

FUSIONMATTERS

CANADA

As 2023 comes to an end, we would like to take this opportunity to look back at the year that was and look forward to the opportunities of 2024.

2023 began with the fusion ecosystem still buzzing over the milestone burn at the National Ignition Facility (NIF) at Lawrence Livermore Laboratory on 5 December 2022 and then repeating it on 30 July 2023. The Fusion Industry Association (FIA) 2023 Global Fusion Energy Report that 43 private fusion companies had attracted US\$6.21 billion from investors, 4 companies predicting they will deliver power to the grid by 2030, and 19 companies predicting 2035. General Fusion announced that their Lawson Machine 26 (LM26), targeting scientific breakeven by 2026, will be developed in Vancouver with US\$25 new funding from the Canadian and British Columbia Governments.

The Fusion Energy Council of Canada (FECC) continued to advocate for fusion energy in Canada. The work included collaboration with Canadian National Laboratories (CNL) in a fusion energy roadmap report, contributing to the planning of the 2025 International Tritium Conference in Ottawa, and successfully cohosting CWFEST 2023 in October. The latter was a virtual workshop, attracting more than 100 registrants and 10 presenters from private sector companies. Internationally, FECC members attended the Fuel Cycle Workshop Charlotte, NC, U.S.A. – May 22-25 and 2023 IAEA Fusion Conference, London, UK, Oct 16 to 21.

We look forward to build on this momentum and, with your help, continue to grow the fusion ecosystem in Canada.



May the reason
for the season
fill you with
Hope
Joy
Love
Peace

2023 Highlights

CNL Project Update

A first draft (Revision 0) of the document called “Fusion Energy for Canada's Net-Zero 2050 and Beyond; A Forward-Looking Assessment, Vision, Strategy, and Roadmap” was developed by CNL with input from FECC and others. It highlights the potential of fusion energy as a largely carbon-free energy source and identifies areas where Canada can contribute to global fusion energy developments. The draft is presently undergoing refinement, with Revision 1 being expected early in 2024.

Agile Nations Working Charter

Canada is a participant in the 'Agile Nations Charter' that has led to the "establishment of an intergovernmental network (the 'Agile Nations') to foster co-operation on rulemaking, with a mission to make it easier for businesses within their jurisdictions to introduce and scale innovations across their markets while upholding protections for citizens and the environment" ([Agile Nations Charter - Canada.ca](#)). A working group on fusion energy regulations has been formed and initial recommendations were published in October 2023 [Agile Nations working group on fusion energy regulation: initial recommendations - GOV.UK \(www.gov.uk\)](#).

Tritium Focus Group meeting in Chalk River, ON (May 16-18, 2023)

The Tritium Focus Group functions under the auspices of the U.S. Department of Energy. It meets several times per year. Its membership is international, and participation is by invitation only. Its meetings provide opportunities for discussions on a wide range of tritium topics that include but are not restricted to tritium science, technology, standards, regulations, business, and collaboration. The Chalk River meeting was organized by CNL and offered not only presentations on latest tritium developments, but also show-cased CNL's world-class tritium facilities and expertise. Tritium and tritium expertise will become major areas of Canada's contributions to fusion energy development. (Axel participated.)

Fuel Cycle Workshop Charlotte, NC, U.S.A. – May 22-25

The Workshop was hosted by the U.S. Department of Energy with the following goals and objectives:

- Develop the ten-year roadmap needed to raise the technology readiness level (TRL) of fuel-cycle and blanket technologies required for successful operation of a fusion pilot plant.
- Facilitate consensus and collaboration across attendees investigating similar problems.
- Discuss the facilities and demonstrations needed to provide confidence in blanket and fuel cycle technologies.

The Workshop was well attended and included representatives from Canadian organizations and companies, including FECC. A detailed summary report of the discussions is expected to become available in early 2024. It is expected to contain useful guidance as Canada develops fusion energy. (Axel participated.)

Tritium 2025

Planning for the 2025 International Tritium Conference, which has been awarded to Canada, continues. It will bring tritium experts to Canada from around the world and include visits to CNL's Chalk River facility and OPG's Darlington nuclear generating site. FECC is a member of the planning committee and has responsibility for an introductory workshop on tritium and the use of tritium in fusion energy production.

Canadian Academy of Engineering (CAE), Victoria, Jun 19 to 21, 2023

In addition to the induction of new Fellows, there was a technical panel on 'Fusion and Fission Energy', chaired by Axel. Panelists were Dr. Michel Laberge, Founder and Chief Scientist, General Fusion Inc., Dr. Bibake Uppal, Business Development Manager, Kyoto Fusioneering Ltd., and Dr. Igor Pioro, Professor, Ontario Tech University. The former two outlined work in fusion while the latter spoke about fission technologies, opportunities, and challenges. The

panelists provided a comprehensive overview of fusion developments, and the discussion highlighted the differences between fusion and fission energy production.

2023 IAEA Fusion Conference, London, UK, Oct 16 to 21, 2023

Significant advances were reported, especially in the area of fusion plasma modelling, but no new breakthroughs were revealed that had not been communicated previously. The following are noteworthy:

- Fusion strategies were re-announced by Government representatives from the UK, Germany, Japan, Korea, and China. The U.S. strategy and its decadal vision were also highlighted. All strategies are supported by major governmental investments.
- The EU, largely through Euratom, strongly supports fusion developments.
- Major delays and cost increases were foreshadowed for ITER, but specifics will not be known till mid-2024.
- Progress with major public sector fusion initiatives is generally slow.
- Major fusion investments from private and public sectors are continuing.
- Canadian representatives were few in number. A paper was given by Kinetics on Isotopic Modelling software for fission and fusion plants.

UK – Canada Meeting on Fusion, London, UK and Ottawa, Oct 18, 2023

A UK delegation (sponsored by the UK Department of Business and Trade) visited Canada in the week of Oct 16th with support from OCNL. An online meeting was conducted with representatives in London to discuss UK-Canada collaboration in fusion.

U.S. – Canada Informal Meeting on Fusion., London, UK, Oct 21, 2023

The U.S. (through Scott Hsu and J.P Allain) reiterated interest in working with Canada and other nations on fusion developments. The preparation of a draft collaboration agreement was informally discussed for potential future action by the U.S. and Canadian Governments. The U.S. subsequently announced an International Partnership Initiative in Fusion. This Initiative parallels but goes significantly beyond the informal discussions in London. [International Partnerships in a New Era of Fusion Energy Development | OSTP | The White House](#).

In summary, it has been an active year for FECC and we have made sound, creative preparations for substantive advances in Canada's involvement in fusion development. The next year is expected to yield solid results.

Calendar



16- 21 June 2024 the 16th conference of Computer Simulation of IRadiation Effects in Solids

Cohosted by Queen's University and Canadian Nuclear Laboratories in Kingston Ontario, this international conference attracts outstanding people in the fusion nuclear materials space. For more information visit their website <https://sites.google.com/view/cosires2024/home> Call for abstracts closes 15 December 2023.



21-22 February 2024 FusionXInvest in Boston, MA

Following on from the successful launch event in London in May 2023, FusionX Group—a partnership of Fusion Energy Insights, Realfin and New Energy Events—is bringing FusionXInvest to the US, a hive of fusion industry and investor activity. FusionXInvest is designed to bring capital and investment to the fusion energy industry—and to bring the considerable opportunity of fusion to investors. <https://fusionenergyinsights.com/blog/post/fusionxinvest-in-boston-2024>

CANtrit 2025 Canada has been chosen to host the next International Tritium conference in Ottawa in 2025. Watch this space for more information as it becomes available.

If you like what you see, please let us know and forward **FusionMatters** Canada to your colleagues or anyone else who needs to know more about fusion; encourage them to subscribe [here](#) or please share your suggestions for changes.

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