

**THE LONG ISLAND – NEW YORK CITY OFFSHORE WIND
COLLABORATIVE**

REQUEST FOR INFORMATION

TO SUPPORT THE PREPARATION OF A REQUEST FOR PROPOSAL

TO ACQUIRE POWER FROM AN OFFSHORE WIND ENERGY FACILITY

IN THE ATLANTIC OCEAN OFF THE ROCKAWAY PENINSULA AND SOUTH OF LONG ISLAND

ISSUED: JUNE 30, 2009

RESPONSE DUE DATE: August 31, 2009

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Request for Information

I. INTRODUCTION

The Long Island-New York City Offshore Wind Collaborative (the “Collaborative”) is a newly-formed coalition of utilities, State and New York City agencies seeking to obtain power from an offshore wind energy facility in the Atlantic Ocean off the Rockaway Peninsula and south of Long Island. The goal is to acquire significant amounts of wind-based clean energy for delivery to, and purchase by, Long Island, New York City, and Westchester County consumers beginning in 2015. The Collaborative, which is in the formative stages, consists of:

- Con Edison
- Long Island Power Authority
- Metropolitan Transportation Authority
- New York City Economic Development Corporation
- New York Power Authority
- New York State Energy Research & Development Authority
- Port Authority of New York & New Jersey

The Collaborative has determined that the offshore wind facility would have a capacity of up to 700 MW as filed with the New York Independent System Operator. The initial block could be as small as 350 MW, which is expected to generate at least 1,000,000 megawatt-hours (MWh) per year, or enough energy for over 250,000 homes. A proposed location for the offshore project has been identified by the Collaborative, as have interconnection points for connection to the Con Edison and LIPA transmission systems. Depending on the success of this initial phase, the Collaborative may consider another project increment to bring the total project to 700 MW.

Objective of Request for Information (RFI) – The purpose of this RFI is to solicit information from the wind power industry and other interested parties, including community groups, to support the development of a Request for Proposal (RFP) through which the Collaborative will pursue a Power Purchase Agreement (PPA) that would support the installation of up to 700 MW of offshore wind generation by one or more private developers. The RFP will contain appropriate terms, conditions and other information to encourage the submission of high quality proposals from capable wind power developers. The Collaborative intends to issue the RFP by the end of 2009. This RFI is for information and planning purposes only and should not be construed as a solicitation or obligation on the part of the Collaborative.

Section II, Project Description, that follows provides more details about the proposed project’s location, preferred interconnection points, anticipated participant roles, and overall schedule. Subsequent sections address the topical areas for which feedback is sought, the anticipated attributes of the future RFP, and instructions on how to respond to this RFI.

II. PROJECT DESCRIPTION

Proposed Project Location and Size – A proposed project area has been identified by the Collaborative that is in relatively close proximity to Long Island and New York City and has the potential to accommodate large-scale wind energy development. The proposed location has an area of approximately 57 square nautical miles (196 sq km) and is located approximately 13 miles off the Rockaway Peninsula, Long Island. This location is bordered by the Ambrose-to-Nantucket and Hudson Canyon-to-Ambrose traffic lanes, which are identified on official navigational charts. Annual average wind speeds within the proposed area are expected to exceed 8.5 m/s at a height of 90 m above mean sea level. Water depths range from approximately 18 m to 37 m (60-120 ft).

Although a proposed location has been identified, the Collaborative is open to considering one or more alternative locations for fulfilling its clean energy acquisition objective as defined by this RFI. Responders to this RFI are welcome to consider and suggest alternative locations, along with the reasons why the alternative locations are more appropriate.

Proposed Interconnection Point(s) – Con Edison and LIPA recently evaluated the feasibility of their transmission systems to connect with and support a large source of new wind power proposed off the Rockaway Peninsula and south of Long Island. The joint study, published in March 2009 and attached to this RFI as Appendix A, evaluated the necessary electric transmission system requirements that would be required to obtain wind power in increments of 350 MW, an amount that is equivalent to a moderate fossil power generating facility. This initial phase of the project focused only on the necessary electric transmission required for the onshore portion of the project. The infrastructure and costs for the anticipated transmission from the offshore wind facility to landfall have not yet been evaluated.

The study determined the following:

For an offshore wind facility up to 350 MW in capacity, a new transmission line from an onshore receiver station to an existing station in northern Queens, combined with a connection to the LIPA transmission system in the vicinity of the Rockaways, is optimal from simplicity, intersection of both systems and cost perspective.

For a phased facility greater than an initial amount of 350 MW, it would be necessary to build new transmission lines from an onshore receiver station to a new substation in the vicinity of eastern Queens, combined with a connection to the LIPA transmission system in the vicinity of the Rockaways. In addition, existing transmission lines between LIPA and Con Edison would be reconfigured to connect at the new station, allowing each utility its full access to the wind power. This configuration provides deliverability, reliability, and synergies for future growth and expansion.

Although a transmission system interconnection solution for the onshore portion has been evaluated for the proposed offshore wind facility, the Collaborative is open to considering alternative interconnection points, along with the reasons why the alternate locations are more appropriate. Any such proposal should describe how the energy from the project could be delivered to both the Con Edison and LIPA systems.

Anticipated Roles of Project Participants – It is anticipated that the selected developer(s) will be responsible for siting, permitting, constructing, operating and maintaining the offshore wind energy facility, including the interconnection to the onshore receiver station, and would assume all development, construction and operating risks associated with the project. The Collaborative, or some of its members, would purchase capacity, energy, ancillary services, and renewable energy credits (RECs) produced by the facility(ies) pursuant to one or more long term Power Purchase Agreements (PPAs). Depending on the business arrangements, some Collaborative members may purchase the power for resale to other members of the Collaborative. Con Edison and LIPA will also conduct advanced interconnection studies and invest in certain onshore transmission system improvements to accept the offshore wind facility’s output. In addition, the Collaborative will play an active role in public outreach and communication activities. One or more Collaborative members may also consider taking an equity stake in the facility.

Preliminary Project Schedule – The following table provides a tentative bidder selection and project development schedule for the Long Island – New York City Offshore Wind Facility. All dates are subject to change.

Preliminary Project Schedule	
Activity	Date
Issuance of RFI	June 30, 2009
Deadline for Questions on RFI	August 3, 2009
Deadline for Notice of Intent to Respond	August 17, 2009
Due Date for RFI Response	August 31, 2009
Issue RFP	December 31, 2009
RFP Response Due Date	April 1, 2010
Announcement of Bidder Selection	Summer/Fall 2010
Board Approvals of Selection	Winter 2010
Contract Negotiation & Approval	Winter 2010 – Fall 2011
Technical Studies and Permit Approval Process	2011-2013
Facility Construction	2014-15
Facility Commissioning	Fall 2015

III. TOPICAL AREAS FOR RESPONDENT FEEDBACK

The Collaborative is seeking feedback from knowledgeable parties on various aspects of offshore wind projects. These aspects include technical, operational, regulatory, commercial, environmental, community and other topics, which are described below. Respondents are requested to provide information on these topics or any other topics that will assist the Collaborative in preparing a comprehensive and competitive RFP. Respondents are requested to format their responses to this RFI in the same order as the topics are presented.

- a. **Technology Availability and Limitations** – Given the facility’s proposed location and capacity, and the proposed development schedule, please describe your expectations and concerns about the following technology-related items:
 - Size, track record, market availability, and suitability of commercial offshore wind turbines
 - The foundation type(s) likely to be required for the site given the water depths and anticipated wind/wave conditions
 - Market availability of recommended foundation type(s) and any special logistical or cost considerations
 - Facility’s ability to withstand wind and hydrodynamic loads and a corrosive marine environment over the project life
 - Anticipated life of facility components
 - Quality and duration of original equipment manufacturer warranties.

- b. **Technical/Environmental Issues and Anticipated Studies** – Please describe the studies and field data collection programs needed to define:
 - The parameters required to design and engineer a safe, reliable, efficient, and cost-effective offshore wind facility. It is expected these will include wind, weather, wave, tide, current, bathymetry (water depth) and geotechnical parameters. Indicate preferences for location of one or more meteorological/oceanographic monitoring stations.
 - An assessment of potential environmental impacts and characterization of offshore uses, and potential compatibility of those uses, during construction and operations. Environmental impacts include local and migratory birds, bats, insects, marine mammals, benthic (seabed) life, and other aquatic life, including significant impediments to dispersal. Based on local knowledge, identify potential impacts that may be of particular significance and concern.
 - In both cases, identify studies, data collection programs, and assessments that are recommended to be initiated by the Collaborative that would support proposal/bid development, and explain why.
 - Please describe any accepted advanced technologies or methodologies that might be used to reduce data collection costs or to accelerate the collection of required data for licensing and permitting the project.

- Provide cost and schedule estimates for meteorological, environmental and other studies.
- c. **Infrastructure for Construction and Maintenance** – Please provide information related to the infrastructure required to execute the construction and maintenance phases of the facility. Issues to address:
- Specialized vessels and equipment needed and their availability
 - Implications of the Jones Act
 - Availability of skilled labor and trained crews
 - Access of appropriate port facilities, including staging and pre-assembly areas
 - Airfield/heliport access
 - Laying of cable interconnection (collection grid and cable from wind facility to onshore receiver station)
 - Insurance matters, including marine labor coverage
 - Potential weather and other seasonal impacts on construction, maintenance, production and availability
 - Other issues that should be considered.
- d. **Operations and Performance** – The RFP will request bidders to describe in detail their complete operations and maintenance (O&M) program, their production performance projections and their strategies to maximize performance for the facility’s full life cycle. Please provide information related to the following O&M and performance issues:
- Anticipated average turbine availability—first year and long-term—and basis for projections
 - Anticipated performance degradation over project life
 - Ability to accurately predict wake effects on production and on component fatigue loads
 - Maintenance plan, facilities, staffing, spare parts, and response time for unscheduled maintenance
 - Scheduled maintenance procedures and frequency (including periodic turbine overhauls or major component replacement/repair)
 - Remote communications, control, monitoring and dispatch systems
 - Documented safety and emergency rescue plans and facilities
 - Any anticipation of construction and/or operational curtailment due to bird or marine mammal migration
 - Any additional items to be included in the RFP.
- e. **Regulatory Approval Process** – Please identify the primary issues of concern related to the process of obtaining all anticipated permits and approvals for the development of the offshore wind facility. In addition:
- What key uncertainties are known or anticipated in this process at the federal, state and local levels?
 - In what ways can the Collaborative assist in resolving these uncertainties?

- f. **Interconnection** – Please provide information related to the design of the overall electrical interconnection system, with consideration of the completed study of recommended interconnection points that has been provided (Appendix A). Relevant issues include:
- The need for one or more offshore substations
 - The preference for, and viability and availability of, AC or HVDC cables for interconnection
 - Location of converter stations (HVDC option)
 - Ocean floor, routing and landfall considerations
 - Strategies for interconnection reliability, security, and energy deliverability
 - In what ways can the Collaborative facilitate the interconnection component of the project as part of the RFP?

As mentioned previously, the Collaborative is open to considering alternative interconnection points, along with the reasons why the alternate locations would be more appropriate.

- g. **Capital Requirements, Financing & Indicative Pricing** – Please provide guidance on the following financial aspects of the offshore wind facility:
- Anticipated total capital costs, description of cost components, and cost uncertainty factors
 - Sources of capital and availability of financing (short- and long-term)
 - Anticipated levels of debt and equity
 - Potential roles of Collaborative to facilitate developer(s) ability to finance project
 - Projected range of pricing for energy, capacity and ancillary services
 - Anticipated incentives, such as the Production Tax Credit (PTC), and their impacts of pricing
 - Preference of developer to maintain all or a portion of renewable energy credits (RECs) or other environmental benefits attributable to the project
 - Risks of price changes due to changes in prices for commodities, manufacturer quotations, and other materials and services
 - Ways to reduce pricing and pricing uncertainty
 - Provisions for decommissioning and removal of turbines
 - What pricing structure should be requested by the RFP? (e.g. what type of indexing should be permitted, how should pricing be adjusted for project size, what pricing components should be required, etc.)
 - To evaluate the RFP, it is necessary that the price quotes be stable. Given the schedule of RFP submittals on April 1, 2010, Board approvals of the selection in the Winter of 2010-11, and final contract approval in Fall 2011, how long a period of time is it reasonable to request that the pricing remain firm?
 - Other issues that should be addressed in the RFP.

- h. **Business Structure** – Please describe the potential business structures that may be appropriate for the envisioned offshore wind facility (e.g. different entities owning different parts of the project, public/private partnerships, etc.). The pros and cons of the following items can be considered when addressing potential business structures:
- What is the best way to take advantage of anticipated federal tax credits?
 - Is there a way to leverage the tax exempt financing of the public entities in the Collaborative?
 - The Collaborative anticipates that multiple members will purchase power from the project. Is it better to:
 - i. have a separate PPA with each purchaser?
 - ii. have one member purchase all power and resell to other members?
 - iii. Create a new entity to purchase all power and resell power to members?
 - How could private corporations like Con Edison, or public entities such as New York City, NYPA or MTA, potentially participate as an equity partner?
 - Does it make sense for the offshore facility-to-onshore transmission line to be owned by a separate party from the wind facility?
 - What significant commercial opportunities exist for branding and advertising as part of the offshore wind facility?
 - Additional information or recommendations for other business structure concepts.
- i. **Power Purchase Agreement (PPA)** – The Collaborative envisions purchasing the full output from the wind facility for resale to others at both the retail and wholesale levels, but is open to other options. A proposed PPA will be provided as part of the RFP. Among its provisions, the PPA will require that the facility’s output be scheduled into markets administered by the New York Independent System Operator. Following are pertinent PPA-related provisions for which feedback is requested:
- Respondent’s interest in maintaining a portion of the project output for it to sell on a merchant basis
 - The relationship between the length of the PPA term and the level of pricing
 - Recommendations on terms of service considered acceptable and preferable
 - Description of ancillary services (e.g., reactive supply and voltage support, operating reserves, regulation and frequency response, black start) the facility is expected to provide
 - Preferences for pricing structures for energy, capacity, ancillary services, and RECs, including pricing incentives
 - Incorporation of minimum production and availability guarantees and how these guarantees should be structured
 - PPA treatment of both forced and scheduled outages

- Recommendation for the appropriate level and structure of seller security (in \$/MW)
- Anticipated limits on facility operating criteria, including availability and dispatch, curtailment, and start-up and shut-down considerations
- Insurance and indemnification requirements
- PPA default provisions, including provisions for curing
- Additional information or recommendations for other PPA terms and conditions that should be considered.

j. **Public Outreach and Stakeholder Engagement** – Please identify the anticipated public impacts, benefits, and affected user groups. Identify strategies and measures that can allow for the continuation of existing uses and resolve use conflicts with the proposed project. Comments are invited not only from potential RFP respondents but also from community groups. Anticipated issues include:

- Benefits to the community
- Aesthetics (day and night)
- Noise
- Impacts on real estate and property values
- Impacts on recreation
- Access to waters within facility for recreational boating and fishing
- Impacts on commercial fishing
- Impacts on commercial navigation & recommended setbacks from channels
- Impacts on aviation (commercial, private and military)
- Impacts on radar
- Local tourism
- Public safety and security
- Assurance of site decommissioning and restoration at end of useful life
- Approaches to addressing these issues and engaging the local community to ensure that all concerns are addressed
- Other issues not addressed above
- Specific ways in which the Collaborative can support the addressing of issues.

The impacts during construction and operation may be different. In your comments, where appropriate, please differentiate these effects.

k. **Economic Development Opportunities** – Please identify the economic development opportunities that the proposed offshore wind facility could bring to New York State, and more specifically, to New York City and Long Island in terms of:

- Job retention, creation of new jobs (temporary and permanent), and retraining opportunities
- Commerce, including procurement of regional products and services to fulfill development requirements

- Port development and enhancement opportunities
 - Establishment of an industrial site for the manufacture of wind components
 - Encouraging and supporting the development of green jobs
 - Developing wind industry maintenance facilities and/or training centers
 - Construction of vessels necessary to locating an offshore wind facility
 - Other economic benefits
 - Potential for adverse economic impacts.
- i. **Development Schedule and Critical Path Items** – Please identify issues related to the development schedule and the ability to meet it.
- Is the Collaborative’s preliminary project schedule realistic? If not, please recommend schedule modifications and provide a rationale.
 - What are likely to be the longest lead and/or critical path items in the facility’s development and construction schedule?
 - What are the greatest uncertainties in scheduling, and how can they be mitigated?
 - What is the current view of the Minerals Management Service (MMS) leasing and siting process?
 - What activities could the Collaborative take to mitigate development scheduling risks?
 - What are the potential impacts (both positive and negative) on this project from other planned/proposed offshore wind projects in the eastern U.S. that may be developed within the same general timeframe?
- m. **Developer Expectations of the Collaborative** – In this section, please indicate the roles of the Collaborative that, if not already defined, are desired or required to facilitate the development of the offshore wind facility. New York State is a member of the Mid-Atlantic Regional Council on the Ocean and has a state-focused Ocean and Great Lakes Ecosystem Conservation Council. What opportunities are there for the Collaborative to work through these or other groups to enhance the development of the project?
- n. **Additional Items** – The Collaborative is interested in feedback on any other issues including:
- What key issues has this RFI not addressed?
 - What additional information should the RFP include to assist developers in preparing a quality proposal?
 - What can the Collaborative do to enhance the quality of proposals?

IV. RFP DESCRIPTION

This section provides guidance regarding the Request for Proposal that will be developed following receipt and evaluation of responses to this RFI.

- a. **Content** - The RFP is anticipated to include at a minimum the following material:
- Minimum and maximum size (MW and/or annual MWh) requirements

- Results of available Collaborative-commissioned assessment studies
- Proposed facility location
- Proposed interconnection point(s)
- Proposed assembly location
- Terms of interconnection agreement
- List of required/requested information
- Draft PPA
- Proposal evaluation criteria
- Specifications for proposal contents
- Procurement schedule.

Through this RFI, the Collaborative is requesting suggestions for additional content components that should be included in the RFP or ideas for an alternative RFP structure. Lessons learned from other similar RFPs are welcomed.

- b. **Evaluation Criteria** - Following are some of the evaluation criteria the Collaborative is considering for evaluating proposals. The Collaborative may change or completely revise the evaluation criteria that are under consideration at this time. The Collaborative is seeking comments on the following and suggestions for additional criteria:

- Experience in developing large wind projects
- Experience in operating large wind projects
- Experience with developing offshore wind projects
- Experience with operating offshore wind projects
- Pricing and risks imposed on the Collaborative
- Value provided to Collaborative members
- Proposed minimum production guarantee and availability
- Generation duration curve (projected hourly and seasonal performance)
- Site selection and interconnection plan
- Plan for community involvement
- Permitting/approval plan, including the environmental impact statement
- Operation and maintenance plan and strategy for responding to related issues
- Methodology for forecasting generation
- Program for decommissioning and site restoration
- Financing plan
- Responsiveness to RFP requirements.

The Collaborative's ultimate selection of a successful project will be based on the overall quantitative (pricing) and qualitative attributes of a proposal.

- c. **Schedule** – The RFP is currently scheduled to be released on or about December 31, 2009, with a proposed response due date of April 1, 2010. Comments on this schedule are welcomed.

V. RESPONDING TO THIS RFI

Communications - To facilitate communications between the Collaborative and respondents and to ensure that all respondents have access to the same information, the Collaborative has established a

web site that will be the means of communications during the RFI process. The web site is accessible via the Collaborative's home page located at www.linycoffshorewind.com. This RFI will be posted on the web site for public access.

Respondents are invited to pose questions to the Collaborative regarding this RFI until August 3, 2009. Instructions on how to submit questions are on the RFI web site (www.linycoffshorewind-rfp.com). The Collaborative will target posting all responses to questions prior to August 10, 2009. The Collaborative reserves the right to, at its discretion, not answer some questions. The Collaborative is not bound to the responses to the questions it does answer. Posted responses will be available to all respondents via the "respondents only" portion of the web site. Respondents seeking access to this portion of the site need to obtain a user name and password from the Collaborative. Instructions for obtaining such access are posted on the public portion of the web site. Respondents are not required to have submitted a **Notice of Intent to Respond to RFI** (see discussion below) prior to obtaining access to the web site.

Notice of Intent to Respond to RFI - All potential respondents are strongly encouraged to provide a Notice of Intent to Respond to RFI to the Collaborative by 5 pm, Eastern Time on August 17, 2009. Such notice should contain the name, address, and phone number of the proposed respondent and a contact name, address, phone number, and e-mail address. This notice should be submitted via the web site discussed above.

Submittal Format – Respondents are requested to submit their response to this RFI according to the following outline:

- Description of respondent's company and experience
- Name of person(s), and contact information, to whom the RFP should be sent
- Provision of information according to the topics identified in Sections II, III and IV above.

Submission of Responses to RFI - One original document and one CD is required. The CD should contain standard Microsoft Office 2003 files or PDF files of all material contained in the Original document. The response must be mailed, sent by courier, or hand-delivered so that it is received by 3:00 p.m. Eastern Time on August 31, 2009 at the following address:

Mr. George Jee
Director, Energy Management
Consolidated Edison Company
Room 1310-S
4 Irving Place
New York, New York 10003

Additional Guidelines and Terms - This RFI is not a contract offer by the Collaborative. The Collaborative reserves the right to discontinue or modify the RFI process at any time, and makes no commitments, implied or otherwise, that this process will result in a business transaction or negotiation with one or more responders. Responders are advised that the Collaborative will not pay any cost

incurred in response to this RFI. All costs associated with responding to this RFI will be solely at the responder's expense.

The Collaborative makes no representations or warranties regarding the accuracy or completeness of the information contained in this RFI. The respondent is responsible for making its own evaluation of information and data contained in this RFI and in preparing and submitting responses to this RFI.

Responders to this RFI are cautioned to clearly label as "propriety" and "confidential" any specific information or other material that responders consider to be confidential. Members of the Collaborative are subject to the New York State Freedom of Information Law ("FOIL") which provides, as a general rule, that member records are accessible to the public, subject only to exceptions enumerated in FOIL which include, but are not limited to, an exception protecting trade secrets. After receipt of a FOIL request for information provided by a responder to this RFI, the Collaborative, to the fullest extent permitted by FOIL, would seek to protect the information submitted by the RFI responder that is marked "confidential" and "proprietary".

APPENDIX A

Joint Con Edison – LIPA Offshore Wind Power Integration Project Feasibility Assessment

(March 20, 2009 report follows)

A photograph of several white wind turbines against a clear blue sky. The turbines are positioned at different heights and angles, creating a sense of depth. The central turbine is the most prominent, with its three blades extending outwards. Other turbines are visible in the foreground and background, some partially obscured.

**Joint Con Edison – LIPA
Offshore Wind Power Integration Project
Feasibility Assessment**

March 20, 2009

**Joint Con Edison – LIPA Offshore Wind Power Integration Project
Feasibility Assessment**

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Joint Con Edison – LIPA Offshore Wind Power Integration Project Feasibility Assessment

Executive Summary:

This report summarizes the findings with respect to a critical aspect of a recently announced joint initiative to investigate the potential of renewable energy. Engineers from Con Edison and LIPA combined forces to determine the feasibility of their transmission systems to connect with and support a large source of new wind power to be located off the south shore of Long Island.

The joint study evaluated the necessary electric transmission system requirements that would be required to obtain wind power in increments of 350 MW, an amount that is equivalent to a moderate fossil power generating facility. This initial phase of the project focused only on the necessary electric transmission required for the on-shore portion of the project. The infrastructure and costs for the anticipated offshore wind and transmission to landfall have not yet been evaluated.

The study determined the following:

For a wind power installation up to 350 MW, a new transmission line from an on-shore receiver station to an existing station in northern Queens, combined with a connection to the LIPA transmission system in the vicinity of the Rockaways, is optimal from a simplicity and cost perspective.

For a phased wind power installation greater than an initial amount of 350 MW, it would be necessary to build new transmission lines from an on-shore receiver station to a new substation in the vicinity of eastern Queens, combined with a connection to the LIPA transmission system in the vicinity of the Rockaways. In addition, existing transmission lines between LIPA and Con Edison would be reconfigured to connect at the new station, allowing each utility its full access to the wind power. This configuration provides deliverability, reliability, and synergies for future growth and expansion.

Beneficial Environmental Impact

A 350 MW wind facility operating at 30% capacity factor would generate about 920,000 megawatt-hours per year, enough energy for over 250,000 homes.

The New York Public Service Commission estimates that every megawatt-hour of displaced fossil power in the state is equivalent to 900 pounds of carbon dioxide or CO₂. Therefore, a wind facility of this size would displace 400,000 tons of CO₂ annually, equivalent to removing 68,000 cars from local roads.

New renewable resources will help meet the New York State Renewable Portfolio Standard (RPS) and expected federal renewable energy goals and provide for added fuel diversity.

Background Information

An interest in reducing the use of fossil fuels for electricity production has generated interest in all types of renewable energy options. For New York City and Long Island, the potential use of offshore wind power appears to be a renewable resource that could provide a significant amount of clean energy to consumers. The practical aspects of harnessing wind and assessing the cost of putting a successful wind project into commercial service are the subject of this study.

In theory, any successful wind generation project for the New York metropolitan area must be centralized and large enough to be cost effective. It must interact with the electric grid at a high-voltage transmission level, and provide power on the order of hundreds of megawatts (MW). It must also be close enough to where electricity is used, so that energy can be harnessed economically due to lower transmission costs.

A New York City - Long Island area wind project warrants an offshore location due to the sheer size and number of wind turbines, coupled with the availability of strong, consistent and unobstructed wind. Wind's relative low-energy density makes it necessary to build large wind turbines in order to generate reasonable amounts of wind power.

An offshore wind facility of this size has distinct advantages over inland options. Ocean-based wind power is stronger, more consistently available, and can be situated closer to New York City and Long Island in contrast to land-based wind facilities in remote regions of the state. Also, land-based wind power availability, rather than that of offshore facilities, tends to drop off during the hottest part of a summer day, which is precisely the time that Con Edison and LIPA customers use the most electricity. The higher transmission costs add to the expense of remote land-based wind power

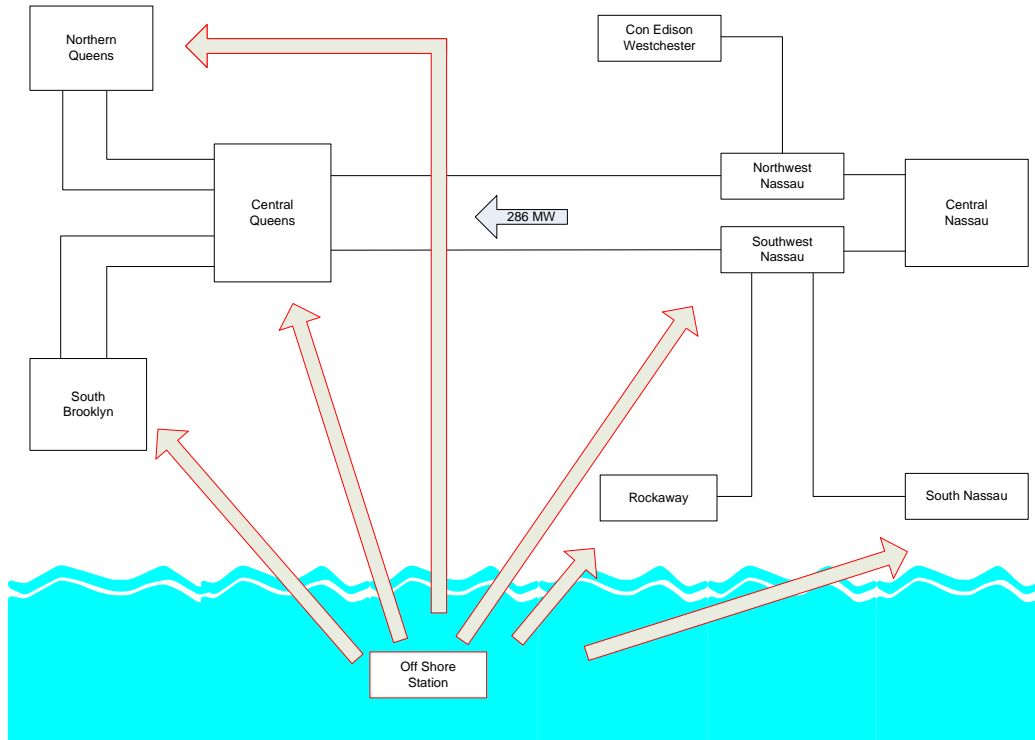
Scope and Objectives

This study evaluated the necessary transmission reinforcement required for 350 MW and 700 MW of generation. Preliminary analysis showed that more than 700 MW would require significant reinforcement in the transmission system, which would significantly increase the cost of the project.

The main objectives of this study include identifying and agreeing on the best interconnection sites, identifying the transmission paths required to deliver wind power to substations of each entity's electric system, and obtaining "order of magnitude" cost estimates for required transmission system reinforcement.

This study identifies the basic transmission system reinforcements required to deliver energy produced by a potential wind farm located off the coast of Long Island in the Atlantic Ocean with a connection to the Con Edison and LIPA electric systems.

Options Evaluated



The study considered six separate single points of interconnection. No one solution was considered to be best in all categories of reliability, cost-effectiveness and expandability. A two-phased approach with multiple points of interconnection was then considered.

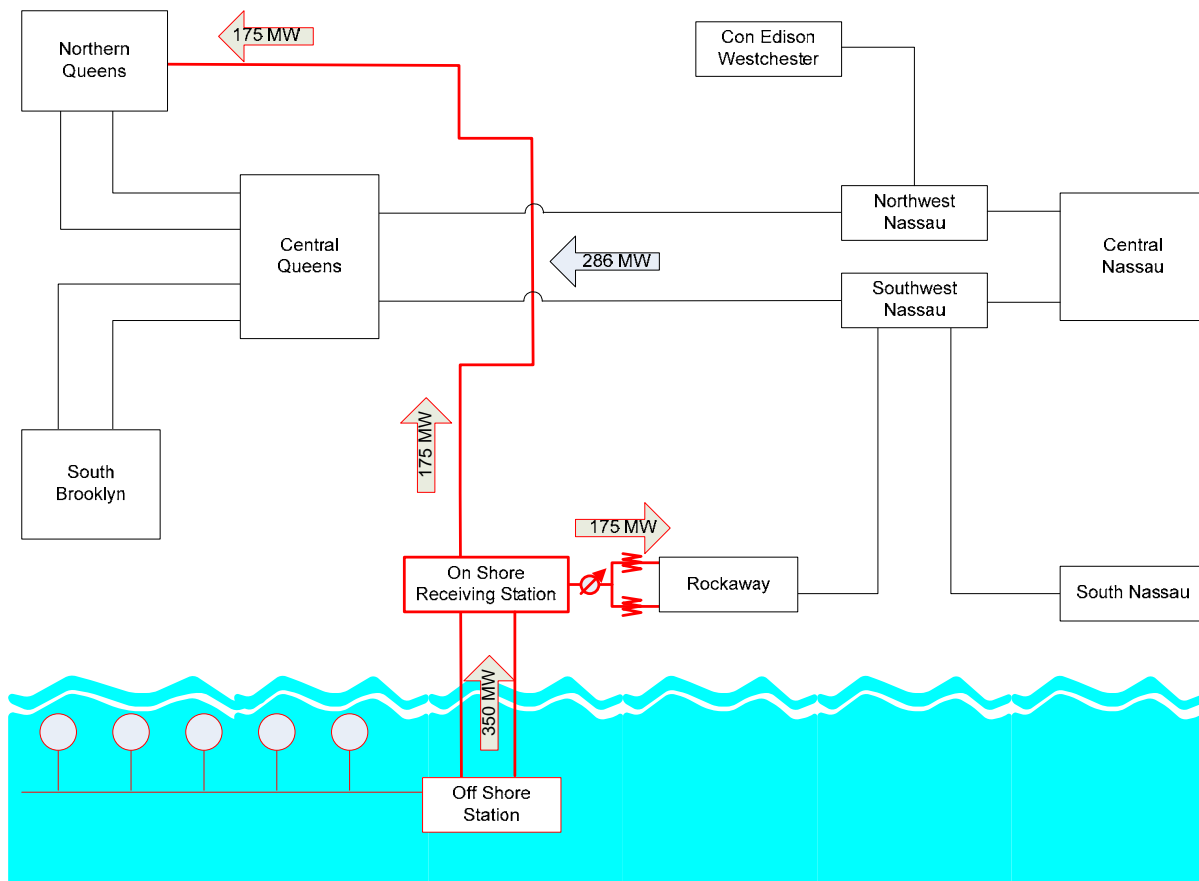
The phased approach has several advantages over the individual options:

1. Large construction costs are distributed at roughly the same level over time. No economies of scale were observed.
2. Multiple points of entry for wind power within both utilities improve flexibility and reliability.
3. The utilization of 138 kV voltage for this project allows for immediate and cost effective connectivity with the existing transmission infrastructure, and provides for a longer run of submarine cable to the wind farm, with minimal need for reactive compensation.
4. The location of the proposed Eastern Queens substation between Con Edison and LIPA provides opportunities for mutual support and sharing of resources, without taxing either utility's present infrastructure limitations.
5. The establishment of the Eastern Queens substation will support future electricity demand growth in the Con Edison service area, and could provide connectivity for potential future generation.
6. The power flows at each stage of development are within the existing transmission-system capabilities.

Each phase is described below in detail.

Phased-In Approach – Phase I

Phase I of the interconnection assumes the establishment of the offshore wind site with a capacity of 350 MW. New transmission would connect the on-shore station to the LIPA transmission system in the vicinity of the Rockaways, and the on-shore station to the Con Edison transmission system in northern Queens. This phase can accommodate up to 350 MW of wind power, shared equally between LIPA and Con Edison, without impacting the current interchange between the utilities. Power to the Northern Queens station will be provided on a single 138 kV feeder that is routed to pass near the location of the anticipated Eastern Queens transmission station. A spare set of conduits for this line could also be built in anticipation for a second transmission path to be established in Phase II. The following diagram shows the new infrastructure that would be installed during phase 1 in red:



The following table provides a gross order-of-magnitude estimate for the on-shore transmission Phase I infrastructure:

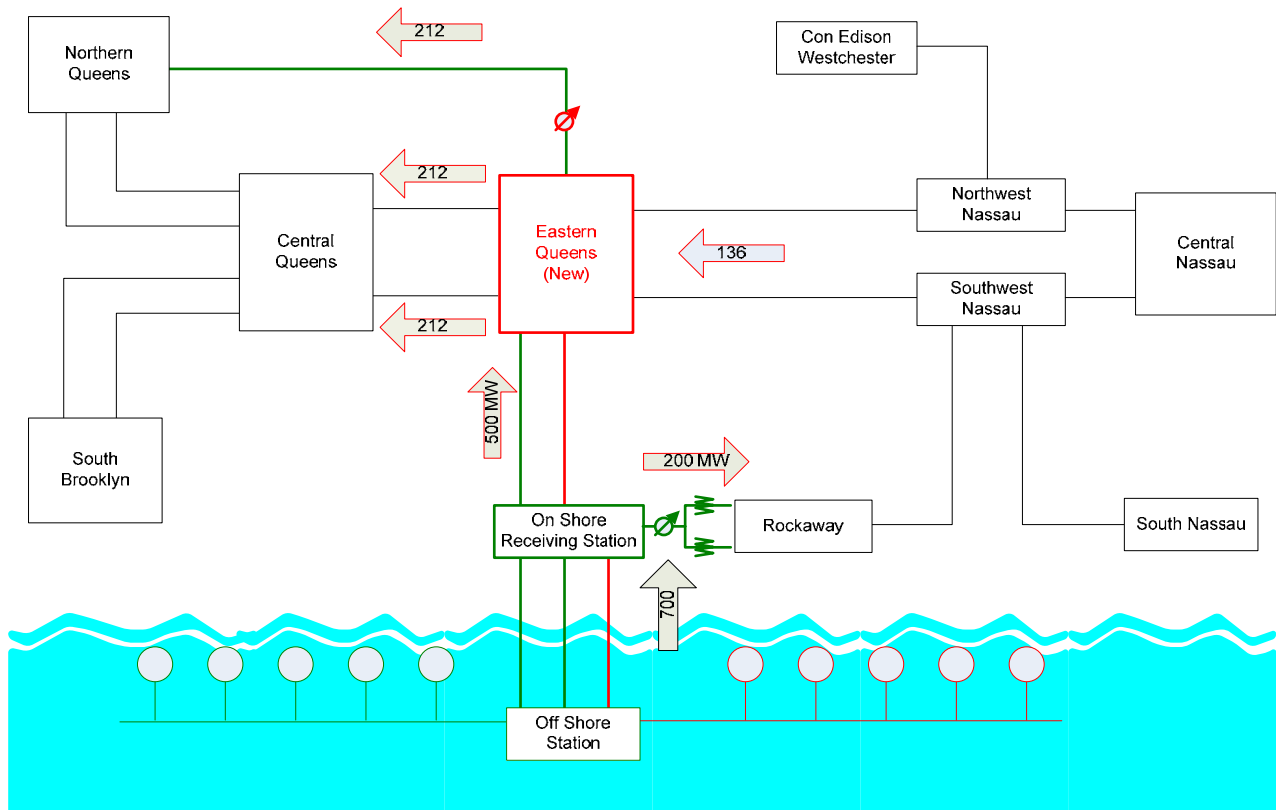
Phase I: Wind = 350 MW	Cost Description (Transmission Upgrades Only)	Costs
	Northern Queens: 2 Bus Sections, Breakers, MODs	\$35
	On-shore to Northern Queens (1 Transmission path+2nd conduit)	\$320
	LIPA Work At On-Shore Station	\$60
	Total Phase I Costs (2009 \$Millions)	\$415

Phased-In Approach – Phase II

Phase II assumes the expansion of an existing 350 MW Phase I facility up to 700 MW. The transmission system will include a new substation at Eastern Queens. The first transmission path is cut at Eastern Queens, leaving one transmission path going to Northern Queens and one transmission path coming from the On-Shore station. A second transmission line is run in parallel to the Eastern Queens / On-Shore station line. Two existing transmission lines between Central Queens and LIPA are rerouted to be intercepted by the Eastern Queens substation. An electrical device called a phase angle regulator is required on the transmission line between Eastern Queens and Northern Queens to regulate power flows from Eastern Queens into the Con Edison system.

Phase II can accommodate up to 700 MW of wind power, shared equally between LIPA and Con Edison. Power up to 200 MW for LIPA is tapped at the On-Shore Station as in Phase I, connected to LIPA's Rockaway substation. The remaining power for LIPA will be delivered through the Eastern Queens station by reducing the current net flow from LIPA to Con Edison by 150 MW, from 286 MW to 136 MW. Power for Con Edison can be delivered through the Eastern Queens station into the Northern and Central Queens stations.

The following diagram shows the incremental infrastructure changes for phase II in red, and the previous phase I infrastructure in green:



The following table provides a gross order-of-magnitude estimate for the Phase II expansion of transmission infrastructure as well as the total cost of both phases:

Phase II: Wind = 700 MW	Cost Description (Transmission Upgrades Only)	Costs
	Eastern Queens 138 kV Station (8 Breakers)	\$200
	Transmission Costs (2nd Trans Path + Reroute)	\$100
	PAR for Eastern Queens to Northern Queens Tie	\$30
	Redirect Con Ed - LIPA Ties thru Eastern Queens	\$76
	LIPA Expansion at On-shore Station	N/A
	Total Phase II Costs (2009 \$Millions)	\$406
	Cumulative Costs (Phase I and II)	\$821

Conclusions

The connection of a large offshore wind power facility is feasible within the context of the current transmission infrastructure of the Con Edison and LIPA utilities.

For a wind power installation with capacity up to 350 MW, utilization of the existing station in Northern Queens combined with a connection to the LIPA transmission system in the Rockaways is optimal for simplicity and cost.

For an expansion to a larger installation (up to 700 MW) the establishment of a new station in the vicinity of Eastern Queens provides additional capability to supply Con Edison and LIPA with their full share of the expanded wind facility. This solution is optimal for flexibility, reliability improvement, and synergies with future transmission opportunities.

Next Steps

Con Edison and LIPA are in the process of developing a plan to move the wind project evaluation forward. This would involve a more detailed assessment of the potential options, refinement of interconnection costs and construction plans and conducting an evaluation of the impact that a wind farm would have on grid operations. In order to gather the more detailed information that will be required to perform this assessment, Con Edison and LIPA plan to issue a Request for Information so that equipment manufacturers, wind developers and other interested parties can provide the necessary input. In addition, Con Edison and LIPA plan to initiate the process for installing wind monitoring equipment in the Atlantic Ocean to collect wind data and characteristics to support the assessment of the wind potential off of Long Island and Queens.