

**Mr. Colin Hunt (Secretary, Canadian Nuclear Society):**

Good morning, Mr. Chair and ladies and gentlemen of the committee.

My name is Colin Hunt. I'm the secretary of the Canadian Nuclear Society.

The Canadian Nuclear Society is a national, not-for-profit, learned society across Canada whose members are interested in nuclear science and applied technology in Canada. The CNS has branches of local operations across the country.

The committee posed a number of questions to the Canadian Nuclear Society. My opening remarks this morning will provide short answers to each of those questions.

With respect to the future opportunities for Canadian nuclear science and technology, we believe it lies in the following areas.

The first, immediately, is the various refurbishment projects of 10 Ontario nuclear power reactors, four at Darlington, six at Bruce, in a \$25-billion program stretching out over the next 10 to 12 years. It should be noted that much of this investment is private sector capital, specifically at the Bruce plant. This means that the private sector is willing to invest its capital in domestic nuclear power projects where there exists stable government policy. This ensures that nuclear power will remain the dominant source of electricity for Canada's principal industrial province well past the mid-point of this century.

The CNS also notes that the implementation of nuclear generation lies within the jurisdiction of the provinces, as noted by our friends at NRCan just a moment ago, and it is thus up to the provinces to determine their means of electricity production. It should also be observed that because of the previous restart of six nuclear reactors in Ontario—four at Bruce, two at Pickering—that province is now nearly free of gaseous emissions from its electricity sector.

The second area is the immediate prospects before us of new CANDU reactors in Romania, Argentina, and China.

The third area, over the longer term, is expansion into more regions of Canada of nuclear power generation via small reactor technology for both grid applications and remote locations across northern Canada. SMR technology is also applicable to site-specific industrial applications.

The fourth area is the strong prospects of export of fuel and services to large new markets, and I'm specifically referring here to India.

The committee also asked us about the state of Canada's technology domestically and internationally. The view of the Canadian Nuclear Society is that the state of Canada's CANDU technology domestically and internationally is strong. Domestically, Canada's nuclear reactor fleet is among the best performing in the world in terms of both safety and efficiency. This performance is attributable in part to the expertise of Canada's nuclear plant operators and in part to the thoroughness and effectiveness of its regulator, the Canadian Nuclear Safety Commission.

Internationally, aside from the new construction prospects noted above, one of the most promising developments is the agreement between SNC-Lavalin and two large companies in China to build a new CANDU project in China to demonstrate advanced fuel cycles, and again, our friends at NRCan have made reference to this impending project. Unlike most of the other nuclear power reactors around the world, CANDU reactors can use a variety of different fuels without significant modification of the reactor.

With respect to the question the committee asked about benefiting other economic sectors within Canada, one of the principal ways it can benefit Canada's other resource sectors is by providing a cost-effective energy supply free of gaseous emissions to support primary industry.

The use of small modular reactors, for example, can reduce significantly the need of Canada's oil industry to use large amounts of natural gas for oil sands or for shale oil projects. Small reactors can avoid the need to rely on diesel fuel for energy supply in Canada's Arctic regions. This would lower costs and greatly reduce the risk of shortages. Providing reliable energy supplies would in turn encourage greater economic development of these regions in the interests of local populations.

A third point here would be that expanding reliable supplies of electricity to remote communities will greatly assist in improving health and water treatment in the local communities. At this time, existing energy supplies to these communities, primarily diesel fuel, can be highly unreliable.

With respect to research and development, Canada has a strong nuclear R and D structure, and this should not be surprising given that Canada is an innovator nuclear nation. It is active in all areas of nuclear science and technology, and it was, in fact, the second nation in the world to demonstrate controlled nuclear fission.

Canada's R and D structure is not confined strictly to Canadian Nuclear Laboratories, though I'm in no way understating the importance of that facility. Canada's nuclear R and D structure is distributed through a host of other institutions, universities, and corporations. Canada has a large number of research reactors and particle accelerators across the country, many of which are engaged in various research activities.

But all nuclear innovator nations—and this specifically includes Canada—need high-flux neutrons for large parts of nuclear research. Thus far, the only large source for this has been the NRU at Chalk River. Its impending shutdown does not mean that all such research in Canada will cease. What it means is that such research in Canada will have to go outside Canada for irradiation of targets. Unless the supply of high-flux neutrons is addressed by the Government of Canada, over the long term there is a risk that nuclear expertise in Canada must diminish.

With respect to R and D and nuclear medicine, this is a question I would more happily defer to other associations and societies more expert in the science and application of nuclear isotopes for medical purposes. The CRPA comes to mind in that regard.

The committee asked us about isotope supply, and, again, we would prefer to defer that to other organizations. We can provide the committee with a list of those who we believe are appropriate organizations to deal with that matter specifically.

The committee asked us a series of questions regarding waste management decommissioning. I would prefer to make a general statement here. All radioactive wastes in Canada are comprehensively managed by the owners of the waste. It should further be noted that, over the past decade, the Government of Canada has taken steps to manage comprehensively the legacy waste from the early years of nuclear science and research in Canada.

With respect to existing waste management, it's the view of the CNS that Canada's record is as effective as that of any other nation in terms of public safety. For the longer term, Canada has a long-term plan for management of all of Canada's nuclear waste in a program administered by the Nuclear Waste Management Organization. The CNS is in fundamental agreement with the approach taken by the NWMO.

Those constitute the bulk of my introductory remarks.