

A new Canadian nuclear solution



Canada looks to lead in small modular reactor technology with initiatives and investment in research

The CANDU Owners Group, its members and the supply community along with other industry partners are using their existing nuclear expertise to lead the next wave of nuclear generation — small modular reactors (SMRs), that offer the potential for new uses of nuclear energy while at the same time offering the benefits of existing nuclear in combatting climate change while providing reliable, low-cost electricity.

SMRs, a smaller, scalable model of nuclear plant can be used in on or off-grid applications including as a load-following generation and as a combined heat and power source for resource extraction or heavy industry. They also offer potential as an off-grid, regional electricity source for remote communities, including as a diesel replacement.

“As an industry, we have been highly engaged in exploring and developing opportunities for SMRs,” says COG President and CEO Fred Dermakar. “This includes helping to shape the regulatory and technical framework that can support that development,” he says.

An SMR Technology Forum

In 2017, COG created an SMR Technology Forum (SMRTF), which provides an opportunity for members to discuss SMR-related issues and developments. The SMRTF members include Canada’s three current nuclear operators

– Bruce Power, New Brunswick Power and Ontario Power Generation -- as well as Canadian Nuclear Laboratories. Observers to the forum include other Canadian utilities with a potential interest in SMRs as well as the Canadian government through the involvement of Natural Resources Canada (NRCan). The Canadian Standards Association and industry associations such as the Canadian Nuclear Association and the Canadian Nuclear Society are also observers.

A Canadian SMR Roadmap

A parallel and coordinated effort is supported by the Canadian Nuclear Association, as part of NRCan’s Energy Innovation program, to develop a Canadian SMR Roadmap. This stakeholder-driven process encompasses the Canadian Nuclear Association’s Vision 2050 – a vision for the industry’s next 30 years of development, as well as CNL’s SMR strategy and is currently gathering input from across Canada to identify the interests and applications of SMRs for Canadians.

Announcements on SMR development

Bruce Power: Bruce Power, MIRARCO Mining Innovation and Laurentian University have signed a Memorandum of Understanding that will enhance strategic research opportunities, including the long-term potential for Small Modular Reactors (SMRs) to generate clean, low-cost and reliable electricity in rural/remote regions. The five-year, \$1 million research agreement will create an Industrial Chair position at MIRARCO Mining Innovation, focused on clean energy solutions in Ontario’s north.

CNL: On April 17, CNL issued an invitation to small modular reactor (SMR) project proponents who wish to participate in the evaluation process for the



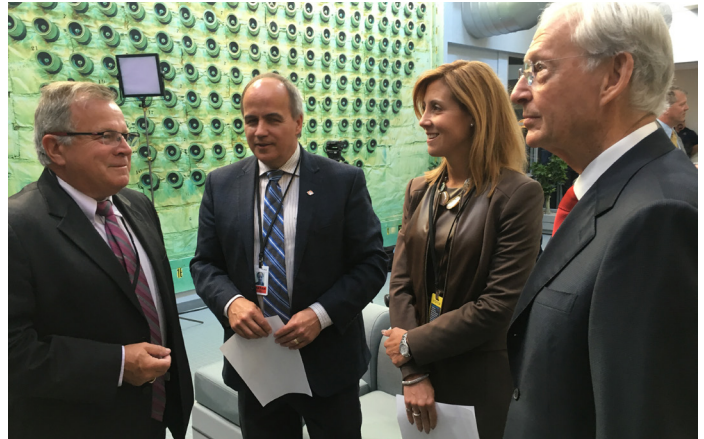
SMRs continued...

New Brunswick government commits \$10 million and attracts private sector funding for SMR development

construction and operation of an SMR demonstration project at a CNL-managed site. The invitation represents the launch of CNL's SMR review process, including the pre-qualification stage, which allows CNL to evaluate technical and business merits of proposed designs, assess the financial viability of the projects, and review the necessary national security and integrity requirements.

New Brunswick Power: In June, the New Brunswick government announced a \$10-million investment toward creation of a nuclear research cluster including exploration of SMR development. In July, additional private investment was announced.

"Canada and New Brunswick have an opportunity to become world leaders in SMR technology and to bring a clean, new and reliable source of ultra-low carbon power to the forefront of global climate change," Rick Doucet, the province's energy minister said.



From left: Energy and Resource Development Minister Rick Doucet; Gaëtan Thomas, president and CEO of NB Power; GE Healthcare president Heather Chalmers; and Don Wolf, CEO and chairman of Advanced Research Concepts at a July 9 announcement related to New Brunswick's nuclear research cluster.



COG gets a new Board member

Carla Carmichael joined the COG Board of Directors replacing Steve Woods as Ontario Power Generation's representative, recently. Carmichael (second from right with the rest of the COG Board, above) holds both CPA and MBA designations. She came to the nuclear industry with years of prior experience in various industries, joining OPG in 2009 as Director of Nuclear Business Planning. Currently serving as Vice President of Project Assurance and Contract Management, she oversees the commercial management of major nuclear projects. Prior to this role, Carmichael led OPG's Canadian Nuclear Partners and Isotopes businesses. She has been an expert witness for OPG at its rate hearings focused on nuclear generation planning, nuclear operational benchmarking and overall performance of OPG's nuclear fleet. Beyond her core responsibilities, Carmichael has distinguished herself as an effective advocate working to empower women in the workplace. In 2017, Carmichael was awarded the OPG President's Leadership Award, leadership skills.

Joint project on whole-site PSA provides new insights on risk assessment

The outcome of a COG joint project (JP) provided an important approach to addressing whole-site probabilistic safety assessment ahead of the Pickering Nuclear hearing and with benefits for other operators, worldwide.

The JP participants: OPG, Bruce Power, New Brunswick Power, Canadian Nuclear Laboratories as well later participants, SNN Romania and KHNP Korea, worked with researchers from Kinectrics and Amec Foster Wheeler (now part of Kinectrics) to develop a methodology for multi-unit probabilistic safety assessment (MUPSA), which was applied to the Pickering Nuclear site in response to a 2013 request by the Canadian Nuclear Safety Commission (CNSC).

In its acceptance of the work, the CNSC said the "substantial" research effort provided a "good characterization of whole site risk" and in some aspects, such as risk aggregation at the site level, the work provided is "first of a kind."

Through the efforts of the COG team, OPG was able to break ground on this issue.

Committee chair, OPG's Jack Vecchiarelli noted, "Our lengthy deliberations and novel technical work led to a high-quality set of reports used to support that the Pickering whole-site risk is low."