CANDU Owners Group and member organizations represented Canada when delegates from around the world converged at the IAEA conference on climate change, Oct. 7-11. The event was an opportunity to "exchange science-based information and have objective discussions" about the role of nuclear power in addressing the critical global issue.

Canada is nuclear-ready to address climate change

IAEA conference examined the use of nuclear power to tackle the world's most universal challenge

Canadian delegates joined international peers to discuss the world's state of readiness – both technically and psychologically – to apply nuclear power to the challenge of climate change. As it happens, they had a lot to share about the country's state of readiness.

The role of nuclear in mitigating climate change has gained recognition as countries worldwide recognize the need for increasingly aggressive targets to reduce greenhouse gas emissions in what is now widely acknowledged to be a climate emergency.

Canadian nuclear industry leaders lent their expertise to the International Atomic Energy Agency's (IAEA) first conference on climate change in Vienna, Oct. 7-11. The event, billed as an opportunity to exchange "science-based information and objective discussions," attracted 550 participants representing 79 countries and 18 international organizations.

The conference looked at how nuclear could help the world meet its sustainable development goals, and in particular, SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all and SDG 13: Take urgent action to combat climate change and its impacts. As well, participants examined the potential synergies between nuclear power and other low-carbon energy sources.

Practical considerations for effective use of nuclear

But it wasn't all policy discussion. The conference also focused on the practical application requirements of leveraging nuclear to its fullest to achieve these goals, including two major factors:

- The ability to deploy new nuclear generation, and,
- The ability to keep existing reactors operating reliably through long-term operation (LTO).

Top: *Chair of the Intergovernmental Panel on Climate Change Hoesung Lee spoke on the potential to use nuclear power to address climate change at the IAEA conference.*

Lower: *Canadian Nuclear Laboratories President and CEO Mark Lesinski shared CNL's efforts to both strengthen existing plant performance in long-term operation and its role in development of new nuclear generation.*

Achieving long-term operation

CANDU Owners Group President and CEO Fred Dermarkar moderated a panel on LTO that included Ontario Power Generation's Senior Vice President, Nuclear Engineering Mark Knutson, who highlighted the company's refurbishment efforts at its Darlington Nuclear station. The project will add about three decades of additional operating life to the station's four reactors, which collectively generate about 20 per cent of Ontario's electricity, carbon free. Other session panelists highlighted the efforts of their LTO programs in the European Union and the U.S.

The panel concluded strong performing LTO is an essential bridge in nuclear's contribution to addressing climate change until new nuclear generation can be deployed. Achieving the fullest generation time from an asset requires three things, the panel found:

- Achieving excellence through on-time, on-budget delivery of refurbishment programs;
- Sustaining excellence through aging management, knowledge transfer and shared operational experience (OPEX); and
- Accelerating excellence through innovation.

Supply chain, market, regulatory and public support

Dermarkar says the panel recognized the need for a secure and capable supply chain that has long-term retention of knowledge. As well, the industry needs a stable regulatory environment that can evolve with it, and it needs market frameworks that "recognize and reward the inherent economic and environmental benefits of nuclear energy."

Another finding, was "while nuclear provides a massive amount of reliable, low-carbon electricity, it also requires significant investment in capital projects. This requires broad-based public support that goes beyond the communities local to the plants," says Dermarkar.

Achieving this can mean building broad-based support by demonstrating the capability of nuclear to meet several societal needs including other valued products beyond electricity generation, including medical isotopes.

The COG president says many of these identified conditions are already well-satisfied in Canada, especially in Ontario and New Brunswick, which both enjoy strong public support and investment in long-term operation through mid-life refurbishments and research investment that has already paid substantial dividends in extended operation of the assets.

"Thanks to mid-life refurbishments and innovation in areas such as fuel channel life management, Canada is well-positioned to leverage its existing fleet for continued operation, in some cases, into the 2060s," he says. "Through the COG collaboration model, tremendous work has been done to gain regulatory certainty and to help plants thrive as they age."

Strategies in obsolescence management and development of a knowledgeable and thriving supply chain are just two accomplishments COG members have achieved together through the organization, he says.

A roadmap for new nuclear generation

In parallel, the Canadian industry has set out a roadmap for new generation development using small modular reactors (SMRs). As well, through COG, the industry created an SMR technology forum and an SMR Vendor Participant Program to advance development.

Canadian Nuclear Laboratories' President and CEO Mark Lesinski and Director, Science and Technology Christina Van Drunen, as well as Ontario Tech University's Igor Pioro also represented Canada at the conference.

In his address, Lesinski highlighted the national lab's research to strengthen performance of existing plants and its efforts to launch new nuclear generation in Canada, including through development of micro grids.

The conference was held in cooperation with the Nuclear Energy Agency (NEA) of the Organisation for Economic Cooperation and Development (OECD).

To read more, view the IAEA conference notes at https://www.iaea.org/atoms4climate

Photos courtesy of IAEA and CNL