October 19, 2008

VIA ELECTRONIC MAIL

Paul A. DeCotis
Deputy Secretary for Energy
Chairman, Energy Planning Board
Executive Chamber
State Capitol, Room 245
Albany, NY 12224

RE: Comments of Anbaric Holding, LLC to the 2009 New York State Energy Plan (“2009 NYS Energy Plan” or “the Plan”).

Secretary DeCotis:

Please accept the enclosed comments of Anbaric Holding, LLC (“Anbaric”) to the above referenced Plan. Anbaric is an independent, privately-owned electrical transmission development company that specializes in the development of innovative transmission projects that fall outside the traditional scope of investor owned utilities. Anbaric requests that all further correspondence, communications and other documents relating to this matter be served upon the following individual as follows:

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At the outset, Anbaric commends the efforts of the Energy Coordinating Working Group in advancing prudent energy policy in New York. Please find attached a copy of Anbaric’s whitepaper, *Smart Energy City, Smart Energy State: Suggestions on Projects to Integrate Renewable Energy, Smart Demand Response, and Controllable Transmission in New York City and New York State,* which we are incorporating into our formal comments. Anbaric has devoted considerable thought and analysis on how to best maximize New York’s energy resources in a manner that furthers the region’s economic, environmental and social policies.

A. **New Electric Transmission will be Needed to Connect Renewable Energy that will help New York State Meet its Clean Energy Policy Goals**.

of the project capacity to anchor customers before holding open season auctions to allocate the remaining capacity because the projects were deemed necessary to help deliver energy from wind power projects to the Southwest electric markets. The Chinook and Zephyr orders provide a valuable framework for transmission investment that seeks to tap additional new renewable resources in areas that can support their development, but that are not located near load centers. The Energy Coordinating Working Group should use this template to propose a transmission infrastructure system that anticipates future project development.

F. **New York's Ability to Increase Renewable Generation in the State will Depend on Transmission Development and Market Policy Evolution that Further Integrates New York's Resources with the Broader Market for Renewable Energy**.

The amount of available renewable energy capacity in New York is very large. With over 8,000 MW of wind projects in the generator interconnection queue, New York is well positioned to be the leading renewable energy state in the Northeast, perhaps the entire east coast. It will benefit the state to create policies that encourage and enable the development of renewable resources. New York has already succeeded in adding tremendous capacity in a short period of time with its unique approach to acquiring renewable energy. Providing resources to developers has encouraged new projects to this point, but as those resources are exhausted, the policies need to evolve in such a way that wind developers can compete in a broader regional market to sell attributes of their clean energy. Creating a Renewable Energy Credit tracking and trading system could enable that transition to a more market-based approach to supporting renewable energy growth in the region.

Anbaric appreciates the opportunity to present these comments to the Plan. We welcome the opportunity to provide any further information upon request.

Sincerely,

Allison W. Smith
Anbaric Holdings, LLC

Enclosure (1)

Smart Energy City
Smart Energy State

Suggestions on Projects to Integrate Renewable Energy, Smart Demand Response, and Controllable Transmission in New York City and New York State

Coastal cities and states like New York aspire to materially reduce their green house gas emissions by means of (1) buying more renewable energy from on and offshore intermittent resources, (2) installing appropriate and smart transmission lines, (3) installing Smart Grid devices, and (4) enhancing the operational controls of the local utility and distribution companies. Anbaric Transmission respectfully offers this White Paper as documentation of a potential path for both New York State and New York City to accomplish these goals.

Edward N. Krapels, Christopher Sherman, Allison Smith
Anbaric Transmission LLC
August 2009

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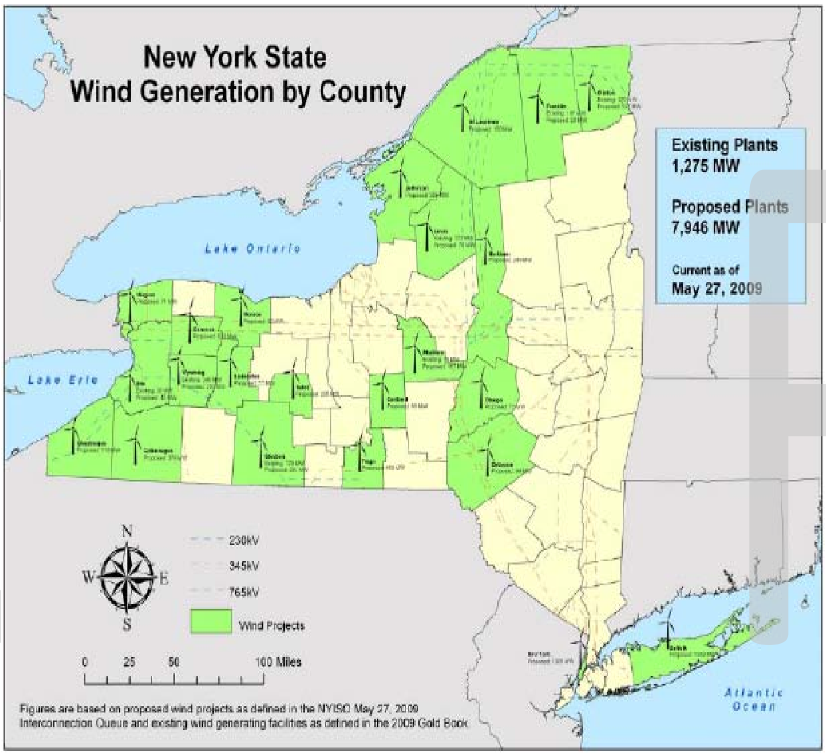
1. As shown in the figure below[13], upstate New York has abundant wind resources, and many communities would welcome the economic growth created by the development of those clean resources. And indeed, renewable energy developers have made herculean efforts to develop resources in response to RPS policies. The amount of wind power generation in New York State grew by 300% in the past year, now totaling 1,274 MW, up from 424 MW in March 2008. Additionally, 8,017 MW of wind power project proposals have been submitted by developers to be studied by the NYISO for interconnection to the grid. At the capacity factors of those wind resources (approximately 25 percent), sixty-two percent of projects in the interconnection queue will need to be developed by 2013 to attain the 11GWh needed for RPS compliance.



Historically, only twenty percent of queued projects have become commercially operable. As NYSERDA's report indicates, the development difficulty is tied, in large part, to the absence of transmission from upstate to downstate to take the wind the market. **Therefore, upstate New York can fill some of the renewables gap, but perhaps not all of it.**

2. The second logical source of affordable wind is the neighboring PJM market, which has 3,500MW of wind already developed and under construction, and an additional **44,000 MWs of proposed wind** at various stages of development.[14] Because PJM is a different control area, accessing its wind presents a different kind of transmission challenge.
3. The third source of wind – somewhat more challenging technologically and economically, is off the coasts of New York, both on the northern end (the Great Lakes) and the southern end (the Atlantic Ocean).

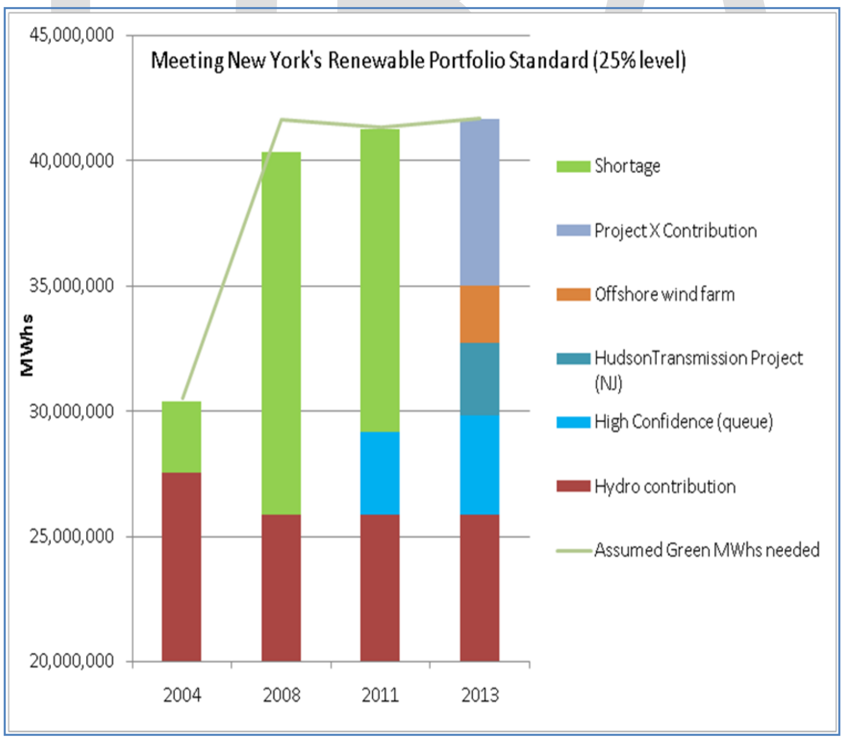
Transmission for New York's Renewable Resources

Closing the renewables gap now depends on building transmission connections between the load centers (primarily, New York City and Long Island) and the renewable resources in upstate New York and neighboring PJM. Interestingly, this is where New York City becomes a player in the renewables game, as the customer for the renewable energy.

One important step towards developing additional renewable capacity may be taken by the New York Power Authority, if it completes a contract for transmission rights on the Hudson Transmission Project, a 660MW high voltage, Direct Current line between PJM and Manhattan scheduled for construction in 2009 and completionin late 2011. Depending on the environmental attributes of the capacity NYPA buys in PJM (all green, or part green energy), the Hudson project can inject up to 5.7 GWhs of RPS-compliant energy into the City (approximately 39% of the projected deficit in the state-wide 2013 requirement). If half of the energy flowing across Hudson were green, it could provide 16% of the State RPS requirement.[15]

A second step towards a greener New York City could be the potential development of 750MWs of wind off the coast of New York recently announced by ConEd and LIPA. If that project had a 35 percent capacity factor it could inject 2.3 GWhs of renewable energy into the City (and the State).

As shown in the chart below, even with these two new resources, however, New York State would fall short of the RPS target, whether at the original 25 percent or the Governor's 30 percent target level. To fill that gap, the state needs what we will call "Project X", which could deliver up to 7GWh of green energy into the load centers of New York City and Long Island.



As we survey the development terrain, there are three candidates for Project X:

1. A 1200MW transmission line to upstate wind and other renewable resources. At that size, New York can bring on 5.2 GWh of renewables if the line is filled with renewable energy 50% of the time.

2. An 800 MW transmission line to Quebec, if hydro-generated power from Quebec could become RPS-compliant. As baseload energy, it could close the RPS gap with 7 GWh of constant green energy delivery.[16]

3. ~2,305MWs of additional offshore wind development with high (35 percent) capacity factors.

Even though it is clear that New York needs to execute on projects like these, from a tactical perspective **it is unclear who should make the selection between the different projects (upstate, downstate, wind or hydro or other sources), and who should pay for the potentially higher cost of meeting the RPS requirements for the state as a whole.** Because the intent of RPS requirement is to advance the public good, we suspect that New York – like other jurisdictions – will ultimately find a way to spread the cost of the transmission and generation needed to bridge the RPS gap to all electricity users. There is no doubt the City of New York and Long Island will be the targets for green energy – after all, they constitute 50% percent of the state's total energy demand. What is open to question and policy deliberation is who should pay what to accomplish these societal goals.

New York's Smart Grid

Assuming New York will figure out how to develop "Project X,"it seems obvious that compliance with the State's RPS requirements will lead to a power system with a lot of intermittent energy infusions. **What are the challenges raised by this electricity and renewables profile?** Assuming the State and the City mean what they have said about wanting a transformation towards renewable energy in the state, and towards a greener profile for its iconic City, the rapid deployment of new renewable generation poses a number of readily apparent challenges:

a. Intermittency: More wind requires more sources of firming energy. Onshore and upstate wind can use existing thermal resources (albeit somewhat reconfigured away from baseload services). Offshore wind directly into the City will require use of DC cables (whose quick response time due to the undersea cable distance and power rating, is well suited to this task), and/or conversion of some thermal units from baseload to peaking services.

b. Stability: The inherent instability of intermittent resources requires additional capability to maintain a stable power supply. This goes beyond intermittency – it deals with handling the seams between the loss of wind energy and the offsetting gain of whatever takes its place (either alternative supply or responsive demand). There is a technical challenge here. The flexibility and controllability of HVDC transmission is part of the solution but responsive demand is another.

c. Voltage needs to be maintained within its strict reliability limits. Intermittent energy and responsive demand create new stresses that will have to be identified and managed. One cannot talk about voltage without also mentioning reactive power. If the City is to be served by intermittent resources and DC cables, sources of reactive power will have to be found. Potentially, if "Project X" is a DC cable, adding Voltage Source Converter technology would do a lot to address the need. In addition, some peaking units built specifically for these tasks may also be required.

In other words, a Grid with lots of renewables has to cope with intermittent energy infusions that can cause the system to become less stable for a variety of reasons (like varied wind speeds). A substantial part of the challenge in a complex grid like that of New York is to be able to observe the state of the system in real time. This is not as trivial a task as one might first think. The system already has to deal with enormous and instantaneous changes in supply and demand as a result of its traditional structure, which was built to accommodate a relatively small number of supply disturbances. With hundreds (and potentially thousands) of wind inputs, the supply disturbances increase exponentially. At some point, the amount and variety of wind may begin to net out a less perturbed pattern (especially if there are substantial transmission ties into New York from other areas), but it is far from clear at what mix that begins to occur. Almost certainly, the first 1000MWs of wind will add to the complexity of the system.

With that added complexity, it becomes more and more important to add controllability to the system wherever possible and, of course, economical. Some resources – certain types of immediately dispatchable generation, new forms of demand management, and controllable transmission – will become much more useful to the system than they have been historically. Put another way, New York will need many more controllable resources than it has today in order to manage the "uncontrollable" or intermittent resources.

Adding much more controllable demand – ideally, demand from consumers that can be shifted or curtailed in response to intermittent supply – sounds somewhat primitive ("*Could we really manage to not use energy when the wind doesn't blow?*), but with today's modern technology, it has a completely different and new aspect. In the transmission arena, direct current (DC) transmission, and certain types of controllable AC transmission (such as the new Variable Frequency Transformer), will become more and more useful. Thus, the fact that New York has four three such projects already (the Neptune DC cable, the Cross Sound Cable, the Linden VFT project under construction between New Jersey and Staten Island, and the pending Hudson Cable) is likely to be much more valuable than originally thought.[17]

Finally, the new intermittent and controllable "tool kits" need to be efficiently deployed by those in charge of running the system (the load-serving utilities of New York and the New York ISO that binds them all). The task of reliably running a New York power grid with 30 percent renewables, in other words, will be challenging.

Controllable Demand in New York

As discussed in the preceding pages, New York – both City and State – can accomplish renewable portfolio standard objectives. New York is blessed with abundant renewable resources both in-state and "next door" (in PJM and in Canada), both of which can only be accessed if transmission is built. The intermittency is challenging, but there are both supply-side and transmission resources that can make huge contributions to managing that problem.

With that as background, we can turn to the demand side. As it happens, new developments in demand management technology can both help meet New York's efficiency objectives and provide additional support for managing intermittent supply. For the sake of convenience and clarity, we will call permanent reductions in demand "efficiency improvements," and the ability to use demand as a resource to manage intermittent supply as "controllable demand." Both are improvements in the generic terms – "Smart Grid" and "demand response" – about which much has been written but little is clear.[18]

In the emerging dynamic smart-grid world, the demand provider will have the ability to optimize the electric power it obtains from the grid with a) what it can either produce through behind-the-meter generationor storage resources or b) what it can avoid using through control devices. Fortunately, advances in behind-the-meter generation and smart-grid technologies are quickly making this capability an economic and technical reality[19].

In the future, demand response in New York City can be coupled to intermittent resources without the intervention of the ISO. If a demand responder wishes to do so, it can tie its load dispatch with the natural variability of an intermittent resource such as wind. Depending on the size of the demand response and the size of the wind generator, this coupling effectively allows demand response to become a firming resource for the variable wind energy. New York City and Long Island – with their huge load and multiple large-use electricity customers - may be ideal partners for coupling with the offshore wind resources now under consideration by the City's utilities. Since the location of the controlled load may be sufficiently close to where the wind enters the system, the coupling effect also mitigates stresses to the system created by the variability of the renewable resource.

Finally, there is universal agreement that controlling demand provides significant value to the wholesale electric power markets. As with any other disruptive resource, the determination of how best to use and value DR will be an iterative process. What should be clear, however, is that given its value to the market and systems, the industry should focus on those changes that add to the availability and use of controlled demand as a critical energy resource. The use of DR as a dispatchable resource in the real time energy markets should be encouraged, not discouraged. We are fortunate that the smart grid technology now exists to fully exploit this valuable resource. The requirement now is to ensure that the policies and rules governing the bidding and measurement of demand response reflect these technological advancements.

Conclusion: Smart Energy City, Smart Energy State

In the long run, the essence of the Smart Energy City, as part of the Smart Energy State, is to harness its most economic renewables, which in the case of New York is likely to be nearby onshore wind and then nearby offshore wind, with controllable transmission and controllable demand.

Some will say this is a lot of trouble and expense. The long-run benefit of wind energy as a "fuel from heaven," however, is that it ultimately allows New York to escape from the tyranny of commoditized fossil fuel markets. We have seen in the last ten years the cost of the extreme fluctuations in fuels prices. Both oil and natural gas prices ratcheted up, not just by multiples of one or two from traditional price levels, but by multiples of five or six. Who can forget the summer of 2008, when oil prices reached $150/barrel, and natural gas prices reached $14/MMBTU?

Perhaps the most important reason for New York to embark on the "Smart City, Smart State" strategy, however, is the urgent need it has to comply with its own environmental regulations. Surely it was the better angels of New York's political dynamics that persuaded the state to embark on its ambitious renewables program. There are now some who claim the State and the City should slow down, but given how long it takes to reshape the fundamental infrastructure of a system as complex as that of New York, the time to start down this road is now.

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[1] From the PLANYC website: http://www.nyc.gov/html/planyc2030/html/plan/energy.shtml; accessed May 25, 2009.

[2] Charles River Associates, *A Master Electrical Plan for New York City,* August 2009.

[3] Governor Paterson has proposed increasing the Renewable Portfolio Standard to 30 percent. He has set a goal of decreasing electricity usage by 15 percent.

[4] 2009 New York State Energy Plan, Interim Report Presented By The Energy Coordinating Working Group, March 31, 2009. http://www.nysenergyplan.com/. Accessed May 25, 2009.

[5] New York ISO, 2009 Comprehensive Reliability Plan, Comprehensive System Planning Process, FINAL REPORT, May 19, 2009. http://www.nyiso.com/public/webdocs/services/planning/reliability_assessments/CRP__FINAL_5-19-09.pdf. Accessed May 25, 2009. Meanwhile, New York transmission owners also began a study in the spring of 2009. The Statewide Transmission and Reliability Study (STARS) is a long-term, forward looking transmission planning exercise that will assess system needs 11 to 20 years from now.

[6] These restrictions include "the Ozone Transmission Commission (OTC) High Electric Demand Days (HEDD) program and Department of Environmental Conservation (DEC) new NOx Reasonably Available Control Technologies (RACT) program, could adversely impact the reliability of the electric system. Implementation of the OTC-HEDD Load Following Boilers (LFBs) and High Emitting Combustion Turbines (HECT) program could render some units unavailable and others limited to reduced output at times of peak energy needs, which would result in violations of the resource adequacy criterion in 2017 and 2018. The New York DEC is developing several proposals to lower emissions from generators in New York State."

[7] In addition, In addition to RGGI targets, Governor Paterson signed Executive Order No. 24 on August 6, 2009 stating the goal for New York was to reduce its carbon emissions to 80% below 1990 levels by 2050. The order also created the Climate Action Council which will produce a Climate Action Plan by September of 2010 to assess how all economic sectors can reduce carbon emissions and the extent to which these actions will support the Governor's goal to build a clean energy economy. Executive Order No. 24, "Establishing a Goal to Reduce Greenhouse Gas Emissions Eighty Percent by the year 2050 and Preparing a Climate Action Plan." August 6, 2009 http://www.ny.gov/governor/executive_orders/exeorders/pdf/eo_24.pdf

[8] *2009 Comprehensive Reliability Plan*, pages iv – v.

[9] New York State's Renewable Portfolio Standard (RPS) goal is to reach 25% by 2013. An RPS is a policy that seeks to increase the proportion of renewable electricity used by retail customers. Currently there are 24 states plus the District of Columbia that have RPS policies in place.

[10] NYSERDA, *New York Renewable Portfolio Standard Situation Report, 2009 Review, Draft Report,* March 31, 2009. Pages 4, 8. http://www.nyserda.org/Energy_Information/NY%20Renewable%20Portfolio%20Standard%20Program%20Evaluation%20Report%20(2009%20Review)-FINAL.pdf. Accessed May 25, 2009.

[11] NYSERDA, *New York Renewable Portfolio Standard Program Evaluation Report, 2009 Review,* page 4.

[12] To understand the respective roles of the City and the State, we have to look behind the aggregates of the RPS program. When it was enacted in 2004, the Department of Public Service (1) enacted a 25 percent target, and (b) allowed the large-scale hydro capacity that New York possesses (at Niagara Falls) to count towards that target. In that year, the existing hydroelectric generation provided 27.5 Gigawatt-hours (GWh), or 19 percent, of the total power supplied to consumers. Renewable energy acquired to meet the 25 percent by 2013 goal would be additional to the "renewable baseload" of 19 percent hydro.

[13] Source:

[14] PJM, "A Greener Grid," http://www.pjm.com/~/media/about-pjm/newsroom/downloads/greener-grid.ashx. Accessed August 24, 2009.

[15] The author is a Principal in Hudson Transmission Partners, developers of this Project.

[16] In August 2009 the New York Power Authority announced it was pursuing a project that could entail up to 2000MW of energy delivered into New York City. "NYPA Negotiating Massive Energy Project with Canadian Entities", POWERnews, August 5, 2009. (http://www.powermag.com/POWERnews/NYPA-Negotiating-Massive-Energy-Project-with-Canadian-Entities_2092.html) Accessed August 14, 2009.

[17] NYPA also has a Convertible Static Compensator (CSC) at Marcy Substation, which is a member of the FACTS family of technology and provides controllability to the transmission system. FACTS is the sister technology to HVDC. This installation provides a number of benefits, but the main one was increased capacity flowing north to south, without changing the overhead lines.

[18] The following pages are based on Audrey Zibelman and Edward N. Krapels, "Deployment of Demand Response as a Real-Time Resource in Organized Markets," *Electricity Journal,* June 2008, Vol. 21, Issue 5, pp. 51 – 56.

[19] In addition, smaller demand providers will likely require companies that can aggregate individual loads and provide the necessary two-way communication between the provider and the RTO. Larger users, such as large industrial complexes, are more likely to establish direct communication with the relevant RTO and in effect behave like a "virtual generator" on the system. For example, New York City and New York State have a number of large campuses that could reduce the amount of electricity they consume by controlling their load and utilizing distributed generation resources like traditional heat and power turbines, or solar panels, geo-thermal sources, and even hybrid cars. Internet communication devices can signal the campus to reduce its loading on the grid and monitor the changes in the campus' loads on a real time basis. Given these capabilities, the information and controls necessary to develop 24 hour, day-ahead, and real time bid strategies, the campus would appear no different than any generator or distribution utility from the perspective of the RTO.