



By Don Horne

DISTRIBUTION WILL DETERMINE THE SUCCESS OF GREEN GENERATION

The challenges in the next two decades to meet demand while incorporating renewable electricity rests squarely on just where the distribution infrastructure will be located, and where it can best exploit and encourage such environment-friendly generation.

In Ontario's case, charting future population growth and reworking the grid after the proposed shutdown of that province's coal-fired plants present an immense puzzle for the Ontario Power Authority and Hydro One.

Add to this the ongoing maintenance of a transmission system that is, on average, 56 years old.

When you consider that by 2025 Ontario hopes to double its renewable generation sources to 15,700 megawatts, it begs the question: where will these megawatts come from?

As wind, biomass and solar cannot produce all of this (or even half, let alone on a reliable basis), the logical conclusion is to turn to hydro sources.

And all of the potential large sources of undeveloped hydro power lie beyond current transmission corridors – or where lines are basically at full capacity.

Wind resources – which some analysts say could easily provide 5,000 megawatts – would be located far from where that power would be consumed. The vast wind-generation potential of James Bay, Georgian Bay and Lake Superior would require billions spent on new transmission corridors to send that energy to the urban centres of southern Ontario.

The commitment from the private sector is already here, but that may disappear with the 4- to 6-year land leases that these companies have signed for future wind farm generation projects. If these investments evaporate because of transmission constraints, that could strike a severe blow to Ontario's renewable energy push.

Already, the provincial government (specifically the Ministry of Natural



Resources) has taken a deep breath to examine the environmental impact of this explosion of wind generation, placing on hold any new development – especially around the Great Lakes, where bird migration routes, bats, butterflies and aquatic species would be most affected.

Currently, the province is expanding the capacity of transmission lines to the nuclear plant and surrounding wind farms near Lake Huron in Bruce County. A safe investment, but one that illustrates the need for dependable power at a cost of \$3 million per kilometre in upgrades.

The erratic nature of wind generation could be used as an “investment” by banking that power with neighbouring Quebec and Manitoba, whose vast hydroelectric capacity would be used as a dependable source for electricity in trade for Ontario's fluctuating wind farm power.

The other side of the coin is the cost of building new transmission corridors. For example, the Conawapa hydroelectric project in Manitoba would require a 1,500-kilometre corridor from Kenora to Toronto costing \$10 billion.

Although it would foster an east-

west grid for these provinces, it would be the most amount of money spent by any government on new transmission.

But the questions of reconfiguring the grid go beyond the need to reach new generation sources.

The decision to eliminate coal-fired generation means that the loss of such grid anchors as Nanticoke would require increases in inter-tie capacity to other jurisdictions and new transformer stations to provide the missing 4,000 megawatts of voltage from Nanticoke.

Failing to do so would mean that power couldn't be imported from Michigan or sent from Bruce Power, leaving Toronto and the surrounding area flickering on the edge of brownouts and blackouts.

But the possibility of reduced voltage isn't the only threat to Toronto.

Currently the two major transformer stations that service the city, Leaside and Manby, are at capacity; and building new infrastructure would take too long to solve this problem.

Local generation – specifically natural gas generation – is the only answer.

And it may be the only answer to avoid the loss of Nanticoke as a source of generation.

The Ontario Clean Air Alliance has put forth a proposal to convert the plant to natural gas, a proposal that would keep Canada's commitment to the Kyoto Protocol and avoid a costly re-jigging of the grid.

The debate continues on how, what and where the new generation will come from for Ontario, a province that already leans heavily on its neighbours for electricity during the air-conditioned-starved summer months. The unfunny joke is that renewables were supposed to provide an immediate source of new generation for power-starved Ontario; now that source has been put into limbo, and the private companies who have risked millions on projects throughout the province are left to only reap the whirlwind of uncertainty.