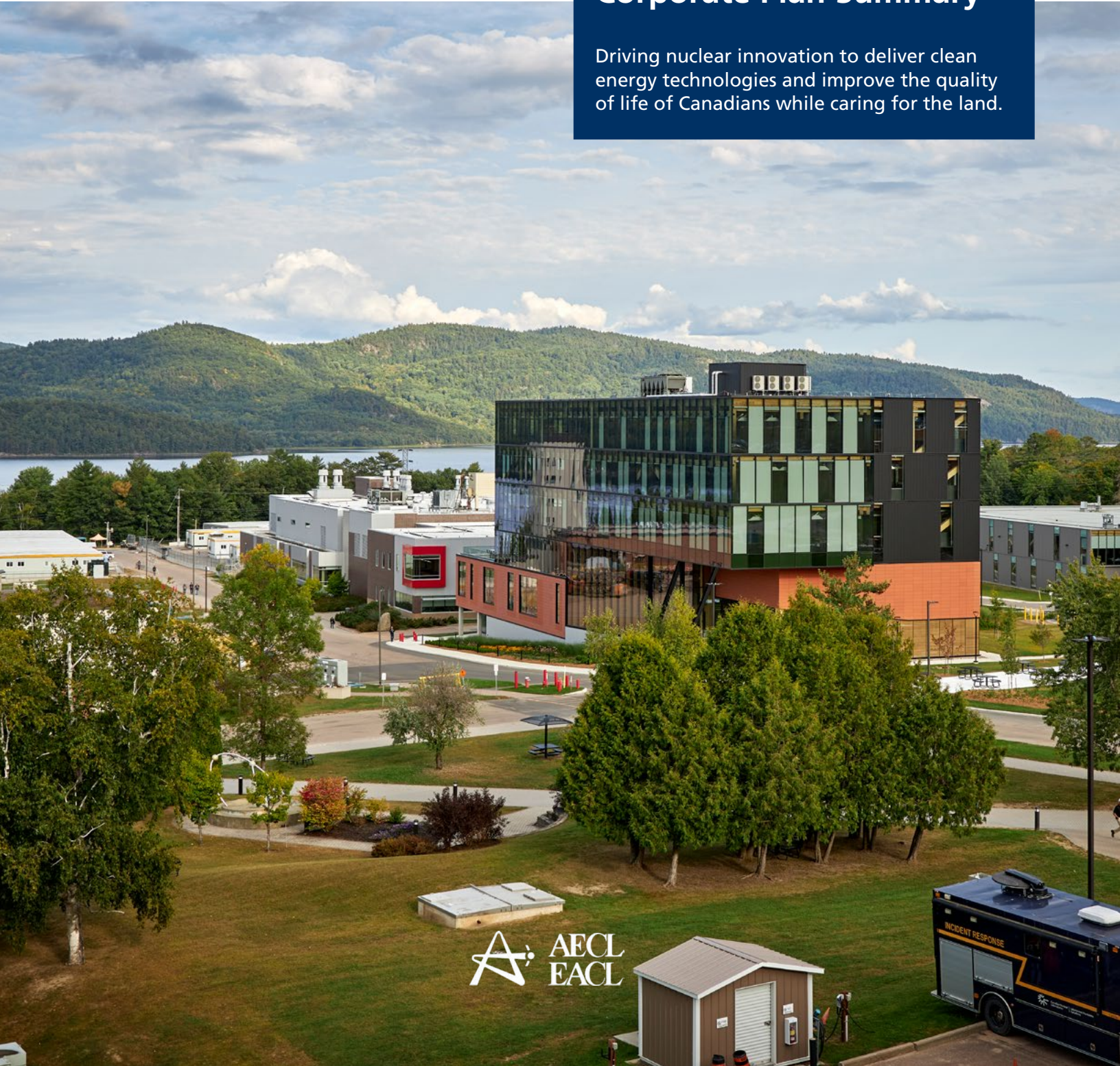


Atomic Energy of Canada Limited

2025-26 to 2029-30 Corporate Plan Summary

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



With gratitude, AECL acknowledges that it operates on the territories that have, since time immemorial, been the traditional lands of Indigenous peoples in Canada.



Table of Contents

- 1 Executive Summary
- 3 Overview
- 6 Operating Environment
- 9 Objectives and Plans
- 28 Annex 1 – Financial Statements and Budgets

Executive Summary

This Corporate Plan Summary presents an overview of Atomic Energy of Canada Limited's (AECL's) operating environment, alignment with government priorities, and key planning highlights for the 2025-26 to 2029-30 period.

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.

Looking at the overall operating environment, Canada's nuclear sector is thriving and AECL is poised to help drive growth through contributions to innovation and technology development. AECL – through the Chalk River Laboratories – plays a critical role in providing services to the Government of Canada to fulfill its core responsibilities related to nuclear regulations, through research supporting the Canadian Nuclear Safety Commission's (CNSC) policy and programs. The unique research capabilities at the Chalk River Laboratories also play a key role in supporting the nuclear sector, including sustaining the safe operations of the current fleet of Canada Deuterium Uranium (CANDU) reactors as well as the potential role for additional CANDU reactors to fulfill Canada's growing electricity needs.

AECL accessed new funding from Budget 2024 to execute its mandate and support long-term operations for the next 11 years. This Corporate Plan Summary provides detailed information on AECL's plans, highlighted by the following major components:

Nuclear Innovation

AECL is pushing ahead in establishing itself and Canadian Nuclear Laboratories (CNL) as global nuclear science leaders, implementing projects and initiatives designed to connect challenges to solutions and rapidly advance promising technologies to market. This includes the establishment of the New Nuclear & Emerging Technologies (N2ET) program, and the formation and continued advancement of joint ventures such as Fusion Fuel Cycles Inc. and Actineer Inc. AECL is delivering critical support to federal priorities through the Federal Nuclear Science and Technology (FNST) Work Plan, which provides science-based evidence to inform decision making to 15 federal departments and agencies.

AECL is bringing its convening power and establishment of new partnerships and business opportunities that bring academia, research institutions and private-sector partners together.

The revitalization of the Chalk River Laboratories is continuing through important capital investments, including construction of the Advanced Nuclear Materials Research Centre which is well underway.

Decommissioning and Waste Management

The clean-up of the Chalk River Laboratories is continuing, with over 121 legacy facilities and structures decommissioned, and associated risks and hazards reduced.

Regulatory approval to build the Near Surface Disposal Facility (NSDF) at the Chalk River Laboratories has been obtained, although the project faces delay pending decisions on judicial reviews of the CNSC process around, among other things, Indigenous consultations, as well as the issuance by Environment and Climate Change Canada of a permit under the *Species at Risk Act*; pending decisions have the potential to significantly delay the project. AECL remains committed to the current project plan, but will adjust if necessary.

Major progress of the Port Hope Area Initiative – a community driven initiative to clean-up historic low-level radioactive waste – continues with the remediation of major sites having been completed or close to it, and only residential properties remaining.

After work stoppage at the Whiteshell Laboratories (which is undergoing decommissioning) due to gaps in the fire protection program, the project is on track to return to full operation of decommissioning activities, and advancing clean-up and remediation activities.

Indigenous Engagement and Reconciliation

AECL and CNL are building relationships across the lands on which they operate, developing and implementing Nation-specific Memorandum of Understanding (MOUs) and agreements to increase capacity, knowledge sharing and increased involvement in work on AECL-owned sites.

AECL is developing plans and policies to support reconciliation activities and broader discussions related to site planning, environmental restoration, procurement and economic opportunities.

Strategic Management of CANDU Intellectual Property

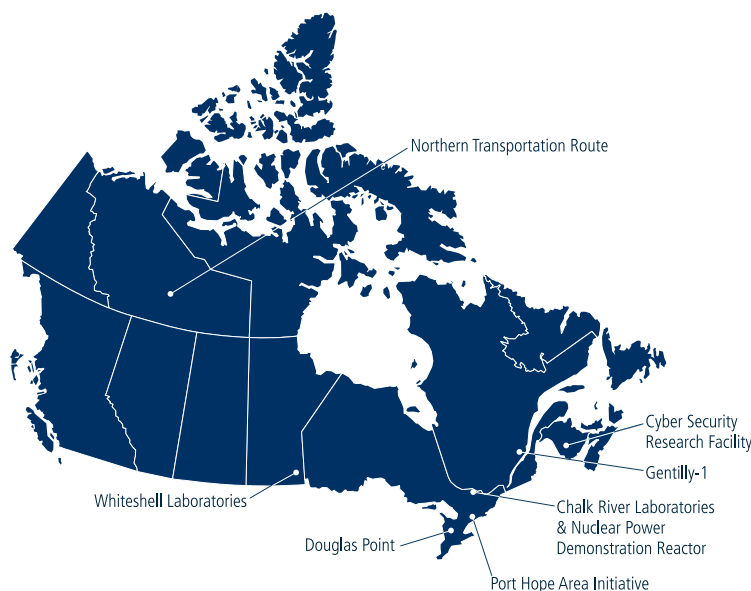
For the Government of Canada, AECL is the owner of the CANDU intellectual property (IP), one of Canada's foremost technology assets. AECL, on behalf of the Government of Canada, is responsible for managing CANDU IP, including the license of CANDU IP to AtkinsRéalis. The strategic, economic, and environmental context for CANDU has changed substantially in recent years and, accordingly AECL is now working with its commercial counterparts to seize the opportunity for investment in CANDU, particularly in an effort to see the technology developed to meet market demand, create economic growth and further energy security for Canada.

Government-owned, Contractor-Operated Procurement Process

The process to procure the services of a contractor to manage CNL remains on track, with the selection of a preferred bidder expected in the spring of 2025, in advance of contract commencement in September 2025.

AECL is planning for the transition to a new contract and potential new contractor, with a view to ensuring continuity of operations.

Overview



AECL is a federal Crown corporation that has a mandate to enable nuclear science and technology, protect the environment by fulfilling the Government of Canada's radioactive waste and decommissioning responsibilities, and derive optimal value for Canada from the Government of Canada's nuclear intellectual property (IP) including CANDU. This work is undertaken at several sites across Canada, with headquarters in Chalk River, Ontario. AECL's operating model allows it to leverage the expertise and experience of the private sector to advance work and drive priorities in two main areas.

Nuclear Innovation

AECL is focused on leveraging the successes of its past as well as future nuclear innovation to benefit Canada and Canadians. Working with industry, academia, and government, AECL is enabling the development of new technologies to advance Small Modular Reactors (SMRs), clean hydrogen and fusion all with a view to building on the success of CANDU and its already realized, and potentially enhanced, contributions to climate objectives, energy security and jobs. Advancements in nuclear medicine are being pursued in an effort to further revolutionize the diagnosis and treatment of disease. This includes supporting the research and development of new and promising nuclear health technologies, including emerging radiotherapies, diagnostics, and radiotheranostics such as Targeted Alpha Therapy. AECL and CNL, based on decades of experience, are at the forefront of the production and uses of deuterium and deuterium-based products, which are key to unlocking fusion technologies.

Work in these areas is enabled by the vast and unique capabilities of CNL and the Chalk River Laboratories, Canada's largest science and technology complex and host to over 3,000 employees. The work undertaken at the laboratories supports Canada's federal priorities and responsibilities in the areas of health, energy and climate change, the environment, safety, and security. Services are also provided to industry and other third parties on a commercial basis.

Overview

The Chalk River site is currently undergoing an important renewal that will transform the site into a modern, world-class nuclear science and technology campus, thanks to multi-billion-dollar investments over two decades, starting in 2016.

Through the work and capabilities of the Chalk River Laboratories, AECL and CNL can act as a conduit between the Government of Canada and private industry by identifying and facilitating opportunities to build support for initiatives that serve federal priorities, commitments, and goals.

Environmental Stewardship

AECL's objective is to safely and responsibly address the environmental responsibilities and liabilities which have resulted from legacy activities at AECL sites. These legacy liabilities are the result of decades of significant contributions and advancements in nuclear science which have benefitted Canadians and the world, including the development of the CANDU technology and the production of medical isotopes which are used in the diagnosis and treatment of cancer and other diseases. Part of AECL's mandate is to decontaminate and decommission redundant structures and buildings, remediate contaminated lands and manage the disposal of radioactive waste at AECL sites. AECL is also responsible for the remediation and long-term management of sites contaminated with historic, low-level radioactive waste where the Government of Canada has accepted responsibility.

Responsible decommissioning and radioactive waste management is necessary to clean up AECL's sites, protect the environment, and make way for new buildings that will support the ongoing nuclear science and technology mission at the Chalk River site. AECL also continues to manage radioactive waste that is produced from its ongoing science and technology activities, in a manner that is aligned with modern standards and practices.

Operating Model

AECL's Oversight Role

AECL exercises oversight responsibility in two broad categories: oversight of the commercialization of the CANDU intellectual property (licensed to AtkinsRéalis), and oversight of the operation of AECL sites by CNL. AECL fulfills its mandate with respect to CANDU intellectual property primarily through its relationship with AtkinsRéalis.

With respect to the operation of its sites, AECL receives funding from the Government of Canada and earns commercial revenues to fulfill its mandate, which it delivers through long-term contracts with the private sector for the management and operation of its sites. This operating model, known as a government-owned, contractor-operated model, allows for AECL's mandate to be delivered in a disciplined manner such that the government and the private sector each play to their strengths. Under this model, AECL sets out the results needed to deliver on its mandate, drawing from its and the government's overarching priorities. The contractor determines how to deliver on overall objectives, drawing upon extensive experience in managing and operating national laboratories, performing complex decommissioning and waste management activities, and delivering capital construction projects.



AECL oversees all CNL activities:

- We set priorities for CNL.
- We approve their long-term plan.
- We provide guidance for and approve their annual plan and budgets.
- We use internationally-recognized tools to track performance based on activities set out in the plans.
- We review their performance and perform audits.
- We can reduce incentive fee if performance is not adequate.

AECL then focuses on oversight of priorities and performance monitoring to drive value for Canada. AECL plays a crucial role in ensuring the advancement of its priorities in the most effective and efficient manner, while ensuring that CNL maintains safety, security, and the protection of the environment.

To systematically monitor and assess performance, a performance measurement plan is issued by AECL annually. The plan is based on, and developed in parallel with, an annual work plan developed by CNL and accepted by AECL. The performance measurement plan outlines AECL's priorities for CNL and sets out areas where the contractor stands to earn fee for the management and operation of AECL's sites, as per contractual arrangements.

The current Government-owned, Contractor-operated contract is set to expire in September 2025. In early 2024, AECL issued a Request for Proposal for a contractor to manage AECL's sites post 2025, and the procurement process is proceeding on schedule. Based on current plans, it is expected that the contract would be awarded to the preferred bidder in the spring of 2025, and that transition activities would take place over several months.

As an agent of government, AECL also supports the government's development of nuclear policy. AECL works closely with the Government of Canada to provide technical expertise, operational insight and strategic advice that inform policy directions.

As a federal Crown corporation, AECL [reports annually](#) to Parliament through the Minister of Energy and Natural Resources.

Operating Environment

State of the Nuclear Sector

AECL sees distinct needs in four timeframes: the present, the near future, the medium term, and the long term, with specific actions and investments for each.

The present is about extending the operational lives of, and refurbishing, the existing Canadian reactor fleet. This process is well established and ongoing, and the Chalk River Laboratories play a major role in supporting these utility-led projects.

The near future is the design and deployment of the next generation of large reactors. As detailed in this plan, AECL and Canada have a strong interest in the success of CANDU technology. Notwithstanding AECL's connection to CANDU, the national nuclear laboratories are technology agnostic, and will be ready to support the safe, secure, and efficient operation of any new reactor technology over the life of those reactors.

The medium term is where we see a focus on Advanced Reactors, including small modular reactors (SMRs) and Micro-reactors. We have a head start thanks to Canada's extensive capabilities in nuclear technology, including academia, research, engineering, manufacturing, and existing supply chain.

SMR vendors have risen to the challenge. Many have entered the Vendor Design Review process with the CNSC and are well on their way towards having viable designs. Various levels of government have also expressly stated their intentions for SMRs, including providing funding to advance those objectives. Ontario, New Brunswick, and Saskatchewan have announced investments in SMRs, with Ontario announcing the construction of four BWRX-300 SMRs at the Darlington site with the first scheduled to be operational by 2029. AECL and CNL created an invitation process to host an SMR at the Chalk River Laboratories and the process remains open to all technology developers. Why are SMRs and other advanced reactors important? Due to Canada's immense size, with remote communities and remote industrial and resource extraction activities (not to mention potential data centres fueling the AI revolution), our country is particularly poised to benefit from smaller, remotely deployable energy sources.

Looking further into the future, Canada and the world are making moves to harness the power of nuclear fusion. This technology is still at the early stages, but holds immense promise. Canada has unique experience and expertise in tritium, which can be leveraged for fusion fuel cycles. AECL and CNL have developed a fusion roadmap, and are engaging NRCAN on their fusion-related priorities. When fusion technology matures, Canada could be poised to take a leadership role because of the investments being made today into new capabilities and facilities, including the UNITY-2 project, a groundbreaking integrated and flexible fuel cycle test facility located at Chalk River Laboratories. As a first step, CNL has announced that its invitation process for the siting of SMR technologies has been expanded to include clean energy technologies such as fusion.

In addition, Canadian leadership on nuclear science is a strategic asset on the global stage. Canadian nuclear technology and know-how can reap the benefits of international markets, but more importantly can help deliver energy security and bolster our allies around the globe.

Procurement Process for the Government-owned, Contractor-operated Contract

A major strategic consideration for AECL in 2025-26 and beyond is completing the procurement process for the management of CNL under the government-owned, contractor-operated model. The present contract ends in September 2025, and given the scope and size of this procurement process, AECL has put in place a dedicated team staffed with senior AECL employees across a range of functions, supplemented by external support. In 2025-26, AECL expects to select the preferred bidder and transition to the new contractor. This process is discussed further under the Objectives and Plans section (Other Areas of Focus).

People and Culture

AECL is a small organization with a complement of experts with diverse industry background who bring experience in the management of similar Government-owned, Contractor-operated arrangements, both from a government and contractor perspective. As of July 2024, AECL had 57 employees, which includes a temporary increase of 6 full-time employees (FTE) to support the Government-owned, Contractor-operated procurement process. A recent strategic workforce analysis was conducted to forecast the number of resources and type of skillsets which will be required to continue to provide oversight. Considering its growing scope of interests, AECL forecasts that its FTE complement will grow its headcount by ten FTEs over the next ten years. AECL is committed to fostering an environment that embraces diversity and promotes equity and inclusion. AECL's workforce is made up of employees that self-identify as 54% women, 8% visible minorities and 4% Indigenous.

Aligned with advancing our efforts toward the *Equality in Energy Transition Initiative's Equal by 30*, AECL established an employee-led, executive sponsored, Diversity, Equity and Inclusion (DE&I) working group as a result of an organization-wide cultural competency assessment survey. The working group regularly highlights environmental, social and governance issues at all-staff meetings, remains involved in the Women in Nuclear (WiN) Canada association, provides an anonymous reporting tool with upcoming associated training, posts its [Accessibility Plan](#), encourages work-life balance with a hybrid work model, and completed a pay equity review and job validation process.

AECL continues to experience low voluntary turnover with a rate of 3.4% since the start of 2024-25. However, approximately 10% of employees are eligible for retirement. AECL is accordingly focusing on strategic workforce planning and succession plans to mitigate risk. Given its small size, the impact of attrition in any particular area can be significant, particularly given the specialized knowledge and unique skillset of employees.

Indigenous Engagement and Reconciliation

Indigenous engagement and reconciliation are integral to AECL and CNL mandates. Our innovation and environmental stewardship missions depend on strong relationships with Indigenous Nations and their communities. Most importantly, the exchange of knowledge and information, Indigenous involvement, and ongoing cultural awareness training make our work better. At Chalk River Laboratories, AECL, CNL and the Algonquins of Pikwàkanagàn First Nation (AOPFN) are implementing key commitments under a Long-Term Relationship Agreement signed in May 2023. This collaboration includes the establishment of the Neyagada Wabandangaki Guardian Program and various working groups to strengthen early engagement and AOPFN presence and participation on site. In addition, strong Indigenous engagement – built on relationships, not just project-driven interactions – is critical for ensuring that current work and future projects meet and exceed regulatory requirements.

AECL Funding

Budget 2024 provided new funding over 11 years for AECL's operations. The approved funding will enable AECL to continue its current activities, as described in this Corporate Plan Summary. The funding commitment over an eleven-year period is extremely beneficial as it enables long-term planning and allows for the most efficient and effective use of resources by AECL and its contractor to deliver a very large scope of work and multi-year projects.

Total Funding Projections Based on Approved Federal Funding

(millions of Canadian dollars)	Actual 2023-24	Budget 2024-25	Plan					5 Year Total
			2025-26	2026-27	2027-28	2028-29	2029-30	
Funding Requirements								
Environmental Stewardship	1,015	1,197	1,234	1,104	959	898	686	4,881
Nuclear Laboratories - Operating	168	236	281	187	204	217	229	1,118
Nuclear Laboratories - Capital	163	159	345	303	264	247	225	1,384
Federal Funding Requirements AECL	1,346	1,592	1,860	1,594	1,427	1,362	1,140	7,383

The new funding will allow AECL to deliver, over the next 10 years, on existing activities and maintain capabilities, with some additional investments in capital projects which are needed to address an important backlog of work focused on addressing areas with high risks of failure. Such projects include the replacement of S&T research facilities which are no longer cost-effective to operate and the replacement of aged infrastructure in the utility services.

Risks

AECL manages a large liability comprised of sites and facilities that are contaminated and require decommissioning, existing radioactive waste that requires disposal, and contaminated sites that require remediation. This liability can increase in complex projects as hazards are discovered and risks are realized. This is a common challenge related to the decommissioning and remediation of legacy and historic nuclear sites internationally. In some cases, the remediation of decades-old radioactive waste material is proving more challenging than originally planned, either because of changed/unanticipated conditions, or higher hazards (e.g., higher levels of contamination, more complicated contamination, or other industrial hazards) being discovered. While some of these cost increases have been included in AECL's liabilities, risks remain for further liability increases as work continues in remediating AECL's complex sites and facilities.

Consistent with its mandate and international best practices, AECL is focusing on accelerating decommissioning, remediation, and waste disposal projects as it is the most safe and effective way of reducing risks and costs over the long term. Addressing risks and hazards now protects facilities from further degradation, which can otherwise lead to further complications, contamination, and overall cost increases.

AECL maintains close oversight on CNL's management of long-term financial sustainability, incentivizing where required to drive an optimal outcome without compromising safety, security, and the protection of the environment. However, recent events (e.g. Covid-19) have demonstrated that cost risk and pressures remain real and susceptible to external factors.

The Near Surface Disposal Facility, a key project necessary to enable large-scale environmental remediation and risk reduction, received regulatory approval in January 2024 but has been further delayed due to judicial review proceedings.

Objectives and Plans

AECL's objectives under the Government-owned, Contractor-operated model include accelerating decommissioning, site remediation and waste management activities in order to protect the environment and building a world-class nuclear laboratory that fulfills government requirements and grows commercial revenues while reducing or containing costs and risks to Canada. Laboratory operations also include vital support to federal departments via the Federal Nuclear Science and Technology Work Plan.

Our plans are grouped under two main outcomes: nuclear innovation and environmental stewardship. Another major priority that cuts across all of our work is our Indigenous engagement and reconciliation efforts. Finally, the procurement process for the management of CNL, as well as CANDU IP exploitation and commercialization are other areas of focus presented in this report.

Nuclear Innovation

AECL's nuclear innovation mission has four main components: the Federal Nuclear Science and Technology (FNST) Work Plan, commercial services, Technology Advancement and Commercialization Program, and the revitalization of the Chalk River Laboratories.

The Federal Nuclear Science and Technology (FNST) Work Plan is government funded. The FNST Work Plan performs nuclear-related science and technology (S&T) to support core federal roles, responsibilities and priorities, while maintaining necessary national capabilities and expertise at the Chalk River Laboratories. The program is responsible for research and scientific activities that advance federal priorities. It has provided the funding to maintain core and unique capabilities at CNL that can be leveraged by government, academia, and industry.

AECL oversees the delivery of the FNST 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 FNST Work Plan serves to build, maintain and maximize those capabilities that are unique to CNL. AECL engages with 15 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.

Nuclear Laboratories Five-Year Projection for Use of Approved Federal Funding

			Plan					
(millions of Canadian dollars)	Actual 2023-24	Budget 2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	5 Year Total
Nuclear Laboratories								
Nuclear Laboratories – Operating	237	316	366	273	293	312	328	1,572
Revenue	69	80	85	86	89	95	99	454
Capital (Revitalization of the Chalk River Laboratories)	163	159	345	303	264	247	225	1,384
Federal Funding Requirement	331	395	626	490	468	464	454	2,502

AECL's Federal Nuclear Science and Technology Work Plan

- | | |
|--|--|
| 1. Canada Border Services Agency | 9. Global Affairs Canada |
| 2. Canada Coast Guard | 10. Health Canada |
| 3. Canadian Nuclear Safety Commission | 11. Innovation, Science and Economic Development |
| 4. Canadian Space Agency | 12. Natural Resources Canada |
| 5. Communications Security Establishment | 13. National Research Council of Canada |
| 6. Defense Research and Development Canada | 14. Public Safety Canada |
| 7. Department of National Defence | 15. Royal Canadian Mounted Police |
| 8. Environment and Climate Change Canada | |



AECL's FNST Work Plan focuses on four research themes:

1. Supporting the development of biological applications and understanding the implications of radiation on human health.
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.

The [federal interdepartmental committees](#), representing fifteen departments and agencies, work with AECL and CNL on developing a program of work that addresses the medium and long-term Government priorities in the areas of climate change and a clean environment, innovation for economic growth and prosperity, and the health, safety, and security of Canadians. This is consistent with and responsive to AECL's priorities and those of the Government of Canada, including supporting the Government of Canada to reach its climate change targets in 2030 and 2050.

Under the FNST Work Plan, AECL is supporting the safety and efficacy of new and existing medical treatments using radiotherapy for future development and optimization. AECL is also supporting clean energy development and climate change initiatives through new nuclear technology advancements in SMRs and Advanced Reactor research, the CEDIR (Clean Energy, Innovation and Research) Initiative, new energy technologies such as hydrogen and fusion, as well as supporting existing nuclear technology in Canada. Another notable project under the FNST Work Plan is strengthening Canada's defence strategies through the development of technologies in support of the safety and security of nuclear technologies, border defence and critical infrastructure.

On the international front, priorities continue to include strengthening Canada's bilateral partnerships on nuclear science and technology with countries such as the United States and the United Kingdom, as well as multilateral partnerships and agreements including the Nuclear Energy Agency, the International Atomic Energy Agency, the Generation IV International Forum, the Fissile Material Cut-off Treaty (in negotiation), the Comprehensive Nuclear Test Ban Treaty, and the International Partnership for Nuclear Disarmament Verification. Support provided by the FNST Work Plan allows for Canada's participation in these important international fora when connected to FNST priorities and specific projects.

During the 2025-26 fiscal year and over the planning period, AECL will work with CNL to plan for a modest ramp up of activities under the FNST Work Plan that reflects the Budget 2024 allocation. This includes funding for research projects through the annual call for proposals with the federal interdepartmental committees to address the needs and priorities of government, funding to maintain critical infrastructure, expertise and knowledge management at CNL, as well as strategic initiatives that address emerging government priorities that require longer term planning and broader engagement with academia and industry such as and not limited to: a multi-purpose research reactor in Canada, isotope and medical applications, center of excellence for fusion research, nuclear security and critical infrastructure, and center for reactor sustainability. The availability of facilities and technical staff remain risks to delivering this program, which can be mitigated through careful planning and appropriate facility maintenance and upgrades.

Commercial Services generate third-party revenues. CNL provides science and technology services and other products to third-party customers on a commercial basis. Activities in this area are self-funded through commercial revenues, meaning no government funding is necessary, but are aligned to AECL and CNL long-term and annual plans. Canada's nuclear operators are the most significant source of this commercial revenue.

CNL will continue to provide commercial services to third parties and is expected to grow commercial margins in order to enable increased recovery of corporate and site support costs, and to continue to build a strong, vibrant, and sustainable nuclear science and technology mission. The objective is to leverage the assets and capabilities of CNL to undertake third-party commercial work on a full cost-recovery basis. As CNL grows its revenues and associated margin, CNL will further grow its science and technology capabilities, with intended benefits for government and Canadians.

For instance, CNL is leveraging its world-class expertise in medical isotope production to advance the development of targeted alpha therapy – a next-generation cancer treatment. The Targeted Alpha Therapy initiative is a joint venture with private sector entity ITM.

Most of CNL's commercial services have followed a traditional customer-supplier relationship. In particular, AECL has incentivized CNL to grow its commercial revenues, taking into account internal and external factors, market trends, as well as the broader long-term vision for CNL with a focus on the establishment of sustainable, long-term customer relationships which leverage unique expertise or facilities. Following the shutdown of the National Research Universal (NRU) reactor in March 2018, revenues from the sale of reactor-based isotopes have reduced to zero as the last of the cobalt-60 produced in the reactor was sold in 2019-20. Moreover, COVID-19 impacted growth plans, delaying some of the planned marketing efforts and enabling activities, which has negatively impacted revenue growth in the medium-term. Ongoing efforts to grow commercial margin for other products and services are therefore critical to mitigate the loss of revenue and the increase in allocated overhead costs to other parts of the S&T mission.

The market for deuterium oxide or deuterium gas related technology and health products has grown exponentially in the last few years. This is an important new opportunity for CNL where it has a significant niche experience and could work in partnership with industry to accelerate advancements.

Objectives and Plans

Commercial opportunities in science and technology for industry customers continue to be pursued in the areas of fleet support, hydrogen and tritium, medical isotopes and medical application of radiation, radiobiology, and environment, safety and security, and Advanced Reactors – with CANDU reactor fleet support being the single largest area of current work and one of the largest growth areas. Work for industry customers includes energy-related services to the CANDU Owners Group, major utility companies, marine propulsion companies, and new work in the light-water reactor market.

The Laboratory-Directed Science and Technology Program is funded through commercial margin and other sources as approved by AECL. This program provides seed funding and investment for projects and capabilities considered to be essential to the future of the nuclear industry, as well as growth areas for the Chalk River Laboratories potentially leading to increased commercial revenue. These investments allow CNL to explore opportunities to respond to industry needs and have resulted in partnerships which have led to demonstrable products, listed below.

New Technology Initiatives Fund

The New Technology Initiatives Fund (NTIF) 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.

Here are some activities under the NTIF:

- Utilizing nanobodies for targeted delivery of radioisotopes in cancer therapy.
- Modelling of corrosion of the silicon carbide (SiC) layer in TRISO fuel in support of SMR and advanced reactor deployment.
- Strategic, Enabling, Engaging, Development (SEED) Program; inviting staff to submit their ideas for growing and enabling improved S&T capabilities and outcomes. These ideas can be technical problems in need of a solution, inventions and gadgets, widgets or devices, or process and/or workflow improvements.

New Nuclear & Emerging Technologies (N2ET) Program

CNL has consolidated a number of clean energy and health sciences projects into a single program: the New Nuclear & Emerging Technologies (N2ET). The goal of the program is to fast-track promising research and technologies, toward commercialization and deployment. The program directly supports AECL's vision of nuclear innovation and leveraging nuclear science and technology for the benefit of Canada. The N2ET program encompasses the **SMR Invitation Process**, which invites vendors to construct small modular reactors, and or other advanced reactor demonstration units at one of the sites that CNL manages on behalf of AECL. It also includes the **Canadian Nuclear Research Initiative (CNRI)** program, which is designed to accelerate the development and deployment of advanced reactor designs, which allows participants to optimize resources, share technical knowledge and gain access to CNL's expertise and unique facilities. In August 2024 CNL and the Business Development Bank of Canada announced a \$20M investment in Canadian company General Fusion (\$10M from each party). This investment is targeted toward fast-tracking the path to commercialization of the Lawson Machine 26 plasma compression system, and includes a seat on the General Fusion board of directors for CNL. This is another step in building a Canadian fusion ecosystem.

In addition, AECL has concluded a MOU with the Saskatchewan Research Council (SRC), a provincial Crown corporation with a complementary research mandate. The intent of this agreement is to enable collaboration between the two organizations, particularly with respect to the eVinci microreactor being sited at the SRC. AECL and CNL have important expertise and capabilities that will be of great value to SRC in the furtherance of this project, and cooperation here furthers national clean energy progress and important federal-provincial cooperation.

The N2ET program also includes the Clean Energy Demonstration, Innovation, and Research (CEDIR) Initiative, which advances the science behind hybrid energy systems to better understand how clean energy technologies can work together alongside other renewable energy technologies. Also under this program are new joint ventures, such as **Actineer Inc.**, a new joint venture company between CNL and ITM that is pursuing the industrial scale production of Actinium-225, a promising new medical isotope in the fight against cancer, and **Fusion Fuel Cycles Inc.**, a joint venture between CNL and Kyoto Fusioneering, which aims to develop and deploy deuterium-tritium (D-T) fusion fuel cycle technologies.

In 2025-26, N2ET will expand the SMR Invitation Process to include fusion reactors and renamed to the **Clean Energy Invitation Process**. Similarly, the CNRI program will also expand to include other forms of clean energy, including a larger focus on fusion-based research and development. Investment to advance the Actineer Inc. and Fusion Fuel Cycles Inc. joint ventures will continue to ensure Canada's competitive advantage in medical isotopes and fusion fuel cycles.

Opportunity for a New Research Reactor

As a leader in the nuclear industry, Canada benefits from having its domestic nuclear power technology, supply chain, uranium mining, research infrastructure and academic support, all of which promote energy sovereignty and security, and ultimately contribute to meeting net zero goals. However, Canada lacks a high-flux multi-purpose reactor to support the qualification and innovation needs of a growing nuclear industry, which is on the cusp of engaging with alternate technologies such as SMRs, new types of fuels, and a wide range of challenges to support deployment and on-going operations of a new research reactor.

The Canadian industry currently relies on a small complement of significantly smaller low-flux research reactors domestically, which alone cannot meet Canadian research needs given their smaller capacity and capabilities. In the past, Canada has relied on accessing foreign research reactors, one of which was also shutdown in 2018 (the Halden reactor located in Norway) and most recently the High Flux Isotope Reactor in Oak Ridge National Laboratory. However, access to other multi-purpose research reactors remains very limited. AECL has already conducted exploratory analysis which confirmed that there is a case for consideration of a research reactor, given the existing reliance on foreign reactors, the high cost and complicated logistics of doing so, potential for isotope production, and the related national security and sovereignty considerations associated with this dependency on foreign research facilities. Recent global issues such as the war in Ukraine and the COVID-19 pandemic have highlighted the fragility of the international supply chain affecting critical materials and life-saving isotopes. Reliance on foreign research capability makes Canadian nuclear energy dependent on sources outside of Canadian control and influence, a particularly noteworthy risk in an international environment increasingly characterized by protectionism.

As a result, AECL and CNL have been working with the Canadian nuclear ecosystem, including utilities, academia, other research institutes, federal departments and agencies, and provinces, to develop a detailed analysis on the feasibility of having a multi-purpose high-flux reactor serving industry needs on a commercial basis, carrying out applied science research, driving innovation, and creating commercial products for export like medical isotopes. Together with McMaster University, a Pan-Canadian partnership with academic, research organizations and labs government and industry is being explored through joint projects to determine the right policy, social, economic, and environmental conditions for such a project in Canada.

Heavy Water

AECL currently owns heavy water assets. CNL acts as an agent for AECL for the marketing, sale, and distribution of AECL's existing heavy water inventory. CNL also manages AECL's inventory of legacy heavy water at AECL's facility in Laprade, Quebec. CNL is currently working on a project to remove contaminants (tritium) from a large amount of heavy water currently considered a liability. In addition to reducing a liability, the decontaminated heavy water can be sold to industry, and allows CNL to continue to build its prominence, expertise, and capabilities in purifying and upgrading heavy water, which is a cornerstone of CANDU reactor needs. Construction of the Modernized Combined Electrolysis and Catalytic Exchange Facility is expected to be completed by 2028.

AECL is looking to CNL to continue its work to optimize the management and sales of legacy heavy water (the current stock of detritiated heavy water will continue to be sold over the coming years) as well as leverage its decade of expertise to realize new opportunities both in the non-nuclear and nuclear markets. Revenues from legacy heavy water are retained by AECL to fund historic liabilities and priorities in science and technology and related capital expenditures to maximize the value of the asset to Canadian society.

Risks in this area include delays to the Modernized Combined Electrolysis and Catalytic Exchange Facility project (MCECE), which could increase costs and lead to a scenario where AECL's existing stock of (clean) heavy water are depleted. This may have significant impacts on the S&T mission, as revenues from heavy water sales are re-invested in the labs to advance partnerships and early technology. As part of the implementation of CNL's strategic approach to the heavy water market which seeks to derisk and maximize the opportunity, they will convene an industry wide taskforce that will consider and seek to address the long term nuclear heavy water requirements in Canada.

Additionally, and looking ahead to the potential of a new CANDU fleet in Canada, AECL, CNL and AtkinsRéalis have entered into an MOU to explore opportunities to work together to accelerate technologies to either produce or upgrade heavy water that could be used in the commissioning and operation of new CANDU reactors in Canada. All three organizations recognize that the construction of CANDU reactor new builds would require significant volumes of heavy water, a need that would require the construction of new facilities in Canada. As this exploratory process matures, AECL will be able to provide more detail about what new heavy water production technologies and facilities might look like.

The **Revitalization of the Chalk River Laboratories** uses a capital investment that is distinct from the Chalk River decommissioning mission. This area includes both new science infrastructure and site infrastructure, the supporting water, sewage, electrical, and other systems required to operate the Chalk River Laboratories.

Capital Plan

AECL's Chalk River Laboratories cover 38 km² with over 300 structures including 16 major facilities, and hosts more than 3,100 CNL employees. It includes some of the most advanced and unique laboratories in the country which require security commensurate with the materials and levels of hazards present. The site includes everything from natural gas lines, electrical switchyard and distribution, a powerhouse to generate heat and distribute via steam lines, a sanitation plant, fire water infrastructure, potable water distribution, and general roads and grounds requirements for the 61 km of road on the site.

AECL's capital requirements are based on asset management plans which consider health, safety, security and environmental risks, current facility conditions, regulatory requirements, sustainability goals and future business needs. The Capital Plan is intended to address two main areas of focus, new science infrastructure and existing site infrastructure.

New science infrastructure is aligned with AECL and CNL's long-term plans which aim to build a modern, world-class nuclear science and technology campus that serves the needs of government and industry.

Existing site infrastructure includes **facility revitalization, utilities infrastructure, and other capital investments**. This includes systems and facilities at the Chalk River site such as potable water, storm sewer, sewage treatment, electrical system, and other utilities. Investments in these utilities are necessary to respond to regulatory and health, safety, security, and environmental requirements, as well as to maintain a cost efficient and reliable site.

Further details on specific projects over the planning period are presented below. The projected capital expenditures reflect the estimated inflation adjusted expenditures for the portfolio. It is based on the best current estimates for each planned project within the portfolio. The planned projects have cost estimates commensurate with the stage of the respective projects. As scope, schedule and cost estimates are refined for these projects, the overall capital plan and funding profile may have to be adjusted. Consistent with best practices in project management, contingency is also included as part of the total planned capital expenditures.

There remains the potential for unexpected capital requirements putting pressure on the available capital funding given the age of the site and certain infrastructure components. This is mitigated through various site and facility assessments so that there is a clear understanding of the state of facilities and infrastructure. There are also risks to project cost and schedule as field work begins and site conditions or supply chain markets change. This is mitigated through subcontract structuring and significant upfront planning activities.

New Science Infrastructure

The main project to be undertaken is the completion of the Advanced Nuclear Materials Research Centre (ANMRC), 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 to position itself as a leader in the nuclear industry.



Objectives and Plans

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 SMRs and the associated fuel development technology. It will combine the current capabilities from the Universal Cells building, the Fuel and Materials Hot Cells facility, and the metallographic laboratories into a modern shielded facility and laboratory research complex. This new facility will allow further advancements in the nuclear science and technology program, including on alpha therapy research, SMRs, reactor fuel development, nuclear forensics, and response, as well as ongoing work in support of nuclear power utilities with reactor life extension and reliability.

Construction is expected to be completed in 2028 and active commissioning in 2030.

<i>(millions of Canadian dollars)</i>	Actual Costs	2024-25 Estimate	2025-26	2026-27	2027-28	Future	Total
Advanced Nuclear Materials Research Centre	301.8	143.9	150.3	159.2	124.9	145.3	1,025.4

Facility Revitalization

Upkeeping existing building services at the Chalk River site is essential for the functionality, safety, integrity, and accessing the facilities. Work in this area includes maintaining current capabilities while new buildings and facilities are designed and constructed.

This also includes the acquisition of stand-alone equipment, which is part of normal asset management practices in order to preserve CNL's capabilities. Capital purchases are in support of equipment replacement in the areas of science and technology, health, safety, security and environmental programs, and fleet and facilities.

Current activities over the planning period include continued investment to keep the hot cells (large containment rooms that allow for manipulation and testing on radioactive material) safely operational until the ANMRC is scheduled to be completed. Other work includes the completion of the site-wide fire hazard upgrades on numerous fire systems, the installation of new, modern fume hoods in many S&T facilities, and ongoing architectural and electrical upgrades to facilities to improve reliability.

Utilities Infrastructure

To address immediate safety and reliability risks, the objective is to further enable reliable electrical power and other essential utility services, continuing the upgrades to aging infrastructure at the Chalk River site. As such, a strategy has been developed that focuses efforts on work which addresses the immediate safety and reliability risks which can be performed within budget.

Today, AECL continues to focus on utilities distributions systems for the newly constructed facilities and upgrades to existing distribution networks. Work has been completed on relocating the buried services and utilities in and around the footprint of the ANMRC project site. In 2025-26, planning activities will continue for the larger investment required to upgrade aging infrastructure.



Other Capital Investments

Other investments are necessary, such as IT infrastructure upgrades, replacements and implementation of hardware, software, applications, networks, and communications technologies throughout the CNL organization. The multiple improvements being implemented are focused on base infrastructure, business intelligence solutions, collaborative workspace and security.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Science Collaboration Center Energy performance audit complete. Continue construction of the Advanced Nuclear Materials Research Centre.	Continue construction of the new Advanced Nuclear Materials Research Centre.	Complete construction and commissioning of the Advanced Nuclear Materials Research Centre.
Ensure stability in health, safety, security, and environmental industry standard metrics against industry standard benchmarks.	Continue improving health, safety, security, and environmental metrics.	
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.	Continue achieving industry best practices for the management of all AECL's sites.	

Indigenous Engagement and Reconciliation

AECL operates on land and territories that have, since time immemorial, been the traditional lands of Indigenous peoples in Canada. AECL, with its contractor, CNL, is committed to advancing reconciliation with First Nation, Métis, and Inuit peoples through a renewed relationship based on recognition of rights, mutual understanding and respect, and meaningful engagement and collaboration.

AECL has made four commitments consistent with the government's reconciliation priorities:

1. **Listen, understand, improve**, and take meaningful actions to advance reconciliation with Indigenous Nations and communities on whose lands we operate.
2. **Learn about Indigenous history**, culture, traditions, and world views.
3. **Integrate Indigenous knowledge and values** into AECL's policies, procedures, practices, and projects so that they become embedded in all that we do.
4. **Find ways to empower** Indigenous Nations, communities and organizations to enable collaboration, capacity-building and economic improvement.



Reconciliation

As stewards of the environment, AECL recognizes that our nuclear science and research activities have created radioactive materials and waste, and we are committed to addressing this responsibly. We are dedicated to working in partnership with Indigenous Nations and communities to recognize and incorporate traditional knowledge, ceremony, and various cultural and stewardship practices. We have much to learn from each other as we work towards our common objective of environmental protection.

Our Long-Term Relationship Agreement with the Algonquins of Pikwàkanagàn First Nation (AOPFN) is a testament to this commitment. Under the first year of our agreement, AOPFN has established their Neyagada Wabandangaki Guardian Program, including onsite monitoring activities, and together, we have launched working groups to advance more collaborative communications, employment and procurement opportunities, and AOPFN involvement in waste management. These achievements, in addition to regular leadership tables and AOPFN-led cultural awareness training, are strengthening trust and the foundation for work planning moving forward.

AECL and CNL are applying the same principles to engagement and relationship-building across the lands on which we operate, developing and implementing Nation-specific MOUs and agreements to increase capacity, knowledge sharing and involvement in the work we do. Both organizations are also adapting and co-developing plans and policies to support these activities and broader discussions related to site planning, environmental restoration, procurement and economic opportunities. This ongoing collaboration will inform AECL's reconciliation action planning moving forward.

Environmental Stewardship

AECL has been conducting nuclear science and technology activities for 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-level waste and low-level waste. Several sites and/or buildings have also been contaminated as a result of nuclear science and technology activities and past waste management practices; these now need to be decontaminated and demolished, sites cleaned up and remediated, and the radioactive waste managed properly and safely.

Environmental Stewardship Five-Year Projection for Use of Approved Federal Funding

(millions of Canadian dollars)	Actual 2023-24	Budget 2024-25	Plan					5 Year Total
			2025-26	2026-27	2027-28	2028-29	2029-30	
Environmental Stewardship								
Total Environmental Stewardship	1,017	1,199	1,236	1,106	961	900	688	4,891
Revenue	2	2	2	2	2	2	2	10
Federal Funding Requirement	1,015	1,197	1,234	1,104	959	898	686	4,881

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.

Decommissioning and 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 site. A key project in this area is the proposed Near Surface Disposal Facility, which is necessary to enable large-scale environmental remediation and risk reduction. The project received regulatory approval in January 2024, but the decision on when to proceed is subject to judicial review proceedings.

Currently, existing radioactive waste is safely stored at the Chalk River site. However, final 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. Near surface disposal is an internationally proven method of safely disposing of this type of low-level waste. The facility will allow for the permanent disposal of the vast majority of AECL low-level radioactive waste currently in interim storage, as well as waste which will be generated as a result of contaminated land remediation activities, decommissioning activities, and continued operations of the nuclear laboratories.

CNL also manages AECL's inventory of highly radioactive stored liquid waste which is a byproduct of nuclear science and technology and medical isotope production. A project is in place to safely remove and process the legacy radioactive liquid wastes from existing tanks at the Chalk River site, put the resulting solidified waste product into the appropriate storage facilities, and to decommission the tanks and associated structures.



Until disposal solutions are available, CNL will continue to manage existing 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.

Delays in the construction of the Near Surface Disposal Facility are causing a significant impact to the planned scope of work at Chalk River and other AECL sites both from a cost and schedule perspective. This project is critical to advance decommissioning and remediation activities at AECL sites, and further delays, as a function of judicial reviews, or unforeseen delays in meeting other licensing conditions, could have significant cost implications for AECL. This is mitigated to some extent through characterization work, planning and verification.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Prepare for and commence construction of the Near Surface Disposal Facility.	Construct the Near Surface Disposal Facility.	Commission and safely operate the Near Surface Disposal Facility and routinely emplace low-level waste from decommissioning, remediation and ongoing nuclear science and technology activities. Retrieve low-level waste from legacy storage, characterize and process for disposal, and emplace in the Near Surface Disposal Facility.
Radioactive waste from other AECL sites is received at the Chalk River Laboratories (low-level radioactive waste received for storage and disposal when NSDF is operational, and intermediate-level waste for storage).	Radioactive waste from other AECL sites is received at the Chalk River Laboratories (low-level radioactive waste received for storage and disposal when NSDF is operational, and intermediate-level waste for storage).	Complete consolidation of low and intermediate level radioactive waste from other AECL sites at the Chalk River Laboratories (low-level radioactive waste for disposal in NSDF and intermediate-level waste for storage).
Complete the construction of a facility for the interim storage of intermediate-level radioactive waste at the Chalk River Laboratories.	Work with the Nuclear Waste Management Organization to ensure that AECL's inventory of intermediate-level waste can be appropriately accommodated in the facility to be implemented for the disposal of intermediate-level waste and non-fuel high level waste in Canada.	Work with the Nuclear Waste Management Organization to ensure that AECL's inventory of intermediate-level waste can be appropriately accommodated in the facility to be implemented for the disposal of intermediate-level waste and non-fuel high level waste in Canada.

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. These wastes are 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 time as a final disposal option is available, legacy waste is being safely managed and closely monitored.

Today, 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. CNL is developing the site infrastructure requirements and appropriate permissions required to safely and efficiently remediate the affected lands and emplace the low-level waste in the Near Surface Disposal Facility once it is available. Ongoing ground water monitoring and plume assessments continue to ensure the legacy wastes are contained within the boundary of the Chalk River site.

In January 2024 CNL received regulatory approval from the CNSC to proceed with construction of the Near Surface Disposal Facility at Chalk River. Progress has been limited because of pending judicial reviews of that approval process, as well as the related *Species at Risk Act* permit issued by Environment and Climate Change Canada. These judicial review proceedings may result in significant delays to the Near Surface Disposal Facility project and potentially necessitate new strategies for the project and other decommissioning work that depends on having the Near Surface Disposal Facility available for waste.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Complete characterization and remediation plans for various waste management areas at the Chalk River site.	Continue with the completion of characterization and remediation plans for various waste management areas at the Chalk River site.	Remediate the waste management areas once the Near Surface Disposal Facility is available.

Decommissioning of buildings 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 standing today date back to that era. Some facilities were used as nuclear science and technology facilities and do have some level of radioactive contamination, while others were used as support buildings, such as 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, with 121 buildings and structures having been decontaminated, decommissioned and demolished. This has allowed CNL to build Canadian expertise and experience as it moved towards higher hazard and more complex projects. CNL is continuing work to decommission a large former laboratory that housed a tritium facility, hot cells, an active liquid storage tank, and other buildings, which represent the highest risks at the Chalk River site. This series of buildings include three large structures used for laboratories and nuclear materials storage.

Objectives and Plans

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Complete the decommissioning of 20 buildings and structures.	Complete the decommissioning of highest risk buildings and the MAPLE reactors. Advance the non-radioactive decommissioning activities for the NRX and NRU reactors.	Reduce long-term liabilities through the safe environmentally responsible removal of redundant facilities and structures.

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 complex storage. As part of the Global Threat Reduction Initiative, an initiative aiming to reduce the 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. Repatriation of highly enriched uranium is planned to be completed by 2035.

The repatriation program for highly-enriched uranium continues to focus on the repatriation of nuclear fuel and fuel material to their respective countries of origin, thereby removing this risk and liability from Canada, and contributing to our non-proliferation and nuclear security objectives. Repatriation shipments of highly enriched uranium continue to be made to the US. AECL continues to evaluate and assess their inventory of special fissile material and investigates the potential repatriation of the material back to its country of origin.

CNL has continued to advance efforts to consolidate AECL's inventory of used fuel at the Chalk River site from the Whiteshell and Gentilly-1 sites, with the active commissioning of the first phase of storage canisters and the construction and inactive commissioning of the second phase of storage canisters in the waste management areas. The objective of the consolidation program is to reduce the number of locations where used fuel is stored, to safeguard the material in a central location, as opposed to having the material distributed across the country with associated safety and security-related costs. Fuel transfers from AECL's Gentilly-1 to Chalk River are underway.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Planning activities, including stakeholder and Indigenous engagement, for used fuel retrieval, characterization, packaging and storage.	Planning activities continued.	
Continue to investigate and pursue the disposition or repatriation of fresh and irradiated fuel material to further reduce liabilities for Canada.	Continue to investigate and pursue the disposition or repatriation of fresh and irradiated fuel material to further reduce liabilities for Canada.	
Advance plans and engagement for the shipment of AECL used fuel to the Chalk River site.	Used fuel is shipped from the Whiteshell Laboratories and other sites to the Chalk River Laboratories.	Complete AECL fuel consolidation at the Chalk River Laboratories for interim storage.

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 waterpower reactors (Gentilly-1) and steam condenser power reactors (Douglas Point). Both reactors are now in a safe shutdown state prior to being fully decommissioned.

With a view to reducing costs associated with storage and surveillance of this aging infrastructure, plans are being prepared to advance decommissioning work. At the Douglas Point site, CNL requested an amendment to its operating license and was granted permission to move forward with non-nuclear decommissioning in 2021. Further characterization of the reactor and associated nuclear facilities is ongoing and will help develop detailed decommissioning plans, which will be the subject of additional stakeholder and Indigenous engagement, as well as future licensing decisions. It is expected that a similar path will be taken for the decommissioning of the Gentilly-1 prototype reactor; public and Indigenous engagement is already well underway.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Demolish supporting and/or redundant facilities at the Douglas Point reactor. Review options for Douglas Point and Gentilly-1 for transport of fuel to the Chalk River Laboratories.	Continue to advance planning and Indigenous and community engagement for the decommissioning of the Douglas Point and Gentilly-1 reactors. Complete hearings for both the Gentilly-1 and Douglas Point Sites to allow the decommissioning of the sites to proceed.	Decommission and remove all plant, equipment, and fuel from both the Douglas Point and Gentilly-1 facilities.

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 2.7 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 complete and has entered the long-term monitoring and maintenance phase, the Port Hope Project is significantly more complex and will remain ongoing for the coming years.

Despite significant challenges, remediation for the Port Granby Project 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 has now been transitioned to a long-term monitoring and maintenance phase.

As for the Port Hope Project, all the major remediation sites have now either been completed or have begun remediation. However, there remain approximately 1,000 private properties which are required to be remediated. After conducting comprehensive and thorough scientific and technical studies, and in response to feedback received from the community about the impacts of the project, CNL has made an application to the Canadian Nuclear Safety Commission to amend the cleanup criteria which would in effect increase the acceptable threshold for arsenic contamination. Should the revised cleanup criteria be accepted by the regulator, this would have the effect of reducing the disruption in the community and the loss of the tree canopy. In October 2024, the Port Hope Municipal Council voted unanimously to endorse the proposed criteria changes, demonstrating public support for this direction, and strong community engagement. AECL and CNL continue to work with regulators, stakeholders, and Indigenous Nations and communities to revise the clean-up criteria for the remediation of residential properties.

Objectives and Plans

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Port Granby: Continue long term monitoring and surveillance of the closed waste management facility. Port Hope: Complete Remediation of large scale and industrial sites.	Port Hope Project: Complete Restoration of Harbour Centre Pier	Complete the remediation of low-level radioactive waste for residential properties in Port Hope. The Port Hope long-term waste management facility is closed and capped and placed into long-term surveillance.
Engage local Indigenous Nations and communities to explore options and gather feedback on potential changes to the cleanup criteria for the Port Hope Project.		

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, or where 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. This includes ongoing interim waste management and remediation projects mostly in Ontario, Alberta, and the Northwest Territories.

Planning, stakeholder, and Indigenous engagement continues to enable the remediation of sites along the Northern Transportation Route. At this time, material in the temporary storage sites at the Fort Smith landfill in the Northwest Territories and at Fort Fitzgerald, in Northern Alberta has been removed.

AECL and CNL continue to engage with Indigenous Nations and communities, building capacity through contribution agreements and preparing detailed remediation plans in collaboration with communities that will enable the final clean-up.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Engage local stakeholders and Indigenous communities to agree on cleanup plans for sites along the Northern Transportation Route located in the southeastern Northwest Territories and northern Alberta.	Continue to engage local stakeholders and Indigenous communities. Complete remediation activities for sites along the Northern Transportation Route locations in the southeastern Northwest Territories and northern Alberta. Commence remediation for sites in the Sahtu region along the Northern Transportation Route.	Complete remediation for all sites along the Northern Transportation Route. Complete remediation of Greater Toronto Area sites where the Government of Canada has accepted the liability.



Decommissioning 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. The site also includes a radioactive waste management area which serves to provide interim storage of radioactive waste for the Whiteshell site.

CNL is proposing to close the site by 2030 at the earliest, nearly 30 years ahead of the original schedule. Part of this would entail the in-situ decommissioning of the WR-1 research reactor, meaning that the reactor components and systems would remain underground inside the thick concrete foundation structure which would then be filled with grout and the current above ground structures demolished. The grouted structure would then be capped with concrete and covered with an engineered barrier. This approach minimizes the risks to the health, safety and security of the public, workers, and the environment.

The project is currently undergoing an Environmental Assessment which has experienced delays due to additional safety reviews and extensive Indigenous engagement. However, CNL has been progressing the decommissioning of the site, with several buildings being decontaminated and demolished. Significant challenges have emerged with respect to the complexity and level of hazard related to the retrieval and processing of radioactive waste. Given the level of risk involved with their remediation, CNL has had to adjust its approach which is now more complex and costly, in order to protect workers and the environment.

Furthermore, regulatory compliance issues in the area of training have led to important and significant site stand downs (when operations are stopped and only safety and security critical activities remain), which is impacting the overall cost and schedule for the overall decommissioning and closure of the Whiteshell Laboratories site. In particular, gaps in the Whiteshell fire protection program, and documentation of training and certification, led to a stand down at the site, which has now return to full decommissioning operations after completing a CNSC-approved, eight stage phased approach to reopening.

Another significant risk remains relating to the ability to secure and retain the required number and quality of specialized expert staff at Whiteshell that are required to match the decommissioning plans. CNL is currently recruiting, utilizing resources provided by the contractor and supply chain staff to support its work.

Objectives and Plans

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Begin manual retrieval of selected standpipes.	Remove and transport all high-level radioactive waste and used fuel to the Chalk River Laboratories.	Complete Whiteshell site contamination remediation, as well as a long-term surveillance plan.
Prepare the robotic retrieval system for the standpipes and bunkers to start operations.		Complete waste retrieval for all the standpipes in the waste management area.
Submit the final Environmental Impact Statement for the proposed <i>in-situ</i> decommissioning of the WR-1 reactor.		The Canadian Nuclear Safety Commission accepts as complete all active decommissioning and waste management activities, with only long-term monitoring and surveillance activities remaining.

Decommissioning of the Nuclear Power Demonstration Reactor

The Nuclear Power Demonstration 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. 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 Nuclear Power Demonstration reactor site. As a result, CNL is proposing to decommission the reactor *in situ*, meaning that it would be immobilized in place by cementing the reactor which is located below the surface.

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. The CNSC requested that CNL wait until lessons learned from the NSDF process could be incorporated. CNL have incorporated the lessons learned from the NSDF submission and the Draft Environmental Impact Statement was submitted in late 2024.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Submit the final Environmental Impact Statement for the proposed <i>in-situ</i> decommissioning of the Nuclear Power Demonstration reactor.	Should approval be granted by the Canadian Nuclear Safety Commission, complete the decommissioning of the Nuclear Power Demonstration reactor. CNSC accepts as complete all active decommissioning and waste management activities, with only long-term monitoring and surveillance activities remaining.	Long-term monitoring and surveillance continues.

Third-party Radioactive Waste

Historically, AECL has accepted small amounts of radioactive waste from Canadian facilities, most notably hospitals and universities or federal sites. Through CNL, AECL continues to provide these services to third parties on a case-by-case basis. This represents a small fraction of waste that is otherwise produced by activities at AECL sites.

Other Areas of Focus

Fueling the Next Generation of CANDU

AECL, for the Government of Canada, owns the intellectual property (IP) for the CANDU reactor, a major nuclear success story, and one of Canada's most significant technological exports. Looking ahead at the five-year planning period, AECL is seeking to make sure that the call for new large reactors is met with CANDU IP and, in turn, meets Canada's forecast for far greater clean electricity supply, supports ongoing energy security and creates jobs and economic growth for Canadians.

To these ends, AECL and AtkinsRéalis entered into a non-binding MOU in early 2024 with a view to advancing the CANDU technology and collaborating for the purpose of successfully deploying CANDU reactors in Canada and internationally. The collaboration and licensing agreement expected to follow this MOU is aimed at accelerating the development of CANDU reactor technology, including the previously announced CANDU MONARK reactor, at a critical time during the energy transition.

Successful CANDU deployment means significant economic benefits with business going to Canadian companies and Canadian workers. Indeed, the vast majority of CANDU components, fuel and services are sourced domestically and more than 85 per cent of a CANDU reactor's equipment and parts can be supplied by Canadian manufacturers. In addition, the success of CANDU can significantly contribute to and enable the decarbonization, energy security and economic objectives as well as sustaining Canada's leadership position in the nuclear sector worldwide. AECL aims to continue to work with government, utilities, and the licensee to seize this opportunity.

Wrap-Up Office (retained liabilities from former CANDU Reactor Division)

Given the reduced number of AECL legal matters arising from its CANDU Reactor Division, in 2016-17, AECL closed down its physical Wrap-up Office location, dissolving the team (save one employee) which had been dedicated to resolving matters related to outstanding liabilities and claims related to AECL's former CANDU Reactor Division. The few remaining disputes that comprise the business of the Wrap-up Office are now being managed by AECL's legal team, supported by external counsel, and the one AECL employee formerly with the Wrap-up Office.

Procurement Process to Renew the Government-owned, Contractor-operated Contract

CNL has been managed since September 2015 by Canadian National Energy Alliance, under a Government-owned, Contractor-operated contract that expires in September 2025. In 2022, AECL launched a procurement process to award a follow-on Government-owned, Contractor-operated contract to continue the management of CNL beyond this period.

The procurement process is well underway, with a Request for Pre-Qualification stage having been launched in 2023, and the Request for Proposals issued to qualified bidders in the spring of 2024. An important part of the project has been to update the suite of Government-owned, Contractor-operated contracts to reflect lessons learned and to provide AECL with additional mechanisms to drive results. The procurement process remains on track, with a preferred bidder expected to be selected in the spring of 2025. AECL is currently preparing detailed transition plans to ensure continuity of operations and a smooth transition to the new contract in 2025.

Annex 1 – Financial Statements and Budgets

Financial statements and notes

This section presents AECL's financial statements reflecting AECL's role under the Government-owned, Contractor-operated model, where CNL manages and operates AECL's sites and undertakes the necessary activities to respond to AECL priorities as per its contractual arrangement with AECL. These statements include payments to CNL and its parent company, Canadian National Energy Alliance and include both direct and indirect costs. The statements are prepared under Public Sector Accounting Standards.

AECL funds its expenses and operations principally through parliamentary appropriations. It also generates additional funding through the sale of services performed under the Government-owned, Contractor-operated contract (work performed by CNL to support the nuclear energy industry and research and development provided to third parties), the sale and lease of heavy water, and investment and interest income from its treasury operations.

These sources of funding permit AECL to deliver on its commitments, priorities and objectives related to the nuclear laboratories (including nuclear science and technology and the revitalization of the Chalk River site), as well as environmental stewardship (decommissioning and waste management).

Certain columns and rows may not add due to the use of rounded numbers.

Operating Budget and Notes

Approved Federal Funding - Operating

(millions of Canadian dollars)	Actual 2023-24	Budget 2024-25	Plan					5 Year Total
			2025-26	2026-27	2027-28	2028-29	2029-30	
AECL								
Environmental Stewardship	1,015	1,197	1,234	1,104	959	898	686	4,881
Nuclear Laboratories – Operating	168	236	281	187	204	217	229	1,118
Total Government Funding – Operating	1,183	1,433	1,515	1,291	1,163	1,115	915	5,999

Reconciliation between Operating Budget and Financial Statements

(millions of Canadian dollars)	Budget 2024-25	Plan					5 Year Total
		2025-26	2026-27	2027-28	2028-29	2029-30	
Government of Canada Funding – operating (cash)	1,433	1,515	1,291	1,163	1,115	915	5,999
Expenses for the year (accrual)	755	756	629	618	612	604	3,219
	678	759	662	545	503	311	2,780
Adjusting items between cash and accrual							
Decommissioning and Waste Management funding	(1,197)	(1,234)	(1,104)	(959)	(898)	(686)	(4,881)
Amortization expense on tangible capital assets	52	50	48	45	43	42	228
Decommissioning, waste management and contaminated sites expenses	326	297	266	238	214	191	1,206
Commercial revenue	129	120	123	121	128	133	625
Other adjustments	12	8	5	10	10	9	42
	(678)	(759)	(662)	(545)	(503)	(311)	(2,780)

Capital Budget and Notes

Approved Federal Funding - Capital

(millions of Canadian dollars)	Actual 2023-24	Budget 2024-25	Plan					5 Year Total
			2025-26	2026-27	2027-28	2028-29	2029-30	
AECL								
Capital (Revitalization of the Chalk River Laboratories)	163	159	345	303	264	247	225	1,384
Total Government Funding – Capital	163	159	345	303	264	247	225	1,384

Statement of Financial Position

(millions of Canadian dollars)	Actual 2023-24	Budget 2024-25	Plan				
			2025-26	2026-27	2027-28	2028-29	2029-30
Financial Assets							
Cash	226	226	226	226	226	226	226
Investments	339	336	320	305	286	268	250
Trade and other receivables	47	45	45	45	45	45	45
Inventories held for resale	41	22	20	20	20	20	20
	653	629	610	596	577	559	541
Liabilities							
Accounts payable and accrued liabilities	23	22	23	26	24	22	26
Employee future benefits	12	10	9	7	6	4	3
Due to Canadian Nuclear Laboratories	289	285	280	275	275	275	270
Decommissioning and waste management provision	8,672	8,102	7,411	6,781	6,181	5,577	5,095
Contaminated sites liability	1,172	873	629	423	303	224	214
	10,168	9,292	8,351	7,511	6,789	6,103	5,607
Net Debt	(9,515)	(8,663)	(7,741)	(6,915)	(6,212)	(5,544)	(5,066)
Non-Financial Assets							
Tangible capital assets	1,097	1,221	1,533	1,805	2,041	2,262	2,462
Prepaid expenses	–	1	1	1	1	1	1
	1,097	1,222	1,534	1,806	2,042	2,263	2,463
Accumulated Deficit	(8,418)	(7,441)	(6,207)	(5,110)	(4,170)	(3,282)	(2,603)
Accumulated deficit is comprised of:							
Accumulated operating deficit	(8,417)	(7,441)	(6,207)	(5,110)	(4,170)	(3,282)	(2,603)
Accumulated remeasurement losses	(1)	–	–	–	–	–	–
	(8,418)	(7,441)	(6,207)	(5,110)	(4,170)	(3,282)	(2,603)

The decommissioning and waste management provision and contaminated sites liability represent the future obligation to address waste management and decommissioning liabilities. The liability is expressed in terms of the net present value of future expenditures required to discharge the obligation. AECL's decommissioning and waste management provision and contaminated sites liability are adjusted annually to reflect progress to date, new estimates as they become available and new waste liabilities arising from ongoing CNL operations. The year-over-year change in these accounts represents the increase in the net present value with the passage of time (accretion) offset by the reduction in the liability from the spending incurred each year. Other changes to the liability may occur in future years as CNL advances decommissioning activities. The assessment and planning of projects, which are understood in more detail as projects are undertaken, could result in adjustments to expected cost estimates, which would impact the value of the liability.

However, as decommissioning work continues in the coming years, the liability will be decreasing commensurate with the liabilities being settled. As the decommissioning and waste management provision and contaminated sites liability decrease, so will AECL's overall negative Accumulated Deficit. The above projections do not attempt to capture the impact of potential future changes in the interest rate used to derive the net present value changes of the reported liability.

Tangible capital assets are expected to increase in line with increased investment in infrastructure at the Chalk River site, as reflected by the funding provided for revitalizing the Chalk River Laboratories in the coming years.

Accumulated deficit changes are largely reflective of changes in surplus for the period.

Statement of Operations and Accumulated Deficit

(millions of Canadian dollars)	Notes	Actual 2023-24	Budget 2024-25	Plan					5 Year Total
				2025-26	2026-27	2027-28	2028-29	2029-30	
Revenues									
Parliamentary appropriations		1,345	1,592	1,860	1,594	1,427	1,362	1,140	7,383
Commercial revenue		112	129	120	123	121	128	133	625
Interest income		29	10	10	10	10	10	10	50
		1,485	1,731	1,990	1,727	1,558	1,500	1,283	8,058
Expenses									
Cost of sales		80	90	84	86	85	90	93	438
Operating expenses	1	90	80	80	76	75	75	74	380
Contractual expenses	2	237	258	295	201	220	233	246	1,196
Decommissioning, waste management and contaminated sites expenses	3	734	326	297	266	238	214	191	1,206
		1,141	755	756	629	618	612	604	3,219
Surplus for the year	4	344	976	1,234	1,098	940	888	679	4,839
Accumulated operating deficit, beginning of year		(8,761)	(8,417)	(7,441)	(6,207)	(5,110)	(4,170)	(3,282)	
Accumulated operating deficit, end of year		(8,417)	(7,441)	(6,207)	(5,110)	(4,170)	(3,282)	(2,603)	

1 These amounts represent AECL's operating expenses associated with its oversight activities.

2 Contractual expenses include payments to CNL (less payments for decommissioning and waste management, cost of sales and capital) and contractor fees.

3 Decommissioning, waste management and contaminated sites expenses represent the accretion expense on the decommissioning and waste management provision and Contaminated sites liability, as well as any revisions in estimate and timing of expenditures.

4 Large surpluses are a result of Capital and DWM funding received for which there are smaller corresponding accrual expenses. Capital funding received is partially offset by amortization expense, and DWM funding is partially offset by accretion expense.

Operating expenses are comprised of AECL oversight operations associated with its oversight activities.

Decommissioning, waste management and contaminated sites expenses include the increase in the net present value (accretion of discount) of the decommissioning and waste management provision and contaminated sites liability. As these obligations decrease, the decommissioning, waste management and contaminated sites expenses will decrease as well.

Statement of Cash Flows

(millions of Canadian dollars)	Notes	Actual 2023-24	Budget 2024-25	Plan					5 Year Total
				2025-26	2026-27	2027-28	2028-29	2029-30	
Operating transactions									
Cash receipts from Parliamentary appropriations	1	1,505	1,592	1,860	1,594	1,427	1,362	1,140	7,383
Cash receipts from customers and other sources		106	129	120	123	121	128	133	625
Cash paid to suppliers		(285)	(369)	(419)	(326)	(345)	(365)	(380)	(2,489)
Cash paid to employees		(14)	(15)	(15)	(15)	(16)	(16)	(16)	(78)
Cash paid for decommissioning, waste management and contaminated sites activities		(947)	(1,197)	(1,234)	(1,104)	(959)	(898)	(686)	(4,881)
Cash paid to Investments held in trust		–	(1)	(1)	(1)	(1)	(1)	(1)	(5)
Cash paid for acquisition of investments in the Long-term disposal of waste fund		(35)	(4)	(5)	(5)	(5)	(5)	(5)	(23)
Cash receipts from redemption of investments in the Long-term disposal of waste fund		33	–	–	–	–	–	–	–
Interest received		26	10	10	10	10	10	10	50
Cash provided by operating transactions		389	144	317	276	232	216	195	581
Capital transactions									
Acquisition of tangible capital assets		(175)	(159)	(345)	(303)	(264)	(247)	(225)	(1,384)
Cash applied to capital transactions		(175)	(159)	(345)	(303)	(264)	(247)	(225)	(1,384)
Investing transactions									
Cash paid for acquisition of Other investments		(471)	(52)	(38)	(40)	(35)	(36)	(37)	(186)
Cash receipts from redemption of Other investments		337	67	67	67	67	67	67	335
Cash (applied to) provided by investing transactions		(134)	15	29	27	32	31	30	149
Increase in cash		80	–	–	–	–	–	–	
Cash at beginning of year		146	226	226	226	226	226	226	
Cash at end of year		226	226	226	226	226	226	226	

1 Parliamentary appropriations have been updated to reflect AECL's current projection of spend and required funding.

