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To: [Committee, Nuclear Energy \(REPS\)](#)
Subject: Canadian nuclear experience
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Before moving to 18 years ago I lived in Canada - where the Nuclear industry has a long and rather checkered history. The Canadian experience is not as dramatic as that of Chernobyl or Fukushima, but does include spills at several facilities, a “loss of coolant” event at Chalk River resulting in hydrogen explosions (fortunately it was a small reactor so the damage was reasonably contained) and several fuel rupture events (the one at Chalk River causing a fire and contamination of the NRU [National Research Universal] building). Despite the accidents, failures and spills, the main problem for the Canadian nuclear industry is the cost issue – the industry always estimates the costs of power generation and waste disposal on a rather unfeasible basis. For example, the refurbishments (late 1990’s-2005) of the 4 reactors of Pickering A (Pickering nuclear facility is one of the largest in the world) were subject to 5 fold cost overruns! The cost blowout was so bad, that the refurbishment of two of the reactors was eventually cancelled and the reactors mothballed. This was also not the first time expensive refurbishments were needed, in the early 1980’s a refurbishment was required after a loss of coolant accident which cost more than the original cost of the station some ten years earlier. Similarly Darlington nuclear station design cost was estimated at CA\$ 3.9 billion in the late 1970’s, when construction began in 1981 the budget had already blown out to CA\$ 7.4 billion and the actual cost was CA\$14.4 billion. The Bruce station was better than either Pickering B or Darlington in terms of cost overruns: Bruce A was projected to cost CA\$0.9 billion but actually cost CA\$1.8 billion; Bruce B was projected to cost CA\$3.9 billion but actually cost CA\$6 billion. At one point Bruce A held the operating record for a nuclear plant ... 474 days one might expect something a bit better for CA\$1.8 billion (1978 dollars).

Of course all the estimates for the cost of electricity generated from these stations were based on the design costs (not the actual costs), did not account for the costs of refurbishments or of any accidents (most of which are usually borne by the government anyway) and neglect the cost of management of long term waste storage. Currently in Canada, despite Ontario have 20 reactors (not all operational of course), there are no long term storage facilities for nuclear waste. The Nuclear Waste Management Organisation has been looking for long term storage site for 10 years and has spent more than CA\$100 million on public engagement alone. The storage site is anticipated to cost between CA\$16 and CA\$24 billion dollars (judging from the industry’s previous estimation performance these estimates should be doubled or trebled)! There are also significant difficulties in moving nuclear waste – both in Canada and the US most nuclear waste is stored on site – and attempts to move it have been fiercely resisted by the communities through which it will travel. From 2009 until 2020 Ontario, a province with 60+ years of nuclear experience and being the developer of the CANDU reactor shelved their plans for nuclear development. This was not because of perceived risks, waste management problems (although they do have these too), it was purely a matter of the costs were just too high – years of subsidising nuclear generating power from their hydro-electric power generation schemes and coal fired plants, combined with the prohibitively high capital costs. And that is in a country where the reactors would be locally built, so much of that money would end up in the local economy... still not enough of an incentive for Ontario to go ahead with Nuclear. It is true that recently Canada has revived plans for SMR nuclear reactors, part of this is because of the potential of exporting these SMRs (made in Canada with Canadian expertise) to other countries for eye watering amounts of money. For Canada this may be a way to recoup some of the capital already sunk into nuclear. Australia has fantastic renewable potential and already leads the world in roof top solar. Do we really want to open this can of nuclear worms – they have expensive tastes! Renewable technology, like

solar and wind have demonstrated dramatic reduction in costs over the past few years... while nuclear has demonstrated cost blowouts. Forget nuclear, go with truly renewable technology (no waste to deal with) which is also inherently more secure because it is distributed.

Regards,
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