ASSESSMENT OF EXTENT OF IMMEDIATE TRANSMISSION NEED IN THE NEW YORK POWER AUTHORITY GRID IN SUPPORT OF THE PROPOSED 663 MWe FERTILIZER PLANT, SYRACUSE, NEW YORK

By:

Walter James O'Brien
Managing Director
Applied Studies Centre
Syracuse, New York

For:

Industrial Development Authority
County of Onondaga
Syracuse, New York

CANADIAN POWER GOING OFF-LINE

On 3 September 2009, four coal-fired units in Ontario are planned to be shut down by the fall of 2010. The province is closing two of the eight units at the 3,920 MW Nanticoke Station and half of the units at the 1,976 MW Lambton Generating Station.

Ontario officials said they promised to eliminate coal-fired generation by the end of 2014. Along with the closure of the Lakeview Generating Station in 2005, the province's coal capacity will be reduced by 40 percent. With the cancellation of construction of (2) 1,200 MWe nuclear plants in Ontario, this positions the Province of Ontario for a potential electrical generation shortfall “window” of as much as 5.3 gigawatts generation capacity between the time of commencement of construction of the planned new Quebec hydroelectric facilities to service this need and these new hydro plants’ completion.

POWER GENERATION COMING ON-LINE WITHIN THE NYPA GRID

A total of 1.3 Gigwatts of wind power generation is scheduled to come online between now and 2012, per the 2007 NYISO Interconnection Queue. The proposed IGCC fertilizer manufacturing facility will add another 663 MWe to the generation mix for the NYPA grid. UniStar Nuclear Energy, a joint venture of Constellation Energy and EDF Development Inc. has proposed the construction of a new, technologically advanced 1,600 MW nuclear plant at the existing Nine Mile Point Nuclear Station site in Oswego County.

This brings the total of new proposed generation capacity for the Oswego “Junction Box” to around 3.6 Gigawatts. In addition, there are planned new transmission contracts with HydroQuebec linking Chateauguay with the NYPA at Marcy, New York for approximately another 1.5 Gigawatts.

For none of these projects is there adequate transmission wire on the pole in place.

(cited from the draft 2009 NYISO information brief on the state of the New York grid, available in full on request):

“Preliminary interconnection studies are being performed to provide a screening level indication of the impacts the project would have on the bulk electric system and what level of system upgrades would be required to integrate the plant into the New York State system. Because the plant location is west of the Central-East transmission constraint, injection of additional power in this area of the system will likely further exacerbate transmission congestion in the northern area of the State. Thus, it is anticipated that major transmission reinforcements would likely be required.

“As with the Indian Point facility discussed earlier, modeling was also undertaken for this Plan to assess the impact of the addition of a 1,600 MW nuclear unit in Oswego in 2018. The results indicate that the output from nuclear generation in the State would understandably increase (by 30 percent, 13,525 GWh). The output of natural gas, oil/gas, and coal units would consequently decrease (from as little as 1 percent in the case of oil/gas units to as much as 10 percent in the case of natural gas fueled combined cycle and combustion turbine units). The output of natural gas fueled combined cycle and combustion turbine units would either decrease by 8 or 10 percent,

depending on whether or not the State's 15 by 15 efficiency program goals are achieved. Consequently, CO2 emissions would decrease by from 4 to 5 percent; CO2 allowance prices would decrease from 16 to 23 percent; and average statewide wholesale electricity prices would decrease from 3 to 6 percent. The 30 percent increase in nuclear output along with the potential change in output from combined cycle natural gas generation, would also significantly impact net imports: they would decrease from 43 to 78 percent, providing a better trade balance and allowing more future imports to occur."

Electricity Transmission Facility Expansion Considerations

"Considerations of reliability, economics and public policy suggest that transmission expansion and replacement/upgrade of aging facilities should be evaluated for both the near term and longer term. Statewide annual gross congestion costs (reflected as bid production costs) have risen from $86 million in 2003 to $130 million in 2007, and preliminary figures indicate that they were significantly higher in 2008 due to transmission outages during the summer period. As the State pursues low-carbon, low-emissions producing resources, transmission assets will likely need to be expanded to exploit fully New York State's natural wind resources and hydro development in neighboring areas, including Quebec. However, the State currently lacks the information to determine what, if any, upgrades would be in the ratepayer and State's interest. For example, knowing the annual cost of congestion serves little purpose until it can be compared to the cost of a system upgrade to resolve the congestion. It is anticipated, however, that the NYISO's congestion assessment and resource integration study (CARIS), its wind study, and the utilities' statewide transmission and reliability study will produce information defining the problems, quantifying the congestion costs, and suggesting possible solutions. As these studies develop, the State will need to refine its infrastructure planning decisions. Further, successful implementation of the State's "15 by 15" electricity program may impact future decisions on new infrastructure needs to accommodate the changing nature of New York's electric system topography.

"Economic analyses of possible future transmission development will be dependent on a number of factors, including precise locations, distances, sizing, engineering design, and integration with existing infrastructure and equipment. The net costs and/or benefits to ratepayers of actual projects could be highly dependent on negotiated long-term contractual agreements among specific parties, other generation, transmission, and natural gas infrastructure that is built or retired (both in New York and in neighboring regions), and significant additions to energy supply (such as potential large-scale hydro projects in Canada). Additions to the State's transmission system, while perhaps not called for to meet reliability needs, may be prompted by the clean energy policy objectives outlined in the State Energy Plan."

TRANSMISSION IMPACTS

" In the transition to competitive markets, stakeholders focused on the creation of wholesale generation markets for the purchase and sale of electricity, and the utilities divest the majority of their generation assets. Consequently, market rules were developed with the intent to allow the new owners of power plants opportunities to collect cash flows sufficient to support continued operation of the generation and to facilitate the building of new generation when required. Transmission infrastructure, however, was treated differently. Bulk transmission facilities were turned over to the

NYISO for operation and monitoring, but the utilities retained ownership and ultimate responsibility for maintenance, hands-on operation (based on direction from the NYISO) and upgrades.

“After the generation markets were determined to be functioning properly, however, the Department of Public Service (DPS) staff convened a meeting with the NYISO and its stakeholders to explore what market mechanisms might be developed to provide incentives for the construction of merchant transmission projects, similar to the way generation would now be expanded. The exploration, however, has so far been unsuccessful, primarily because of two major stumbling blocks: the lumpiness associated with building new transmission facilities and the potential loss of economic value affecting some market participants. As the construction of new transmission typically requires the acquisition of linear property rights to establish rights-of-way, which can result in environmental impacts and disruption of communities, and because they require major capital investments and usually require many years to site, license, design, and construct, new transmission lines must, by necessity, typically be planned to accommodate long-term use instead of just the immediate needs. Therefore, an immediate need of 200 MW of transmission capability might result in a desire to construct a 400 MW facility.

“This lumpiness of development not only affects the cost and impacts of the planned facility, but it can lead to dramatic reductions in locational marginal price differences between the two ends of the new facility, diminishing, at least in the short-run, the value of any transmission congestion contracts (TCCs) that would be generated by the new line to help fund it. The devaluation of TCCs, however, will occur to some extent regardless of the size of the facility. Therefore, by default, continuation of traditional rate-of-return regulation of utilities with the obligation to serve appears, at least for now, to be the most practical approach to constructing most new major new transmission facilities, whether needed for reliability, economics, environmental, or public policy reasons.

“The only transmission-specific provisions in the NYISO tariff that might be considered a transmission market mechanism to encourage developers to build such facilities are the rules providing for awards of incremental transmission congestion contracts for the transfer capacity of new projects. To date, the only major non-utility constructed projects have been the Cross Sound Cable between Connecticut and Long Island and the Neptune Line from New Jersey to Long Island, both of which have long-term contracts for the capacity backed by ratepayer funding. Looking forward, the costs of economic transmission expansion projects emerging from the NYISO’s Congestion Assessment and Resource Integration Study (CARIS) process (described later in this Brief) will be able to be recovered through the NYISO’s tariffs if approved by an 80 percent super-majority vote of the projects’ identified beneficiaries.”

“While pure merchant-based transmission infrastructure may not soon materialize in New York, transmission infrastructure construction by non-utility entities is still possible under federal legislation. The Energy Policy Act of 2005 authorizes FERC to ensure cost recovery for transmission projects that relieve congestion – regardless of ownership. The New York Regional Interconnect was the most recent independent project in New York to submit a siting application (since withdrawn); the project was seeking regulated rate treatment before FERC (rather than through the PSC as would a utility regulated directly by it).”

What there studies indicate most glaringly is that there is not one private-sector major transmission project on the table. This puts ALL our projects, if not in jeopardy, then certainly so far out in time to completion as to cause many planned projects to fold through investors pulling out.

LONG TERM OBJECTIVES (THROUGH 2024) OF THE WIND ENERGY DEVELOPMENT COMMUNITY THROUGH 2024 IN TERMS OF PROJECTED NEW SITED CAPACITY

Region	Wind CF Applied (%)	Mandate Required (%)	2024 Estimated Energy Need for Wind Mandate (GWh)	Existing or Planned Wind Energy by 2024 Applied (GWh)	Incremental Mandated Installed Nameplate (MW)
Midwest ISO Central*	40%	20%	50,939	43	15,000
Midwest ISO East*	35%	20%	51,938	1,065	17,000
Midwest ISO West*	45%	20%	47,610	9,040	10,000
MAPP*	45%	20%	20,460	1,869	5,000
Midwest ISO & MAPP		20%	170,947	12,016	47,000
IESO	35%	20%	37,254	3,230	12,000
New York	35%	20%	38,658	1,449	13,000
PJM	35%	20%	186,456	3,890	60,000
TVA	35%	20%	59,266	667	20,000
SERC	35%	20%	130,564	0	43,000
Entergy	35%	20%	37,061	0	13,000
New England	35%	20%	35,518	1,953	11,000
SPP	45%	20%	51,465	12,773	10,000
TOTAL			747,189	35,977	229,000

Table 5-10: 20% Wind RPS Calculation for Study Years for Siting 2008-2024
(* The Midwest ISO & MAPP values are calculated at sub-regional levels and aggregated for data reporting purposes)

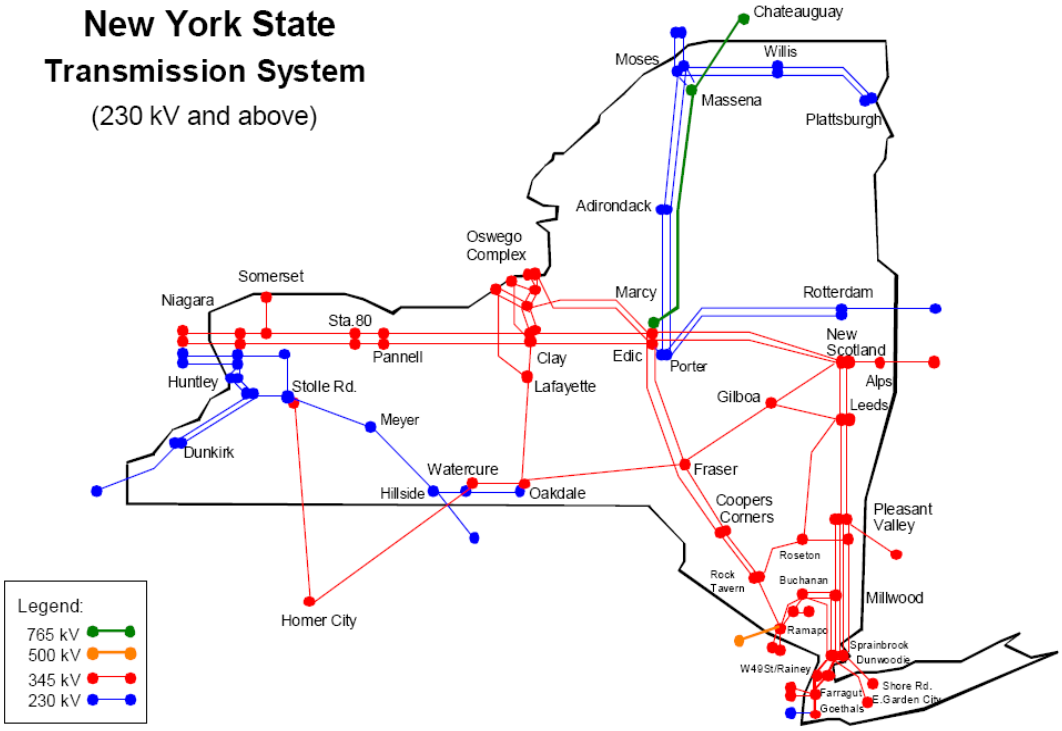
Table courtesy of the JCSP, a wind study development research and development organization whose main site is at http://www.jcspstudy.org

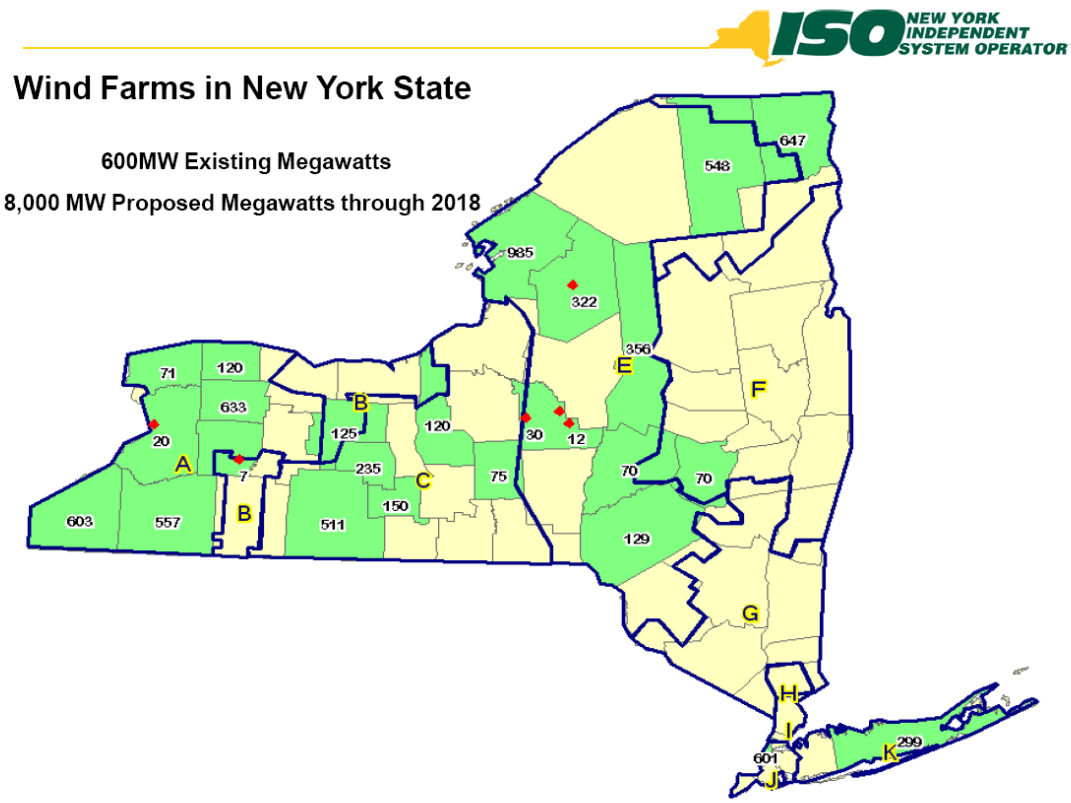
As there have already been extensive court battles between such entities as NRG Energy and NYISO over whether the wind farms' electrical output is to take precedence over firm supplied capacity from conventional generation even before the NYPA-sited wind farms have been put in place, and as the grid for the State of New York is already stable with adequate reserves of existing generation (which stability has been reinforced by the slowdown in the economy), the following is proposed (please view maps below):

1. Seek financing and subcontract services to run a five gigawatt HVDC buried cable bundle from the proposed 663 MWe IGCC fertilizer plant from Syracuse to the Oswego Complex which would be the tie-in point for all NYPA's new generation; and
2. From that point, run a continuance of this cable bundle across and under Lake Ontario to tie into the Kingston, Ontario, hub.

3. This cable run will serve as a common and shared linkage for the proposed new mix of thermal, nuclear and wind generation which will provide them collectively with the precedence in the queue their owner/operators desire while helping Ontario's grid solve their generation supply problems without the headaches and adversarial negotiations which accompany their dealings with the Province of Quebec.

My best argument for this new power line complex is that it is unrealistic to think New York City's and PJM's service area growth will provide the revenue stream to bury the first costs of all this generation going on-line, whereas Canada's power demand is in growth mode.





Further benefits of the installation of this 5-Gigawatt HVDC buried cable are that HVDC has minimal environmental impact, with no known EMR, corona effect nor thermal radiant side effects, and may be safely buried beneath existing 365 Kv tower structures without either weakening those towers structurally nor interacting with the tower's transmission system electromagnetically. Also, given that 33 Gigawatts of wind power are slated for the State of New York, and of these, many more will be planned and constructed for and within the NYPA grid, the proposed HVDC cable will serve as an expansion corridor anticipating this growth to service our northern neighbors in Ontario. Given that the proposed new wind farms have proposed no load-following thermal generation, the 663 MWe IGCC proposed can serve that function with efficiency and reliability, too, through smoothing their composite power delivery curve in response to fluctuations in load-driven demand.

Most importantly, installation and operation of this corridor will help to maintain the present stability and NERC compliance of the NYISO grid in the face of such explosively rapid development of alternative energy generation facilities, and in a manner which supports the satisfaction of all generation participants' bottom-line expectations.

How this transmission line "Ghordian knot cutter" solution will be paid for is not out of the tax revenues for the State of New York nor by the Federal government, but from the statutory NYISO-defined, limited, regulated and fair charges and tariffs for wheeling of power from one grid into another, payable to the owners of this 5 Gigawatt private sector-provided HVDC power line. These payments will be made possible through

enabling all this new generation access to meeting our neighbors' needs for power in Ontario on a billable basis.

Available is the Ontario Power Authority "Progress Report on Electricity Supply (Second Quarter 2009) which outlines their power plant projects under development. The Province intends to spend 14.1 billion dollars Canadian on new plant, and currently have a "hole" in their generation queue for around 5.5 Gigawatts of new electric power generation needs. Please see

http://www.powerauthority.on.ca/Storage/106/15329_2009_Q2_A_Progress_Supply_on_Electricity_Supply.pdf

Here is the page for downloading Ontario Power Authority's generation supply contract and review procedures for such facilities as we can provide. OPA currently has bought 11,500 MWe of new generation capacity from wind, nuclear, renewables, alternative and natural gas-based generation suppliers. Basically this comes down to filling out the forms then delivering the goods:

http://www.powerauthority.on.ca/Page.asp?PageID=1212&SiteNodeID=123

Here is a link to OPA's Integrated Power Systems Plan transmission expansion plans, so most of what needs to be done to approach them on an informed basis can be done from here:
http://www.powerauthority.on.ca/Page.asp?PageID=122&ContentID=6215&SiteNodeID=320&BL_ExpandID=

That for which I ask the County of Onondaga is for support in making possible the regulatory compliances and rights of way for the burying of HVDC cable from the proposed IGCC fertilizer plant to the Oswego Complex, and for their support in enabling the running of the submarine HVDC cable from there to the Kingston, Ontario hub, insofar as the County of Onondaga has any jurisdiction.

Respectfully submitted,
Walter James O'Brien
9 September 2009