Intelligence MEMOS

From: Neil Alexander

To: Canadian Nuclear Watchers

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Re: **Creating a Successful Small Modular Reactor Business in Canada**

Last month, Alberta signed on to the existing memorandum of understanding between Ontario, Saskatchewan and New Brunswick signalling its desire to collaborate on the deployment of Small Modular Reactors (SMR).

It's the latest step in Canada's useful progress towards the demonstration of this new technology, the first hurdle in the race to anchor Canada at the forefront.

Among other initiatives, the federal government is providing funding to progress the development of the Moltex and Terrestrial Energy reactor designs and the Minister of Natural Resources is reinforcing the message that Canada cannot meet its emissions targets without the help of nuclear.

Meanwhile, Ontario Power Generation is proceeding with the extension of its Darlington licence for nuclear new build and has selected three designs (GE, Terrestrial Energy and X-Energy) that might be suitable for deployment. And SaskPower, New Brunswick Power are active in the field, as is OPG at Chalk River and Bruce Power on Lake Huron with Westinghouse.

In all, the Canadian Nuclear Safety Commission lists 12 different designs in various stage of their pre-licencing vendor design review.

Unlike the large reactors of the past, these smaller designs must be built in fleets if they are to be economic. This fleet approach controls costs through the benefits of repetitive building, and, to some extent, mass production. It is also needed to bring down the operating costs by ensuring the ability to resolve any arising problems and the availability of cost-effective support services (such as waste disposal) and replacement components.

However, demonstration of the technology will not, in itself, guarantee the creation of the fleet or the desired emissions reductions and export success.

To use a farming analogy, appropriate given Saskatchewan's involvement, you can develop the perfect seed but it won't grow in a desert.

Much has been made of that fact that the more manageable cost of SMRs will allow nuclear power to move away from the government-focused approach of Canada's nuclear past, towards a model with much greater private sector involvement. But there is some tilling, fertilization and irrigation that still need government involvement.

These ground-preparing actions should include:

1. Ensuring public support for SMRs, through education about the role SMRs can play in achieving emissions goals and the opportunities for job creation.
2. Building on the existing confidence in the regulators ability to ensure the health and safety of Canadians and the quality of our environment.
3. Building cross-party support to ensure that the program survives changes in government.
4. Providing long-dated financial guarantees to assure the public that legacy materials will be removed from sites and that liabilities from commercial SMR operation are suitably bounded. Such guarantees are already applied to other industries.
5. Streamlining the environmental assessment and regulatory processes to ensure they provide the necessary protections but do not create undue cost or delays.
6. Aligning legal processes to ensure procedural legal suits, such as that which delayed the UK program, do not unnecessarily increase costs, create delays or, in the worst case, prevent deployment.
7. Enabling access to finance appropriate to infrastructure projects with longer payback periods.
8. Establishing international relationships/partnerships that will expand markets and ensure acceptability.
9. Using their convening power to bring together potential customers and assist them to reduce emissions by acquiring nuclear technology, enabling these customers to avoid first-mover perils by reducing the risk of ending up with an expensive orphaned machine.

This list may look long, but these are not expensive actions and the costs pale in comparison to the investments in technology development.

This program would best be implemented by a multi-disciplinary team, independently led and with representation from potential customers (domestic and export), environmental specialists, Indigenous people, politicians from all parties, lawyers, financiers, economists and social scientists as well as the nuclear experts who are presently in the driving seat.

While a seed planted in a desert will fail, fertile ground will become a forest whether anything is planted or not. The right diverse leadership will ensure the ground for new nuclear will be fertile and that Canada's investments in SMR technology will bear fruit.

Neil Alexander has held senior executive positions within the nuclear industry, led a nuclear-focused academic institute and is now an independent consultant.

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