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VIA EMAIL AND OVERNIGHT DELIVERY

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RE: New York Energy Highway Request for Information

Dear Mr. Quinones:

On behalf of the Sierra Club we want to thank you for the opportunity to offer comments regarding Governor Cuomo's ambitious and exciting New York Energy Highway initiative. Founded in 1892, the Sierra Club is the nation's oldest grassroots environmental organization with more than 600,000 members in all 50 states, including more than 36,000 members in the State of New York. The mission of the Sierra Club is to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments. In view of this mission, the Sierra Club seeks to ensure the availability of safe and reliable energy in a manner that protects human health and promotes a healthy environment.

The Energy Highway initiative provides the State of New York with an opportunity to become a leader in clean energy nationwide and a model for other states. New York is blessed with bountiful renewable energy resources, including significant offshore wind resources off the south shore of Long Island, thousands of megawatts of onshore wind resources upstate, and solar resources distributed throughout the state. Fostered appropriately, the renewable energy industry in New York can move to the forefront nationally in offshore and onshore wind and in distributed solar, creating thousands of jobs for New Yorkers in the process, and improving the health of New Yorkers as the State transitions away from old and highly polluting fossil fuel generation.

However, in order for New York to fully realize the opportunities presented by the Energy Highway initiative, the Task Force must clarify the specific energy and transmission needs that the Energy Highway seeks to address and establish prudent and transparent criteria by which it will evaluate the project proposals that it receives to ensure that these needs are appropriately addressed. In clarifying needs, the Task Force

should ensure that it possesses robust and up-to-date information regarding current and projected reliability concerns in the State, including the location and time frame of these concerns. The recently-released comprehensive State Transmission and Reliability Study Phase II Study Report ("STARS Phase II Report")[1] and the 2009 New York State Energy Plan and forthcoming 2013 Energy Plan directly addresses these issues and can help the Task Force distinguish between projects that provide significant ongoing benefits from those for which there is no present need.

In tandem with identifying the specific needs that it seeks to address through the Energy Highway, the Task Force must enumerate the criteria by which these projects will be evaluated. These criteria should include, **first and foremost**, *the full environmental impact of the project, including its overall effect on the full suite of air emissions.* Such a criterion is essential for evaluating projects regardless of whether they are in the form of new generation or new transmission infrastructure, as transmission upgrades that serve to prolong the life or energy output of old and uncontrolled fossil-fuel power plants are as detrimental to the health of New Yorkers as constructing such generation from scratch. Central to the evaluation of environmental impacts is the effect that the project will have on the State's overall greenhouse gas ("GHG") emissions. All projects must be evaluated in light of their consistency with the New York State Climate Action Plan and the State's ambitious and well-justified goal of reducing GHG emissions by 80% from 1990 levels by 2050. Moreover, the review of each proposed project should consider its lifecycle environmental impacts. The scope of such environmental impact should not be limited to New York State, but should include all areas affected by the project and the energy resources used by that project. For example, the evaluation of proposed new natural gas generation projects should consider the direct and cumulative environmental impacts of the hydraulic fracturing required to obtain their fuel in addition to the direct air emissions that the new plants will have.

Second, *projects should be evaluated in light of their effect on net energy demand.* While the Energy Highway initiative purports to focus exclusively on "supply-side and infrastructure projects that generate and transmit energy,"[2] the Task Force should nevertheless consider the comparative cost-effectiveness of energy efficiency and demand side management when evaluating proposals for new generation. This will help protect ratepayers by avoiding expensive new generation in situations where targeted energy efficiency or demand resources could cost-effectively alleviate reliability concerns.

Third, *potential projects should be evaluated in light of their ability to help New York meet the administrative targets of its renewable portfolio standard ("RPS").* New York has an ambitious goal of obtaining 30% of its energy from renewable sources by 2015. As the Task Force has already signaled, considerable weight should be given to projects that help New York achieve this laudable (and legally mandated) goal.

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[1] A copy of the STARS Phase II Report is attached as Exhibit 1.
[2] *See* http://nyenergyhighway.com/Content/pdf/Energy_Highway_FAQ.pdf.

Fourth and finally, *projects should be evaluated with an eye to minimizing long-term ratepayer impacts.* To the extent that new generation would be secured through power purchase agreements, the Task Force should consider both the fuel price risk and emission price risk (e.g., a tax on carbon) associated with the new generation to protect ratepayers from excessive increases to their electricity bills.

I. Factual Background

In his January 4, 2012 State of the State address, New York Governor Andrew Cuomo announced an ambitious initiative to revitalize New York's energy generation and transmission infrastructure. The New York Energy Highway initiative seeks to foster new energy projects in the State and upgrade New York's transmission infrastructure to ensure that generation resources are connected with the areas of heaviest load. The Energy Highway's goals also include assuring long-term reliability of the electric system in the face of likely retirements of aging fossil fuel units, encouraging the development of utility-scale renewable generation resources throughout the State, and increasing the efficiency of power generation, particularly in densely populated urban areas. As the Task Force has identified, the Energy Highway has the potential to create jobs for New Yorkers and maximize ratepayer value in the operation of the electric grid while contributing to an environmentally sustainable future for New York.

On April 11, 2012, the Task Force issued a Request for Information ("RFI") seeking proposals for projects that would advance the goals of the Energy Highway. Beyond identifying broad issues such as an aging transmission infrastructure, the potential retirement of upstate coal plants, and the mismatch between upstate generation and downstate load, the RFI provides little guidance as to the location, nature, or time frame of generation and transmission needs. In addition, although New York State Energy Research and Development Authority ("NYSERDA") CEO Frank Murray indicated at the April 19, 2012 stakeholder meeting that projects will be judged based upon how they address the objectives of the RFI, the Task Force does not appear to have fully fleshed out the criteria for evaluating the hundreds of project proposals that it is certain to receive.

II. Statutory and Regulatory Background

The Energy Highway initiative exists within a landscape of regulations and planning processes that guide and cabin the discretion of the Task Force. These include:

A. The New York State Energy Planning Process

New York Energy Law Article 6 creates a robust energy planning process for New York State. Section 6-102 creates an energy planning board ("Board") chaired by the president of NYSERDA. This Board is responsible for developing, through a process

of stakeholder input, an Energy Plan for New York every four years. Energy Law §§ 6-104(1), 6-106(1). The most recent Energy Plan is from 2009,[3] and the Board is in the process of developing its forthcoming 2013 Energy Plan.[4] Each quadrennial plan is required to incorporate forecasts of at least ten years for electricity demand, accounting for energy conservation, load management, and demand-reducing measures, and energy supply by generation type. *See id.* § 6-104(2)(a)(i) & (ii). The plan must then assess the ability of the existing transmission and supply to satisfy projected needs, and determine what additional electric capacity and/or transmission is required to meet energy supply requirements, including consideration of whether distributed generation, energy efficiency and conservation measures can address these needs. *Id.* § 6-104(2)(a)(iii) & (iv).

In developing the plan, the Board is guided by a number of goals set forth in the statute. These are:

- improving the reliability of the state's energy systems;
- insulating consumers from volatility in market prices;
- reducing the overall cost of energy in the state; and
- minimizing public health and environmental impacts, in particular, environmental impacts related to climate change.

Id. § 6-102(5). Each energy plan must also identify policies and programs designed to maximize cost-effective energy efficiency and conservation activities to meet projected demand growth. *Id.*

In addition, by September 1, 2012 and every four years thereafter, the Board is required to undertake a "study of the overall reliability of the state's electric transmission and distribution system." *Id.* § 6-108(1). Among other things, this study is required to include an assessment of "the current and projected reliability of the electric power system over the term of the planning period, with specific focus on transmission systems and distribution systems within the state. The assessment shall examine: (i) investment in infrastructure, including capital improvements, expansions, and maintenance; and (ii) workforce utilization." *Id.* § 6-108(1)(a). The study must also consider the impact on the transmission systems of: (i) distributed electric generation, especially using renewable or innovative energy resources; (ii) energy conservation and efficiency; (iii) load control and peak saving measures; (iv) corporate reorganization of electric utilities; (v) performance ratemaking, multi-year rate agreements, and other departures from traditional regulatory mechanisms; and (vi) large scale industrial development; (vii) changes in protocols for electricity dispatched through the federally-designated bulk system operator or its successor or successors; (viii) accommodation of proposed new electric generation facilities or repowering or life extension of existing facilities; and (ix)

[3] The 2009 Energy Plan is available at http://www.nysenergyplan.com/2009stateenergyplan.html.
[4] The Board completed its Final Scope for the 2013 Energy Plan on October 26, 2011. The Final Scope is available at http://www.nysenergyplan.com/scope.html.

the market-driven nature of decisions to build, size, and locate such facilities. *Id.* § 6-108(1)(c).

B. Executive Order No. 24 (2009)

On August 6, 2009, then New York Governor David A. Paterson issued an executive order declaring it to be the goal of the State to reduce GHG emissions from all sources within the State by 80% below 1990 levels by 2050. *See* Executive Order No. 24 (2009).[5] Governor Paterson's executive order created a Climate Action Council ("CAC"), which was tasked with preparing a draft Climate Action Plan by September 30, 2010. The Climate Action Plan Interim Report, released in November 2010, recognized that "achieving the 2050 GHG reduction goal will require dramatic change." Interim Report at ES-1.[6] As the CAC explained: "To meet th[e 80% by 2050] goal, we must transform the way we make and use energy—we must maximize efficiency and make a major shift toward zero-GHG emissions in electricity generation, smart electric transmission and distribution systems, low-carbon buildings, and zero-emission vehicles, and increase options for alternative modes of travel and land use." *Id.* at ES-1 to ES-2. In the power supply and delivery sector, the CAC advocated, among other things, accelerating the introduction of zero- and low-carbon sources of power including renewable resources, increasing the RPS, expanding the Regional Greenhouse Gas Initiative ("RGGI"), establishing GHG emission standards for new power plants, and fostering policies that encourage the repowering of existing fossil fuel plants. *Id.* at ES-3. The New York State Department of Environmental Conservation ("NYSDEC") has already promulgated proposed regulations to limit carbon dioxide ("CO2") emissions from new or uprated fossil fuel-fired power plants. *See* 6 NYCRR Part 251 (proposed Jan. 18, 2012). The proposed regulation is based on an emission rate achievable by a new natural gas plant, meaning that any proposed new coal plant would be required to capture and sequester a significant fraction of its CO2 emissions.

C. The New York State Renewable Portfolio Standard

Renewable resources, including significant amounts of hydroelectric power, comprise an important fraction of New York State's energy mix. Through orders by the PSC, New York has formalized its reliance on renewable energy into a Renewable Portfolio Standard ("RPS"), which dictates the percentage of New York's energy that must come from qualified renewable resources. Unlike most other states, New York uses a central procurement model whereby NYSERDA administers or is otherwise responsible for the majority of the RPS's goal. NYSERDA's obligations include procuring resources from two distinct tiers: the Main Tier, which is comprised of larger utility scale resources, and the Customer Sited Tier, which includes smaller, behind the meter resources. Any shortfall is made up by the Voluntary Market, purchases made by state agencies under

[5] Available at http://www.dec.ny.gov/energy/71394.html.
[6] A copy of the Interim Report is available at http://www.nyclimatechange.us/InterimReport.cfm.

Executive Order 111, and purchases made by the Long Island Power Authority. *See, e.g.*, New York State Energy Plan (December 2009), Vol. I at 46.

By order dated January 8, 2010, the New York Public Service Commission ("PSC") increased the New York Renewable Portfolio Standard ("RPS") from 25% to 30% by 2015. This decision was driven in large part by New York's aggressive Energy Efficiency Portfolio Standard ("EEPS"), discussed below, which is anticipated to significantly reduce energy consumption in the State, and thereby has the potential to incidentally weaken the RPS if the RPS goals were not raised. *See* PSC Order, Case No. 03-E-0188, at 3 (Jan. 8, 2010). This recent increase to the RPS is primarily targeted at the Main Tier.

D. The Energy Efficiency Portfolio Standard

In June 2008, the PSC issued an order creating an Energy Efficiency Portfolio Standard for the State of New York. *See* PSC Order, Case No. 07-M-0548 (June 23, 2008). The EEPS established a goal of reducing electricity usage by 15% statewide by 2015. *Id.* at 2. It also establishes a fixed MWh electricity target for 2015 corresponding to the requisite level of savings from the State's electric utilities to achieve the 15% reduction. New York utilities were required to file energy efficiency programs, and NYSERDA, as well as independent parties, were invited to submit energy efficiency program proposals for approval by the PSC. Since June 2009 the Commission has approved over 90 electric and gas energy efficiency programs, along with rules to guide implementation and measure results.[7]

III. The Task Force Should Clarify the Needs to Be Addressed Through the Energy Highway Initiative

As a prerequisite to evaluating the proposals that the Task Force receives, the Task Force needs to clarify the specific generation and transmission needs that it hopes to address through the Energy Highway initiative. Without such a clarification of needs, the Task Force will not be in a position to distinguish projects that fill critical generation and transmission gaps from those that are redundant or untimely.

Fortunately, several existing and forthcoming reports shed considerable light on the State's transmission and generation needs. In particular, the Task Force should draw heavily on the January 13, 2010 STARS Phase I[8] and April 30, 2012 STARS Phase II Reports, which, respectively, identify the need for additional transfer capability to meet state-wide Loss-of-Load Expectation ("LOLE") with the existing transmission system, and identify the most suitable and cost effective transmission alternatives to meet the

[7] *See generally* http://www3.dps.ny.gov/W/PSCWeb.nsf/All/06F2FEE55575BD8A852576E4006F9AF7?OpenDocument.
[8] A copy of the STARS Phase I Report is attached as Exhibit 2.

previously determined additional transfer capability while considering aged infrastructure and integration of renewable resources.

In addition, the New York State energy planning process provides important resources to guide the Task Force's assessment of needs. The Task Force should keep itself apprised of developments in the 2013 New York State Energy Plan, the first public draft of which should be available for comments in September 2012 and the final version of which is due to be completed in March 2013. At the same time, the Task Force should be tracking the development of the forthcoming September 1 study of the overall reliability of the state's electric transmission and distribution system, which must be issued by the Board pursuant to Energy Law § 6-108(1). The Task Force can use the findings of these studies and plans to appropriately target the Energy Highway initiative toward the most critical and timely projects.

IV. The Task Force Should Clarify the Criteria By Which Projects Will Be Evaluated and Ensure That These Criteria Include a Complete Evaluation of the Project's Environmental Impacts, Including Climate Change Impacts, the Cost-Effectiveness of the Project Relative to Energy Efficiency and Demand Side Management, the Ability of the Project to Help New York State Fulfill Its RPS Obligations, and the Impact of the Project on Ratepayers

To maximize the value of the Energy Highway initiative, not only must the Task Force clarify the specific needs to be addressed, it must also enumerate prudent and transparent criteria by which project proposals will be evaluated. These criteria, which will be driven by both legal and policy considerations, include: (1) the full environmental impact of the project, including the effect of both GHG and non-GHG air emissions; (2) the cost-effectiveness of the project relative to energy efficiency and demand resources; (3) the project's ability to help New York meet its RPS obligations; and (4) the impact of the project on ratepayers.

A. Criterion 1: Full Environmental Impact of the Project

Consistent with New York's energy planning legislation and Executive Order No. 24, the Task Force must give weight to the full environmental impact of each project taking into consideration both climate and non-climate impacts.

In developing the State's quadrennial energy plans, the legislature required that express consideration be given to "minimizing public health and environmental impacts, in particular, environmental impacts related to climate change." Energy Law § 6-102(5). This mandate is echoed and extended by Executive Order No. 24, which establishes as a state goal the reduction of New York's greenhouse gas emissions to 80% below 1990 levels by the year 2050. The CAC's Interim Report provides a roadmap for achieving

these reductions, and should likewise guide the Task Force's deliberations regarding proposed projects.

The legal mandates to consider climate and other environmental impacts are backed by strong policy considerations. New York has reached a pivotal moment in determining its energy future. Through the Energy Highway initiative, the Task Force will be making energy generation and transmission decisions that will shape energy policy in the State for decades to come and will determine whether New York is putting itself on a course to reduce pollution and meet the aggressive GHG emission reductions set forth in Executive Order No. 24, or whether it is committing itself to significant continued GHG and other emissions from the energy sector.

The energy sector already plays a significant role in New York's GHG emissions. This role is likely to continue to grow in the future as electrification of vehicle types currently powered by petroleum based fuels shifts GHG emissions from the transportation sector to the energy sector.[9] As highly polluting and GHG-intensive coal plants are transitioned out of the energy mix, the crucial question is whether they will be replaced by more fossil fuel generation, or whether energy and capacity needs created by these retirements will be addressed through energy efficiency, demand side resources, and carbon-free renewable resources like on-shore and offshore wind and distributed and utility-scale solar. As the CAC explained: "To meet th[e 80% by 2050] goal, we must transform the way we make and use energy—we must maximize efficiency and make a major shift toward zero-GHG emissions in electricity generation, smart electric transmission and distribution systems, low-carbon buildings, and zero-emission vehicles, and increase options for alternative modes of travel and land use." Interim Report at ES-1 to ES-2.

The correctness of the CAC's insight is bolstered by recent work by Myhrvold and Caldeira.[10] As Myhrvold and Caldeira's paper illustrates (see figure below), transitioning from coal to natural gas does not go anywhere near far enough in reducing greenhouse gas emissions to meet long-term emission reduction targets. With emissions from combustion of natural gas approximately half those of coal,[11] and lifecycle emissions well more than half those of coal when wellhead methane leakage and system leakage are properly accounted for, natural gas cannot factor too prominently into a meaningful long-term GHG reduction strategy.

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[9] For a discussion of the role of electrification of transportation in achieving 80% GHG reductions by 2050, see James H. Williams et al., The Technology Path to Deep Greenhouse Gas Emissions Cuts by 2050: The Pivotal Role of Electricity, Science Vol. 335, pp 53-59 (Jan. 6, 2012), a copy of which is attached as Exhibit 3.

[10] *See* N.P. Myhrvold and K. Caldeira, Greenhouse Gases, Climate Change and the Transition from Coal to Low-Carbon Electricity, Env. Res. Letters 7 (2012), at Fig. 2 (illustrating the minimal incremental climate benefit from switching from coal to natural gas). A copy of Myhrvold & Caldeira is attached as Exhibit 4.

[11] *See* EPA, Natural Gas, available at http://www.epa.gov/cleanenergy/energy-and-you/affect/natural-gas.html.

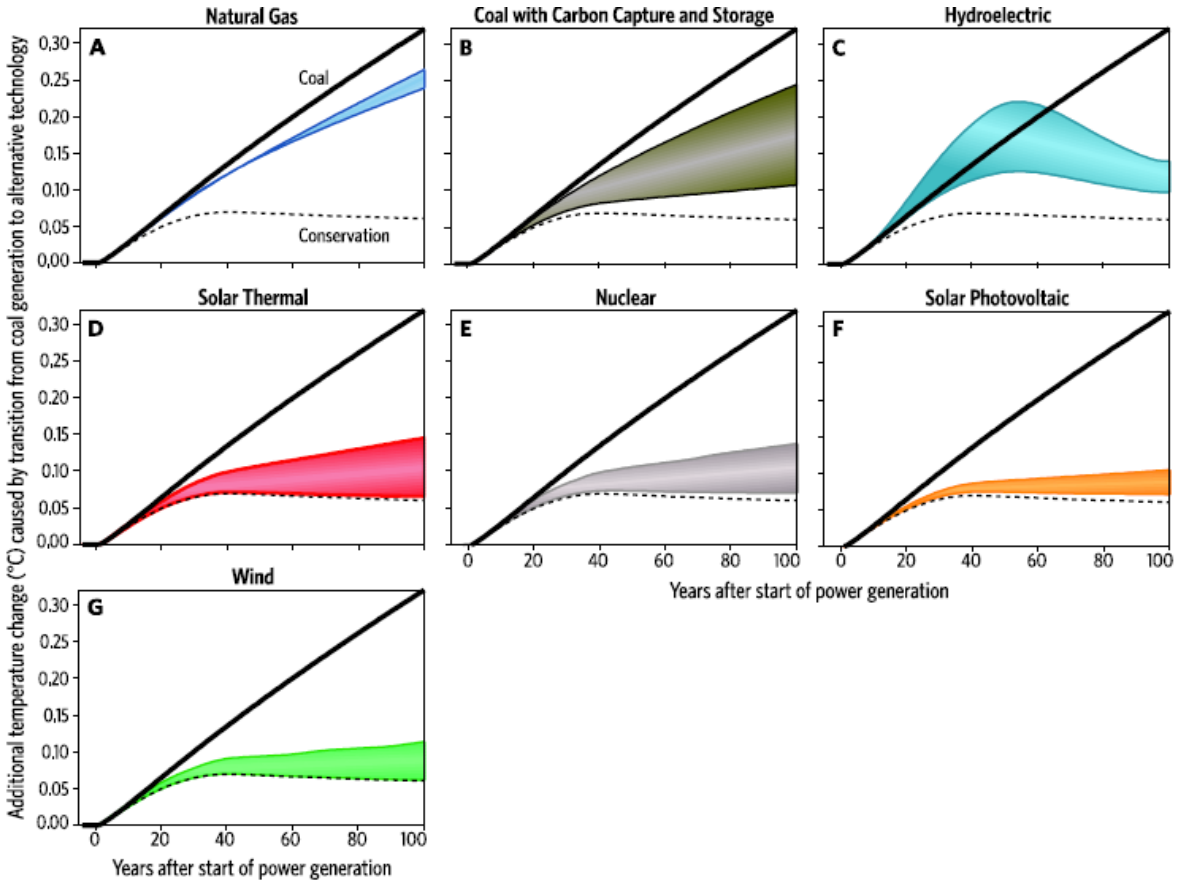


Figure 2. Many decades may pass before a transition from coal-based electricity to alternative generation technologies yields substantial temperature benefits. Panels above show the temperature increases predicted to occur during a 40 yr transition of 1 TW_e of generating capacity. Warming resulting from continued coal use with no alternative technology sets an upper bound (solid black lines), and the temperature increase predicted to occur even if coal were replaced by idealized conservation with zero CO_2 emissions (dashed lines) represents a lower bound. The colored bands represent the range of warming outcomes spanned by high and low life-cycle estimates for the energy technologies illustrated: (A) natural gas, (B) coal with carbon capture and storage, (C) hydroelectric, (D) solar thermal, (E) nuclear, (F) solar photovoltaic and (G) wind.

The Task Force should heed the guidance of the CAC in evaluating project proposals and carefully consider projects' consistency with New York's long-term climate planning goals.

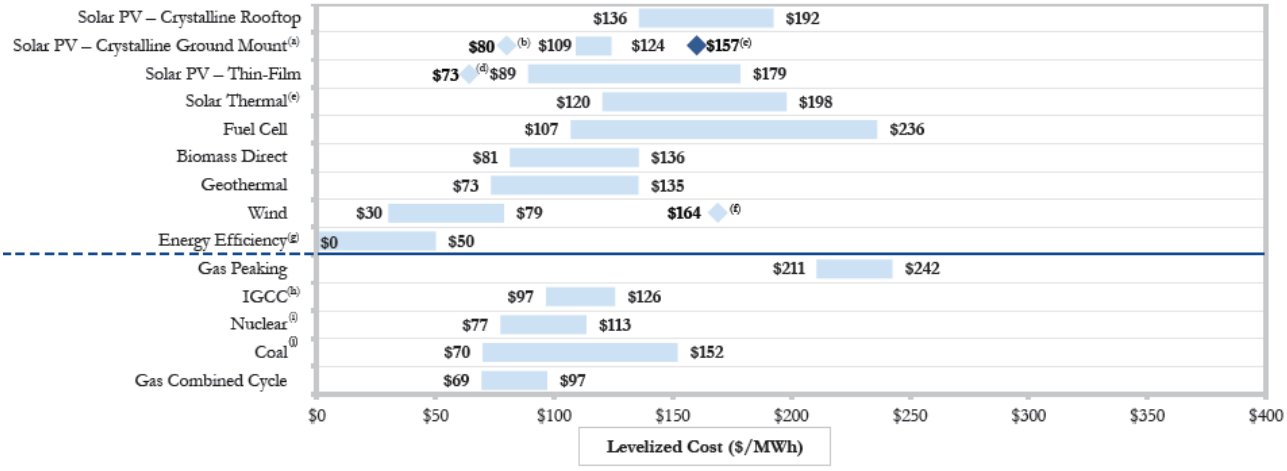
In addition, the review of each proposed project should consider the project's full lifecycle environmental impacts, and should consider the impacts not only to New York State, but to all areas affected by the project and the energy resources used by that project. This consideration is particularly important in the context of new natural gas generation. When evaluating proposals for new natural gas projects, the Task Force should look to both the direct and cumulative environmental impacts of the hydraulic fracturing required to obtain the fuel in addition to the direct air emissions that the new plants will have.

B. Criterion 2: Effect of the Project on Net Energy Demand

Despite the Energy Highways' stated focus on supply-side and infrastructure projects that generate and transmit energy, the Task Force should not lose sight of the comparative cost-effectiveness of energy efficiency and demand side management when evaluating proposals for new generation. Consideration of demand side alternatives will help protect ratepayers by ensuring that the Task Force avoiding approval of expensive new generation in situations where targeted energy efficiency or demand resources could cost-effectively alleviate reliability concerns.

By way of example, the latest Congestion Assessment and Resource Integration Study ("CARIS") report conducted cost-benefit analysis for resolving the top three congestion problems in the New York Control Area through construction of new generation, construction of new transmission, and demand response. *See* 2011 Congestion Assessment and Resource Integration Study: Phase 1, Final Report (Mar. 20, 2012).[12] In each instance, under high cost assumptions, the solution with the highest benefit-to-cost ratio was demand response. Indeed, for the Central East – North Scotland – Pleasant Valley congestion area, the solution with the highest benefit under all cost assumptions was demand response. *See id.* at 6, Fig. 1.

More generally, as the most recent Lazard report clearly illustrates, energy efficiency is typically far more cost-effective than new generation on a levelized cost basis. *See* Lazard, Levelized Cost of Energy Analysis – Version 5.0 (June 2011).[13]



The task force should remain cognizant of the frequent and often significant cost advantages of energy efficiency and demand resources vis-à-vis new generation when reviewing projects to ensure that it does not pursue highly inefficient solutions to perceived needs that can most cost-effectively been by reducing demand.

[12] A copy of the CARIS Phase 1 Report is attached as Exhibit 5.
[13] A copy of Lazard 5.0 is attached as Exhibit 6.

C. Criterion 3: Effect of the Project on Compliance with the New York RPS

Potential projects should also be evaluated in light of their ability to help New York meet the legislative targets of its RPS, particularly in light of the recent increase in the RPS target from 25% to 30% by 2015.

Renewable energy has shown remarkable declining cost trends in recent years and is increasingly cost-competitive with all fossil fuel generation, including natural gas. According to the latest version of the Lazard Report, the levelized cost of new onshore wind has largely dropped below that of natural gas combined cycle ("NGCC"), which is in turn the least expensive of the fossil fuels. According to Lazard's data for 2010, onshore wind had a levelized cost range of $30 to $79/MWh, as compared with $69 to $97/MWh for NGCC. Lazard version 5.0. Even in the absence of federal subsidies and tax credits, the levelized cost of wind ranged from $50 to $92/MWh, which still compares very favorably with natural gas. *See id.* Thus, outside of energy efficiency, in many places onshore wind has become the least cost new energy resource.

Moreover, several trends in the wind industry suggest that wind will continue to improve its position relative to natural gas. From 2009 to 2010 wind fell on the low end of its levelized cost range by more than 50% (from $65/MWh to $30/MWh), which is largely accounted for the 2/3rd decline in capital costs.[14] Likewise, according to the latest edition of the U.S. Department of Energy's Wind Technologies Market Report, turbine prices decreased by as much as 33 percent or more between late 2008 and 2010. DOE 2010 Wind Technologies Market Report (June 2011), at vii. It is projected that these declines will yield lower project-level installed costs and power sale prices in the years ahead. *Id.* Bloomberg New Energy Finance ("BNEF") forecasts that onshore wind will reach cost parity with fossil-fuel electricity, including natural gas, by 2016. BNEF Press Release (Nov. 10, 2011).

Like wind, solar photovoltaics have been experiencing significant price decreases in recent years and are becoming increasingly cost-competitive with fossil fuels. Wholesale module prices fell by $0.90/W from 2008 to 2009, by $0.50/W from 2009 to 2010, and fell further still in 2011. *See* Lawrence Berkeley National Laboratory, Tracking the Sun IV: An Historical Summary of the Installed Cost of Photovoltaics in the United States from 1998 to 2010 (Sept. 2011), at 2. Several news sources have reported a 70% decline in the price of panels between 2009 and the end of 2011. *See, e.g.*, Sun Solar Electric, Solar Panel Prices Down by 70 Percent from 2009 (Nov. 29, 2011).[15]

And offshore wind, while still in the early stages of development on this side of the Atlantic, has been maturing for years in Europe. The European Wind Energy Association reports a total of 1,371 offshore turbines currently installed and grid

[14] *Compare id. with* Lazard, Levelized Cost of Energy Analysis – Version 4.0 (June 2010), attached as Exhibit 7.
[15] Available at http://sunsolarelectric.com/solar-panel-prices-down-by-70-percent-from-2009/.

connected in European waters, with a total capacity of 3,813 MW. EWEA, The European Offshore Wind Industry Key 2011 Trends and Statistics (Jan. 2012). An additional nine projects currently under construction will bring this total up to 6,188 MW. *Id.* Lazard already reports a decline on the low end of the levelized cost range for offshore wind from $112/MWh to $94/MWh between 2009 and 2010 for the United States.[16] Even lower costs are likely in the future as projects move forward in the United States and as the United States benefits from European knowledge and experience.

Despite the impressive cost declines, certain renewables, including solar and offshore wind, have not reached cost parity with the least costly fossil fuels. To do so will require additional time and development of the respective renewable industries. To hasten this development, in order to obtain the myriad climate and other environmental benefits that these renewable resources provide, it makes sense to incentivize additional renewable development through power purchase agreements ("PPAs"). Not only will this speed the development of these industries, leading to lower prices in the future, it will help to ensure that New York meets its aggressive RPS targets, as the law requires.

D. Criterion 4: Ratepayer Impacts of the Project

Projects should be evaluated with an eye to minimizing long-term ratepayer impacts. To the extent that new generation would be secured through PPAs, the Task Force should consider both the fuel price and emission price risk associated with the new generation to protect ratepayers from excessive increases to their electricity bills. In particular, building significant portions of the Energy Highway around expanded reliance on natural gas generation from PPAs is advantageous to customers only if natural gas prices remain low and stable over the coming decades. As natural gas' eventful recent price history reveals, this may well not be the case (though, to be sure, natural gas is and is expected to remain cheaper and cleaner than coal).

Current low natural gas prices reflect the market's present enthusiasm for the recently commercialized extraction technique of fracking. This enthusiasm has resulted in natural gas production well in excess of current demand; at least part of this is because of drilling requirements written into many gas leases. The cost of such drilling is said to exceed the current market price of the produced gas, leading many companies to move their drilling rigs out of the area to shale oil plays as soon as their lease drilling obligations have been met.

Not only is the commercial efficacy of this technique unclear, so too are its environmental ramifications and regulatory future. Should commercially extractable gas reserves prove to be overstated, should recently promulgated or future regulations affecting natural gas extraction drive up production costs, or should natural gas demand increase in the future, natural gas prices will rebound. In considering these risks associated with natural gas, the Task Force should bear in mind that many forms of

[16] Compare Lazard version 5.0 at 14 with Lazard version 4.0 at 16.

renewable energy, including wind and solar, have no fuel or emissions costs, no fuel price or emission price volatility, and no GHG emissions. Their levelized costs are far more predictable, depending only on the construction and financing costs at the time they are built.

1. Emissions Cost Variability of Natural Gas Compared To Renewables

The Energy Information Administration ("EIA") has highlighted natural gas' price volatility over time. According to the EIA:

> [n]atural gas prices have been particularly sensitive to short-term supply and demand shifts in recent years because of the highly inelastic nature of this market. . . . Limited short-term price responsiveness means that natural gas prices will be highly sensitive to market factors such as weather swings or supply disruptions. Inelasticity is characteristic of many energy commodities. However, analyses of natural gas volatility relative to other commodities have ranked it among the highest.

U.S. Energy Information Administration, An Analysis of Price Volatility in Natural Gas Markets (2007), at 2.[17] Natural gas prices are influenced by a number of factors that affect supply or demand including weather, imports, exports, quantities in storage, and broader economic conditions. *See* U.S. EIA, Natural Gas Explained: Factors Affecting Natural Gas Prices.[18] The country is coming out of an economic downturn and "[a]s economic recovery leads to increasing demand for natural gas in the industrial sector, natural gas prices are expected to rise again." *Id.* In addition, major drilling companies, including Chesapeake Energy have announced plans to cut dry gas drilling in 2012, which is expected to raise natural gas prices. Clifford Krauss, Chesapeake to Cut Number of Gas Rigs, N.Y Times (Jan. 23, 2012).[19] Table 2 below highlights the volatile nature of natural gas prices in New York over the past six years:

Table 2: Historic Annual Average Natural Gas Prices in New York for Electric Power

2006	2007	2008	2009	2010	2011
$7.75	$8.09	$10.85	$5.26	$5.73	$5.54

Source: U.S. EIA, Natural Gas Summary: New York, available at http://www.eia.gov/dnav/ng/ng_sum_lsum_dcu_SNY_a.htm.

Variability in gas prices is exacerbated by the fact that significant amounts of natural gas are now being produced from shale formations using the relatively new and

[17] Available at http://www.eia.gov/pub/oil_gas/natural_gas/feature_articles/2007/ngprivolatility/ngprivolatility.pdf, attached as Exhibit 8.
[18] Available at http://www.eia.gov/energyexplained/index.cfm?page=natural_gas_factors_affecting_prices.
[19] Available at http://www.nytimes.com/2012/01/24/business/energy-environment/chesapeake-to-cut-number-of-gas-rigs.html?_r=1&scp=1&sq=chesapeake%20energy%20cut%20production&st=cse.

largely unregulated technique of fracking. Fracking increases price variability in two ways. First, the quantity of commercially recoverable gas in the United States is unknown and subject to widely divergent estimates. Recent reports suggest that early estimates may have dramatically overstated the amount of gas fracking can commercially recover from the major shale plays. Arthur Berman and Lynn Pittinger, for example, estimate that industry may have overstated the shale gas reserves in the Barnett, Fayettesville and Haynesville shale plays by a factor of two. *See* U.S. Shale Gas: Less Abundance, Higher Cost (Aug. 5, 2011).[20] For the Marcellus shale, overestimates may be even greater. According to the EIA in April 2011, the Marcellus shale has an estimated technically recoverable resource base of about 400 trillion cubic feet. EIA, Annual Energy Outlook 2011 (Apr. 2011), at 80.[21] However, the U.S. Geological Survey recently released a report revising its estimate of the recoverable reserves in the Marcellus Shale to 84.2 trillion cubic feet, a downward revision of nearly 80%. *See* U.S. Geological Survey, Assessment of Undiscovered Oil and Gas Resources of the Devonian Marcellus Shale of the Appalachian Basin Province, 2011 (Aug. 2011), at 1.[22] While more marginal shale gas resources will prove commercially extractable if natural gas prices rise, this is cold consolation for New York electricity and heating customers if their rates are bound too closely to these rising natural gas prices.

Second, there are alarming signs that fracking, and gas extraction more generally, is having significant adverse environmental impacts, which are already leading to new air regulation, and may lead to additional regulations in the future. Shale gas deposits typically sit beneath the groundwater aquifers meaning that extraction wells must be drilled through the aquifer to reach the deposits below. Faulty well casings can result in infiltration of fracking fluids into groundwater. In December 2011 EPA released a report officially linking for the first time fracking to groundwater contamination in Wyoming. U.S. EPA, Investigation of Groundwater Contamination Near Pavillion, Wyoming ii-xiii, 33 (2011).[23] The report found "high concentrations of benzene, xylenes, gasoline range organics, diesel range organics, and total purgeable hydrocarbons in ground water samples" and determined that "the data indicate[d] likely impact to ground water that can be explained by hydraulic fracturing." *Id.* In addition, serious air contamination has been linked to gas drilling in Wyoming. Smog levels in rural Wyoming reached levels in excess of those in Los Angeles last year as a result of gas drilling activities in those areas. *See* Wendy Koch, Wyoming's Smog Exceeds Los Angeles' Due to Gas Drilling, USA Today (Mar. 9, 2011).[24] In addition, U.S Geological Survey researchers have linked the rise in fracking to increasing incidences of earthquakes. *See* Bill Callahan & Mark Drajem, Fracking Wastewater Tied by Scientists to Earthquakes, Bloomberg (Apr. 19,

[20] Available at http://www.theoildrum.com/node/8212.
[21] Available at http://www.eia.gov/forecasts/aeo/pdf/0383(2011).pdf, and attached as Exhibit 9.
[22] Available at http://pubs.usgs.gov/fs/2011/3092/.
[23] Available at http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf, and attached as Exhibit 10.
[24] Available at http://content.usatoday.com/communities/greenhouse/post/2011/03/wyomings-smog-exceeds-los-angeles-due-to-gas-drilling/1.

2012).[25] This rise in seismic activity is leading some states to adopt regulations to limit the risk of earthquakes from fracking, which could affect the areas in which fracking activities can be undertaken. *See* Jim Efstathiou Jr., Fracking-Linked Earthquakes Spurring State Regulations, Bloomberg (Apr. 20, 2012).[26]

EPA recently promulgated regulations for emissions of criteria and hazardous air pollutants from natural gas production sites that represent the first federal air standards for natural gas wells that are hydraulically fracked.[27] In order to reduce emissions of volatile organic carbons ("VOCs") from wellheads, the regulations require "reduced emissions completion" at the wells, which uses equipment to separate gas and liquid hydrocarbons from the flowback that comes from the well as it is being prepared for production. *Id.* While EPA does not anticipate the cost of compliance with these regulations to be overly onerous, these regulations are likely to be just the first of many regulations of fracking. This is because the new EPA regulations address only air emissions of certain pollutants from fracking wells while leaving all water and waste discharges unregulated. If and when states or the federal government promulgate regulations for additional air, water or waste discharges from fracking operations, this will increase the costs associated with fracking and increase the price of natural gas.

2. Emissions Cost Variability of Natural Gas Compared To Renewables

While far superior to coal in its emissions profile for traditional pollutants, and thus more insulated than coal from swings in emissions costs, [28] natural gas is nevertheless a fossil fuel, and its extraction and combustion result in the emission of both conventional and global warming pollutants. Increased regulation of such emissions, particularly carbon dioxide, is increasingly likely, and the cost of such future regulation must be considered in evaluating the promise of natural gas as part of a long-term energy strategy.

V. The Special Situation of Long Island

Long Island—specifically the Nassau and Suffolk County service areas of the Long Island Power Authority ("LIPA")—provides a special set of problems for consideration. First, energy costs to the customer are quite high for a variety of reasons,

[25] Available at http://www.bloomberg.com/news/2012-04-19/fracking-wastewater-tied-by-scientists-to-earthquakes.html.
[26] Available at http://www.bloomberg.com/news/2012-04-20/fracking-linked-earthquakes-spurring-state-regulations.html.
[27] Oil and Natural Gas Sector: New Source Performance Standards and National Emissions Standards for Hazardous Air Pollutants Reviews; Final Rule (published Apr. 17, 2012), attached as Exhibit 11; Fact Sheet: Overview of Final Amendments to Air Regulations for the Oil and Gas Industry (Apr. 17, 2012), at 1 ("Fact Sheet"), attached as Exhibit 12.
[28] According to the EPA, from a purely combustion perspective, "[c]ompared to the average air emissions from coal-fired generation, natural gas produces half as much carbon dioxide, less than a third as much nitrogen oxides, and one percent as much sulfur oxides at the power plant." *See* http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html.

including obsolete on-Island plants with high fuel costs, which continue to be contracted for because of power transmission limitations onto Long Island. When not actually providing power these plants are often kept on standby so they can be ready if or when the power is needed. These same transmission limitations are one factor determining the NY ISO requirement for on-Island "locational" generational requirements.[29]

In addition, according to the American Lung Association, Long Island has the dubious distinction of being one of the twenty smoggiest areas in the country, receiving an "F" for the number of high ozone days.[30] There is undoubtedly a causal connection between these two circumstances: burning fossil fuel in inefficient plants with less than state of the art pollution controls contributes to air pollution and smog. According to data from LIPA's 2010-2020 Energy Plan, even after a substantial decline from 1998, 45% of LIPA's energy production came from fossil fuels (10% oil, 35% natural gas), with the remainder coming from a variety of sources, including 2% renewable (distributed PV and contracted hydro), refuse, nuclear, and purchases on the spot market.

Adding transmission capacity so that additional, less expensive, and renewably generated electric power can be reliably brought from upstate areas to the NYC metro area and Long Island load pockets is likely to provide benefits in the first four areas of responsibility of the New York Energy Board, as described in section I-A above. In particular, this could reduce end user costs and would certainly reduce air pollution on Long Island. Such increased capacity would be absolutely necessary as Long Island continues to exploit its great resources of non-dispatchable renewable wind and solar power so as to obtain a much greater fraction of its electric power from renewable sources.

This is not as farfetched or far off a prospect as one might think. A soon to be released professional study has demonstrated that with a greater penetration of efficiency measures, renewable power sources could supply in a cost-effective manner a significant fraction of Long Island's electric energy consumption by 2020; and virtually all of it by 2030.

Some of this renewable energy will be locally generated by rooftop and larger PV installations. There are already 5,000 solar roofs on Long Island, a much greater number than in the service area of any other New York utility. These provide 41 MW of peak capacity. A large project at Brookhaven National Laboratory adds another 32 MW, and EnXco has already completed 6 MW of a planned 17 MW of parking lot carports. When this is completed LIPA will have about 90 MW of PV. The proposed 50 MW LIPA feed-

[29] Long Island Power Authority, Electric Resource Plan 2010-2020, App. B, Technical Analysis, available at http://lipower.org/pdfs/company/projects/energyplan10/energyplan10-b.pdf.
[30] Nassau County reported no air pollution data, but both Queens and Suffolk received an "F" so one can reasonably conclude that Nassau is not better than the counties that surround it. American Lung Association, State of the Air 2010, available at http://www.stateoftheair.org/2012/assets/state-of-the-air2012.pdf.

in tariff and additional normally occurring rooftop installations should bring this to about 150 MW by about 2015. However, while the maximum summer solar PV power does offset summer air conditioning demand, most of the renewable power that Long Island will need must come from the wind.

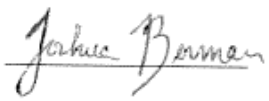
Several offshore wind proposals now exist. The one furthest advanced is the NYPA-LIPA-Con Edison proposal whose lease application has been submitted to BOEM. The submission of this application is a significant step forward toward expanding the sources of Long Island's energy. We expect that the formal aspects of this project will continue in a timely fashion. In addition, Deepwater Wind has proposed two 1,000 MW offshore wind farms: the Hudson Canyon project off the New Jersey Coast and 35 miles south of Long Island, and the Deepwater Wind Energy Center in the Rhode Island Sound, and connected to Eastern Long Island and New England.[31] One or more of these developments, or some variant of them, will need to be built and connected to Long Island. *The Task Force should state when it anticipates that such facilities will be incorporated into the Energy Highway planning process.*

For reasons of its additional potential capacity and required geographic redundancy, much of Long Island's required wind power will come from upstate. Getting that energy to Long Island requires a timely expansion of the existing transmission facilities. The involvement of the Energy Highway Task Force is critical if Long Island is to achieve its potential of being the first region of the State to make a rapid transition to completely renewable electric power.

VI. Conclusion

The New York Energy Highway provides an exciting opportunity for New York to set itself as an example for other states by fostering the development of a clean, safe, and reliable energy generation and transmission infrastructure while simultaneously creating jobs, promoting human health and the environment, helping New York meet its aggressive climate goals and protecting the interests of New York ratepayers money. In order to achieve these desirable outcomes, however, the Task Force must provide greater clarity regarding the specific needs to be addressed by Energy Highway projects and identify clear and transparent criteria for evaluation that include those identified and discussed above.

Respectfully submitted,



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[31] http://dwwind.com/hudson-canyon/hudson-canyon-project-overview and http://dwwind.com/rhode-island/rhode-island-project-overview, and Deepwater Wind Projects Fact Sheet, attached as Exhibit 13.

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