

Thinking Outside the Nuclear Box

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Nuclear power appears to be a future technology whose time is past.

This was evident as far back as 1978 – the last year that a CANDU nuclear plant was ordered in North America. In that year the Ontario Royal Commission on Electric Power Planning – in its Report on Nuclear Power entitled “A Race Against Time” – summed up two years of hearings by saying: “Far from offering energy self-sufficiency, nuclear power at best offers uncertainty.”

And so it has proved to be – not only in Canada, but throughout much of the world.

In 1999 Ontario Hydro went technically bankrupt, broken under the burden of its long-term nuclear debt – which amounted to some \$34 billion. Twenty billion was off-loaded to Ontario ratepayers, who are still paying for that “stranded debt” on every month’s hydro bill. They have about \$5 billion left to go.

Hydro’s debt was inflated because of the nuclear industry’s failure to get costs in line with reality. The Bruce plant, supposed to cost \$3 billion, ended up at \$6 billion. The Darlington plant, originally estimated at \$3.2 billion, came in at \$14.3 billion.

Since then, while no new nuclear plants have been built, refurbishing old plants has begun, and cost over-runs have not gone away. The four refurbished Pickering A reactors were to be restarted at a total cost of \$800 million – an average of \$200 million a pop – within a period of 18 months. Three years later, only one of those reactors was up and running at a cost of \$1200 million.

After an inquiry and a scolding, Ontario Power Generation (OPG) was told to restart another Pickering A reactor – at less than \$500 million. Two years later that second unit was running, but it cost a billion. The remaining two reactors were written off by OPG.

OPG has decided not to refurbish the four Pickering B reactors; they are to be shut down permanently in 2020. So in 8 years time, only 2 of the original 8 reactors at Pickering will still be in operation. And that’s assuming nothing else goes wrong.

Last week the first of two refurbished Bruce A reactors was started up and “synchronized with the grid” for the first time in 15 years. The second one is soon to follow. Estimated cost of refurbishment, \$2.7 billion. Actual cost, over \$4.8 billion. Estimated time, 4 years; actual time, 6 years.

There's another problem. Ontario has had a sizable surplus of electricity for several years, and that surplus is expected to continue. Accordingly, electricity has often been sold at a "negative price". It's cheaper to pay customers to take electricity than to shut the nuclear plants down.

Because nuclear plants cannot easily be restarted after shutdown, other generators are usually shut off first when there is over-supply in order to keep the more unwieldy nuclear plants running.

So the more nuclear plants there are, the more renewables are sidelined in times of slack demand – making them less cost-effective. This is a formidable obstacle preventing the development of a sustainable energy policy based on renewables. The prevalence of nuclear plants even provides an incentive not to invest in energy efficiency, since lowering demand threatens to idle the nuclear plants.

There is an important societal choice to be made. Either we commit to giving renewable energy a fair chance to become the mainstay of our society, or we continue to invest in nuclear plants and perpetually marginalize the non-nuclear alternatives.

To build a renewable-energy society we need to develop smart grids, using modern electronics to handle thousands of small intermittent generators, rather than sticking with an old-fashioned grid that favors huge blocks of base-load power that must be running 24/7 in order to justify the enormous investments needed to create that system. We also have to develop and deploy superior energy storage systems.

For decades, nuclear power has been given every advantage – massive subsidies, unquestioning political support, priority in R&D funds – yet it has failed to solve any of the fundamental problems plaguing the technology, such as lack of a permanent disposal for nuclear waste, absence of inherently safe reactors, and prevention of nuclear weapons proliferation potential using materials associated with the civilian nuclear fuel chain.

It's time to give alternative energy strategies an opportunity to thrive. Energy efficiency, industrial cogeneration, combined cycle plants, smart grids, and renewable energy sources deserve to be given the kind of favorable treatment once lavished on nuclear power.

The July Report of the Standing Senate Committee on Energy, the Environment and Natural Resources, entitled "Now or Never", gives a higher priority to smart grids, energy efficiency, and renewables, than it does to nuclear power – which appears only as 12th out of 13 priorities. Let's insist that our governments respect this ordering of the priorities when it comes to investments.

Global nuclear prospects are not looking rosy either. Germany, Switzerland, and

Belgium are committed to phasing out nuclear power completely. Siemens is getting out of the nuclear business and will focus its efforts on renewable energy, which it dubs “the engineering challenge of the 21st century”. Japan, too, is under strong pressure to adopt a non-nuclear energy strategy. Even France has announced that it will be retiring and dismantling some of its nuclear power plants.

A panel of experts for Fortune Magazine predicted that the maximum number of new nuclear plants to be built in North America in the next decade is three or less. Despite plans for more nuclear plants in China, India, and Russia, a number of independent studies have concluded that nuclear power’s role will continue to decline world-wide for at least the next couple of decades, as older plants will be retired faster than new plants can be built. Nuclear power certainly offers no quick solution to climate change!

Cameco, the uranium giant, recently conceded that prospects for a uranium price rebound is non-existent, because nuclear growth will be “only moderate” and centered mainly in Asia.

Quebec has become the first political jurisdiction in North America to opt for a total phase-out of nuclear power, by permanently closing the only nuclear plant operating in the province, Gentilly-2.

It’s time for other governments to read the handwriting on the wall. It’s time for us to try something truly sustainable.