



December 12, 2024

Ministry of Energy and Electrification
77 Grenville Street, 10th Floor
Toronto, ON M7A 2C1

RE: Integrated Energy Resource Plan Consultation (019-9285)

The Organization of Canadian Nuclear Industries (OCNI) is pleased to have this opportunity to provide comments in response to the Government of Ontario's plans to develop an Integrated Energy Resource Plan (IERP).

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.

Our membership is made up of more than 240 leading suppliers of the nuclear industry in Canada and the international marketplace. Member companies employ more than 20,000 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, LWR and SMR technology for nuclear power plants domestically and internationally.

As advocates for the Canadian nuclear supply chain, we actively promote the use of Canadian-made components and knowledge in the production of safe, clean, and reliable nuclear electricity. We do this by encouraging and supporting our member companies in 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. As the central industry association of a Tier 1 nuclear nation, OCNI frequently engages in international outreach to expand cooperation with foreign supplier associations. Over the last decade, OCNI has managed over 20 international trade missions to 11 countries, such as Argentina, India, South Korea, China, and France, and signed six MOUs with local supplier associations to build out opportunities for the Canadian supply chain.

Here at home, nuclear power is playing an increasingly important role in ensuring Ontario's energy grid remains one of the cleanest, and most reliable in the world. As the province's Independent Electricity System Operator (IESO) anticipates the province's electricity demand is anticipated to grow 75% by 2050¹, our nuclear supply chain is being called on to mobilize more rapidly than ever before to support a variety of projects.

To that end, our organization welcomes the development of an Integrated Energy Resource Plan for the province. Not only would such an endeavor bring Ontario's approach to energy planning in line with that of other jurisdictions, such as Quebec, New Brunswick, and Saskatchewan; it would also provide the small- and medium-sized organizations we represent with the clarity and certainty they need to make long-term business decisions.

¹ <https://www.ieso.ca/Sector-Participants/IESO-News/2024/10/IESO-Releases-Updated-Demand-Forecast>

Planning for Growth

1. **Building on the recommendations of the EETP’s final report, what actions should be prioritized to enhance planning across natural gas, electricity, and other fuels?**
2. **The government’s priority is to ensure Ontario has the energy resources it needs to support growth. Are there opportunities to enhance the province’s approach to procuring electricity generation supply to better serve this priority?**

OCNI believes Questions 1 and 2 are deeply interconnected, and will answer both with a combined response.

Our organization was pleased to participate in the Electrification and Energy Transition Panel’s (EETP) consultation process, and the development of its final report.

While we applaud the government’s recent efforts to act on the EETP’s priorities, including the enshrinement of nuclear’s importance in the government’s *Affordable Energy Act, 2024*, we believe that the government can most meaningfully build on this effort by prioritizing action on Recommendation 11, and work with safety regulators and technical standards organizations to find ways to streamline approval processes on nuclear components manufactured for small modular nuclear reactors using Advanced Manufacturing (AM) methods, where the same components are being replicated consistently from one project to another.

As we shared in our submission on the *Pathways to Decarbonization Report*, as Canadian nuclear plants continue to age, there is an increasing need to replace many of the ageing or broken components within these plants. Many of these reactors were built with parts supplied by companies who have ceased production sometime between now and initial construction, or no longer produce the same part that was originally supplied. The current solution to these problems requires an expensive engineering and procuring process to find a part of similar function while not compromising the efficiency or safety of the plant. Many utility companies try to avoid these issues by constructing and staffing large warehouses and stockpiling plant components for future use adding to the expense of part replacement, but even in this scenario the parts can deteriorate over time if conditions are not kept within storage specifications.

Reverse engineering and digitization of obsolete components in ageing nuclear plants can enable these components to be directly “printed” quickly and cost-effectively or produced by conventional means using moulds “printed” from the digitized design. A diverse AM supplier base can also provide the ability to complete in-situ repairs and coatings which could be very beneficial to nuclear power plants (NPPs).

Advanced manufacturing can be used to make complex and intricate SMR components that were heretofore beyond the reach of conventional manufacturing or make larger components faster and cheaper than by conventional methods. These AM features combine to promise cost and schedule reductions and enable optimized design features that will help make SMRs cost-competitive with other forms of energy production. Investing in AM as outlined in this roadmap will help make Canada a leader in both domestic and international SMR deployments. However, additive manufacturing requires much more than hitting the print button. High-quality, repeatable production requires a broad range of interlinked capabilities and equipment. Printing is only one element of the additive manufacturing process as demonstrated in Exhibit A below.

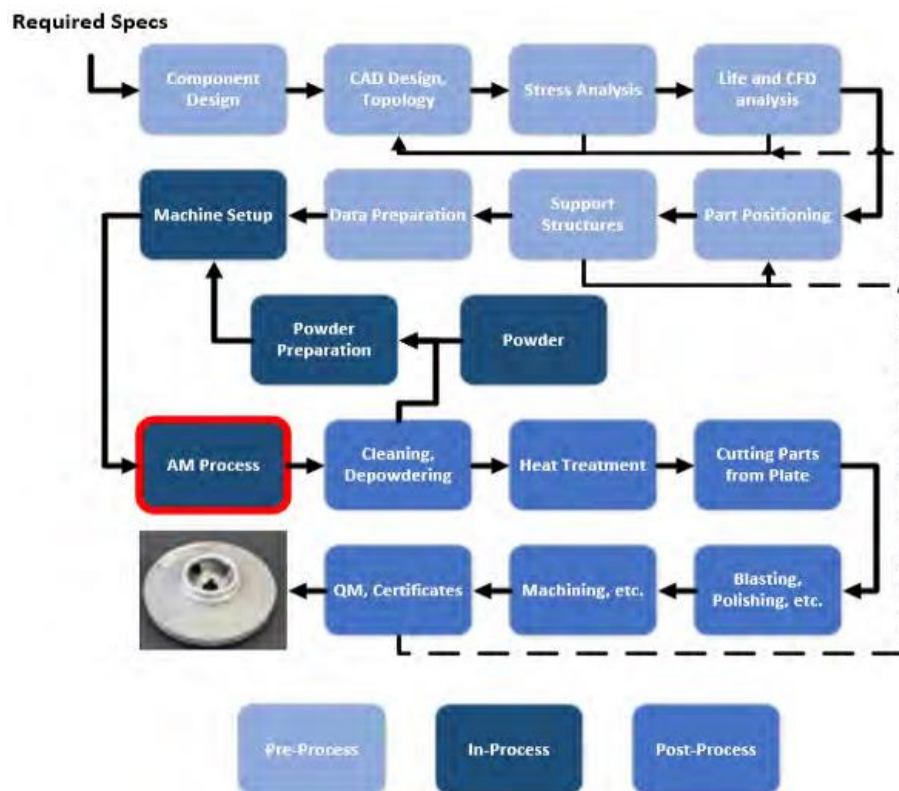


Exhibit A: Additive Manufacturing Flowsheet and Quality Process

Through the Ready4SMR Program, OCNI members and partners can work collaboratively with project proponents to identify technology gaps, and develop a supply strategy for these highly specialized components that considers:

- a. The suitability of using advanced manufacturing methods for some of the parts; and
- b. Whether existing standards and codes for these parts are suitable.

To support this work, OCNI is currently coordinating with Chalk River Nuclear Laboratories on the implementation of additive manufacturing in the Canadian nuclear industry by leveraging our 2021 Advanced Manufacturing Roadmap for the Canadian Nuclear Industry².

3. How can the government best support Indigenous leadership and participation in energy planning and projects?

OCNI is committed to developing positive and mutually beneficial relationships with Indigenous communities and implementing an Indigenous relations strategy that aligns with OCNI's values of integrity and transparency, as well as our by-laws and Governance Policies.

We recognize that genuine engagement with Indigenous peoples necessitates consistent and unwavering efforts, dedication, and commitment. We are resolved to the ongoing advancement of our

² <https://www.ocni.ca/wp-content/uploads/2024/10/Advanced-Manufacturing-Roadmap-for-the-Canadian-Nuclear-Industry-December-14-2021C.pdf>

Indigenous engagement program, and we will persistently strive for excellence in this field. OCNI is proud to have achieved PAIR Bronze certification in 2022 and we are on a path to achieve our PAIR Silver certification.

One way OCNI is seeking to make an impact is through the continued delivery of our Indigenous & Women Skilled Trade Development Pathway program, which is run in partnership with the First Nations Power Authority (FNPA). As part of the program, we bring together Indigenous communities, employment organizations, unions, post-secondary education institutions, nuclear suppliers, and plant operator companies to recruit, train, and place Indigenous people and women from all over Ontario in various skilled trades positions within the nuclear supply chain.

With new builds and refurbishments on the horizon, demand for skilled workers is expected to increase in the nuclear sector, with many companies expecting to grow their workforce by as much as 20% over the next three years³. In Ontario, Bruce Power's MCR project is anticipated to secure 22,000 direct and indirect jobs from operations⁴; OPG's Darlington refurbishment is anticipated to provide an additional 2,000 direct jobs⁵; and the Pickering refurbishment is expected to create 11,000 jobs per year, with more than 6,400 jobs created as part of post-refurbishment operations⁶.

Despite anticipated job creation and workforce growth, more can and needs to be done to help fill these roles, especially when it comes to tapping into the potential of under-represented groups like Indigenous peoples.

A 2019 report commissioned by the Canadian Nuclear Association (CNA) and OCNI titled *Benefits of Nuclear Energy for Canadians* found that only 3% of the workforce was Indigenous⁷.

To help grow Indigenous representation in our sector, OCNI recommends the Ontario Government make investments in training programs, such as ours, that supports their long-term participation in these and future projects.

4. What types of technical information and forecasts would best support sector participants and energy consumers as the system is built out for growth and the economy increasingly electrifies?

In the nuclear sector, reliable information and long-term planning is paramount to support business planning and to bolster investor confidence in Ontario's nuclear supply chain. In order to best support our members and the nuclear sector as the province's system continues to be developed for growth and further electrification, a more detailed and clear understanding of gaps and sector needs is necessary to support sector planning and risk mitigation.

To this end, OCNI recommends that the Government of Ontario:

³ <https://www.world-nuclear-news.org/articles/successful-projects-lead-to-canadian-nuclear-job-surge>

⁴ <https://www.brucepower.com/life-extension-program-mcr-project/#:~:text=The%20program%20will%20secure%20an,injecting%20billions%20into%20Ontario's%20economy>

⁵ https://www.opg.com/projects-services/projects/nuclear/darlington-refurbishment/?gad_source=1&gclid=CjwKCAjw9p24BhBEiwA8ID5BpVl1z66MrILonWEZnjuPzkFehudFMaPs kZIOow4_PjUJMiTytsLWBoCBREQAvD_BwE

⁶ <https://news.ontario.ca/en/release/1004128/ontario-supporting-plan-to-refurbish-pickering-nuclear-generating-station>

⁷ <https://cna.ca/wp-content/uploads/2019/11/MZ-Consulting-Benefits-of-Nuclear-Energy-for-Canadians.pdf>

- **Conduct and publish a detailed technical gap analysis** that examines any capacity or capability gaps within the Ontario nuclear supply chain would reveal those areas where some small procurement risk may exist and be mitigated.

It is expected that the Ontario supply chain has the capability to manufacture 100% of the required components for GE Hitachi's BWRX-300 and other grid-scale SMRs, but the supply chain may reach capacity limits with several orders as further SMRs are procured in the province.

Additionally, the capacity to meet 100% of the procurement needs of a future advanced SMR project is unknown, as some of the I&C or other sophisticated equipment for these designs may not have yet been procured anywhere in the world. As such, a detailed technical gap analysis conducted proactively will more adequately prepare the province's supply chain to support the development of nuclear energy solutions to meet the government's growing energy and procurement demands.

Affordable and Reliable Energy

5. What specific actions could position the integrated energy resource plan to best leverage distributed energy resources (DER) that enhance local and province wide grids to support energy system needs reliably and at the lowest cost?

The Government of Ontario is aware of the exceptional advantage of CANDU reactors in terms of providing clean, reliable energy to millions of residents and businesses within the province.

However, new nuclear technologies are expanding our understanding of what is possible when it comes to delivering the same clean, reliable energy to small, northern, remote, and/ or Indigenous communities. Due to their smaller size, scalability, and standardized design, SMRs and micro-reactors have the unique potential to help serve communities that have previously had no option but to rely on intermittent or fossil fuel-based technologies.

The opportunity for the deployment of microreactors in particular in rural and remote communities is increasingly being explored around the world, including in Saskatchewan, where OCNI is supporting the provincial government and the Saskatchewan Research Council as it looks to deploy Westinghouse's eVinci project⁸.

Microreactors can serve as a backup power supply in emergency situations, replace power generators that are fuelled by fossil fuels, like diesel, and even function as effective energy sources for industry and remote activity like mines.

OCNI recommends the Government of Ontario:

- **Identify the areas and communities that bear the largest cost burden**, both economically and environmentally, with their current energy system. Consult the public, community leaders and local industry on their preferences and needs regarding their energy consumption and desire to transition to a lower cost and carbon energy source, including nuclear.
- **Fund various SMR and microreactor pilot programs in a diversity of communities**, such as certain Indigenous communities and heavy industry installations that still rely on diesel. Annual updates on the efficacy of SMRs in transitioning the pilot communities off of non-renewable fuels

⁸ <https://www.saskatchewan.ca/government/news-and-media/2022/may/18/westinghouse-and-saskatchewan-research-council-advance-micro-reactors-in-canada>

like diesel at a low cost while still providing reliable power can be published and disseminated for other communities and entities considering nuclear SMR adoption.

- **Hold consultations with industry, communities and other stakeholders** on the current perceptions of nuclear power and their desires for the expansion of nuclear power in the form of SMRs and microreactors.

Becoming an Energy Superpower

7. **What opportunities exist to further capitalize on Ontario's leadership and expertise in nuclear technology and nuclear innovation?**
8. **What opportunities should Ontario consider to leverage its position as a clean energy leader?**

OCNI also views Questions 7 and 8 as intrinsically linked and will address them simultaneously.

Ontario's nuclear supply chain stands on the precipice of a significant moment of opportunity and growth. International markets and partners are looking to Ontario's longstanding and world-leading nuclear energy expertise to help ensure their energy security and affordability. To seize the potential of this moment, clear and decisive action to support the nuclear supply chain will be needed from the provincial government.

OCNI recommends that:

- **That the Ministry of Energy and Electrification work with the Ministry of Colleges and Universities, the Ministry of Labour, Immigration, Training and Skills Development, and the Ministry of Education, to create a nuclear education and career pathway strategy to make students and young people aware of the career opportunities in the nuclear sector, identify gaps and strengthen curricula and programming in training and post-secondary schools, and connect graduates with high-skilled, good paying jobs in the industry.** The current slate of nuclear energy projects supported by the sector and the Government of Ontario will require a significant increase of skilled labour. Additionally, if Ontario is going to be ready to support international peers in their pursuit of nuclear energy, we must start work now to ensure we have the talent ready to match demand.
- **That the Government of Ontario continue to grow the province's international reputation for innovation in nuclear energy by establishing a fund to support manufacturing and R&D facilities with retooling as they work to reshape their facilities to support the latest progress in technology.** OCNI's membership consists of a significant number of SMEs who contribute to the economy of communities across Ontario. As the government pursues and begins significant nuclear energy development over the coming years, OCNI is more than willing to work with the relevant ministries to identify which elements of the supply chain require support to upscale their operations in looking to ensure Ontario's nuclear energy development is made in Ontario, by Ontario workers.
- **That the Government of Ontario continue to support and collaborate with the nuclear sector to access and leverage opportunities in international markets,** building on successful agreements in Romania, Estonia, Poland, and France, in aiming to maximize the value of international nuclear energy development to the Ontario supply chain and workforce.