

To: SRSR Committee on SMR
From: OCNi
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Committee Briefing Note

About OCNi

The Organization of Canadian Nuclear Industries (OCNi) is an association of more than 200 leading suppliers of the nuclear industry in Canada and the international marketplace. OCNi member companies employ more than 15,000 highly skilled and specialized people in Canada, who manufacture major equipment, medical and safe applications of nuclear technology, and provide engineering support services with CANDU and SMR technology for nuclear power plants domestically and internationally. OCNi is the leading voice of the Canadian nuclear supply chain and actively promotes the production of safe, clean, and reliable nuclear base load electricity as a central part of Canada's balanced electricity generation portfolio. OCNi also encourages and supports its member companies with taking their unique capabilities and high standards of quality and customer value to offshore nuclear markets through partnerships with local suppliers, power plant designers, nuclear utilities, and government agencies.

CANDU nuclear generation plants at the Pickering, Bruce, and Darlington provide more than 50% of Ontario's electrical energy. Ontario's 'Long Term Energy Plan' calls for the refurbishment of existing CANDU units at Darlington and Bruce, as well as the construction of new nuclear units at the Darlington site to maintain a balanced and reliable electricity supply portfolio for the province.

CANDU power plants in New Brunswick and Quebec have supplied reliable and carbon-free electricity to provincial grids.

Nuclear power projects are being considered in Saskatchewan and Alberta to help these provinces meet increasing electricity supply needs reducing greenhouse gas emissions.

International Interest in Nuclear

International interest in nuclear energy, and in particular Small Modular Reactors (SMRs), has skyrocketed as global energy security concerns have risen to the forefront. Countries like Poland, Estonia, Wales, the UK, the United States and Japan are all in various stages of developing or acquiring their own SMRs, some of them from Canada itself. Many other countries, from Southeast Asia to United Arab Emirates, have contacted OCNi this year to engage in preliminary discussions.

As there are no SMRs operating commercially, there are no regulatory processes developed regarding licensing. Since Canada is leading deployment of SMRs, this creates the opportunity to provide regulatory guidance to other countries looking to implement (i.e., Poland, Baltic

states). There is also opportunity for the Canadian supply chain to supply international markets, though to realize this opportunity it's key that there be adequate regulatory expertise domestically and internationally to deploy these projects.

Wales

OCNI led a trade mission to Wales and the UK from July 18 to 22nd that included a very specific focus on SMR deployment. This trade mission explored bilateral opportunities in Canada, England and Wales, and also into other markets of interest for UK and Canadian companies through working with Natural Resources Canada, Kinetic Cubed and the UK Departments of International Trade. The mission aimed to demonstrate Canada's leadership in nuclear energy and small modular reactors, and identify opportunities to collaborate with the UK on solutions for reducing carbon emissions and climate change.

Poland

From 20-22 September of 2022, OCNI, along with the Canadian Embassy in Warsaw and the Ministry of Climate and the Environment of the Republic of Poland, organized a business forum for the nuclear industry to establish and deepen cooperation between companies from both countries in the field of nuclear energy.

The event was attended by nearly 90 representatives of the Polish and Canadian nuclear industries - mainly from enterprises themselves, chambers of commerce (Organization of Canadian Nuclear Industries, Canadian Nuclear Association, and on the Polish side - Chamber of Commerce for Energy and Environmental Protection) and government administration.

The event was also attended by representatives from the nearby Baltic states of Estonia and Latvia, with government and industry officials from those markets outlining their interest and initial strategy for nuclear energy.

HALEU

SMRs are crucial in Canada's efforts to achieve its net-zero carbon goals as well as to contribute to clean energy generation. For years, Russia has been the only viable commercial supplier of high-assay low-enriched uranium (HALEU), the necessary fuel in advanced smaller nuclear reactors. However, the geopolitical situation in Ukraine has escalated fears that fuel supply chain issues will grow. In order to ensure the success of the SMR program, new sources of HALEU must be cultivated.

Ready4SMR Program

To support the development of Canada's SMR Supply Chain, OCNI has introduced the Ready4SMR Program to help Canadian businesses become "SMR Ready". The plan focuses on the development and enhancement of local supply chains in the four provinces (Ontario,

Saskatchewan, New Brunswick and Alberta) planning on deploying SMRs, creating the structures that will enable them to realize the economic benefits of SMR deployment cited in the April 2021 SMR feasibility study. Existing nuclear component fabricators will also need to implement Advanced Manufacturing Methods (AMM) to ensure that SMR costs will be competitive.

Ontario has a strong nuclear qualified supply chain which will require retooling and reskilling to meet the unique SMR equipment and material specifications as well as new methods of deployment modular construction/factory assembly.

New Brunswick, Saskatchewan, and Alberta have varying but limited local nuclear supply capabilities but have an industrial base that could be retooled/reskilled to become nuclear qualified or “Ready4SMR”

The Ready4SMR program is a part of OCNi’s work under Canada’s larger SMR Action Plan that has three specific actions for OCNi:

OCN01 – Develop a pan-Canadian supply chain

OCN02 – Promote Advanced Manufacturing Methods to reduce SMR costs

OCN03 – Promote SMR Workforce Diversity & Indigenous Engagement

The Ready4SMR Plan has two pillars:

OCNi Pillar One focuses on the Ontario/Quebec based supply chain which is already Tier 1 in terms of capability, and so the OCNi focus here is on Actions 2 and 3 from above, implementing advanced manufacturing methods and promoting SMR Workforce diversity and Indigenous Engagement.

Activities within Pillar One consist of:

1. ***Ready4SMR - “make the nuclear supply chain SMR ready”***
 - a. OCNi will lead Advanced Manufacturing Forums and events for companies to analyze and prepare matrices of the unique and cross-cutting construction, component fabrication, installation, and service needs of contending SMR vendors in each of three streams (On-grid, Advanced SMRs for NB, Off-grid).
 - b. Work with regional partners to understand cross-cutting capabilities that Canadian nuclear suppliers will need to improve / develop including: enhanced fire prevention technologies, materials science, machining of custom metals, robotic inspection systems for new SMR designs, safety code validation.
 - c. OCNi and its partner “supply chain experts” will compare the SMR “needs matrices” with Canadian nuclear supply chain “capability matrices” and identify gaps that need to be filled by training, facility upgrades or expansions, development of new robotic tooling, or investments in advanced manufacturing systems. Development of an SMR fuel supply is managed by a separate CNL-led

Task Force. (NTD – I think COG might actually have the lead on this, the COG working group is chaired by somebody from CNL)

- d. OCNi will work with Canadian nuclear suppliers, SMR vendors, owners, and governments to develop and fund programs to fill the Canadian nuclear supply chain gaps in order to help the supply chain be “SMR Ready” and minimize risk to SMR projects.

Pillar Two focuses on making the SMR Supply Chain ‘pan-Canadian’ with new suppliers, including Indigenous-owned suppliers, in new regions.

2. *Ready4SMR - “Make SMR supply chain “pan-Canadian” with new suppliers from other sectors”*

OCNi will encourage and enable the development of new localized SMR nuclear capability, including strong Indigenous participation, to ensure that the SMR-deploying provinces benefit from industrial diversification and good local jobs.

- a. OCNi will encourage and assist companies, including Indigenous-owned companies, in adapting the business processes, quality management programs, and overarching “safety culture” that are required of nuclear qualified suppliers. The Ready4SMR program will coach companies along the journey to become qualified to participate in a highly regulated industry, with unique quality control processes (N299 series, ASME-NQA-1, NCA3800 etc.) and a prevailing “safety culture” that is largely unique to the nuclear industry.
- b. OCNi will recruit and train regional supply chain advisors who coach, guide and evaluate companies along the typical 18-month journey to becoming “nuclear-qualified”. The OCNi “Ready4SMR” program will build on the key features of and lessons learned from the UK’s successful “Fit4Nuclear” program customized for the Canadian context with SMR deployment as its principal focus – under license from the UK NAMRC (owner of the “Fit4Nuclear” methodology).
- c. The essence of Pillar Two involves a combination of coaching, training, and advising “new to nuclear suppliers” on best practices and management tools that are prevalent in the nuclear supply chain.

Partnerships

SIMSA

In May 2022, OCNi and the Saskatchewan Industrial and Mining Suppliers Association (SIMSA), signed a Memorandum of Understanding (MOU) to further a collaborative relationship for the overall benefit of Saskatchewan-based companies and for OCNi’s Ready4SMR Program, and to enhance communication and information exchange in these common interest areas.

OCNi has engaged SIMSA as the exclusive Saskatchewan-industry-based representative in the Ready4SMR program. Both groups are committed to working collaboratively within their respective mandates within OCNi’s proposed Ready4SMR Program.

The MOU cites that the specific areas to collaborate and exchange information on, may include but are not limited to:

- Education about nuclear energy and the nuclear industry and green energy;
- Skills and knowledge related to working in the nuclear industry;
- Identifying companies that may be interested or suitable for considering a transition to nuclear;
- The development of plans for participating companies to transition to the nuclear industry;
- Support for companies executing a transition to nuclear, such as through training or their application for further funding.

To accomplish the above, SIMSA's member database will be used and updated. The parties will also conduct in-person and virtual events.

CAMiNA

In February of 2022, OCNI announced the creation of the Canadian Advanced Manufacturing in Nuclear Alliance (CAMiNA). CAMiNA is an industry body of representatives from the Canadian nuclear industry, including suppliers, utilities, research organizations, universities, and government entities convened to oversee progress of the "Advanced Manufacturing Roadmap for the Canadian Nuclear Industry" released January 12, 2022.

CAMiNA advocates for the research, development, and application of various Advanced Manufacturing technologies to maintain or improve cost, reliability and safety performance of Canada's existing nuclear fleet, as well as for future SMRs. CAMiNA members also consult with governments, regulators, and standards bodies on regulations and standards that will facilitate the implementation of additive manufacturing in nuclear applications.

Advanced Manufacturing, including additive manufacturing, offers a potential solution to address equipment or component obsolescence challenges in Canada's CANDU reactor fleet, and has the potential to reduce fabrication costs of specific complex SMR components.

CAMiNA brings together a cross-section of nuclear industry stakeholders to share experience on various applications of Advanced Manufacturing technologies, learn about new developments in the field, discuss manufacturing challenges, review R&D programs, and seek collaboration opportunities.

Links:

- [OCNI Advanced Manufacturing Roadmap](#)
- [SIMSA signs MOU with Organization of Canadian Nuclear Industries](#)