LOOKING BACK, LOOKING FORWARD: NUCLEAR INNOVATION IN CANADA

Atomic Energy of Canada Limited
2022 Annual Report

AECL EACL 70 YEARS ANS

AECL Overview

As a federal Crown corporation, Atomic Energy of Canada Limited (AECL) advances Canada's interests through leading edge nuclear science and technology and environmental stewardship. This includes combating climate change through clean energy growth and decarbonization strategies, pioneering new treatments for cancer and other diseases, and accelerating Canada's environmental remediation projects.

Since 2015, AECL has been delivering its mandate through a Government-owned, Contractor-operated model, whereby a private-sector organization, Canadian Nuclear Laboratories (CNL), is responsible for managing and operating our sites.

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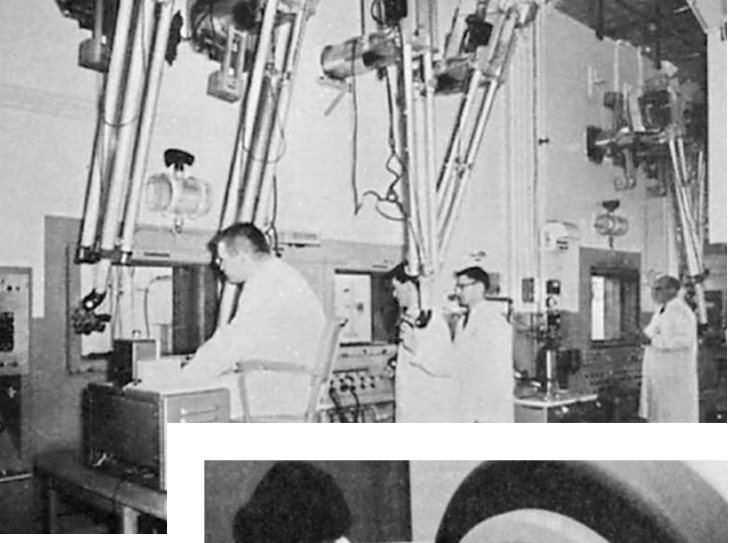
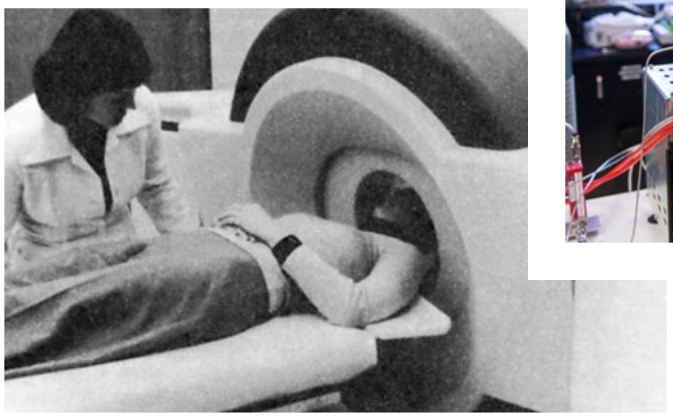
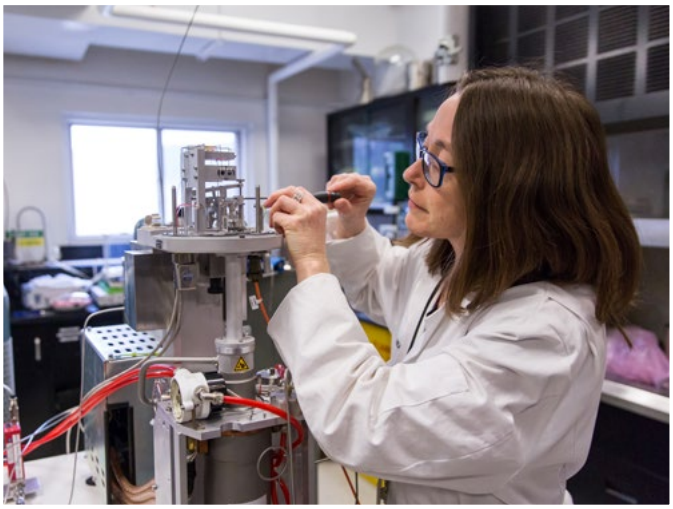






LOOKING BACK, LOOKING FORWARD: NUCLEAR INNOVATION IN CANADA

AECL acknowledges with gratitude that we operate on lands that have been the traditional territories of Indigenous peoples since time immemorial.

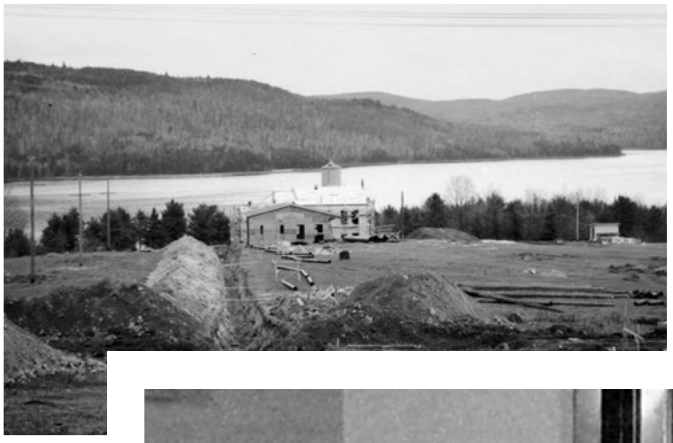
As we celebrate our 70th anniversary, we have an opportunity to reflect on and learn from the past and to renew our commitment to establishing a new relationship with First Nations, Métis and Inuit, the original stewards of the lands and waters on which we live, work and play.

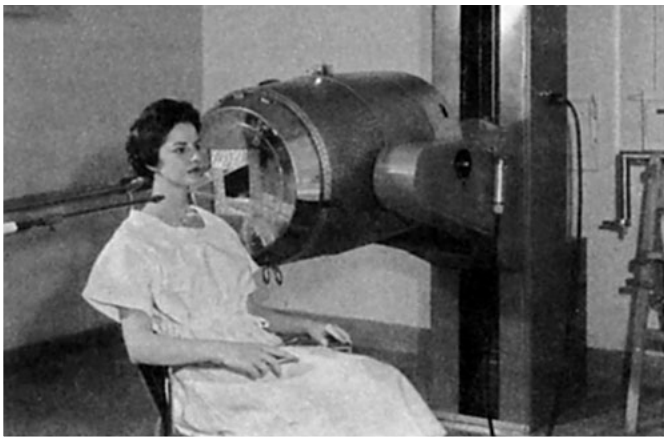
Only together – and in collaboration with industry, government, academia and local communities – can we enhance stewardship and advance nuclear science and technology to support today's priorities and tomorrow's opportunities.

Job creation, climate action, safety and security, and health and health care all demand a vibrant and innovative nuclear science and technology sector.

The extent to which nuclear innovation can shape the next 70 years – and better the lives of Canadians and Indigenous peoples – will be defined by the strength and resilience of the relationships and partnerships we build today.

70 Years at a Glance





Top left: 1944, work begins to build the Chalk River Laboratories in Ontario.

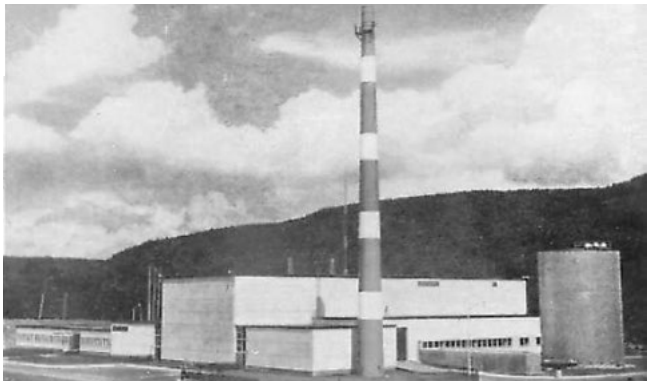
Bottom left: 1951, first Cobalt-60 treatment takes place.

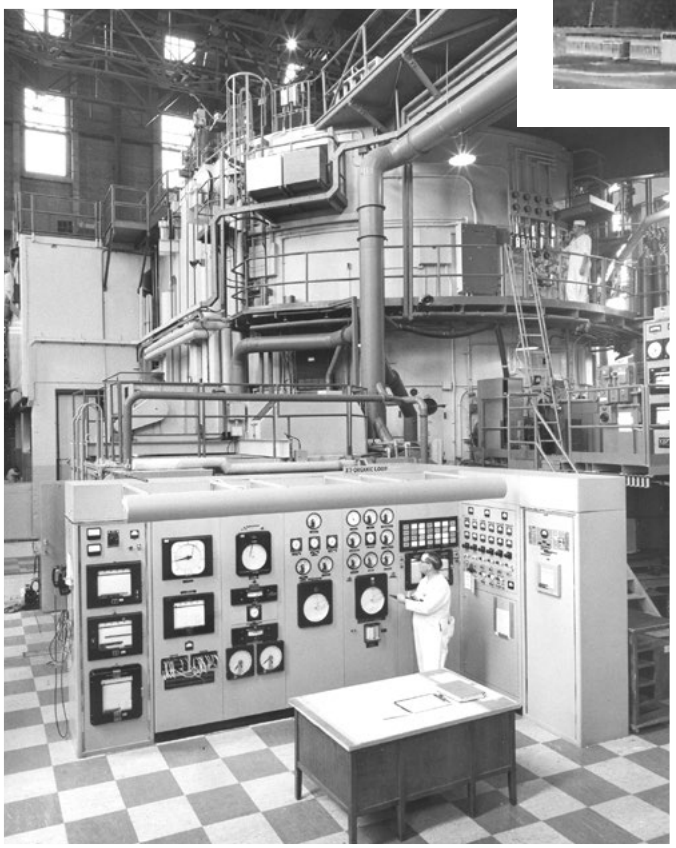
Right: 1952, AECL formed as a Crown corporation.

Left: 1957, the National Research Universal Reactor (NRU) goes critical.
University of Alberta Archives

Top right: 1965, the Whiteshell Reactor 1 (WR-1) research reactor goes critical.

Bottom right: 1971, first commercial CANDU reactor begins operations (Pickering).

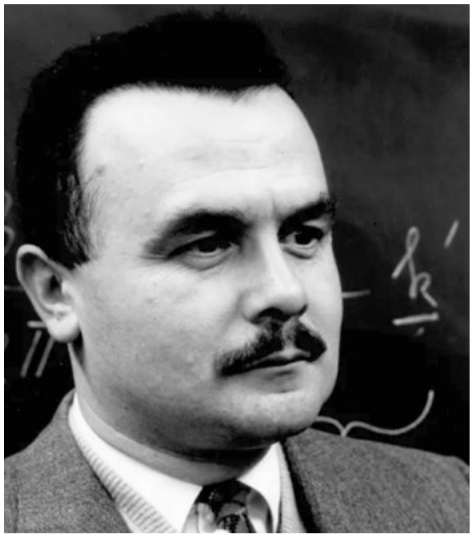




Top left: 1977, the Gentilly-1 prototype reactor is shut down. *Google Earth*

Right: 1987, the Nuclear Power Demonstration (NPD) prototype reactor is shut down.

Bottom: 1993, the National Research Experimental Reactor (NRX) research reactor is shut down. *NRC Archives*



Right: 1994, Dr. Bertram Brockhouse receives Nobel Prize.

Left: 2020, CNL develops a ventilator to help the fight against COVID-19.

Bottom: 2021, Minwamon building inaugurated at the Chalk River site.

Message from the Chair of the Board

On February 14th this year, AECL marked its 70th Anniversary. I am honoured to celebrate the organization as a leader in nuclear science and innovation.

In 1952, the federal government created AECL and gave us the mandate to develop nuclear energy and science for peaceful purposes, along with the accountability for Canada's national nuclear laboratories. Together with the best and brightest minds in Canada, we built research reactors that not only provided essential science for future nuclear power development but also formed the backbone for Canada being the leader it is today in medical isotope production.

Shortly after it was created, AECL also partnered with Ontario Hydro to build and operate demonstration reactors in Ontario that went into service in the 1960s and operated through to the 1980s, proving the CANDU concept. Their bold vision and collaboration paved the way for the construction of 22 more power reactors built across Canada in New Brunswick, Quebec, and Ontario, and another 11 power reactors built in six countries around the globe. Today, active CANDU reactors contribute greatly to the reduction of greenhouse gas emissions and the fight against climate change.

I take this moment to reflect on the past and recognize how we got here today – through cooperation and collaboration, through innovation and creativity, through problem solving and an unwavering commitment to improving the lives of Canadians.

Today, we are again facing tremendous opportunities and challenges, especially in the wake of the ongoing COVID-19 pandemic, and I am proud of the achievements and milestones of the past year.

AECL continued to advance a strategic planning process to align our efforts and collaborations with key federal priorities, the market, and our capabilities, and to propel Canada – a Tier 1 nuclear nation – to the forefront of nuclear science and technology. Through this process, AECL engaged with a host of stakeholders and Indigenous nations and communities to renew and strengthen our vision and work towards a plan that allows us to meet our shared goals now and into the future.

Today, we are again facing tremendous opportunities and challenges, especially in the wake of the ongoing COVID-19 pandemic, and I am proud of the achievements and milestones of the past year.

We continue to see opportunities to reduce risks and care for the environment, opportunities to maximize the Canadian nuclear industry's contribution to net zero, and opportunities to make a difference in people's lives through the important work carried out by our contractor, Canadian Nuclear Laboratories (CNL), at the Chalk River Laboratories.

As we look towards the future and our legacy, I remain steadfast in my belief that AECL and CNL, together with our partners, will play an important role in creating a sustainable future for Canada.

James Burpee, *Chair of the Board*

Message from the President and CEO

Reaching a milestone anniversary is a tremendous opportunity to reflect on achievements and renew our commitments, ambitions and vision for the future.

Since 2015, AECL has delivered its mandate through a Government-owned, Contractor-operated model where a private-sector contractor, CNL, is responsible for the day-to-day management of AECL's sites. This model continues to drive environmental stewardship and nuclear innovation, bringing value to Canada in areas as diverse and interconnected as health and clean energy.

It is also an opportunity to reflect on how we can do better. For many, including me, the treatment of Indigenous peoples is one that invokes shame, frustration and sorrow. As an organization – and as individuals – we have much work to do to acknowledge the past and to learn and grow together through healing and reconciliation. This journey will take time and a steadfast commitment to meaningful engagement, tangible action that builds trust, and strong, lasting relationships with First Nations, Métis and Inuit on whose land we live and work.

In Port Granby, as part of the Port Hope Area Initiative, CNL cleaned up historic low-level radioactive waste along the shoreline of Lake Ontario and relocated it to an engineered containment mound less than one kilometer away. The new facility was closed and capped in 2021 and is safely storing 1.3 million tonnes of low-level waste. AECL is now working with local First Nations and municipalities to explore options to create a nature reserve on lands surrounding the facility.

After years of studies, Indigenous and public engagement, and environmental assessment preparations, AECL and CNL are looking forward to participating in the public hearing for the near surface disposal facility proposed at the Chalk River Laboratories. Similar to the Port Granby project, the NSDF will bring Canada one step closer to leaving a positive legacy for future generations.

The Chalk River Laboratories is being transformed into a modern, world-class nuclear science and technology campus through a $1.2 billion investment by the Government of Canada. CNL recently completed the construction of two vital support facilities, and this year, broke ground on another – the Science Collaboration Centre – with doors slated to open in 2023. In addition, CNL continued significant environmental remediation activities, notably decommissioning contaminated, redundant and outdated buildings. I am pleased to report that this includes 100+ structures at Chalk River, all since 2015.

CNL recently completed the construction of two vital support facilities, and this year, broke ground on another – the Science Collaboration Centre – with doors slated to open in 2023.

Work to advance research in the areas of small modular reactors (SMRs), hydrogen technologies and reactor sustainability have also placed AECL and CNL at the forefront of key initiatives to help Canada tackle climate change.

As we electrify the everyday activities of Canadians, the demand for new forms of clean energy will only continue to increase here in Canada and worldwide. The reality is that renewables alone cannot meet this need. We will need stable, baseload electricity – ideally using Canadian technology and supply chains – to power our homes and businesses when the sun isn't shining and the wind isn't blowing. These are important considerations as we plan for the sustainable and clean grids of the future.

Nuclear energy provides a viable pathway to achieve this and to help us meet our net zero goals. There are three pathways for nuclear generation: refurbishment of existing CANDU nuclear facilities; development and deployment of advanced and SMR technologies; and, deployment of proven large-scale CANDU technology, updated and refreshed to reflect latest innovations.

I am proud to say that part of what drew me to this organization was the opportunity to leverage AECL's experience, expertise, and networks to catalyze meaningful action towards addressing climate change. There is simply no credible pathway to net-zero without nuclear.

Planning and design activities are underway for the new Advanced Nuclear Materials Research Centre at the Chalk River Laboratories, a facility that will support Canada's clean energy goals by furthering advancements in SMRs and providing services critical to the long-term reliability of existing reactors, including Canada's fleet of CANDU nuclear power reactors and other designs from around the world.

We must continue to harness nuclear science and technology and enhance collaboration with industry partners, academia, Indigenous nations, governments, and local communities to leverage our collective knowledge and strengths to build a cleaner, safer and more prosperous future for all.

Fred Dermarkar, *President and CEO*

Who We Are and How We Operate

Our role as a federal Crown corporation is two-pronged: enable nuclear science and technology and manage the Government of Canada's radioactive waste and decommissioning responsibilities.

Mission

Realize value for Canadians by driving nuclear innovation, creating a state-of-the-art nuclear campus, and cleaning up legacy wastes.

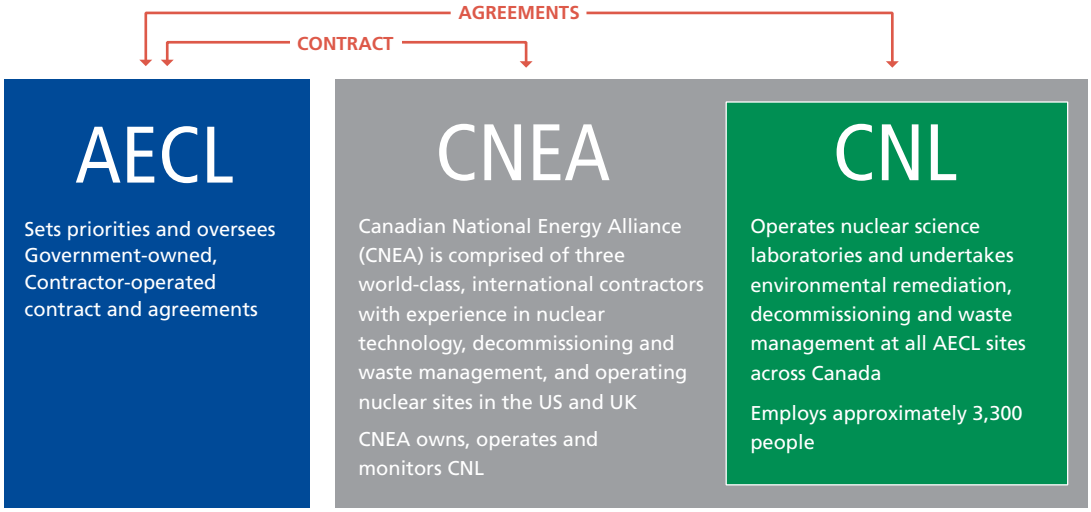
Vision

Driving nuclear opportunity for Canada.

We deliver our mandate through a long-term contract with Canadian Nuclear Laboratories (CNL) for the management and operations of our sites. Under this Government-owned, Contractor-operated model, we set priorities, oversee CNL's work and measure performance. AECL owns the sites, facilities, assets, intellectual property and responsibility for environmental remediation and radioactive waste management, the "What," while CNL is responsible for the day-to-day operations of our sites, the "How."

AECL accepts CNL's annual plans and monitors and assesses performance based on targets and measures that we establish at the beginning of each year. In addition, we oversee two target-cost contracts, also with CNL, for the decommissioning and closure of two nuclear sites: the Nuclear Power Demonstration reactor, in Ontario, and the Whiteshell Laboratories, in Manitoba.

The Government-owned, Contractor-operated model allows us to leverage international knowledge and skills to advance work and priorities while bringing private sector rigour and efficiencies to the operation of our sites. This is supported by our own team of experts who have broad-based experience to oversee the contract with CNL and play an appropriate oversight and challenge function to achieve value for money for Canada.



Driving Canada's Nuclear Future

Our mandate, mission and vision lay the foundation for the scope of AECL's role – from managing legacy nuclear waste to advancing cutting-edge nuclear applications that benefit all Canadians.

As a federal Crown corporation, it is our responsibility to implement a vision for the nuclear industry in Canada through the next decade and beyond. We recognize that we cannot do this alone.

We are accountable to Indigenous peoples and Canadians from coast-to-coast-to-coast and are in a unique position to coalesce stakeholders, partners and communities around a vision based on shared goals and mutual benefits.

Over the past year, AECL engaged a range of representatives from government, industry, Indigenous nations, local communities, academia, and advocacy groups to discuss priorities, perceptions, challenges and opportunities associated with nuclear waste management and nuclear innovation in Canada.

We look forward to sharing this feedback and working with Indigenous peoples, community leaders and stakeholders across sectors to establish robust relationships and the trust and support needed to develop a path for Canada's nuclear future.

Conceptual image: Third Way

Healing and Reconciliation

The lands on which AECL's sites and operations are situated have been stewarded by Indigenous peoples since time immemorial. In alignment with the Government of Canada, AECL is committed to achieving reconciliation with Indigenous peoples through a renewed relationship based on recognition of rights, mutual understanding and respectful, meaningful engagement and collaboration.

We understand that this takes time, resources and tangible actions that build trust, including co-developing plans and strategies; integrating Indigenous knowledge, perspectives, practices and ceremony across operations; prioritizing capacity-building initiatives; and developing long-term relationship agreements to support these commitments.

Working towards a Diverse and Inclusive Workplace

AECL has in place a *Diversity and Inclusion Action Plan* that includes three overarching goals: 1) promote a culture that encourages collaboration, flexibility and fairness; 2) attract, retain and develop a talented and diverse workforce; and 3) enable and promote knowledge and understanding about diversity and inclusion and why they are important. AECL is also a member of Equal by 30 – an initiative dedicated to equal pay and equal opportunities for women in the clean energy sector.

While today women make up 50% of our workforce and 50% of our Board of Directors, we remain committed to closing the gender gap, particularly in leadership roles, and to strengthening the diversity and inclusiveness of our team. The continuation of work in these areas will allow us to break biases, raise awareness and demonstrate meaningful change.

Sustainability

Sustainability is at the core of everything we do and how we do it. Historically, nuclear energy has played a significant role in reducing Canada's carbon footprint and it will play an even larger role as the Government of Canada embarks on its pathway towards net zero emissions by 2050.

AECL is working to advance Canada's interests through leading edge nuclear science and technology and environmental initiatives. This includes contributing to climate action efforts through clean energy growth and decarbonization strategies, pioneering new medical treatments and accelerating Canada's environmental remediation projects.

In tandem with CNL, we are championing the development and deployment of new nuclear projects, especially SMRs, that could provide clean energy options to help Canada achieve its emissions reduction objectives. At the same time and key to the sustainability of the nuclear industry, AECL and CNL, in collaboration with local Indigenous nations and communities, are advancing some of Canada's largest and most complex environmental remediation projects. Responsible decommissioning and radioactive waste management are necessary to clean up AECL sites, restore and care for the environment, and make way for new infrastructure that supports future achievements, partnerships and innovation in health, clean energy, and environmental stewardship.

Notably, CNL is pioneering new treatments for cancer and other diseases by leveraging the facilities and vast expertise at the Chalk River Laboratories to help improve the lives of Canadians and those around the world. This includes opportunities related to actinium-225, a promising medical isotope that targets cancer cells while minimizing damage to healthy tissues.

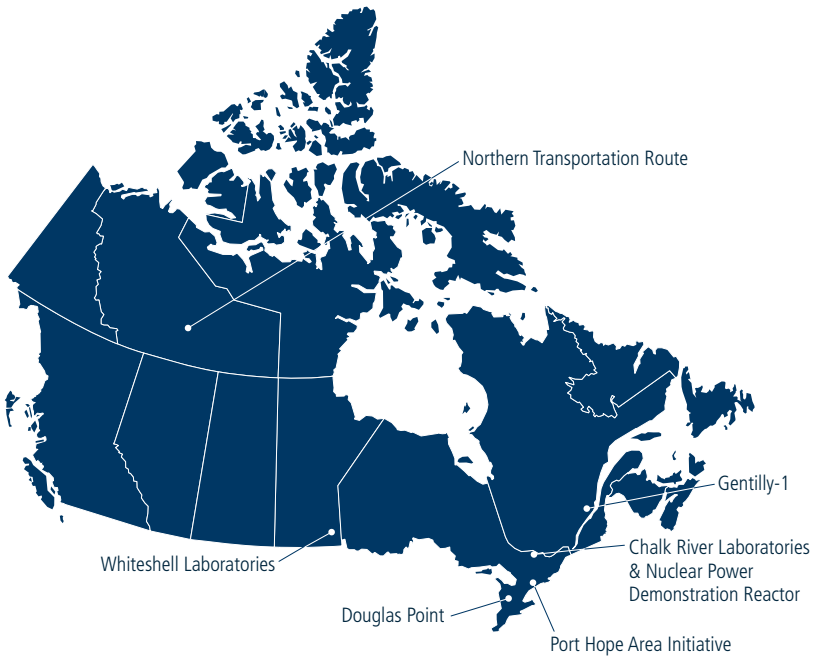
AECL's Sustainability Strategy objectives and target outcomes are meant to leverage our existing environmental, social and governance policies, helping us further embed sustainability considerations in all aspects of decision-making. We also recognize that required actions will largely be developed and executed by CNL. Therefore, AECL commits to reporting on performance, supporting CNL in its sustainability efforts and annually reviewing our Strategy to incorporate leading practices. AECL's 2021-22 Sustainability Report will be available publicly later this year.

Our Sites

Science and innovation have been driving AECL's mandate for 70 years. The Chalk River Laboratories, in Ontario, is our flagship site and Canada's largest science and technology centre. Research activities support federal responsibilities and priorities in the areas of health, nuclear safety and security, energy and the environment, and provide products and services to third parties on a commercial basis. The Chalk River Laboratories is currently undergoing extensive renewal to transform the site into a modern, world-class nuclear science and technology campus. This work includes decommissioning – 111 buildings and structures since 2015 – and restoration to clean up contaminated lands and protect the surrounding environment.

As part of our mandate, we are also responsible for cleaning up legacy sites and radioactive wastes, many the product of science and technology activities that have benefitted Canadians; for example, the production of medical isotopes and research supporting the development and deployment of carbon-free nuclear energy.

In addition, we are responsible for environmental remediation and waste management in areas where the Government of Canada has assumed responsibility for historic low-level radioactive waste, notably in the municipalities of Port Hope and Clarington through the Port Hope Area Initiative, and along the Northern Transportation Route in the Northwest Territories and northern Alberta.



Sites	Location	Overview
Chalk River Laboratories	Chalk River, Ontario	The Chalk River Laboratories is Canada's largest science and technology centre. From 2016 to 2026, the federal government is investing $1.2 billion in new and renewed science and site infrastructure that will help build a state-of-the-art nuclear science and technology campus. Already, multiple new buildings, including new laboratory space, have been commissioned to drive our science activities. The site's transformation is also enabled by large-scale decommissioning of outdated buildings and facilities, environmental restoration and waste management. This includes a proposal to build a near surface disposal facility for the management of AECL's low-level radioactive waste. The project is undergoing an Environmental Assessment.
Nuclear Power Demonstration Reactor	Rolphton, Ontario	The Nuclear Power Demonstration reactor was Canada's first nuclear power reactor to supply electricity to the grid and served as a key training facility for engineers and operators. It has been in a safe shut down state for more than 30 years. CNL has proposed to decommission the reactor in situ. The project is undergoing an Environmental Assessment.
Port Hope Area Initiative	Port Hope and Clarington, Ontario	The Port Hope Area Initiative represents the Government of Canada's commitment to cleanup and safely manage historic low-level radioactive waste located in both municipalities. Two engineered near surface facilities have been constructed to facilitate long-term waste management.
Douglas Point Reactor	Kincardine, Ontario	The Douglas Point reactor is a shutdown prototype nuclear reactor currently in a safe shutdown state pending full decommissioning.
Gentilly-1 Reactor	Bécancour, Quebec	The Gentilly-1 reactor is a shutdown prototype nuclear reactor currently in a safe shutdown state pending full decommissioning.
Whiteshell Laboratories	Pinawa, Manitoba	The Whiteshell Laboratories were formerly AECL's second largest research site; today they are being decommissioned for closure. CNL's plans include a proposal for in situ disposal of the WR-1 research reactor. The project is undergoing an Environmental Assessment.
Northern Transportation Route	Northwest Territories and northern Alberta	The Northern Transportation Route represents AECL's commitment to work with Indigenous peoples and local communities to cleanup small quantities of uranium ore at a variety of sites in the Northwest Territories and northern Alberta.

2021-22 Achievements

This section highlights key targets achieved over the course of the year based on performance measures outlined in AECL's 2021-22 Corporate Plan Summary. For more details on our achievements and future activities, visit www.aecl.ca.

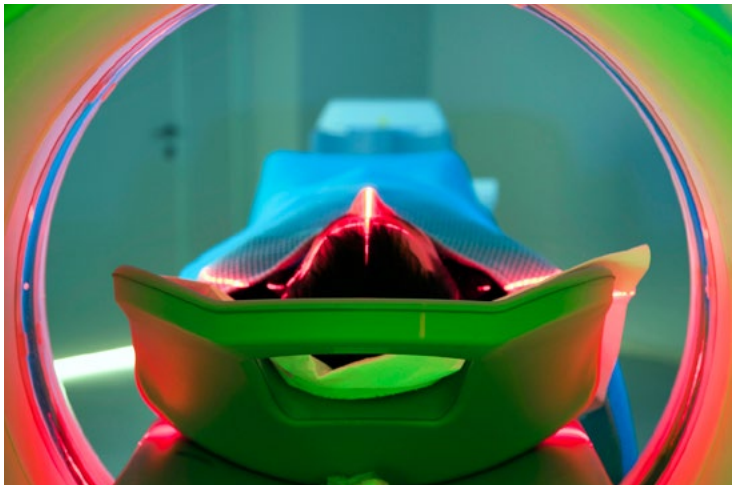
Nuclear Laboratories

For more than seven decades, researchers and scientists have applied vast expertise at AECL facilities to pursue innovation in health, energy, and nuclear safety and security. This work has allowed Ontario to phase out coal, improved the lives of more than a billion patients worldwide, and contributed to Canada's COVID-19 pandemic response. AECL is committed to strengthening partnerships with academia, national laboratories and industry experts to drive innovation in nuclear science and technology to help meet Canada's net-zero targets and improve the health and well-being of Canadians.

The Chalk River Laboratories – a 200-acre complex with 17 nuclear facilities and a research reactor – has been at the centre of research and breakthroughs in science and technology for decades. This includes the production of life-saving medical isotopes used in the treatment and detection of cancer and other diseases, and the development of the CANDU reactor technology that today is used at 19 reactors in Canada and 30 CANDU or CANDU-derivatives internationally.

AECL's unique facilities make it an attractive research destination for experts across Canada and around the globe, leading to innovation and the development and retention of highly qualified nuclear workers and scientists. To further enhance these capabilities, the federal government is investing $1.2 billion in new and renewed science and site infrastructure that is helping build a state-of-the-art nuclear science and technology campus.

Nuclear science and technology activities at the Chalk River Laboratories support federal needs and priorities, and CNL offers research and development services that support the broader nuclear sector in Canada. Importantly, CNL is aligning science and technology activities with best-in-class project management practices, increasing commercial revenues, and optimizing administrative and management costs to deliver more science for the benefit of Canadians.



Leveraging Technology to Advance Next Generation Cancer Therapy:
CNL is leveraging its world-class expertise to produce actinium-225, a rare medical isotope used in the development of targeted alpha therapy. This emerging class of cancer therapy delivers radiation directly to disease cells while sparing nearby healthy cells. This new and innovative drug can be used to treat many forms of cancers in Canada, such as prostate, breast and colon cancer, to name a few - and CNL has the capabilities needed to design and produce these radiotherapeutics.

Federal Nuclear Science and Technology Work Plan

AECL is responsible for the Federal Nuclear Science and Technology Work Plan – a program that supports the nuclear science and technology needs of the federal government. To manage the program, AECL engages with 14 federal departments and agencies to develop a program of work that meets broad federal needs and priorities while supporting Canada's international partnerships, commitments, and obligations. This program continues to foster innovation in energy, health, safety and security, and the environment.

The Federal Nuclear Science and Technology Work Plan focuses on four themes:

1) Supporting the development of biological applications and understanding the implications of radiation on living things.
2) Supporting environmental stewardship and radioactive waste management.
3) Enhancing national and global security, nuclear preparedness, and emergency response.
4) Supporting safe, secure, and responsible use and development of nuclear technologies.

Targets	Results
Deliver quality research projects on time, as set out in the Federal Nuclear Science and Technology Work Plan and detailed in CNL's annual plan.	88% of project milestones were met.

In addition to meeting just under 90% of project milestones, the number of peer-reviewed publications increased in 2021-22, with 89 papers accepted in peer-reviewed journals compared to 59 in 2020-21.

To minimize the impact of supply chain disruptions and reduced site operations due to COVID-19, CNL continued to prioritize remote work and deferred most laboratory (experiment and field) work to later in the year. Virtual program meetings, workshops and webinars continued throughout 2021-22. CNL also participated in virtual meetings and conferences with organizations such as the International Atomic Energy Agency, the Nuclear Energy Agency and the Generation IV International Forum.

CNL as a Federal Laboratory

In addition to work for federal departments and agencies under the Federal Nuclear Science and Technology Work Plan, CNL provides services and access to its facilities and expertise on a commercial basis. These capabilities are also available to other federal and international entities such as the International Atomic Energy Agency and the Nuclear Energy Agency.

Targets	Results
Propose and develop 3 to 5 collaborative agreements, memoranda of understanding or other agreements with organizations.	AECL and CNL signed a total of 11 agreements for work with federal departments and agencies on a commercial basis.

Memoranda of understanding signed in 2021-22 included those related to the deployment of SMRs in Canada (Environment and Climate Change Canada); zero-emissions fuels (Canadian Coast Guard); and health effects of radiation (Canadian Nuclear Safety Commission). In addition, under a memorandum of understanding between AECL and Natural Resources Canada, CNL undertook two studies regarding SMR fuel supply chains and hydrogen production. Lastly, CNL continued to leverage work from the Federal Nuclear Science and Technology Work Plan with Defence Research and Development Canada's Canadian Safety and Security Program for two projects related to nuclear detection and forensics.

In 2021-22, under a Letter of Arrangement signed last year between AECL and the Department of National Defence, CNL completed a study evaluating the potential of providing Garrison Petawawa with energy generated from an SMR located at the Chalk River Laboratories. Specifically, the study demonstrated the feasibility of providing electrical and thermal energy to achieve several goals, including reaching net-zero by 2050 and reducing the Garrison's reliance on and use of diesel fuel.

New Technology Initiatives Fund

Consistent with similar programs at national laboratories around the world, the New Technology Initiatives Fund helps grow CNL's science and technology capabilities to bolster emerging and future opportunities. An example of work supported by this fund includes research activities related to the fabrication of TRISO fuel (TRi-structural ISOtropic particle fuel) pellets. This research helps CNL develop capabilities in advanced fuels and is key to advancing SMR fuel production.

Targets	Results
Maintain and enhance expertise and capabilities.	In support of the Centre for Reactor Sustainability, CNL commissioned the Medium Activity Materials Testing Facility – a new shielded facility that eliminates the need for a hot cell, freeing up these facilities for higher activity work. The Strategic, Enabling, Engaging, Development Crowd Sourcing Initiative continued with 23 projects.

The Strategic, Enabling, Engaging, Development Crowd Sourcing Initiative, a program that started in 2018-19, continued with 23 projects to allow scientists to pursue early-stage ideas and test concepts, and explore potential opportunities outside of core priority areas. This is essential in maintaining an innovative culture, encouraging creativity, and attracting and retaining top talent.

Commercial Science and Technology

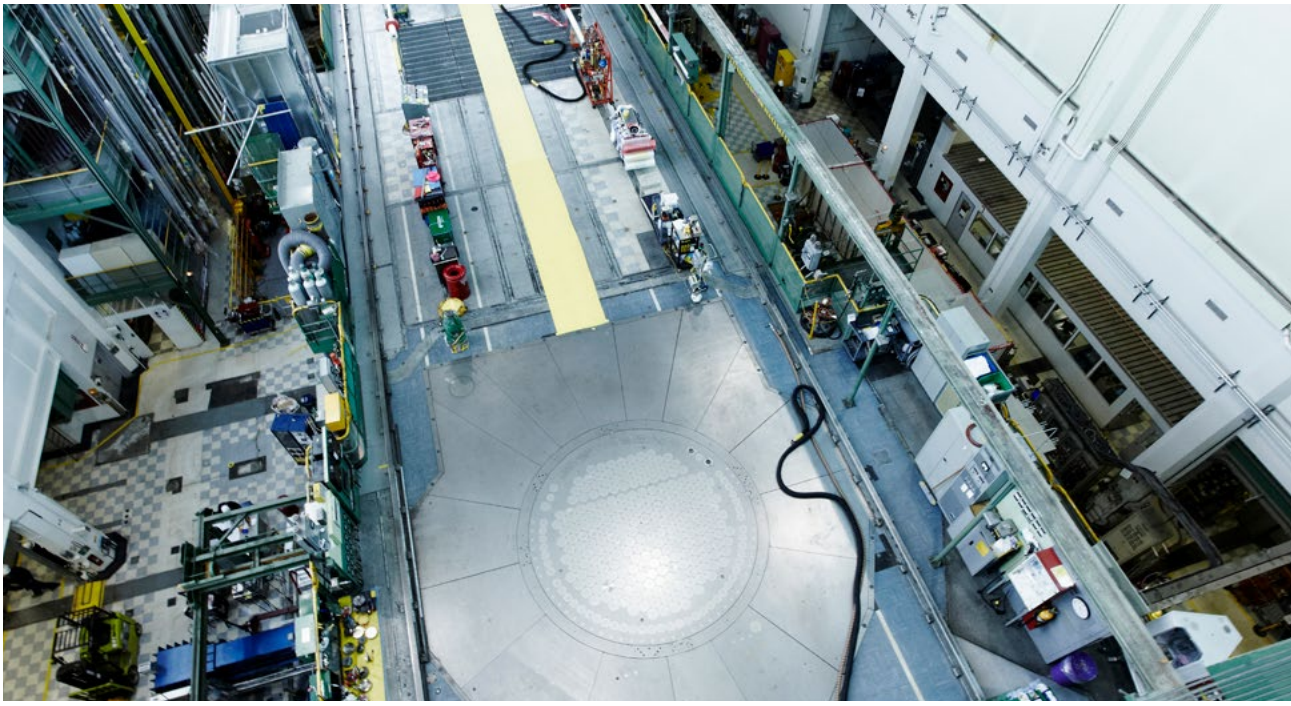
To further grow and build the science expertise and capabilities at Chalk River, CNL provides technical services and research and development products to third parties on a commercial basis. CNL continues to work with its traditional customers, and is expanding its reach to include new markets, with a focus on light-water reactors, nuclear security, SMRs and new medical isotope segments.

By growing its commercial work, CNL can maintain and enhance its scientific and technical capabilities, including retaining and attracting top scientists to its facilities. This also contributes to Canada's broader science and innovation goals.

Targets	Results
Generate more than $60.0M in revenue.*	Commercial science and technology revenue was $70.2M.

* Revenue target adjusted for COVID-19 impact

The COVID-19 pandemic continued to affect overall demand, disruptions in the supply chain, CNL's capacity to deliver services, and business development opportunities which are dependent on in-person engagements. Careful planning and emerging work to support utilities helped CNL exceed its COVID-adjusted target.



National Research Universal Reactor

After 60 years of operation, the National Research Universal reactor was shut down in March 2018. The reactor was used to prove out concepts that later appeared in the CANDU reactor; spawned a global medical radioisotope industry; and provided the neutron source to conduct research across a spectrum of applied and basic sciences.

Since the shutdown, significant progress has been made to reduce nuclear and conventional safety hazards. The facility and auxiliary buildings have been turned over to the Facilities Decommissioning group at CNL and many of the reactor system shutdowns, as well as modifications to electrical and ventilation systems, have occurred or are in progress to achieve 'storage with surveillance' in preparation for decommissioning.

Revitalization of the Chalk River Laboratories

Owned by AECL and managed by CNL, the Chalk River Laboratories comprises several licensed nuclear facilities and more than 50 unique research amenities. It supports key nuclear science and technology priorities for government and industry, including research and advancements in health, safety, security, environmental stewardship, and clean energy.

Despite ongoing COVID-19 challenges, noteworthy progress has been made to revitalize the Chalk River Laboratories. CNL is reducing operating risks by replacing aging infrastructure and building new dynamic facilities that attract experts, innovators and entrepreneurs. The objective is to enable targeted and strategic capital investments to grow the Laboratories' unique complement of expertise and capabilities while allowing the site to adapt to emerging and future opportunities in nuclear, health and energy-related fields.

The following projects are transforming the site into a modern, world-class nuclear science and technology campus.

Advanced Nuclear Materials Research Centre – combines the capabilities of existing but outdated facilities into a modern shielded facility and laboratory research complex that will support further advancements in nuclear science and technology, including SMRs and nuclear safety and security. Planning and detailed design activities are currently underway.

The Advanced Nuclear Materials Research Centre will support Canada's clean energy goals by providing services critical to the life extension and long-term reliability of existing reactors, including Canada's fleet of CANDU® nuclear power reactors and other designs from around the world. As the largest single capital investment in the revitalization of the Chalk River campus, the Centre will be a 10,000 square metre research complex that will accommodate 240 employees and consolidate key capabilities from aging facilities that are scheduled for decommissioning. The Centre will feature 12 new shielded cells that will enable post-irradiation examination of SMR and next-generation nuclear fuels, and glovebox facilities to support the development of advanced fuel fabrication concepts.

Science Collaboration Centre – this six-story office building will serve as a business hub and accommodate current and future CNL staffing projections; support process efficiencies, collaboration and business development; and enable potential expansion based on the future of work and programs at the Chalk River Laboratories. CNL completed the foundation in 2020-21, and construction is progressing on the main building. Doors are slated to open in 2023.

As noted in AECL's 2020-21 Annual Report, a new logistics facility (site entrance building) is in active use. CNL also completed the construction of a new maintenance facility. These conventional, or non-nuclear, builds are key to the transformation at Chalk River Laboratories.

In December 2021, the Algonquins of Ontario honoured AECL and CNL with a name for the new entrance building. Now known as the **Minwamon Building**, which means 'clear path' in the Algonquin language, the facility was officially inaugurated during a ceremony at the Chalk River campus. A testament to our shared understanding that everything and everyone is connected, Minwamon is a reminder of the importance of the Kichi-Sìbì and of our collective vision for building a positive future together. We recognize that we share an obligation to be responsible stewards of the lands and waters and are committed to establishing a lasting relationship with the Algonquins of Ontario as part of our journey towards healing and reconciliation.

The Minwamon Building is one of a series of new builds at the Chalk River campus with sustainability at the forefront of design and construction. Its main structural material is a new generation of mass timber products sourced from within Canada, a renewable resource that reduces our carbon footprint. It was also constructed using strategies that include sustainable site development, water and energy efficiency, and indoor environmental quality. In 2020, the building was named a recipient of the Ontario Wood Design Innovation Award, which recognizes new projects that push the limits of wood design.

Targets	Results
Complete and commission new non-nuclear facilities.	The Minwamon Building and Maintenance Facility were completed in 2020 and 2021, respectively, and construction is well underway on the Science Collaboration Centre.
Ensure stability in health, safety, security, and environmental industry standard metrics against industry standard benchmarks.	CNL's performance across industry standard health, safety and environment metrics has improved year-over-year, and for many metrics has met or exceeded industry standard benchmarks.
Implement actions to achieve CNL's objectives to manage operating costs while maintaining safety and the protection of the environment, with a view to ensuring a sustainable and science-focused organization in the long-term.	CNL continues to make progress in optimizing indirect costs while improving facilities and business services and responding to the ongoing COVID-19 pandemic.

Environmental Stewardship

Responsible decommissioning and radioactive waste management are necessary to clean up AECL sites, restore and care for the environment, and make way for new facilities and infrastructure that support further achievements and innovation in health, clean energy and environmental stewardship.

AECL's history encompasses seven decades of research in nuclear science and technology. Significant advancements in health, clean energy and nuclear safety and security have benefitted Canadians and people living around the globe. They have also generated radioactive waste that exists in various forms and locations across Canada.

These scientific activities and past waste management practices have also contaminated sites and building structures. To meet current environmental stewardship objectives, these now need to be decontaminated and decommissioned, and radioactive waste managed in a safe, cost-effective manner that meets or exceeds Canadian regulatory requirements and international best practices.

Furthermore, AECL is responsible for historic low-level waste at sites where the original owner no longer exists or where another party cannot be held liable and for which the Government of Canada has accepted responsibility. This includes the cleanup and safe long-term management of historic low-level radioactive waste in the municipalities of Port Hope and Clarington, in Ontario.

Working in collaboration with Indigenous nations and local communities, industry experts and key stakeholders, AECL and CNL are advancing decommissioning activities and looking at various solutions to address the unique challenges and opportunities associated with long-term radioactive waste disposal.

Environmental Remediation Projects

CNL is leading three projects that are currently undergoing Environmental Assessments through the Canadian Nuclear Safety Commission, including:

- Construction of a near surface disposal facility at the Chalk River Laboratories in Ontario.
- In situ disposal of the WR-1 research reactor at the Whiteshell Laboratories in Pinawa, Manitoba.
- In situ disposal of the Nuclear Power Demonstration reactor in Rolphton, Ontario.

Timelines for all three projects have been extended to consider and respond to questions, comments and concerns; incorporate Traditional Knowledge and other studies recommended by Indigenous peoples; accommodate additional technical and environmental studies requested by the Canadian Nuclear Safety Commission; and adjust aspects of the project, where possible, based on Indigenous, public, government and regulatory feedback.

We are steadfast in our commitment to establishing long-term relationships with Indigenous nations, governments and communities, and working together to determine a mutually acceptable path forward on all projects. This means supporting initiatives and mitigations that reduce and overcome harm at the community level, and finding collaborative ways to broaden, strengthen and formalize Indigenous participation in site-wide planning, design and operations.

These projects can only proceed with approval from the Canadian Nuclear Safety Commission, a process that includes input from other regulatory bodies, Indigenous peoples, local governments, stakeholders and the public. If approved, the Commission will continue to provide regulatory oversight of these projects and confirm, through compliance and verification activities, that the health, safety and security of people and the environment are protected at all times.

Waste Management and Disposal at the Chalk River Site

Existing radioactive waste continues to be safely stored at the Chalk River site in compliance with licence conditions. However, AECL must transition from temporary storage to long-term management solutions to advance decommissioning and environmental remediation activities at our sites. CNL has thus proposed to build a near surface disposal facility for AECL's low-level radioactive waste.

> Near surface disposal is an internationally accepted and proven method of low-level radioactive waste management, which employs an engineered, multi-layer protection facility to contain and isolate waste from the environment.

This proposed project would facilitate the disposal of the majority of AECL's low-level waste currently in interim storage, as well as that generated from building decommissioning, land and soil remediation, and ongoing research at the Chalk River Laboratories. It would also accommodate small amounts of waste from other Canadian producers such as hospitals and universities.

Since some of the waste at the Chalk River site has been stored for decades, CNL is characterizing existing inventories to confirm specific wastes and exact volumes and to enhance planning for transfer to the proposed near surface disposal facility. Longer than expected timelines have required development of expanded interim waste storage capacity so that building decontamination and demolition can continue without interruption.

Since 2016, CNL has been undertaking environmental and technical assessments and engaging Indigenous communities, local municipalities, provincial and federal regulatory bodies, environmental and community-based organizations, and the public to share information about near surface disposal, gather input, and respond to questions and concerns about the proposed project. CNL submitted a draft Environmental Impact Statement to the Canadian Nuclear Safety Commission in 2017 and has since incorporated changes to the scope of work and project design based on Traditional Knowledge studies, additional environmental and technical assessments, and ongoing feedback and recommendations from Indigenous nations, local communities, industry experts and key stakeholders.

CNL's final Environmental Impact Statement was deemed "complete" by the Canadian Nuclear Safety Commission in 2021. Part 1 of a two-part public hearing took place in February 2022, and Part 2 commenced on May 30, 2022. Outreach, engagement and collaboration with Indigenous nations, municipalities, stakeholders and the public will continue throughout the regulatory process.

Targets	Results
Develop a program for radioactive waste that does not currently have a disposition route (where there are no plans for disposal). This will be aligned with the work that the Nuclear Waste Management Organization is doing, as requested by the Minister of Natural Resources, to develop an Integrated Radioactive Waste Strategy for Canada.	AECL and CNL provided input as part of the Nuclear Waste Management Organization's engagement process related to the development of an Integrated Radioactive Waste Strategy for Canada. CNL continues to evaluate waste disposal options for AECL-owned intermediate-level waste.
Receive low-level radioactive waste from the Whiteshell Laboratories site for storage and/or disposal.	Additional storage capacity for low-level radioactive waste is in place, and transfers from other sites, primarily the Whiteshell Laboratories in Manitoba, are ongoing.
Receive regulatory approval to begin construction on the near surface disposal facility.	CNL's final Environmental Impact Statement and licensing documents, submitted in 2021, were deemed "complete" by the Canadian Nuclear Safety Commission. Part 1 of a two-part public hearing took place in February 2022; Part 2 commenced at the end of May 2022. A decision from the Commission is anticipated in winter 2022-23.

Environmental Restoration at the Chalk River Site

Decades of science and technology activities supporting advancements in health, clean energy and nuclear safety and security have generated radioactive and hazardous wastes that have been stored in dedicated waste management areas and carefully monitored over the years. These areas contain a significant amount of buried waste and contaminated soil that need to be removed to further protect the environment.

CNL is undertaking characterization activities to gain more information about the type and state of this waste and to advance environmental remediation planning for waste management areas. The volume of waste, however, is too large for temporary storage. Large-scale land and soil remediation depends on the availability of the proposed near surface disposal facility.

CNL is aiming to complete characterization and planning activities to allow remediation to proceed as soon as the proposed near surface disposal facility is operational.

Targets	Results
Complete characterization and remediation plans for various waste management areas at the Chalk River site.	Characterization is ongoing for waste management areas at the Chalk River site and CNL completed a remediation plan for one of these areas.

Decommissioning at the Chalk River Site

The Chalk River site was established in the mid-1940s and some buildings still standing today date back to that era. Most of these facilities are outdated and no longer needed for current operations. They also require energy and ongoing maintenance to meet safety and security protocols.

Since 2015, CNL has accelerated decommissioning at the Chalk River site, building Canadian expertise and experience in increasingly complex projects. To date, CNL has decontaminated and demolished a total of 111 redundant facilities and support buildings and completed work to prepare for further decommissioning in 2022-23. This is significantly reducing site costs and making way for safer, more sustainable world-class nuclear science and technology buildings.

Targets	Results
Demolish 10 buildings and structures.	CNL demolished 10 structures.

CNL demonstrated increasing expertise as they advanced decommissioning activities for Building 250 and the Building 200 series – the highest risk structures at the Chalk River site. CNL successfully removed large quantities of external asbestos siding and internal asbestos insulation from Building 250. With respect to the Building 200 series, CNL removed substantial amounts of internal piping and electrical equipment and initiated contaminated concrete remediation.

For the second year, COVID-19 required all active decommissioning field work to pause for several months, lengthening overall project timelines. CNL continues to adjust plans to recover schedules to the extent possible.

Management of Used Fuel and Repatriation of Highly-Enriched Uranium

Highly-enriched uranium originating in the United States was used at the Chalk River site both as reactor fuel and in the production of the key medical isotope molybdenum-99. This material requires high levels of security, as well as costly and complicated storage.

As part of the Materials Management and Minimization Initiative, AECL has been working with the United States Department of Energy and CNL to return Canada's inventory of highly-enriched uranium to the United States. To date, CNL repatriated close to 370 kilograms of highly-enriched uranium in the form of fuel rods and liquids, reducing risks and liabilities and contributing to Canada's non-proliferation and nuclear security objectives.

CNL is also advancing efforts to consolidate AECL's inventory of used fuel. This entails transferring used fuel, currently stored at the Whiteshell Laboratories and Gentilly-1 and Douglas Point sites, to the Chalk River Laboratories. Consolidating used fuel will increase safety and security and reduce costs while a permanent disposal solution is being developed by the Nuclear Waste Management Organization.

Targets	Results
Continue to investigate and pursue the disposition or repatriation of fresh and irradiated fuel material to further reduce liabilities for Canada.	CNL completed preparations to repatriate, over the next couple of years, fresh and irradiated highly-enriched and low-enriched uranium fuel and fuel material, and completed assessments on other Special Fissile Material.
Prepare plans and begin stakeholder and Indigenous engagement activities for the shipments of AECL used fuel to the Chalk River site.	Planning and stakeholder and Indigenous engagement activities are ongoing.

Closure of the Nuclear Power Demonstration Reactor Site

The Nuclear Power Demonstration reactor, located in Rolphton, Ontario, was Canada's first nuclear power reactor and the prototype for the CANDU reactor design. For 25 years, the reactor produced low-carbon energy and served as a training centre for nuclear operators and engineers from across Canada and around the world. Operations ended in 1987, and the first stages of decommissioning were completed shortly thereafter. The site has been in a safe shutdown state for the last 30 years.

As part of our efforts to advance decommissioning and address environmental responsibilities, AECL asked CNL to safely decommission and close the Nuclear Power Demonstration reactor site. The majority of the reactor's infrastructure is below ground and CNL's plan includes decommissioning remaining components in situ.

In situ disposal: A process where reactor components remain underground inside a thick concrete foundation that is filled with grout. Aboveground structures are removed, and the grouted structure is capped and covered with an engineered barrier. This process encases radioactivity in a stable, secure form to allow for continued decay. Long-term monitoring is in place until the end of the institutional control phase.

Since 2016, CNL has been undertaking environmental and technical assessments and engaging Indigenous communities, local municipalities, provincial and federal regulators, environmental and community-based organizations, and the public to share information, gather input, and respond to questions and concerns about the proposed project. CNL submitted a draft Environmental Impact Statement to the Canadian Nuclear Safety Commission in 2020 and has since integrated learnings from Traditional Knowledge studies and additional feedback received from Indigenous nations and technical representatives.

CNL submitted a revised draft in December 2021 for a completeness check, a key step in the ongoing federal review process. In January 2022, the Commission requested that CNL provide further revisions to information included in the draft. CNL is currently working with Indigenous nations, local communities and other stakeholders to adjust the submission based on regulatory feedback, and to ensure that interests and concerns are reflected in the revised draft and addressed by the project.

Once the completeness check has been achieved, the next step in the Environmental Assessment process is a technical review by Indigenous, federal and provincial representatives. CNL is endeavouring to submit a final Environmental Impact Statement in 2022.

Targets	Results
Submit the final Environmental Impact Statement for the proposed in situ decommissioning of the Nuclear Power Demonstration reactor.	CNL is currently working with Indigenous nations, local communities and other stakeholders to adjust the revised draft Environmental Impact Statement based on regulatory feedback and anticipates submitting the final document to the Canadian Nuclear Safety Commission in 2022. Public hearings are yet to be scheduled.

Port Hope Area Initiative

The Port Hope Area Initiative represents Canada's commitment to respond to community recommendations for the cleanup and safe long-term management of historic low-level radioactive waste in the municipalities of Port Hope and Clarington, Ontario. The initiative is one of Canada's largest environmental remediation efforts and involves two complex projects.

The Port Granby Project in Clarington focuses on the cleanup of historic low-level radioactive waste at an existing waste management facility located on the shoreline of Lake Ontario and its relocation to a new engineered aboveground containment mound less than a kilometer away. The waste, a product of former radium and uranium refining operations of Eldorado Nuclear in Port Hope, was deposited at the Port Granby site beginning in 1955 until the facility was closed in 1988.

The new facility was closed and capped in 2021 and is safely storing 1.3 million tonnes of low-level radioactive waste. It also includes a new dedicated wastewater treatment plant. CNL is restoring remediated lands and will transition to long-term maintenance and monitoring by spring 2023. This phase will continue for at least one hundred years.

Moving Forward in Healing and Partnership

AECL has been working in collaboration with the Mississaugas First Nations and the municipalities of Clarington and Port Hope to create a nature reserve on lands surrounding the Port Granby site. Located within the Johnson-Butler Purchase 1787-88, or "Gunshot Treaty," the lands are the traditional territory of the Michi Saagiig Anishinaabeg (Mississauga People), also signatories to the Williams Treaties of 1923.

Based on a community-driven proposal submitted to the Government of Canada in 2015, our work together is focused on establishing a collective vision for the nature reserve. This includes the development of a co-management model and the renewal of the original stewardship plan to integrate Indigenous knowledge, values and rights into planning, operating and caring for the lands and waters within the nature reserve.

The Port Hope Project involves the cleanup of historic low-level radioactive waste at an existing waste management facility, various large-scale industrial sites, and public and private properties throughout the municipality. Waste at the existing site is being excavated and placed in a new engineered aboveground containment mound constructed at the same location. Other historic low-level radioactive waste and specified industrial waste are being removed and safely transported to the new facility.

CNL continued to make considerable progress in Port Hope over the past year, including ongoing remediation of the harbour basin and completion of major upgrades to the water treatment facility at the harbour. CNL also completed several project site remediations, notably the Mill Street site and the Waterworks – East site. The most significant challenge remains the scope and execution of residential remediation activities.

In Port Hope, the number of residential properties requiring remediation has increased more than anticipated. After three years of remediation experience, comprehensive environmental and technical studies, and consistent feedback from community members, CNL submitted an application to the Canadian Nuclear Safety Commission to amend the Port Hope Area Initiative cleanup criteria; specifically, to increase the regulated thresholds for arsenic and uranium. These adjustments would continue to protect human health and the environment while minimizing disruption and unintended impacts to the community's built and natural character, including trees and local heritage features.

CNL and AECL are currently in the process of engaging federal and provincial regulators, the municipality, local Indigenous communities, and the public to move this application forward. Any change to the cleanup criteria will require approval from the Canadian Nuclear Safety Commission. If approved, the amendment would reduce the scope of the cleanup and the number of properties requiring remediation.

A public hearing is now scheduled for November 2022 to renew the site licence. An additional hearing will be required for proposed cleanup criteria changes and is expected to take place in spring 2023.

Targets	Results
Close and cap the Port Granby long-term waste management facility.	CNL completed the remediation of the Port Granby site in fall 2020 and closed and capped the new waste management facility in fall 2021.
Engage Indigenous communities and the municipality to explore options and gather feedback on potential changes to the cleanup criteria for the Port Hope Project.	Engagement is ongoing with Indigenous nations, the local municipality and community members. A public hearing regarding proposed changes to the cleanup criteria is anticipated to take place in spring 2023.

Closure of the Whiteshell Laboratories

The Whiteshell Laboratories, located in Pinawa, Manitoba, is the second largest site owned by AECL and operated by CNL. It was established in 1963 as a research laboratory, equipped with the largest organically cooled, heavy water moderated nuclear reactor in the world (the WR-1), a SLOWPOKE reactor and shielded hot cell facilities. The site includes a waste management area for radioactive waste that was generated by the research reactor and nuclear laboratories.

In 1998, the Government of Canada announced the closure of Whiteshell Laboratories; decommissioning has been underway since. Under the Government-owned, Contractor-operated model and with increased focus on environmental stewardship, AECL asked CNL to accelerate decommissioning and site closure. CNL's plan includes a proposal for in situ disposal of the WR-1 reactor. Site closure is targeted for 2027, approximately 30 years ahead of the previous schedule.

Since 2016, CNL has been undertaking environmental and technical assessments and engaging regulators, Indigenous nations, local municipalities, and the public to share information about in situ disposal, gather input, and respond to questions and comments about the proposed project.

CNL submitted a draft Environmental Impact Statement to the Canadian Nuclear Safety Commission in 2017 and has since worked to broaden understanding of municipal and Indigenous perspectives through collaborative capacity-building initiatives, Traditional Knowledge studies and community participation in site monitoring activities. Subsequent learnings and recommendations are driving updates and revisions to the Environmental Impact Statement. CNL plans to submit a final version of the document in 2022-23.

Targets	Results
Decommission the majority of buildings on the main campus by 2022.	CNL plans to complete most main campus decommissioning activities by the end of 2022.
Prepare the retrieval system for the standpipes and bunkers to start operations.	CNL plans to complete fabrication of the standpipes and bunkers waste retrieval system in 2022.
Submit the final Environmental Impact Statement for the proposed in situ disposal of the WR-1 reactor.	CNL plans to submit a final Environmental Impact Statement to the Canadian Nuclear safety Commission in 2022-23. Public hearings are yet to be scheduled.

For the most part, Indigenous, community and stakeholder engagement proceeded virtually this year, with several in person meetings taking place in accordance with public health guidelines. AECL continues to participate in a growing number of these activities to support capacity-building initiatives and to establish long-term relationships with local First Nations and the Red River Métis.

Enhancing Community Engagement and Participation

With support from CNL and AECL, the Sagkeeng Anicinabe First Nation's Community Liaison Committee held its first meeting in March 2022. Comprised of seven members – with equal gender representation among elders and youth – the committee will support and inform Sagkeeng's involvement in the decommissioning and closure of the Whiteshell Laboratories site, and how this can be accomplished in a manner that protects and promotes Sagkeeng rights and interests.

Low-Level Radioactive Waste Management Office

Working with CNL, AECL has been actively engaging Indigenous communities and local municipalities in northern Alberta and the Northwest territories to find safe, suitable, cost-effective, and accepted solutions for the remediation of sites located along the Northern Transportation Route.

Northern Transportation Route: Small quantities of historic low-level radioactive waste (in the form of uranium ore) are present in the Northwest Territories and northern Alberta. This material is a result of past handling and spillage at certain points along the Northern Transportation Route, a 2,200 km route made up of waterways and portages between Port Radium, Northwest Territories and Fort McMurray, Alberta. The material does not pose a risk to people or the environment in its current form; however, certain sites must be remediated to enable unrestricted future use.

This engagement continues to drive advancements in environmental remediation that respond to the unique needs of communities along the route. In 2021, CNL removed material in temporary storage sites at the Fort Smith landfill in the Northwest Territories and at Fort Fitzgerald in northern Alberta. The project team is now engaging local communities and Indigenous nations to plan for Phase 2 remediation activities at sites located in northern Alberta and the southeastern Northwest Territories.

Targets	Results
Engage local communities and Indigenous nations to agree on cleanup plans for the Northern Transportation Route.	Engagement is ongoing with local communities and Indigenous nations. CNL completed remediation of temporary storage sites at Fort Smith and Fort Fitzgerald.

Decommissioning of Prototype Reactors

Gentilly-1 and Douglas Point are shutdown prototype nuclear reactors owned by AECL and located in Bécancour, Quebec and Kincardine, Ontario, respectively. The reactors operated from the late 1960s to the mid-1980s to advance understanding of boiling light-water reactors (Gentilly-1) and steam condenser power reactors (Douglas Point). Both reactors are in a safe shutdown state pending full decommissioning.

To reduce storage and surveillance costs associated with this aging infrastructure, CNL is performing approved hazard reduction activities, such as asbestos and bulk waste removal, and preparing plans to advance decommissioning. In 2021, the Canadian Nuclear Safety Commission amended CNL's operating licence to include decommissioning of specific non-nuclear buildings at the Douglas Point site. Engagement with Indigenous and local communities is ongoing and/or planned in relation to both sites.

Targets	Results
Demolish supporting and/or redundant facilities at the Douglas Point reactor.	CNL removed asbestos and isolated all services in specific non-nuclear buildings in preparation for demolition slated in 2022-23.
Review options for Douglas Point and Gentilly-1 for transport of fuel to the Chalk River Laboratories.	CNL continues to review and consider options with respect to the transport of fuel to Chalk River.

Third-Party Waste

AECL's sites and waste management capabilities are unique in Canada. Historically, AECL has accepted small amounts of radioactive waste from Canadian facilities. This allows hospitals and universities, for example, to advance research in medical and other scientific fields and improve the lives of Canadians.

Under the Government-owned, Contractor-operated model, CNL continues to provide these services to third parties, including the handling, storage and disposal of radioactive waste. Activities are delivered on a commercial basis and do not require government funding.

Management Discussion and Analysis

Forward Looking Statements

This Management Discussion and Analysis has been reviewed by AECL's Audit Committee and approved by AECL's Board of Directors. It provides comments on the performance of AECL for the year ended March 31, 2022 and should be read in conjunction with the financial statements and accompanying notes included in this Annual Report.

This Management Discussions and Analysis contains forward-looking statements with respect to AECL based on assumptions that management considers reasonable as at June 21, 2022, when AECL's Board of Directors approved this document. These forward-looking statements, by their nature, necessarily involve risks and uncertainties that could cause future results to differ materially from current expectations. We caution the reader that the assumptions regarding future events, many of which are difficult to predict, may ultimately require revision.

Organization

AECL is an agent Crown corporation reporting to Parliament through the Minister of Natural Resources. AECL's operations are funded through Parliamentary appropriations and third-party revenues which result from commercial work that CNL undertakes, as a contractor of AECL, principally in the areas of nuclear science and technology as well as the sale of heavy water.

AECL operations include all of the activities associated with the management and oversight of the Government-owned, Contractor-operated model, including Environmental Stewardship activities as well as the Nuclear Laboratories. In this respect, AECL sets priorities for CNL, oversees the contract and assesses CNL's performance. AECL also supports the Government of Canada's development of nuclear policy.

Risks and Opportunities

AECL carefully plans for and manages risks as part of sound risk management practices. Due to its oversight role, AECL's risk management approach goes beyond the internal organizational risk and includes oversight of CNL risks. Through ongoing communication between AECL and CNL, plans and activities are monitored to mitigate risks as necessary. This section highlights some risks and opportunities that could ultimately impact financial results.

COVID-19 Pandemic: The ongoing pandemic presents risks to the safety and security of personnel and the sites, as well as risk of financial impacts to AECL and CNL. To mitigate the safety and security risks, AECL and CNL are following comprehensive plans for recovery that reflect government and health authority guidance, and provide for COVID-19 countermeasures, including changes to workspaces and work procedures to maintain physical distancing, personal protective equipment and training, and appropriate restrictions on travel, amongst other things. CNL and AECL are closely monitoring the financial impacts of COVID-19, including impacts to revenue and cash flow in 2021-22, as well as longer-term impacts to the efficiency of work and project costs and schedules.

Human Resources: AECL is a small organization that relies on a small complement of highly trained and experienced personnel, many of whom bring experience in the management of similar Government-owned, Contractor-operated arrangements, both from a government and contractor perspective. AECL's goal is to maintain the necessary expertise and capabilities to oversee the Government-owned, Contractor-operated contract and play an appropriate oversight and challenge function to achieve value for money for Canada. Given AECL's small size, an ongoing challenge is to adapt to fluctuating resourcing requirements across different areas of the organization and backfill those on short-term leave where appropriate. To manage this, AECL strives to be adaptable and flexible, deploying a handful of third-party service contracts to bolster resourcing when and where required and cross-training employees when opportunities arise. A succession plan has also been developed and is reviewed regularly. Furthermore, AECL regularly reviews its total compensation package to remain competitive amongst similar employers nationally and internationally.

Contractor Performance: As AECL relies on a private-sector contractor to execute scope related to its mandate, an inherent risk is failure of the contractor to execute and perform. To mitigate this risk and drive the appropriate behaviour, the contract with CNL is carefully structured to include several mechanisms for AECL to track CNL's performance. On an annual basis, AECL sets priorities supported by achievable stretch targets to drive value for Canada. Ongoing evaluation of the contractor throughout the year provides AECL the opportunity to highlight strengths and weaknesses and the contractor the opportunity to correct where needed.

Costs to Operate Chalk River Laboratories: The shutdown of the National Research Universal reactor in March 2018 has created cost pressures. The combination of lost revenue from the activities of the reactor (including isotope sales) and diminishing funding for the National Research Universal reactor, have created funding pressures in terms of corporate support and site operating costs that must be borne by the remaining programs. This is further compounded by the cost pressures created by the COVID-19 pandemic. While CNL is making progress by lowering indirect costs to address the cost pressures, it continues to look at all options to lower costs and manage the cost pressures with a view to ensuring a sustainable organization in the long-term, while remaining protective of the environment and health and safety.

Major Waste Disposal Projects: Part of AECL's core mandate is environmental stewardship and remediation of sites for the benefit of future generations. Currently, three important projects which are aimed at reducing environmental risks and protecting the environment are at various stages of environmental assessment:

- Construction of a near surface disposal facility at the Chalk River Laboratories;
- In situ decommissioning of the WR-1 research reactor at the Whiteshell site; and
- In situ decommissioning of the Nuclear Power Demonstration facility in Rolphton, Ontario.

The regulatory environment, as well as engagement of the public and Indigenous communities are key to the success of these projects. Already, timelines have been revised to ensure that all comments and concerns from the public and Indigenous communities have been considered for all three projects, as well as requests from the Canadian Nuclear Safety Commission to provide additional technical studies. As a result, additional time has been needed to build the safety case for each project. Overall, while these schedule changes have impacted CNL's ability to commence large-scale cleanup and remediation activities at AECL sites, they are allowing for more public and Indigenous engagement, and the development of additional studies in support of the projects' safety cases.

Indigenous Engagement and Consultation: Indigenous reconciliation continues to be a priority. There are increasing needs for support for capacity to engage, Traditional Knowledge studies, and participation in formal regulatory processes, as well as environmental monitoring operations. CNL continues its outreach activities across all sites. AECL is engaged with Indigenous communities in building meaningful and mutually beneficial relationships, recognizing that these take time. AECL and CNL are working closely together and are looking for more ways to increase participation, collaboration and mutual benefit with Indigenous communities.

Public Relations: In order to be successful in delivering its mandate, AECL depends on the support of key stakeholders, including government and the public. AECL is continually looking for relationship building opportunities, as well as innovative and effective means to reach its audiences. Working with CNL, AECL endeavours, when communicating with the public, to use clear messaging and a variety of communications tools to more effectively reach key audiences.

Cybersecurity: Cybersecurity is top of mind at AECL. AECL's approach to cybersecurity is two-fold: cybersecurity within its own organization and CNL's cybersecurity efforts to protect AECL's information assets as part of the Government-owned, Contractor-operated contract. AECL and CNL work to continuously improve cybersecurity capabilities, with a focus on training and adaptation.

Financial Review

	March 31	
($ millions)	**2022**	2021
	$	$
Revenues		
Parliamentary appropriations	**1,009**	941
Commercial revenue	**137**	95
Interest income	**3**	4
Other proceeds	**20**	–
	1,169	1,040
Expenses		
Cost of sales	**89**	71
Operating expenses	**99**	71
Contractual expenses	**240**	213
Decommissioning, waste management and contaminated sites expenses	**1,375**	678
	1,803	1,033
(Deficit) surplus for the year	**(634)**	7

Parliamentary Appropriations

The Government of Canada provides funding for AECL to advance its priorities and deliver on its mandate. AECL recognized $1,009 million of Parliamentary appropriations in fiscal year 2021-22, an increase of $68 million compared to the prior year. The increase is largely a result of increased activities in decommissioning, waste management and remediation of contaminated sites.

Commercial Revenue

In 2021-22, revenue was $137 million, an increase from $95 million in 2020-21. Revenue included technology sales and research and development activities performed by CNL for commercial customers as well as heavy water sales. The reported increase can be attributed to the COVID-19 pandemic, as work was delayed and activity was reduced in the prior year, as well as an increase in heavy water sales.

Interest Income

Interest income is earned on cash, short-term investments from appropriations and investments held in trust. Income earned in the year is comparable to the prior period.

Other Proceeds

Other proceeds relate to commercial settlements recorded during the year.

Cost of Sales

Cost of sales is higher than the prior year as a result of increased revenues as discussed above. Cost of sales as a percentage of revenue decreased compared to the prior period due to some lower margin research and development work and additional costs for COVID-19 related efforts for increased planning and rescheduling in the prior period.

Operating Expenses

Operating expenses are largely comprised of AECL's oversight expenses and amortization of tangible capital assets. There were operating expenses of $99 million in 2021-22 compared to $71 million in 2020-21. The increase is due primarily to commercial settlements paid during the year of $20 million, as well as write-offs in the current year of construction in progress totalling $6 million, compared to $1 million in the prior year.

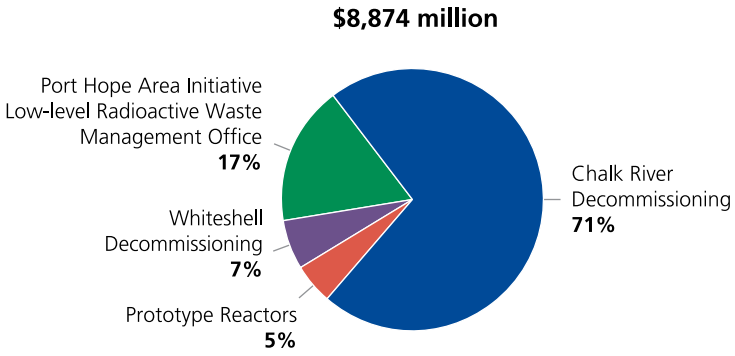
Contractual Expenses

AECL delivers its mandate through a long-term contract with CNL for the management and operation of its sites. CNL expenditures are reported by AECL as Contractual expenses. Expenses in this category for 2021-22 total $240 million, compared to $213 million in 2020-21. The variance with the prior year is largely a result of increased spending on nuclear science and technology activities in the current year.

Decommissioning, Waste Management and Contaminated Sites Expenses

Decommissioning, waste management and contaminated sites expenses consist of financial expenses and the revaluation (gain) loss on these reported liabilities. Financial expenses reflect the increase in the net present value (accretion of discount) of these reported liabilities. The reported $697 million increase in 2021-22 is primarily a result of increases in various project estimates compared to the prior year, specifically for the Port Hope Area Initiative. The decommissioning and contaminated sites liability is made up of a collection of estimates which provide a projected value of the cost of undertaking decommissioning, remediation and waste management projects, some far into the future. As projects near, they are examined in more detail to plan for execution, which can lead to increases in estimates. This is due to the fact that these projects are related to legacy sites, which brings a high level of uncertainty around sites, waste and contamination levels. As work is planned for and undertaken, risks may materialize which leads to increased costs. This is typical of legacy nuclear research sites, and consistent with what is experienced in other similar sites in other countries such as the United States and United Kingdom.

Decommissioning and Contaminated Sites Liability 2021-22



Surplus (Deficit) for the Year

Consistent with AECL's financial reporting framework, appropriations are recognized as revenue when received in a given year and may be greater or less than the reported expenditures for the same year. For instance, amounts received to fund decommissioning, waste management and contaminated sites expenditures are recorded as Parliamentary appropriations revenue in the current year while the related expenditures are drawn down from the associated liabilities previously recorded on the Statement of Financial Position. With respect to tangible capital assets, Parliamentary appropriations revenue includes amounts received in the year to fund the purchase and construction of these assets while the related expenditures are capitalized; therefore, the reported operating expenses include only the amortization of existing tangible capital assets. The excess of appropriations over the related expenses reported has been more than offset by the expenses associated with the change in contaminated sites estimates.

Outlook

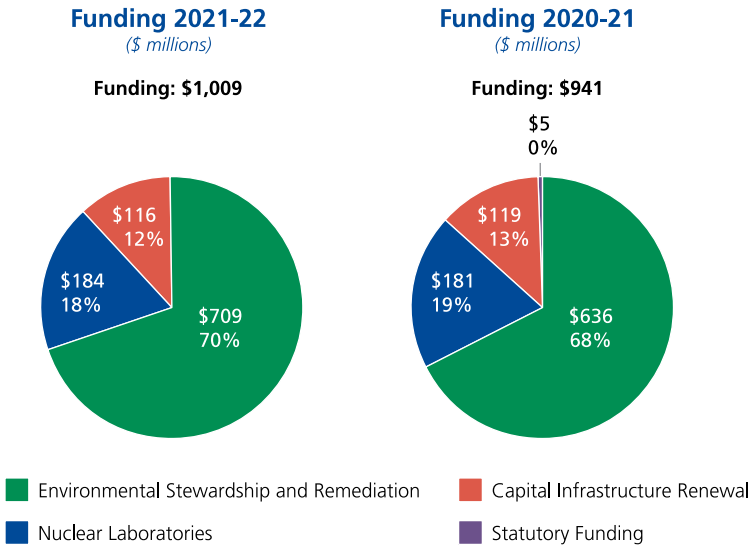
AECL will continue to deliver on its commitments based on its 2022-23 Corporate Plan. As part of the implementation of the Government-owned, Contractor-operated model, AECL has asked CNL to accelerate activities to address AECL's environmental responsibilities. This includes, for example, proposing solutions for AECL's low-level radioactive waste (for which CNL is proposing to build a near surface disposal facility at the Chalk River Laboratories), as well as the acceleration of the decommissioning and closure of the Whiteshell Laboratories and Nuclear Power Demonstration reactor (located in Manitoba and Ontario, respectively). There is also a focus on renewing the site infrastructure at the Chalk River Laboratories, including new and renewed science facilities and conventional (or non-nuclear) support buildings, that will allow CNL to grow its nuclear science and technology mission and serve the needs of the federal government as well as industry.

Funding

Total funding recognized in 2021-22 for operating and capital activities was $1,008 million (2020-21: $941 million).

The 2021-22 funding included:

- $184 million (2020-21: $181 million) to support nuclear science and technology activities as well as ongoing safe operations at the Chalk River Laboratories.
- $709 million (2020-21: $636 million) for environmental remediation, decommissioning and waste management activities at the Chalk River and Whiteshell sites and environmental remediation programs primarily as part of the Port Hope Area Initiative.
- $116 million (2020-21: $119 million) for capital infrastructure renewal at the Chalk River Laboratories.
- $nil (2020-21: $5 million) of statutory funding for activities associated with addressing matters associated with AECL's former commercial division.



Results Compared to 2021-22 Corporate Plan

($ millions)	**2022 Actual**	2022 Corporate Plan
	$	$
Parliamentary appropriations	**1,009**	1,189
Commercial revenue	**137**	91
Operating expenses	**100**	64
Contractual expenses	**240**	249
Decommissioning, waste management and contaminated sites expenses	**1,375**	278
(Deficit) surplus	**(634)**	630

AECL reported a deficit of $634 million compared to a planned surplus of $630 million. This variance is mostly related to the above referenced increases in project estimates for the decommissioning and waste management provision and contaminated sites liability, which also explains the variance in Decommissioning, waste management and contaminated sites expenses compared to plan.

Cash Flow and Working Capital

	March 31	
($ millions)	**2022**	2021
	$	$
Cash provided by operating transactions	**286**	203
Cash applied to capital transactions	**(112)**	(124)
Cash applied to investing transactions	**(57)**	(14)
Increase in cash	**117**	65
Balance at beginning of the year	**145**	80
Balance at end of the year	**262**	145

Operating Transactions

Operating transactions resulted in a net cash inflow of $286 million compared to a net inflow of $203 million in 2020-21. This variance is mainly due to receiving the final appropriations for Q4 before the end of year. In the prior year this was a receivable at year-end.

Capital Transactions

The $112 million cash used in capital transactions in 2021-22 was lower than the $124 million in the prior year. The decrease is primarily due to increased spending in the prior year toward new Chalk River site infrastructure.

Investing Transactions

The $57 million cash used in investing transactions in 2021-22 was higher than the $14 million in the prior year. The increase is primarily due to increased investment in short-term investments during the year.

Overall, AECL's March 31, 2022 closing cash position increased by $117 million to $262 million from the previous year's balance of $145 million.

Highlights of the Statement of Financial Position

	March 31, 2022	March 31, 2021	Variance in $	Variance by %
($ millions)				
	$	$	$	%
Financial Assets	**597**	561	36	6
Liabilities	**9,117**	8,381	736	9
Non-Financial Assets	**849**	787	62	8
Accumulated Deficit	**(7,671)**	(7,033)	(638)	9

The increase in Financial Assets of $36 million is largely a result of the increased cash and short-term investments balance at the end of the year, partially offset by a decrease in appropriations receivable.

The increase in Liabilities of $736 million can be attributed primarily to the increase in the contaminated sites liability as a result of changes in project estimates, partly offset by a decrease related to liabilities settled on the provision.

The increase in Non-Financial Assets of $62 million is mainly a result of spending toward tangible capital assets during the year.

Use of Parliamentary Appropriations

AECL receives its funding primarily through Parliamentary appropriations. The appropriations are drawn down based on quarterly cash flow projections and may not necessarily match the timing of expenses reported in the Statement of Operations and Accumulated Deficit. AECL records Parliamentary appropriations received in the year as revenue in the Statement of Operations and Accumulated Deficit. Refer to Note 15 of the financial statements for a reporting on how appropriations received were used during the period.

Five-Year Financial Summary

Unaudited

	2022	2021	2020	2019	2018
($ millions)					
	$	$	$	$	$
Parliamentary appropriations					
Operating	**893**	817	753	755	707
Capital	**116**	119	113	71	119
Statutory	**–**	5	2	3	–
	1,009	941	868	829	826
Operations					
Commercial revenue	**138**	95	112	109	88
Interest income	**3**	4	6	5	4
Other proceeds	**20**	–	50	–	–
Decommissioning, waste management and contaminated sites expenses	**(1,375)**	(678)	(955)	(713)	(295)
Operating, contractual and other expenses	**(428)**	(355)	(400)	(409)	(489)
(Deficit) surplus	**(634)**	7	(319)	(179)	134
Financial position					
Cash	**262**	145	80	62	38
Long-term disposal of waste fund	**30**	48	43	31	26
Appropriations receivable	**–**	123	100	69	104
Inventories held for resale	**94**	129	151	177	193
Tangible capital assets	**849**	787	716	665	644
Due to Canadian Nuclear Laboratories	**190**	176	164	100	117
Decommissioning and waste management provision and Contaminated sites liability	**8,874**	8,152	8,062	7,669	7,462
Other					
Number of employees	**46**	45	45	43	42

* Certain amounts have been reclassified to conform to the 2022 Financial Statement presentation.

Financial Statements

Management's Responsibility

The financial statements, all other information presented in this Annual Report and the financial reporting process are the responsibility of management. These statements have been prepared in accordance with Public Sector Accounting Standards and include estimates based on the assumptions, experience and judgment of management. Financial information presented elsewhere in this Annual Report is consistent with the financial statements.

AECL maintains books of account, financial and management control, and information systems, together with management practices designed to provide reasonable assurance that reliable and accurate financial information is available on a timely basis, that assets are safeguarded and controlled, that resources are managed economically and efficiently in the attainment of corporate objectives, and that operations are carried out effectively.

These systems and practices are also designed to provide reasonable assurance that transactions are in accordance with Part X of the *Financial Administration Act* (FAA) and its regulations, the *Canada Business Corporations Act,* and the articles, by-laws and policies of AECL. AECL has met all reporting requirements established by the FAA including submission of a Corporate Plan, an operating budget, a capital budget and this Annual Report. AECL's internal auditor has the responsibility of assessing the management systems and practices of AECL. AECL's independent auditor, the Auditor General of Canada, conducts an audit of the financial statements of AECL and reports on its audit to the Minister of Natural Resources.

The Board of Directors is responsible for ensuring that management fulfills its responsibility. To accomplish this, the Board has two standing committees: the Audit Committee and Human Resources and Governance Committee. The Audit Committee, composed of independent directors, has a mandate for overseeing the independent audit, directing the internal audit function and assessing the adequacy of AECL's business systems, practices and financial reporting. The Audit Committee meets with management, the internal auditor and independent auditor on a regular basis to discuss significant issues and findings, in accordance with their mandate.

The independent auditor and internal auditor have unrestricted access to the Audit Committee, including without management's presence. The Audit Committee reviews the financial statements and the Management's Discussion and Analysis report with both management and the independent auditor before they are approved by the Board of Directors and submitted to the Minister of Natural Resources. The Board of Directors, on the recommendation of the Audit Committee, approves the financial statements.

Fred Dermarkar
President and Chief Executive Officer

June 21, 2022

Thomas Assimes
Chief Financial Officer

June 21, 2022

Office of the Auditor General of Canada
Bureau du vérificateur général du Canada

INDEPENDENT AUDITOR'S REPORT

To the Minister of Natural Resources

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of Atomic Energy of Canada Limited (AECL), which comprise the statement of financial position as at 31 March 2022, and the statement of operations and accumulated deficit, statement of remeasurement gains and losses, statement of change in net debt and statement of cash flows for the year then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of AECL as at 31 March 2022, and the results of its operations, its remeasurement gains and losses, changes in its net debt, and its cash flows for the year then ended in accordance with Canadian public sector accounting standards.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the *Auditor's Responsibilities for the Audit of the Financial Statements* section of our report. We are independent of AECL in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Other Information

Management is responsible for the other information. The other information comprises the information included in the annual report, but does not include the financial statements and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing AECL's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate AECL or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing AECL's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of AECL's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on AECL's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause AECL to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the business activities within AECL to express an opinion on the financial statements. We are responsible for the direction, supervision, and performance of the audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Report on Compliance with Specified Authorities

Opinion

In conjunction with the audit of the financial statements, we have audited transactions of Atomic Energy of Canada Limited coming to our notice for compliance with specified authorities. The specified authorities against which compliance was audited are Part X of the *Financial Administration Act* and regulations, the *Canada Business Corporations Act*, the articles and by-laws of Atomic Energy of Canada Limited, and the directive issued pursuant to section 89 of the *Financial Administration Act*.

In our opinion, the transactions of Atomic Energy of Canada Limited that came to our notice during the audit of the financial statements have complied, in all material respects, with the specified authorities referred to above. Further, as required by the *Financial Administration Act*, we report that, in our opinion, the accounting principles in Canadian public sector accounting standards have been applied on a basis consistent with that of the preceding year.

Responsibilities of Management for Compliance with Specified Authorities

Management is responsible for Atomic Energy of Canada Limited's compliance with the specified authorities named above, and for such internal control as management determines is necessary to enable Atomic Energy of Canada Limited to comply with the specified authorities.

Auditor's Responsibilities for the Audit of Compliance with Specified Authorities

Our audit responsibilities include planning and performing procedures to provide an audit opinion and reporting on whether the transactions coming to our notice during the audit of the financial statements are in compliance with the specified authorities referred to above.

Sana Garda, CPA, CA
Principal
for the Auditor General of Canada

Ottawa, Canada
21 June 2022

Statement of Financial Position

As at March 31

	Notes	2022	2021
(thousands of Canadian dollars)			
		$	$
Financial assets			
Cash		**262,095**	145,097
Short-term investments	3	**71,707**	14,060
Long-term disposal of waste fund	4	**29,890**	48,030
Investments held in trust	5	**73,858**	58,315
Trade and other receivables	6	**65,436**	43,342
Appropriations receivable	15	**–**	122,601
Inventories held for resale	7	**93,893**	129,239
		596,879	560,684
Liabilities			
Accounts payable and accrued liabilities	8	**38,158**	37,029
Employee future benefits	9	**14,557**	16,211
Due to Canadian Nuclear Laboratories		**190,280**	175,620
Decommissioning and waste management provision	10	**7,342,841**	7,362,192
Contaminated sites liability	11	**1,531,318**	790,190
		9,117,154	8,381,242
Net debt		**(8,520,275)**	(7,820,558)
Non-financial assets			
Tangible capital assets	12	**848,730**	786,819
Prepaid expenses		**143**	444
		848,873	787,263
Accumulated deficit		**(7,671,402)**	(7,033,295)
Accumulated deficit is comprised of:			
Accumulated operating deficit		**(7,668,887)**	(7,034,916)
Accumulated remeasurement (losses) gains		**(2,515)**	1,621
		(7,671,402)	(7,033,295)
Commitments	13		
Contingent liabilities	14		

The accompanying notes are an integral part of these financial statements

Approved on behalf of the Board

Martha Tory, *Director*

Fred Dermarkar, *President and Chief Executive Officer*

Statement of Operations and Accumulated Deficit

For the year ended March 31

	Notes	2022 Budget	**2022**	2021
(thousands of Canadian dollars)				
		$	**$**	$
Revenues				
Parliamentary appropriations	15	1,188,800	**1,008,769**	940,741
Commercial revenue		91,000	**137,217**	95,089
Interest income		4,000	**3,255**	3,647
Other proceeds		–	**20,050**	–
		1,283,800	**1,169,291**	1,039,477
Expenses				
Cost of sales		63,700	**88,584**	71,140
Operating expenses		63,643	**99,793**	71,173
Contractual expenses	16	248,785	**239,758**	212,666
Decommissioning, waste management and contaminated sites expenses		277,708	**1,375,127**	677,944
	17	653,836	**1,803,262**	1,032,923
Surplus (deficit) for the year		629,964	**(633,971)**	6,554
Accumulated operating deficit, beginning of year		(7,034,916)	**(7,034,916)**	(7,041,470)
Accumulated operating deficit, end of year		(6,404,952)	**(7,668,887)**	(7,034,916)

The accompanying notes are an integral part of these financial statements

Statement of Remeasurement Gains and Losses

For the year ended March 31

	2022	2021
(thousands of Canadian dollars)		
	$	$
Accumulated remeasurement gains, beginning of year	**1,621**	1,801
Remeasurement (losses) gains arising during the year		
Unrealized (losses) gains on Investments held in trust	**(4,254)**	499
Reclassifications to the Statement of Operations and Accumulated Deficit		
Realized losses (gains) on Investments held in trust	**118**	(679)
Net remeasurement losses for the year	**(4,136)**	(180)
Accumulated remeasurement (losses) gains, end of year	**(2,515)**	1,621

The accompanying notes are an integral part of these financial statements

Statement of Change in Net Debt

For the year ended March 31

	Notes	2022 Budget	**2022**	2021
(thousands of Canadian dollars)				
		$	**$**	$
Surplus (deficit) for the year		629,964	**(633,971)**	6,554
Tangible capital assets				
Acquisition of tangible capital assets	12	(151,846)	**(116,359)**	(118,843)
Amortization of tangible capital assets	12	45,233	**48,816**	47,756
Write-down of tangible capital assets	12	–	**5,719**	1,106
Other changes	12	–	**(87)**	(806)
		(106,613)	**(61,911)**	(70,787)
Non-financial assets				
Changes in prepaid expenses		–	**301**	8
Net remeasurement losses for the year		–	**(4,136)**	(180)
Decrease (increase) in net debt		523,351	**(699,717)**	(64,405)
Net debt, beginning of year		(7,820,558)	**(7,820,558)**	(7,756,153)
Net debt, end of year		(7,297,207)	**(8,520,275)**	(7,820,558)

The accompanying notes are an integral part of these financial statements

Statement of Cash Flows

For the year ended March 31

	2022	2021
(thousands of Canadian dollars)		
	$	$
Operating transactions		
Cash receipts from Parliamentary appropriations	**1,131,370**	918,190
Cash receipts from customers and other sources	**139,272**	146,512
Cash paid to suppliers	**(317,089)**	(258,383)
Cash paid to employees	**(12,386)**	(12,501)
Cash paid for decommissioning, waste management and contaminated sites activities	**(653,350)**	(587,668)
Cash designated for future waste management and disposal activities	**(2,766)**	(5,053)
Interest received	**1,375**	1,826
Cash provided by operating transactions	**286,426**	202,923
Capital transactions		
Acquisition of tangible capital assets	**(111,995)**	(123,677)
Cash applied to capital transactions	**(111,995)**	(123,677)
Investing transactions		
Cash invested in short-term investments	**(57,433)**	(14,000)
Cash applied to investing transactions	**(57,433)**	(14,000)
Increase in cash	**116,998**	65,246
Cash, beginning of year	**145,097**	79,851
Cash, end of year	**262,095**	145,097

The accompanying notes are an integral part of these financial statements

Notes to the Financial Statements

For the year ended March 31, 2022

1. General Information

Atomic Energy of Canada Limited (AECL) is a federal Crown corporation whose mandate is to enable nuclear science and technology and manage the Government of Canada's radioactive waste and decommissioning activities. Since 2015, AECL has been delivering its mandate through a Government-owned, Contractor-operated model, whereby Canadian Nuclear Laboratories (CNL), a private-sector organization, operates and manages AECL's sites pursuant to a contractual arrangement. The expected impact of the COVID-19 pandemic on AECL's results has been reflected in the 2021-22 budget figures presented above, other than $39.1 million of special funding that AECL has requested for COVID-19 relief.

AECL was incorporated in 1952 under the provisions of the *Canada Corporations Act* (and continued in 1977 under the provisions of the *Canada Business Corporations Act*), pursuant to the authority and powers of the Minister of Natural Resources under the *Nuclear Energy Act*.

In July 2015, AECL was issued a directive (P.C. 2015-1111) pursuant to section 89 of the *Financial Administration Act* to align its travel, hospitality, conference and event expenditure policies, guidelines and practices with Treasury Board policies, directives and related instruments on travel, hospitality, conference and event expenditures in a manner that is consistent with its legal obligations, and to report on the implementation of this directive in AECL's next Corporate Plan. As at March 31, 2022, AECL remains compliant with the requirements of the directive.

AECL is a Schedule III Part I Crown corporation under the *Financial Administration Act* and an agent of Her Majesty in Right of Canada. As a result, AECL's liabilities are ultimately liabilities of Her Majesty in Right of Canada. AECL receives funding from the Government of Canada and is exempt from income taxes in Canada.

AECL has submitted its 2022-2023 to 2026-2027 Corporate Plan to the Treasury Board for approval. The Corporate Plan is aligned with the direction provided by AECL's sole shareholder, the Government of Canada, and reflects AECL's plans and priorities to be delivered under the Government-owned, Contractor-operated model.

2. Significant Accounting Policies

a) Basis of Accounting

These financial statements have been prepared in accordance with Canadian Public Sector Accounting Standards (PSAS) established by the Public Sector Accounting Board (PSAB), and reflect the policies below.

Both financial and non-financial assets are reported on the Statement of Financial Position. Non-financial assets are normally employed to provide future services, and are charged to expense through amortization or upon utilization. Non-financial assets are not taken into consideration when determining the net debt (or net financial assets), but rather are added to the net debt (or net financial assets) to determine the accumulated surplus (deficit).

Measurement Uncertainty

The preparation of the financial statements in accordance with PSAS requires management to make estimates and assumptions that affect the reported amounts of financial assets, liabilities and non-financial assets at the date of the financial statements, and the reported amounts of revenue and expenses during the reporting period. Items requiring the use of significant estimates and assumptions include those related to the fair value of financial instruments, useful life and write-down of tangible capital assets, employee future benefits, contingent liabilities and provisions including the decommissioning and waste management provision and contaminated sites liability. Estimates and assumptions are based on the best information available at the time of preparation of the financial statements and are reviewed annually to reflect new information as it becomes available. Where actual results differ from these estimates and assumptions, the impact will be recorded in future periods when the difference becomes known.

AECL has considered the impact of the COVID-19 pandemic on the valuation of its assets and has determined that no impairments are required. AECL has also considered the impact of the pandemic on the valuation of its Decommissioning and waste management provision and Contaminated sites liability, and where impacts were known, changes to the provision have been made.

Budget Figures

The 2021-22 budget is reflected in the Statement of Operations and Accumulated Deficit and the Statement of Change in Net Debt. Budget data for 2021-22 presented in these financial statements is based upon the 2021-22 projections and estimates contained within the 2021-22 to 2025-26 Corporate Plan.

b) Foreign Currency Translation

Transactions denominated in a foreign currency are translated into Canadian dollars at the exchange rate in effect at the date of the transaction. Monetary assets and liabilities, not denominated in the functional currency of AECL and outstanding at the statement of financial position date, are adjusted to reflect the exchange rate in effect at that date. Realized exchange gains and losses arising from the translation of foreign currencies are included in the Statement of Operations and Accumulated Deficit.

c) Financial Instruments

AECL's Cash, Short-term investments, Long-term disposal of waste fund, Trade and other receivables, Accounts payable and accrued liabilities, and Due to Canadian Nuclear Laboratories are measured at amortized cost. Transaction costs are a component of cost for financial instruments measured using cost or amortized cost.

AECL has elected to measure Investments held in trust at fair value, to correspond with how they are evaluated and managed. These financial instruments are not reclassified for the duration of the period they are held. Unrealized gains and losses from changes in the fair value of financial instruments are recognized in the Statement of Remeasurement Gains and Losses. Upon settlement, the cumulative gain or loss is reclassified from the Statement of Remeasurement Gains and Losses and recognized in the Statement of Operations and Accumulated Deficit. Transaction costs are expensed for financial instruments measured at fair value.

Interest attributable to financial instruments is reported in the Statement of Operations and Accumulated Deficit.

d) Short-term Investments

Short-term investments consist primarily of term deposits and are available on demand with one month notice.

Interest earned is included in Interest income in the Statement of Operations and Accumulated Deficit.

e) Long-term Disposal of Waste Fund

Cash has been invested in a fund to cover the costs of the future disposal of radioactive waste generated starting in 2015. This fund, established and maintained by AECL, is intended to provide funding for the future disposal costs associated with radioactive waste generated from ongoing operations at AECL sites.

Interest earned is included in Interest income in the Statement of Operations and Accumulated Deficit.

f) Investments Held in Trust

The Trust Fund is a special fund established pursuant to the *Nuclear Fuel Waste Act* to finance the implementation of an approach for the long-term management of nuclear fuel waste. Management has determined that AECL, in substance, controls the Trust Fund. Accordingly, the Trust Fund has been consolidated into AECL's financial statements.

Interest earned is included in Interest income in the Statement of Operations and Accumulated Deficit.

g) Inventory

Heavy water and mechanical seals are measured at the lower of cost and net realizable value. Cost includes amounts for improvements to prepare the assets for sale. Net realizable value is the estimated selling price in the ordinary course of business, less the estimated costs of completion and selling expenses. Where cost exceeds net realizable value, a write-down is recorded.

h) Employee Future Benefits

AECL provides employee benefits such as pension benefits, voluntary termination compensation benefits and other benefits, including continuation of health and dental benefits during long-term disability, and self-insured workers' compensation.

Pension Benefits

Substantially all AECL employees are covered by the Public Service Pension Plan (PSPP), a contributory defined benefit plan established through legislation and sponsored by the Government of Canada. Contributions are required by both the employees and AECL to cover current service cost.

Pursuant to legislation currently in place, AECL has no legal or constructive obligation to pay further contributions with respect to any past service or funding deficiencies of the PSPP. Consequently, contributions are recognized as an expense in the year when employees have rendered service and represent the total pension obligation of AECL.

Non-pension Post-Employment Benefit Plans

AECL's obligation with respect to its non-pension post-employment defined benefit plans is the amount of future benefit that employees have earned in return for their service in the current and prior periods. These benefits include voluntary termination compensation benefits.

That obligation is discounted to determine its present value. The calculation is performed annually by a qualified actuary using the projected benefit method prorated on service and Management's best estimate of salary escalation, retirement ages of employees, mortality and expected employee turnover.

The discount rate is based on AECL's cost of borrowing as determined based on long-term Government of Canada bond yields. AECL amortizes any actuarial gains and losses arising from non-pension defined benefit plans into the Statement of Operations and Accumulated Deficit over the expected average remaining service life.

Other Long-Term Employee Benefits

AECL's obligation with respect to other long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. These benefits include self-insured workers' compensation benefits and health and dental care benefits during long-term disability.

That obligation is discounted to determine its present value. The discount rate is based on AECL's cost of borrowing as determined based on long-term Government of Canada bond yields. The calculation is performed using a combination of the Projected Unit Credit Method prorated on service and event-driven calculations for Workers' Compensation. Any actuarial gains and losses are amortized into the Statement of Operations and Accumulated Deficit over the expected average remaining service life.

AECL expenses amounts reimbursed to Employment and Social Development Canada for workers' compensation claims in accordance with the *Government Employees Compensation Act* for current payments billed by the provincial compensation boards.

i) Decommissioning and Waste Management Provision

AECL has obligations to decommission nuclear facilities and to manage radioactive waste in order to protect the environment and satisfy regulatory requirements. The best estimate of an obligation is recognized in the period in which a reasonable estimate can be determined and it is probable that an outflow of economic benefits will be required to settle the obligation.

The provision takes into account current technological, environmental and regulatory requirements and is determined by discounting the expected future cash flows at a rate that reflects current market assessments of the time value of money and the risks specific to the provision. The estimated future cash flows are adjusted for inflation using a rate that is derived on the basis of Consensus Economics forecasts and Bank of Canada historical and target inflation rates.

As the provision is recorded based on a discounted value of the projected future cash flows, it is increased quarterly to reflect the passage of time by removing one quarter's discount. The unwinding of the discount is charged to Decommissioning, waste management and contaminated sites expenses in the Statement of Operations and Accumulated Deficit. The provision is reduced by actual expenditures incurred.

The cost estimate is subject to periodic review and any significant changes in the estimated amount or timing of the underlying future cash flows are recorded as an adjustment to the provision. The provision includes future construction costs associated with certain enabling facilities, such as processing and disposal facilities for nuclear waste.

Decommissioning costs of new assets are added to the carrying amount and amortized over the related assets' useful lives. The effect of subsequent changes in estimating an obligation for which the provision was recognized as part of the cost of the asset is adjusted against the asset.

j) Contaminated Sites Liability

AECL recognizes a provision for contaminated sites when all of the following conditions are prevalent: an environmental standard exists; the level of contamination has been determined to exceed the environmental standard and AECL is directly responsible or accepts responsibility; it is expected that future economic benefits will be given up; and a reasonable estimate of the amount can be made at that time. The liability includes all costs directly attributable to remediation activities including post remediation operations, maintenance and monitoring. The liability is determined by discounting the expected future cash flows at a rate that reflects current market assessments of the time value of money.

k) Trade and Other Receivables, Accounts Payable and Accrued Liabilities

Certain contracts may have revenue recognized in excess of billings (unbilled revenues) and other contracts may have billings in excess of revenue recognized (customer advances and obligations). Unbilled revenues are recorded as an asset and included in Trade and other receivables. Billings collected in excess of revenue recognized on contracts and advances for which the related work has not started are recognized as a liability and included in Accounts payable and accrued liabilities.

l) Tangible Capital Assets

Tangible capital assets are recorded at cost less accumulated amortization. Cost includes amounts that are directly related to the acquisition, design, construction, development, improvement or betterment of the assets, overhead directly attributable to the construction and development, as well as the estimated costs of dismantling and removing the items and restoring the site on which they are located.

The cost of tangible capital assets in use is amortized on a straight-line basis over the estimated useful life, as follows:

Asset	Rate
Land Improvements	10-40 years
Buildings	20-40 years
Reactors, Machinery & Equipment	3-40 years

Construction in progress represents assets that are not yet available for use and therefore are not subject to amortization. When complete, the constructed asset is transferred to the appropriate category of tangible capital asset and amortized at the rate applicable to that category. Amortization commences when the asset is put into use and ceases when it no longer provides any further economic benefit to AECL or when it is no longer in service.

When conditions indicate that a tangible capital asset no longer contributes to AECL's ability to provide goods and services, or that the value of future economic benefits associated with the tangible capital asset is less than its net book value, the cost of the tangible capital asset is reduced to reflect the decline in the asset's value. The net write-down is then accounted for as an expense in the Statement of Operations and Accumulated Deficit.

Useful lives are assessed annually and revisions to the useful life are made as required.

AECL has unrecognized intangible intellectual property assets since intangible assets are not recognized in the financial statements.

m) Revenue Recognition

Revenue is derived from sales of services and products. Revenue is recognized in the period in which the transactions or events occurred that gave rise to the revenues. All revenue is recorded on an accrual basis, except when the accruals cannot be determined with a reasonable degree of certainty or when their estimation is impracticable. Revenue related to fees or services received in advance of the fee being earned or the service is performed, is deferred and recognized when the fee is earned or service performed.

Cost-reimbursement Contracts

Revenue under cost-reimbursement contracts is recognized as reimbursable costs are incurred and includes a proportion of fees earned.

Other Service Contracts

When services are performed over a specified period of time, revenue is recognized on a straight-line basis unless there is evidence that some other method better represents the stage of completion. For waste management services, revenue is recognized based on the contractual arrangements specified in a contract for disposal with the customer.

Supply of Product

Revenue is recognized when the risks and rewards of ownership have been transferred to the customer, which generally coincides with the transfer of title. When goods require significant tailoring, modification or integration, the revenue is recognized using the percentage-of-completion method.

Royalty Revenue

Revenue from licensing of intellectual property is recorded as revenue in accordance with the terms of the specific agreement.

n) Parliamentary Appropriations

AECL receives Parliamentary appropriations for operating expenditures and tangible capital assets. These Parliamentary appropriations are free of any stipulations limiting their use, and are recorded as funding from the Government of Canada in the Statement of Operations and Accumulated Deficit, up to the authorized amount, where eligibility criteria have been met.

o) Interest Income

Interest income earned on Cash, Short-term investments, Long-term disposal of waste fund and Investments held in trust is recognized in the Statement of Operations and Accumulated Deficit.

p) Contingent Liabilities

Contingent liabilities are potential liabilities which may become actual liabilities when one or more future events occur or fail to occur. To the extent that the future event is likely to occur or fail to occur, and a reasonable estimate of the obligation can be made by AECL, an estimated liability is accrued and an expense recorded. If the likelihood is not determinable, or an amount cannot be reasonably estimated, the contingency is disclosed in the notes to the financial statements.

q) Standards and Guidelines Issued to be Adopted at a Later Date

The following standards have been issued by the PSAB:

PS 3280 Asset retirement obligations: This new Section establishes standards on how to account for and report a liability for asset retirement obligations.

This Section applies to fiscal years beginning on or after April 1, 2022.

AECL intends to adopt this standard when it becomes applicable. This standard is not expected to have a significant impact on AECL's financial reporting.

PS 3400 Revenue: This new Section establishes standards on how to account for and report on revenue.

This Section applies to fiscal years beginning on or after April 1, 2023.

AECL intends to adopt this standard when it becomes applicable. AECL is currently evaluating the impact of adopting this standard on its financial statements.

PSG-8 Purchased intangibles: This new Section establishes guidelines on how to account for and report on purchased intangibles.

This section applies to fiscal years beginning on or after April 1, 2023.

AECL intends to adopt this guideline when it becomes applicable. AECL is currently evaluating the impact of adopting this guideline on its financial statements.

3. Short-term Investments

Short-term investments are comprised largely of term deposits that are available on demand with one month notice. The cash in these investments are not expected to be used for operations in the upcoming fiscal year.

	March 31			
(thousands of Canadian dollars)	**2022**	**Yield**	2021	Yield
	$	**%**	$	%
Short-term investments	**71,707**	**0.9**	14,060	0.8
	71,707		14,060	

4. Long-Term Disposal of Waste Fund

AECL is required to invest cash in a fund to cover the costs related to the future disposal of radioactive waste arising from ongoing operations at its sites. This fund is intended to cover the future disposal costs associated with radioactive waste generated starting in 2015. The cash dedicated to this purpose is not expected to be used in the upcoming fiscal year. During the year, $17.7 million of funds previously set aside to address high-level waste generated from ongoing operations was transferred from this fund to Investments held in trust and will be used to finance the implementation of an approach for the long-term management of nuclear fuel waste. The fund is comprised of the following:

		March 31			
(thousands of Canadian dollars)	Maturities	**2022**	**Yield**	2021	Yield
		$	**%**	$	%
Term deposits	Available with 30 days' notice	**29,890**	**0.8**	48,030	0.8
		29,890		48,030	

5. Investments Held In Trust

The *Nuclear Fuel Waste Act* requires Canadian nuclear utilities to form a waste management organization, the Nuclear Waste Management Organization (NWMO), to provide recommendations to the Government of Canada on the long-term management of nuclear fuel waste and to implement the approach selected. The legislation also requires that each nuclear fuel waste owner establish a trust fund to finance the implementation of the approach proposed by the NWMO. The liability for AECL's nuclear fuel waste is recorded in the Decommissioning and waste management provision (Note 10).

Each individual trust fund is held in order to meet the requirements of the *Nuclear Fuel Waste Act* and only the NWMO may withdraw monies from it in accordance with the provisions of the *Nuclear Fuel Waste Act*, Section II. As required by the *Nuclear Fuel Waste Act*, AECL's initial deposit to its Trust Fund was $10 million on November 25, 2002. Subsequent annual deposits have been made as required, and will continue until the full lifecycle costs of managing the nuclear fuel waste over the long-term are set aside.

AECL's trust fund, managed by CIBC on behalf of AECL, invests in fixed income instruments, with various maturities. The fund has been incorporated in these financial statements and the investments held by the fund are measured at fair value. Quoted market values for the instruments or similar instruments, in the case of the bonds, are estimated at $73.9 million as at March 31, 2022 (March 31, 2021 – $58.3 million). Interest earned on trust assets accrues to the Trust Fund. Interest earned on these instruments is largely fixed, whereas the fair values of the instruments vary according to the prevailing market rate of interest. These investments are comprised of the following:

		March 31			
(thousands of Canadian dollars)	Maturities	**2022**	**Yield**	2021	Yield
		$	**%**	$	%
Deposits	Not applicable	**7,885**	**0.5**	404	0.0
Canadian government bonds*	September 2022 – April 2035	**35,364**	**2.4**	28,386	2.5
Corporate bonds	June 2022 – January 2030	**30,609**	**2.1**	29,525	2.2
		73,858		58,315	

** Canadian government bonds include federal, provincial and municipal bonds.*

6. Trade and Other Receivables

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Trade receivables	**25,159**	11,480
Unbilled revenue	**13,321**	18,026
Consumption taxes receivable	**13,956**	13,836
Other proceeds	**13,000**	–
	65,436	43,342

AECL maintains allowances for specific potential credit losses, if required. Outstanding trade receivables are collected in accordance with the terms of the sales contracts.

Other proceeds relate to a commercial settlement.

AECL's exposure to credit risks related to Trade and other receivables, including unbilled revenue, is disclosed in Note 18.

7. Inventories Held for Resale

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Mechanical seals	**2,616**	2,698
Heavy water inventory	**91,277**	126,541
	93,893	129,239

The cost of inventory for mechanical seals recognized as an expense and included in Cost of sales was $0.1 million (2021 – $0.1 million).

The cost of inventory for heavy water recognized as an expense and included in Cost of sales was $35.3 million (2021 – $21.2 million).

8. Accounts Payable and Accrued Liabilities

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Trade payables	**1,640**	4,642
Other payables and accrued expenses	**25,544**	21,830
Accrued payroll liabilities	**1,960**	2,002
Amounts due to related parties	**248**	234
Provisions	**4,665**	5,704
Customer advances and obligations	**4,101**	2,617
	38,158	37,029

Amounts due to related parties represent royalty revenues payable to the Government. Provisions are short-term in nature and are not discounted and include estimated costs related to lawsuits and legal claims and disputes with suppliers.

9. Employee Future Benefits

a) Pension Plan

As described in Note 2(h), AECL's employees participate in the PSPP.

The President of the Treasury Board of Canada sets the required employer contributions based on a multiple of the employees' required contribution. The contributions made by AECL to the PSPP are 5.91 times (2021 – 3.59 times) the employees' contribution on salaries in excess of $191,300 (2021 – $181,600). For salaries below $191,300, AECL's contribution rate is approximately 1.0 times the employees' contributions.

The Government of Canada holds a statutory obligation for the payment of benefits relating to the PSPP. Pension benefits generally accrue up to a maximum period of 35 years at an annual rate of two per cent of pensionable service, times the average of the best five consecutive years of earnings. The benefits are coordinated with Canada/Québec Pension Plan benefits and they are indexed to inflation.

Total contributions made on account of current service are as follows:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Payments by employees	**823**	761
Payments by employer	**1,388**	1,368

b) Other Employee Future Benefits

AECL provides certain voluntary termination compensation (VTC) and other post-employment benefits as described in Note 2(h). The defined benefit obligation is not funded, as funding is provided when benefits are paid. Accordingly, there are no plan assets and the defined plan deficit is equal to the defined benefit obligation.

The VTC is payable in instances of future voluntary resignations and retirements. Consistent with Government of Canada expectations of federal agencies and Crown corporations, AECL began eliminating this benefit in fiscal 2012-13.

The VTC included in the 2022 Employee future benefits liability is $5.7 million (2021 - $6.1 million). This balance includes the amounts for employees who have chosen to defer payment to the time of the termination of their employment.

The measurement date of the Employee future benefits liability is March 31, 2022, and the latest actuarial valuation of these benefits was performed at that date. The weighted average duration of the defined benefit obligation at the end of the reporting period is 7.8 years (2021 – 7.7 years). The amortization period for post-employment benefits is 7 years. The amortization period for other long-term benefits is 12 years.

The following summarizes the activity in the post-employment and other long-term benefit plans:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Accrued benefit obligation, beginning of year	**16,245**	18,478
Benefits earned	**4**	4
Interest on Accrued benefit obligation	**246**	176
Benefits paid	**(1,817)**	(2,167)
Actuarial loss (gain)	**229**	(246)
Accrued benefit obligation, end of year	**14,907**	16,245
Less: Unamortized actuarial gain	**350**	34
Employee future benefits liability	**14,557**	16,211

The following summarizes expenses arising from AECL's post-employment and other long-term benefit plans recognized in Operating expenses in the Statement of Operations and Accumulated Deficit:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Benefit and interest expense		
Benefits earned	**4**	4
Amortization of actuarial gain recognized	**(87)**	(63)
Total benefit income	**(83)**	(59)
Interest on Accrued benefit obligation	**246**	176
Total benefit and interest expense	**163**	117

The significant actuarial assumptions adopted in measuring AECL's Employee future benefits are summarized as follows:

	March 31	
	2022	2021
	%	%
Discount rate at year-end	**2.40**	1.60
Rate of increase in salaries	**3.00**	2.75
Health care cost trend	**4.00**	4.00

The mortality rates are those used by the Canadian Pensioners' Mortality for 2014. The disabled mortality rates are those used for the valuation of the benefit liabilities of the schedule 1 insurance fund of the Workplace Safety and Insurance Board of Ontario as of December 31, 2020.

The Employee future benefits liability and costs are subject to measurement uncertainty due to the use of actuarial assumptions. The impact of these factors on the remeasurement of the Employee future benefits liability can be significant and volatile at times. Detailed sensitivity analysis disclosures have not been provided as the impacts of the sensitivity analyses performed did not result in material changes to the recognized balances.

10. Decommissioning and Waste Management Provision

AECL has an obligation to decommission its nuclear facilities and other assets in order to address its liabilities, reduce risk, protect the environment and meet applicable regulatory requirements. These facilities include prototype reactors, heavy water plants, nuclear research and development laboratories, waste management and other facilities. Due to the variety of facilities, the decommissioning process may differ in each case. In some situations, decommissioning activities are carried out in stages, with intervals of several decades between them, to allow radioactivity to decay before moving on to the next stage. These activities include surveillance and monitoring, decontamination, demolition and the management of the associated waste. A portion of the liabilities relate to obligations that existed prior to the creation of AECL in 1952.

The Decommissioning and waste management provision is as follows:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Carrying amount – Beginning of year	**7,362,192**	7,184,910
Liabilities settled	**(452,745)**	(432,194)
Unwinding of discount	**279,399**	271,357
Revision in estimate and timing of expenditures	**150,307**	335,037
Estimates affecting Property, plant and equipment and future disposal costs for waste from ongoing operations	**3,688**	3,082
Carrying amount – End of year	**7,342,841**	7,362,192

The undiscounted future expenditures, adjusted for inflation, for the planned projects comprising the liability are $15,840.1 million (March 31, 2021 – $16,073.0 million). The provision is re-valued at the discount rate in effect at each statement of financial position date.

Key assumptions used in determining the provision:

	March 31	
	2022	2021
Discount period	**163 years**	164 years
Discount rate	**3.78%**	3.80%
Short-term inflation rate	**2.21%**	2.21%
Long-term inflation rate	**1.70%**	1.70%

The provision is highly sensitive to the interest rate used to discount the future expenditures. The following table outlines the sensitivity of a 1% change in the discount rate used to estimate the provision:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
1% increase	**(952,293)**	(963,412)
1% decrease	**1,274,792**	1,291,340

The provision is also sensitive to the inflation rate used to calculate future expenditures. The following table outlines the sensitivity of a 1% change in the inflation rate used to estimate the provision:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
1% increase	**1,230,268**	1,190,312
1% decrease	**(935,040)**	(913,823)

11. Contaminated Sites Liability

AECL has responsibility for the implementation of the Government of Canada's commitments with respect to the Port Hope Area Initiative and other historic low-level waste liabilities. The nature of the Port Hope Area Initiative liability is the cleanup and safe long-term management of historic low-level radioactive waste in the Ontario municipalities of Port Hope and Clarington. This waste consists mainly of past process residues containing uranium and radium, and associated contaminated soils, the result of activities of a former federal Crown corporation and its private sector predecessors. The implementation phase is forecast to be complete in 2028-29, with long-term monitoring and maintenance expected to continue for 100 years after implementation.

AECL also has responsibility for the Low-Level Radioactive Waste Management Office which includes all activities to address and manage historic low-level waste at sites in Canada for which the Government has assumed responsibility (excluding the Port Hope Area Initiative). Historic low-level radioactive waste is material contaminated with radioactivity resulting from the processing and shipment of uranium and radium. This cleanup is forecast to be complete by 2027-28.

The Contaminated sites liability is as follows:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Carrying amount – Beginning of year	**790,190**	877,196
Liabilities settled	**(204,294)**	(158,557)
Unwinding of discount	**15,057**	17,528
Revision in estimate and timing of expenditures	**930,365**	54,023
Carrying amount – End of year	**1,531,318**	790,190

The liability for the Port Hope Area Initiative and the Low-Level Radioactive Waste Management Office is discounted using present value techniques. The estimated total undiscounted expenditures are $1,689.5 million (March 31, 2021 – $860.9 million).

Key assumptions used in determining the provision:

	March 31	
	2022	2021
Discount period	**48 years**	49 years
Discount rate	**2.20%**	1.91%
Short-term inflation rate	**2.21%**	2.21%
Long-term inflation rate	**1.70%**	1.70%

The liability is sensitive to the interest rate used to discount the future expenditures. The following table outlines the sensitivity of a 1% change in the discount rate used to estimate the liability:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
1% increase	**(61,633)**	(31,080)
1% decrease	**67,529**	34,927

The liability is also sensitive to the inflation rate used to calculate future expenditures. The following table outlines the sensitivity of a 1% change in the inflation rate used to estimate the liability:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
1% increase	**66,955**	26,529
1% decrease	**(62,300)**	(23,825)

12. Tangible Capital Assets

	Construction in progress	Land and land improvements	Buildings	Reactors, Machinery and Equipment	Total
(thousands of Canadian dollars)					
	$	$	$	$	$
Cost at March 31, 2021	**182,064**	**145,586**	**545,437**	**502,368**	**1,375,455**
Additions and transfers	116,359	7,748	50,271	21,025	195,403
Disposals and transfers	(77,249)	(170)	(7,310)	(8,295)	(93,024)
Write-downs	(5,719)	–	–	–	(5,719)
Cost at March 31, 2022	**215,455**	**153,164**	**588,398**	**515,098**	**1,472,115**
Accumulated amortization at March 31, 2021	**–**	**52,558**	**235,210**	**300,868**	**588,636**
Increase in amortization	–	5,611	17,598	25,607	48,816
Disposals and transfers	–	(166)	(6,149)	(7,752)	(14,067)
Accumulated amortization at March 31, 2022	**–**	**58,003**	**246,659**	**318,723**	**623,385**
Net carrying amount at March 31, 2021	**182,064**	**93,028**	**310,227**	**201,500**	**786,819**
Net carrying amount at March 31, 2022	**215,455**	**95,161**	**341,739**	**196,375**	**848,730**

	Construction in progress	Land and land improvements	Buildings	Reactors, Machinery and Equipment	Total
(thousands of Canadian dollars)					
	$	$	$	$	$
Cost at March 31, 2020	141,172	139,107	510,144	486,342	1,276,765
Additions and transfers	118,843	6,548	36,691	34,591	196,673
Disposals and transfers	(76,845)	(69)	(1,398)	(18,565)	(96,877)
Write-downs	(1,106)	–	–	–	(1,106)
Cost at March 31, 2021	182,064	145,586	545,437	502,368	1,375,455
Accumulated amortization at March 31, 2020	–	46,973	222,370	291,390	560,733
Increase in amortization	–	5,602	14,218	27,936	47,756
Disposals and transfers	–	(17)	(1,378)	(18,458)	(19,853)
Accumulated amortization at March 31, 2021	–	52,558	235,210	300,868	588,636
Net carrying amount at March 31, 2020	141,172	92,134	287,774	194,952	716,032
Net carrying amount at March 31, 2021	182,064	93,028	310,227	201,500	786,819

Write-downs of $5.7 million were recorded in 2022 (2021 – $1.1 million).

The amortization and write-downs of Tangible capital assets are recognized in Operating expenses in the Statement of Operations and Accumulated Deficit.

13. Commitments

a) Operating Leases:

Non-cancellable office space operating lease rental is payable as follows:

	Leases
(thousands of Canadian dollars)	
	$
2022-2023	96
2023-2024	103
2024-2025	104
2025-2026	111
2026-2027	112
2027 and thereafter	121
	647

During the year ended March 31, 2022, an amount of $0.2 million (2021 – $0.3 million) was recognized for leases as an Operating expense in the Statement of Operations and Accumulated Deficit.

b) Operating and Capital Commitments:

The nature of AECL's activities can result in multiyear contracts and obligations whereby AECL is committed to make future payments. As at March 31, 2022, AECL has contractual arrangements with third party suppliers, including contracts that allow for termination with penalties, approximating $659.0 million. Most of these commitments are held by CNL in accordance with the Government-owned, Contractor-operated model. Included in this amount are contracts related to the purchase of Tangible capital assets of approximately $136.9 million. The details of the Government-owned, Contractor-operated model are discussed in Note 16.

14. Contingent Liabilities

AECL is engaged in various legal proceedings and claims that have arisen in the ordinary course of business. Where the potential liability is likely and able to be estimated, management has recorded its best estimate of the potential liability in Accounts payable and accrued liabilities (Note 8).

15. Funding

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Parliamentary appropriations for operating, capital and statutory expenditures		
Amount received during the year for operating, capital and statutory expenditures	**1,131,370**	918,190
Amount receivable at the end of the year	**–**	122,601
Amount receivable from a previous year	**(122,601)**	(100,050)
Total Parliamentary appropriations recognized	**1,008,769**	940,741

During the year, the above funding was received to support AECL and CNL planned activities. This funding was used in the following manner:

- Support the activities of the nuclear laboratories, including ongoing science and technology activities at the Chalk River site, capital infrastructure renewal, as well as the ongoing operations of the site in order to meet regulatory, health, safety and environmental needs and requirements.
- Decommissioning and waste management activities primarily at the Chalk River and Whiteshell sites and environmental remediation programs primarily in Port Hope.

The amounts approved for operating and capital expenditures for the year ending March 31, 2022 totalled $1,228.3 million.

16. Contractual Arrangement

Since 2015, AECL has been delivering its mandate through a Government-owned, Contractor-operated model whereby CNL operates and manages AECL's sites.

Under this model, the assets, sites and facilities continue to be owned by AECL, but are being managed and operated by a private-sector company. As such, AECL makes payments to CNL and its parent company, Canadian National Energy Alliance ("Contractual amounts paid or payable"), as per the terms of the contractual arrangement.

The following contractual expenditures were incurred:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Contractual amounts paid or payable	**1,062,892**	968,671
Less: Costs charged to Decommissioning and waste management provision and Contaminated sites liability	**(654,319)**	(588,114)
Less: Costs charged to Construction in progress	**(116,359)**	(118,843)
Less: Costs classified as Cost of sales	**(52,456)**	(49,048)
Contractual expenses	**239,758**	212,666

Contractual amounts paid or payable include fees paid to Canadian National Energy Alliance, in accordance with the long-term contractual arrangement between AECL, Canadian National Energy Alliance and CNL.

17. Additional Information by Type of Expense

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Payroll expenses	**10,690**	10,471
General and administrative expenses	**2,174**	2,390
Site and program operating costs	**74,121**	33,326
Amortization of tangible capital assets (Note 12)	**48,816**	47,756
Realized losses (gains) on Investments held in trust	**118**	(679)
Contractual amounts paid or payable less costs charged to Construction in progress (Notes 12 and 16) and less liabilities settled for Decommissioning and waste management provision and Contaminated sites liability (Notes 10, 11 and 16)	**292,215**	261,714
Finance expenses	**294,456**	288,885
Loss on revision in estimate and timing of expenditures on Decommissioning and waste management provision (Note 10)	**150,307**	335,037
Loss on revision in estimate and timing of expenditures on Contaminated sites liability (Note 11)	**930,365**	54,023
	1,803,262	1,032,923

18. Financial Instruments

AECL has exposure to the following risks from its use of financial instruments: credit risk, market risk, regulatory risk and liquidity risk.

The Board of Directors ensures that AECL has identified its major risks and ensures that management effectively monitors and mitigates them.

a) Credit Risk

Credit risk is the risk of financial loss to AECL if a customer or counterparty to a financial instrument fails to meet its contractual obligations. Such risks arise principally from certain financial assets held by AECL consisting of cash, investments and trade and other receivables. The maximum exposure to credit risk of AECL at March 31, 2022 is the carrying value of Cash, Short-term investments, the Long-term disposal of waste fund, Investments held in trust and Trade and other receivables.

AECL manages its credit risk surrounding its Trade and other receivables of $65.4 million (2021 - $43.3 million) by dealing solely with reputable customers and evaluating customer creditworthiness before credit is extended. The risk is reduced by monitoring at the appropriate levels of management. The credit risk for Cash, Short-term investments, the Long-term disposal of waste fund and Investments held in trust is minimized by ensuring these instruments are held with well-established financial institutions, invested in government and corporate bonds and applying a conservative investment strategy.

Details of trade receivables are as follows:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Current	**16,164**	4,627
1 to 30 days past due	**2,117**	3,590
31 to 60 days past due	**6,431**	2,859
61 to 90 days past due	**7**	–
More than 90 days past due	**440**	404
	25,159	11,480

b) Market Risk

Market risk is the risk that changes in market prices, such as those caused by changes in interest rates and foreign exchange rates, will affect AECL's income or the value of its holdings of financial instruments. The objective of market risk management is to control market risk exposures within acceptable parameters while optimizing the return on risk.

AECL's financial statements are presented in Canadian dollars, but a portion of its business is conducted in other currencies, with the exposure to foreign currency transactions primarily related to the U.S. dollar. The objective of AECL's foreign exchange risk management activities is to minimize transaction exposure and the resulting volatility of AECL's earnings and commitments. As of March 31, 2022 and March 31, 2021, had the exchange rate (CAN$/US$) been 5% higher or lower, the impact on the Statement of Operations and Accumulated Deficit for the year would have been insignificant.

Interest rate risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in the market interest rates. The objective of AECL's interest rate management activities is to minimize the volatility of AECL's earnings and expenses. AECL's exposure to interest rate risk is limited to changes in interest rates associated with its investments in bonds and discount rates associated with the Decommissioning and waste management provision and Contaminated sites liability (Notes 10 and 11).

c) Regulatory Risk

Regulatory risk is the risk that changes in government policy may have an adverse impact on AECL's financial position. AECL's sites are operated in a highly regulated business environment. Changes in government policy may have an adverse impact on AECL's financial position. AECL's objective in managing regulatory risk is to actively monitor and implement changes on a timely basis to enable operations. In 2022, AECL's regulatory risk management objectives were unchanged from those in 2021.

d) Liquidity Risk

Liquidity risk is the risk that AECL will not be able to meet its financial obligations as they become due. AECL is economically dependent on Parliamentary appropriations that are received from the Government of Canada.

AECL manages liquidity risk by cross-functional participation in project and business reviews, frequent communication with its shareholder to manage ongoing cash requirements and secure appropriate funding, and maintaining a portfolio of highly liquid investments or instruments readily convertible into cash with high-quality counterparties.

Details of accounts payables are as follows:

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Current	**1,640**	4,214
1 to 30 days past due	**–**	91
31 to 60 days past due	**–**	37
61 to 90 days past due	**–**	–
More than 90 days past due	**–**	300
	1,640	4,642

All other financial liabilities, including Due to Canadian Nuclear Laboratories, are due within the year.

e) Fair Value of Financial Instruments

Accounting standard guidance establishes a framework for measuring fair value and provides disclosure about fair value measurements. That framework provides a fair value hierarchy that gives the highest priority to unadjusted quoted prices in active markets for identical assets or liabilities (Level 1 measurements) and the lowest priority to unobservable inputs (Level 3 measurements).

The carrying amounts of Cash, Short-term investments, Trade and other receivables, and Accounts payable and accrued liabilities approximate fair value because of the short-term nature of these items.

The following table analyzes financial instruments measured at fair value by valuation method. AECL uses the following hierarchy to classify fair value measurements:

Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e., as prices) or indirectly (i.e., derived from prices).

Level 3: Inputs for the asset or liability that are not based on observable market data (unobservable inputs).

Changes in valuation methods may result in transfers into or out of levels 1, 2, and 3. For the reporting periods ended March 31, 2022 and March 31, 2021, there were no transfers between levels.

	March 31, 2022			
(thousands of Canadian dollars)	**Level 1**	**Level 2**	**Level 3**	**Total**
	$	**$**	**$**	**$**
Assets measured at fair value				
Investments held in trust – Deposits	**7,885**	**–**	**–**	**7,885**
Investments held in trust – Bonds	**–**	**65,973**	**–**	**65,973**
	7,885	**65,973**	**–**	**73,858**

	March 31, 2021			
(thousands of Canadian dollars)	Level 1	Level 2	Level 3	Total
	$	$	$	$
Assets measured at fair value				
Investments held in trust – Deposits	404	–	–	404
Investments held in trust – Bonds	–	57,911	–	57,911
	404	57,911	–	58,315

19. Related Party Transactions

AECL is related, in terms of common ownership, to all Government of Canada departments, agencies and Crown corporations. AECL enters into transactions with government entities in the normal course of business and on normal trade terms applicable to all individuals and enterprises. The transactions are measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

In addition to the transactions disclosed in Notes 8, 9 and 15, AECL, in the normal course of business, also entered into various transactions with the Government, its agencies and other Crown corporations.

AECL also has transactions with its key management personnel. Key management personnel are those persons having authority and responsibility for planning, directing and controlling the activities of AECL, including AECL's directors and executive officers. The table below summarizes the amounts paid or payable to key management personnel on a comparative basis.

	March 31	
(thousands of Canadian dollars)	**2022**	2021
	$	$
Salaries and other short-term benefits	**3,212**	3,199
Post-employment benefits	**677**	711
	3,889	3,910

With the implementation of the Government-owned, Contractor-operated model in 2015, AECL transitioned from being a large Crown corporation to a small Crown corporation. As a result, AECL has, with the help of external compensation consultants, developed a compensation philosophy to align with its new role. The objective is to attract and retain the skills and expertise needed to fulfill its mandate and deliver value for money for Canada, including seeking international experts with experience in similar Government-owned, Contractor-operated models in the United Kingdom and the United States.

AECL's compensation philosophy is to align its total compensation with a comparator group, while recognizing that specific differentiation may be needed for hard-to-hire and/or specialized skills. It considers factors such as appropriate market comparators, the geographical location of AECL employees and the internationally limited availability of the specialized personnel needed to provide effective oversight of this complex model and the activities that are required to deliver on AECL's mandate. As part of its approach to compensation, AECL will periodically review its compensation philosophy, including the appropriateness of its comparator group and employee compensation relative to market median.

20. Comparative Figures

Certain of the March 31, 2021 comparative figures have been reclassified to conform to the financial statement presentation adopted in the 2021-22 fiscal year.

Corporate Governance

The corporate governance structure of AECL is similar to that of other corporations incorporated pursuant to the *Canada Business Corporations Act* with the following important exceptions:

i. AECL is an agent and a parent Crown corporation and is subject to the provisions of Part X of the *Financial Administration Act* of Canada;

ii. The sole shareholder of AECL is the Government of Canada as represented by the Minister of Natural Resources; and

iii. AECL's Board of Directors, the Board Chair and the President and Chief Executive Officer are appointed by the Government of Canada by Order-in-Council.

AECL's President and CEO was appointed by the Governor-in-Council to serve a term of three years, starting in February 2021. The President and CEO leads AECL in achieving its mandate through a Government-owned, Contractor-operated model. All direct reports to the President and CEO are appointed by the Board of Directors through the Human Resources and Governance Committee on the recommendation of the President and CEO. Each of these direct reports is accountable for specific areas of business and operations.

Board of Directors / Officers

AECL is governed by a Board of Directors, which provides strategic direction and advice to the President and CEO. The Board, through its Chair or Chair of a Board Committee, receives direction from AECL's single shareholder, the Government of Canada, as represented by the Minister of Natural Resources. It is accountable to Parliament through the Minister of Natural Resources.

AECL's Board has two committees, the Audit Committee and Human Resources and Governance Committee, each having specific charters that set out respective responsibilities for and on behalf of the Board. The Board consists of seven Directors (the Chair, appointed Board members and the President and CEO). Biographies of Board members are presented in the following pages.

James Burpee, Chair

Mr. Burpee was appointed as Chair of AECL's Board of Directors in July 2019. He previously served as a director of AECL's Board of Directors and Chair of the Board's Human Resources and Governance Committee from June 2017 to July 2019.

Mr. Burpee brings almost four decades of experience as a senior strategist and executive in the electricity industry, having worked in a variety of senior management roles for Ontario Hydro and Ontario Power Generation. Mr. Burpee has also served as Chief Executive Officer at Bridge Renewable Energy Technologies Inc., a company which marketed Biomass Gasification Electricity Systems primarily in the developing world. Most recently, Mr. Burpee served as President and Chief Executive Officer of the Canadian Electricity Association.

Mr. Burpee also sat on the board of the Energy Council of Canada and the Canadian Electricity Association, including one year as Chairperson.

Mr. Burpee is currently a Senior Counsel in the Energy and Environment Practice at Sussex Strategy Group.

Mr. Burpee holds a Bachelor of Applied Science in Mechanical Engineering from the University of Toronto and is a member of Professional Engineers Ontario and the Institute for Corporate Directors, and holds the ICD.D designation. In 2021, Mr. Burpee became a Fellow of the Canadian Academy of Engineering.

Fred Dermarkar, President and CEO

Fred Dermarkar is AECL's President and CEO. He was appointed in February 2021 for a term of three years.

Prior to joining AECL, Fred was President and CEO of the CANDU Owners Group, where he led the not-for-profit organization to advance collaboration between CANDU nuclear reactor operators worldwide.

Fred has been working in the Canadian nuclear industry for close to 40 years. Throughout his career, he has occupied a variety of key technical and senior leadership positions at Ontario Power Generation in support of the design, commissioning, operation and refurbishment of its CANDU reactors.

Fred has received the Canadian Nuclear Association's Ian McRae award in recognition of his substantive engineering contributions, leadership and positive influence on the Canadian nuclear industry and the advancement of nuclear energy in Canada, and the Nuclear Excellence Award from the World Association of Nuclear Operators (WANO) in recognition of his contributions to Ontario Power Generation's overall post-Fukushima response.

As President and CEO of AECL, Fred is leading the organization in its oversight role, seeing that the priorities of Government are delivered safely and efficiently under the Government-owned, Contractor-operated model.

Fred holds a bachelor's degree in mechanical engineering from the University of Toronto and is a registered professional engineer in the Province of Ontario.

Carmen Abela, Board Member

Carmen Abela was appointed to AECL's Board of Directors in June 2017, for a term of three years, and reappointed in June of 2020 for a term of four years.

Ms. Abela is the Managing Director of WindReach Consulting Services Inc., an Ottawa-based consultancy that focuses on public sector oversight, internal audit, risk and performance management. For over twenty years, Ms. Abela has been advising senior leaders from various regulatory, Science & Technology, and operational departments and agencies on their governance, risk management and control processes. She previously served as the interim Chief Risk Officer of the Bank of Canada and brings to the Board specific expertise in Indigenous issues. Ms. Abela is internationally and domestically recognized as a leader in the field of risk management and internal audit and is regularly sought out as a speaker, author and advisor.

Ms. Abela is also a member of the Board of Directors for Colleges and Institutes Canada and is the former Chairperson of the Board for the Institute of Internal Auditors Canada.

She has a Master's Degree in Public Administration from Carleton University, is a Certified Internal Auditor and holds a Chartered Director designation from the Director's College (McMaster University and the Conference Board).

Virendra Jha, Board Member

Virendra Jha was appointed to AECL's Board of Directors in February 2019 for a term of two years, and reappointed in February 2021 for a term of three years.

Dr. Jha has over 42 years of experience in the Canadian Space Program ranging from in-depth engineering work to senior management positions in both the private and the public sectors, including that of Vice-President and acting President of the Canadian Space Agency.

As Vice-President responsible for science, technology and programs at the Canadian Space Agency, Dr. Jha provided strategic direction, vision and leadership to all core technical sectors of the Agency and led a number of major projects, including RADARSAT, Canada's participation on the International Space Station and the Anik F2 program, which provided some of Canada's most remote communities with access to high-speed internet. Dr. Jha published and presented more than twenty papers on space related subjects, and has served as a Board member for five technology related not for profit organizations.

Dr. Jha received his B. Tech. degree in Mechanical Engineering from the Indian Institute of Technology Delhi India, his Master's degree in Mechanical Engineering from McMaster University, and his Ph.D. degree in Mechanical Engineering from Concordia University. He also has a Chartered Director Degree from McMaster University. He received the Order of Canada in 2018.

Kamilia Sofia, Board Member

Kamilia Sofia was first appointed to AECL's Board of Directors in July 2019 for a term of three years.

Dr. Sofia has been a strategic leader for 30 years, with technical and management experience locally and internationally. Dr. Sofia has held CEO level positions internationally in the last ten years with global organizations in multiple industries: high technology, aerospace, nuclear, and oil & gas, including CEO of Methanex Egypt, Executive Vice President of Rolls Royce Nuclear, CEO Services at Dubai Aerospace Enterprise, and Vice President of Strategy at CAE Inc. She has been a Director and Audit committee member of NorthStar Earth & Space, an information services platform that works to ensure the sustainability of the environment on earth and in space, since 2018.

Dr. Sofia received her Ph.D. degree in Nuclear Physics from McGill University and has also completed the Directors Education Program from the Institute of Corporate Directors at McGill University. In 2005, she was voted as one of Canada's top 100 women from the Women's Executive Network.

Martha Tory, Board Member

Martha Tory was appointed to AECL's Board of Directors in October 2016 for a term of one year, and subsequently reappointed in October 2017 for a term of three years. In October 2020, her term was renewed for another four years.

Ms. Tory retired in 2015 from Ernst & Young LLP where she was an audit partner with responsibility for clients in a variety of industries. She is currently involved as a Board member with a number of organizations: her current positions include being a Board member and Chair of the Audit Committee at HomeEquity Bank, MaRS Discovery District, University of Toronto Press and Sunnybrook Health Sciences Centre.

Ms. Tory is a Chartered Professional Accountant and a Fellow of the Institute of Chartered Professional Accountants of Ontario. She holds the ICD.D designation from the Institute of Corporate Directors and a Bachelor of Commerce from the University of Toronto, Trinity College.

Shawn Tupper, Board Member

Shawn Tupper was appointed to AECL's Board of Directors in January 2019 for a term of two years, and reappointed in January 2021 for a term of two years.

Mr. Tupper is Deputy Secretary to the Cabinet, Operations, at the Privy Council Office. Prior to taking on this role, Mr. Tupper served as Associate Deputy Minister at Natural Resources Canada; Assistant Secretary to the Cabinet, Economic and Regional Development Policy, at the Privy Council Office; and Assistant Deputy Minister, Policy, at Transport Canada. He also served in a variety of senior management roles at Public Safety Canada, Human Resources and Social Development Canada and the Office of Indian Residential Schools Resolution of Canada.

Mr. Tupper holds a Bachelor of Social Science, Political Science, from the University of Calgary.

Director Attendance at Board and Committee Meetings (2021-22)

Director	Audit (9 meetings)	Human Resources and Governance (7 meetings)	Board of Directors (12 meetings)
Jim Burpee	9/9	7/7	12/12
Fred Dermarkar	n/a	n/a	12/12
Carmen Abela	9/9	7/7	12/12
Virendra Jha	5/5	7/7	12/12
Kamilia Sofia	9/9	3/3	12/12
Martha Tory	9/9	7/7	12/12
Shawn Tupper	5/5	2/3	8/12

Notes:

- Fred Dermarkar is not a member of any committee.
- Shawn Tupper was not a member of either committee until November 17, 2021 when he was appointed to both the Audit & HRG committee.
- Kamilia Sofia was appointed to the HRG committee on November 17, 2021.
- Virendra Jha was appointed to the Audit committee on November 17, 2021.

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