ONTARIO CLEAN AIR ALLIANCE

Standing Committee on Science and Research
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To members of the Standing Committee on Science and Research,

Re: Why Small Modular Nuclear Reactors (SMRs) should not receive federal funds earmarked for climate action

The nuclear industry, in steep decline worldwide, is working hard to convince governments that it has a bright technological future in the form of small modular reactors. The industry's problem is that not only does this technology not exist beyond the very early conceptual stage, but it offers no answers to the problems that are driving the industry's current decline.

Waste

After more than half a century of nuclear operations in Canada, there is still no long-term solution for high-level radioactive waste disposal. No other industry would be allowed to continue operating while producing deadly toxic waste it lacks the ability to properly remediate, and which will remain toxic for millions of years.

No high-level radioactive waste storage facility exists anywhere in the world for good reason: the safety concerns surrounding such facilities make finding "willing host" communities extremely difficult. The likelihood of finding any waste storage "solution" will depend on exploiting low-opportunity, high social stress communities. But Canada's First Nations have made it clear they do not welcome such facilities in their territories.

Furthermore, the technical challenges of storing such waste for tens of thousands of years are massive (and likely unsolvable under any honest risk assessment). Industry spin aside, we are little closer to solving these challenges than we were 50 years ago. Worse, SMRs will not solve the waste issue but will *make it worse*. A study published May 31 in *Proceedings of the National Academy of Sciences* concludes:

> "Our results show that most small modular reactor designs will actually **increase** the volume of nuclear waste in need of management and disposal, **by factors of 2 to 30** for the reactors in our case study. These findings stand in sharp contrast to the cost and waste reduction benefits that advocates have claimed for advanced nuclear technologies."

Cost

The Canadian Small Modular Reactor Roadmap Steering Committee optimistically projects that power from SMRs will cost 16.3 cents per kWh, almost three times the current price of power from wind and solar. Unlike these easy-to-deploy forms of waste-free energy with declining costs, the outlook for complex SMR technology does not suggest a rapid fall in costs. No SMR components are currently being manufactured and none are actually modular. This continues to be "bespoke" technology poorly suited to the kind of "learning curve" price declines we have seen in solar and wind. Even remote communities can meet their power needs at a much lower costs with a combination of renewables and storage today.

Security

The idea that we will "drop in" nuclear reactors filled with fissionable materials to remote communities is a security nightmare in the making. Let's remember that far too many of Canada's First Nation communities are still struggling to secure and maintain working water-treatment systems. The idea that SMRs are a solution to these communities' energy needs is farfetched at best and more likely, completely untenable in terms of community acceptance and risk. Who is going to pay for and implement the security measures needed? Who is going to deal with any incidents when access to communities often takes hours of travel?

Similarly, the notion of using SMRs to power oil sands operations makes little sense. These are sunset operations in any case. By the time SMRs might possibly be ready, the oil sands will be well on their way into the history books.

Not a good fit

Whether Canada recognizes it or not, the world is moving toward a major tipping point in electricity system design that will involve a rapid shift to highly decentralized systems instead of the old hub-and-spoke model that SMRs are designed for (being not particularly small). We now have the technological know-how to effectively blend efficiency, highly distributed renewable power and multiple kinds of storage to create systems that are more resilient, more efficient and less costly for meeting our energy needs. SMRs, with their inflexible and costly power output, are poorly suited to this fast-emerging system type and will be little more than white elephants within such systems.

Beyond industry hype, there is little to suggest any pressing need for SMR technology or any likelihood that they are going to be part of an effective climate solution. We have the tools we need to decarbonize electricity right now (as study after study has confirmed) and do not need to wait 20 to 30 years for the nuclear industry to develop yet another "false promise" technology.

Canada has wasted tens of billions of dollars on the failed Maple Reactor technology and on Advanced CANDUs that ended up never being built. Wasting more public money on a clear technological dead-end is not only a mistake, it is scandalous at a time when we need immediate and effective action to reduce emissions and curb climate damage.

It is time to tune out nuclear industry promises that "this time it will be different" and instead seriously consider whether an industry that has never completed a project on time or on budget is really a good bet for limited funding meant to drive real action on climate.

Thank you for considering my contribution.

Angela Bischoff, Director

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