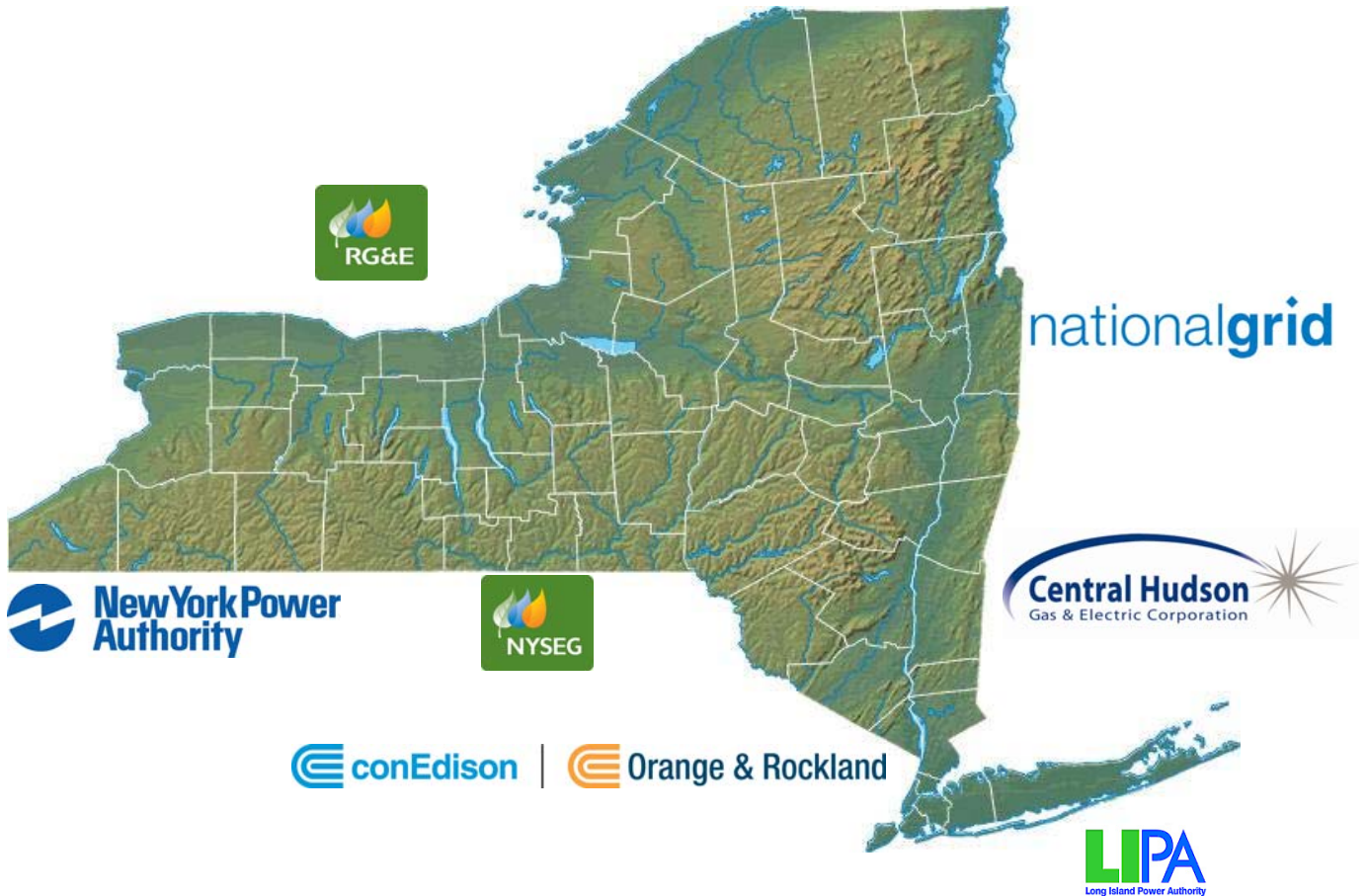


The Response to the New York State Energy Highway Request for Information



New York Transco Participants:

Central Hudson Gas and Electric Corporation

Consolidated Edison Company of New York, Inc./Orange & Rockland Utilities, Inc.

Niagara Mohawk Power Corporation/National Grid

New York State Electric & Gas Corporation/Rochester Gas and Electric Corporation

New York Power Authority

Long Island Power Authority

May 30, 2012

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I. Executive Summary

On April 11, 2012, the Governor's New York Energy Highway Task Force issued its Request for Information (RFI) inviting parties to "submit information concerning projects that will advance one or more of the Task Force's specific objectives."¹ The RFI further states that "[w]e must modernize the transmission system and eliminate the bottlenecks."²

In response to the RFI, the New York Transmission Owners (NYTOs)³ are pleased to propose a public-private partnership to jointly develop and own transmission facilities in New York State. The proposed partnership anticipates the creation of a new statewide transmission entity, the New York Transmission Company (NY Transco). The NY Transco will pursue the development, construction and ownership of new transmission projects that will enhance the current capabilities of the bulk power system within New York State. This new structure combined with the interconnected nature of the bulk power system creates synergies among the NYTOs that permits and encourages continued investment in the State's transmission infrastructure where it makes the most sense to improve statewide reliability and provide cost-effective infrastructure improvements to benefit all New Yorkers.

The NYTOs are committed to meeting the New York Energy Highway objectives of reducing transmission constraints, assuring the long-term reliability of the system, and encouraging the development of renewable generation resources throughout the State. The NYTOs are proud to propose eighteen transmission projects (Projects) to respond to these objectives. These Projects will result in an estimated total investment of \$2.9 billion in the New York transmission system, of which \$1.9 billion will be financed through the NY Transco and \$1 billion will be financed by the host transmission owner. This innovative financing arrangement recognizes the investment NYTOs currently have planned for their transmission assets and allows the NY Transco to invest in existing assets to expand the capabilities of the transmission system as well as develop new transmission assets to enhance the transmission system to the benefit of New York State consumers.

These Projects were identified keeping in mind the responsiveness the Task Force desires. Three of the Projects, with an investment of \$385 million, are immediately actionable, have been on-going and will continue to progress until a commitment of significant funding is required. A cost recovery mechanism is being proposed and approval will be necessary to advance these Projects to completion as well as for the remaining Projects before moving them beyond conceptual engineering. The overall investment of approximately \$2.9 billion in these Projects will stimulate over \$7.2 billion of total economic activity including the creation of an estimated 12,000 direct jobs and nearly 38,000 total jobs. The Projects will relieve significant transmission constraints facilitating the development of renewable generation which in turn will generate almost \$4.6 billion of economic activity and the creation of an additional 8,000 direct

¹ RFI, p. 6. Please see Section IV for an explanation of how this response meets each of the Task Force's objectives.

² Id.

³ The NYTOs are: Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc./ Orange & Rockland Utilities, Inc., Niagara Mohawk Power Corporation/National Grid, New York State Electric & Gas Corporation/Rochester Gas and Electric Corporation, New York Power Authority and the Long Island Power Authority.

jobs. There will also be approximately \$175 million of annual production cost savings and the potential for additional economic and public policy benefits.

A significant benefit of this proposal is the positive environmental impact these Projects will bring to New York State. To fully meet the objectives of the Energy Highway requires a large amount of transmission build-out. Greenfield projects would require about 29 square miles of new land corridors to construct the required transmission. The Projects will impact only 2.9 square miles and most, if not all, of this land will be adjacent to existing utility corridors. The NY Transco will be able to leverage the rights-of-way (ROW) assets of the NYTOs to minimize the impact of the transmission additions. Further, the Projects will allow for a large reduction in CO₂ and NO_x emissions annually, equal to 370,000 tons and 200,000 tons, respectively. An additional benefit is the speed at which these Projects can be developed.

Most of the Projects are supported by the analysis documented in the New York State Transmission Assessment and Reliability Study (STARS) that was performed by the NYTOs with assistance from the New York Independent System Operator (NYISO). It analyzed the long-term needs of the state's transmission system beyond the immediate 10-year horizon currently studied by the NYISO. STARS also analyzed the state's bulk power system to identify the system replacement needs over a 30 year period. The STARS Phase II report was issued on April 30, 2012.⁴

The NYTOs are proposing 18 major Projects to upgrade and modernize New York State's electric power system. This investment in the State's energy infrastructure promises to deliver,

- Jobs for New York State
- Economic benefits by relieving transmission constraints
- Significant ratepayer value by leveraging existing assets
- Enhanced NY electric system reliability
- Significant environmental benefits
- New York State economic development opportunities
- Fundable projects supported by financially-strong participants
- Transmission system capacity to support renewable generation development
- Modernization of the transmission system through the select use of advanced technology, if applicable.

The NY Transco will be the vehicle to deliver these Projects and allow New York State to realize the extensive benefits this proposal offers. The creation of the NY Transco is an exciting development for the State of New York. It is a shared investment ownership structure that is expected to allow transmission development to advance more rapidly. The NYTOs are pleased to introduce this entity in response to the RFI and in full support of the Governor's Energy Highway Initiative.

⁴ The STARS Phase II report was made publicly available on April 30, 2012 and is posted on the NYISO website. The NYTOs made periodic updates and sought input in the development of the study through the NYISO's stakeholder process.

II. Respondent Information

Summary descriptions for each New York Transmission Owner can be found in Appendix A. The primary contact for inquiries concerning this joint NYTO RFI response is:

Mr. David Kimiecik
Vice President – Energy Services
NYSEG/RGE
18 Link Drive
PO Box 5224
Binghamton, NY 13902-5224
1.866.717.2283

III. Project Descriptions

The NYTOs are pleased to propose 18 transmission projects which will reduce the constraints on the electric transmission system, expand the diversity of the power generation sources, assure the long-term reliability of the electric system, and encourage the development of renewable generation resources. These Projects will result in an estimated total investment of \$2.9 billion in the New York transmission system, of which \$1.9 billion will be financed through the NY Transco and \$1 billion will be financed by the host transmission owner.⁵

The Projects have been evaluated in terms of how well and how quickly they can address each of the RFI's objectives.⁶ The geographical locations of the Projects are illustrated on a map in Appendix B and detailed project descriptions are provided in Appendix C.

The Projects have been categorized into four distinct groupings⁷ as follows:

- Immediately Actionable Projects
- Actionable Projects
- Projects to Address Potential Indian Point/Downstate Generation Retirements
- Projects to Enable Wind Generation

⁵ The \$1.9 billion investment represents the level of currently anticipated investment that will be made by the NY Transco. The remaining \$1.0 billion represents the estimated total cost for the replacement of certain existing transmission assets within the proposed projects by the host NYTO.

⁶ Project justifications can be found in Section IV of this response.

⁷ To accrue all of the benefits outlined in this proposal all 18 of the projects would need to be implemented. However, depending on the specific objectives being pursued, projects may be drawn from one or more of these groupings.

Immediately Actionable Projects

Immediately Actionable Projects provide a broad range of benefits and are distinguished from the Actionable Projects for several reasons: (1) they have had more detailed engineering evaluations completed, (2) they are needed in order to achieve many of the benefits associated with the Actionable Projects; (3) they have the ability to mitigate reliability needs that may occur as a result of the retirement of downstate generators including Indian Point; and (4) they can proceed forward rather quickly because, in certain cases, they have either received or initiated NYISO and/or New York Public Service Commission (PSC) approval. The estimated total investment for these projects is \$ 385 million. The projects included in this category are:

1. 3rd Leeds - Pleasant Valley 345kV Line
2. Marcy South Series Compensation and Fraser - Coopers Corners Reconductoring
3. 2nd Rock Tavern to Ramapo 345kV Line

Actionable Projects

Actionable Projects also provide a broad range of benefits, however, these projects have not advanced as far as the Immediately Actionable Projects in terms of detailed engineering evaluations and regulatory approval. In addition, this set of projects leverage the Immediately Actionable Projects to fully realize their benefits. The estimated total investment for these projects is \$ 1.72 billion.⁸ The projects included in this category are:

1. Marcy – New Scotland 345 kV Line
2. 3rd New Scotland – Leeds 345 kV Line
3. Oakdale – Fraser 345 kV Line Upgrade
4. Moses – Marcy 230 kV to 345 kV Upgrade

Projects to Address Potential Indian Point/Downstate Generation Retirement

This group of actionable projects is primarily beneficial in addressing reliability concerns stemming from the retirement of downstate generation, including the potential retirement of the Indian Point generation facilities. The start time of these projects would be advanced so that they would be ready as the needs materialize. The estimated total investment for these projects is \$ 370 million. The projects included in this category are:

1. Transmission to Un-bottle Staten Island Generation
2. East Garden City - Newbridge 345 kV Upgrade

⁸ Of this estimated amount, \$714 million represents the level of currently anticipated investment that will be made by the NY Transco. The remaining \$1.0 billion investment represents the replacement of certain existing transmission assets within the proposed projects by the host NYTO.

These projects and the Immediately Actionable Projects are necessary to maintain reliability in the event of the retirement of Indian Point or other downstate generation.

Projects to Enable Wind Generation

These actionable Projects to Enable Wind Generation are identified in the NYISO's 2010 Wind Study. They are primarily beneficial in enabling the full energy output from wind facilities in Jefferson County and in the Western New York regions to be delivered throughout New York State. The wind development projects currently in the NYISO queue have been re-evaluated and support the completion of these projects. As currently proposed, the start time of these projects would be advanced so that the completion of these projects would be aligned with the timing of the construction of the wind projects. The estimated total investment for these projects is \$ 435 million. The projects included in this category are:

1. Canandaigua – Hillside and Hillside – Watercure Road 230 kV Lines Reconfiguration
2. Montour Falls – Hillside 115 kV Line Reconductoring
3. Hillside – North Waverly 115 kV Line Reconductoring
4. Canandaigua – Avoca – Hillside 230 kV Line Reconductoring
5. Delhi – Colliers 115 kV Line Reconductoring
6. Bennett – Howard – Bath – Montour Falls 115 kV Line Reconductoring
7. Bennett – Moraine Road – Meyer 115 kV Line Reconductoring
8. Meyer – Eel Pot Rd – Ecogen – Flat St. – Greenidge 115 kV Line Reconductoring
9. Coffeen St. – Adirondack New 345 kV Line

IV. Project Justifications

This section describes how the Projects address the goals and objectives of the NY Energy Highway initiative.

“Reduce constraints on the flow of electricity to, and within, the downstate area; and expand the diversity of power generation sources supplying downstate.”

The electric transmission system moves power from region to region across the state in a generally west to east, north to south direction. Electric generators located in the western and northern regions of the state are net exporters whereas the more heavily populated southeastern regions of the State are heavy importers of electricity. Much of the generation in the western and northern regions of the State has lower costs than the generation in New York City and Long Island. Therefore, the consumers in the downstate regions are more likely to benefit from this lower cost upstate generation if the electricity can be transmitted to them.

Transmitting electricity across regions in the state has its limitations. There is only so much capacity on the transmission lines available to deliver energy to the heavy load regions and when that capacity is reached, the transmission system is constrained, or congested, and more expensive local generation is needed to meet customer needs. These constraints have a negative impact on the price of electricity, primarily to the downstate consumers. In fact, according to the NYISO’s 2011 Congestion Assessment and Resource Integration Study (CARIS) these constraints cost New York consumers approximately \$1.1 billion in 2010, as measured by the Demand Congestion metric. Historical congestion in the NYISO’s control area has ranged from \$1 billion to \$2.6 billion. Demand congestion contributes to increased production costs, consumer payments and is a sign of inefficiencies with the transmission system.

The STARS Phase II report evaluated these constraints and identified projects capable of significantly reducing the cost of congestion. The STARS report looked at how much transmission capacity was needed to make all of the generation in the state deliverable to all locations statewide, thereby enabling consumers to access power more economically. As shown by the table below, assuming that all of the Projects are placed into service, the normal transfer capability over key transmission interfaces throughout New York State will increase by as much as 2,377 MW.

Increase in Upstate to Downstate Normal Transfer Capability Resulting From the Projects

NYISO Transmission Interface	Basecase Limit (MW)	New Limit (MW)	Net Increase (MW)
UPNY-SENY	5,942	7,462	1,520
UPNY-ConEd	6,297	8,674	2,377
Central East	3,151	3,595	444
Total East	4,640	5,169	529
Moses South	1,518	3,672	2,154

Production cost savings were used as the primary metric to measure the economic benefits of the Projects. Production costs are the total costs incurred by generators to produce power within a region. These include costs for fuel, maintenance and emissions. The annual production cost savings of these Projects is estimated to be \$175 Million.⁹ This benefit is a direct result of freeing constrained (bottled) economic generation throughout New York. These Projects have the potential to provide even greater economic benefits under certain situations such as higher generator fuel costs or if a disproportionate amount of new generation is sited remotely rather than in proximity to load growth. The Projects being proposed in this RFI most closely align with Trial 3 of the STARS Phase II Report which is the basis for the estimated production cost savings. A more detailed explanation of these benefits can be found in the STARS Phase II Report.

Developing the Projects and relieving existing constraints on the transmission system can provide additional non-quantifiable benefits including:

- Increased market competition so that more upstate generation can compete in the downstate regions.
- The potential to allow for increased energy imports from Canada, opening up the New York market to more diverse generation sources.

The Projects will ensure that transmission infrastructure that needs to be replaced, will be replaced in the most efficient and cost-effective manner. This means that to the extent possible, the new transmission facilities will be built using existing transmission ROW and using some existing transmission towers. Economies of scale will be created by replacing existing transmission facilities with new ones that have a higher voltage or greater capacity, when feasible.

Facilitate Energy Diversity

Upstate regions of New York are home to vast natural sources of renewable energy with total wind and hydro generation having a potential capacity of at least 13,000 MW which would account for approximately 30 percent of the total state energy requirements. Relieving existing transmission constraints will allow for more renewable energy to be transmitted downstate and enable clean-burning fossil fuels to play a greater role in meeting the long term energy needs of the state.

Leverage In-state Resources in Meeting Resource Needs

The increased transmission capacity may also help to reduce the need for additional capacity zones and to lower the locational requirements for the downstate regions, which have recently increased. This better leverages the existing generation resources across the state and has the potential to lower costs for consumers even further. It is noteworthy, however, that some local resources will continue to be needed for reliability purposes.

⁹ Projected production cost savings are based on studies conducted with the 2009 CARIS model of the system. The recently released 2011 CARIS study and associated model reported substantially more congestion than reflected in the 2009 study. The 2011 CARIS system representation could therefore improve the production cost benefits reported herein.

“Assure that long-term reliability of the electric system is maintained in the face of major system uncertainties.”

The Projects also provide tangible reliability benefits that result from a more robust transmission system. These reliability benefits include increased emergency transfer capability, improved resource adequacy, and a reduction in the amount of generation required to maintain system reliability. The standard reliability metric used in New York State and nationally is Loss of Load Expectation (LOLE). This is a measure of the likelihood there will not be enough generation to serve the entire load. The accepted LOLE standard is that there will not be enough generation to serve load one day in ten years, or 0.1 days/year or lower. The projected statewide system LOLE is 0.08 days/year, which corresponds to one day in 12.5 years. The addition of the Projects would improve the statewide LOLE to between 0.07 and 0.074 days/year. This benefit could even be greater if more generation is developed further from the load than the STARS Phase II analysis assumed, *i.e.*, more generation is developed in upstate as opposed to evenly distributed across the state.

The NYTOs’ STARS report quantified the LOLE benefit associated with adding additional transmission infrastructure by determining the amount of generation that would be needed to achieve New York’s higher level of system reliability. The report estimated that this value is between 300 to 400 MW of future generation. The Projects will eliminate the need for this generation providing a potential annual savings in the range of \$55 million to \$218 million, which could vary year to year.

The STARS study also performed a high-level age-based condition assessment of the transmission system. It looked at lines that will require significant investment over the next 30 years. This assessment combined with independent analyses performed by some of the NYTOs identified three lines requiring significant infrastructure work totaling approximately \$1.0 billion. These lines are the Moses - Marcy 230kV to 345kV Upgrade, the Marcy - New Scotland 345kV Line, and the Oakdale - Fraser 345kV Line Upgrade. As currently proposed, these lines would create additional statewide benefits by being upgraded rather than by being replaced in kind. The incremental cost for these upgrades is approximately \$600M.

The Projects together with the process to replace facilities based on condition assessment allow the overall transmission system to remain in reliable operating condition well into the future.

Address Reliability Concerns Associated with Potential Downstate Generation Retirements

The Projects increase the transmission capacity into the Lower Hudson Valley, New York City and Long Island regions. They address transmission security and resource adequacy needs that would result if large generation sources in this region, such as Indian Point, were to be shut down. While these deficiencies may not be entirely mitigated with transmission, the transmission reinforcements proposed herein can significantly address them. The Projects that address this objective include the 3rd Leeds - Pleasant Valley 345kV Line, the 2nd Rock Tavern - Ramapo 345kV Line, the Marcy South Series Compensation and Fraser – Coopers Corners Reconductoring, the Transmission to Un-bottle Staten Island Generation, and the East Garden City - Newbridge 345 kV Upgrade. These projects will provide an estimated transmission security benefit of almost 2,000 MW which will ensure that the transmission system operates adequately during emergency conditions. In addition, they more than adequately address significant identified resource

adequacy deficiencies resulting from retirements, bringing the statewide LOLE back to well within the 0.1 days/year limit.

“Encourage development of utility-scale renewable generation resources throughout the State.”

The Projects mitigate the major constraints that were identified in the NYISO’s 2010 Wind Study by addressing a two-fold need. First, the underlying 115 kV and 230 kV transmission systems are reinforced or upgraded allowing for the constrained wind energy to be delivered to the bulk system. Second, the transfer capability of the bulk power system is increased to permit the renewable energy to more freely flow to downstate markets.

A review was performed of the current wind projects in the NYISO generator queue as compared to those contained in the Wind Study. While there have been some changes in the project mix, in general the amount of generation being proposed in each of the three constrained areas identified in the study -- North Country, Jefferson County, and Western NY -- remains relatively unchanged. The transmission projects that were identified in the study, consequently, are still valid. Under the analysis in the Wind Study, with 6,000 MW of total potential wind generation, approximately 1,300,000 MWh of energy from these projects would not be deliverable due to existing transmission constraints. Construction of these projects will reduce the level of bottled energy to about 248,000 MWh.

Projects 1 and 4 from the Projects to Enable Wind Generation group will enable the full energy output of the existing 520 MW of operational wind generation in the western part of the state. Projects 1 through 8 from that same group will provide the reinforcements needed to enable full energy delivery for approximately 1,500 MW of western New York wind generation projects that are currently in the NYISO queue. The Coffeen St - Adirondack New 345 kV Line project addresses constraints related to wind development projects in Jefferson County. Currently there are 320 MW of operational wind resources in this region and approximately 800 MW of projects in the NYISO queue.

“Create jobs and opportunities for New Yorkers.”

Direct Benefits of the Projects

The Projects are estimated to cost approximately \$2.9 billion in current year dollars. Based on analyses performed by WIRES in conjunction with the Brattle Group, this \$2.9 billion of investment will support an estimated 12,000 direct full time equivalent (FTE) jobs and nearly 38,000 total FTE jobs, and stimulate over \$7.2 billion of total economic activity. The directly supported jobs represent those related to domestic construction, engineering and transmission component manufacturing. Indirect job stimulation represents suppliers to the construction, engineering and equipment manufacturing sectors as well as jobs created in the service industries (i.e., food and clothing) supporting those directly and indirectly employed.

Indirect Benefits Associated with Enabling Wind Development

In addition to the benefits resulting from the transmission construction, many of the Projects address constraints that exist in wind-rich areas of the state. By relieving these constraints, the wind generation projects will become more viable to proceed to construction. Based on an analysis utilizing the U.S. Department of Energy's National Renewable Energy Lab's (NREL) Job and Economic Development Impact (JEDI) model the 2,300 MW of wind generation development projects that would be enabled by the Projects are estimated to add approximately 8,000 direct FTE jobs during construction and approximately 300 permanent jobs. In addition, the JEDI model estimates that almost \$4.6 billion in total economic activity would be stimulated by the development of the Projects.

Local Tax Revenues

The Projects are estimated to increase annual local tax revenue by approximately \$ 60 to 90 million. The majority of this increased revenue will flow to upstate and western regions of New York.

"Contribute to an environmentally sustainable future for New York State."

Emissions Reduction

The portfolio of Projects will allow for a significant amount of constrained wind energy to be delivered as well as allow for other potentially cleaner upstate resources to be dispatched. The estimated net statewide benefit of the Projects is the reduction in CO₂ emissions of more than 370,000 tons and NO_x emissions of more than 200,000 tons annually.

Leveraging Existing Rights-of-way

The Projects represent approximately 856 circuit miles of transmission ranging from 115 kV to 345 kV. If they were to be constructed on all new ROW, they would require the acquisition of approximately 29 square miles of additional property. Because the Projects are leveraging to the greatest extent possible existing ROW, only 2.9 square miles of new ROW will be needed most of which will be adjacent to existing ROW. This represents a 90 percent reduction in the amount of corridor that could be potentially impacted, which would, significantly reduce the environmental impacts when compared to greenfield projects.

NYTOs have long been responsible stewards of the environment. Quite often the NYTOs' ROWs are habitats for threatened or endangered species. Because of this, the NYTOs have an excellent working relationship with the New York State Department of Environmental Conservation (NYSDEC), which enables the NYTOs to collaborate often on project design and construction practices to mitigate environmental impacts. The NY Transco will be committed to continuing this relationship and being stewards of the environment.

“Apply advanced technologies that benefit system performance and operations.”

The NYTOs continually explore new technologies that can be adopted and implemented with each project. Investment in new technology is aligned with the NYTOs’ goal to seek and deploy advanced, proven systems that will optimize and improve operating reliability and extend the lifecycle of the New York State power grid. With each project, technology advancements will be balanced against the cost effectiveness and overall benefits they may provide. Potential applications that can be considered include high temperature, low sag conductors; optical ground wires for enhanced communication; transmission line inspection robots; advanced transmission line dynamic rating systems; phasor monitoring units; improved fault detectors and hard fiber process buses (relay protection). Finally, the NY Transco will be committed to investigating new industry advancements that could transition from research and development to commercial application in the future.

“Maximize New York State electric ratepayer value in the operation of electric grid.”

A preliminary analysis was prepared to examine the potential range of ratepayer impacts for the Immediately Actionable Projects (i.e., the 3rd Leads - Pleasant Valley 345kV Line, the Marcy South Series Compensation and Fraser – Cooper Corners Reconductoring, and the 2nd Rock Tavern - Ramapo 345kV Line) as well as for all of the Projects.

The estimated annual revenue requirement for each set of transmission projects was developed based on the projected construction costs and an annual carrying charge factor of 20 percent. The annual carrying charge rate reflects generic figures for return on investment, federal and state income taxes, property taxes, insurance, fixed operating and maintenance, and depreciation (assuming 60-year straight line).

The annualized cost for each project set was then converted to 2010 dollars using a 7.36 percent discount rate, which is the current weighted average cost of capital for the NYTOs as reported in the March 20, 2012 NYISO CARIS. The 2010 annualized net cost for each project set was then divided by total state-wide energy load (163,322,188 MWH) as reported to the NYISO for 2010 to determine the unitized cost per kWh.

The average monthly residential bill impact¹⁰ for the Immediately Actionable Projects was calculated to be \$0.22/month and for all Projects,¹¹ \$1.66/month. These estimates do not include any offsets for reduced commodity costs and transmission congestion contract auction revenues. Taking only the estimated benefits of \$175 million included in the STARS Phase II report, production cost savings would reduce the calculated average monthly residential bill impact for all Projects to \$1.13/month. These impacts do not capture capacity market benefits.

¹⁰ Based on an assumed monthly usage of 500 kWhrs.

¹¹ Includes NY Transco and host NYTO costs.

V. Financial

Cost Recovery Plan

The NYTOs anticipate a cost recovery mechanism for the Projects developed by the NY Transco that will have a wholesale transmission revenue requirement and rates that would be approved by FERC and stated in the NYISO's Open Access Transmission Tariff (OATT).

Once approved by FERC, the NYTOs anticipate that the NY Transco's revenue requirement will be recovered from all load serving entities (LSEs) in the NYISO's control area. LSEs include ESCOs, the NYTOs with respect to their full-service customers, public power and municipal entities. The NYISO will be responsible for billing and collecting from all LSEs based on their energy consumption and location. The NY Transco will receive payments from the NYISO after the NYISO receives payments from the LSEs. The NYTOs, in their role as an LSE, will pass the NY Transco charge onto their full service retail customers as a NYISO charge consistent with their PSC-approved retail tariffs. In this regard, the NY Transco charge will be recovered from retail ratepayers in a way that resembles the current way investor owned NYTOs recover other NYISO charges such as NYISO Rate Schedule 1 and the NYPA Transmission Adjustment Charge. Ongoing local transmission work by the NYTOs will be recovered by the host utilities through their PSC approved retail tariffs or other existing cost recovery mechanisms.

Construction Financing

During construction, the NY Transco will be financed with a combination of debt and equity. The construction debt financing will be converted to longer term permanent financing post commercial operation. Post construction, equity support will be provided to the NY Transco by the NYTOs or their affiliates.

Estimated Project Costs

The total estimated cost for the Projects is \$2.9 billion.¹² The table on the following page provides the estimate for each project.

¹² Of this estimated amount, \$1.9 billion represents the level of currently anticipated investment that will be made by the NY Transco. The remaining \$1.0 billion investment represents the replacement of certain existing transmission assets within the proposed projects by the host NYTO.

	Estimated Cost (\$M)
Immediately Actionable Projects	
3 rd Leeds – Pleasant Valley 345kV Line	\$ 207
Marcy South Series Compensation and Fraser – Coopers Corners Reconductoring	\$ 65
2 nd Rock Tavern-Ramapo 345kV Line	\$ 113
Sub-Total:	\$ 385
Actionable Projects	
Marcy – New Scotland 345kV Line	\$ 386*
3 rd New Scotland – Leeds 345kV Line	\$ 96
Oakdale – Fraser 345kV Line Upgrade	\$ 205*
Moses – Marcy 230kV to 345kV Upgrade	\$ 1,035*
Sub-Total:	\$ 1,722
Projects to Address Potential Indian Point/Downstate Generation Retirement	
Transmission to Un-bottle Staten Island Generation	\$ 300
East Garden City - Newbridge 345kV Upgrade	\$ 70
Sub-Total:	\$ 370
Projects to Enable Wind Generation	
Canandaigua – Hillside and Hillside – Watercure Road 230kV Lines Reconfiguration	\$ 1
Montour Falls – Hillside 115kV Line Reconductoring	\$ 20
Hillside – North Waverly 115kV Line Reconductoring	\$ 18
Canandaigua – Avoca – Hillside 230kV Line Reconductoring	\$ 66
Delhi – Colliers 115kV Line Reconductoring	\$ 20
Bennett – Howard – Bath – Montour Falls 115kV Line Reconductoring	\$ 48
Bennett – Moraine Road – Meyer 115kV Line Reconductoring	\$ 22
Meyer – Eelpot Rd – Ecogen – Flat St. – Greenidge 115kV Line Reconductoring	\$ 41
Coffeen St-Adirondack New 345kV Line	\$ 199
Sub-Total:	\$ 435

* The estimated project costs include costs to be spent by both the NY Transco and the host NYTO.

VI. Permit/Approval Process

The NY Transco will be committed to constructing electric transmission projects that will minimize the impact to the environment and local communities. The Projects will be submitted, as required, to the appropriate Federal, State, and local agencies for review and approval. NY Transco will collaborate with all agencies and host utilities to develop the best projects for the State of New York.

The permits required will depend on each projects scope and proposed route, which, for most of the projects, have not been finalized. A listing of the most common agencies and quasi-governmental entities that the NY Transco can expect to interface with to obtain the necessary permits and approvals is set forth immediately below:

- NY Public Service Commission
- NY Office of General Services
- NY Office of Parks, Recreation, and Historic
- U.S. Army Corp of Engineers
- NY Independent System Operator
- Federal Energy Regulatory Commission
- NY Dept. of Environmental Conservation
- NY Dept. of Transportation
- NY Agriculture and Markets
- Federal Aviation Administration
- Adirondack Park Agency

A few of the Projects are further advanced than others. They have either submitted an application for approval or have obtained an earlier Article VII Certificate. These include:

2nd Rock Tavern – Ramapo 345kV Line	<ul style="list-style-type: none"> • NYISO Interconnection Application filed October 2011, Queue position 368 • SIS Scope Approved May 2012 • Article VII Certificate Received January 25, 1972, Case 25845, Consolidated Edison Company of New York, Inc. and Case 25741, Consolidated Edison Company of New York, Inc. and Orange and Rockland Utilities, Inc. • Article VII Certificate Received January 24, 2011, Case 10-T-0283, Orange & Rockland Utilities, Inc. (Feeder 28)
Marcy Series Compensation and Fraser – Coopers Corners Reconductoring	<ul style="list-style-type: none"> • NYISO Interconnection Application filed May 12, 2012; Queue position 380
East Garden City - Newbridge 345kV Upgrade	<ul style="list-style-type: none"> • Article VII Certificate Issued March 3, 1976, East Garden City to Newbridge Road 345kV Underground Transmission Facility, Case #26955 • Article VII Order Adopting Terms of Joint Proposal, Issued November 23, 2005, Case # 04-T-1687 LIPA

The table below provides a more extensive, although not all encompassing, list of approving and permitting agencies for transmission infrastructure projects.

Permit, Approval, or Regulatory Review Requirement	Law References
<u>STATE</u>	
1. PSC – Article VII	16 NYCRR Parts 85-88
Phase III	16 NYCRR Part 102
2. DEC – Wetlands	6 NYCRR Part 663
Streams	6 NYCRR Part 608
Water Quality	6 NYCRR Part 608
Scenic Highways	Title 49 ECL
Scenic Rivers	Title 27 ECL
Flood Zones	6 NYCRR 500 & 502
Endangered Species	6 NYCRR 182, 193
SPCC Plan	40 CFR 112
SWPPP Stormwater	Section 402 CWA, Article 17 ECL
Forest Preserves, Reforestation Areas, Wildlife MAs	NYS Constitution Article XIV
3. Ag and Markets	1 NYCRR 370-371
4. OPRHP/SHPO	Article 14 PRHP Law
5. Dept of State Coastal Areas	19 NYCRR 602
6. Office of General Services – River Xings	P.L.L. Art. 6, Sec. 75
7, Dept. of Transportation	
8. SEQRA EAF/EIS	6 NYCRR 617
<u>FEDERAL</u>	
1. Corp of Engineers – Wetlands	33 CFR 323-330
River Crossings	33 CFR 322
2. Fish & Wildlife Svc.	18 CFR 157, 50 CFR 17
3. Dept. of Transportation	
4. Federal Aviation Admin.	
5. Railroads	
6. National Historic Preservation Act	
7. Endangered Species Act	
8. Wild and Scenic Rivers Act	
<u>N.Y. STATE – REGIONAL</u>	
1. Adirondack Park Agency	9 NYCRR 570-588
2. Soil Conservation Service	
<u>LOCAL (Town/Village/City/County)</u>	
1. Building/Zoning	Local Codes
2. Highways	Local Codes
3. ROW Easements	Local Codes
<u>NYISO</u>	
1. System Impact Study Scope	
2. System Impact Study	

Permitting is an important and lengthy process in transmission line development. To bring the Projects in-service in the shortest period of time, early and frequent collaboration with the permitting authorities will be necessary. Further, the NY Transco will seek from the permitting agencies the support and likewise commitment to the NY Energy Highway goals by providing an expeditious and complete review.

VII. Other Considerations

To facilitate construction of economically efficient transmission facilities and to increase economic value to New Yorkers, LIPA and NYPA will need the State of New York to expressly authorize them to participate as members in the NY Transco structure as equity investors.

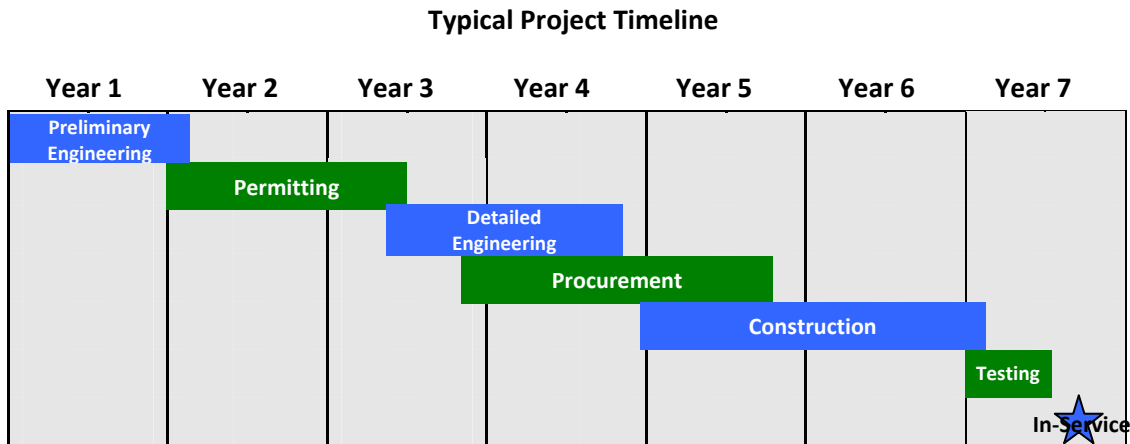
VIII. Additional Information

A. Property

The details related to the leveraging of existing ROW are included in the Justification section above. The majority of the Projects are upgrades that will be constructed within the confines of existing ROW and therefore are expected to have greatly reduced environmental and aesthetic impacts. The few proposed new transmission lines will follow existing corridors to a substantial extent and thus reduce the amount of ROW that would otherwise be required if they were greenfield construction projects. As a result, these Projects will reduce the environmental and aesthetic impacts.

B. Project Schedule and Projected In-Service Date

The Projects can be brought into service over the next three to ten years. A generic project schedule identifying the stages and durations for a traditionally developed transmission line is presented below.



These stages are applicable to all projects. However, the durations of those stages will vary based on the specific scope of work required. More complex projects involving extensive permitting and land acquisition tend to be the longest duration projects, while projects that have limited permitting needs and fully utilize existing ROW typically can be placed in service in the shortest time. With all projects, opportunities exist to shorten the development lifecycle. The NY Transco is prepared to accelerate those projects the State determines to be most significant and needed.

Most of the Projects are moderately scaled and can be constructed in less time than illustrated. The 2nd Rock Tavern - Ramapo 345kV Line and the Marcy South Series Compensation and Fraser – Coopers Corners Reconductoring projects have been initiated and therefore could be expected to be in-service in a shorter duration.

The Immediately Actionable Projects have been on-going and will continue to progress until a commitment of significant funding is required. An approved cost recovery mechanism will be necessary to advance these projects to completion as well as for the remaining Projects before moving them beyond conceptual engineering.

The table on the following page lists the projects, their status, and a projected in-service date.

Project (Note 1)	Status	Start Date	Project Duration	Projected I/S Date
Immediately Actionable Projects				
3 rd Leeds-Pleasant Valley 345kV Line	Preliminary Engineering	In-progress	7 years	2019
Marcy South Series Compensation and Fraser – Coopers Corners Reconductoring	Preliminary Engineering/Permitting	In-progress	3 years	2015
2 nd Rock Tavern-Ramapo 345kV Line	Permitting	In-progress	4 years	2016
Actionable Projects				
Marcy-New Scotland 345kV Line	Conceptual Engineering	2013	6 – 9 years (Note 2)	2022
3 rd New Scotland-Leeds 345kV Line	Conceptual Engineering	2013	7 years	2020
Oakdale-Fraser 345kV Line Upgrade	Conceptual Engineering	2012	6 years	2018
Moses-Marcy 230kV to 345kV Upgrade	Conceptual Engineering	2012	7 years	2019
Projects to Address Potential Indian Point/Downstate Generation Retirement				
Transmission to Un-bottle Staten Island Generation	Conceptual Engineering	See Note 3	3 years	
East Garden City-Newbridge 345kV Upgrade	Conceptual Engineering	See Note 3	5 years	
Projects to Enable Wind Generation				
Canandaigua-Hillside and Hillside-Watercure Road 230kV Lines Reconductoring	Conceptual Engineering	2012	1 year	2013
Montour Falls-Hillside 115kV Line Reconductoring	Conceptual Engineering	See Note 4	5 years	
Hillside-North Waverly 115kV Line Reconductoring	Conceptual Engineering	See Note 4	5 years	
Canandaigua-Avoca-Hillside 230kV Line Reconductoring	Conceptual Engineering	2012	6 years	2018
Delhi-Colliers 115kV Line Reconductoring	Conceptual Engineering	See Note 4	5 years	
Bennett-Howard-Bath-Montour Falls 115kV Line Reconductoring	Conceptual Engineering	See Note 4	6 years	
Bennett-Moraine Road-Meyer 115kV Line Reconductoring	Conceptual Engineering	See Note 4	5 years	
Meyer-Eelpot Rd-Ecogen-Flat St. – Greenridge 115kV Line Reconductoring	Conceptual Engineering	See Note 4	6 years	
Coffeen St- Adirondack New 345kV Line	Conceptual Engineering	See Note 4	5-7 years	

Notes:

- (1) Projection based on receipt of appropriate approvals and cost recovery
- (2) Phased projected completion
- (3) Initiate permitting, full project engineering and construction start tied to generation retirement
- (4) These wind related projects would commence permitting in 2013 with project completion pending wind project initiation and approval of cost recovery mechanism

C. Construction

As currently proposed the NY Transco would work with the franchised utilities for the planning, permitting and design work associated with the Projects. All engineering, procurement, and construction would be in accordance with good utility practices. The construction of the Projects is being sequenced over a multi-year period and it is not envisioned that the availability of construction resources will be a constraint in their timely completion. The construction contractors that would be performing this work would be expected to employ skilled labor from within New York State, to the extent it is available.

D. Socio-Economic

The socio-economic benefits the Projects provide are fully described in Section IV. They will support an estimated 12,000 direct FTE jobs, 38,000 total FTE jobs, \$7.2 billion in total economic activity and generate approximately \$60 to 90 million annually in local property tax revenue. In addition, it is estimated that the 2,300 MW of wind projects that would be facilitated by these proposed project developments would add an additional 8,000 total FTE jobs and \$4.6 billion in total construction-related economic activity. Since the majority of the Projects are within or along existing ROW they are not expected to have a material negative impact on real estate or property values. Further, utilizing existing utility corridors will minimize any potential impacts that might otherwise occur through the development of transmission projects that are not planned in a coordinated fashion.

E. Environmental

The environmental benefits are fully described in Section IV. It is estimated that on an annual basis, the Projects will reduce CO₂ emissions by 370,000 tons and NO_x emissions by 200,000 tons. Further, the Projects will, to the maximum extent possible, utilize existing ROW thereby significantly minimizing temporary and long-term environmental impacts. There are over 856 circuit miles of transmission lines proposed and it is estimated only 2.9 square miles of new permanent ROW will be required.

F. Public Outreach and Stakeholder Engagement

The successful planning, development and implementation of the Projects will include thorough communications with elected officials, regulatory agencies and the host communities. Emphasis will be placed on the benefits to the host communities in terms of jobs created, revenues generated and improvements to the reliability of the electricity grid as a result of investments in these projects, among other factors. The Public Outreach and Stakeholder Engagement (POSE)

plan will require engagement of a broad and diverse group of stakeholders by the NY Transco and NYTOs.

Stakeholder Engagement/Community Outreach

Since the NYTOs each know their service areas best, the POSE will be focused on meeting transmission owner-identified needs within each community. Outreach efforts will be centrally coordinated on a statewide basis by the proposed NY Transco organization to ensure consistency and coordination of project descriptions, facts and project benefits. Outreach to stakeholders will commence in a timely and consistent manner, providing the maximum opportunity to provide stakeholders with information regarding the individual projects and timeframes for each project. The NYTOs will identify community and government relations liaisons as subject matter experts on projects proposed within or extending through their respective service areas. A variety of public meeting formats will be used to convey the benefits of proposed projects. Stakeholders include, but are not limited to:

- State and local elected officials (Executive, Legislature, Municipal Leaders)
- permitting entities
- environmental organizations
- community boards and civic organizations
- religious organizations
- schools
- business groups
- media outlets/editorial boards/social media (metropolitan/local)
- business/trade organizations
- large customers
- community leaders
- energy watchdog groups

Public Information and Messaging

Fact sheets containing project specifics will be developed for each project and provided to stakeholders. In addition, the proposed NY Transco will develop a public website that will include project descriptions and up-to-date information on project status and upcoming community meetings. Public information will include:

- Impact of the projects on the flow of electricity across the State to address long-term reliability needs
- Economic and environmental benefits of proposed projects to host communities and statewide
- Importance of projects to achieve public policy objectives identified in New York's State Energy Plan, Climate Action Plan and gubernatorial and legislative priorities
- Impact on diversity of generation resources within the state
- Creating New York-based job opportunities and investing in New York's economic recovery
- Lowering costs for customers

IX. NY Transco

Business structure

The NYTOs plan to create a NY Transco that will seek to develop transmission in New York State including those Projects represented herein. The NY Transco's business strategy will be to identify and develop transmission projects for the New York grid that provide long term value to New York's electricity consumers. The new structure would allow the NY Transco to develop and own incremental new projects, while the NYTOs own the pre-existing assets that have been developed to serve its customers. This new structure creates synergies among the NYTOs that permits and encourages continued investment in the State's transmission infrastructure where it makes the most sense to improve statewide reliability and provide cost-effective infrastructure improvements to benefit all New Yorkers. It allows for facilities where the utility continues to invest in the portion of the project that replaces existing facilities, while the NY Transco invests in the incremental new portion of the project that provides the necessary upgrades to achieve the State's overall objectives, including those sought in the Energy Highway RFI, to meet future energy needs in New York State.

Public / Private partnership

The public authorities plan to participate in the NY Transco as direct equity owners but will need legislative authorization to do so. Their participation is critical because together they own facilities throughout the state, many of which are integral to the projects proposed herein. Their participation allows for all transmission upgrades to be considered in the process and consideration of the benefits that would be provided to the public authorities' consumers. The public entities may need to initially participate through a contractual arrangement¹³ with the NY Transco pending receipt of legislative authorization. Any interim contractual relationship would be designed to migrate to a full equity ownership structure upon legislation authorization. Inclusion of the Authorities in equity ownership structure would improve the ability of the NY Transco to develop new transmission throughout the state in a more streamlined, efficient fashion for less cost.

¹³ The precise nature of which will require further analysis but will, in any event, be subject to Comptroller approval.

APPENDIX A

Summary of NY Transco Participants

The New York Transco includes all of the New York Transmission Owners, including the investor owned private utilities Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc./Orange & Rockland Utilities, Inc., Niagara Mohawk Power Corporation/National Grid, and New York State Electric & Gas Corporation/Rochester Gas and Electric Corporation. It also includes the participation of two state authorities, the New York Power Authority and the Long Island Power Authority. The New York Transmission Owners are members of the NYISO in the Transmission Owners sector, or in the case of the state public authorities, the Public Power sector.

Central Hudson Gas & Electric Corporation

Central Hudson Gas & Electric Corporation (Central Hudson) is a regulated public utility organized under the laws of the State of New York. Central Hudson is engaged in the transmission and distribution of electric power and natural gas, and provides electric service to 300,000 customers within 8 counties of New York State. The Company owns 629 miles of electric transmission lines, 8,700 miles of electric distribution lines and 85 substations. In 2011, Central Hudson had total assets of \$1.6 billion and revenues of \$700 million. Central Hudson is a wholly-owned subsidiary of CH Energy Group, Inc.

Contact: Mr. Paul Haering
Vice President – Engineering and System Operations
Central Hudson Gas & Electric
284 South Avenue
Poughkeepsie, NY 12601

Consolidated Edison Company of New York, Inc./ Orange and Rockland Utilities, Inc.

Consolidated Edison Company of New York, Inc. (Con Edison) and Orange and Rockland Utilities, Inc. (O&R) are regulated public utilities that are subsidiaries of Consolidated Edison, Inc., a holding company. In 2011, Consolidated Edison, Inc. had \$39.2 billion in assets and \$12.9 billion in revenues.

Con Edison serves a 660 square mile area with a population of more than nine million people. In that area, Con Edison serves approximately 3.3 million electric customers, 1.1 million gas customers, and 1,700 steam customers. Con Edison provides electric service in New York City and most of Westchester County, gas service in parts of New York City and steam service within the borough of Manhattan. Con Edison has approximately 1,180 circuit miles of transmission, including 438 circuit miles of overhead and 742 circuit miles of underground transmission. O&R and its utility subsidiaries, Rockland Electric Company (RECO) and Pike County Light & Power Company (Pike), operate in Orange, Rockland and part of Sullivan counties in New York State and in parts of Pennsylvania and New Jersey, and serve a 1,350 square mile area. O&R provides

electric service to approximately 300,000 customers and gas service to 100,000 customers in southeastern New York and in adjacent areas of northern New Jersey and northeastern Pennsylvania. O&R has approximately 558 circuit miles of transmission.

Contact: Mr. Stuart Nachmias
Vice President – Energy Policy & Regulatory Affairs
Consolidated Edison Company of New York, Inc.
4 Irving Place, 23rd Floor
New York, NY 10003

New York State Electric & Gas Corporation and Rochester Gas and Electric Corporation

New York State Electric & Gas Corporation (NYSEG) is a regulated public utility organized under the laws of the State of New York. NYSEG is engaged in the transmission and distribution of electric power and natural gas. NYSEG provides electric service to 878,000 customers in 42 counties in New York State. The Company owns 4,583 miles of electric transmission lines, 32,881 miles of electric distribution lines and 444 substations. In 2011, NYSEG had total assets of \$4.4 billion and revenues of \$1.7 billion. NYSEG is a wholly-owned subsidiary of Iberdrola USA, Inc., which in turn is a subsidiary of Iberdrola, S.A. (an international energy company listed on the Madrid Stock Exchange).

Rochester Gas and Electric Corporation (RG&E) is a regulated public utility organized under the laws of the State of New York. RG&E is engaged in the transmission and distribution of electric power and natural gas. RG&E provides electric service to 367,000 customers in nine counties in New York State. The Company owns 1,017 miles of electric transmission lines, 7,597 miles of electric distribution lines and 177 substations. In 2011, RG&E had total assets of \$2.7 billion and revenues of \$950 million. RG&E is a wholly-owned subsidiary of Iberdrola USA, Inc., which in turn is a subsidiary of Iberdrola, S.A. (an international energy company listed on the Madrid Stock Exchange).

Contact: Mr. Ray Kinney
Director - Transmission
NYSEG/RGE
PO Box 5224
Binghamton, NY 13902

Niagara Mohawk Power Corporation/National Grid

Niagara Mohawk Power Corporation was organized in 1937 under the laws of New York State and is engaged principally in the regulated energy delivery business in New York State. The Company provides electric service to approximately 1.6 million electric customers in the areas of eastern, central, northern and western New York. The Company owns over 6,000 miles of electric transmission lines and over 700 substations. In 2011, Niagara Mohawk had total assets of \$11.1 billion and revenues of \$3.3 billion. The Company is a wholly-owned subsidiary of Niagara Mohawk Holdings, Inc., which is wholly-owned by National Grid USA (NGUSA), a public utility holding company with regulated subsidiaries engaged in the generation of electricity and the transmission, distribution and sale of both natural gas and electricity. NGUSA is an indirectly-owned subsidiary of National Grid plc, a public limited company incorporated under the laws of England and Wales.

Contact: Mr. Brian McCabe
Vice President – U.S. Business Development
National Grid
25 Hub Drive
Melville, NY 11747-3503

Long Island Power Authority

The Long Island Power Authority (“Authority”) is a corporate municipal instrumentality and a political subdivision of the State of New York. The Long Island Power Authority began operating in 1998 as a non-profit municipal electric provider owning the retail electric transmission and distribution system on Long Island that provides electric service to Nassau and Suffolk counties and the Rockaway Peninsula in Queens and provides electric service to 1.1 million customers. The Authority owns 1,300 miles of electric transmission lines, 13,600 miles of electric distribution lines and 110 substations. In 2011, it had 21,000 GWh of electricity sales, revenues of \$3.7 billion and total assets of \$11.8 billion. The Long Island Power Authority is a fiscally independent public corporation that does not receive State funds, tax revenues or credits.

Contact: Mr. James Parmelee
Assistant Vice President of Planning and Analysis
Long Island Power Authority
333 Earle Ovington Boulevard, Suite 403
Uniondale, NY 11553

New York Power Authority

Created in 1931, the New York Power Authority (“NYPA”) is a public authority and political subdivision of the State which owns and operates 17 generating facilities and about 1400 circuit miles of high voltage transmission lines. The electricity it generates and purchases is sold to municipally owned utilities and electric cooperatives, as well as to a variety of business, industrial and public customers throughout the State. NYPA is a fiscally independent public corporation that does not receive State funds, tax revenues or credits.

Contact: Mr. John Suloway
Vice President of Project Development and Licensing
New York Power Authority
123 Main Street
White Plains, NY 10601

Note on the Role of New York Power Authority

While NYPA participates in the NY Transco project, it also recognizes that it currently plays a role in guiding Governor Cuomo’s Energy Highway initiative. Accordingly, NYPA has created two distinct teams of employees, with a communications wall between the two teams. One team is working on the development of the NY Transco under the direction of NYPA’s Vice-Chairman, John S. Dyson. The other team is working on the Energy Highway initiative under the direction of NYPA’s Chief Executive Officer, Gil Quiniones, who serves as the co-chair of the Task Force, spearheading that initiative.

Appendix B

APPENDIX C

3rd Leeds - Pleasant Valley 345kV Line

Immediately Actionable Project

Project Description:

Build one new 40 mile 345kV line between National Grid's Leeds and Con Ed's Pleasant Valley station. The transmission line will traverse Greene, Columbia, and Dutchess Counties. It will utilize the existing right of way corridor requiring a slight increase in width. It will be single circuit construction utilizing bundled 1590 ACSR (2 x 1590 ACSR). Both terminals of the project are located in NYISO Zone G.

Project Size:

Length: 40 miles

Voltage: 345 kV

Anticipated Rating: 1986 MVA (summer normal)

Terminal Stations and required upgrades:

1. Add one line position at the Leeds Station.
2. Add one new line position at Pleasant Valley
3. Re-conductor the Feura Bush-N. Catskill #2 line using 795ACSR. This existing 115kV line traverses Albany and Greene counties for 24 miles. This will increase the line rating by 116MVA/220MVA (summer/winter @ 115kV).

Marcy-South Series Compensation and Fraser - Coopers Corners Reconductoring

Immediately Actionable Project

Project Description:

This project will allow better utilization of the Marcy – Coopers Corners and Edic-Fraser/Fraser -Coopers Corners 345KV lines by adding switchable series compensation. Series compensation will be added in the following levels:

40% compensation will be added to the Marcy-Coopers Corners line

25% compensation will be added to the Edic-Fraser/Fraser-Coopers Corners line

This project also re-conductors approximately 21 miles of the NYSEG –owned Fraser-Coopers Corners 345KV line with 2156MCM ACCC conductor on existing towers.

Marcy and Edic stations are located in Oneida County near Utica, NY. Fraser station is located in Delaware County near Delhi, NY. Coopers Corners station is located in Sullivan County near Monticello, NY.

All new station equipment and the re-conducted transmission line will be located in NYISO Zone E.

Project Size:

Length: 21 miles of re-conducted 345KV overhead line

Voltage: 345KV

Terminal Stations and required upgrades:

Fraser 345KV

2nd 345 kV Rock Tavern – Ramapo 345 kV Line

Immediately Actionable Project

Project Description:

Central Hudson's Rock Tavern 345 kV substation will be connected to Con Edison's Ramapo 345 kV substation by performing three concurrent system upgrades. The first upgrade would be to convert O&R's line 28 (Ramapo 138 kV to Sugarloaf 138 kV) from current operating voltage of 138 kV to 345 kV by reconnecting line 28 at the Ramapo 345 kV substation. The second upgrade would be to create a Sugarloaf 345 kV substation and add a 345 / 138 kV step-down transformer between the Sugarloaf 345 kV and 138 kV substations. The third upgrade would be to install a 345 kV line between Rock Tavern and the Sugarloaf 345 kV substation utilizing bundled 1590 ACSR (2 x 1590 ACSR). The Project will increase the import capability into Southeastern New York, including New York City, during normal and emergency conditions. The Project will be located in Orange and Rockland Counties in New York along the existing Right of Way (ROW) of the existing Con Edison 345 kV line 77 (Rock Tavern – Ramapo). The transmission line terminals are located in NYISO Zone G.

Project Size:

The transmission portion of the project will mimic the capability of Con Edison's existing 345 kV line 77 (Rock Tavern – Ramapo):

- 1) Length: 27.4 miles
- 2) Operating Voltage: 345 kV
- 3) Thermal Ratings: Summer (3030 Amperes)

The Sugarloaf 345 / 138 kV step down transformer will be a 400 MVA unit.

Terminal Stations and required upgrades:

The terminal stations are:

- 1) Central Hudson's Rock Tavern 345 kV substation; where additional substation bay is required for the proposed 345 kV feeder interconnection.
- 2) Con Edison's Ramapo 345 kV substation; where additional substation bay is required for the proposed 345 kV feeder interconnection.
- 3) Sugarloaf 345 kV substation needs to be established.

Marcy to New Scotland 345KV Line

Actionable Project

Project Description:

Replace two existing aging Porter –Rotterdam 230KV lines with one 70 mile 345KV line from Marcy Station located in Utica N.Y. to a new Princetown 345 kV station located in Albany N.Y. Also build a new 20 mile 345kV line from Princetown Station to a new New Scotland Station. The Princetown station will also connect to the 230 kV Rotterdam station via two 345/230 kV transformer banks and 8 miles of existing 230 kV lines. These 230 kV lines will also be rebuilt utilizing single 1192 ACSR overhead conductor. The 345kV transmission line will be single circuit construction utilizing bundled 1590 ACSR conductor (2 x 1590). It will utilize the existing transmission line corridor to the maximum extent possible.

The Marcy to Princetown line will traverse Oneida, Herkimer, Fulton, Schenectady, and Albany counties. The Princetown to New Scotland line will traverse Schenectady and Albany counties. Marcy substation is located in NYISO Zone E. Princetown and New Scotland are located in NYISO Zone F.

Project Size:

A. Marcy to Princetown transmission line

Length: 70 miles

Voltage: 345kV

Anticipated Rating (summer normal MVA @ 345 kV): 1986

B. Princetown to New Scotland transmission line

Length: 20 miles

Voltage: 345kV

Anticipated Rating (summer normal MVA @ 345 kV): 1986

C. Princetown to Rotterdam transmission line re-build

Length: 8 miles

Voltage: 230kV

Anticipate Rating (summer normal MVA @ 230 kV): 557

Terminal Stations and required upgrades if any:

1. Marcy Station – Expand to accept new 345 kV line (to Princetown).
2. Princetown Station – New 345 kV 3/2 breaker station with two 345/230 kV transformers.
3. Build a new New Scotland station to a 3/2 breaker arrangement.
4. Retire the 230kV at Porter substation.

3rd New Scotland - Leeds 345kV Line

Actionable Project

Project Description:

Build one new 26 mile 345 kV circuit between National Grid's New Scotland and Leeds substations. The project will traverse Albany and Greene Counties. It will be a single circuit transmission line using bundled 1590 ACSR conductor (2x1590 ACSR). The line will utilize or be adjacent to the existing transmission line corridor to the maximum extent possible. New Scotland is located in NYISO Zone F and Leeds is located in NYISO Zone G.

Project Size:

Length: 26 miles

Voltage: 345kV

Anticipated rating (summer normal MVA @ 345kV): 1986

Terminal Stations and required upgrades:

1. Replace New Scotland substation with a 3/2 breaker scheme.
2. Add one line position at the Leeds Station.

Oakdale - Fraser 345 kV Line Upgrade

Actionable Project

Project Description:

Construct a new 345 kV line from Oakdale Substation to Fraser Substation by converting the existing Oakdale-Kattelville-Jennison 115 kV line to 345 kV operation and extending the line from Jennison on to Fraser Substation. The conductor should be sized to no less than 1431 ACSR or equivalent (1505 A summer normal). The new line will extend from the Town of Union (Broome County) to the Town of Delhi (Delaware County). Oakdale Substation is located in NYISO Zone C and Fraser Substation is located in NYISO Zone E.

Project Size:

Length: 57 miles

Voltage: 345kV

Anticipated rating (summer normal): 1505

Terminal Stations and required upgrades:

New 345 kV terminals and breakers will be required at Oakdale and Fraser Substations to accommodate the new line.

Moses - Marcy 230 kV to 345kV Upgrade

Actionable Project

Project Description:

Rebuild/Replace the two existing Moses-Adirondack-Porter 230KV lines with two 345KV lines. The two new 345KV lines will have northern terminals at Moses station, located near Massena, NY. One of the new lines will connect with the Chases Lake wind generation facility (which is near the existing Adirondack station) and then continue to Marcy station which will be the location of its' southern terminal. The other new 345KV line will run directly from Moses to its southern terminal at Edic station. Marcy and Edic stations are located near Utica, NY. The project will rebuild approximately 260 circuit miles (each line is approximately 130 miles from terminal to terminal), and will traverse the following counties: St. Lawrence, Lewis, and Oneida. All transmission line terminals are located in NYISO Zone E.

Note 1 - Regarding the existing 230KV lines, NYPA owns the Moses-Adirondack section, and National Grid owns the Adirondack-Porter section.

Note 2 – The Watertown area wind resources are not included in these plans.

Project Size:

Length- 2x130miles or 260 circuit miles

Voltage- 345KV

Rating Increase-Approximate Per line :

-Moses-Adirondack – From 348 MVA @ 230KV, to 1963 MVA @ 345KV (Assumed 2*1431 ACSR 45/7 Conductor)

-Adirondack-Porter – From 434 MVA @ 230KV, to 1963 MVA @ 345KV (Assumed 2*1431 ACSR 45/7 Conductor)

Terminal Stations and required upgrades:

Moses – One or two new 345KV/230KV transformers, 345KV bus and associated breaker/switching equipment.

Chases Lake – Rebuild existing 230KV ring bus section to 345KV and add one new 345KV/230KVtransformer.

Adirondack – The Adirondack station will be converted to 345KV to provide accommodation for the future Adirondack-Coffeen St transmission line.

Marcy – 345KV station modifications for connecting the new line.

Edic - 345KV station modifications for connecting the new line and add a new 345KV/115KV transformer for local network support.

Porter – The Porter 230KV bus will be retired.

Transmission to Un-bottle Staten Island Generation

Project to Address Potential Indian Point/Downstate Generation Retirement

Project Description:

Un-bottling Staten Island generation resources will occur in two phases. Phase 1 would mitigate a contingency within New York City by separating a common pipe double leg feeder into two separate feeders with independent positions at the Goethals and Linden Substations. Phase 2 increases transmission capacity by adding forced cooling to existing feeders between Goethals, Gowanus, and Farragut. The Project would be located in Staten Island and Brooklyn, New York and Union County (Linden), New Jersey. This project is located entirely in NYISO Zone J.

Project Size:

Phase 1: The length of the feeder, operating voltage level (345 kV) and ratings would not change. However the cables will be able to carry an additional of 280MW.

Phase 2: The length of the feeders, operating voltage level (345 kV) would not change but the ratings would increase by 200 MW.

Total Project Size: 480 MW

Terminal Stations and required upgrades:

The terminal stations are:

- 1) Goethals 345 kV substation where a bus position needs to be established for the feeder separation.
- 2) Linden 345 kV substation where a bus position needs to be established for the feeder separation.

East Garden - Newbridge 345 kV Upgrade

Project to Address Potential Indian Point/Downstate Generation Retirement

Project Description:

This project encompasses the conversion of two of the four 138 kV transmission cables between East Garden City and Newbridge to 345 kV operation. Circuits 138-465 & 138-467, both built to 345 kV standards but currently operating at 138kV, were built in 1981 and 2007, respectively.

These transmission circuits are located within an approximately 4-mile area almost entirely within the existing Long Island Railroad right-of-way (LIRR ROW). Because this project is utilizing the existing path of the cable circuits, the locations do not change. The project is in Nassau County and traverses through the Town of Hempstead. This transmission line is entirely in NYISO Zone K.

Project Size:

Length: Approximately 4 miles for both circuits 138-465 and 138-467

Voltage: 345 kV Operation

Rating Increase: Increases the existing rating by an approximate by a factor of 2.5 due to the conversion to high voltage.

Terminal Stations and required upgrades:

The conversion of two 138kV operated cables to 345kV operation between East Garden City and Newbridge assumes reconfiguration of existing Y-49 345 kV interconnection, includes use of the 345 kV step-downs, new shunt reactor and addition of the two new phase shifters at East Garden City 345kV bus to control the flow on East Garden City-Newbridge 345kV circuits. This also includes a new GIS 345 kV ring bus at East Garden City and the extension of the existing 345 kV at Newbridge.

Canandaigua - Hillside and Hillside - Watercure Road 230 kV Lines Reconfiguration

Project to Address Potential Indian Point/Downstate Generation Retirement

Project Description:

Currently, the Hillside-Canandaigua and Hillside-Watercure Road 230 kV lines are on 6 double circuit towers as they exit Hillside Substation. To eliminate the potential double circuit outage, one of these towers needs to be reconfigured to reduce the total number of double circuit towers from 6 to 5. The double circuit towers are located in the City of Elmira (Chemung County). All terminals of the project are located in NYISO Zone C.

Project Size:

There is no change in line length, voltage or rating. This is simply a separation of 1 of the 230 kV double circuit towers as the 68 and 69 lines exit Hillside Substation.

Terminal Stations and required upgrades:

None required.

Montour Falls - Hillside 115 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the two existing 115 kV lines (963 and 978) from Montour Falls Substation to Hillside Substation with a conductor sized to no less than double 1033 ACSR or equivalent (2500A summer normal). The existing line extends from Village of Montour Falls (Schuyler County) to the City of Elmira (Chemung County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 16 miles

Voltage: 115kV

Anticipated rating (summer normal): 2500A

Terminal Stations and required upgrades:

The terminal substations are Montour Falls and Hillside. The 115 kV buswork, switches and current transformers at Montour Falls and Hillside Substations will need to be upgraded to match the capacity of the 2-1033 ACSR conductor.

Hillside - North Waverly 115 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the existing 115 kV line from Hillside Substation to North Waverly Substation with a conductor sized to no less than double 1033 ACSR or equivalent (2500A summer normal). The existing line extends from the City of Elmira (Chemung County) to the Village of North Waverly (Tioga County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 16 miles

Voltage: 115kV

Anticipated rating (summer normal): 2500 A

Terminal Stations and required upgrades:

The terminal substations are Hillside and North Waverly. The 115 kV buswork and current transformers at North Waverly and Chemung Substations and line terminal equipment at Hillside will need to be upgraded to match the capacity of the 2-1033 ACSR conductor.

Canandaigua - Avoca - Hillside 230 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the existing 230 kV line from Canandaigua Substation to Avoca Substation to Hillside Substation with a conductor sized to no less than double 1033 ACSR or equivalent (2500A summer normal). The existing line extends from the Town of Cohocton (Steuben County) to the City of Elmira (Chemung County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 50.8 miles

Voltage: 230kV

Anticipated rating (summer normal): 2500 A

Terminal Stations and required upgrades:

The terminal substations are Canandaigua IPP, Avoca and Hillside. The buswork at Avoca Substation and buswork, CT's and wavetraps at Hillside will need to be upgraded to match the capacity of the 2-1033 ACSR conductor.

Delhi - Colliers 115 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the existing 115 kV line from Delhi Substation to Colliers Substation with a conductor sized to no less than double 1033 ACSR or equivalent (2500A summer normal). The existing line extends from the Town of Colliersville (Otsego County) to the Village of Delhi (Delaware County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 17.5 miles

Voltage: 115kV

Anticipated rating (summer normal): 2500 A

Terminal Stations and required upgrades:

The terminal substations are Delhi and Colliers. The 115 kV buswork, switches and current transformers at Delhi and Colliers Substations will need to be upgraded to match the capacity of the 2-1033 ACSR conductor.

Bennett-Howard-Bath-Montour Falls 115 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the existing 115 kV line from Bennett Substation to Howard Substation to Bath Substation to Montour Falls Substation with a conductor sized to no less than double 1033 ACSR or equivalent (2500A summer normal). The existing line extends from the City of Hornell (Steuben County) to the Village of Montour Falls (Schuyler County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 42.5 miles

Voltage: 115kV

Anticipated rating (summer normal): 2500 A

Terminal Stations and required upgrades:

The terminal substations are Bennett, Howard, Bath, and Montour Falls. The 115 kV breakers and CT's at Bennett and the 115 kV buswork, switches, and CT's at Bath and Montour Falls Substations will need to be upgraded to match the capacity of the 2-1033 ACSR conductor.

Bennett-Moraine Road-Meyer 115 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the existing 115 kV line from Bennett Substation to Moraine Road Substation to Meyer Substation with a conductor sized to no less than double 1033 ACSR or equivalent (2500A summer normal). The existing line extends from the City of Hornell (Steuben County) to the Village of Dansville (Livingston County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 19.3 miles

Voltage: 115kV

Anticipated rating (summer normal): 2500 A

Terminal Stations and required upgrades:

The terminal substations are Bennett and Meyer. The 115 kV buswork, breakers, and switches, and CTs at Bennett and Meyer Substations will need to be upgraded to match the capacity of the 2-1033 ACSR conductor.

Meyer-Eelpot Road-Ecogen-Flat Street-Greenidge 115 kV Line Reconductoring

Project to Enable Wind Generation

Project Description:

Reconductor the existing 115 kV line from Meyer Substation to Eelpot Road Substation to Ecogen Substation to Flat Street Substation to Greenidge Substation with a conductor sized to no less than 1033 ACSR or equivalent (1250 A summer normal). The existing line extends from the Village of Dansville (Livingston County) to the Village of Dresden (Yates County). All terminals of the project are located in NYISO Zone C.

Project Size:

Length: 43.5 miles

Voltage: 115kV

Anticipated rating (summer normal): 1250 A

Terminal Stations and required upgrades:

The terminal substations are Meyer, Eelpot Road, Ecogen, Flat Street, and Greenidge. The 115 kV buswork, switches, and CT's at Greenidge and Meyer, the CT's at Flat Street, and the 115 kV switches at Eelpot Road Substations will need to be upgraded to match the capacity of the 1033 ACSR conductor.

Coffeen St. - Adirondack New 345kV line

Project to Enable Wind Generation

Project Description:

This project will accommodate approximately 550 MW of Wind projects located in the Watertown N.Y. area that is presently in the NYISO queue.

Construct a new 345 kV transmission line between Coffeen Street substation in Watertown, NY and Adirondack substation in Taylorville, NY. This transmission line will be a single circuit tower utilizing a bundled conductor overhead construction. It will traverse Lewis and Jefferson counties. In addition, construct two transmission lines (anticipated 115 kV construction) from the town of Lyme to Watertown and the town of Henderson to Watertown. All facilities are located in NYISO Zone E.

Project Size:

A. Watertown to Adirondack Line traversing Lewis and Jefferson Counties

Length: 40 miles

Voltage: 345 kV

Anticipated Construction: 2x 795 ACSR (26/7)

Anticipated Rating (in MVA @ 345 kV): 1331

B. Lyme to Watertown Line traversing Jefferson County

Length: 16 miles

Anticipated Voltage: 115 kV

Anticipated Construction: 2x 795 ACSR (26/7)

Anticipated Rating (summer normal MVA @ 115 kV): 444

C. Watertown to Henderson Line traversing and Jefferson County

Length: 25 miles

Anticipated Voltage: 115 kV

Anticipated Construction: 2x 795 ACSR (26/7)

Anticipated Rating (in MVA @ 115 kV): 444

New Terminal Stations and required upgrades:

1. Add single 345 kV position at Adirondack substation
(it is assumed here Adirondack Station has been previously rebuilt to 345 kV)
2. Build Watertown 345 kV/ 115 kV collector station
(it is presently anticipated that a nominally rated 448 MVA autotransformer will be required at this station as well as ample shunt compensation)