission buildout within Long Island proposed by T049 could be pursued in the future by LIPA or the offshore wind developer
- The additional benefits from T051 outweigh the higher cost (\$427 million) compared to T049

Next Steps

Draft Report Next Steps

- Identify the “Designated Public Policy Projects” for the recommended project, as well as the Required Project In-Service Date and other in-service dates for the Designated Public Policy Projects, as applicable
- Stakeholder review of all appendices
- Review process:
 - May16: ESPWG/TPAS review
 - May 24: BIC advisory vote
 - May 31: MC advisory vote (including MMU’s review and consideration)
 - Board review and action

Comments

- **Further questions and comments regarding these results can be sent to PublicPolicyPlanningMailbox@nyiso.com**
 - Comments are requested as soon as they are available, but no later than May 15, 2023
- **Comments will be posted for stakeholder consideration**

Questions?

Our Mission & Vision



Mission

Ensure power system reliability and competitive markets for New York in a clean energy future



Vision

Working together with stakeholders to build the cleanest, most reliable electric system in the nation