

# Science for Net-Zero



Atomic Energy of Canada Limited  
Annual Report 2023



AECL acknowledges, with gratitude, that we operate on territories that have, since time immemorial, been the traditional lands of Indigenous peoples in Canada. We pay respect to all Indigenous people, from all nations across Canada. We acknowledge the traditional knowledge keepers, both young and old. And we honour their courageous leaders: past, present, and future.

## 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, 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), operates AECL's sites.

# Science for Net-Zero

Climate change is the biggest issue of our time, and Canada is committed to achieving net-zero emissions by 2050. With the effects of climate change becoming ever more tangible, nuclear is increasingly seen as a necessary solution to meet Canada and the world’s clean energy goals. At AECL, we believe we can be integral to achieving these objectives by leveraging the CANDU reactor technology and advancing nuclear science and technology to deliver clean energy solutions.

Our objective is to support the advancement and application of nuclear science and technology and help shape Canada’s nuclear future. We do this by working together with the nuclear community, local communities and Indigenous Peoples.

We are also dedicated to addressing legacy risks and hazards, and managing our radioactive waste and decommissioning responsibilities in a responsible manner, so as not to leave it to future generations.

As we do this, we will continue our journey to strengthen our relationships with Indigenous peoples and communities. We are committed to continuing our efforts to establish new relationships with the Indigenous communities on the land on which we operate.

Achieving our goals, including reaching net-zero by 2050, requires us to bring partners and communities together to contribute to a better Canada.

## Table of Contents

<b>Message from the Chair of the Board</b>	<b>2</b>
<b>Message from the President and CEO</b>	<b>3</b>
<b>Who We Are and How We Operate</b>	<b>5</b>
<b>Our Sites</b>	<b>9</b>
<b>2022-23 Achievements</b>	<b>11</b>
<b>Management Discussion and Analysis</b>	<b>34</b>
<b>Financial Statements</b>	<b>42</b>
<b>Corporate Governance</b>	<b>71</b>



# Message from the Chair of the Board

At AECL, we are building the future. It is a bright future, enabled by leveraging the full potential of Canada's expertise in nuclear technology. It is a future where nuclear science is solving the world's biggest problems, from climate change to energy security, from border safety to cancer treatments. And it is a future where we work in partnerships with industry, academia, governments, communities and Indigenous Peoples to advance common interests.

Building on a storied history of nuclear achievements in Canada, we are using science and nuclear technologies to improve the lives of Canadians. Our work is supporting the Canadian energy system to reach net-zero and enabling medical research and new cancer treatment therapies. We are also committed to remediating contaminated sites and buildings, managing radioactive waste responsibly, and healing the land.

This past year has been marked by important progress, both for AECL and the nuclear sector more broadly. As nuclear is increasingly being recognized as necessary to help reduce greenhouse gas (GHG) emissions and meet our growing clean electricity needs, AECL is poised to play an important role to enable this. Our expertise, CANDU technology, laboratory infrastructure, and the capabilities of our contractor, Canadian Nuclear Laboratories (CNL), are critical to help the country seize these clean energy opportunities – in nuclear (including large nuclear and small modular reactors), hydrogen, and fusion.

Our recently completed strategic plan presents a vision and approach to support our nation's nuclear community within a landscape of changing environmental, political, social, and technological needs. It sees us investing in our capabilities and environmental duties, driving the future of nuclear in Canada, and facilitating nuclear innovation to benefit the public good. It highlights our plan to develop long-term clean energy solutions, enable better health for Canadians, protect our natural environment, bring continued safety and security of citizens and enable sustainable economic growth. Most importantly, it underscores our role in building bridges and relationships by bringing domestic and international partners together and establishing meaningful partnerships and relationships with Indigenous Peoples.

We have already made tremendous progress to achieve this. In the past year alone, we broke ground on the Advanced Nuclear Materials Research Centre, the most significant new science facility to be built at our Chalk River Laboratories in decades, celebrated the completion of the Port Granby Project, launched the "Niigan Aki," an independent environmental monitoring program led by the Sagkeeng First Nation, and signed memoranda of understanding with five Canadian universities to pursue collaborative research and share access to specialized infrastructure. In addition, public hearings were held on CNL's proposal to build a Near Surface Disposal Facility to manage our low-level radioactive waste and enable the remediation of contaminated land at our sites.

To further position us for the future, we have launched a competitive process to renew the management and operation of CNL beyond the end of the current contract, set to expire in 2025. Our objective is to further advance our nuclear science & technology, research and innovation agenda and position the Chalk River Laboratories to leverage their capabilities to address the priorities of Canada, including reaching net-zero by 2050. We will also be looking for a contractor that can continue to build strong community engagement, collaboration with the Canadian nuclear ecosystem, and contribute to reconciliation by building partnerships with Indigenous communities. This will enable us to bring best value to Canada while driving forward the best ideas and innovation for the Canadian nuclear agenda and AECL's vision for the future.

James Burpee, *Chair of the Board*



# Message from the President and CEO

It is an exciting time at AECL. Some key projects are taking flight and relationships are being strengthened, enabled by years of planning and nurturing. This is a testament that we must work collaboratively to advance our objectives in nuclear innovation, environmental stewardship and reconciliation.

As the world is focusing on addressing climate change, nuclear technologies have been brought into the spotlight given their ability to help decarbonize the energy sector and meet long-term clean energy needs. This has rapidly brought new interest and investment in nuclear technologies from both the public and private sectors. Given our long history of enabling nuclear innovation for the public good, AECL is poised to seize this opportunity.

Our recently completed strategic plan outlines our vision to do just this. The culmination of extensive engagement with industry, government, community stakeholders and Indigenous communities, the strategy is meant to showcase how AECL will leverage its unique role at the nexus of private and public sectors and expertise in nuclear technologies, to bring industry, stakeholders and Indigenous communities together, for the benefit of Canadians.

At the heart of this is our contribution to achieving net-zero by 2050. We cannot reach this goal without prioritizing nuclear and addressing the need for new sources of clean energy. Making nuclear part of Canada's net-zero 2050 solution not only advances climate goals and provides energy security, but it also contributes to Canada's GDP and employment. CANDU reactors are the backbone of Canada's nuclear energy sector. They currently provide approximately 15% of Canada's electricity; with the completion of the current and planned refurbishments and the potential for new builds, they are poised to continue to be a vital source of clean energy for decades to come.

A variety of clean energy technologies will be needed, and AECL and CNL are ready to help. Be it by supporting the current fleet of CANDU reactors, enabling the development and deployment of small modular reactors, facilitating the adoption of hydrogen or contributing to advancing fusion technology, we have the expertise and capabilities to move things forward.

This is enabled by large investments in our Chalk River Laboratories, including the Advanced Nuclear Materials Research Centre for which we broke ground this year. This facility will be a state-of-the-art research complex that will be one of the largest nuclear research facilities ever built in Canada. When construction is complete, it will serve as the backbone of research and development infrastructure at our Chalk River Laboratories and will be an essential part of Canada's nuclear future.

At the Chalk River Laboratories, we are also contributing to innovation in health sciences through opportunities in nuclear medicine and radiotherapies. We are leveraging our world-class expertise in medical isotope production to advance the development of targeted alpha therapy – a next-generation cancer treatment. We are also enabling a safer Canada by supporting national and international security and policy objectives in the areas of nuclear non-proliferation and counterterrorism and to respond in the event of a nuclear emergency.

An important part of our mandate is focused on cleaning up the past, so that we can make way for the future. Since 2015, more than 115 buildings and structures have been decontaminated and demolished at the Chalk River Laboratories, and 40 at the Whiteshell Laboratories. At the Chalk River site, CNL has been advancing its proposal to build a near surface disposal facility to manage AECL's low-level radioactive waste and enable land remediation. The project, undergoing an environmental assessment, went through public hearings in 2022. Following a procedural directive issued by the Canadian Nuclear Safety Commission, we have been diligently working with CNL to continue advancing on our journey towards healing and reconciliation with local Indigenous communities. Our objective is to build relationships founded on trust and leading to mutually beneficial outcomes.



I was pleased during the year to engage with Indigenous leaders and communities. One of the highlights of the year was the launch of the Niigan Aki, meaning ‘land first’, an independent environmental monitoring program led by the Sagkeeng First Nation and funded by AECL and CNL. The program was established to empower Sagkeeng’s ability to monitor and steward its territory, and improve understanding of the Whiteshell site and operations, which is located in the Sagkeeng’s unceded traditional territory.

AECL’s mission is to drive nuclear innovation to deliver clean energy technologies and improve the quality of life of Canadians while caring for the land. And we will only succeed in delivering on our mission by working together with local Indigenous communities, building meaningful partnerships and finding areas of common interest and mutual benefit. We are stronger together.

A handwritten signature in black ink, reading "F. Dermarkar".

Fred Dermarkar, *President and CEO*

# Who We Are and How We Operate

AECL works to advance Canada's interests through leading edge nuclear science and technology and environmental protection initiatives. This includes combating climate change through clean energy growth and decarbonization strategies, pioneering new treatment methods for cancer and other diseases, and accelerating Canada's environmental remediation projects.

## Mission

Driving nuclear innovation to deliver clean energy technologies and improve the quality of life of Canadians while caring for the land.

## Vision

Leveraging the full potential of Canada's expertise in nuclear technology to achieve a better future for Canada and the world.

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 environmental liabilities, while CNL is responsible for the day-to-day operations of our sites.

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. We also oversee two target-cost contracts 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 the necessary broad-based experience to oversee the contract with CNL and play an appropriate oversight and challenge function to achieve value for Canada.



## Working Towards Reconciliation

The lands on which AECL's sites 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 First Nation, Métis and Inuit peoples through a renewed relationship based on recognition of rights, mutual understanding and respectful, meaningful engagement and collaboration.

We have made four commitments related to reconciliation:

- Listening, understanding, improving, and taking meaningful actions to advance reconciliation with Indigenous nations and communities on whose lands we operate.
- Continuously learn about Indigenous history, culture, traditions, and world views.
- Integrating Indigenous knowledge and values into AECL's policies, procedures, practices, and projects so that they become embedded in all that we do.
- Finding ways to empower Indigenous nations and communities to participate in projects across AECL sites.

We acknowledge 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.





## Creating a Diverse and Inclusive AECL

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.

This year we also introduced AECL's [Accessibility Plan](#), which outlines our goals which include making physical spaces at AECL more accessible and providing more training to employees. AECL is committed to being an accessible organization for employees and to sharing accessible information with Canadians.

While today women make up 55% of our workforce and 50% of our Board of Directors, AECL remains committed to closing the gender gap, particularly in leadership roles, and to strengthening the diversity and inclusiveness of our team. In addition, visible minorities represent 9% of AECL's workforce, and Indigenous populations 2%.

## 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.

This year, to further outline how sustainability is reflected across all AECL's activities, the first [Climate Resiliency Report](#) was published. This report provides an overview of the organization's progress and alignment to the Task Force on Climate-related Financial Disclosures framework, a set of recommendations for bringing a sustainability lens across four pillars: governance, strategy, risk management, and metrics and targets.

Climate change is one of the most pressing challenges of our time. As a federal Crown corporation working to advance Canada's interests through leading-edge nuclear science and technology, AECL recognizes the importance of its role in helping Canada meet its climate objectives.



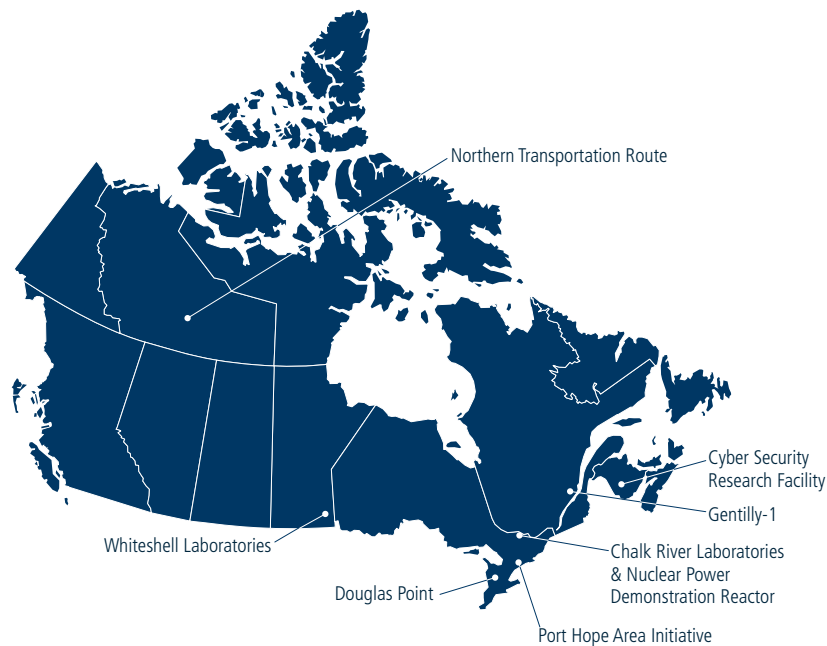
Conceptual image: Third Way

## Our Sites

The Chalk River Laboratories, in Ontario, is AECL's 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 – 116 buildings and structures since 2015 – and restoration to clean up contaminated lands and protect the surrounding environment.

As part of its mandate, AECL is 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, AECL is responsible for environmental remediation and waste management in areas where the Government of Canada has assumed responsibility for historic low-level radioactive waste, notably 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	<p>The Chalk River Laboratories is Canada's largest science and technology centre. From 2016 to 2026, the federal government is investing \$1.3 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.</p> <p>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.</p>
Nuclear Power Demonstration Reactor	Rolphton, Ontario	<p>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.</p>
Port Hope Area Initiative	Port Hope and Clarington, Ontario	<p>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.</p>
Douglas Point Reactor	Kincardine, Ontario	<p>The Douglas Point reactor is a shutdown prototype nuclear reactor currently in a safe shutdown state pending full decommissioning.</p>
Gentilly-1 Reactor	Bécancour, Quebec	<p>The Gentilly-1 reactor is a shutdown prototype nuclear reactor currently in a safe shutdown state pending full decommissioning.</p>
Whiteshell Laboratories	Pinawa, Manitoba	<p>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.</p>
Northern Transportation Route	Northwest Territories and northern Alberta	<p>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.</p>

# 2022-23 Achievements

This section highlights key targets achieved over the course of the year based on performance measures outlined in AECL's 2022-23 Corporate Plan Summary. For more details on our achievements and future activities, visit [www.aecl.ca](http://www.aecl.ca).



# Indigenous Engagement, Consultation and Reconciliation



We have commenced our journey to strengthen our relationships with Indigenous peoples and communities and are committed to continuing our efforts to establish new relationships with the Indigenous communities on the land on which we operate. This relationship is one rooted in efforts to understand perspectives of Indigenous peoples, and that contributes to healing and reconciliation between Indigenous peoples and all Canadians.



We have been making measurable strides but recognize that it takes time to develop meaningful and trusting relationships, and that we still have a long way to go in this regard. We have created a plan to guide our engagement with Indigenous peoples and are working to establish a process to help us build a Reconciliation Action Plan, developed in collaboration with Indigenous

partners, before 2025. This will guide how we engage with Indigenous communities and seek to embed their perspectives in the work we do. CNL, as a site operator, project proponent, and member of the local community, is also responsible for engaging with Indigenous peoples. This includes on environmental remediation projects, future land uses, as well as site development.

Targets	Results
Develop or renew between 3 and 5 agreements with Indigenous communities.	Several agreements were advanced throughout the fiscal year, with 2 having been concluded. Others remain in discussion.

# Nuclear Laboratories



AECL has been leading nuclear science and technology for over seven decades. The organization was the birthplace of Canada's nuclear industry, having hosted the first sustained criticality (controlled nuclear chain reaction) outside of the United States. More importantly, the Chalk River Laboratories were the birthplace of the CANDU reactor technology developed and commercialized by AECL's former CANDU Reactor Division, a technology that today is used at 19 reactors in Canada and 30 (CANDU or CANDU-derivatives) internationally. It also provided the research and facilities for breakthroughs in the life saving application of medical isotopes, including cobalt-60. Work undertaken at the Chalk River Laboratories has led to numerous and important scientific achievements – including two Nobel Prize winners.

Over the years, AECL has played an important role in supporting public policy and in delivering programs for the Government of Canada. This includes the production of medical isotopes and the provision of nuclear science and technology in the areas of energy, non-proliferation, emergency preparedness, counterterrorism, health, and security. AECL's unique facilities have made it an attractive research destination for scientists across Canada and the world, leading to home-grown innovation and the development and retention of highly qualified nuclear workers and scientists.

To further enhance these capabilities, the federal government is investing \$1.3 billion over ten years (starting in 2016) 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.



### Federal Nuclear Science and Technology Work Plan

AECL oversees the delivery of the Federal Nuclear Science and Technology Work Plan for nuclear research and development to support the Government's priorities and core responsibilities in the areas of health, nuclear safety and security, energy, and the environment. The Federal Nuclear Science and Technology Work Plan serves to build, maintain and maximize those capabilities that are unique to CNL. AECL engages with fourteen federal departments and agencies to develop a program of work that meets broad federal needs and priorities and fosters innovation through the development of technologies and applications, while supporting Canada's international partnerships, commitments, and obligations.

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.

Activities in 2022-23 supported AECL's priorities, including support for the government's priorities and the achievement of its climate change targets in 2030 and 2050. This included:

- Advancing small modular reactor technologies and deployment for Canada to inform regulatory guidance, assessments, and policies such as experimental validation of predictive models in support of safety analysis and licensing and the development of sensor monitoring of remote and underground structures.
- Examining the safety and efficacy of Actinium-225 in support of new medical applications and developing proof-of-concept production of high-quality radioisotopes for cancer treatments.
- Supporting regulatory and licensing decisions for projects to understand the behavior of materials in advanced reactors, small modular reactors and the current fleet in extreme environments.
- Examining the effects of aging, corrosion and degradation of in-core materials for new and current reactor types as well as developing state of the art online monitoring networks.
- Examining the potential for small modular reactors to meet the needs of a near-zero carbon remote mining operation.
- Contributing to Canada's emergency response capability by developing improved bio dosimetry techniques for rapid triage in emergency response; improvement of techniques for rapid measurement of radionuclides and development of decorporation and decontamination techniques.
- Improving the understanding of the basis of biological effectiveness of different radiations at low doses and dose rate.
- Advancing technologies for the detection of special nuclear materials at the border.
- Studying nuclear security and emergency response considerations for deployment of small modular reactors in remote sites.
- Reducing uncertainties in low-dose risk assessment to address challenges in regulatory policy, health assessment and public communication through in vivo mice studies.
- Improving the understanding of environmental impacts and waste of small modular reactor operations in support of the Small Modular Reactor Action Plan.
- Hosting exercises to test cyber security resilience for nuclear power plants in a full-scale cyber physical simulation of the control and safety systems; and,
- Supporting Canada's interests, commitments and arrangements in non-proliferation, counter- terrorism and disarmament priorities such as the International Partnership for Nuclear Disarmament Verification.

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.	81% of project milestones were met.

Canadian Nuclear Laboratories as a Federal Laboratory

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

In 2022-23, CNL continued to work with various Government departments and agencies, including Defense Research and Development Canada through its Canadian Safety and Security Program, the Canadian Nuclear Safety Commission, the Canadian Space Agency, Transport Canada, Department of National Defense, Canadian Coast Guards, and Natural Resources Canada.

Targets	Results
Propose and develop between 3 and 5 collaborative agreements, memoranda of understanding or other agreements with organizations.	11 new agreements were signed with government.

### New Technology Initiatives Fund

The New Technology Initiatives Fund allows CNL to undertake science and technology activities to build expertise and capability at the Chalk River Laboratories, with a long-term view to attracting and retaining world-class expertise and building skills and knowledge that are anticipated to be needed for future or emerging opportunities. Consistent with similar programs at national laboratories around the world, providing funding to support work and projects that may be at very early stages, peripheral to current research priorities, high risk, or exploratory, the New Technology Initiatives Fund is expected to promote innovative thinking, reward initiative, balance near-term priorities with long-term vision, and improve employee engagement.



Activities completed in 2022-23 include:

- Launch of the fifth iteration of the Strategic, Enabling, Engaging, Development (SEED) Crowd Sourcing Initiative. This program draws inspiration from the startup model and crowd sources employee ideas for new projects, investing in those selected for the research pipeline.
- Development of capabilities in the Medium Activity Materials Testing Laboratory of the Centre for Reactor Sustainability for work involving non-contaminated radioactive materials and components.
- Continued work in new and emerging areas, including the development of models for coupling hydrogen production processes to small modular reactors and hydrogen isotope exchange processes, advancing the modelling of nuclear graphite and undertaking research on targeted alpha therapy using intracellular nanobodies.
- The characterization of boron nanotube composite materials for radiation protection in space. The intended use of this technology is to provide a lightweight, radiation shielding material for space applications.
- A novel prototype neutron detector based on nanoparticle aerogels. This project was initiated following a successful SEED project, where neutron absorbing nanoparticle aerogel technology was investigated as possible alternative neutron detectors to Helium-3. This project will enable CNL to maintain and expand its unique expertise in neutron detection and development of novel neutron detectors.

Targets	Results
Maintain and enhance expertise and capabilities.	Seven of this year's projects were continuing projects from FY 2021-22, and five were new projects.

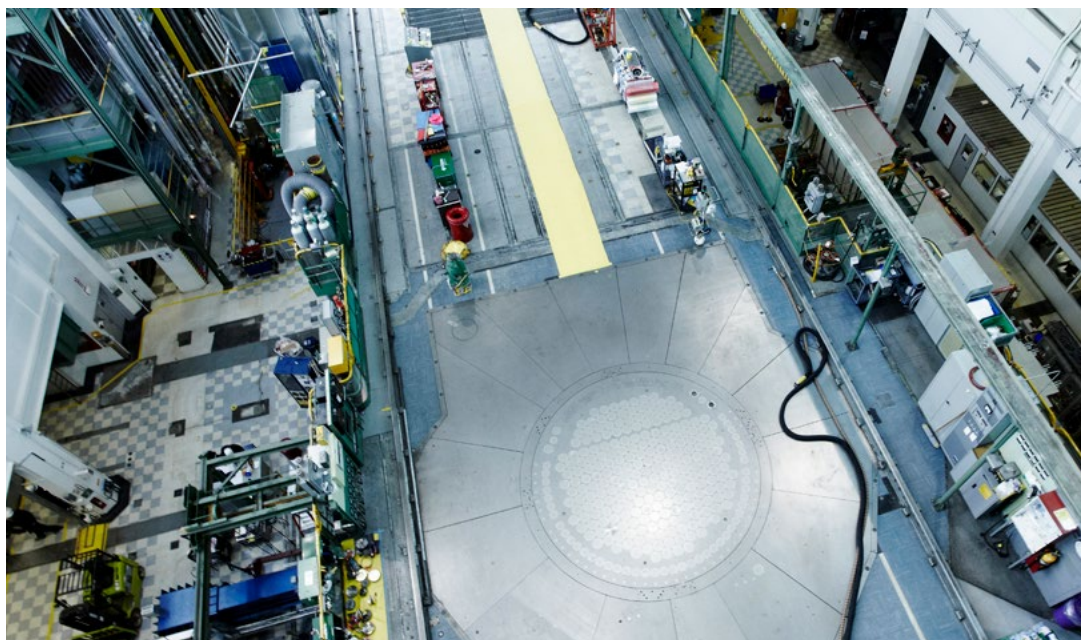
Commercial Science and Technology

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.

Building on previous years' efforts, in 2022-23 CNL continued to engage with and respond to existing customers' requests and explore new markets, to the extent possible as COVID-19 restrictions were lifted. Areas of work included nuclear reactor support, hydrogen and tritium, isotopes, radiobiology, and environment, safety and security, and advanced reactors.

Targets	Results
Generate more than \$65.3M in revenue.	The actual revenue generated for 2022-23 was \$63.6M.



### **National Research Universal Reactor**

After 60 years of operation, the National Research Universal reactor was shut down in March 2018. Designed in the early 1950's, the low-temperature, low pressure, research reactor enabled great advances across a wide variety of globally important industrial sectors. The National Research Universal reactor was used to prove out many concepts which later appeared in the CANDU reactor. It spawned a global medical radioisotope industry and provided the neutron source to conduct research across a wide spectrum of sciences, both applied and basic.

The reactor shutdown has left a significant gap in research capabilities at the Chalk River Laboratories. AECL and CNL are currently exploring options around a future research reactor.

### **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.

CNL's long-term plans for targeted and strategic capital investments will allow the laboratories to grow the unique complement of science and technology capabilities, while remaining flexible to quickly adapt to the evolutionary opportunities of nuclear and energy-related, leading-edge innovation. These investments will contribute to an efficient and cost-effective campus, replacing aged facilities and infrastructure that are costly to operate and maintain.

As part of AECL's role in overseeing CNL's activities for the management and operations of our sites, a clear focus is placed on the ongoing, safe operations of the nuclear laboratories and decommissioning sites. Above and beyond the role of the Canadian Nuclear Safety Commission which, as a regulator, ensures that all nuclear activities in Canada are delivered safely, AECL expects high levels of performance from CNL in health, safety, security, and environmental protection.



AECL has also asked CNL to transform its operations to increase value for money and reduce costs and risks to Canada. The overall objective is to have in place a cost-effective, modern campus-like site with new and refurbished facilities to support the future growth of CNL. Any capital investments at AECL sites will take into consideration best practices with respect to sustainability and green building standards in order for AECL to meet its GHG emission reduction targets.

The Capital Plan addresses two main areas of focus:

- **New Science Infrastructure** – These investments are part of a longer-term plan to revitalize the Chalk River site and construct new science facilities in order to build a modern, world-class nuclear science and technology campus that serves the needs of government and industry.
- **Site Infrastructure** – Investments have been required to support existing and aging infrastructure systems and facilities at the Chalk River site such as potable water, storm sewer, sewage treatment, electrical and other utilities. These investments are necessary to respond to regulatory and health, safety, security and environmental requirements, as well as to maintain a cost-effective and reliable site.

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 small modular reactors and nuclear safety and security. It will feature modern shielded facilities and a laboratory research complex. Construction was started in 2022 and is expected to be completed in 2028.

**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. Construction is well underway and is expected to be completed in the later part of 2023.

Targets	Results
Complete and commission new non-nuclear facilities.	The Science Collaboration Center achieved weathertight status which allowed for additional progress on interior finishes.
Improve stability in health, safety, security, and environmental industry standard metrics against industry standard benchmarks.	CNL achieved excellent safety performance and is well placed in the top quartile of industry performance, while other key indicators demonstrate solid continuous improvement.
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.	Cost pressure due to post-pandemic inflation and abnormal escalation continue to be a challenge to manage impact on the business. However, core focus on safety and environmental performance remains in control, while solid progress made to advance energy efficiency and carbon footprint reduction initiatives, from optimizing automation of building controls and adoption of electric vehicles, and continuing to enable core science mission strategies.



### Advanced Nuclear Materials Research Centre

The Advanced Nuclear Materials Research Centre is AECL's most significant capital investment at the Chalk River Laboratories. The objective is to combine the capabilities of existing, outdated facilities into a modern shielded facility and laboratory research complex essential to Canada's nuclear operations and status as a Tier 1 nuclear nation. The facility will enable continued support to Canada's CANDU fleet, the needs of the federal government (particularly in safety, security and nuclear forensics), and new and emerging science and technology areas such as small modular reactors and the associated fuel development technology.

# Environmental Stewardship



AECL's objective is to protect the environment by advancing key decommissioning, remediation, and waste management projects to address risks and hazards.

AECL has been conducting nuclear science and technology activities for over seven decades. While these activities have had important benefits for Canada and Canadians—for example the production of medical isotopes used in the detection and treatment of cancer—they also produced radioactive waste. AECL has various types of radioactive waste at its sites, including high-level waste (used fuel), intermediate- and low-level waste. Several sites, buildings and structures have also been contaminated as a result of nuclear science and technology activities and past waste-management practices; these need to be decontaminated and demolished, sites cleaned up and remediated, and the radioactive waste managed properly and safely.

AECL is also responsible for fulfilling Canada's responsibilities with respect to historic low-level waste at sites where the original owner no longer exists, or another party cannot be held liable and for which the Government 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, pursuant to an agreement between Canada and the municipalities. This project is one of the largest and most complex environmental projects in Canada.

With the implementation of the Government-owned, Contractor-operated model, AECL was given a mandate to accelerate these activities to reduce risks and costs for Canada in a safe manner, consistent with international leading practices. Specifically, AECL has asked CNL to propose long-term radioactive waste disposal solutions and to advance other decommissioning activities to reduce its environmental liabilities.

This work is well underway, with significant progress having been made at the Chalk River Laboratories where over 115 old and outdated buildings and facilities have been demolished. This not only reduces AECL's environmental liabilities and overall site maintenance costs, but it also paves the way for new facilities to be constructed as part of the site's revitalization.

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.

### **Remediation, Decommissioning and Radioactive Waste Management at the Chalk River Laboratories**

Activities in this area include all waste and decommissioning activities to address AECL's environmental, decommissioning, and waste management responsibilities at its Chalk River Laboratories.



## Waste Management and Disposal at the Chalk River Laboratories

Radioactive waste is safely stored at the Chalk River site. However, long-term management and disposal solutions must be developed for various types of wastes to allow for the remediation of contaminated buildings, lands and soils, and to move away from continuous temporary storage. As such, CNL has proposed to build a Near Surface Disposal Facility for the disposal of AECL's low-level radioactive waste, as well as small amounts of waste from other Canadian producers such as hospitals and universities.

The facility would allow for the disposal of the vast majority of AECL wastes currently in interim storage, as well as waste generated as a result of contaminated land remediation activities, decommissioning activities and continued operations of the nuclear laboratories. This project is critical to advance decommissioning and remediation activities at AECL sites, and to further protect the environment. In 2022-23, the Canadian Nuclear Safety Commission held a two-part public hearing to consider CNL's application for the Near Surface Disposal Facility. The Commission withheld a decision until 2023 and directed staff from the Canadian Nuclear Safety Commission, AECL and CNL to continue to engage and consult with Kebaowek First Nation and Kitigan Zibi First Nation, with further evidence to be submitted and an additional public hearing to take place in 2023. AECL and CNL have been actively engaging with the First Nations to build relationships and address outstanding concerns related to the project.

In the meantime, interim waste storage has continued to expand to accommodate waste which is produced as a result of continued building decontamination and decommissioning at the Chalk River site, as well as ongoing nuclear science and technology operations.

With respect to AECL's intermediate-level waste, CNL continued to engage with the Nuclear Waste Management Organization in its work, requested by the Minister of Natural Resources, to develop an Integrated Radioactive Waste Strategy for Canada. AECL's high-level waste (used fuel) is destined to be disposed of in the Nuclear Waste Management Organization's proposed repository. Projects to manage used fuel are discussed in more detail in the section on Management of used fuel and repatriation of highly-enriched uranium below.

CNL also manages AECL's inventory of highly radioactive stored liquid waste which is a byproduct of medical isotope production. A project is in place to safely remove and process the legacy radioactive liquid waste from existing tanks at the Chalk River site and to decommission the tanks and associated structures.

Until disposal solutions are approved and available, CNL continues to manage radioactive waste inventories at dedicated waste management facilities at the Chalk River site in a manner that is safe and minimizes the impacts on the environment.

Targets	Results
Develop a program for radioactive waste where there are no plans for disposal. This will be aligned with the Nuclear Waste Management Organization's work, as requested by the Minister of Natural Resources, to develop an Integrated Radioactive Waste Strategy for Canada.	AECL participated in the process led by the Nuclear Waste Management Organization in its development of an Integrated Radioactive Waste Strategy for Canada. As of spring 2023, recommendations on this strategy had not yet been presented to the Minister of Natural Resources by the Nuclear Waste Management Organization.
Receive low-level radioactive waste from the Whiteshell Laboratories site for storage and/or disposal.	Low-level radioactive waste from the Whiteshell Laboratories continues to be shipped to Chalk River Laboratories for storage and eventual disposal.
Receive regulatory approval to begin construction on the Near Surface Disposal Facility.	The regulatory approval process is still underway following the procedural direction issued by the Canadian Nuclear Safety Commission in summer 2022.

### Environmental Restoration at the Chalk River Site

For more than 70 years, nuclear science and technology activities at the Chalk River site have led to the production of a variety of radioactive and other hazardous wastes. This waste is carefully managed in dedicated areas, otherwise known as waste management areas. While the majority of the Chalk River site remains undisturbed, certain areas, including the waste management areas, have contaminated soil and waste requiring retrieval and processing to allow for final disposal. As there remains a significant amount of buried waste, soil contamination and associated plumes, remedial actions are required to further protect the environment. Until such a time, legacy waste is being safely managed and closely monitored.

The remediation of the Waste Management Areas cannot progress until the Near Surface Disposal Facility is available. The intent is to align the completion of the characterization and remediation planning of the waste management areas with the availability of the disposal facility.

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. CNL has completed a remediation action plan for Waste Management Area F, which is one of the waste management areas at the Chalk River site.

Decommissioning at the Chalk River Site

The Chalk River site includes multiple redundant and outdated buildings which require decontamination, decommissioning and demolition. The site has been in existence since the 1940s, and some buildings still standing today date back to that era. Some facilities were used as nuclear science and technology facilities (and therefore may have some level of radioactive contamination), while others were used as support buildings (for example machine shops, garages, etc.). Most of these facilities and buildings are outdated, no longer required to meet operational needs and contribute to high site costs through ongoing maintenance for safety and security purposes, energy consumption, etc. Buildings also need to be removed to make way for the Chalk River site revitalization.

Since 2015, there has been significant acceleration of decommissioning work at the Chalk River site: more than 115 buildings and structures have been decontaminated, decommissioned and demolished. This significantly reduces site costs and makes way for safer, more sustainable world-class nuclear science and technology buildings. It should also be noted that delays in the approval for the Near Surface Disposal Facility have required expanded interim waste storage so that building decontamination and demolition can continue to progress.

Targets	Results
Demolish 5 buildings and structures.	6 buildings have been demolished during the 2022-23 fiscal year.



## 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 as reactor fuel and in the production of medical isotopes. This material requires high levels of security as well as costly and complicated storage. As part of the Global Threat Reduction Initiative (an initiative which aims at reducing proliferation risks by consolidating highly enriched uranium inventories in fewer locations around the world), AECL is working with the United States Department of Energy and CNL to return (repatriate) this material to the United States for conversion and reuse. This initiative provides for a safe, secure, timely and permanent solution to Canada's long-term management of this material.

CNL is also advancing efforts to consolidate AECL's inventory of used fuel. This entails transferring used fuel, currently stored in various locations across Canada, to the Chalk River Laboratories. Consolidating used fuel in a single location will increase safety and security and reduce costs while the Nuclear Waste Management Organization develops a permanent disposal solution.

Targets	Results
Continue to investigate and pursue the disposition or repatriation of fresh and irradiated fuel material to further reduce liabilities for Canada.	The repatriation of fuel continued, consistent with commitments made by Canada at the Nuclear Security Summit. In total, 6 shipments were made during fiscal year 2022-23, thereby reducing risks for Canada.
Prepare plans and begin stakeholder and Indigenous engagement activities for the shipments of AECL used fuel to the Chalk River site. Various levels of engagement have already taken place.	Planning and stakeholder and Indigenous engagement activities are ongoing.
New fuel storage capacity is ready to accommodate AECL used fuel.	Infrastructure has been constructed and final reviews and approvals are underway.

## 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 in the late 1960's through the mid 1980's to advance the understanding of boiling light water power reactors (Gentilly-1) and steam condenser power reactors (Douglas Point). Both reactors are now shut down and in a safe shutdown state prior to being fully decommissioned.

Originally the decommissioning of these prototype reactors was not planned to occur for many decades. However, to reduce costs associated with storage and surveillance of this aging infrastructure, decommissioning plans are being prepared to advance this work. In order to move forward with the decommissioning of certain non-nuclear buildings at the Douglas Point site, CNL requested an amendment to its operating license. Permission to begin removing these facilities was granted in 2021. At Gentilly-1, asbestos and bulk dry active waste removal continued in 2022-23.

Targets	Results
Demolish supporting and/or redundant facilities at the Douglas Point reactor.	All building isolations are complete, and the demolition contractor is mobilizing in FY 2023-24 to demolish the Admin and Turbine Buildings at Douglas Point.
Review options for Douglas Point and Gentilly-1 for transport of fuel to the Chalk River Laboratories.	Preparations are advancing for the consolidation of the Gentilly-1 Fuel at Chalk River Laboratories. The decision to consolidate the Douglas Point Fuel at Chalk River Laboratories is currently on hold until it is established where the Canadian deep geological repository for fuel will be situated.

## Port Hope Area Initiative

The Port Hope Area Initiative represents Canada's commitment to clean up and safely manage historic low-level radioactive waste situated in the municipalities of Port Hope and Clarington, in Ontario. The objective is to safely relocate and manage roughly 2.1 million cubic meters of historic low-level radioactive waste and contaminated soils. To achieve this, two projects are being undertaken: the Port Granby Project and the Port Hope Project. Both involve the remediation of contaminated material and the construction of a near surface long-term waste management facility (one in each municipality). Whereas the Port Granby Project is now complete, the Port Hope Project is significantly more complex and will remain ongoing for the coming years.

The project has faced challenges associated with scope increase on many fronts as remediation work has progressed, with higher-than-anticipated volumes of waste needing to be remediated. At the Port Granby site, the total estimated waste volume increased 1.36 times from the original estimates (550,000 m<sup>3</sup> to 750,000 m<sup>3</sup>) due to the wider spread of contamination. That said, remediation was completed in the fall of 2020 and the facility is now capped and closed, with internal roads having been removed. The Port Granby site is now being transitioned to a long-term monitoring and maintenance phase.

As part of the Port Hope Project, completion of the last cell of the Long-term Waste Management Facility was completed in 2022-23. The remediation of the Port Hope harbour has also continued to progress after work stoppages due to COVID-19. Remediation of all four temporary storage sites, Pine Street consolidation site, Strachan Street site, waterworks east site and the Mill Street site are all now completed. The remediation of the lands directly under and surrounding the railway viaducts was also completed in 2022-23.

The remediation of the industrial sites also continued with preparations to remediate the Chemetron lagoon, the Lions Park and the Coal Gasification Site. Remediation of the Highland Drive site begun in late 2022-23 and will conclude in 2023-24.

The largest challenge in this project relates to the scope and execution of the remediation of residential properties. As characterization activities have advanced, the number of properties requiring remediation work has increased. Port Hope property owners and residents have expressed dissatisfaction about the time it will take to remediate their properties. CNL's experience in the field has identified the fact that a significant number of property cleanups are being driven by the generic, conservative cleanup criteria for arsenic in soil. As such, CNL is recommending changes to the Port Hope Area Initiative cleanup criteria for arsenic to minimize unintended negative environmental impacts and disruption to the community.



CNL has made an application to the Canadian Nuclear Safety Commission to amend the cleanup criteria and is engaging federal and provincial regulators, the municipality, local Indigenous communities, and the public to move its application forward. This would minimize impacts to the environment and to the surrounding communities, while still being protective of human health and the environment. Importantly, it would continue to meet the intent of the Government of Canada's commitment in the original Legal Agreement with the Municipalities to leave properties such that they can be used for "all current and foreseeable unrestricted uses." Should the revised cleanup criteria be accepted by the Canadian Nuclear Safety Commission, this would have the effect of reducing the scope of the cleanup and the overall number of properties requiring remediation.

Targets	Results
Restore the Port Granby remediation site and place the long-term waste management facility into long term surveillance.	The Port Granby site restoration was completed. The Port Granby site is now being transitioned to a long-term monitoring and maintenance phase.
Engage local Indigenous nations and communities 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.

Low-Level Radioactive Waste Management Office

The Government of Canada, through AECL, has assumed responsibility for historic, low-level radioactive waste where the original owner no longer exists, and the current owner cannot reasonably be held responsible. Through CNL, AECL is managing these responsibilities which include the cleanup of historic low-level radioactive waste at various sites across Canada (excluding the Port Hope Area Initiative, discussed above). This includes ongoing interim waste management and remediation projects mostly in Ontario, Alberta and the Northwest Territories.

Planning, stakeholder and Indigenous engagement continued to enable the remediation of sites along the Northern Transportation Route.

Targets	Results
Engage local stakeholders and Indigenous communities to agree on phase 2 cleanup plans for sites along the Northern Transportation Route located in the southeastern Northwest Territories and northern Alberta.	Engagement activities continued with local stakeholder and Indigenous communities regarding phase 2 cleanup plans.

Decommissioning and Closure of the Whiteshell Laboratories

The Whiteshell Laboratories, located in Pinawa, Manitoba, is the second largest of AECL's sites operated by CNL. It was established in 1963 as a research laboratory, with a focus on the largest organically cooled, heavy water moderated nuclear reactor in the world, the WR-1. Facilities also included a SLOWPOKE reactor as well as shielded hot cell facilities and other nuclear research laboratories. The site also includes a radioactive waste management area which serves to provide interim storage of radioactive waste for the Whiteshell site which was created as a result of the operations of the research reactor and nuclear laboratories.

In 1998, the Government of Canada announced the closure of the Whiteshell Laboratories, and decommissioning activities have been underway since then. With the implementation of the Government-owned, Contractor-operated model and the increased emphasis placed on tackling its environmental and decommissioning responsibilities, AECL has asked CNL to accelerate and complete the decommissioning and closure of the site. As a result, CNL is proposing to decommission and close the site by 2027, approximately 30 years ahead of the previous schedule. The acceleration of the decommissioning of the site includes a proposal by CNL to decommission the WR-1 reactor in-situ. That project is undergoing an Environmental Assessment.

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.

In 2022-23, CNL submitted a final version of its Environmental Impact Statement to the Canadian Nuclear Safety Commission, based on its work to broaden understanding of municipal and Indigenous perspectives through collaborative capacity-building initiatives, Traditional Knowledge studies and community participation in site monitoring activities.

Other activities to advance the decommissioning of the Whiteshell Laboratories have included the decontamination and demolition of several buildings. However, significant challenges have emerged with respect to the complexity and level of hazard related to the retrieval, processing and transport of radioactive waste currently being stored in a radioactive waste management area known as the 'standpipes and bunkers'. These are concrete structures, mostly below grade, which contain intermediate-level waste and potentially fissile nuclear material that cannot be fully characterized before retrieval begins. Given the level of risk involved with their remediation, CNL has had to adjust its approach, which is now more complex and costly (as it is based on remote tooling and robotics), to protect workers and the environment.

Targets	Results
Decommission the majority of buildings on the main campus by 2022.	Given the complexities related to the retrieval of some of the waste located in the management area (discussed above), a decision was made to extend the life cycle of many buildings beyond 2022 in order to accommodate staff and operations.
Prepare the retrieval system for the standpipes and bunkers to start operations.	Design of the retrieval system was advanced in 2022-23, with testing expected in the next fiscal year.
Submit the final Environmental Impact Statement for the proposed in-situ decommissioning of the WR-1 reactor.	CNL submitted the final Environmental Impact Statement in 2022-23, with the document passing the completeness check as assessed by the Canadian Nuclear Safety Commission. It is now undergoing final technical reviews by the federal, provincial and Indigenous review team.

Looking to the final site closure and being mindful of the impact on the local community, AECL will continue to work with local communities and Indigenous communities to discuss the future of AECL's lands, which could include consideration for siting a small modular reactor at the Whiteshell site. Further engagement to that effect will take place in 2023-24.



### Niigan Aki

In 2022, AECL, Sagkeeng Anicinabe First Nation and CNL launched the “Niigan Aki,” meaning “Land First,” an independent environmental monitoring program led by the Sagkeeng Anicinabe First Nation. Developed and administered by the Sagkeeng Anicinabe First Nation, with resources and support provided by AECL and CNL, the program was established to empower Sagkeeng’s ability to monitor and steward its territory, and improve understanding of the Whiteshell site and operations, which is located in the Sagkeeng’s unceded traditional territory.

### Closure of the Nuclear Power Demonstration Reactor Site

The Nuclear Power Demonstration (NPD) reactor, located in Rolphton, Ontario, was the first Canadian nuclear power reactor and the prototype for the CANDU reactor design. For 25 years, the reactor produced low-carbon energy and operated as a training centre for nuclear operators and engineers from Canada and around the world. Operations at the Nuclear Power Demonstration reactor ended in 1987, after which the first stages of decommissioning were completed, including the removal of all fuel from the site and the draining of the systems. The site has been in a safe shutdown state for the last 30 years.

As part of its objectives to protect the environment and address its environmental and decommissioning responsibilities, AECL has asked CNL to propose plans to safely decommission and close the reactor site. As a result, CNL is proposing to decommission the reactor in-situ, meaning that it would be immobilized in place by grouting (cementing) the reactor which is located below the surface. The project is currently undergoing an Environmental Assessment.

Since the launch of the Environmental Assessment process in 2016, CNL has been developing its safety case and preparing scientific studies with a view to providing all necessary documentation and responding to stakeholders and Indigenous groups' concerns. A final draft Environmental Impact Statement was submitted in 2023. While the project is more than three years delayed, it has allowed for additional engagement of stakeholders and Indigenous communities on the project in order to gather input and adjust the proposed approach as necessary. Activities have included multiple meetings, site tours and outreach to Indigenous communities, including providing funding for capacity building and traditional knowledge studies, and to enable Indigenous communities to engage technical experts to comment on the Environmental Impact Statement.

Targets	Results
Submit the final Draft Environmental Impact Statement for the proposed in-situ decommissioning of the Nuclear Power Demonstration reactor.	CNL plans to submit a final Draft Environmental Impact Statement (EIS) to the Canadian Nuclear safety Commission in 2023-24. The Commission has extended the hearing process for the NSDF and this is having a direct impact on when the NPD EIS can be submitted.

### 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, most notably hospitals and universities. CNL continues to provide these services to third parties for the handling, storage and disposal of radioactive waste. These activities are delivered on a full cost-recovery 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, 2023, 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 16, 2023, 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.

**Contractor performance:** As AECL relies on a private-sector contractor to execute scope related to its mandate, an inherent internal risk is the inability of the contractor to consistently execute and perform based on agreed-upon plans. To mitigate this risk and drive the appropriate behavior, the contract with CNL is carefully structured to include several mechanisms for AECL to track CNL's performance. Key amongst these is a performance measurement plan, which is used by AECL to set priorities supported by achievable stretch targets in order to drive value for money for Canada. Ongoing evaluation of the contractor against the plan throughout the year provides AECL the opportunity to highlight strengths and weaknesses and the contractor the opportunity to correct course where needed.

**Costs to operate the Chalk River Laboratories:** The shutdown of the National Research Universal reactor in 2018 has created cost and funding pressures. This is due to the combination of lost revenue from the activities of the reactor (including isotope sales), diminishing funding for the National Research Universal reactor, and site costs that have not proportionally decreased. Key mitigation measures include working with CNL to look at all options for lowering costs and increasing revenues. This is actively being pursued and implemented to enable a sustainable and science-focused organization in the long-term, while protecting workers, the public, and the environment.

**Human resources:** AECL is a small organization that relies on a small complement of national and international experts 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 bring value 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.

**Environmental Assessments:** As part of AECL's environmental stewardship responsibilities, three projects are currently undergoing Environmental Assessments through the Canadian Nuclear Safety Commission:

- 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.
- 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, which are discussed in more detail in the following section. All three projects have faced significant delays, which are due to higher-than-anticipated public and Indigenous engagement, requests from the Canadian Nuclear Safety Commission to provide additional technical studies and COVID-19. As a result, additional time has been needed to prepare the safety case for each project, which includes: making adjustments based on feedback and comments received from the regulator, other government organizations, the public and Indigenous groups; continuing engagement with key stakeholder and Indigenous groups; and, focusing communications activities with a view to increasing understanding of the rationale behind the projects – protection of the environment – as well as AECL's role specifically. Overall, while these delays 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 (which are also facilitating public and Indigenous engagement).

Progress has been made on the Near Surface Disposal Facility project as the Canadian Nuclear Safety Commission held a two-part public hearing which took place in February and May/June 2022. In July 2022, the Commission issued a decision to extend the Indigenous consultation period requiring Commission staff, CNL and AECL to submit additional evidence and information on the subject of engagement and consultation by the end of January 2023, a deadline which has been extended to May 1, 2023. An additional hearing for Indigenous Nations and communities will take place in June 2023.

## Financial Review

	March 31	
(\$ millions)	2023	2022
	\$	\$
<b>Revenues</b>		
Parliamentary appropriations	1,083	1,009
Commercial revenue	137	137
Interest income	16	3
Other proceeds	7	20
	<b>1,243</b>	<b>1,169</b>
<b>Expenses</b>		
Cost of sales	87	88
Operating expenses	75	100
Contractual expenses	247	240
Decommissioning, waste management and contaminated sites expenses	(28)	1,317
	<b>381</b>	<b>1,745</b>
<b>Surplus (deficit) for the year</b>	<b>862</b>	<b>(576)</b>

### Parliamentary Appropriations

The Government of Canada provides funding for AECL to advance its priorities and deliver on its mandate. AECL recognized \$1,083 million of Parliamentary appropriations in fiscal year 2022-23, an increase of \$74 million compared to the prior year. The increase is largely a result of increased activities in decommissioning, waste management and remediation of contaminated sites as well as spending toward capital infrastructure.

### Commercial Revenue

In 2022-23, revenue was \$137 million, consistent with 2021-22. Revenue included technology sales and research and development activities performed by CNL for commercial customers as well as heavy water sales. There was a small increase in heavy water sales that offset a similar decrease in commercial activities.

### Interest Income

Interest income is earned on cash, short-term investments and investments held in trust. Income earned increased compared to the prior year due to higher market interest rates.

### Other Proceeds

Other proceeds relate to commercial settlements recorded during the year.

### Cost of Sales

Cost of sales is consistent with the prior year and is consistent as a percentage of revenue from the prior year.

### Operating Expenses

Operating expenses are largely comprised of AECL's oversight expenses and amortization of tangible capital assets. There were operating expenses of \$75 million in 2022-23 compared to \$100 million in 2021-22. The decrease is due primarily to commercial settlements paid during the prior year of \$20 million, as well as write-offs of construction in progress totalling \$6 million, compared to \$2 million in the current year.

### Contractual Expenses

AECL delivers its mandate through a contract with CNL for the operation of its sites. A portion of CNL expenditures are reported by AECL as Contractual expenses. Expenses in this category for 2022-23 total \$247 million, compared to \$240 million in 2021-22. The variance with the prior year is largely a result of increased spending on nuclear science and technology activities in the current year.

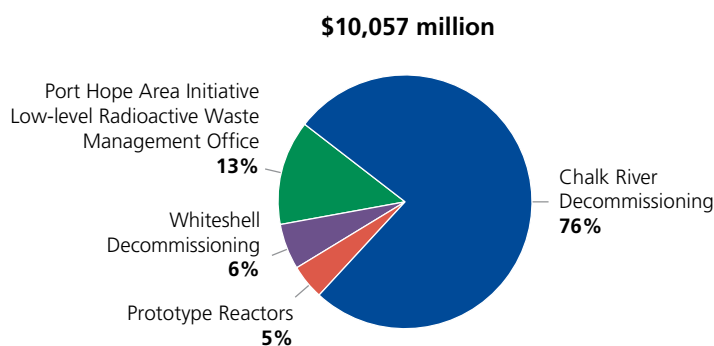
### Decommissioning, Waste Management and Contaminated Sites Expenses

Decommissioning, waste management and contaminated sites expenses consist of financial expenses, the impact on the liability of a change in discount rate, 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. Changes in discount rate will impact the net present value of the reported liabilities. If the discount rate increases during the year, the result would be a decrease in the Decommissioning, waste management and contaminated sites expenses. If the discount rate decreases, the result would be an increase to the reported expenses. Refer to Note 11 for a sensitivity of a 1% change in the discount rate.

The \$1,345 million decrease in 2022-23 is primarily a result of a change in the discount rate this year compared to last year, as a result of using a current rate methodology as part of adopting the new PSAS Asset Retirement Obligation standard.

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 2022-23



### 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 increased by the effect of the change in discount rate on the decommissioning, waste management and contaminated sites liability.

### Outlook

AECL will continue to deliver on its commitments based on its 2023-24 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

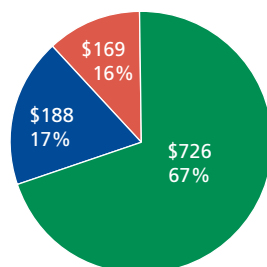
Total funding recognized in 2022-23 for operating and capital activities was \$1,083 million (2021-22: \$1,009 million).

The 2022-23 funding included:

- \$188 million (2021-22: \$184 million) to support nuclear science and technology activities as well as ongoing safe operations at the Chalk River Laboratories.
- \$726 million (2021-22: \$709 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.
- \$169 million (2021-22: \$116 million) for capital infrastructure renewal at the Chalk River Laboratories.

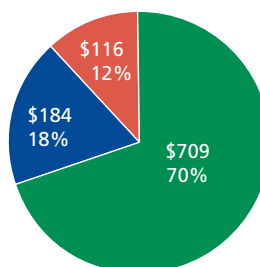
## Funding 2022-23

\$1,083 million



## Funding 2021-22

\$1,009 million



■ Environmental Stewardship and Remediations
 ■ Nuclear Laboratories
 ■ Capital Infrastructure Renewal

## Results Compared to 2022-23 Corporate Plan

	2023 Actual	2022-23 Corporate Plan
(\$ millions)		
	\$	\$
Parliamentary appropriations	1,083	1,326
Commercial revenue	137	95
Operating expenses	75	69
Contractual expenses	247	219
Decommissioning, waste management and contaminated sites expenses	(28)	295
Surplus	862	776

AECL reported a surplus of \$862 million compared to a planned surplus of \$776 million. This variance is mostly related to the above referenced surplus for the effect of change on discount rate 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)	2023	2022
	\$	\$
Cash provided by operating transactions	56	286
Cash applied to capital transactions	(154)	(112)
Cash applied to investing transactions	(19)	(57)
(Decrease) increase in cash	(117)	117
Balance at beginning of the year	262	145
<b>Balance at end of the year</b>	<b>145</b>	<b>262</b>

## Operating Transactions

Operating transactions resulted in a net cash inflow of \$56 million compared to a net inflow of \$286 million in 2021-22. This variance is mainly due to receiving the final appropriations for Q4 before the end of year in the prior year. In the current year this was a receivable at year-end.

## Capital Transactions

The \$154 million cash used in capital transactions in 2022-23 was higher than the \$112 million in the prior year. The increase is primarily due to increased spending in the current year toward new Chalk River site infrastructure and new build projects.

## Investing Transactions

The \$19 million cash used in investing transactions in 2022-23 was lower than the \$57 million in the prior year. The decrease is primarily due to fewer investments in short-term investments during the year.

Overall, AECL's March 31, 2023 closing cash position decreased by \$117 million to \$145 million from the previous year's balance of \$262 million.

## Highlights of the Statement of Financial Position

	March 31, 2023	March 31, 2022	Variance in \$	Variance by %
(\$ millions)				
	\$	\$	\$	%
Financial Assets	607	597	10	2
Liabilities	10,346	11,079	(733)	-7
Non-Financial Assets	975	857	118	14
Accumulated Deficit	(8,764)	(9,625)	861	-9

The increase in Financial Assets of \$10 million is largely a result of the increased appropriations receivable and short-term investments balance at the end of the year, partially offset by a decrease in trade receivables and inventories held for resale.

The decrease in Liabilities of \$733 million can be attributed primarily to the decrease in the decommissioning, waste management and contaminated sites liability as a result of the increase in discount rate.

The increase in Non-Financial Assets of \$118 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. AECL records Parliamentary appropriations received in the year as revenue in the Statement of Operations. Refer to Note 16 of the financial statements for a reporting on how appropriations received were used during the period.

## Five-Year Financial Summary

### Unaudited

	2023	Restated (Note 3) 2022	2021	2020	2019
(\$ millions)					
	\$	\$	\$	\$	\$
<b>Parliamentary appropriations</b>					
Operating	914	893	817	753	755
Capital	169	116	119	113	71
Statutory	–	–	5	2	3
	<b>1,083</b>	1,009	941	868	829
<b>Operations</b>					
Commercial revenue	137	137	95	112	109
Interest income	16	3	4	6	5
Other proceeds	7	20	–	50	–
Decommissioning, waste management and contaminated sites expenses	28	(1,317)	(678)	(955)	(713)
Operating, contractual and other expenses	(409)	(428)	(355)	(400)	(409)
Surplus (deficit)	<b>862</b>	(576)	7	(319)	(179)
<b>Financial position</b>					
Cash	146	262	145	80	62
Long-term disposal of waste fund	33	30	48	43	31
Appropriations receivable	161	–	123	100	69
Inventories held for resale	61	94	129	151	177
Tangible capital assets	974	857	787	716	665
Due to Canadian Nuclear Laboratories	248	190	176	164	100
Decommissioning and waste management provision and Contaminated sites liability	<b>10,057</b>	10,836	8,152	8,062	7,669
<b>Other</b>					
Number of employees	49	46	45	45	43

\* Certain amounts have been reclassified to conform to the 2023 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 16, 2023



Thomas Assimes  
*Chief Financial Officer*

June 16, 2023



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 2023, and the statement of operations, 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 2023, 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*.

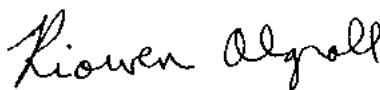
In our opinion, the transactions of Atomic Energy of Canada Limited that came to our notice during the audit of the financial statements have complied, in all material respects, with the specified authorities referred to above. Further, as required by the *Financial Administration Act*, we report that, in our opinion, the accounting principles in Canadian public sector accounting standards have been applied, after giving retroactive effect to the change in the method of accounting for asset retirement obligations as explained in Note 3 to the financial statements, 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.



Riowen Yves Abgrall, CPA, CA  
Principal  
for the Auditor General of Canada

Ottawa, Canada  
16 June 2023

# Statement of Financial Position

As at March 31

	Notes	2023	Restated (Note 3) 2022
<i>(thousands of Canadian dollars)</i>			
		\$	\$
<b>Financial assets</b>			
Cash		145,522	262,095
Short-term investments	4	92,428	71,707
Long-term disposal of waste fund	5	32,734	29,890
Investments held in trust	6	74,259	73,858
Trade and other receivables	7	40,892	65,436
Appropriations receivable	16	160,500	–
Inventories held for resale	8	60,746	93,893
		<b>607,081</b>	596,879
<b>Liabilities</b>			
Accounts payable and accrued liabilities	9	27,394	38,158
Employee future benefits	10	12,880	14,557
Due to Canadian Nuclear Laboratories		247,978	190,280
Decommissioning and waste management provision	11	8,723,480	9,304,857
Contaminated sites liability	12	1,333,856	1,531,318
		<b>10,345,588</b>	11,079,170
<b>Net debt</b>		<b>(9,738,507)</b>	(10,482,291)
<b>Non-financial assets</b>			
Tangible capital assets	13	973,537	856,783
Prepaid expenses		1,045	143
		<b>974,582</b>	856,926
<b>Accumulated deficit</b>		<b>(8,763,925)</b>	(9,625,365)
Accumulated deficit is comprised of:			
Accumulated operating deficit		(8,761,229)	(9,622,850)
Accumulated remeasurement losses		(2,696)	(2,515)
		<b>(8,763,925)</b>	(9,625,365)
Commitments	14		
Contingent liabilities	15		

The accompanying notes are an integral part of these financial statements

Approved on behalf of the Board

  
Martha Tory, Director

  
Fred Dermarker, President and Chief Executive Officer

# Statement of Operations

For the year ended March 31

	Notes	2023 Budget	2023	Restated (Note 3) 2022
<i>(thousands of Canadian dollars)</i>				
		\$	\$	\$
<b>Revenues</b>				
Parliamentary appropriations	16	1,326,160	<b>1,083,200</b>	1,008,769
Commercial revenue		95,300	<b>137,297</b>	137,217
Interest income		4,000	<b>15,862</b>	3,255
Other proceeds		–	<b>7,000</b>	20,050
		1,425,460	<b>1,243,359</b>	1,169,291
<b>Expenses</b>				
Cost of sales		66,710	<b>86,735</b>	88,584
Operating expenses		68,894	<b>75,316</b>	100,111
Contractual expenses	17	219,265	<b>247,161</b>	239,758
Decommissioning, waste management and contaminated sites expenses		294,596	<b>(27,474)</b>	1,316,985
	18	649,465	<b>381,738</b>	1,745,438
<b>Surplus (deficit) for the year</b>		775,995	<b>861,621</b>	(576,147)
<b>Accumulated operating deficit, beginning of year</b>		(9,622,850)	<b>(9,622,850)</b>	(9,046,703)
<b>Accumulated operating deficit, end of year</b>		(8,846,855)	<b>(8,761,229)</b>	(9,622,850)

The accompanying notes are an integral part of these financial statements

# Statement of Remeasurement Gains and Losses

For the year ended March 31

	2023	2022
<i>(thousands of Canadian dollars)</i>		
	\$	\$
<b>Accumulated remeasurement (losses) gains, beginning of year</b>	<b>(2,515)</b>	1,621
<b>Remeasurement losses arising during the year</b>		
Unrealized losses on Investments held in trust	<b>(2,113)</b>	(4,254)
<b>Reclassifications to the Statement of Operations</b>		
Realized losses on Investments held in trust	<b>1,932</b>	118
<b>Net remeasurement losses for the year</b>	<b>(181)</b>	(4,136)
<b>Accumulated remeasurement losses, end of year</b>	<b>(2,696)</b>	(2,515)

The accompanying notes are an integral part of these financial statements

## Statement of Change in Net Debt

For the year ended March 31

	Notes	2023 Budget	2023	Restated (Note 3) 2022
<i>(thousands of Canadian dollars)</i>				
		\$	\$	\$
<b>Surplus (deficit) for the year</b>		775,995	<b>861,621</b>	(576,147)
<b>Tangible capital assets</b>				
Acquisition of tangible capital assets	13	(147,000)	<b>(169,127)</b>	(116,359)
Amortization of tangible capital assets	13	47,274	<b>47,913</b>	49,134
Write-down of tangible capital assets	13	–	<b>2,271</b>	5,719
Other changes	13	–	<b>2,189</b>	(1,442)
		(99,726)	<b>(116,754)</b>	(62,948)
<b>Non-financial assets</b>				
Changes in prepaid expenses		–	<b>(902)</b>	301
<b>Net remeasurement losses for the year</b>		–	<b>(181)</b>	(4,136)
<b>Decrease (increase) in net debt</b>		676,269	<b>743,784</b>	(642,930)
<b>Net debt, beginning of year</b>		(10,482,291)	<b>(10,482,291)</b>	(9,839,361)
<b>Net debt, end of year</b>		(9,806,022)	<b>(9,738,507)</b>	(10,482,291)

The accompanying notes are an integral part of these financial statements

# Statement of Cash Flows

For the year ended March 31

	2023	2022
<i>(thousands of Canadian dollars)</i>		
	\$	\$
<b>Operating transactions</b>		
Cash receipts from Parliamentary appropriations	922,700	1,131,370
Cash receipts from customers and other sources	167,808	139,272
Cash paid to suppliers	(277,968)	(317,089)
Cash paid to employees	(13,477)	(12,386)
Cash paid for decommissioning, waste management and contaminated sites activities	(751,365)	(653,350)
Cash designated for future waste management and disposal activities	(2,476)	(2,766)
Interest received	11,246	1,375
<b>Cash provided by operating transactions</b>	<b>56,467</b>	<b>286,426</b>
<b>Capital transactions</b>		
Acquisition of tangible capital assets	(153,852)	(111,995)
<b>Cash applied to capital transactions</b>	<b>(153,852)</b>	<b>(111,995)</b>
<b>Investing transactions</b>		
Cash invested in short-term investments	(19,188)	(57,433)
<b>Cash applied to investing transactions</b>	<b>(19,188)</b>	<b>(57,433)</b>
<b>(Decrease) increase in cash</b>	<b>(116,573)</b>	<b>116,998</b>
<b>Cash, beginning of year</b>	<b>262,095</b>	<b>145,097</b>
<b>Cash, end of year</b>	<b>145,522</b>	<b>262,095</b>

The accompanying notes are an integral part of these financial statements

# Notes to the Financial Statements

For the year ended March 31, 2023

## 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.

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, 2023, 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 His Majesty in Right of Canada. As a result, AECL's liabilities are ultimately liabilities of His 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 2023-2024 to 2027-2028 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.

### Budget Figures

The 2022-23 budget is reflected in the Statement of Operations and the Statement of Change in Net Debt. Budget data for 2022-23 presented in these financial statements is based upon the 2022-23 projections and estimates contained within the 2022-23 to 2026-27 Corporate Plan. Since actual opening balances of the accumulated operating deficit and net debt were not available at the time of preparation of Budget 2023, the corresponding amounts in the budget column have been adjusted to the actual closing balances of the previous year.

### 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.

### c) Financial Instruments

Financial instruments are classified in one of the following categories: (i) fair value; or (ii) cost or amortized cost. AECL determines the classification of its financial instruments at initial recognition.

Investments held in trust comprise investments that are managed on a fair value basis and the fair value option is elected. Transaction costs are recognized in the Statement of Operations in the period during which they are incurred. Investments at fair value are remeasured at their fair value at the end of each reporting period. Any remeasurement gains and losses are recognized in the Statement of Remeasurement Gains and Losses and are cumulatively reclassified to the Statement of Operations upon disposal or settlement.

Investments in securities not designated to be measured at fair value are initially recorded at fair value plus transaction costs and are subsequently measured at amortized cost using the effective interest rate method, less any provision for impairment. AECL has no investments in securities measured at amortized cost as at March 31, 2023.

A write-down is recognized in the Statement of Operations for an investment in either category where there has been a loss in the value of the investment considered as an "other than temporary" loss. Subsequent changes to the remeasurement of Investments held in trust are reported in the Statement of Remeasurement Gains and Losses. If the loss in value of an Investment held in trust subsequently reverses, the write-down to the Statement of Operations is not reversed until the investment is sold.

Other financial instruments, including 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 initially recorded at their fair value and are subsequently measured at amortized cost, net of any provisions for impairment.

Interest income and realized gains and losses earned on Cash, Short-term investments, Long-term disposal of waste fund and Investments held in trust are recognized in the Statement of Operations.

**d) 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.

**e) 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. The voluntary termination compensation 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 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 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.

#### **f) 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. A liability is recognized when all of the following conditions are prevalent: there is a legal obligation to incur retirement costs in relation to a tangible capital asset; the past transaction or event giving rise to the liability has occurred; it is expected that future economic benefits will be given up; and a reasonable estimate of the amount can be made.

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 liability is discounted using a current rate methodology with the Bank of Canada zero-coupon bond yield curve, in line with the expected weighted average spending profile. 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. The initial estimate of the liability includes costs directly attributable to asset retirement activities, including post-retirement operation, maintenance and monitoring.

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. 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. For assets no longer in productive use, all subsequent changes in the estimate of the obligation are recognized as an expense in the period they are incurred.

#### **g) 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. The liability is discounted using a current rate methodology with the Bank of Canada zero-coupon bond yield curve, in line with the expected spending profile of the liability.

#### **h) 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.

### i) 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.

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.

### j) 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 being 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.

## k) 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, up to the authorized amount, where eligibility criteria have been met.

## l) 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.

## m) Standards and Guidelines

The following standard has been issued by the PSAB effective April 1, 2022 and was adopted using a modified retroactive application by AECL on April 1, 2022:

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

As a result of adopting PS 3280, AECL has elected to use a current rate methodology for its discount rate. This has resulted in a change to the opening accumulated deficit for April 1, 2021. Refer to Note 3 for additional discussion on the adoption of PS 3280.

The following standards have been issued by the PSAB:

*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. This standard is not expected to have a significant impact on AECL's financial reporting.

### 3. Change in Accounting Policy

Effective April 1, 2022, AECL adopted PS 3280 Asset retirement obligations. The new standard includes the requirement to review and update the discount rate at each financial reporting date when discounting the liability. As a result of adopting this standard, AECL is using a current rate methodology to discount the Decommissioning and waste management provision. Previously, AECL used a historical blended rate methodology to calculate its discount rate. The adoption of the current rate generated a decreased discount rate, resulting in an increase to the Decommissioning and waste management provision. This standard was adopted with modified retroactive application, in which all previous assets and liabilities were derecognized and new comparative figures were established. These amounts are measured using assumptions and discount rates that are current at the beginning of the fiscal year in which the new standard is applied. The discount rate used to establish the comparative figures was the April 1, 2022 rate of 2.35%. The change in discount rate has resulted in a significant impact to AECL's financial statements.

As a result of the change in accounting policy, the opening accumulated deficit for April 1, 2021 was adjusted. A summary of this and other adjustments as at March 31, 2022 has been provided below:

	March 31, 2022		
(thousands of Canadian dollars)	As previously reported	Effect of change in accounting	As restated
	\$	\$	\$
<b>Statement of Financial Position</b>			
Liabilities			
Decommissioning and waste management provision	7,342,841	1,962,016	9,304,857
Net Debt	(8,520,275)	(1,962,016)	(10,482,291)
Non-Financial Assets			
Tangible capital assets	848,730	8,053	856,783
Accumulated deficit	(7,671,402)	(1,953,963)	(9,625,365)
<b>Statement of Operations</b>			
Expenses			
Operating expenses	99,793	318	100,111
Decommissioning, waste management and contaminated sites expenses	1,375,127	(58,142)	1,316,985
Surplus (deficit) for the year	(633,971)	57,824	(576,147)
Accumulated operating deficit, beginning of year	(7,034,916)	(2,011,787)	(9,046,703)
Accumulated operating deficit, end of year	(7,668,887)	(1,953,963)	(9,622,850)
<b>Statement of Change in Net Debt</b>			
Surplus (deficit) for the year	(633,971)	57,824	(576,147)
Tangible capital assets			
Amortization of tangible capital assets	48,816	318	49,134
Other changes	(87)	(1,355)	(1,442)
Decrease in net debt	(699,717)	56,787	(642,930)
Net debt, beginning of year	(7,820,558)	(2,018,803)	(9,839,361)
Net debt, end of year	(8,520,275)	(1,962,016)	(10,482,291)

The following items were adjusted in the Buildings comparative figures of Note 13:

<i>(thousands of Canadian dollars)</i>	As previously reported	Effect of change in accounting	As restated
	\$	\$	\$
Cost at March 31, 2021	545,437	8,161	553,598
Additions and transfers	50,271	1,355	51,626
Cost at March 31, 2022	588,398	9,516	597,914
Accumulated amortization at March 31, 2021	235,210	1,145	236,355
Increase in amortization	17,598	318	17,916
Accumulated amortization at March 31, 2022	246,659	1,463	248,122
Net carrying amount at March 31, 2021	310,227	7,016	317,243
Net carrying amount at March 31, 2022	341,739	8,053	349,792

The following items were adjusted in the comparative figures of Note 18:

<i>(thousands of Canadian dollars)</i>	As previously reported	Effect of change in accounting	As restated
	\$	\$	\$
Amortization of tangible capital assets	48,816	318	49,134
Finance expenses	294,456	(59,265)	235,191
Loss and revision in estimate and timing of expenditures on Decommissioning and waste management provision	150,307	1,123	151,430

#### 4. Short-term Investments

Short-term investments are comprised largely of investment certificates and 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	
<i>(thousands of Canadian dollars)</i>	2023	2022
	\$	\$
Short-term Investments	92,428	71,707
	92,428	71,707

## 5. 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 low- and intermediate-level radioactive waste generated starting in 2015. The cash dedicated to this purpose, available on demand with one month notice, is not expected to be used in the upcoming fiscal year. The fund is comprised of the following:

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
Term deposits	32,734	29,890
	32,734	29,890

## 6. 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 11).

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. 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:

	Maturities	March 31	
(thousands of Canadian dollars)		2023	2022
		\$	\$
Deposits	Not applicable	460	7,885
Canadian government bonds*	September 2022 - April 2035	59,114	35,364
Corporate bonds	June 2022 - January 2030	14,685	30,609
		74,259	73,858

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

## 7. Trade and Other Receivables

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
Trade receivables	14,336	25,159
Unbilled revenue	11,404	13,321
Consumption taxes receivable	15,152	13,956
Other proceeds	–	13,000
	<b>40,892</b>	<b>65,436</b>

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 related to a commercial settlement.

AECL's exposure to credit risks related to Trade and other receivables, including unbilled revenue, is disclosed in Note 19.

## 8. Inventories Held for Resale

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
Mechanical seals	2,481	2,616
Heavy water inventory	58,265	91,277
	<b>60,746</b>	<b>93,893</b>

The cost of inventory for mechanical seals recognized as an expense and included in Cost of sales was \$0.1 million (2022 – \$0.1 million).

The cost of inventory for heavy water recognized as an expense and included in Cost of sales was \$33.0 million (2022 – \$35.3 million).

## 9. Accounts Payable and Accrued Liabilities

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
Trade payables	1,488	1,640
Other payables and accrued expenses	19,820	25,544
Accrued payroll liabilities	2,410	1,960
Amounts due to related parties	443	248
Provisions	165	4,665
Customer advances and obligations	3,068	4,101
	<b>27,394</b>	<b>38,158</b>

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.

## 10. Employee Future Benefits

### a) Pension Plan

As described in Note 2(e), 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 5.29 times (2022 – 5.91 times) the employees' contribution on salaries in excess of \$196,200 (2022 – \$191,300). For salaries below \$196,200, 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)	2023	2022
	\$	\$
Payments by employees	867	823
Payments by employer	1,775	1,388

### b) Other Employee Future Benefits

AECL provides certain voluntary termination compensation (VTC) and other post-employment benefits as described in Note 2(e). 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 2023 Employee future benefits liability is \$4.7 million (2022 – \$5.7 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, 2023, 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 7.2 years (2022 – 7.8 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)	2023	2022
	\$	\$
<b>Accrued benefit obligation, beginning of year</b>	<b>14,907</b>	16,245
Benefits earned	<b>3</b>	4
Interest on Accrued benefit obligation	<b>334</b>	246
Benefits paid	<b>(1,768)</b>	(1,817)
Actuarial loss	<b>440</b>	229
Other gains	<b>(180)</b>	–
<b>Accrued benefit obligation, end of year</b>	<b>13,736</b>	14,907
Less: Unamortized actuarial gain	<b>856</b>	350
<b>Employee future benefits liability</b>	<b>12,880</b>	14,557

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:

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
<b>Benefit and interest expense</b>		
Benefits earned	<b>3</b>	4
Amortization of actuarial gain recognized	<b>(90)</b>	(87)
Total benefit income	<b>(87)</b>	(83)
Interest on Accrued benefit obligation	<b>334</b>	246
<b>Total benefit and interest expense</b>	<b>247</b>	163

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

	March 31	
	2023	2022
	%	%
Discount rate at year-end	<b>3.05</b>	2.40
Rate of increase in salaries	<b>3.00</b>	3.00
Health care cost trend	<b>4.00 - 6.00</b>	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, 2021.

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.

## 11. 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	
		Restated (Note 3)
(thousands of Canadian dollars)	2023	2022
	\$	\$
<b>Carrying amount – Beginning of year</b>	<b>9,304,857</b>	9,380,995
Liabilities settled	<b>(522,266)</b>	(452,745)
Unwinding of discount	<b>218,348</b>	220,134
Effect of change in discount rate	<b>(994,968)</b>	–
Revision in estimate and timing of expenditures	<b>715,390</b>	151,430
Estimates affecting Property, plant and equipment and future disposal costs for waste from ongoing operations	<b>2,119</b>	5,043
<b>Carrying amount – End of year</b>	<b>8,723,480</b>	9,304,857

The undiscounted future expenditures, adjusted for inflation, for the planned projects comprising the liability are \$17,024.4 million (March 31, 2022 – \$15,840.1 million). The provision is re-valued at the discount rate in effect at each Statement of Financial Position date. The provision is discounted using a 30-year rate from the Bank of Canada zero-coupon bond yield curve.

Key assumptions used in determining the provision:

	March 31	
		Restated (Note 3)
	2023	2022
Discount period	<b>162 years</b>	163 years
Discount rate	<b>3.01%</b>	2.35%
Short-term inflation rate	<b>2.21%</b>	2.21%
Long-term inflation rate	<b>2.00%</b>	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	
		Restated (Note 3)
(thousands of Canadian dollars)	2023	2022
	\$	\$
1% increase	<b>(1,280,721)</b>	(1,460,363)
1% decrease	<b>1,771,232</b>	2,060,044

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	
	2023	Restated (Note 3) 2022
<i>(thousands of Canadian dollars)</i>		
	\$	\$
1% increase	1,736,046	1,944,516
1% decrease	(1,283,872)	(1,416,509)

## 12. 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. One project to address this liability, the Port Granby Project, was closed and capped in the fall of 2021 with site restoration activities completed by March 2023, and has now transitioned into long-term monitoring and maintenance which is expected to continue for 100 years. The other large project, the Port Hope Project, is forecasted to be complete in 2030-31, 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	
	2023	2022
<i>(thousands of Canadian dollars)</i>		
	\$	\$
<b>Carrying amount – Beginning of year</b>	<b>1,531,318</b>	790,190
Liabilities settled	(231,217)	(204,294)
Unwinding of discount	33,714	15,057
Effect of change in discount rate	(35,348)	–
Revision in estimate and timing of expenditures	35,389	930,365
<b>Carrying amount – End of year</b>	<b>1,333,856</b>	1,531,318

The liability for the Port Hope Area Initiative and the Low-Level Radioactive Waste Management Office is discounted using present value techniques. The liability is discounted using a 5-year rate from the Bank of Canada zero-coupon bond yield curve. The estimated total undiscounted expenditures are \$1,502.9 million (March 31, 2022 – \$1,689.5 million).

Key assumptions used in determining the provision:

	March 31	
	2023	2022
Discount period	<b>47 years</b>	48 years
Discount rate	<b>2.92%</b>	2.20%
Short-term inflation rate	<b>2.21%</b>	2.21%
Long-term inflation rate	<b>2.00%</b>	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)	2023	2022
	\$	\$
1% increase	<b>(47,939)</b>	(61,633)
1% decrease	<b>52,344</b>	67,529

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)	2023	2022
	\$	\$
1% increase	<b>65,800</b>	66,955
1% decrease	<b>(61,327)</b>	(62,300)

### 13. Tangible Capital Assets

	Construction in progress	Land and land improvements	Buildings	Reactors, Machinery and Equipment	Total
(thousands of Canadian dollars)					
	\$	\$	\$	\$	\$
<b>Cost at March 31, 2022</b>	<b>215,455</b>	<b>153,164</b>	<b>597,914</b>	<b>515,098</b>	<b>1,481,631</b>
Additions and transfers	169,127	1,453	11,366	26,387	208,333
Disposals and transfers	(39,131)	(146)	(2,032)	(20,375)	(61,684)
Write-downs	(2,271)	–	–	–	(2,271)
<b>Cost at March 31, 2023</b>	<b>343,180</b>	<b>154,471</b>	<b>607,248</b>	<b>521,110</b>	<b>1,626,009</b>
<b>Accumulated amortization at March 31, 2022</b>	<b>–</b>	<b>58,003</b>	<b>248,122</b>	<b>318,723</b>	<b>624,848</b>
Increase in amortization	–	5,487	16,119	26,307	47,913
Disposals and transfers	–	(51)	(1,222)	(19,055)	(20,328)
Other charges	–	–	39	–	39
<b>Accumulated amortization at March 31, 2023</b>	<b>–</b>	<b>63,439</b>	<b>263,058</b>	<b>325,975</b>	<b>652,472</b>
<b>Net carrying amount at March 31, 2022</b>	<b>215,455</b>	<b>95,161</b>	<b>349,792</b>	<b>196,375</b>	<b>856,783</b>
<b>Net carrying amount at March 31, 2023</b>	<b>343,180</b>	<b>91,032</b>	<b>344,190</b>	<b>195,135</b>	<b>973,537</b>

	Restated (Note 3)				
	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	553,598	502,368	1,383,616
Additions and transfers	116,359	7,748	51,626	21,025	196,758
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	597,914	515,098	1,481,631
Accumulated amortization at March 31, 2021	–	52,558	236,355	300,868	589,781
Increase in amortization	–	5,611	17,916	25,607	49,134
Disposals and transfers	–	(166)	(6,149)	(7,752)	(14,067)
Accumulated amortization at March 31, 2022	–	58,003	248,122	318,723	624,848
Net carrying amount at March 31, 2021	182,064	93,028	317,243	201,500	793,835
Net carrying amount at March 31, 2022	215,455	95,161	349,792	196,375	856,783

Write-downs of \$2.3 million were recorded in 2023 (2022 – \$5.7 million).

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

## 14. Commitments

### a) Operating Leases:

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

	Leases
<i>(thousands of Canadian dollars)</i>	
	\$
2023-2024	103
2024-2025	104
2025-2026	111
2026-2027	112
2027-2028	112
2028 and thereafter	9
	551

During the year ended March 31, 2023, an amount of \$0.2 million (2022 – \$0.2 million) was recognized for leases as an Operating expense in the Statement of Operations.

### 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, 2023, AECL has contractual arrangements with third party suppliers, including contracts that allow for termination with penalties, approximating \$660.2 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 \$56.2 million. The details of the Government-owned, Contractor-operated model are discussed in Note 17.

## 15. 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 9).

## 16. Funding

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
<b>Parliamentary appropriations for operating, capital and statutory expenditures</b>		
Amount received during the year for operating, capital and statutory expenditures	<b>922,700</b>	1,131,370
Amount receivable at the end of the year	<b>160,500</b>	–
Amount receivable from a previous year	–	(122,601)
<b>Total Parliamentary appropriations recognized</b>	<b>1,083,200</b>	1,008,769

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, 2023 totalled \$1,326.6 million.

## 17. 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. This contract will expire in September of 2025.

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)	2023	2022
	\$	\$
<b>Contractual amounts paid or payable</b>	<b>1,219,166</b>	1,062,892
Less: Costs charged to Decommissioning and waste management provision and Contaminated sites liability	<b>(750,687)</b>	(654,319)
Less: Costs charged to Construction in progress	<b>(169,127)</b>	(116,359)
Less: Costs classified as Cost of sales	<b>(52,191)</b>	(52,456)
<b>Contractual expenses</b>	<b>247,161</b>	239,758

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.

## 18. Additional Information by Type of Expense

	March 31	
		Restated (Note 3)
(thousands of Canadian dollars)	2023	2022
	\$	\$
Payroll expenses	12,250	10,690
General and administrative expenses	2,842	2,174
Site and program operating costs	44,924	74,121
Amortization of tangible capital assets (Note 13)	47,913	49,134
Realized losses on Investments held in trust	1,932	118
Contractual amounts paid or payable less costs charged to Construction in progress (Notes 13 and 17) and less liabilities settled for Decommissioning and waste management provision and Contaminated sites liability (Notes 11, 12 and 17)	299,352	292,215
Finance expenses	252,062	235,191
(Gain) loss on revision in estimate and timing of expenditures on Decommissioning and waste management provision (Note 11)	(279,578)	151,430
Loss on revision in estimate and timing of expenditures on Contaminated sites liability (Note 12)	41	930,365
	381,738	1,745,438

## 19. 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, 2023 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 \$40.9 million (2022 - \$65.4 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, as set out in AECL's investment policy. All bond investments are rated at an A level or higher using Standard & Poors as at March 31, 2023.

Details of trade receivables are as follows:

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
Current	12,566	16,164
1 to 30 days past due	875	2,117
31 to 60 days past due	456	6,431
61 to 90 days past due	121	7
More than 90 days past due	318	440
	14,336	25,159

With respect to accounts receivable past due but not impaired, based on credit history, there are no indications that customers will not be able to meet their obligations.

## 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, 2023 and March 31, 2022, had the exchange rate (CAN\$/US\$) been 5% higher or lower, the impact on the Statement of Operations 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 risk 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 11 and 12).

## 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 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 2023, AECL's regulatory risk management objectives were unchanged from those in 2022.

## 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. The liquidity available in AECL's investments ensure that AECL is able to meet its obligations and commitments.

Details of accounts payables are as follows:

	March 31	
(thousands of Canadian dollars)	2023	2022
	\$	\$
Current	999	1,640
1 to 30 days past due	489	–
31 to 60 days past due	–	–
61 to 90 days past due	–	–
More than 90 days past due	–	–
	<b>1,488</b>	<b>1,640</b>

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, 2023 and March 31, 2022, there were no transfers between levels.

	March 31, 2023			
(thousands of Canadian dollars)	Level 1	Level 2	Level 3	Total
	\$	\$	\$	\$
<b>Assets measured at fair value</b>				
Investments held in trust – Deposits	460	–	–	460
Investments held in trust – Bonds	41,248	32,551	–	73,799
	<b>41,708</b>	<b>32,551</b>	<b>–</b>	<b>74,259</b>

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

## 20. 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 9, 10 and 16, 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)	2023	2022
	\$	\$
Salaries and other short-term benefits	3,612	3,212
Post-employment benefits	1,031	677
	4,643	3,889

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.

# 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. 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, 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 the Human Resources and Governance Committee, each having specific charters that set out their responsibilities. 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**

Appointed as Chair in July 2019 for a term of five years. Mr. Burpee 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 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. Mr. Burpee is also a Fellow of the Canadian Academy of Engineering.

AECL Committees: Audit, Human Resources and Governance



**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.

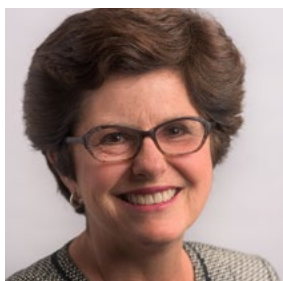
Prior to joining AECL, Fred was President and CEO of the CANDU Owners Group, where he led the not-for-profit organization to advance collaboration between CANDU nuclear reactor operators worldwide.

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.



#### **Martha Tory, Board Member**

Appointed in October 2016 for a term of one year, subsequently reappointed in October 2017 for a term of three years, and again in October 2020 for a term of 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 at the 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.

AECL committees: Audit (Chair), Human Resources and Governance



#### **Carmen Abela, Board Member**

Appointed in June 2017 for a term of three years and reappointed in June 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 public administration and 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 of 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).

AECL Committees: Audit, Human Resources and Governance (Chair)



**Kamilia Sofia, Board Member**

Appointed in July 2019 for a term of three years (the appointment remains in effect until a replacement is appointed or there is a reappointment).

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

AECL Committees: Audit, Human Resources and Governance



**Virendra Jha, Board Member**

Appointed 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.

AECL Committees: Audit, Human Resources and Governance

### Director Attendance at Board Committee Meetings, 2022-23

Director	Audit (10 meetings)	Human Resources and Governance (8 meetings)	Board of Directors (13 meetings)
Carmen Abela	10/10	8/8	13/13
Jim Burpee	9/10	7/8	12/13
Fred Dermarkar	n/a	n/a	13/13
Virendra Jha	9/10	8/8	12/13
Kamilia Sofia	10/10	7/8	11/13
Martha Tory	10/10	8/8	13/13
Shawn Tupper	0/1	0/1	0/1

Notes:

- Shawn Tupper ceased to be a Board Member on June 8, 2022.
- Fred Dermarkar is not a member of either committee.

## **AECL Offices**

### Head Office

Chalk River Laboratories  
286 Plant Road, Stn 508A  
Chalk River, Ontario  
Canada K0J 1J0

### Ottawa Office

270 Albert Street, Suite 1500  
Ottawa, Ontario  
Canada K1P 5G8

### Whiteshell Laboratories

1 Ara Mooradian Way  
Pinawa, Manitoba  
Canada R0E 1J0

[www.aecl.ca](http://www.aecl.ca)

