Proposal for assisting the Hudson Valley Smart Energy Coalition in assessing the need for new transmission

Prepared by London Economics International LLC

February 12, 2015

London Economics International LLC ("LEI") understands that the Hudson Valley Smart Energy Coalition ("HVSEC") is seeking a consultant to assess the economics of certain proposed transmission projects currently being considered by the New York State Public Service Commission. In this context, LEI is pleased to submit this proposal to offer its consulting and market analysis services to the HVSEC. With nearly 20 years of experience in analyzing and working in New York's deregulated energy market, significant exposure to projects related to transmission investment appraisal and power system simulation modeling, as well as extensive experience in preparing testimony for state regulators and policymakers on such subject matters, LEI is confident it is well-qualified to provide the HVSEC with its requested services.

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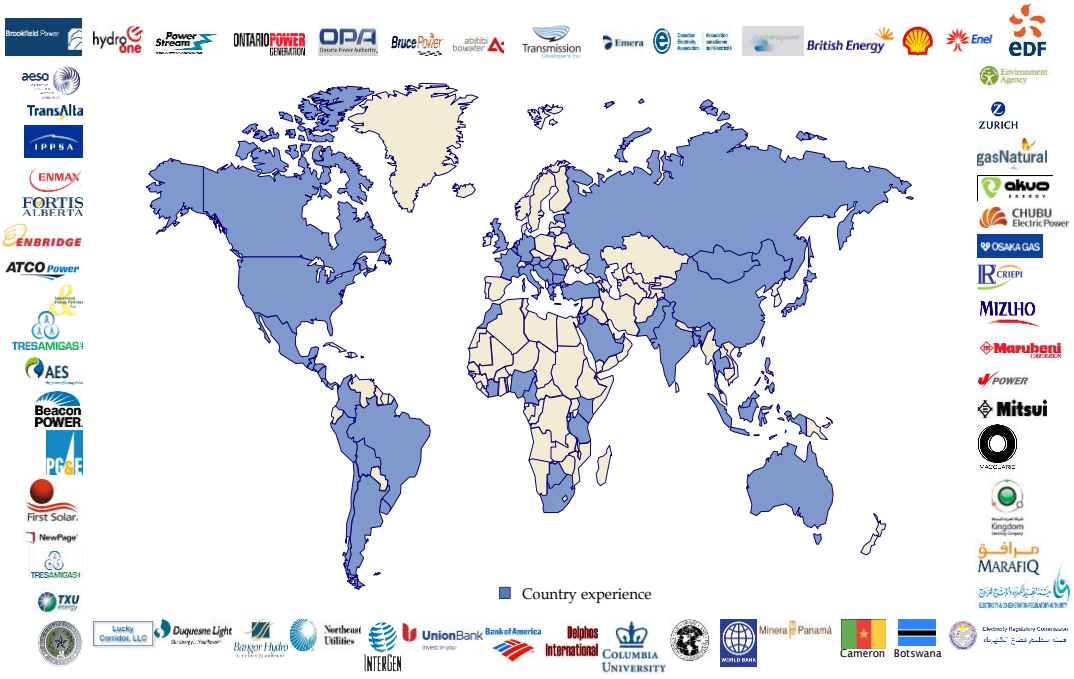
1 Introduction to LEI

London Economics International LLC ("LEI") is a global economic, financial, and strategic advisory professional services firm specializing in energy and infrastructure. The firm combines detailed understanding of specific network and commodity industries, such as electricity generation and distribution, with a suite of proprietary quantitative models to produce reliable and comprehensible results. The firm has its roots in advising on the initial round of privatization of electricity, gas, and water companies in the UK. Since then, LEI has advised private sector clients, market institutions, and governments on privatization, asset valuation, deregulation, tariff design, market power, and strategy in virtually all deregulating markets worldwide.

LEI's areas of expertise straddle both the deregulated/market environments (including for example, price forecasting and asset valuation; wholesale power market analysis; market design (ISO market rules); and competitive procurement) and application of regulatory economics (such as regulated tariff design; cost of service ratemaking and performance based ratemaking; productivity analysis; policy design for incentivizing renewable energy and new technologies; and transmission and distribution network analysis). LEI's principals are equally comfortable presenting the results of its analysis to management teams, lenders and board of directors, and testifying in front of regulators, legislative committees and judicial panels. As shown in the figure below, our clients are diverse and that gives the ability to understand the perspectives of many different stakeholders and also provide strategic advice to our clients regarding the views and likely positions of other parties.

Figure 1. Sample LEI experience throughout the world



The following attributes make LEI unique:

- clear, readable deliverables grounded in substantial topical and quantitative evidence;
- extensive experience in market analysis, long-term price forecasting and assets valuation in the New York ISO ("NYISO") market;
- successful experience working with transmission developers, IPPs, and state regulatory staff in NYISO;
- internally developed proprietary models for electricity price forecasting incorporating game theory, real options, Monte Carlo simulation, and sophisticated statistical techniques; and
- balance of private sector and governmental clients enables LEI to effectively advise both through an objective and multi-disciplinary lens.

2 Understanding of Assignment

LEI understands that the HVSEC is seeking a technical expert to aid in assessing the need for, and potential wholesale electricity market outcomes from, AC Transmission Line upgrades in the Hudson Valley. These include four projects currently being considered by the New York State Public Service Commission ("PSC") (including projects being proposed by Transco, NextEra, Boundless, and North America Transmission). These transmission projects originated following the Governors' Electricity Highway initiative, with a stated purposed being to relieve congestion costs in the Hudson Valley by adding 1,000 MWs of AC transmission capacity, thereby reducing the cost of electricity (energy and capacity) for downstate residents.

Nevertheless, it is unclear whether these proposed transmission projects will create benefits that exceed their costs pursuant to New York's existing regulatory and siting framework. We understand that the HVSEC is currently seeking assistance on issues associated with Part A of the PSC proceeding, and this is not a full Article VII process yet. Of specific interest to the HVSEC is understanding whether the benefits from reducing congestion justify the anticipated costs of these projects.

Based on the preliminary scope of work document received on January 21, 2015, LEI understands that the HVSEC is seeking services that include the following components:

I. Review the transmission sponsors' Part A applications, and any other relevant NYISO and New York State studies on congestion and reliability, as well as the report of Dr. Gidon Eshel.[1] Identify and outline key issues associated with the AC transmission line projects, including congestion issues and preliminary assessment of need for adding transmission capacity, with an expected submission date of March 16, 2015.

II. Prepare and submit a report which will encompass the main deliverable associated with this project, and will detail associated outcomes of the transmission project, to be submitted to the New York State Public Service Commission ("NYSPSC") by July 15, 2015. The proposed report contents are described in Section 3.

III. Present initial findings of Task II at the NYSPSC technical conference around mid-June.

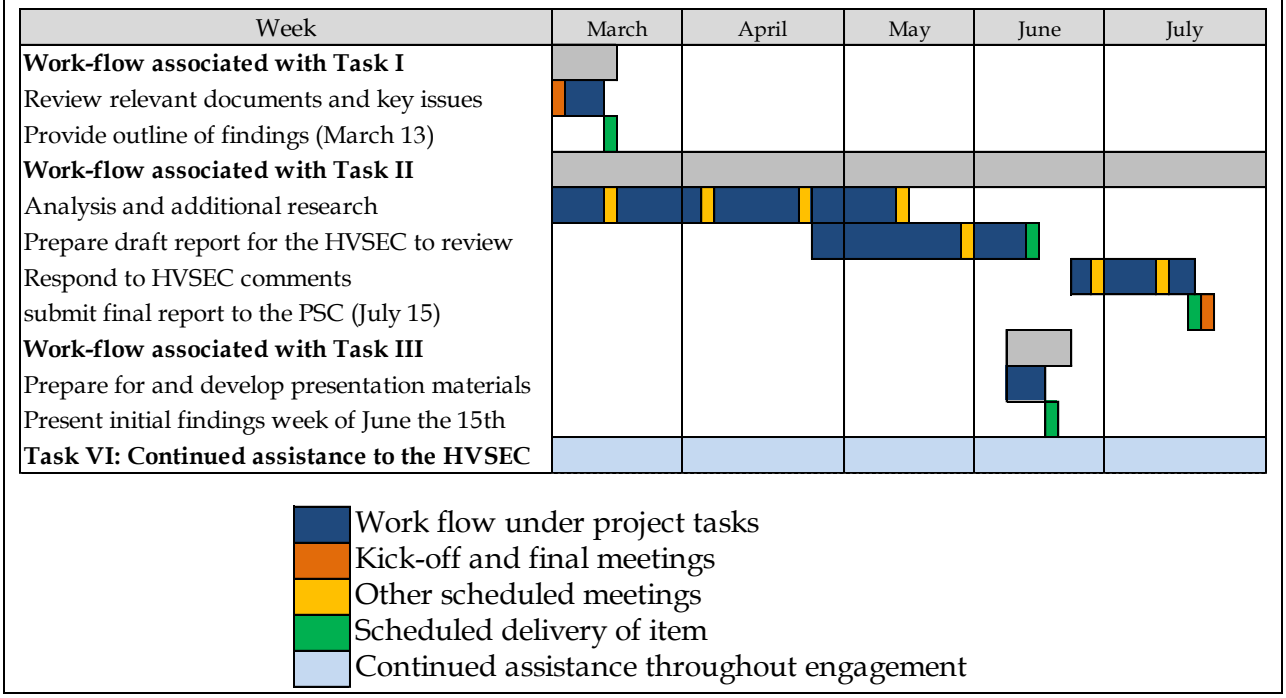
IV. Further assist the HVSEC, including potential preparation of comments as part of the Part A applications, assistance in preparation of replies associated with the report, and assistance in potential future engagements during Part B evidentiary hearings.

[1] We have not read Dr. Eshel's report. However, through our discussions, we understand that he is concluding that demand in downstate New York is not increasing, and additional projects are scheduled to come online in the near future, so there may not be a "need" from a supply-demand perspective for the additional transmission lines.

3 Work Plan and Budget

LEI is available to begin working on the project fairly quickly. To begin, LEI proposes holding a kick-off meeting with key stakeholders from the HVSEC. This meeting will allow the HVSEC to better understand LEI's proposed approach and methodology, and will allow for a discussion of expectations and requirements for both parties. LEI also suggests regular follow-up meetings (for example, bi-monthly) to discuss progress and developments. Figure 2 below presents a possible project plan that includes Tasks I-IV, as described in Section 2, and for illustrative purposes assumes a project commencement date of March 2, 2015 and scheduled delivery dates as outlined in the Scope of Work document received on January 21, 2015 (adjusted for the commencement date of the project).

Figure 2. Illustrative work plan and project schedule



The first associated work-flow item includes a review of all relevant documents (such as transmission sponsors' Part A applications, and NYISO and New York State studies on congestion and reliability), as well as the identification of key issues associated with the AC transmission line projects (such as congestion issues and preliminary assessment of need for additional transmission capacity). Findings from this task will be included in an outline of key issues provided to the HVSEC for an expected submission date of March 16, 2015. The professional fee for this task is priced at $20,000.

The second work flow item would deliver a market study of the congestion costs based on LEI's current base case outlook for the New York wholesale electricity market. Such a congestion analysis will be useful in understanding the basic future benefits of the proposed projects (although it will not specifically study the proposed transmission projects and how each project may change the course of market evolution).

This market study will provide a base case market outlook for NYISO for 20 years for energy and capacity, based on current market rules and using the best and most-up-to-date information on the New York power market. We would analyze the magnitude of congestion in terms of energy prices across New York and the areas around where the transmission projects are planned, as well as give our more general expectations for New York market. We would also look at capacity price differences across the current zones. This market study will show what level of congestion exists in the system currently, as well as projections for future congestion based on forecast energy and capacity prices across major sub-regions of the NYISO. The professional fee for this task is priced at $50,000.

LEI would prepare a report of findings to be submitted to the NYSPSC by July 15, 2015. The preparation and submission of the draft report to the HVSEC (and another iteration of responses to commentary received form the HSVEC) are all included in the quoted prices above. However, LEI's participation in technical workshops and testimony at hearings (as well as assistance with discovery, etc.), which is specifically Tasks III and IV of the work plan, would be incremental. Such effort is difficult to estimate and provide a fixed budget for. LEI proposes to invoice such effort on a Time and Materials ("T&M") basis, at LEI professional standard fee rates. For example, for public presentation of findings, the most likely presenter will be Julia Frayer, and a number of days of additional preparatory assistance from an LEI Consultant or Research Associate will likely be required. Therefore, such a task would likely be invoiced in the range of $8,000 to $12,000 (but could be greater depending on actual effort expended).

Reimbursable expenses for travel and lodging, data acquisition, and licensing and library fees, are all subject to the HVSEC approval, and will be invoiced at cost.[2]

[2] Meals, snacks, beverages, gratuities, laundry, dry cleaning, valet services, dependent care, and personal phone calls will not be billed to the HVSEC.

4 Qualifications of LEI

LEI has **extensive experience with the NYISO electricity market**, having worked for a variety of power sector parties, including investors, developers, lenders, regulators, and utilities since the late 1990s. LEI also has a strong, fundamental understanding of New York power markets, boasting years NYISO and New York transmission system experience. A sample of recent assignments include (but are not limited to):

- LEI was retained by an electricity transmission technology developer to perform an analysis of the macroeconomic impacts of the proposed Champlain Hudson Power Express ("CHPE") project in New York State. The proposed CHPE project would involve substantial investment and spending in-state during the course of construction of the transmission line and converter station. Once operational, the CHPE would also create macroeconomic benefits through direct employment, local spending for operations and maintenance, and also as a result of the electricity cost reductions for ratepayers in the state. LEI utilized the dynamic input-output ("I/O") economic model developed by Regional Economic Models, Inc. ("REMI") to measure the economic benefits to New York from the project, specifically analyzing the impact on employment and economic activity (Gross Domestic Product ("GDP")).
- LEI was engaged by a municipality to provide a critical, high level, review and rate impact assessment as well as a case study analysis on the impact of plant retirements on local communities, due to the loss of property tax revenues.
- LEI was engaged to provide an independent review of the economic analysis in two reports discussing forecasted market benefits, production cost savings and macroeconomic benefits of repowering coal fired units in upstate New York.
- LEI was retained by a consortium that included a global investment bank and a US renewable energy generator to prepare a 10-year outlook on wholesale New York electricity prices. The paper presented the energy price outlook for four key sub-regions of the New York power market and annual average Unforced Capacity ("UCAP") market-clearing prices for the Rest-of-State ("ROS"), New York City (NYC) and Long Island (LI) zones. Our analysis suggested that energy prices across the four modeled zones followed similar patterns due to the influence of gas prices and the new entry and retirement schedule. Findings also showed that UCAP prices reflected the internal reserve margins in each zone.
- LEI was retained by a Canadian nuclear power generator to conduct a comprehensive review and analysis of the New York market, which culminated in a white paper. The scope of the project involved: analysis/ review of state regulatory environment, NYISO market design, wholesale generation market, supply-demand balance, demand projections, transmission/ congestion issues, new plant additions, environmental compliance requirements, fuel price forecasts, restructuring status, key independent power producers, as well as distribution and retail supply.

Additionally, **wholesale power price forecasting and market analysis have been major business practice areas for LEI**. LEI's modeling approach has been refined over a nearly twenty year period to incorporate state-of-the-art statistical and market dynamic examination techniques when analyzing competitive wholesale markets. Using POOLMod, our proprietary pool simulation model, our team is able to develop a range of plausible wholesale electricity market outcomes, which we then employ to forecast revenues to generation stations. POOLMod results have been relied upon by regulators in New England, including in Connecticut, New Hampshire, Maine and Massachusetts, as well as other jurisdictions such as in New York and in MISO. The Appendix in Section 5 below provides an overview of POOLMod.

Using our proprietary simulation modeling, we also have **extensive experience performing economic valuations of transmission assets**. Prior engagements range from review of entire wires companies to specific merchant transmission project assessments to evaluation of complex structured finance transactions involving transmission network companies worldwide. Recently, LEI simulated the New England market in order to determine whether the proposed transmission projects would produce economic benefits to the New England region. In addition, LEI valued the transmission rights of a proposed new transmission line between the Midwest and Canada. One aspect of the project required that LEI assess whether the energy flows on the new transmission line would reduce LMPs in the importing region and thereby generation cost savings to customers. LEI provided context-setting, market analysis to Public Service of New Hampshire in their discussions with stakeholders about the potential benefits of the Northern Pass project. LEI also served as the economic advisor to the investors in the Northeast Reliability Interconnect, connecting New England with the Maritimes. In 2009, LEI supported NU with its Greater Springfield Reliability Project ("GSRP"), determining economic benefits provided to the New England region. Furthermore, in 2007 and early 2008, we also conducted preliminary economic appraisal of several other proposed DC-based projects in New England. LEI has also been engaged by a US power utility to perform a 15-year simulation analysis to estimate the market impacts resulting from a new transmission interconnection and project the impact on Maine customers.

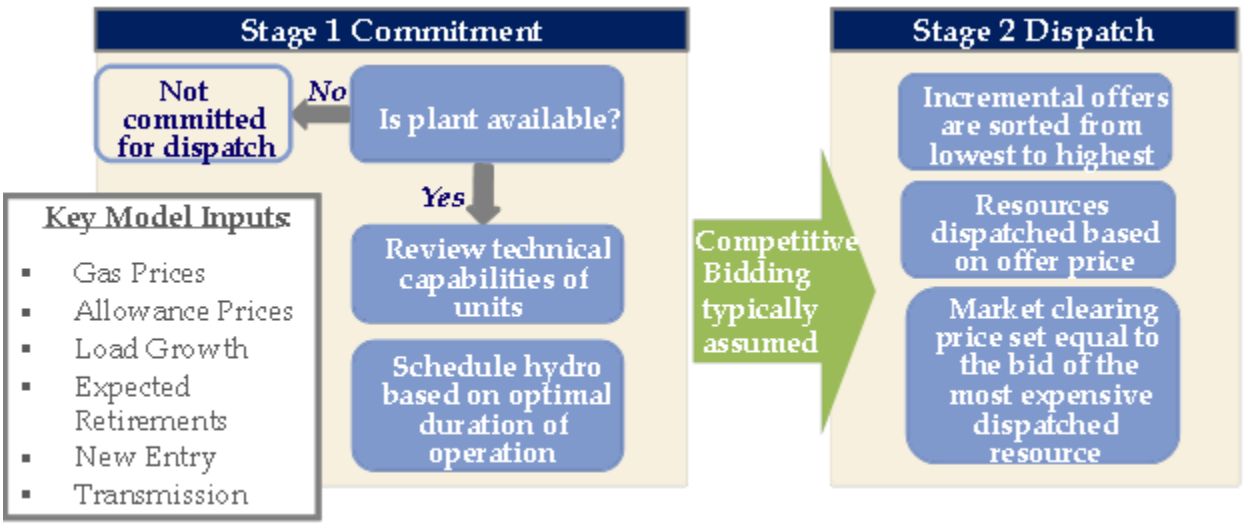
Finally, Julia Frayer, Managing Director at LEI, has extensive experience **testifying** and **providing expert witness services**. Julia has testified before a number of state utility commissions, and regulatory agencies, including New York, Connecticut, and Massachusetts. Julia has also testified at FERC, and in litigation and arbitration proceedings.

5 Appendix: Overview of POOLMod

For the wholesale energy prices outlook, we employ our proprietary simulation model, POOLMod, as the foundation for our electricity price forecast. POOLMod simulates the dispatch of generating resources in the market subject to least cost dispatch principles to meet projected hourly load and technical assumptions on generation operating capacity and availability of transmission.

POOLMod consists of a number of key algorithms, such as maintenance scheduling, assignment of stochastic forced outages, hydro shadow pricing, commitment, and dispatch. The first stage of analysis requires the development of an availability schedule for system resources. First, POOLMod determines a 'near optimal' maintenance schedule on an annual basis, accounting for the need to preserve regional reserve margins across the year and a reasonable baseload, mid-merit, and peaking capacity mix. Then, POOLMod allocates forced (unplanned) outages randomly across the year based on the forced outage rate specified for each resource.

Figure 3. POOLMod's two-stage process



POOLMod next commits and dispatches plants on a daily basis. Commitment is based on the schedule of available plants net of maintenance, and takes into consideration the technical requirements of the units (such as start/stop capabilities, start costs (if any), and minimum on and off times). During the commitment procedure, hydro resources are scheduled according to the optimal duration of operation in the scheduled day. They are then given a shadow price just below the commitment price of the resource that would otherwise operate at that same schedule (i.e., the resource they are displacing).