Canadian Isotope Ecosystem Directory

THE ISOTOPE PRODUCTION PIPELINE, ITS SUPPLIERS AND ASSOCIATED INDUSTRIES

ORGANIZATION OF CANADIAN NUCLEAR INDUSTRIES
OCNI
Clean Energy for a Low Carbon Economy

CNIC
CANADIAN NUCLEAR ISOTOPE COUNCIL

canadianisotopes.ca

The **Canadian Nuclear Isotope Council** (CNIC) is a not-for-profit organization comprising of over 115 members from across the Canadian isotope supply chain, health sector, nuclear industry, and research bodies, convened specifically to advocate for our country's role in the production, development, and use of the world's isotope supply. The CNIC serves as the voice of Canada's isotope community, working to create opportunities for isotope innovation and economic growth across the supply chain, improve patient access, and advance the interests of its members through principled policy work and broad engagement.

ocni.ca

The **Organization of Canadian Nuclear Industries** (OCNI) is an association of more than 260 leading suppliers to the nuclear industry in Canada and the international marketplace. OCNI member companies employ over 15,000 highly skilled and specialized people across Canada who manufacture equipment and components, provide engineering and technical services, and support the nuclear supply chain in all capacities. Member companies also play a vital role in advancing medical applications and other safe uses of nuclear technology.

OCNI supports its members in bringing their expertise, high standards of quality, and innovative capabilities to international markets through partnerships with local suppliers, power plant designers, nuclear utilities, and government agencies.

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Overview

Isotopes play a foundational role across a wide range of high-impact industries, from healthcare and clean energy to advanced manufacturing, environmental science, and national security.

Isotopes enable everything from targeted cancer therapies and diagnostic imaging to industrial radiography, food sterilization, forensic tracing, climate research, and beyond. With the emergence of innovative nuclear technologies and increasing demands from healthcare and clean energy sectors, the global demand for isotopes is steadily growing. As a result, leading countries such as Canada have become vital players in ensuring a reliable and stable supply of isotopes. The world is looking to Canada for its leadership and strength in this field.

Today, Canada stands at the forefront of this transformation. With a legacy of scientific and clinical excellence, a diverse range of production technologies, and strong public–private collaboration and partnerships, Canada is among the few countries able to produce a broad range of isotopes at a commercial scale. In Canada, organizations are working across sectoral boundaries to translate research into commercial applications, deliver complex logistics at a global scale, and maintain the regulatory and quality standards required by the most demanding markets.

Additionally, Canadian companies continue to discover innovative production pathways that support the global transition toward targeted radiopharmaceuticals. These strengths build on longstanding collaborations between reactor and facility operators, radiopharmaceutical manufacturers, research institutions, and government agencies, ensuring reliability and scalability across the isotope supply chain.

This Ecosystem Directory, co-developed by the CNIC and the OCNI, captures the full spectrum of organizations operating within Canada's isotope ecosystem. It reflects a shift from traditional value chains toward a more integrated, multi-functional network of producers, researchers, enablers, and end-users.

This directory showcases Canada's isotope ecosystem: from linear supply chains to a fully integrated network of innovation.

Canada's Historic Legacy of Isotope Innovation

For decades, Canada has built an isotope ecosystem that combines scientific leadership, advanced infrastructure, and close partnerships between the public and private sectors.

Over time, Canada's isotope supply chain has expanded to encompass a full value chain of discovery, production, application, and export capabilities. Recognized internationally, this integrated ecosystem continues to deliver safe, reliable, high-quality isotopes across a broad range of sectors.

Canada's leadership in isotope development stems from a history of bold technological innovation and public policy foresight. As early as the 1930s, leading Canadian scientists recognized the potential of nuclear technologies to support medicine, industry, and research. Canada began extracting radium-226 (Ra-226) at the Eldorado Gold Mine and rapidly became the second largest producer of medical Ra-226 in the world. In these early decades, the National Research Council and Atomic Energy of Canada Limited (AECL) played foundational roles, commissioning the National Research Universal (NRU) and the National Research Experimental (NRX) reactors, which became globally important sources of key medical isotopes into the 2000s.

In the 1950s, leveraging the NRX and NRU reactors, Canadian scientists pioneered the use of cobalt-60 (Co-60) for External Beam Radiation Therapy, revolutionizing cancer care worldwide. Similarly, Canada contributed significantly to the molybdenum-99 (Mo-99) and technetium-99m (Tc-99m) supply chain, which continues to support more than 40 million diagnostic procedures worldwide each year. In their decades of service prior to retirement, the NRU and NRX reactors produced enough isotopes to power more than 1 billion treatments around the world.

From the 1960s to the early 2000s, Canada's ecosystem experienced rapid growth, with major players emerging such as TRIUMF, Ontario Power Generation, Nordion, McMaster University, and Bruce Power, which remain at the forefront of innovation in nuclear technologies and isotope research & development.

Historically, Canada has been at the forefront of developing and scaling isotopes, such as:

RADIUM-226 (RA-226):
Early cancer treatment and medical research.

COPPER-67 (CU-67):
Targeted radiotherapy and theranostics.

COBALT-60 (CO-60):
Cancer radiotherapy, industrial sterilization, materials processing.

MOLYBDENUM-99 (MO-99) AND TECHNETIUM-99M (TC-99M):
SPECT imaging, cardiology, and bone scans.

IODINE-125 (I-125):
Brachytherapy for various cancers.

YTTRIUM-90 (Y-90) AND LUTETIUM-177 (LU-177):
Targeted radionuclide therapies.

ACTINIUM-225 (AC-225):
Next-generation alpha-emitters for theranostics.

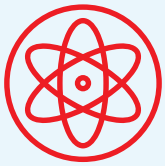
TRITIUM (H-3):
Research in medicine, nuclear power, and biomedical sciences.

Canada's unique isotope infrastructure advantage today

Today, Canada's isotope infrastructure has evolved to include dozens of production facilities, including particle accelerators at major research centres and healthcare institutions across the country, as well as a network of both research and power reactors that produce isotopes at an unmatched scale.

- **Power Reactors:** The reactors at Ontario Power Generation's Darlington & Pickering sites and Bruce Power's site have become major sources of key isotopes, while also producing clean energy by leveraging their CANDU technology. This includes isotopes like Co-60, Lu-177, Mo-99, Y-90, and tritium.
- **Research Reactors:** McMaster University's multi-purpose research reactor remains the largest global producer of I-125 and produces an additional suite of isotopes for clinical and research use.
- **Cyclotron Facilities:** Canada is home to over twenty cyclotron facilities, including TRIUMF in British Columbia, which is home to the largest cyclotron in the world at 520 MeV. These facilities are typically associated with regional healthcare centers or research institutes, and supply short-lived isotopes for procedures like PET and SPECT scans along with research initiatives.
- **Linear Accelerators and Emerging Platforms:** LINAC and other technology-based production is being developed by Canadian companies in collaboration with research centres, like Iotron Medical which leverages Synchrotron technology for Cu-67 production.
- Canada also leverages **generators** for isotope production. For example, Canadian Nuclear Laboratories (CNL) has been commercially producing generator Ac-225 (using Th-229, a waste byproduct) twice a month for over five years.

The ecosystem includes:



POWER REACTORS

RESEARCH REACTORS

CYCLOTRON FACILITIES

LINEAR ACCELERATORS & EMERGING PLATFORMS

This world-class infrastructure is supported by a robust ecosystem of companies including logistics and delivery support, radiopharmacies, technology providers, and regulators such as Health Canada and the Canadian Nuclear Safety Commission (CNSC).

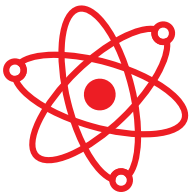
Driven by global demand, clinical discoveries, and new investments, Canada's isotope sector has become a diverse and well-integrated network of companies of all sizes that support isotope production and delivery.

1 Target Material

Secure enriched or natural target materials required for isotope production.

2 Target Irradiation

Expose target in a reactor or particle accelerator to generate the desired isotope.



3 Processing

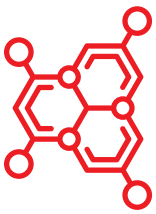
Extract, purify, and process isotopes with strict quality and safety standards.

4 Quality Control and Assurance

Validate isotope purity, sterility, and safety according to Health Canada, CNSC, and international standards.

5 Distribution & Logistics

Manage packaging, transportation, and delivery schedules between each stage of the supply chain to ensure isotopes reach their destination on time.



6 Radiopharmacy/ Compounding

Prepare isotopes into patient-ready doses, ensuring compliance with GMP standards.

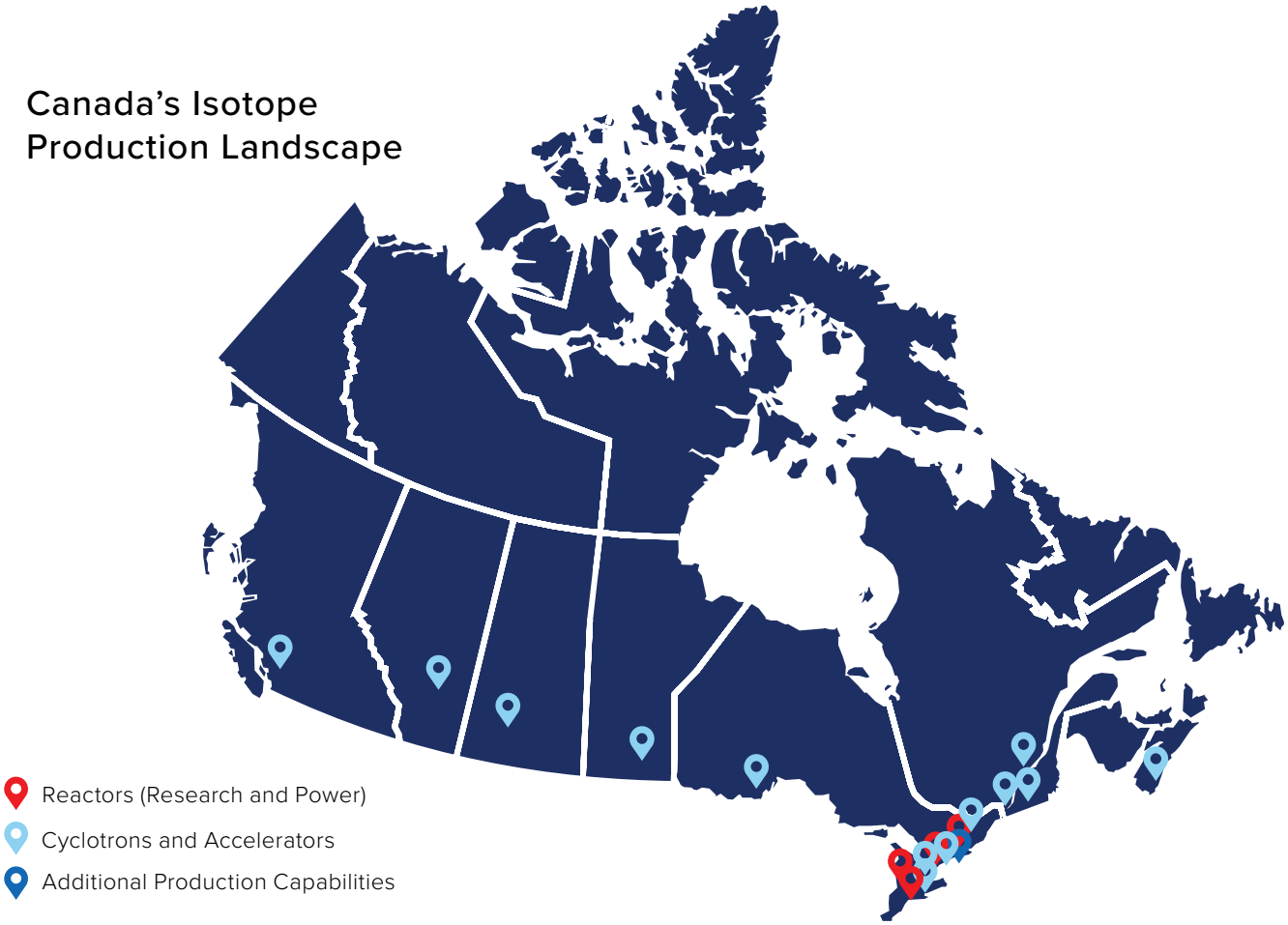
7 Hospital

Track shipment, arrival times, and storage at healthcare facilities.

8 Patient

Administer isotope safely and on-time for diagnosis or therapy.

Canada's Isotope Production Landscape



REACTORS (RESEARCH AND POWER)

Bruce Power Nuclear Generating Station: CANDU (Tiverton, ON)

McMaster Nuclear Research Reactor (Hamilton, ON)

Pickering Nuclear Generating Station: CANDU (Pickering, ON)

Darlington Nuclear Generating Station: CANDU (Darlington, ON)

CYCLOTRONS AND ACCELERATORS

TRIUMF World's largest, 520 MeV cyclotron (1, Vancouver, BC)

TRIUMF Radiochemistry Annex: TR-30 (2) and CP 42 (1) cyclotrons owned by BWXT (Vancouver, BC)

TRIUMF TR-13 cyclotron (1, Vancouver, BC)

TRIUMF Institute for Advanced Medical Isotopes TR-24 cyclotron (1, Vancouver, BC)

BC Cancer cyclotron (1, Vancouver, BC)

University of Alberta Hospital: Medical Isotope & Cyclotron Facility (1, Edmonton, AB)

Edmonton Radiopharmaceutical Centre - Cross Cancer Institute cyclotron (1, Edmonton, AB)

Saskatchewan Cyclotron Facility: Synchrotron and Class II linear accelerator (1, Saskatoon, SK)

Canadian Light Source LINAC facility (1, Saskatoon, SK)

Winnipeg Health Sciences Centre cyclotron (1, Winnipeg, MB)

Thunder Bay Cyclotron and Radiochemistry Laboratories (1, Thunder Bay, ON)

McMaster University cyclotron (1, Hamilton, ON)

Lawson Cyclotron & PET Radiochemistry Facility (1, London, ON)

University Health Network cyclotron (1, Toronto, ON)

Centre for Addiction and Mental Health - Brain Health Imaging Centre cyclotrons (2, Toronto, ON)

Sunnybrook cyclotron (1, Toronto, ON)

University of Ottawa Heart Institute cyclotron (1, Ottawa, ON)

Queen Elizabeth II Health Sciences Centre cyclotron (1, Halifax, NS)

Centre Hospitalier Universitaire de Québec - Université Laval Research Center cyclotron (1, Québec, QC)

Centre Hospitalier de l'Université de Montréal cyclotron (1, Montreal QC)

McGill University: Montreal Neurological Institute "The Neuro" cyclotron (1, Montreal, QC)

Centre de Recherche Sherbrooke cyclotron (1, Sherbrooke, QC)

Nuclear and Molecular Medicine Facility: Health Sciences Centre cyclotron (1, St. John's, NL)

ADDITIONAL PRODUCTION CAPABILITIES - GENERATORS

Canada also produces isotopes through generators. For example, CNL has been commercially producing generator Ac-225 (using Th-229, a waste byproduct) twice a month for over five years.

The Cross-Sectoral Impact of Canadian Isotopes

Isotopes enable innovation and activity across many Canadian industries.

HEALTHCARE

The backbone of diagnostic and therapeutic radiology in Canada and around the world relies on isotopes. PET and SPECT imaging, brachytherapy, targeted alpha therapy, medical equipment sterilization, and emerging therapies and theranostics are all powered by Canadian-produced isotopes.

INFRASTRUCTURE

Isotopes are used in nuclear density gauges to inform decisions on highway and building site locations by helping to measure soil composition and density, and to verify the integrity of aging roadways and overpasses by quantifying the compaction of concrete and asphalt. Nuclear gauges also help detect leaks or defects in chemical plants. The global market for industrial applications of radioisotopes is valued at US $5.2 billion in 2024 and is projected to grow to US $8.6 billion by 2033.

60% of Canada's Gross Domestic Product (GDP) is generated by industries that rely on isotopes in some capacity.

ADVANCED MANUFACTURING

In the manufacturing sector, Non-Destructive Testing (NDT) using industrial radiography helps to verify the quality of welds and internal structures in real time. NDT also allows experts to measure the structural integrity of items like pipeline components and aircraft parts.

NATIONAL SECURITY AND BORDER PROTECTION

Radioisotopes enable cargo scanning, forensic tracing, and radioactive material detection systems, all supported by Canadian-built technologies.

AGRICULTURE AND FOOD

Isotopes are a key element in supporting food safety and preservation. They help to detect pesticides, herbicides, and toxic metals in the soil, and help to extend the life of our foods. Around 20-30% of food harvested is spoiled before it can be consumed, but food irradiation helps extend shelf life and reduce spoilage of grains, spices, meats, fruits and vegetables. Isotopes also prevent the spread of insect-borne diseases like the Zika Virus through the Sterile Insect Technique (SIT), avoiding the need for harmful pesticides by leveraging gamma rays.

RESEARCH AND MORE

Isotopes enable research in agriculture, astronomy, biology, chemistry, materials science, nuclear safety, and more. For example, isotopes are used to power batteries for deep-space exploration, allowing spacecraft to explore distant reaches of the solar system.

Directory Structure

This directory offers an overview of Canada's isotope ecosystem today and builds on the first edition of the *Canadian Isotope Ecosystem Directory,* to better reflect how Canadian organizations operate in today's isotope ecosystem as highly collaborative entities across multiple stages of the value chain.

Organizations included in this directory were selected based on meaningful engagement in Canadian isotope-related activities. The directory is organized into five primary chapters:

CHAPTER 1: Source Material & Isotope Generation

CHAPTER 2: Isotope Processing, Radiopharmaceutical & Product Manufacturing

CHAPTER 3: Packaging, Distribution, & Delivery Logistics

CHAPTER 4: Specialized Equipment & Technology Providers

CHAPTER 5: Industry Coordination, Project Services, and Consulting

CHAPTER 6: Training, Advocacy, and Organizing for the Future

Since many organizations within the Canadian isotope ecosystem will occupy more than one of the above Chapters, this directory also provides a Cross-Reference Master table to outline the other secondary activities and services provided by each organization.

This cross-referenced, multi-dimensional structure ensures that the directory serves not only as a resource for identifying current supply chain participants, but also as a tool for understanding broader ecosystem strengths, capabilities, and future growth trajectories.

Canadian Isotope Supply Chain

CHAPTER 1:
Source Material & Isotope Generation

This chapter features organizations at the front end of the isotope supply chain, which are responsible for producing the raw nuclear material and generating isotopes through irradiation. This chapter includes suppliers of enriched targets and stable isotopes, as well as operators of key irradiation infrastructure such as CANDU and research reactors, cyclotrons, and linear accelerators. These entities play a foundational role by ensuring the availability of the nuclear inputs needed across all downstream stages of the ecosystem.

PART 1: STABLE ISOTOPE GENERATION

- Kinectrics
- TMC Group

PART 2: LEVERAGING NUCLEAR ENERGY CAPACITY

- Bruce Power
- Ontario Power Generation
- Laurentis Energy Partners
- Framatome
- Isogen

PART 3: INNOVATIVE REACTOR AND ACCELERATOR TECHNOLOGIES

- TRIUMF
- McMaster University
- Sylvia Fedoruk Canadian Centre for Nuclear Innovation
- Iotron Medical

KINECTRICS INC.

Headquarters: Toronto, Ontario
Ownership: Canadian-owned
(Subsidiary of BWX Technologies, Inc.)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.kinectrics.com
Key Contact: Travis Besanger, Vice President of Medical Isotopes; travis.besanger@kinectrics.com, (416) 207-6000

Kinectrics is the largest supplier of enriched stable isotopes in Canada, offering engineering solutions, and integrated support services across the isotope production and delivery chain. Kinectrics operates full function radiochemistry laboratories, hot cells, a stable isotope production facility, and enrichment systems, along with engineering and equipment fabrication capabilities tailored for isotope handling and irradiation.

Kinectrics plays a critical role in the global Lu-177 supply chain by manufacturing enriched Yb-176. Through its joint venture Isogen, established with Framatome and in partnership with Bruce Power, Kinectrics provides irradiation, post-irradiation handling, logistics, and irradiation system development. Its Tiverton site also serves as a logistics hub for isotope shipping and delivery, including the Isogen Lu-177 program.

Kinectrics is expanding its portfolio to include isotopes such as Gd-160 and continues to invest in new infrastructure at its Kipling campus. Kinectrics is also expanding its capacity through international partnerships and export agreements with partners such as POINT Biopharma, Isotopia and ITM. With academic collaborations, graduate trainee programs, and internal mentoring initiatives, Kinectrics is helping build the next generation of Canadian isotope experts while strengthening Canada's leadership in the sector.

TMC GROUP

Headquarters: Vancouver, British Columbia
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Medium
Website: www.tmc-group.ca
Key Contact: Thomas Harris, Vice President of Operations; info@technomedics.ca, (604) 973-2151

TMC Group specializes in the development and production of enriched stable isotopes for medical and industrial applications. TMC operates a dedicated stable isotope manufacturing and processing facility, along with a fully equipped chemistry lab and R&D space focused on innovation and process optimization. The company supplies enriched isotopes including Yb-176, Ga-69, and Gd-160 and has produced and exported over 10 kilograms of enriched isotopes to international markets since 2004.

With proprietary production technologies and scalable systems, TMC supports consistent high-purity isotope supply and offers custom isotope manufacturing, process development, and technical consulting. The company maintains a structured in-house training program for new hires and has invested in infrastructure upgrades, facility expansions, and advanced equipment. Ongoing investment initiatives target increased production capacity, new isotope lines, and enhanced operational efficiency.

BRUCE POWER

Headquarters: Tiverton, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Limited Partnership
Company Size: Large
Website: www.brucepower.com

Bruce Power is a private Canadian energy company and one of the world's largest producers of low-specific-activity Co-60 for device sterilization. Since 2019, Bruce Power has also supplied medical-grade, high-specific-activity Co-60 for targeted cancer treatments.

In 2022, Bruce Power expanded its isotope capabilities through a partnership with Isogen, a joint venture of Framatome and Kinectrics, to begin commercial production of Lu-177 using an Isotope Production System (IPS) installed on Unit 7, with a second IPS installed on Unit 6 in 2025.

Bruce Power operates the IPS, which includes packaging irradiated targets for shipment and providing commercial irradiation services.
Bruce Power is expanding its isotope portfolio with plans to commission a dedicated hot cell facility for target carrier removal. Irradiated targets are currently sent for processing in Germany by ITM. The company also maintains a partnership with the Saugeen Ojibway Nation to jointly market the isotopes, supporting both global healthcare and Indigenous economic development.

ONTARIO POWER GENERATION INC.

Headquarters: Oshawa, Ontario
Ownership: Public-owned (by the Province of Ontario)
Governance Model: Board of Directors
Company Size: Large
Website: www.opg.com
Key Contact: Chris Horne, Commercial Director; Chris.Horne@opg.com, (289) 987-0374

Ontario Power Generation (OPG) harnesses its nuclear infrastructure to produce and supply critical medical and industrial isotopes. OPG operates the Pickering and Darlington Nuclear Generating Stations providing irradiation services and the world's largest Tritium Removal Facility. OPG produces Co-60 for sterilization, and extracts Tritium, as a byproduct of energy production, for industrial and scientific use. Through its subsidiary, Laurentis Energy Partners, Darlington Nuclear Generating Station is the first commercial reactor to produce Mo-99 and is part of efforts to advance the supply of Y-90, Lu-177, and He-3. OPG exports isotopes to international markets including the U.S. and Europe and collaborates with partners to strengthen supply chains. The company also invests in workforce and ecosystem development through its Trades Promoting Trades program, Indigenous Opportunities Network, and diversity and inclusion programs.

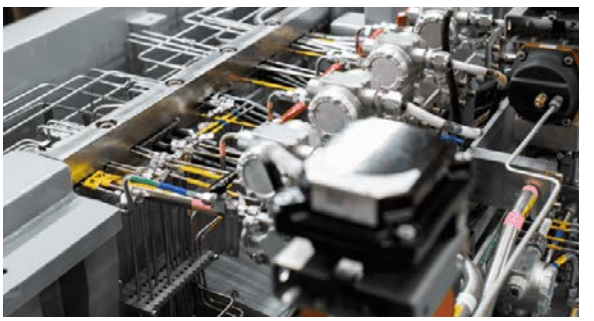
LAURENTIS ENERGY PARTNERS

Headquarters: Oshawa, Ontario
Ownership: Canadian-owned (Subsidiary of Ontario Power Generation Inc.)
Governance Model: Board of Directors
Legal Structure: Crown Corporation
Company Size: Large
Website: www.laurentisenergy.com
Key Contact: info@laurentisenergy.com

Laurentis Energy Partners, a subsidiary of Ontario Power Generation, contributes to the production, processing, and distribution of critical medical and industrial isotopes. The company operates North America's largest Target Delivery System (TDS) at OPG's Darlington Nuclear Station Unit 2, producing Mo-99 in partnership with BWXT Medical Ltd. for the North American market.

Laurentis also produces and supplies He-3 for global use in quantum computing, research, and medical imaging, with plans to expand into Y-90 and Lu-177 production. The company's services are supported by CNSC licensing and regulatory expertise.

Future expansion plans include a second TDS at Darlington's Unit 3 and a new facility in Hamilton, Ontario, to support further isotope services such as packaging.



FRAMATOME CANADA LTD.

Headquarters: Pickering, Ontario
Ownership: Foreign-owned
(Subsidiary of Électricité de France - EDF)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.framatome.com
Key Contact: Justin Gray, Chief Operating Officer; proposals.canada@framatome.com, (416) 662-3163

Framatome Canada, a subsidiary of Électricité de France (EDF), provides specialized engineering, technical services, and system integration expertise, enabling irradiation technologies. Its focus includes the design, construction, operation, and maintenance of isotope production systems for commercial nuclear reactors.

Framatome is a core partner in Isogen, a joint venture with Kinectrics, which successfully designed and installed the IPS at Bruce Power. The IPS enabled the world's first commercial production of Lu-177 within a power reactor. Framatome continues to provide system engineering, technical integration, and maintenance services, with further IPS installations planned to meet growing market demand.

Framatome's technology and services are critical to enabling large-scale, reactor-based isotope production. The company also provides irradiation services and specialized technical support to global partners.

ISOGEN

Headquarters: Toronto, Ontario
Ownership: Canadian-owned, Joint Venture (Kinectrics and Framatome Canada)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Medium
Website: www.isogen.ca
Key Contact: Yousef Yacoob; yousef.yacoob@kinectrics.com, (437) 324-6213

Isogen is a joint venture between Kinectrics and Framatome Canada. The company supplies irradiation services to isotope processors and radiopharmaceutical manufacturers via the CANDU IPS which is installed at Bruce Power. Isogen is the first company globally to deploy commercial isotope production in a power reactor, launching Lu-177 production in 2022 and expanding to a second line in 2024. Isogen handles irradiation of Yb-176 to produce Lu-177 for ITM and is now working to advance IPS capabilities for additional isotopes. The company leverages infrastructure from its parent companies Kinectrics and Framatome, including CNSC-licensed labs, hot cells, machine shops, and transport fleets, as well as teams with extensive expertise in engineering, analysis, fabrication, construction. Isogen also collaborates and conducts work at McMaster University's Centre for Advanced Nuclear Systems and Nuclear Research Reactor.

TRIUMF

Headquarters: Vancouver, British Columbia
Ownership: Canadian-owned (Consortium of 21 Canadian Universities)
Governance Model: Board of Governors
Legal Structure: Not-for-Profit
Company Size: Large
Website: www.triumf.ca
Key Contact: Dr. Cornelia Hoehr, Interim Director, TRIUMF Life Sciences Division; choehr@triumf.ca, (604) 222-7570

TRIUMF is Canada's particle accelerator centre and a global leader in multidisciplinary research. As a not-for-profit corporation, TRIUMF combines state-of-the-art cyclotron and processing infrastructure with a national governance model spanning 21 Canadian universities. Home to the largest 520 MeV cyclotron in the world, TRIUMF advances nuclear science, supports isotope innovation, and enables life sciences research through cross-sectoral partnerships.

TRIUMF provides irradiation services, processing, and R&D, and has invested in its Institute for Advanced Medical Isotopes (IAMI), a new facility that expands cyclotron capacity and radiopharmacy development, scheduled to open in 2026. TRIUMF partners with BWXT Medical on commercial isotope supply and collaborates with University of British Columbia (UBC) Hospital for PET scanning, while also exporting isotopes to European and Asian markets. Through its advanced infrastructure, national academic network, and strategic industry collaborations, TRIUMF supports today's supply needs and the development of next-generation radiopharmaceuticals.

Current Isotope Portfolio:

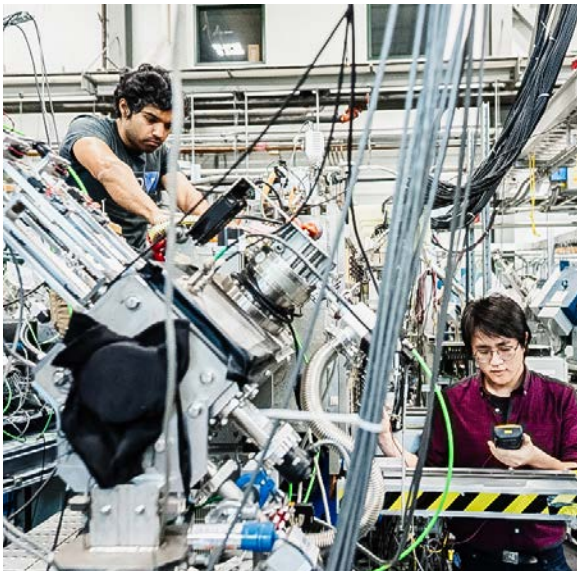
- C-11, F-18, Cu-64, Ga-68, Y-86, Zr-89
- Hg-197, Pb-212, Ra-223/224/228
- Ac-225/227, Bi-213, U-230, Th-227

Partner with BWXT Medical for commercial supply:

- Ac-225
- Sr-82
- Ge-88
- In-111

Emerging Isotopes (R&D and pre-commercial):

- Sc-44, Ti-45, Co-56/58
- Tc-94m/99m, Pd-103, Sb-117/119
- La-132/135, Tb-149/155, Er-165
- Pb-203, At-209/211, Ac-226, Th-226



MCMASTER UNIVERSITY

Headquarters: Hamilton, Ontario
Ownership: Public Institution
Governance Model: Board of Governors and University Senate
Legal Structure: Academic Institution
Company Size: Medium
Website: www.mcmaster.ca
Key Contact: AVP Nuclear, Office of the Vice President Research; avpnuclr@mcmaster.ca, (905) 525-9140 Ext. 27270

McMaster University is a globally recognized leader in nuclear research, isotope production, and radiopharmaceutical innovation, known for its excellence in nuclear research across multiple disciplines. The university operates a 5 MW open-pool research reactor, a 16.5 MeV cyclotron, hot cell facilities with cleanrooms and radiochemistry laboratories, and the Centre for Neutron Activation Analysis. These CNSC-licensed facilities support various research and commercial activities, including irradiation services, isotope processing and purification, target material preparation, contract research and manufacturing, and advanced technical consulting. McMaster also offers unique interdisciplinary education and training programs that prepare engineers, scientists, and healthcare professionals for careers in nuclear fields.

McMaster regularly produces imaging and therapy-focused medical and research isotopes, including I-125, F-18, Lu-177, Y-90, Zr-89, and Tc-94m. Additionally, the radioisotope R&D group conducts both internal and user-driven research on the next generation of medical radioisotopes. McMaster exports isotopes, irradiation services, and research expertise worldwide, with established commercial and academic partnerships in the U.S., Europe, and China. Exports include radiochemicals, contract research and irradiation services, and consulting and technical expertise in reactor- and cyclotron-based isotope production.

Over the past five years, McMaster has upgraded its irradiation and radiochemical processing infrastructure, like installing of new hot cells, expanding radiochemistry labs, and developing a poolside hot cell next to the reactor. McMaster is also transitioning to 24/7 reactor operations to meet the increasing research and commercial demands for Canada's only research reactor. Future investments will expand radiopharmaceutical processing capabilities and enhance reactor and cyclotron throughput through upgrades to target handling and automation systems.

SYLVIA FEDORUK CANADIAN CENTRE FOR NUCLEAR INNOVATION

Headquarters: Saskatoon, Saskatchewan
Ownership: Canadian-owned (Subsidiary of the University of Saskatchewan)
Governance Model: Board of Directors
Legal Structure: Not-for-Profit
Company Size: Medium
Website: www.fedorukcentre.ca
Key Contact: Dale Schick-Martin, Facility General Manager; d.schickm@fedorukcentre.ca, (306) 966-3388

The Sylvia Fedoruk Canadian Centre for Nuclear Innovation (Fedoruk Centre) was established in 2011 to help place Saskatchewan among global leaders of nuclear research, development and training. The Fedoruk Centre invests in partnerships with academia and industry, funding research projects in nuclear topics, supporting new faculty positions, and providing advice on nuclear research. The Fedoruk Centre aspires to facilitate respectful conversations about nuclear technology, and open new opportunities for economic activity in Saskatchewan's nuclear sector.

The Fedoruk Centre operates the Saskatchewan Cyclotron Facility under an operating agreement with the University of Saskatchewan. Its infrastructure supports irradiation, purification, and formulation, and holds relevant CNSC and Health Canada licencing (Drug Establishment Licence), PHAC Biosafety licence, TDG/Known Consignor, and GMP QA certifications. Since beginning operations in 2015, the Facility has been maintained in a competitive state of readiness for access by academic and industrial researchers for the production of radiopharmaceuticals that are needed in medical imaging at regional hospitals. The Fedoruk Centre handles a wide range isotopes including:

Current Isotope Portfolio

Routine Production:

- F-18, C-11, N-13, Zr-89, Ac-225

Target Materials

- Ra-226, Ni-58, Zn-68, O-18

Research Offerings for users:

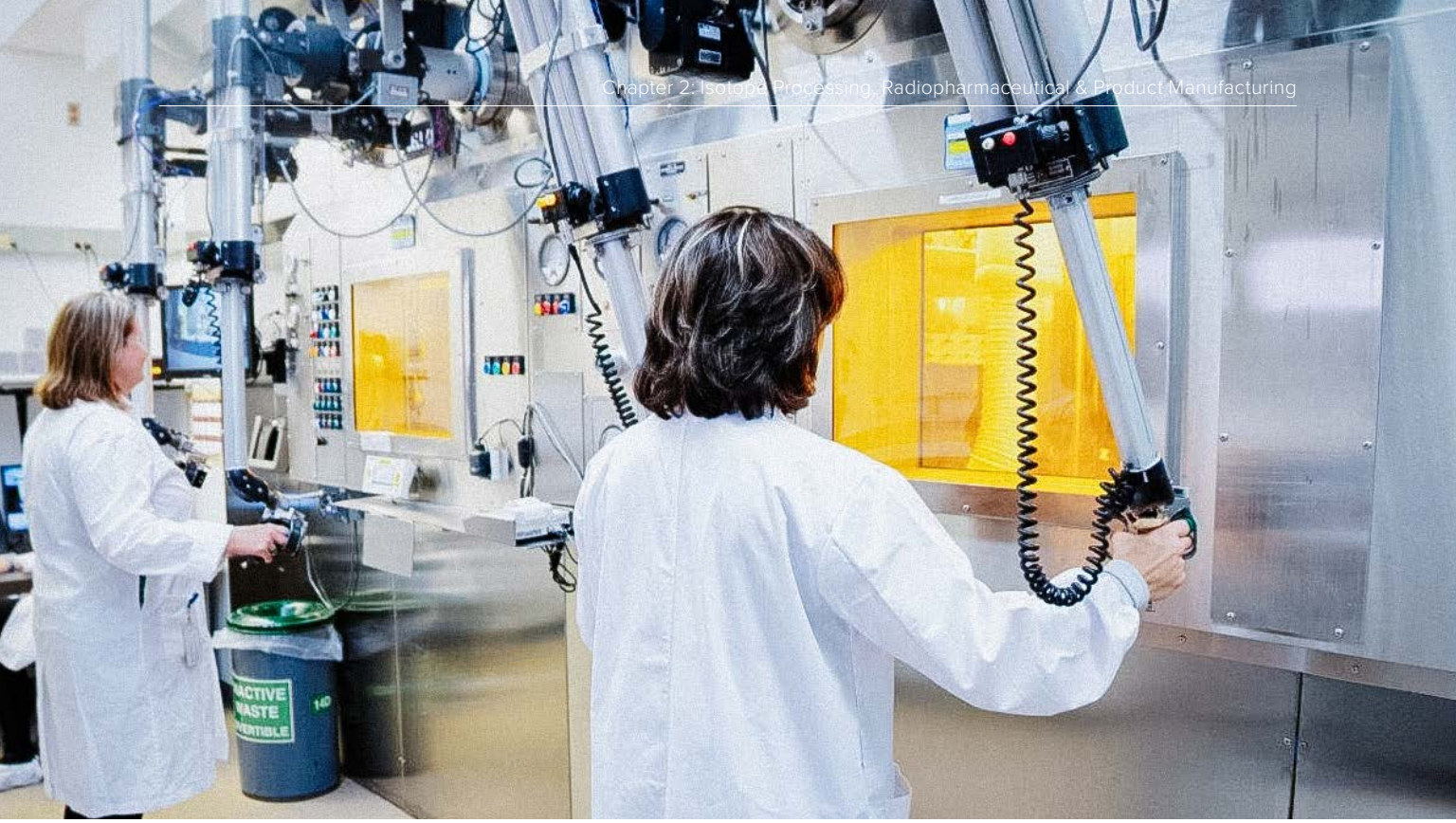
- C-11, N-13, F-18, Co-57, Ga-68, Zr-89, In-111, Tb-161, Lu-177, Ac-225

IOTRON MEDICAL SK

Headquarters: Saskatoon, Saskatchewan
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Medium
Website: www.iotronmedical.com
Key Contact: Patrick Donahue, CEO; pat.donahue@iotronmedical.com, (508) 904-0936
Emily Dollard, Executive Business Partner; emily.dollard@iotronmedical.com, (978) 884-8582

Iotron Medical SK specializes in the production and processing of Cu-67 for medical and research applications. The organization operates an Electron Beam Linear Accelerator, an isotope processing facility, a distribution centre, and an R&D laboratory, with core activities focused on irradiation services, isotope purification, and cold chain logistics. Iotron leases key infrastructure from the Canadian Light Source and the Fedoruk Centre, where final purification and shipment of Cu-67 is conducted for delivery to domestic and international clients.

The company exports isotopes and related services to markets in North America and Europe and maintains strategic partnerships to enable efficient and scalable isotope production. Iotron continues to plan for future infrastructure investments and conducts ongoing work to support emerging isotopes.



CHAPTER 2:
Isotope Processing, Radiopharmaceutical & Product Manufacturing

This chapter highlights organizations that work to transform isotopes into usable products. Their work includes radiochemical processing, purification, formulation, and the manufacturing of final goods such as radiopharmaceuticals, industrial tracers, and research compounds. These players bridge the gap between isotope generation and end-user application, offering the scientific and technical capabilities.

- Nordion
- BWXT Medical
- Canadian Nuclear Laboratories
- Boston Scientific
- Novartis Pharmaceuticals Canada
- Isologic Innovative Radiopharmaceuticals
- AtomVie Global Radiopharma
- ARTMS
- ABK Biomedical
- NUCM Radiopharma
- WWiKY Biosciences
- Actineer

BWXT MEDICAL LTD.

Headquarters: Ottawa, Ontario
Ownership: Foreign-owned
(Subsidiary of BWX Technologies, Inc.)
Legal Structure: Corporation
Company Size: Large
Website: www.bwxtmedical.com
Key Contact: General Inquiries; (613) 963-2300
Customer Inquiries; isotopeorders@bwxt.com,
(613) 963-2621

BWXT Medical is a leader in manufacturing, supplying, and processing medical isotopes. With a robust commercial infrastructure and advanced capabilities, BWXT Medical serves Canada's isotope ecosystem and over 40 countries globally.

Operating two large-scale facilities in Ottawa and Vancouver, BWXT Medical has invested in infrastructure modernization and production scalability. Their 17,000 square ft. operations space in Ottawa houses over 30 hot cells and a comprehensive facility license, isotope processing and CDMO infrastructure and expertise for API, sterile products, and medical devices. In Vancouver, their 60,000 square ft. operations space, located on the TRIUMF campus, has two dedicated cyclotrons, preferred access to TRIUMF's 520 MeV accelerator, over 15 hot cells, and manufacturing suites for API and sterile products.

BWXT Medical also collaborated with Laurentis Energy Partners to develop the Target Delivery System installed at Ontario Power Generation's Darlington Nuclear Generating Station Unit 2 to enable scalable production of isotopes, including Lu-177 and Mo-99. Additionally, BWXT Medical also works with NorthStar Medical Radioisotopes, LLC (NorthStar) to facilitate the production of Ac-225.

BWXT Medical handles a wide range of isotopes, including Ac-225, In-111, I-123, Sr-82, and Ge-68, and serves as exclusive contract manufacturer for TheraSphere™ outside of China in partnership with Boston Scientific. Looking forward, BWXT Medical is developing a n.c.a. Lu-177 chloride radiochemical product and a Tc-99m generator to support the long-term, stable supply for diagnostic imaging and therapeutics.

NORDION

Headquarters: Ottawa, Ontario
Ownership: Canadian-owned
(Subsidiary of Sotera Health)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.nordion.com
Key Contact: (613) 592-3400 Ext. 1253

Nordion is the leading global supplier of Co-60. With operations anchored at its licensed nuclear substance processing facility in Ottawa (Kanata), Nordion leverages strong, long-term partnerships with Bruce Power, Ontario Power Generation, and Westinghouse to ensure a continuous reliable supply. Nordion has invested in expanding production capacity, including the addition of large-scale hot cells, extensive cobalt pool infrastructure, upgrades at Bruce Power and Darlington, and new technologies to enable Co-60 production in Pressurized Water Reactors.

Nordion supplies the majority of the world's Co-60, with approximately 95% of its output exported to customers across the U.S., Europe, and Asia. Nordion's services underpin the sterilization of billions of medical devices and contribute to cancer treatment and food safety applications. Through sustained investment, international reach, and deep expertise, Nordion secures a vital Canadian supply chain for Co-60.

CANADIAN NUCLEAR LABORATORIES, INC.

Headquarters: Chalk River, Ontario
Ownership: Government-owned, Contractor-operated (AECL)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.cnl.ca
Key Contact: commercial@cnl.ca

With over 80 years of expertise as Canada's national nuclear laboratory, Canadian Nuclear Laboratories (CNL) offers end-to-end capabilities spanning isotope processing, radiopharmaceutical development, radiochemical method design, toxicology studies, and preclinical research. CNL's comprehensive infrastructure supports routine production and highly specialized isotope development.

CNL produces and/or handles medical and industrial isotopes, including Ac-225, Lu-177, Pb-212, Ga-68, Zr-89, In-111, Ra-226, Y-90, tritium, and heavy water. The organization holds all necessary CNSC authorizations for the manufacturing, processing, and transportation of radioactive materials, ensuring adherence to the highest safety and quality standards.

CNL exports isotopes and specialized technical services to Europe, the U.S., and other international markets. Looking ahead, CNL is scaling up through new facility builds, laboratory modernization, and developing new joint ventures.

BOSTON SCIENTIFIC

Headquarters: Marlborough, Massachusetts, USA
Legal Structure: Corporation
Company Size: Large
Website: www.bostonscientific.com
Key Contact: Wayne Mullett, Senior Global Director, Supply Chain and Development; Wayne.mullett@bsci.com, (613) 218-8190

Boston Scientific is an expert in the manufacturing and distribution of Y-90 glass microspheres, the TheraSphere™, used to treat liver cancer. The company imports radioactive material and manages the formulation, manufacturing, packaging, and distribution of its radiotherapeutic medical devices. Its export activities primarily focus on the U.S.

Boston Scientific's operations are supported by regulatory authorizations and CNSC licencing. The company maintains a strategic partnership with BWXT Medical, acting as a contract manufacturing organization (CMO).

NOVARTIS PHARMACEUTICALS CANADA INC.

Headquarters: Montreal, Québec
Ownership: Foreign-owned
(Subsidiary of Novartis AG, Switzerland)
Legal Structure: Corporation
Company Size: Large
Website: www.novartis.com/ca-en
Key Contact: (514) 631-6775

Novartis Pharmaceuticals Canada is the Canadian subsidiary of Novartis AG, a global leader in radioligand therapy (RLT) and radiopharmaceutical innovation. Novartis' portfolio includes Lutathera® and Pluvicto®, two Health Canada–approved therapies that use Lu-177 to treat neuroendocrine tumors and metastatic prostate cancer. Novartis is also involved in the global clinical development of Ac-225-based alpha therapies, where Phase I/II trials are advancing and Phase II/III clinical trials are upcoming.

While isotope production and early-stage processing are managed globally, Novartis Canada is critical to national access and deployment. Its operations focus on radiopharmaceutical formulation, regulatory interface, clinical logistics, and cold-chain distribution. Novartis also works closely with Canadian healthcare providers and nuclear medicine specialists to support clinical readiness and integration of these therapies into routine cancer care. Novartis brings unmatched scale, infrastructure, and expertise to Canada's radiopharmaceutical landscape.

ISOLOGIC
Innovative Radiopharmaceuticals

ISOLOGIC INNOVATIVE RADIOPHARMACEUTICALS

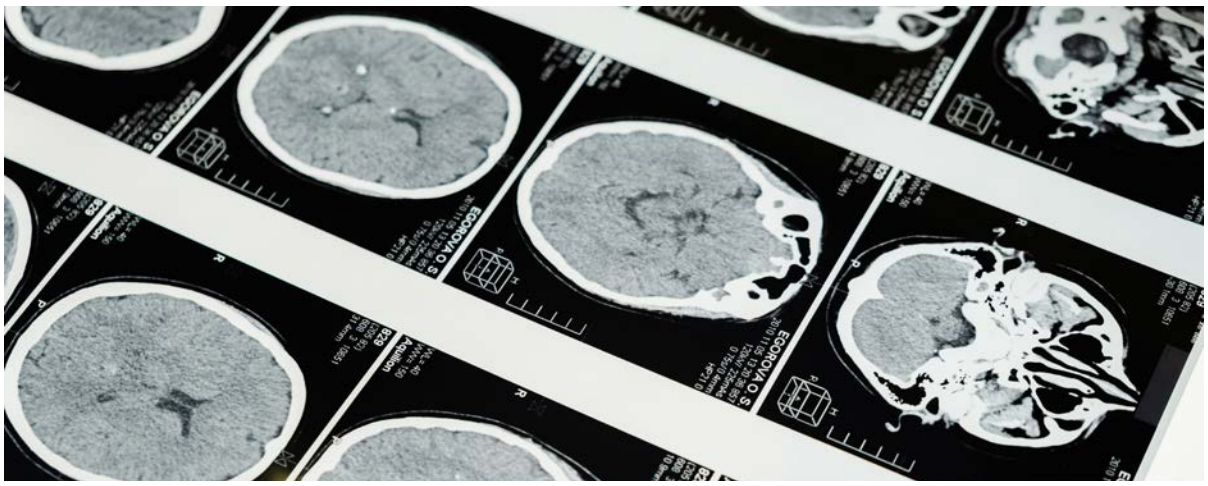
Headquarters: Dorval, Québec
Ownership: Foreign-owned (Subsidiary of PharmaLogic Holdings LLC)
Governance Model: Executive Management Team
Legal Structure: Corporation
Company Size: Medium
Website: www.isologicradiopharm.ca/en/
Key Contact: info@isologicradiopharm.ca, commercial@isologicradiopharma.ca

Isologic Innovative Radiopharmaceuticals (Isologic) is a leading Canadian radiopharmaceutical company specializing in the production and distribution of PET and SPECT radiotracers for clinical and research use. With five SPECT radiopharmacies, three PET manufacturing facilities and logistics, warehousing and distribution facility, Isologic ensures reliable national supply of radiotracers containing key isotopes such as Tc-99m, F-18, Ga-68, I-123, and I-131.

Isologic holds extensive regulatory authorizations, including Health Canada Drug Establishment Licences, CNSC licences, GMP and TDG certification. It maintains several commercial partnership including:

- Telix Pharmaceuticals: Distribution of Illuccix™ (Ga-68 PSMA-11) across Canada for prostate cancer imaging.
- Life Molecular Imaging: Distribution of Neuraceq™ (Florbetaben) for the imaging of beta-amyloid plaques in patients being evaluated for Alzheimer's disease.
- IRE Elit: Distribution of the Galli Eo Ga-68 generator.
- Sunnybrook Hospital and Centre hospitalier de l'Université de Montréal (CHUM):PET manufacturing facility for clinical F18-FDG.
- Ottawa and Vancouver General Hospital: SPECT radiopharmacy for clinical SPECT unit dose preparation.

Isologic is expanding its infrastructure through a major upgrade to its Lachine PET facility, adding a new 18 MeV cyclotron and solid target capabilities to enable the production of Zr-89, Cu-64, Ga-68, and Tc-99m. The company also engages in R&D on novel F-18, Zr-89 and Ga-68 tracers and currently exports Zr-89 radiotracers to Australia for clinical research.



ATOMVIE GLOBAL RADIOPHARMA INC.

Headquarters: Hamilton, Ontario
Ownership: Foreign-owned
Governance Model: Board of Directors
Legal Structure: Private Corporation
Company Size: Large
Website: www.atomvie.com
Key Contact: info@atomvie.com
Ghadeer Shubassi, Director, Business Development; ghadeer.shubassi@atomvie.com, (289) 683-0870

AtomVie Global Radiopharma (AtomVie) is a GMP manufacturer and global distributor of multiple finished-dose therapeutic radiopharmaceutical products to Canada and over 28 countries. As a spin-out of CPDC, AtomVie is the former CMO business unit of CPDC, and offers services across Process & Analytical Method Development & Validation, Quality Operation, Regulatory, Clinical & Commercial Supply, and Logistics. Leveraging its relevant Health Canada Drug Establishment Licences, CNSC Licensing, and GMP certifications, AtomVie is scaling up with the construction of a new state-of-the-art facility in Hamilton through a $100 million CAD investment to expand its current clinical manufacturing capacity and include commercial-level production of radiotherapeutics and medical isotopes.

Current Isotope Portfolio:

- Lu-177
- Ac-225
- I-131
- In-111
- Ho-166
- Zr-89
- Cu-64
- Cu-67

Additional research, development, or pre-commercial work involving isotopes including:

- Pb-212
- Tb-161
- At-211

ARTMS - A TELIX PHARMACEUTICAL COMPANY

Headquarters: Vancouver, British Columbia
Ownership: Foreign-Owned (Owned by Telix Pharmaceuticals)
Governance Model: Board of Directors, Publicly Traded (ASX: TLX, NASDAQ: TLX)
Legal Structure: Corporation
Company Size: Large
Website: www.artms.ca
Key Contact: info@artms.ca, (1-604) 228-4016

ARTMS, owned by Telix Pharmaceuticals, develops and delivers advanced CNSC- and GMP- certified solutions for cyclotron-based isotope production, with expertise spanning target material supply, isotope processing, and radiopharmaceutical manufacturing. ARTMS developed and commercialized its proprietary QUANTM Irradiation System™ (QIS™), a disruptive cyclotron-based solid target platform that allows hospitals, radiopharmacies, and production sites to generate key isotopes locally and reliably. ARTMS also developed Illuccix® (Ga-68 PSMA), a leading diagnostic radiopharmaceutical. ARTMS' footprint also includes a new manufacturing facility in Burnaby, BC, and partnerships with academic and commercial cyclotron sites worldwide.

Current Isotope Portfolio:

- Tc-99m
- Ga-68
- F-18
- C-11
- Cu-64
- Zr-89
- I-131
- Ac-225
- At-211
- Pb-212

ABK BIOMEDICAL INC.

Headquarters: Halifax, Nova Scotia
Ownership: Foreign-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.abkbiomedical.com
Key Contact: Marc Gregoire, VP Nuclear Strategy and Development; m.gregoire@abkbiomedical.com, (613) 859-0052

ABK Biomedical specializes in the formulation and processing of Y-90 glass microspheres for liver cancer treatment through transarterial radioembolization (TARE). The company operates a licensed radiochemical processing facility in Halifax and is advancing plans for a commercial manufacturing site. ABK Biomedical sources irradiated Y-90 from the University of Missouri Research Reactor (MURR) and focuses on in-house formulation, packaging, and regulatory development. Its lead product is undergoing clinical trials in the U.S. ABK Biomedical also possesses expertise in regulatory strategy, quality systems, and nuclear safety, supporting growth in radiotherapeutics in Canada.

NUCM RADIOPHARMA INC.

Headquarters: Oakville, Ontario
Ownership: Canadian-owned, Privately held
Legal Structure: Corporation
Company Size: Small
Website: www.nucm.ca
Key Contact: Neena Kanwar, CEO; neena@nucm.ca, (905) 582-0101, (416) 666-7000

NUCM Radiopharma (NUCM) is a Health Canada (DEL) and CNSC–licensed GMP manufacturer and distributor of radiopharmaceuticals, with 24/7, 365-day services to over 50 nuclear medicine departments across Ontario. NUCM products are used to treat cancers, cardiac and neurological diseases. NUCM's products include Health Canada-approved radiopharmaceuticals including Tc-99m (Tetrofosmin/ Sestamibi/ Medronate), Ga-67, I-123/131, In-111, sealed sources (Co-57, Cs-137), and more.

NUCM conducts custom radiolabeling procedures, like autologous leukocyte radiolabeling for infection/inflammation imaging, and particle-controlled suspension radiopharmaceuticals (Tc-99m Sulfur, Tc-99m MAA). NUCM possesses a state-of-the-art manufacturing site, fleet of electric delivery vehicles (first Radiopharmacy company in Canada to implement an EMV fleet), and a staff of Radiopharmacy experts including Radiopharmacists and Radiopharmacy Technicians, Nuclear Medicine Technologists, Radiation Safety Officers, QA Specialists, and TDG-trained Medical Couriers.

WWIKY BIOSCIENCES INC.

Headquarters: Edmonton, Alberta
Ownership: Canadian-owned
Governance Model: Advisory Board
Legal Structure: Corporation
Company Size: Small
Website: www.wwiky.com

WWiKY Biosciences (WWiKY) is a biotechnology company specializing in the research, development, preclinical and clinical evaluation of radiotheranostic products targeting hypoxic tumors. With the University of Alberta, Cross Cancer Institute (CCI), and clinical and healthcare partners in India, China, and the U.K., WWiKY is developing clinical and bioengineered nanotheranostic radiopharmaceuticals.

WWiKY's lead asset, [I-131]-Hypoxycin-1™, is Health Canada-approved for a Phase I/II clinical trial in cancer patients. WWiKY is also advancing a pipeline of theranostic agents labeled with isotopes like I-124, Ga-68, Lu-177, Sr-88, and Ac-225. WWiKY supports radiopharmaceutical synthesis, preclinical testing, regulatory consulting, and clinical trial execution. It also operates dedicated R&D facilities and plans to build a GMP-compliant radiopharmaceutical manufacturing facility. WWiKY exports clinical precursors to international collaborators and is actively seeking investment to expand its infrastructure, pursue clinical trials, and commercialize its products.

ACTINEER, INC.

Headquarters: Chalk River, Ontario
Ownership: Joint Venture (Canadian Nuclear Laboratories and ITM Canada LTD.)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.actineer.com
Key Contact: info@actineer.com
Joseph Oliverio, President & CEO;
joseph.oliverio@actineer.com, (716) 550-0435

Actineer is a Canadian joint venture between CNL and ITM focused on the production of Ac-225 for Targeted Alpha Therapy. The company is actively engaged in the supply chain for Ra-226 target preparation, irradiation, and Ac-225 extraction, with plans underway to build a dedicated GMP-compliant facility in Canada to scale production capacity. Actineer works to meet the growing demand for alpha-emitting isotopes used in next-generation radiopharmaceuticals. Its operations span product manufacturing, research, and technical consulting, with international exports of Ac-225 to key global partners.

CHAPTER 3:
Packaging, Distribution & Delivery Logistics

This chapter outlines organizations that provide just-in-time logistics, packaging, and secure transport of isotopes. Ensuring timely, compliant, and safe delivery of isotopes is critical to meeting end-user needs. These companies offer the physical and regulatory infrastructure required to support the complex handling, storage, and transport of radioactive products both nationally and internationally, making them vital to the reliability and reach of Canada's isotope ecosystem.

- Agescan International
- MarShield – Custom Radiation Shielding Products
- South West Exposures
- Brotech Precision CNC
- Stevcon Packaging & Logistics
- Pacer Precision Logistics
- NDT Leak Testing (Vacuum Products Canada)
- Megalab Group

AGESCAN INTERNATIONAL INC. – AGESCAN TUNGSTEN

Headquarters: Richmond Hill, Ontario
Ownership: Canadian-owned
Governance: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.agescantungsten.com
Key Contact: Jack Zhou, Managing Director; jack@agescantungsten.com, (647) 284-3766

Agescan Tungsten specializes in advanced, high-density tungsten products for the medical, nuclear, industrial, and research sectors. The company delivers precision-engineered tungsten alloy and pure tungsten components that meet the requirements of radiation shielding, isotope transport, and medical imaging applications. Its expertise includes the design and fabrication of custom shielding assemblies, containers, and collimators - all produced using advanced machining and quality control processes to ensure compliance with rigorous safety and performance standards. Agescan is expanding capacity through new manufacturing investments.

MARSHIELD – CUSTOM RADIATION SHIELDING PRODUCTS

Headquarters: Burlington, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Medium
Website: www.marshield.com
Key Contact: Walter Silva, Vice President; walter.silva@marsmetal.com, (1-800) 381-5335

MarShield designs and manufactures custom radiation shielding solutions for radiopharmaceutical and isotope sectors. Its products, including lead-lined cabinets, decay drums, and storage containers, support the safe handling, storage, and transport of radioactive materials. In addition to manufacturing, MarShield provides engineering design, regulatory compliance support, and logistics services, ensuring compliance with Canadian and international safety standards. The company holds CSA N299.3 and ISO 9001:2015 certifications and plays an important enabling role in supporting safe and secure isotope operations.

SOUTH WEST EXPOSURES

Headquarters: Toronto, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.swexposures.com
Key Contact: Robert Kamen, President; Robert.kamen@swexposures.com, (416) 930-0607

South West Exposures (SWE) is a provider of custom packaging, distribution, and regulatory support services, specializing in the packaging and global shipment of medical devices and radiopharmaceutical products. This includes solutions for isotopes like Ac-225, Cu-64/67, Ga-68, F-18, Lu-177, Zr-89, and At-211. SWE offers cold chain logistics, custom development, and quality assurance services, supporting radiopharmacy networks, CDMOs, and pharmaceutical companies across markets in Canada, the U.S., and Australia. SWE ensures the secure and compliant delivery of isotopes critical to healthcare and research.

BROTECH PRECISION CNC INC.

Headquarters: Barrie, Ontario
Ownership: Canadian-owned
Governance: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.brotechprecisioncnc.com
Key Contact: info@brotechprecisioncnc.com

Brotech Precision CNC manufactures the highest precision components for nuclear applications using CNC machining technology and leading-edge software. With 25 CNC machines, Brotech supplies small to medium size parts and components to the nuclear industry in Canada. Certified by ISO 9001 and AS 9100, as well as under the Controlled Goods Program, Brotech supplies all sizes of isotope capsules and pencils, and any production quantity in a growing supply partnership. In Canada, Brotech manufactures capsules and end caps which are used in isotope packaging for isotopes like Co-60.

STEVCON PACKAGING & LOGISTICS LTD.

Headquarters: Owen Sound, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Medium
Website: www.stevconpackaging.com
Key Contact: Scott David, Director; sdavid@stevconpackaging.com, (519) 372-2775

Stevcon Packaging & Logistics (Stevcon) is a provider of specialized Type A certified packaging and distribution services. Stevcon operates a dedicated logistics and distribution centre supporting the secure packaging and transport of isotopes and radiopharmaceutical products within Canada and to international markets, including the U.S.

Stevcon partners with certified test laboratories and lead pot suppliers to deliver tailored packaging solutions that meet regulatory and safety requirements for radioactive materials. Stevcon supports the safe movement of isotopes through its expertise in compliant packaging, fulfillment, and delivery services.

PACER PRECISION LOGISTICS

Headquarters: Mississauga, Ontario
Ownership: Canadian-owned, Privately held
Governance Model: Management-led
Legal Structure: Corporation
Company Size: Medium
Website: www.pacerair.com
Key Contact: Giovanna Ippolito, Director of Marketing and Sales Strategist; giovanna@pacerair.com

Pacer Precision Logistics (Pacer) is a global logistics provider specializing in time-critical, end-to-end solutions for the medical isotope and nuclear medicine sector. The company offers temperature-controlled transport, dangerous goods (DG) compliance, and customs clearance services tailored to meet strict regulatory demands. Pacer operates an 85,000 sq. ft. GDP-compliant warehouse with secure, temperature-monitored storage and preconditioning capabilities. Its portfolio of validated packaging solutions supports the transport of sensitive materials across the full supply chain. Through its integrated logistics platform that focuses on precision, quality, and reliability, Pacer helps industry partners maintain secure, timely, and regulatory-aligned delivery of medical isotopes.

NDT LEAK TESTING (VACUUM PRODUCTS CANADA INC.)

Headquarters: Mississauga, Ontario
Ownership: Canadian-owned, Privately held
Legal Structure: Corporation
Company Size: Small
Website: www.ndtleaktesting.com
Key Contact: Jean-François Poncelet, CEO; jf.poncelet@vpcinc.ca, (1-800) 269-6030

Founded in 1985, Vacuum Products Canada established the NDT Leak Testing division to provide specialized non-destructive testing services for the nuclear and isotope sectors. The division plays a key role in isotope packaging and transportation leak testing, ensuring compliance and safety across the supply chain. With a highly trained team holding multiple industry-recognized certifications, NDT Leak Testing delivers procedures, consulting, on-site leak testing, and equipment services that support applications in energy, aerospace, medical, military, and research sectors.

MEGALAB GROUP INC.

Headquarters: Aurora, Ontario
Ownership: Canadian-owned, Privately held
Governance Model: Executive Leadership Team and Board-level oversight.
Legal Structure: Corporation
Company Size: Medium
Website: www.megalabinc.com
Key Contact: Sreyas Dasika; info@megalabinc.com, (905) 752-1925

Megalab Group provides product safety validation, environmental testing, and regulatory compliance, including testing for Type A and Type B isotope packaging and transportation products. As a Canadian Federal CGP and ISO 17025 A2LA Accredited Laboratory (electrical, EMC/EMI, mechanical, environmental) with MegaSim specialized simulation services, and ISTA-certified package testing lab (IATA, TP14850e, UN Regulations), Megalab provides testing and validation assistance services to help companies gain domestic and international market access by enabling compliance for Canada, U.S., E.U., Japan, Korea, Mexico, and other regions.

CHAPTER 4:
Specialized equipment & technology providers

This chapter highlights companies that manufacture or supply the specialized equipment required throughout the isotope lifecycle, including automation systems, precision machinery for isotope production and use, and equipment required in hospitals to enable treatment or diagnostics.

- AtkinsRéalis
- D-Pace
- Mevex
- ATS Industrial Automation
- Promation
- Eclipse Automation
- ACIC Equipment USA
- Mirion Technologies
- Siemens Healthineers

ATKINSRÉALIS

Headquarters: Montreal, Québec
Ownership: Canadian-owned (Part of AtkinsRéalis Group Inc.)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.atkinsrealis.com
Key Contact: Maura McDonald, Vice President, Key Accounts and Stakeholder Management, Nuclear Canada (Candu Energy Inc., an AtkinsRéalis company); Maura.McDonald@atkinsrealis.ca, (519) 353-8633

AtkinsRéalis contributes to the isotope supply chain across various divisions, including Minerals & Metals (M&M), Nuclear, Life Sciences, and Healthcare. Notably, through its subsidiary Candu Energy Inc., AtkinsRéalis is the Original Equipment Manufacturer and technology licensee of CANDU reactors, which are uniquely used to produce isotopes in Canada. Through the development of the new CANDU MONARK reactor, AtkinsRéalis is revolutionizing the way isotopes can be produced leveraging nuclear power, with purpose-built ports for isotope irradiation.

The Nuclear division also provides support for radiochemistry laboratories and hot cells, radiopharma facilities, and nuclear waste management. Another subsidiary, Isotek Systems LLC handles and processes isotopes, primarily for the U.S. Department of Energy. Within M&M, AtkinsRéalis provides facility engineering, procurement, and construction management for raw isotope material processing, including Cobalt and Molybdenum. The Life Sciences division designs and delivers full commercial-scale radiopharmaceutical manufacturing facilities. In its Canadian laboratories, the dominant radionuclides handled include Am-241, Pu-241, Fe-55, Co-60, Nb-95, Zr-95, Tritium, and Deuterium, in addition to processing capabilities for U-233 and Th-229. The Healthcare division designs and delivers nuclear medicine facilities, including the integration, commissioning, and decommissioning of cyclotrons.

AtkinsRéalis operates several Canadian facilities that hold Waste Nuclear Substance Licenses (WNSL), including in Mississauga and Whitby, Ontario. The company's End-to-End professional services serve markets across Canada, the U.S., Europe, Asia, South America, the Middle East, and Australia.

D-PACE INC.

Headquarters: Nelson, British Columbia
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Medium
Website: www.d-pace.com
Key Contact: Richard McElroy, CEO, Richard@d-pace.com

D-Pace supplies products and services to the international commercial accelerator industry, with specialized expertise in ion sources, beam diagnostic devices, beamline systems, and solid target stations for research, industrial, and commercial accelerator applications. The company's technology is an integral part of accelerator operations and cyclotron-based radioisotope production worldwide. Its systems and components are used in facilities that produce isotopes for medical imaging, cancer treatment, and other industrial and research applications.

MEVEX, A STERIS COMPANY

Headquarters: Ottawa, Ontario
Ownership: Foreign-owned (Owned by STERIS Corporation)
Governance Model: Operates as part of the Applied Sterilization Technologies (AST) division of STERIS
Company Size: Medium
Website: www.steris-ast.com
Key Contact: ast_info@steris.com

Mevex, a STERIS company, provides integrated electron beam and X-ray accelerators, conveyor systems, process management, automation, and radiation protection systems. This supports applications across isotope production, medical device sterilization, phytosanitary treatment, cannabis decontamination, and materials processing. Mevex equipment provides high-energy linear accelerators for medical isotope development, including a 35 MeV Mevex system in Saskatoon for photonuclear isotope production, and a 40 MeV upgrade at Argonne National Laboratory in the U.S. for isotope R&D. Mevex also contributes to international efforts through its work with the IAEA on improving isotope production and distribution methods.

ATS INDUSTRIAL AUTOMATION

Headquarters: Cambridge, Ontario
Ownership: Publicly Traded, Canadian-Owned (Subsidiary of ATS Corporation)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.atsautomation.com
Key Contact: Majid Afana, Global Director Nuclear Business Development & Sales; Mafana@atsautomation.com, (519) 242-6495

ATS Industrial Automation (ATS) provides advanced automation solutions and equipment to the nuclear medicine and isotope sectors, specializing in equipment for processing, purification, and distribution. Through its acquisition of Comecer in 2019, ATS strengthened its design, engineering, and servicing capabilities for nuclear medicine infrastructure, with Comecer recognized as a leader in hot cell isolators and aseptic containment systems. With facilities in Canada and global export capabilities, ATS enables enhanced safety, precision, and regulatory compliance. Its expertise spans processing systems, cold-chain logistics support, and technical consulting.

PROMATION

Headquarters: Oakville, Ontario
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Medium
Website: www.promation.com
Key Contact: Alex Sakuta, Director, Isotopes and Radiopharma; Sakuta.a@promation.com, (416) 230-1618

Promation is an engineering and manufacturing company specializing in custom equipment solutions for the radiopharmaceutical and isotope sectors. Promation designs and builds shielded isolator systems, automation systems, hot cells, and tooling to support the safe production and handling of medical isotopes. Its Oakville-based facility also produces workforce training materials to ensure safe system operation. Promation plays a growing role in strengthening Canada's isotope supply chain through innovation, equipment development, and technical services.

ECLIPSE AUTOMATION INC.

Headquarters: Cambridge, Ontario
Ownership: Canadian-owned, Privately held
Legal Structure: Corporation
Company Size: Large
Website: www.eclipseautomation.com
Key Contact: Vuk Dulanovic, Sales Account Manager, Nuclear; vuk.dulanovic@eclipseautomation.com, (519) 240-5300

Eclipse Automation (Eclipse) delivers effective and innovative nuclear-engineered automation solutions. With over 450 Canadian employees and more than 20 years of industry experience, Eclipse works to design and build safer, more sustainable, optimized automation systems. Eclipse's systems support reactor life extension, decommissioning, waste management, maintenance and inspection, and mock-up testing and commissioning. Eclipse's automation systems have been used for custom manufacturing training simulators, 3D modelling, plant layout development and concept engineering, proof of concept development, and more. In life sciences, Eclipse has expertise in medical device assembly automation, certified with GMP and ISO 9001 expertise. For example, Eclipse is leveraging its solutions to manufacture large Hot Cells for CNL at the Advanced Nuclear Materials Research Centre (ANMRC).

ACIC EQUIPMENT USA INC.

Headquarters: Brantford, Ontario
Ownership: Canadian-owned
Governance Model: President/Founder-led
Legal Structure: Corporation
Company Size: Small
Website: www.acic.com
Key Contact: equipment@acic.com, (519) 751-3668

ACIC Pharmaceutical Machinery, part of ACIC Equipment USA (ACIC) provides processing equipment and automation solutions, specializing in design and supply of isolators, hot cells, sterilization systems, filling, and packaging equipment that support the safe handling, formulation, and delivery of medical isotopes. With a growing portfolio of clients in Canada and internationally, the organization offers custom development, technical consulting, and systems integration services for isotope production facilities. ACIC provides specialized technologies to support radiopharmaceutical processing and regulatory compliance.

MIRION TECHNOLOGIES

Headquarters: Concord, Ontario
Ownership: Foreign-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.mirion.com
Key Contact: Angie D'Agostini, President & General Manager; Concord.Sales@mirion.com, (905) 695-8498

Mirion Technologies provides radiation detection, monitoring, and calibration solutions that enable safety and regulatory compliance across the isotope, radiopharmaceutical, and nuclear sectors. Through its Concord and Cambridge facilities, Mirion supplies dose calibrators, gamma spectroscopy systems, environmental monitoring, and worker protection technologies used in isotope production and medical applications. The company exports equipment and services globally, including to the U.S., Europe, and Asia, and participates in strategic initiatives such as the FNIH Precision Dosimetry Imaging Biomarker Project.

SIEMENS HEALTHINEERS

Headquarters: Forchheim, Germany
Ownership: Foreign-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.siemens-healthineers.com
Key Contact: (905) 465-8000

Siemens Healthineers is a global leader in healthcare technology and imaging, with a strong presence in nuclear medicine and isotope applications. The company develops advanced medical imaging systems, radiopharmaceutical technologies, and diagnostic solutions that rely on reliable isotope supply chains. In Canada, Siemens Healthineers plays a critical role in supporting hospitals and research institutions through PET/CT and SPECT systems, radiochemistry equipment, and offers consulting services within the theranostics space to support implementation and optimization. Its work supports both patient access to cutting-edge therapies and the broader Canadian isotope ecosystem by advancing diagnostic imaging and therapeutic readiness.

CHAPTER 5:
Industry Coordination, Project Services, and Consulting

Organizations in this chapter provide the specialized services, expertise, and project coordination that sustain Canada's isotope production and research initiatives. This includes engineering and quality assurance and control firms, safety service specialists, and legal and strategic advisors that guide organizations on compliance, governance, and long-term planning within the isotope ecosystem.

PART 1: PROJECT SERVICES AND COORDINATION

- Centre for Probe Development and Commercialization
- isoSolutions
- Rayatom Technologies
- SAGE Engineering Services
- E.S. Fox
- IPS-Integrated Project Services
- Westinghouse Electric Canada
- Minogi Corp
- Conexus Nuclear

PART 2: CONSULTING & ADVISORY SERVICES

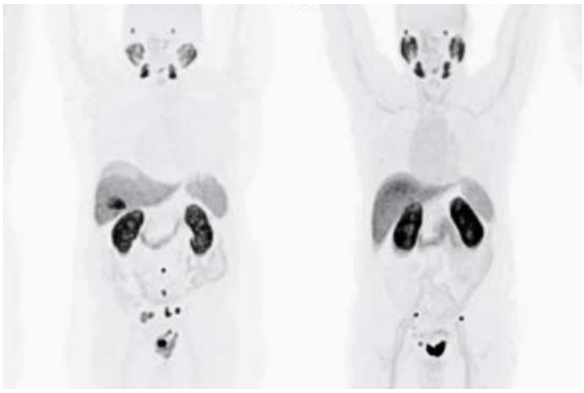
- Big Red Oak
- Pulse Law
- Gowling WLG
- Calian
- Nuclear Promise X Innovations
- Nuclear Innovation Institute
- Accel-Link
- ANRIC Enterprises
- Bucephalus Consulting
- D2B Consulting
- Isotope Insights
- Power Generation Integrated
- Projects Pivot

CENTRE FOR PROBE DEVELOPMENT AND COMMERCIALIZATION

Headquarters: Hamilton, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Not-for-Profit
Company Size: Small
Website: www.cpdc.ca
Key Contact: info@cpdc.ca

Founded in 2008 at McMaster University as a Centre of Excellence for Commercialization and Research, the Centre for Probe Development and Commercialization (CPDC) is a Not-for-Profit corporation that specializes in the development, clinical translation, and commercialization of innovative diagnostics and therapeutics. Over the past 17 years, CPDC has successfully incubated and spun out four Canadian commercial entities: Fusion Pharmaceuticals, AtomVie Global Radiopharma, ARTMS, and CanProbe. CPDC and its partners have accelerated the availability of radiopharmaceuticals, supported and conducted over 60 clinical trials, including Phase 3 studies across Canada, North America, and Europe, and have delivered over 65,000 clinical doses to Canadian patients.

- **2008** CPDC founded
- **2011** CPDC and UHN created CanProbe
- **2013** CPDC, TRIUMF, Lawson, and BC Cancer created ARTMS
- **2015** CPDC created Fusion Pharmaceuticals
- **2017** CPDC spun out Fusion Pharmaceuticals
- **2019** CPDC In-Licensed PSMA-1007 from ABX GmbH
- **2021** CPDC created AtomVie Global Radiopharma
- **2022** CPDC spun out AtomVie Global Radiopharma
- **2023** CPDC and TRIUMF Innovations secured $35M in government funding for Canadian Medical Isotope Ecosystem
- **2024** ARTMS acquired by Telix for up to $82M US
- **2024** Fusion acquired by AstraZeneca for up to $2.4B US



ISOSOLUTIONS

Headquarters: Vancouver, British Columbia
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.isosolutions.com
Key Contact: Gabriel Freitas, Director of Operations; logistics@isosolutions.com, info@isosolutions.com, (604) 669-7277

isoSolutions is a leader in global distribution, marketing, and sales of nuclear medicine products. Its expertise spans sourcing, sales, and logistics for a wide catalog of radiochemicals, radiopharmaceuticals, stable isotopes, sealed sources, quality control instruments, and radiation shielding. isoSolutions supports both clinical and research applications, with a strategic focus on Canada, Mexico, the U.S. and China, as well as emerging global markets.

While marketing and distribution remain the company's core strength, isoSolutions is also engaged in product development. It has invested in the R&D and commercialization of novel solid target systems for cyclotron-based isotope production, including a beamline isolation module, products for which it holds pending patent claims in several jurisdictions. It also holds a Drug Master File for the iThemba Ge-68/Ga-68 generator with Health Canada and supports regulatory compliance across its supply network. IsoSolutions offers internship opportunities for students in nuclear medicine and technology.

Current isotope portfolio:

- **Stable Isotopes:** O-18 water, B-10, Ca-46, Cd-110, DZO (depleted ZnO), Gd-160, He-3, Mo-92, Mo-100, Ni-58, Ni-64, Rb-87, Re-185, Re-187, Si-29, Si-30, Te-124, Tl-203, W-182, W -183, W-184, Yb-176, Zr-90, Zn-64, Zn-68
- **Isotopes for Diagnosis/ Therapy:** Ac-225, C-14, Cu-64, Cu-67, Ga-67, I-124, I-125, In-111, I-131, Lu-177, Mo-99, Ra-223, Ra-226, Sr-89, Sr-90, Tb-161, Th-228, Tl-201, Y-90, Zr-89
- **Generator Isotopes:** Tc-99m, Ga-68

RAYATOM TECHNOLOGIES INC.

Headquarters: Ottawa, Ontario
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Small
Website: www.rayatom.com
Key Contact: Mohammed Hammad, Managing Partner; mhammad@rayatom.com

Rayatom Technologies (Rayatom) is a SME specializing in the end-to-end supply and distribution of PET and radiotheranostics isotopes, radiochemistry equipment, consumables, precursors, peptides, and related ancillaries to radiopharmacies in Canada and worldwide. Rayatom partners with leading global manufacturers to deliver high-quality products and tailored solutions that support research, production, and clinical applications. Rayatom helps Canadian isotope manufacturers commercialize their products by connecting them with end users through a global distribution network and providing complete supply chain integration.

SAGE ENGINEERING SERVICES LTD.

Headquarters: Oakville, Ontario
Ownership: Canadian-owned
Legal Structure: Private Company Limited
Company Size: Small
Website: www.sageeng.com
Key Contact: Ryan Basdeo and Golbahar Rafinejad; info@sageeng.com, (905) 469-8513

SAGE Engineering Services (SAGE) specializes in engineering, validation, and project delivery for North American and international clients. With the relevant Certificate of Authorization as Professional Engineers of Ontario, SAGE provides Engineering validation and project management services. This includes GMP and regulatory compliance assessments, workflow development, and vendor management , facility design, and equipment selection to support manufacturing and development fo isotopes. SAGE further enables design, procurement, and qualification for equipment used in the radiopharmaceuticla industry, like hot cells, shielded isolators, radiation monitoring equipment, dispensers, automated synthesis units, and more.

E.S. FOX LTD.

Headquarters: Niagara Falls, Ontario
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Large
Website: www.esfox.com
Key Contact: Frank Pepers, Vice President of Business Development; frank.pepers@esfox.com, (289) 696-5407

E.S. Fox is a multi-trade fabricator and constructor providing specialized support services to the nuclear and isotope sectors. With expertise in engineering, fabrication, construction, technical services, and systems integration, the company supports major infrastructure projects and facility expansions relevant to isotope production and processing.

IPS-INTEGRATED PROJECT SERVICES, ULC

Headquarters: Toronto, Ontario
Ownership: Foreign-owned (Subsidiary of IPS-Integrated Project Services GmbH)
Governance Model: Board of Directors
Legal Structure: Unlimited Liability Company
Company Size: Small
Website: www.ipsdb.com
Key Contact: Paula Casalino, Regional VP; pcasalino@ipsdb.com, (416) 388-4571

As a provider of integrated Engineering, Procurement, Construction, Management, and Validation (EPCMV) solutions, IPS-Integrated Project Services (IPS) supports clients across the entire isotope lifecycle, including R&D, manufacturing, packaging, and warehouse facilities. With experience helping clients work with regulatory bodies like Health Canada and other international organizations, IPS can ensure facilities and projects meet all current cGMP standards and regulatory requirements.

WESTINGHOUSE ELECTRIC CANADA

Headquarters: Peterborough, Ontario
Ownership: Canadian-owned (Owned by Brookfield Renewable Partners and Cameco Corporation)
Legal Structure: Corporation
Company Size: Medium
Website: www.westinghousenuclear.com
Key Contact: Cameron Nevay, Account Executive; cameron.nevay@westinghouse.com (705) 313-2499

Westinghouse Electric Canada is a global nuclear technology and services provider supporting the isotope ecosystem through systems design, engineering, and manufacturing. Westinghouse offers technical consulting, custom systems integration, and equipment design for isotope production infrastructure. The company engages in feasibility studies and pre-commercial development related to isotope production to explore opportunities for supply chain growth.

MINOGI CORP

Headquarters: Port Perry, Ontario
Ownership: Mississaugas of Scugog Island First Nation (MSIFN)
Governance Model: Board of Directors consisting of MSIFN Chief and Council
Legal Structure: Corporation
Company Size: Small
Website: www.minogi.ca
Key Contact: Don Richardson, CEO; (905) 985-3337 Ext. 700

Minogi Corp is dedicated to advancing First Nations participation and economic development in the Canadian isotope ecosystem. Minogi works to bridge the capabilities of First Nations communities with opportunities across the isotope supply chain, in areas such as research, support services, logistics, and enabling technologies. With a vision rooted in innovation and reconciliation, Minogi advocates for dialogue and policy approaches that promote inclusion to expand First Nations representation within Canada's isotope economy.

CONEXUS NUCLEAR INC.

Headquarters: Toronto, Ontario
Ownership: Canadian-registered
Governance Model: Board of Directors
Legal Structure: Not-for-Profit
Company Size: Medium
Website: www.conexusnuclear.org
Key Contact: Sarah Charuk, Director of Communications; sarah.charuk@conexusnuclear.org, general@conexusnuclear.org, (437) 290-8353

Conexus Nuclear (Conexus) provides specialized research and support services to the nuclear and isotope sectors in support of CANDU techologies. The organization focuses on enabling the safe and efficient operation of nuclear technologies by acting a strategic advisor with expertise in the management of complex, multi-member projects, in safety, environment, and regulatory affairs, and in the procurement of goods across internationl jurisdiction.

BIG RED OAK INC.

Headquarters: Toronto, Ontario
Ownership: Canadian-owned, Privately held
Legal Structure: Corporation
Website: www.bigredoak.com
Key Contact: Tyrell Lisson, Managing Director; tyrell@bigredoak.com, hello@bigredoak.com, (905) 975-4646

Big Red Oak is a communications consultancy specializing in marketing and strategic support for organizations within the nuclear sectors. Big Red Oak offers tailored communications services that help clients advance their visibility, stakeholder engagement, and sector influence. Big Red Oak provides branding, messaging, outreach strategy, and digital communications solutions to many clients within the isotope ecosystem.

PULSE LAW

Headquarters: Waterloo and Toronto, Ontario
Ownership: Canadian-owned
Legal Structure: Limited Liability Partnership
Company Size: Small
Website: www.pulselaw.com
Key Contact: Josh Rosen, Partner; jrosen@pulselaw.com, (647) 558-0417

Pulse Law is a boutique corporate law firm with deep experience advising on corporate transactions with global reach. Pulse supports clients ranging from early-stage ventures to established enterprises and investors on equity and debt financings, mergers and acquisitions, corporate structuring, strategic transactions, contract negotiations, and day-to-day legal matters. Pulse's modern, tech-enabled practice is built for efficiency and responsiveness. Pulse Law provides practical, personalized counsel that helps isotope companies navigate growth milestones, secure investment, and position themselves for long-term success.

GOWLING WLG LLP

Headquarters: Toronto, Ontario
Ownership: Canadian-owned
Legal Structure: Limited Liability Partnership
Company Size: Large
Website: www.gowlingwlg.com/en
Key Contact: Ahab Abdel-Aziz, Partner & Global Director, Nuclear Power Generation; ahab.abdelaziz@gowlingwlg.com, (416) 814-5608

Gowling WLG is a leading law firm providing specialized legal and regulatory services. Gowling WLG advises clients on licensing, compliance, project risk assessment, commercial contracts, tax and environmental issues, and negotiation support. It also supports clients with mergers and acquisitions, joint ventures, and financing arrangements critical to the development and advancement of isotope technologies.

CALIAN LTD.

Headquarters: Kanata, Ontario
Ownership: Canadian-owned, Publicly Traded (Owned by Calian Group)
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.calian.com
Key Contact: Hani Al Anid, VP Nuclear; hani.alanid@calian.com, (613) 599-8600

Through its Nuclear Division, Calian offers specialized services including preparation of licence applications, regulatory compliance, safety analysis, environmental risk analysis, isotope production feasibility studies, safety control area program audits, market research and quality assurance support. Calian has previously played a key role in conducting feasibility studies for Lu-177 production at Bruce Power and for assessing radioisotope production using the ARC-100 SMR for NB Power, shaping new commercial opportunities in isotope generation. Calian Nuclear has invested in a research and development facility in Mississauga that focuses on the application of robotics and automation to nuclear industry challenges. This facility has the potential to further support isotope-related infrastructure and equipment, supporting innovation and systems integration. The Calian Nuclear Quality Assurance Program (QAP) is certified against ISO 9001:2015, and compliant with CSA N286-12, CSA N286.7-16, and CSA N299.1-16.

NUCLEAR PROMISE X INNOVATIONS

Headquarters: Kincardine, Ontario
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Medium
Website: www.npxinnovation.ca
Key Contact: Margaret McBeath, Director, Company Strategy; margaret.mcbeth@npxinnovation.ca

Nuclear Promise X Innovations (NPX) is an innovation firm dedicated to modernizing nuclear and isotope applications to power a sustainable future. With deep industry roots and a solutions-driven mindset, NPX brings a new approach to consulting and engineering project delivery to emphasize agility, creativity, and implementation speed in a sector facing tight timelines, rising expectations, and aging infrastructure.

NUCLEAR INNOVATION INSTITUTE

Headquarters: Port Elgin, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Not-for-Profit
Company Size: Small
Website: www.nuclearinnovationinstitute.ca
Key Contact: info@nii.ca

The Nuclear Innovation Institute (NII) is a member-based organization with a unique role in driving an innovative nuclear voice, skill development, and industry advancement that celebrates nuclear as an integral part of a clean, healthy future. The NII acts as a research body and an advocate for the broader region, the Clean Energy Frontier, leading the way in demonstrating the fundamental connection between nuclear energy and a healthy community. Importantly, the NII is the driver behind the Southwestern Ontario Isotope Coalition (SOIC), a regional organization that unites 34 partner organizations across the nuclear industry, academic institutions, healthcare partners, and municipal leaders.

ACCEL-LINK LTD.

Headquarters: Nelson, British Columbia
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.accel-link.ca
Key Contact: Dr. Morgan Dehnel, President; morgan@accel-link.ca, (250) 509-1288

Accel-Link is a specialized consulting and technology firm focused on developing the next generation of ion sources for increased H-/D- and alpha beams injected into cyclotrons or accelerators for radioisotope production. The company provides technical expertise and strategic advisory services. With contributions to the Selkirk Ion-source Research Centre (SIRC) and partnerships with TRIUMF, D-Pace, and academic institutions across Western Canada, Accel-Link plays a unique role in bridging R&D innovation with commercial and clinical readiness.

ANRIC ENTERPRISES INC.

Headquarters: Etobicoke, Ontario
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Small
Website: www.anric.com
Key Contact: Richard Barnes, President; info@anric.com, (416) 727-3653

ANRIC Enterprises Inc. (ANRIC) is a global professional engineering consulting firm that specializes in the training and application of nuclear codes and standards. The firm provides support services that enable organizations across the isotope and nuclear sectors to strengthen compliance, quality assurance, and operational reliability. With expertise built on decades of industry leadership, ANRIC supports safety culture and regulatory readiness.

BUCEPHALUS INC.

Headquarters: Wainfleet, Ontario
Ownership: Canadian-owned, Privately held
Legal Structure: Single Owner Operator
Company Size: Small
Key Contact: Neil Alexander, President; alexander.neil51@gmail.com

Bucephalus is a consulting firm that provides strategic advisory services in isotope production and commercialization, small modular reactor deployment, decommissioning and waste management, and nuclear supply chain development. Bucephalus supports clients through market studies, business planning, supply chain analysis, and strategy development, including assistance with proposal writing and funding applications.

D2B CONSULTING INC.

Headquarters: Baltimore, Ontario
Ownership: Canadian-owned
Legal Structure: Corporation
Company Size: Small
Website: www.db2consulting.ca
Key Contact: Doug Burton, President; doug@db2consulting.ca, (289) 251-1105

DB2 Consulting (DB2) offers specialized business development services with expertise in domestic and international isotope business development. DB2 offers advisory supports for isotope market development and strategy, which helps clients identify commercial opportunities, build partnerships, and advance market access strategies.

ISOTOPE INSIGHTS

Headquarters: Hamilton, Ontario
Ownership: Canadian-owned, Privately held
Company Size: Small
Key Contact: Andrea Armstrong, Founder & Chief Consultant; Isotope.Insights@gmail.com

Isotope Insights provides consulting services at the intersection of science, strategy, and policy in the medical isotope ecosystem. Drawing on more than two decades of sector expertise and leveraging its technical fluency, Isotope Insights provides consulting services for science and strategy with Canada's isotope ecosystem, medical isotope production and processing, and emerging trends in the global supply chain.

POWER GENERATION INTEGRATED

Headquarters: Toronto, Ontario
Ownership: Canadian-owned, Privately held
Legal Structure: Corporation
Company Size: Small
Website: www.powergenerationintegrated.com
Key Contact: Vinod Chugh, Founder & President; vinod.chugh@pgicl.ca, (647) 575-9349

Power Generation Integrated (PGI) is an engineering and strategic advisory firm that provides tailored solutions in early-stage feasibility, technical integration, regulatory compliance, and investment due diligence, particularly in the context of complex radiopharmaceutical and reactor-related infrastructure projects. Its services extend to strategic sourcing, cost modeling, and client-side engineering support, and its value stems from expertise in navigating regulatory landscapes (CNSC, GMP), advising on lifecycle economics, and accelerating time-to-market for innovative therapies and technologies. PGI has supported projects in Canada, the U.S. and U.K.

PROJECTS PIVOT INC.

Headquarters: Hamilton, Ontario
Ownership: Canadian-owned
Governance Model: Single Director
Legal Structure: Corporation
Company Size: Small
Website: www.projectspivot.com
Key Contact: Barbara Kephart; barbara.kephart@projectspivot.com, (705) 348-0884

Projects Pivot provides project management and specialized supports, including strategic project portfolio consulting, stakeholder coordination, regulatory alignment, and systems integration. Projects Pivot delivers practical and effective project management solutions and helps organizations identify internal talent for project management roles, while providing training and mentoring to develop skills. Projects Pivot also offers fractional project professionals on a project-by-project basis.

CHAPTER 6:
Training, Advocacy, and Organizing for the Future

The organizations in this chapter are actively working to plan for the future of the isotope sector. This includes the academic and training institutions involved in workforce development and research, as well as advocacy groups and professional associations that represent stakeholders, engage policymakers, and govern on behalf of the collective interests of Canada's isotope sector.

PART 1: TRAINING AND RESEARCH INSTITUTIONS

- Georgian College of Applied Arts and Technology
- University of New Brunswick – The Centre for Nuclear Energy Reseach
- Western University
- The Michener Institute of Education
- Centre for Addiction and Mental Health Brain Health Imaging Centre

PART 2: ADVOCACY AND ORGANIZING

- Nuclear Waste Management Organization
- Saugeen Ojibway Nation
- Corporation of the County of Bruce
- Canadian Nuclear Association
- Canadian Nuclear Society
- Canadian Association of Nuclear Medicine
- Canadian Association of Medical Radiation Technologists
- MorePETs Coalition
- North American Young Generation in Nuclear
- Women in Nuclear Canada
- Canadian Cancer Society
- Canadian Union of Skilled Workers
- Society of United Professionals

GEORGIAN COLLEGE OF APPLIED ARTS AND TECHNOLOGY

Headquarters: Barrie, Ontario
Ownership: Public Institution
Governance Model: Board of Governors
Legal Structure: Academic Institution
Company Size: Medium
Website: www.georgiancollege.ca
Key Contact: Dr. Dave Shorey,
Executive Director (Owen Sound Campus);
dave.shorey@georgiancollege.ca , (548) 877-0127

With campuses across Central and Southwestern Ontario, and advanced facilities like the Centre of Industrial Simulation and Prototyping, Power Engineering Technology simulation and R&I manufacturing labs, and MLITSD-approved apprenticeship training programs/centres, Georgian College prepares graduates with the skills needed for the isotope and nuclear sectors. Georgian's programs directly contribute to the isotope workforce, including the launch of the Project Controls & Cost Engineering micro-certificate, and a revised power engineering technology curriculum that includes nuclear-focused courses critical for the deployment, harvesting, and processing of radioisotope targets in commercial reactors. Georgian's healthcare programs like the Bachelor of Science in Nursing support clinical application of nuclear medicine.

Georgian collaborates with industry leaders like Bruce Power, Kinectrics, OPG, BWXT, OCNI, the NII, the CNIC, the CNA, and the SOIC to co-design and tailor programs across engineering technology, skilled trades, advanced manufacturing, and health care. Georgian also advances applied research, capstone projects, and commercialization support, helping companies solve real-world challenges and adopt new technologies.

UNIVERSITY OF NEW BRUNSWICK – THE CENTRE FOR NUCLEAR ENERGY RESEARCH

Headquarters: Fredericton, New Brunswick
Ownership: Public institution
Governance Model: Board of Directors
Legal Structure: Academic Institution
Company Size: Small
Website: www.unb.ca/research/cner
Key Contact: cner@unb.ca

The Centre for Nuclear Energy Research (CNER) at the University of New Brunswick (UNB) is an academic hub advancing nuclear R&D with ties to the isotope sector. The CNER has eight high-temperature, high-pressure research test loops dedicated to PWR, BWP, 2-phase, and supercritical reactor types. The CNER also has research labs and facilities for modelling for computational fluid dynamics, thermal hydraulics, neutronics, and more, and provides unique infrastructure for research in isotope production and reactor system performance. In 2025, UNB invested $5 million to open the Advanced Nuclear Reactors Laboratory, expanding its isotope R&D capacity. CNER also maintains research agreements with CNL and UNENE members, and further strengthens its role in training the next generation of experts through graduate research opportunities that link students with industry.

WESTERN UNIVERSITY

Headquarters: London, Ontario
Ownership: Public Institution
Governance Model: Board of Governors
Legal Structure: Academic Institution
Company Size: Medium
Website: www.uwo.ca
Key Contact: Kate Placide, Partnership Development Manager; kplacide@uwo.ca, (519) 661-2111

Western University is a leading Canadian research institution advancing innovation in medical imaging, radiopharmaceutical development, and isotope science. Through specialized facilities including the Robarts Research Institute, Biomedical Imaging Research Centre, Laboratory for Stable Isotope Science, and Interface Science Western (home to the Tandetron Particle Accelerator Facility), Western supports research and design of radioisotopes and their applications. The university is engaged in cross-disciplinary research spanning oncology, neurology, cardiology, and infectious disease.

Western works closely with London Health Sciences Centre, Lawson Health Research Institute and St. Joseph's Health Care London, leveraging the Nordal Cyclotron & PET Radiochemistry Facility located at St. Joseph's to produce short-lived PET isotopes and advance research. As part of its commitment to training, Western recently launched a new Medical Imaging Technologist (MIT) program in collaboration with its hospital partners. With a student population of over 42,000 and specialized training programs in Medical Biophysics, Biomedical Engineering, Chemistry, and Medical Sciences, Western is vital to isotope workforce development.

THE MICHENER INSTITUTE OF EDUCATION

Headquarters: Toronto, Ontario
Ownership: Public Institution
Governance Model: Board of Governors/UHN Board of Education Committee
Legal Structure: Academic Institution
Company Size: Medium
Website: www.michener.ca
Key Contact: (416) 596-3101

The Michener Institute of Education (Michener) at the University Health Network is Canada's only academic institution devoted to applied health sciences. Michener programs combine academic instruction with hands-on training in radiopharmacy labs and clinical settings. Through joint programs with the University of Toronto, graduates of the Nuclear Medicine & Molecular Imaging steam of the Medical Radiation Sciences program are conferred with a Bachelor of Science in Medical Radiation Sciences degree from the University of Toronto and an Advanced Diploma in Nuclear Medicine and Molecular Imaging Technology from the Michener Institute. Students engage directly with PET/CT and SPECT/CT imaging modalities and learn radiopharmaceutical handling. Michener also supports upskilling and professional development through continuing education courses such as Nuclear Theranostics.

camh | Brain Health Imaging Centre

CENTRE FOR ADDICTION AND MENTAL HEALTH BRAIN HEALTH IMAGING CENTRE

Headquarters: Toronto, Ontario
Ownership: Public Healthcare Institution
Governance Model: Board of Trustees
Company Size: Medium
Website: www.camh.ca
Key Contact: Alvina Ng, PET and PET-CT Studies; Alvina.Ng@camh.ca
Armando Gardio, Radiochemistry Production & Research; Armando.Garcia@camh.ca

The Centre for Addiction and Mental Health (CAMH) Brain Health Imaging Centre is Canada's largest mental health teaching hospital and a leader in brain imaging and molecular radiochemistry research. The facility operates two cyclotrons, and GMP-compliant associated facilities including twelve hot cells and dedicated radiochemistry and quality control laboratories. CAMH focuses on the production and application of short-lived PET isotopes for neuroimaging research and clinical trials.

CAMH supplies radiopharmaceuticals for clinical research across Ontario and Québec, collaborating with partners including Lantheus, Xingimaging, and the Michael J. Fox Foundation. Recent investments in infrastructure and synthesis capacity position CAMH as a key contributor to advancing brain health imaging and radiopharmaceutical development.

Current isotope portfolio:

- F-18
- C-11 and C-14
- Cs-137
- Ge-38
- H-3 (tritium)
- I-125 and I-129
- P-32 and P-33
- Na-22
- S-35

NUCLEAR WASTE MANAGEMENT ORGANIZATION

Headquarters: Toronto, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors and Advisory Council
Legal Structure: Not-for-Profit
Company Size: Large
Website: www.nwmo.ca
Key Contact: Brendan McClughan, Senior Advisor External Relations; bmcclughan@nwmo.ca

The Nuclear Waste Management Organization (NWMO) is Canada's national steward for the safe management of radioactive waste. Established in 2002, the NWMO is leading the development of a deep geological repository to securely contain used nuclear fuel, one of the most significant environmental protection projects in Canada's history. Its work is built on world-class science, engineering, and sustained engagement with communities to ensure safety and trust for generations to come.

In 2023, the NWMO's mandate expanded to include the management of intermediate- and non-fuel high-level radioactive waste, which includes waste from the isotope supply chain. By delivering permanent, science-based solutions, the NWMO is protecting people and the environment, enabling medical innovation, and reinforcing Canada's global leadership in responsible nuclear stewardship.

SAUGEEN OJIBWAY NATION

Headquarters: Neyaashiinigmiing, Ontario (Nawash) and Southampton, Ontario (Saugeen)
Ownership: Chippewas of Nawash Unceded First Nation & Chippewas of Saugeen First Nation
Governance Model: Joint Chiefs and Band Councils
Website: www.nawash.ca, www.saugeenfirstnation.com, www.saugeenojibwaynation.ca
Key Contact: Environment Office Manager; manager@saugeenojibwaynation.ca

The Saugeen Ojibway Nation (SON) is an Indigenous nation formed by the union of the Chippewas of Nawash and the Saugeen First Nations. Collectively, led by the Environment Office, the organization seeks to provide expertise on matters that affects the rights and interestes of the SON. The SON is a leading partner in the Gamzook'aamin aakoziwin initiative. The initiative, which means "We are teaming up to fight the sickness," strives to create new econominc opportunities within the SON Territory by producing medical isotopes in the reactors at Bruce Power, which is located on the traditional territory of SON.

CORPORATION OF THE COUNTY OF BRUCE

Headquarters: Walkerton, Ontario
Ownership: Public Institution - Municipal Government
Governance Model: Municipal Councillors
Legal Structure: Corporation
Company Size: Small
Website: www.brucecounty.on.ca
Key Contact: Jeff Loney, Manager, Economic Development; jloney@brucecounty.on.ca, (226) 909-3306

The Corporation of the County of Bruce enables economic and partnership development, business attraction, and investment support. As the regional government and home to the Bruce Power nuclear facility, the County works to advance local isotope supply chain development, workforce development, and innovation for greater success in local and global nuclear markets.

CANADIAN NUCLEAR ASSOCIATION

Headquarters: Ottawa, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Not-for-Profit
Company Size: Small
Website: www.cna.ca
Key Contact: info@cna.ca, (613) 237-4262

The Canadian Nuclear Association (CNA) represents utilities, manufacturers, suppliers, research organizations, and service providers across the nuclear sector. CNA advances the role of nuclear technologies in energy, health, and innovation, with isotopes a key part of its advocacy mandate. CNA leads workforce-focused initiatives, including the 2024 Canadian Nuclear Jobs Study and a two-phase project that considers workforce needs under various nuclear buildout scenarios, with policy recommendations anticipated in 2025. CNA collaborates with the CNIC through a formal partnership to coordinate policy recommendations and share information to jointly advance advocacy initiatives.

CANADIAN NUCLEAR SOCIETY

Headquarters: Toronto, Ontario
Ownership: Canadian-owned
Governance Model: Elected Council
Legal Structure: Not-for-Profit
Company Size: Small
Website: http://www.cns-snc.ca
Key Contact: cns_office@cns-snc.ca

Established in 1979 and incorporated independently in 1998, the Canadian Nuclear Society (CNS) is "the technical society of the Canadian Nuclear Association." The CNS promotes the exchange of information on all aspects of nuclear science and technology and its applications. This includes nuclear power, fuel production, uranium mining and refining, management of radioactive wastes, and, through its Science and Technology of Radioisotopes (STORI) division, it plays a role in exchanging information about the production of radioisotopes. For many years, the CNS also has run a successful "Geiger Counters for Schools" project and delivered many "Nuclear for Everyone" courses to raise public awareness of the benefits of nuclear technology including but not exclusively Zero-carbon power generation.

CANADIAN ASSOCIATION OF NUCLEAR MEDICINE

Headquarters: Montreal, Québec
Ownership: Canadian-owned
Governance Model: Board of Directors and Executive Committee
Legal Structure: Not-for-Profit
Company Size: Small
Website: www.canm-acmn.ca
Key Contact: Nicolas Rondeau Lapierre, General Manager; nlapierre@canm-acmn.ca, (514) 927-8496

The Canadian Association of Nuclear Medicine (CANM) is the professional society representing nuclear medicine physicians, scientists, technologists, and stakeholders across Canada. With a mandate to advance nuclear medicine and radiopharmaceutical sciences, CANM leads education, knowledge exchange, and advocacy within the isotope sector. Through partnerships with international sister societies such as Society of Nuclear Medicine and Molecular Imaging (SNMMI), European Association of Nuclear Medicine (EANM), and Latin American Association of Societies of Biology and Nuclear Medicine (ALASBIMN), and its annual CANM Scientific Conference, the association fosters global professional excellence.

CANADIAN ASSOCIATION OF MEDICAL RADIATION TECHNOLOGISTS

Headquarters: Ottawa, Ontario
Ownership: Canadian-owned
Governance Model: Board of Directors
Legal Structure: Not-for-Profit
Company Size: Medium
Website: www.camrt.ca
Key Contact: Christopher Topham, Director of Advocacy and Communications; ctopham@camrt.ca and communications@camrt.ca, (613) 234-0012 Ext. 230

The Canadian Association of Medical Radiation Technologists (CAMRT) is the national professional association representing radiological, nuclear medicine, magnetic resonance, and radiation therapy technologists. As the voice of the profession, CAMRT advocates for policy development, advances education, and supports the regulatory and quality framework that underpins the delivery of radiopharmaceutical-based care. CAMRT strengthens the Canadian MRT workforce through professional development programs, post-graduate certifications, and workforce initiatives, and also supports the integration of internationally educated MRTs. Through collaboration with Health Canada, the Canadian Association of Nuclear Medicine, and the Canadian Association of Radiologists, CAMRT ensures the availability of highly skilled MRT professionals.

MORE PETS COALITION

Headquarters: Toronto, Ontario
Ownership: Canadian-owned
Legal Structure: Not-for-Profit organization
Company Size: Small
Website: www.morepets.ca
Key Contact: Victoria Sewell, Manager; contact@morepets.ca, (416) 709-9217

The More PETs Coalition aims to improve access to PET imaging across Ontario and beyond. Representing a network of radiopharmaceutical providers, imaging companies, nuclear medicine physicians, and patient advocacy groups, the coalition advocates for policy change, investment, and public awareness to expand the use of PET scans in clinical care.

NORTH AMERICAN YOUNG GENERATION IN NUCLEAR, INC.

Headquarters: Charlotte, North Carolina, USA
Legal Structure: Not-for-Profit
Company Size: Small
Website: www.naygn.org
Key Contact: Canada@naygn.org

With over 36 Chapters across Canada and growing, North American Young Generation in Nuclear (NAYGN) supports the development of future leaders in the nuclear and isotope sectors through advocacy, education, and professional development. NAYGN offers mentorship, outreach, and workforce engagement programs, and has collaborated with many other key organizations in the ecosystem including the CNIC, CNA, CNS, WiRE (Women in Renewable Energy) and has signed MoUs with ANS (American Nuclear Society), NEI (Nuclear Energy Institute), US WiN (Women in Nuclear), EHRC (Electricity Human Resources) to strengthen collaboration in advancing professional development and member networking in the nuclear technology space.

WOMEN IN NUCLEAR CANADA

Headquarters: Toronto, Ontario
Governance Model: Board of Directors
Legal Structure: Not- for-Profit
Website: www.womeninnuclear.com
Key Contact: Nzinga White, Executive Director
Canada-operations@womeninnuclear.org;
416-915-3020

Women in Nuclear Canada (WiN) emphasizes and supports the role that women can and do have in the nuclear sector and in broader applications of radiation and nuclear technologies. WiN aims to develop a dialogue with the public to promote factual awareness about the contribution of nuclear to people and society, and works to promote career interest in nuclear engineering, science, technology, trades, and other nuclear-related professions among women and young people.

CANADIAN CANCER SOCIETY

Headquarters: Toronto, Ontario
Governance Model: Board of Directors
Legal Structure: Not-for-Profit (Charity)
Company Size: Large
Website: www.cancer.ca
Key Contact: info@cancer.ca, (1-888) 939-3333

The Canadian Cancer Society (CCS) is the country's largest national cancer charity and a leading funder of cancer research. Through investments in clinical and translational research, CCS has advanced new approaches in areas such as targeted radionuclide therapy and isotope-based tracers. By enabling Canadian researchers and institutions, CCS contributes to the isotope ecosystem in support of improved cancer care.

CANADIAN UNION OF SKILLED WORKERS

Headquarters: Toronto, Ontario
Governance Model: Board of Directors
Legal Structure: Not-for-Profit (Charity)
Company Size: Large
Website: www.cusw.ca
Key Contact: info@cancer.ca, (1-888) 939-3333

The Canadian Union of Skilled Workers (CUSW) is a union that represents highly skilled tradespeople across Canada, with a growing presence in sectors supporting the medical isotope and nuclear energy ecosystems. CUSW plays a strategic enabling role in the industry by developing and mobilizing a flexible, future-ready workforce. The organization contributes to high-skill deployment in areas such as isotope logistics, maintenance, and refurbishment. CUSW is committed to member-driven governance, ongoing professional development, and innovative labour practices that align with the demands of an evolving nuclear and health technology sector.

SOCIETY OF UNITED PROFESSIONALS

Headquarters: Toronto, Ontario
Governance Model: Executive Board
Legal Structure: Labour Union
Company Size: Large
Website: www.thesociety.ca
Key Contact: Rebecca Caron, President; president@thesociety.ca, 416-979-2709

The Society of United Professionals (the Society) represents more than 10,000 professionals in Ontario, including engineers, scientists, supervisors, and lawyers. Founded in 1944 by a group of engineers, the Society now represents over 5,500 professionals at Bruce Power and OPG, and an additional 500+ professionals at Kinectrics. The Society's work is fully member-driven, with workers voting on changes ranging from the organization's constitution and dues increases to the ratification of collective agreements and policies. It is also connected to an expansive global network of labour unions, as Local 160 of the International Federation of Professional and Technical Engineers, which represents over 90,000 members across North America.

International Connections

Canada remains a global leader in the isotope community due to its isotope innovation, production capacity and robust ecosystem. Sustaining this leadership requires deeper integration and partnerships with international players as global demand continues to increase. As a result, the CNIC and OCNI have continued to broaden their networks to engage with international organizations and cross-border operators that are actively supporting Canada's isotope ecosystem. This increasing diversification reflects the global nature of isotope supply chains.

These international partnerships help address supply chain gaps, attract investment, and reinforce Canada's role as a collaborative hub in the global isotope landscape. This section highlights international members that, while not based in Canada, actively support Canada's isotope ecosystem through partnerships, technologies, and investments.

- Astral Systems
- ITM
- URENCO Isotopes
- SCK CEN
- CUP Contract Labs
- Serva Energy

ASTRAL SYSTEMS

Headquarters: Bristol, United Kingdom
Ownership: Foreign-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.astralsystems.com
Key Contact: info@astralsystems.com

Astral Systems develops and deploys compact fusion neutron source technology for isotope production, research, and training. Its systems support irradiation services, isotope processing, and the development of next-generation isotopes, with Astral exploring the production of isotopes such as Ac-225, Pb-212, Tb-161, Cu-64/67, I-131, and others. Astral operates a licensed fusion neutron irradiation facility and a research-grade isotope production and processing lab at its headquarters in the U.K., with expansion plans underway. The company partners with Canadian institutions, including McMaster University, to enable localized isotope production. Astral also offers custom development, technical consulting, and enabling technologies around fusion-based neutron capabilities.

ITM ISOTOPE TECHNOLOGIES MUNICH SE

Headquarters: Garching, Germany
Ownership: Foreign-owned
Legal Structure: Corporation
Company Size: Large
Website: www.itm-radiopharma.com
Key Contact: info@itm-radiopharma.com

ITM Isotope Technologies Munich SE (ITM) is a global expert in the production and distribution of therapeutic medical isotopes. ITM supplies no-carrier-added Lu-177 and is advancing Ac-225 production through a joint venture with CNL called Actineer.

The company engages in isotope processing, formulation, regulatory support, and exports its products worldwide, including to Europe, North America, and Asia. With ongoing research into emerging isotopes and plans for future infrastructure expansion, ITM continues to strengthen its role in delivering next-generation radiopharmaceuticals to global healthcare markets.

URENCO ISOTOPES – URENCO NEDERLAND B.V.

Headquarters: Almelo, Overijssel, The Netherlands
Ownership: Foreign-owned (subsidiary of Urenco Limited)
Governance: Board of Directors
Legal Structure: Corporation
Company Size: Large
Website: www.urencoisotopes.com
Key Contact: Urenco Isotopes Sales Department, isotopes@urenco.com

Urenco Isotopes harnesses advanced centrifuge technology to enrich or deplete isotopes for medical, industrial and research applications, supporting isotope production in Canada and globally through the supply of isotopes in tailored chemical forms to meet specific customer needs. Operating from its dedicated enrichment facility in Almelo, Netherlands, Urenco Isotopes delivers enriched target materials to producers worldwide and brings decades of nuclear technology expertise and a reputation for reliability and innovation. Urenco recently commissioned its Blaise Pascal Cascade isotope enrichment installation in 2025, helping to expand capacity and versatility. Urenco also continues to expand enrichment capabilities to support emerging scientific applications, including isotopes like Gd, Yb, and Ni.

Urenco operates under ISO 9001, ISO 14001, and ISO 27001 certifications. Urenco's in-house logistics team manages complex, regulated shipments with precision and reliability. With expertise in international transport, Urenco ensures secure and compliant delivery across borders. Strong carrier relationships and flexible coordination enable rapid response to urgent demands, giving customers confidence in safe, on-time delivery.

Supplied Isotopes Portfolio:

- Zn-64, Zn-66, Zn-67, Zn-68, Zn-70
- Si-28, Si-29, Si-30
- Ir-191, Ir-193
- Ge-70, Ge-72, Ge-73, Ge-74, Ge-76
- Xe-124, Xe-126, Xe-128, Xe-129, Xe-130, Xe-131, Xe-132, Xe-134, Xe-136
- Se-74, Se-76, Se-77, Se-78, Se-80
- Te-120, Te-122, Te-123, Te-124, Te-125, Te-126
- Ti-47, Ti-48, Ti-49, Ti-50
- Mo-94, Mo-95, Mo-96, Mo-97, Mo-98, Mo-100
- W-186

CUP CONTRACT LABS

Headquarters: Radeberg, Germany
Ownership: Foreign-owned
Governance Model: Management team
Legal Structure: Corporation
Company Size: Small
Website: www.cup-contract-labs.com/en
Key Contact: office@cup-contract-labs.com

CUP Contract Labs offers contract laboratory services to clients across the radiopharmaceutical sector. CUP houses over 70 expert employees in state-of-the-art facilities. CUP's clients range from local startups to international manufacturers of radiopharmaceuticals. The laboratories are GMP certified and FDA inspected. CUP Contract Labs specializes in the provision of tailored services for radiopharmaceuticals across Europe and North America, focusing on sterility testing and the analysis of Leachables & Extractables, particularly for radioactive products.

SCK CEN

Headquarters: Brussels, Belgium
Ownership: Public Institution
Governance Model: Board of Directors (With representation from the Ministries of Energy and Economics)
Legal Structure: Foundation of Public Utility
Company Size: Medium
Website: www.sckcen.be/en
Key Contact: (+32) 14 33 21 11

SCK CEN is Belgium's Nuclear Research Centre and has been an international nuclear research leader since 1952, with expertise in radiobiology, radiochemistry, dosimetry, and radiopharmacy. Its dedicated institute on Nuclear Medical Applications includes over 100 professionals focusing on the preclinical research and development of radiopharmaceuticals. SCK CEN is also home to the BR2 research reactor, which can produce 10 to 15 different isotopes per cycle, seven cycles per year, and supports the diagnosis and treatment of over 11 million patients annually. SCK CEN's Centralized Radiochemical Facility (operational in 2027) will help support a reliable supply and process GMP quality radioisotopes and other promising next-generation isotopes for partners all over the world, including Canada. SCK CEN also created a spin-out company, PanTera, which focuses on Ac-225 supply.

Current isotope portfolio:

- Diagnostic: Mo-99/Tc-99m, Xe-133
- Therapeutic: Lu-177, Tb-161, I-131, Y-90, Ho-166, Ac-225
- Palliation: Sr-89, Sm-153, W-188/Re-188, Re-186, Sn-117m, Er-169
- Plus additional research, development, or pre-commercial work involving RLT isotopes like Tb-161, Ac-225, At-211, Pb-212

SERVA ENERGY (FUSION ENERGY SOLUTIONS, INC.)

Headquarters: Tempe, Arizona, USA
Ownership: Foreign-owned
Governance Model: Board of Directors
Legal Structure: Corporation
Company Size: Small
Website: www.servaenergy.com
Key Contact: Nancy Swygert; info@servaenergy.com, (480) 704-3866

Serva Energy's technologies support activity across target material supply, irradiation, processing, product and technology manufacturing, distribution, and more. Serva specializes in the production of reactor irradiation services, including novel Ac-225 and Pb-212 production methods. Serving the North American market and authorized under the U.S. NRC, Serva is developing new reactor-based production methods to ramp up the supply of highly-sought after isotopes using large capacity nuclear reactor facilities and R&D laboratories at numerous universities.

Major Ecosystem Collaborations and Strategic Partnerships

In an industry defined by complexity, where discovery, development, production, and distribution span public and private sectors, Indigenous communities, regulators, and international markets, no single entity can succeed alone. Collaboration forms the backbone of Canada's resilient and innovative isotope ecosystem.

In recent years, strategic partnerships, cross-sector consortia, and landmark acquisitions have fundamentally reshaped the Canadian isotope landscape. Amid rising demand for medical isotopes, recent Canadian partnerships, joint ventures, and strategic purchases serve as case studies in what is possible through coordinated action.

Regionally-based initiatives:

- **Bruce Power, the Saugeen Ojibway Nation (SON), and Isogen** partnered with ITM to launch the world's first commercial production of Lu-177 inside a nuclear power reactor. This groundbreaking Indigenous–public–private collaboration not only advances cancer treatment but also creates meaningful economic opportunities and long-term benefits for the SON. By embedding Indigenous leadership and partnership at the heart of isotope innovation, this initiative strengthens reconciliation while positioning Canada as a trusted global supplier of radiotherapeutic isotopes.
- Following the launch of the CNIC's Isotopes for Hope in 2023, two regional initiatives were formed that aim to unite municipalities, universities, hospitals, and industry leaders. **The Southwestern Ontario Isotope Coalition (SOIC)** and the **Central and Eastern Ontario Isotope Alliance (CEOIA)** work with their respective regions to advance collaboration and strengthen regional capacity for isotope development.

National initiatives and beyond:

- Led by TRIUMF Innovations and CPDC, the **Canadian Medical Isotope Ecosystem (CMIE)**, supported by a $35 Million investment from Innovation, Science and Economic Development Canada (ISED), is an initiative that aims to strengthen Canada's isotope sector by supporting shovel-ready projects and accelerating research & development. CMIE includes a **Development Fund** that advances research and commercialization of early-stage medical isotope technologies.
- The CNIC's **Oncologist and Clinical Scientist Network** is a national initiative that unites leading oncologists and clinical scientists nationwide under the Isotopes for Hope campaign, aiming to strengthen advocacy for medical isotopes. The initiative strives to reduce barriers for patients, support innovation in healthcare, and reinforfes Canada's leadership role.
- Through CNIC's strategic alignment with the **International Atomic Energy Agency (IAEA)** under the Rays of Hope initiative, Canada is working to extend its ecosystem globally, supporting equitable access to radiotherapy in low- and middle-income countries and leveraging Canadian capabilities to improve global cancer care.

Recent Canadian mergers and acquisitions:

- In May 2025, **BWXT Medical** acquired **Kinectrics** in a US $525 million deal, significantly expanding its capabilities across CANDU reactor services, isotope production, and lifecycle asset management. The acquisition doubled BWXT's commercial footprint and enhanced its vertical integration.
- In one of the nuclear sector's largest transactions, **Brookfield Renewable and Cameco** jointly acquired **Westinghouse Electric Company** for US $7.9 billion, integrating uranium supply, reactor services, and global clean energy development.
- **Eli Lilly's** acquired **POINT Biopharma** for US $1.4 billion, and **AstraZeneca** aquired **Fusion Pharmaceuticals** for US $2.4 billion, which demonstrate the broader pharmaceutical industry's interest in radiotherapeutics.
- **Telix Pharmaceuticals** acquired **ARTMS** in 2024 for US $82 million, integrating Telix's global radiopharmaceutical pipeline with ARTMS' cyclotron-based isotope production technology. The acquisition secures reliable access to key isotopes such as Ga-68, Zr-89, and Cu-64, while expanding domestic production capacity.

These developments reflect a sector in motion, leveraging collaboration to deliver isotopes, build resilient value chains, accelerate time-to-market, and ensure Canadian leadership endures.

Cross-Reference Master Table

The Cross-Reference Master List provides a united view of all Canadian organizations in the directory and the specific segments of the isotope supply chain in which they are actively engaged.

While each member is profiled under their primary area of activity in this directory, many contribute to multiple parts of the ecosystem, such as research, isotope processing, product manufacturing, distribution, or enabling technologies. This table allows readers to quickly identify overlapping roles, capabilities, and synergies among members. It is intended to support ecosystem navigation, partnership development, and strategic planning within the Canadian ecosystem.

Red check marks (✓) indicate each organization's primary operations (and the Chapter in which they appear in this directory). Black check marks (✓) indicate other services and operations provided.

Company	Source Material & Isotope Generation	Isotope Processing & Radiopharmaceutical Product Manufacturing	Packaging, Distribution & Delivery Logistics	Specialized Equipment & Technology Providers	Industry Coordination, Project Services, and Consulting	Training, Advocacy, and Organizing for the Future
ABK Biomedical		✓				
Accel-Link					✓	
ACIC Equipment				✓		
Actineer		✓				
Agescan International		✓	✓			
ANRIC Enterprises					✓	✓
ARMTS	✓	✓		✓		
AtkinsRéalis						
AtomVie Global Radiopharma		✓	✓			
ATS Industrial Automation		✓	✓	✓	✓	
Big Red Oak					✓	
Boston Scientific		✓	✓			
Brotech Precision CNC			✓			
Bruce Power	✓					
Bucephalus Consulting					✓	
BWXT Medical	✓	✓		✓		

Company	Source Material & Isotope Generation	Isotope Processing & Radiopharmaceutical Product Manufacturing	Packaging, Distribution & Delivery Logistics	Specialized Equipment & Technology Providers	Industry Coordination, Project Services, and Consulting	Training, Advocacy, and Organizing for the Future
Calian				✓	✓	
Canadian Association of Medical Radiation Technologists						✓
Canadian Association of Nuclear Medicine						✓
Canadian Cancer Society						✓
Canadian Nuclear Association						✓
Canadian Nuclear Laboratories	✓	✓		✓	✓	✓
Canadian Nuclear Society						✓
Canadian Union of Skilled Workers						✓
Centre for Addiction and Mental Health Brain Health Imaging Centre	✓	✓	✓		✓	✓
Centre for Probe Development and Commercialization	✓	✓	✓		✓	
Conexus Nuclear					✓	
Corporation of the County of Bruce						✓
D2B Consulting					✓	
D-Pace				✓		
Eclipse Automation						
E.S. Fox					✓	
Framatome	✓		✓		✓	
Georgian College of Applied Arts and Technology						✓
Gowling WLG					✓	
IPS - Integrated Project Services					✓	
Iotron Medical	✓	✓				
Isogen	✓				✓	
Isologic Innovative Pharmaceuticals	✓	✓	✓			
isoSolutions	✓		✓		✓	
Isotope Insights					✓	
Kinectrics	✓	✓	✓	✓	✓	
Laurentis Energy Partners	✓					
MarShield – Custom Radiation Shielding Products	✓	✓	✓		✓	
McMaster University	✓	✓	✓	✓		✓
Megalab Group			✓		✓	
Mevex				✓	✓	
Michener Institute of Education						✓
Minogi Corp					✓	
Mirion Tehcnologies				✓	✓	

Company	Source Material & Isotope Generation	Isotope Processing & Radiopharmaceutical Product Manufacturing	Packaging, Distribution & Delivery Logistics	Specialized Equipment & Technology Providers	Industry Coordination, Project Services, and Consulting	Training, Advocacy, and Organizing for the Future
MorePETs Coalition						✓
NDT Leak Testing (Vacuum Products Canada)			✓		✓	
Nordion		✓	✓	✓	✓	
North American Young Generation in Nuclear						✓
Novartis Pharmaceuticals Canada		✓	✓			
Nuclear Innovation Institute						
Nuclear Promise X Innovations					✓	
Nuclear Waste Management Organization						✓
NUCM Radiopharma	✓	✓	✓		✓	
Ontario Power Generation	✓					
Pacer Precision Logistics			✓			
Power Generation Integrated					✓	
Projects Pivot					✓	
Promation				✓	✓	
Pulse Law					✓	
Rayatom Technologies			✓		✓	
SAGE Engineering Services					✓	
Saugeen Ojibway Nation						✓
Siemens Healthineers				✓	✓	
Society of United Professionals						✓
South West Exposures			✓		✓	
Stevcon Packaging & Logistics			✓			
Sylvia Fedoruk Canadian Centre for Nuclear Innovation	✓	✓	✓		✓	
TMC Group	✓	✓				
TRIUMF	✓	✓				
University of New Brunswick - The Centre for Nuclear Energy Research						✓
Western University						✓
Westinghouse Electric Canada					✓	
Women in Nuclear Canada						✓
WWiKY Biosciences		✓			✓	

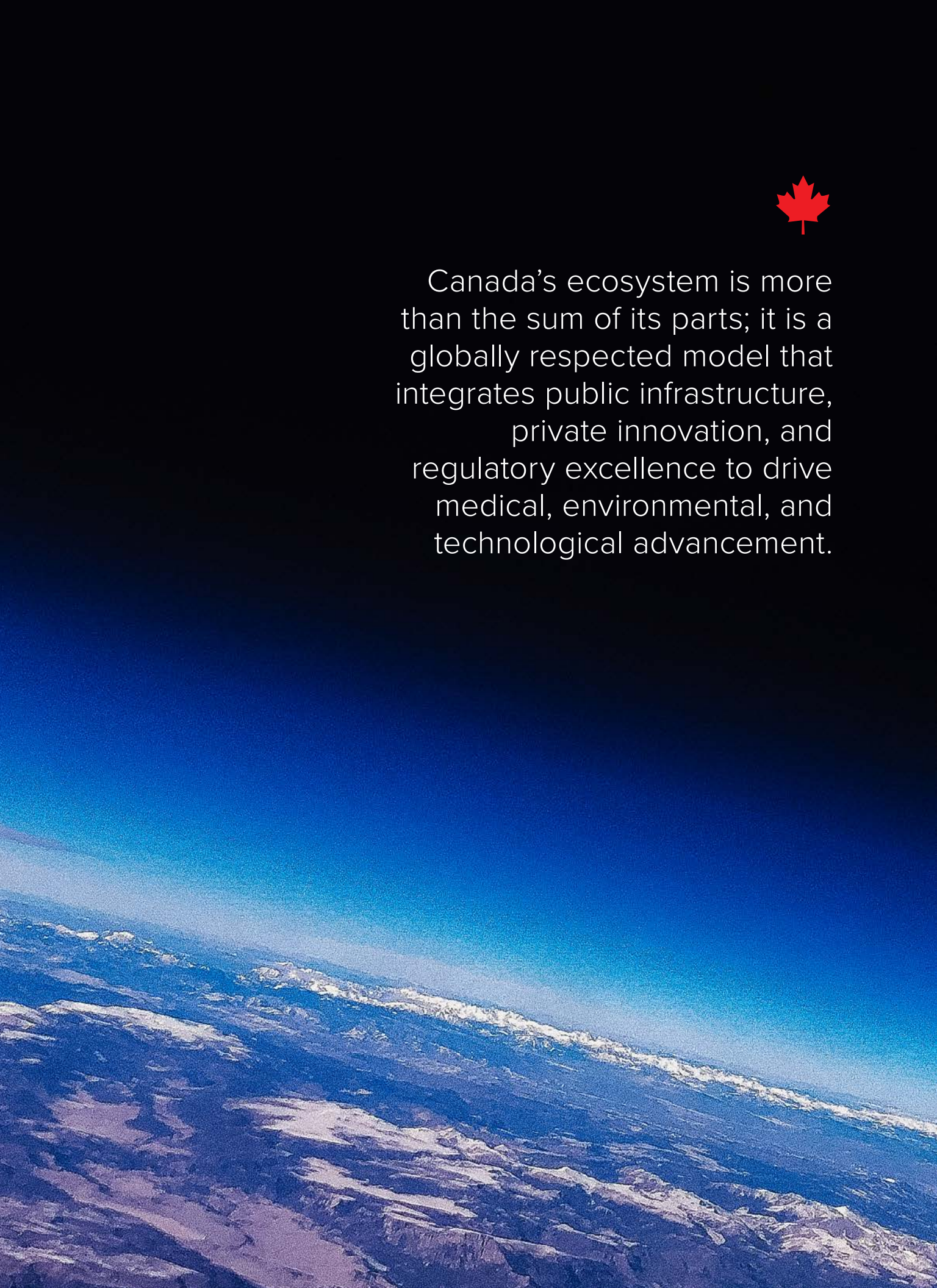
Conclusion: Canada's Global Isotope Future

As exemplified in the vast range of expertise contained within this Ecosystem Directory, Canada is well positioned to lead the next era of isotope innovation. Canada's modern strategic shift to its present-day diversified supply chain has proven to be poised for growth and resilient amid global challenges, such as the COVID-19 pandemic and international isotope supply fluctuations.

Key investments now underpin Canada's modernized and diversified ecosystem:

- Optimizing existing infrastructure capabilities by supporting efforts to retrofit and sustain existing CANDU reactors and better utilize Canada's cyclotron network.
- Building new state-of-the-art facilities for radiopharmaceutical manufacturing and processing
- Strengthening partnerships between industry and academia to address supply and research challenges, and shore up talent
- Ensuring government engagement and support for isotopes, across departments of health, energy, life sciences, science and technology, natural resources, and more.

Canada's ecosystem is more than the sum of its parts; it is a globally respected model that integrates public infrastructure, private innovation, and regulatory excellence to drive medical, environmental, and technological advancement.



ORGANIZATION OF CANADIAN NUCLEAR INDUSTRIES

OCNI

Clean Energy for a Low Carbon Economy

CNIC

CANADIAN NUCLEAR ISOTOPE COUNCIL