

STARS Overview for TPAS

June 25, 2010

Agenda

- STARS Objectives
- Summary of Plans
- Long Range Transmission Plan Development
- Case Review
 - Stars Replacement Plan
 - Condition Assessment
 - Stars Base Transmission Plan
 - NYISO Wind Study
- Next Steps

STARS Objectives

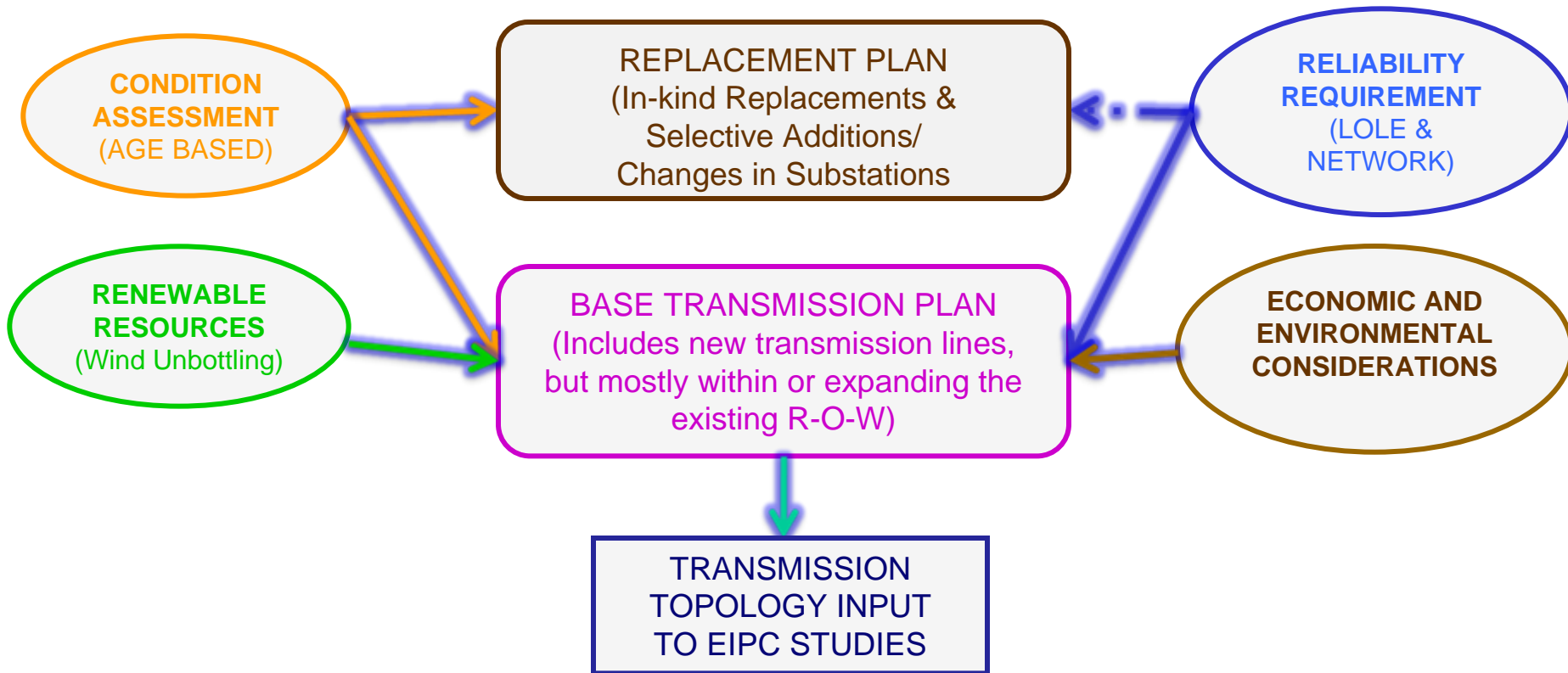
- Develop a thorough assessment of the transmission system and suggest long-range plans for coordinated infrastructure investment in the state's power system
- Help meet future electric needs
- Support the growth of renewable energy sources
- Ensure the reliability of the power system
- Address existing transmission infrastructure and transmission asset conditions as well as future investment needs
- Coordinate study with the NYISO's planning process.
- Meet requirements of FERC Order 890.
- Provide for stakeholder input and transparency.

Summary of Plans

- 'STARS Replacement Plan – Aged Based In-kind Replacement' – Reflects an age-based in-kind replacement of aging infrastructure and other low cost upgrades that will largely maintain existing thermal capability levels. A reference case that meets reliability needs under certain but not all generation expansion scenarios.
- 'STARS Base Transmission Plan' – Reflects enhancements to the Replacement Plan that incorporate projects that also reliably supports New York State energy needs, renewable energy goals, economically justified additions, and is recommended to become the base transmission input to the Eastern Interconnection Planning Collaborative (EIPC) studies.

CONCEPTUAL VIEW OF LONG RANGE TRANSMISSION PLAN DEVELOPMENT by STARS-WG FOR New York State

STUDY HORIZON 20-30 YEARS RANGE

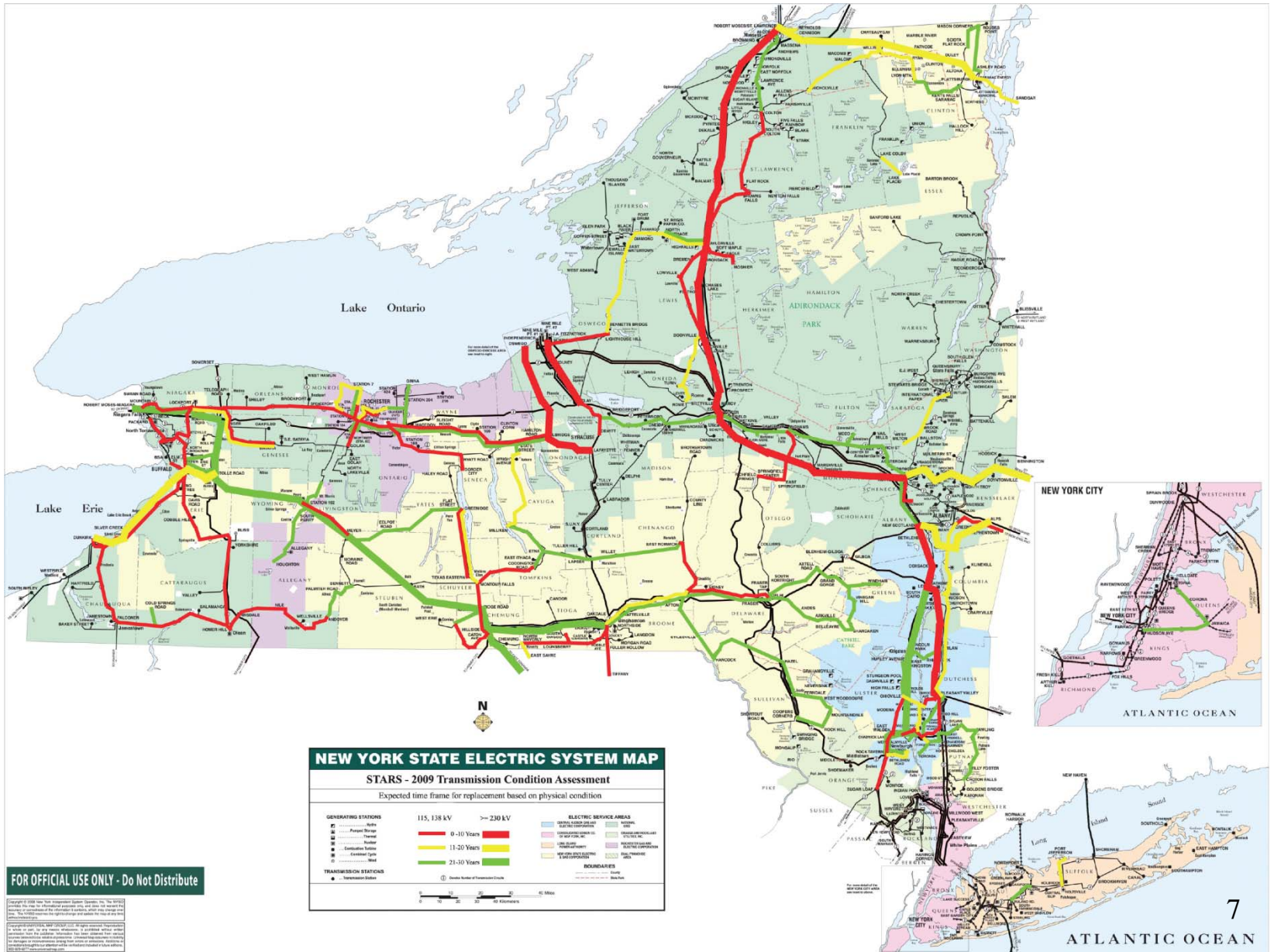


STARS Replacement Plan

Aged Based In-kind Replacement

- Addresses aging infrastructure
 - Aged based
 - No new transmission lines
 - No significant increase in thermal capacity
- Includes some local upgrades
 - Low-cost replacement of limiting elements in substations or the installation of capacitive compensation (including Stimulus funded capacitor banks)
 - Transfer limits may increase due to the alleviation of voltage constrained limits
- Meets LOLE reliability needs for some, but not all, generation expansion scenarios
 - As new generation breaks ground, or are retired, reliability needs may change
- Serves as the initial or reference plan which all other plans' costs and benefits are compared
- Replacement in kind reflect business as usual
 - TOs will need to implement a more aggressive replacement of aged assets
 - Requires additional physical inspections to refine condition assessment

Aged Based Condition Assessment



Aged Based Condition Assessment

- Each company will review condition assessment in detail before expending dollars.
 - There is a significant amount of aged facilities, but that does not mean replacement is needed
 - There will likely need to be some major expenditures in the next few decades
 - Some facilities may be replaced with slightly higher capacity, if warranted.

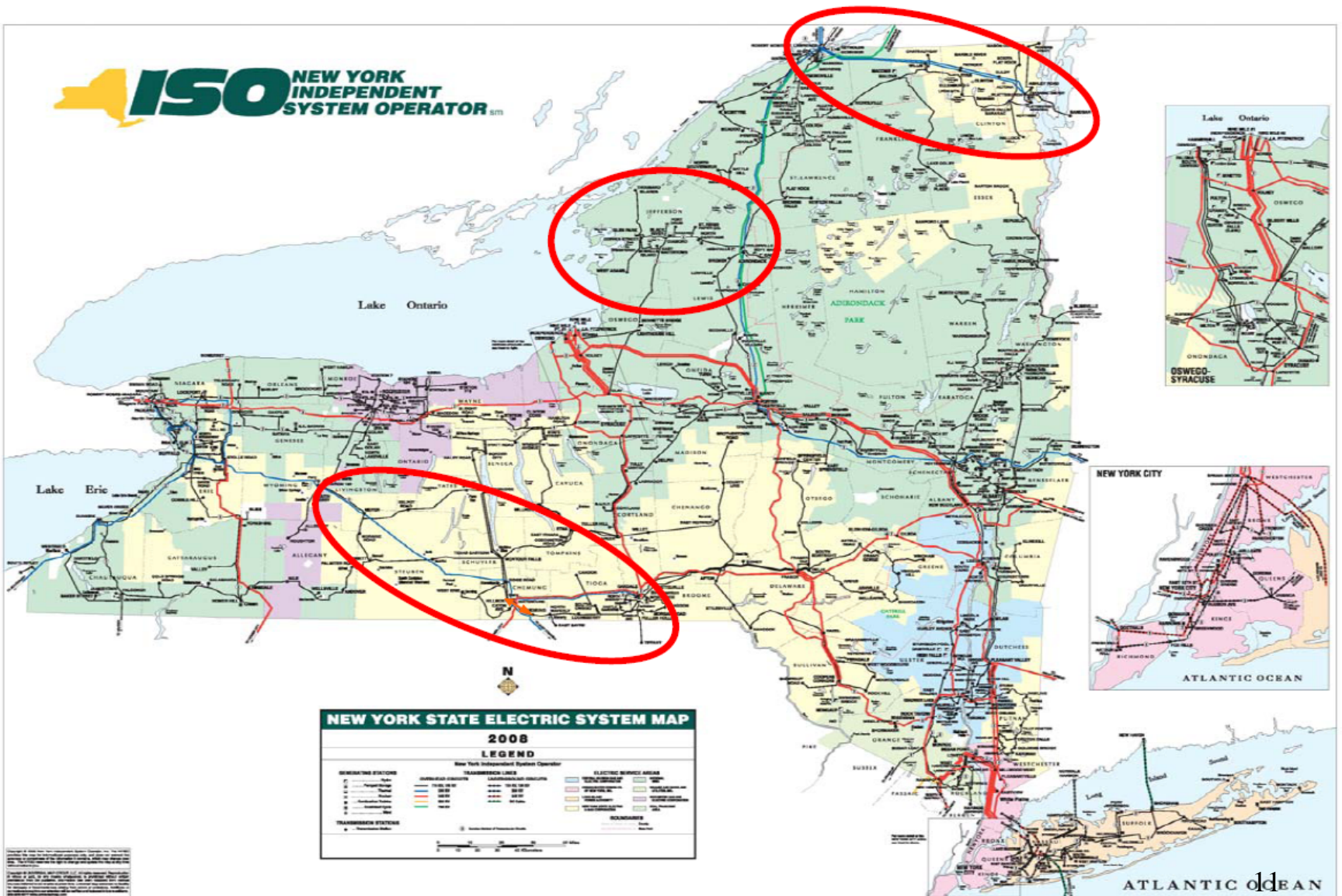
STARS Base Transmission Plan

- Major assumptions
 - Resulting plan will be evaluated on economics and reliability for generation expansion scenarios with resources that are predominately located within New York State;
 - The analysis will confirm to what extent the list of projects meet the needs of these scenarios
 - Local projects to unbottle wind is based on the 6000 MW of total wind generation case from NYISO Wind Study, modified to represent 2018 load.
 - NYS meets its own renewable needs

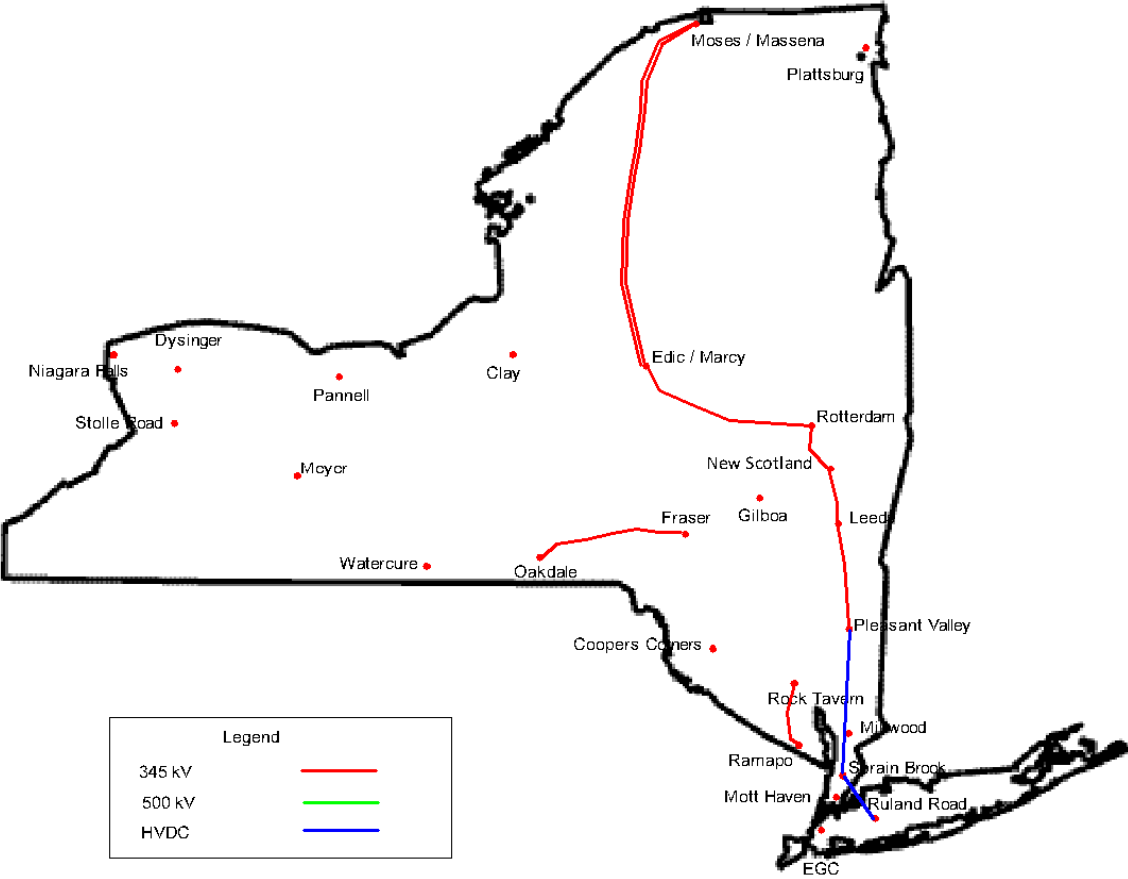
STARS Base Transmission Plan Objectives

- Support future energy needs of NYS
- Meet NYS renewable goals
- Meet NYS reliability goals
- Eliminates bottling of wind resources through local upgrades
 - Integrate NYS Wind resources into the Bulk Power System
- Includes projects to replace aging infrastructure plus projects that add value
 - Transmission lines, mostly within or expanding existing ROW
 - Alternative projects that address aging infrastructure by justifiable designs that provide additional capacity than the existing line
 - Projects that provide additional relief of congested interfaces to further enable other NY zones to share in the benefit of wind generation
- Resulting set of projects proposed for inclusion in the EIPC analyses
 - The evaluation work is still in progress

NYISO Wind Study



STARS Base Transmission Plan Potential Projects Map



STARS Base Transmission Plan

Potential Project List

Assets Retired

- | | | |
|-----|------------------|------------------------|
| (1) | 115 kV Line | Kattelville to Jenison |
| (2) | 230 kV Lines | Moses to Rotterdam |
| (1) | 230/34.5 kV Xfmr | Jordanville |
| (3) | 230/115 kV Xfmr | Rotterdam |
| (1) | 230/115 kV Xfmr | Adirondack B1 |

Assets Refurbished Along Key Interfaces (Note: See map on slide 7 for all other lines requiring refurbishment in kind)

- | | | | |
|-----|--------------|--|----------------------------|
| (2) | 345 kV Lines | Leeds to Pleasant Valley | Structure Refurbishment |
| (1) | 115 kV Line | Inghams to East Springfield | New Conductor |
| (1) | 115 kV Line | Pannell to Farmington | New Conductor |
| (1) | 115 kV Line | Mortimer to Hook Road #1 | Reconductor with 1033 ACSR |
| (1) | 115 kV Line | Hook Road to Elbridge #7 | Reconductor with 1033 ACSR |
| (1) | 115 kV Line | Mortimer to Elbridge #2 | Reconductor with 1033 ACSR |
| (1) | 115 kV Line | Geneva to Elbridge #15 | Reconductor with 1033 ACSR |
| (3) | 115 kV Lines | Lockport to Mortimer (#111, 113 and 114) | Reconductor with 795 ACSR |

STARS Base Transmission Plan

Potential Project List (Cont.)

Wind Deliverability

(1) 230 kV Line	Avoca-Hillside	New Conductor
(1) 230 kV Line	Canandaigua-Avoca	New Conductor
(1) 230 kV Line	Duley-Plattsburgh	Upgrade Terminal
(1) 115 kV Line	Plattsburgh 2/1 #1	Upgrade Terminal
(1) 115 kV Line	Plattsburgh 2/1 #4	Upgrade Terminal
(1) 230 kV Line	Ryan-Plattsburgh	Upgrade Terminal
(1) 115 kV Line	Axtell Rd-So. Kortright	New Conductor
(1) 115 kV Line	Black River-Climax	New Conductor
(1) 115 kV Line	Black River-Fort Drum	New Conductor
(1) 115 kV Line	Climax-N. Carthage	New Conductor
(1) 115 kV Line	Deferiet-Taylorville	New Conductor
(1) 115 kV Line	Delhi Tap-Colliers	New Conductor
(1) 115 kV Line	Delhi Tap-Fraser	New Conductor
(1) 115 kV Line	Delhi-Andes 115kV	New Conductor
(1) 115 kV Line	Delhi-Delhi Tap	New Conductor
(1) 115 kV Line	Fort Drum-Deferiet	New Conductor
(1) 115 kV Line	N. Carthage-Taylorville #8	New Conductor
(1) 115 kV Line	So. Kortright-Delhi	New Conductor
(1) 115 kV Line	Taylorville-Bremen #6	New Conductor
(1) 115 kV Line	TugHill-Boonville #7	New Conductor
(1) 115 kV Line	Bath-Montour Falls	New Conductor

STARS Base Transmission Plan

Potential Project List (Cont.)

Wind Deliverability (Cont.)

(1)	115 kV Line	Bennett-Howard	New Conductor
(1)	115 kV Line	Bennett-Moraine Rd	New Conductor
(1)	115 kV Line	Howard-Bath	New Conductor
(1)	115 kV Line	Moraine Rd-Meyer	New Conductor
(1)	230 kV Line	Moses-Willis 230kV MW-1	Upgrade Terminal & Remove Tower Contingency
(1)	230 kV Line	Moses-Willis 230kV MW-2	Upgrade Terminal & Remove Tower Contingency
(1)	115 kV Line	Clayton-Lyme Tap #4	New Conductor
(1)	115 kV Line	Coffeen St-E. Watertown	New Conductor
(1)	115 kV Line	Coffeen St-Glen Park	New Conductor
(1)	115 kV Line	Glen Park-NY Air Brake	New Conductor
(1)	115 kV Line	NY Air Brake-Black River	New Conductor
(1)	115 kV Line	Rockledge Tap-Lyme Tap #4	New Conductor
(1)	115 kV Line	ECOgen-Flat St	New Conductor
(1)	115 kV Line	Eel Pot Road-Global	New Conductor
(1)	115 kV Line	Flat St-Greenidge	New Conductor
(1)	115 kV Line	Global-ECOgen	New Conductor
(1)	115 kV Line	Meyer-Eel Pot Road	New Conductor
(1)	115 kV Line	Bremen-LyonMtn #6	New Conductor
(1)	115 kV Line	Lowville-Tug Hill #5	New Conductor
(1)	115 kV Line	LyonMtn-Boonville #6	New Conductor
(1)	115 kV Line	Taylorville-Lowville #5	New Conductor
(1)	115 kV Line	Indian River-Black River #9	New Conductor

STARS Base Transmission Plan

Potential Project List (Cont.)

New Assets

			<u>Primary Driver</u>
(2)	345 KV Line	Moses to Adirondack B1&B2	Condition Assessment
(1)	345 kV Line	Adirondack B2 to Edic	Condition Assessment
(1)	345 kV Line	Adirondack B1 to Chases Lake	Condition Assessment
(1)	345 kV Line	Chases Lake to Marcy	Condition Assessment
(1)	345 kV Line	Marcy	Condition Assessment
(1)	345 kV Line	Jordanville	Condition Assessment
(1)	345 kV Line	Princetown **	Condition Assessment
(1)	345 kV Line	New Scotland 99	Deliver Wind Statewide
(1)	345 kV Line	Leeds	Deliver Wind Statewide
(1)	345 kV Line	Pleasant Valley	Deliver Wind Statewide
(1)	230 kV Line	Rotterdam	Condition Assessment
(1)	230 kV Line	Rotterdam	Condition Assessment
(1)	345 kV Line	Rock Tavern to Ramapo	Deliver Wind Statewide
(1)	345 kV Line	Oakdale to Fraser	Condition Assessment
(1)	1500 MW DC Line	Pleasant Valley to Sprainbrook	Deliver Wind Statewide
(1)	750 MW DC Line ***	Sprainbrook to Ruland Road	Deliver Wind Statewide
*** Long Island Interconnection to Sprainbrook shown here, included as alternate to PJM or New England Interconnection			
New Scotland Modification to Breaker and a Half			Condition Assessment and Congestion
** New Princetown 345-230 kV substation is just west of Rotterdam			Condition Assessment and Congestion

STARS Base Transmission Plan

Potential Project List (Cont.)

New Assets (Cont.)

(1)	345/115 kV Xfmr	EDIC 345	Porter 115
(1)	345/230 kV Xfmr	Chases Lake 345	Chases Lake 230
(1)	345/34.5 kV Xfmr	Jordanville 345	Jordanville 34.5
(1)	345/230 kV Xfmr	Princetown 345	Princetown 230
(1)	345/230 kV Xfmr	Princetown 345	Princetown 230
(2)	345/230 kV Xfmr	Moses	
(2)	345/138 kV Xfmr	Ruland Road	
(1)	345/115 kV Xfmr	Adirondack	
(1)	Converter Station	Pleasant Valley	
(2)	Converter Stations	Sprainbrook	
(1)	Converter Station	Ruland Road	

Next Steps

- Economic and Environmental evaluation
- Transmission Security Analysis
- Calculate transfer capability and confirm that LOLE is met
- NYISO to submit 2030 EIPC case
- Sensitivity to reflect NYS Energy Plan goals
- Other sensitivity analyses