



Canadian Small Modular Reactor (SMR) Roadmap
Feuille de route pour les petits réacteurs modulaires (PRM) au Canada

Indigenous Engagement Session
Calgary, June 18, 2018

October 10, 2018

Preface

This report provides a summary of discussion from the Small Modular Reactor Roadmap Project's *Indigenous Engagement Session* held in Calgary, AB on June 18th, 2018.

This session, like the Project, was not driven by any proposal to build or operate a small modular reactor in Canada. Rather, the Project's intention is to consider Canadians' requirements and concerns around SMRs, from a pan-Canadian viewpoint, well in advance of any such project.

Similarly, this session's intention was to engage Indigenous representatives at an early stage, with a view to laying solid and respectful foundations for more engagement, in the event that actual SMR projects are proposed in Canada in the future.

The agenda for the day is contained in Appendix A, and Attendees are listed in Appendix B.

Introduction to the Small Modular Reactor Roadmap

A **Small Modular Reactor (SMR)** is an advanced nuclear reactor that produces electric power up to about 300 MWe, designed to be built in factories, and shipped to a site for installation as required. SMRs provide a range of benefits including reduced greenhouse gas emissions, improved affordability, shorter construction and installation times, a wider range of users and applications, site flexibility, and integration with renewables.

In its October 2017 response to the House of Commons Standing Committee report on Nuclear Energy, the Government committed to initiating a dialogue with key stakeholders to develop a **Canadian Roadmap for SMRs** ("SMR Roadmap" or "Roadmap"). The development of the Roadmap was considered critical in light of the following:

- SMRs are a promising potential source of non-emitting power for various applications;
- The technology is at an early stage of development, with many questions that still need answers;
- Future success involves risks and costs, potentially involving both the private and public sectors across Canada; and
- A pan-Canadian approach could help guide important decisions and reduce uncertainty.

Initial research and analysis in support of the Roadmap identified three main potential applications for SMRs domestically, which are listed below.

- 1) **On-grid power** generation to replace fossil fuel plants in the existing electric power grid system (~150 to 300 MWe).
- 2) Providing non-emitting heat and power for **heavy industry** sites such as resource extraction operations (~10 to 50 MWe).

- 3) Replace existing diesel power generation for electricity, district heating, and desalination in **off-grid northern and remote communities** (~1 to 10 MWe).

Welcome

The meeting began with an opening prayer and song performed by an Indigenous elder.

Guy Lonechild, President of the First Nations Power Authority (Co-facilitator) presented brief welcoming remarks and a preview of the day's program. Phil Carr (Project facilitator) added that the SMR Roadmap Project represents the early stages of consideration of the deployment of SMRs in Canada, and that the Project team is here mainly to listen.

Introductions

The Indigenous participants introduced themselves and their roles in their communities.

The participants also took the opportunity to register concerns their communities have had around the current energy situation. It was noted that there are a lack of alternative energy sources that are available to some of their communities, and that there needs to be a long-term solution to meet their energy needs.

High power costs are also of great concern to their communities. Participants noted that given the economic climate, with nearly 70% of the population of their community being unemployed and another 70% under the age of 30 years old, it has become increasingly difficult to pay their own power bills.

Presentation by NRCan

Diane Cameron, Director of the Nuclear Energy Division for Natural Resources Canada, made a presentation on Canada's nuclear sector, the Generation Energy process, and the SMR Roadmap project. The presentation included a breakdown of the process and structure for writing the Roadmap.

The discussion then focused on the need to continue to include and consult Indigenous people in Saskatchewan and Alberta, as they have always been previously (particularly on the topic of oil and gas regulations). One participant mentioned that they had been urging the Canadian Nuclear Safety Commission (CNSC) to appoint an Indigenous commissioner.

It was then added that Indigenous peoples want meaningful inclusion as producers. This could help create the buy-in that would lead to all key players sharing ownership of nuclear technology.

It was noted that the present early-stage engagement is an effort to address these concerns, as well as other key questions.

Safety and Environment

The discussion then shifted to focus on safety. The concepts of passive and inherent safety were discussed. It was explained that passive safety requires that there be activity in order for the system to keep operating. Without activity, the system would safety shut itself down. It was then explained that inherent safety is where emissions and other harmful external effects are made physically impossible. It was noted that both passive and inherent safety mechanisms are usually objectives of SMR design.

Iain Harry, Director of Innovation and Clean Energy, SaskPower, said environment and safety are generally the first two questions that get raised about nuclear energy because they are the most important questions. While there are good technical answers to these questions, technical answers aren't what people are looking for. There need to be social answers, and SaskPower has been investing on that side of the issue.

In response to Indigenous participants' questions regarding examples of damage scenarios, an industry participant said that these damage scenarios involved human and environmental exposure to ionizing radiation, which is very similar to overexposure to sunlight. This can directly cause some harm (including cases of cancer), but more likely to be important is the consequences of the reactions to the radiation risk -- especially overreaction in the form of evacuating residents unnecessarily (i.e. over too large an area), as in 2011 in Fukushima, Japan.

Discussion then focused on another participant's concern regarding water usage. It was explained that all reactors use water to some extent, which is why they are often located at waterside; however, water is being made much less necessary in small modular reactor designs. Generally some of the water used by the reactor is lost in vapour, and the rest is cleaned and returned to the environment, though generally at a warmer temperature than previously.

Economic benefits

After a coffee break and further discussion of risk issues, one participant turned the conversation to economic benefits: “The blood and bones of our ancestors are in this ground, and all we get is bills to pay.” Another participant added that it’s about retaining people and capacity on reserves. Also, Indigenous people consume the plants and animals that live on the land, and they need to know the effects of economic activities.

In response to these concerns, it was said that a conversation about economic benefits would need to come after a decision that nuclear technology was being seriously considered as an option. The conversation then would be: How would Indigenous people want to be involved and how would they expect to benefit?

One participant suggested that Indigenous businesses could be contracted to manage future engagements. They then commented that “this is a capitalistic model and Indigenous democratic people have been excluded from it.” The participant contrasted Indigenous democratic and collective living, which places spirituality first, with the “capitalistic” model. The challenge here, they said, is how to bring Indigenous people in.

An industry participant cautioned against relying too heavily on assuming there is a profit model available in SMRs. Typically, SMRs do not promise to use a previously unexploited natural resources, such as forests, mineral deposits, or an oil and gas field. Rather, SMR applications in western and northern Canada would merely promise to displace diesel or natural gas as an energy source, which is expensive, unreliable, and dirty. The payoff from SMRs would be to make the energy less expensive, more reliable, and cleaner.

While these are potentially great benefits, they do not necessarily represent an economic margin that can be shared in cash in the same way that (in well managed cases) can be available from resource developments. “The reason provincial and territorial governments seek alternatives to diesel in remote communities isn’t necessarily that their capitalistic system sees a profit there.”

Partnerships

Following the lunch break, Mr. Lonechild took stock of the morning’s conversation, which he said was good. Citing Albertans’ experience with resource wealth, the co-facilitator said there appeared to be an opportunity in SMRs. He noted that there are special circumstances associated with Alberta’s deregulated electric power market. This could actually facilitate Indigenous people owning a piece of the SMR opportunity, especially in hard-to-serve areas of the province.

One participant then discussed the constraints of Natural Resource Transfer Agreements (NRTAs) as they currently exist, and the prospects for improving them. They said Indigenous people have great traditions and assets, which unfortunately have been under-funded, and requested to be “[made] a partner, not just an offer.”

It was added that Indigenous people are too often not at the table and get discussed by external parties. They suggested that they should have been represented in the SMR Roadmap Project working groups.

Another participant extended this idea, saying, “You should come to us -- to our communities, rather than us having to come to town. The way we’re doing this today, we’re just messengers. We work for the people back in our communities and they are the real owners.” A participant added that Indigenous people in Saskatchewan alone have five Indigenous language groups and many institutions.

It was then mentioned that the group is consulting on a vague concept. This led to a discussion of whether or not holding regional workshops is a good approach, or if it would be better to work through national Indigenous organizations. In response to this, one participant advised being as inclusive as possible.

It was then explained that much of what the Indigenous participants were proposing would take place at later stages of the process. A participant suggested that the FSIN could be asked to produce a position paper, a suggestion that Ms. Cameron commended.

It was also noted that, while the legal duty to consult would of course apply to any actual project that might be proposed in the future, and that would imply more detailed engagement than the present one, the SMR Roadmap Project team has reached out at an early stage by holding this event and others like it. Also, the next Indigenous engagement by this Project will be two days of engagement in Ottawa, which will be held at an Indigenous community centre (the Wabano Centre) so as to site the conversations in an Indigenous-friendly milieu.

Further discussion

Important questions that must be addressed before an SMR project proposal can take shape. Some of the questions discussed were: Chalk River Labs is open to hosting a demonstration reactor, but which design? Who would fund it? What constraints will the federal government impose? And one of these questions is: What questions would Indigenous people want to have asked of such a project?

One participant stated that Indigenous knowledge keepers should be involved in all conversations. It was explained that the safety issue should be owned by all players working together, rather than having one group make decisions, especially because an accident at one site affects everyone in the industry.

A participant asked how large the volume of nuclear waste currently is. It was then shared that the spent fuel would fill approximately seven hockey rinks up to the top of the boards. The participant followed-up by asking what the model is for the worst-case accident. It was said that the release at Chalk River in the late 1950s provided an illustration, where responders did what was thought to be right at the time, but those actions turned out to be incorrect, and we are cleaning up the results now.

In response to a participant’s question about carbon taxes, an industry participant replied explaining that uranium is incredibly energy-dense and emission-free, and will end up being the best way to decarbonize. Few people will embrace the scale of land use that low-density alternatives would require if they were to supply much of our energy demand. It was added that there are strong regional differences over carbon taxes; in Saskatchewan, all the big power consumers generate large CO₂ emissions, so a carbon tax would hurt the province’s exports, whereas it would be very easy for Quebec to deal with. Therefore, Saskatchewan would prefer setting an end objective and letting each region find its optimal way to that result. Ultimately, we

must accept that there will be some kind

of penalty to pay for carbon emissions, and currently Saskatchewan generates 75% from fossil fuels and Alberta 92%. Coal will be eliminated in a few years, which will represent a dramatic change for both provinces.

When the question comes down to economic benefits for the province, nuclear really wins at the provincial Cabinet table in Saskatchewan. Buying power from neighbouring provinces is an option, but one that sends all the money elsewhere, whereas even simply operating nuclear power plants (never mind designing or building them) means a lot of high-quality, well paid jobs. Indeed, with adopting nuclear energy, the problem eventually becomes: how do you train enough qualified people to fill all those good jobs?

It was also noted that climate change in northern Saskatchewan was causing damage to communities through windstorms and wildfires. It also increases the need to clear brush from around power transmission lines, triggering the duty to consult with Indigenous people.

Next Steps

Guy Lonechild, Co-facilitator, asked what the next steps might be. Ms. Cameron said there were three more events planned. The two days after this engagement would be devoted to a technical workshop in Calgary on heavy industry applications. Then there would be two separate days of Indigenous engagement in Ottawa during July. Meanwhile, the results from the Project's various Working Groups would be emerging and would feed into the Project report.

The Working Group results, plus the results of the workshops, would be compiled together and then key findings would be distilled for tentative presentation to Ministers at the Energy and Mines Ministers' Conference in August in Iqaluit. Late in the summer there will be a final report, including recommendations. The SMR Roadmap Project team will be talking in the meanwhile about where the path leads from there.

It was noted that a draft report from today's engagement should be circulated to today's participants.

One participant asked about how Indigenous people could go about engaging with SMR designers/developers. Ms. Cameron noted that the SMR developers are unlikely to take on the role of building or operating power plants and selling electricity, instead they are likely to partner with experienced power plant operators, and that includes the utilities represented on the SMR Roadmap Project team. Accordingly, a good point of contact for learning more about possible SMR designs would be to engage with the utilities. It was then offered that participants be put in direct contact with SMR developers if that was still of interest.

Key Points We Heard

Project team members who participated came away with a number of valuable learnings from the session, which could be articulated as follows:

- 1) Importance of early and meaningful engagement (i.e. not just mitigation plans) and of engaging directly in the community (versus inviting representatives to a city venue);

- 2) Importance of indigenous ownership and equal partnership through a variety of potential business models;
- 3) The burden of the high cost of power on reserves;
- 4) The desire to retain people and capacity on reserves, and to have a permanent living on the land;
- 5) SMRs could be acceptable as a component of the future clean energy mix, but Indigenous communities need to know the implications of worst case scenarios.

APPENDIX A -- AGENDA

Canadian Small Modular Reactor (SMR) Roadmap Indigenous Engagement Session

Sandman City Centre Hotel, 888 7 Ave SW, Calgary AB T2P 3J3

9:00am – 4:00pm

June 18, 2018

Overview:

This workshop is an opportunity to facilitate early discussion between Indigenous groups, governments and utilities on Indigenous views, priorities, and concerns related to the future of Small Modular Reactors (SMRs) in Canada.

There are currently no SMR projects planned in Canada, as the technology is at an early stage of development. Most SMRs technologies are 10 to 15 years away from deployment, and many questions need to be answered before their potential could be realized.

Proposed Agenda:

Time	Item
9:00 – 9:10	Opening Prayer
9:10 – 9:30	Introductions and Welcoming Remarks
9:30 – 10:00	Roundtable statements and discussion
10:00 – 10:30	The next generation of nuclear – Small Modular Reactors (SMRs) The Canadian SMR Roadmap
10:30 – 10:45	BREAK

10:45 – 12:00	<p>Discussion: Your views on SMRs</p> <p>What questions do you have related to SMRs?</p> <p>In your opinion, what do you see as the opportunities and challenges with SMRs?</p>
12:00 – 13:00	<p>Lunch (to be provided)</p>
13:00 – 14:00	<p>Discussion: Your role</p> <p>Do you see any opportunities associated with entrepreneurship and economic development with SMRs?</p> <p>What value/role can SMRs provide to your communities?</p> <p>What role would you want to play in potential future SMR development?</p>
14:00 – 14:15	<p>BREAK</p>
14:15 – 15:30	<p>Discussion: Further engagement</p> <p>What further engagement would you like to see related to SMRs?</p> <p>What additional information regarding SMRs and nuclear power in general would you like to have?</p>
15:30 – 16:00	<p>Workshop wrap up</p> <p>Next steps for the SMR Roadmap and SMRs in Canada</p> <p>Final comments or further request for information.</p>

APPENDIX B -- ATTENDEES

Indigenous

First Nations Power Authority

TsuuT'ina Nation

Prince Albert Grand Council

Federation of Sovereign Indigenous Nations Samson Cree Nation

Cote First Nation

Saskatchewan First Nations Natural Resource Centre of Excellence

SMR Roadmap Project

Natural Resources Canada (Steering Committee Chair) Alberta Ministry
of Energy

SaskPower

Atomic Energy of Canada Ltd. Ontario Power
Generation

Strategic Review Group (Project Facilitator)

Canadian Nuclear Association (Project Coordinator)

Canadian Nuclear Association (Project Manager and note-taker)