



Atomic Energy
of Canada Limited

2019-20 TO 2023-24

CORPORATE PLAN SUMMARY

Driving Nuclear Opportunity for Canada

Table of Contents

1	Executive Summary
2	Overview
4	Corporate Profile
10	Objectives and plans – Environmental Stewardship
20	Objectives and plans – Nuclear Laboratories
30	Annex 1 - Financial Overview
36	Annex 2 - Capital Plan



Cover and inside image: Canadian Nuclear Laboratories' (CNL) X-ray Photoelectron Spectrometer which has been configured for analysis of radioactive samples, used to study surface chemistry of materials.

EXECUTIVE SUMMARY

As a federal Crown corporation, Atomic Energy Canada Limited (AECL) receives funding from the Government of Canada to enable nuclear science and technology and manage the Government of Canada's radioactive waste liabilities. Since 2015, AECL has been delivering its mandate through a Government-owned, Contractor-operated (GoCo) model, whereby a private-sector organization, Canadian Nuclear Laboratories (CNL), is responsible for managing and operating AECL's sites.

This change in delivery model has brought about significant transformation in the short amount of time it has been in place. Since the implementation of the GoCo model, more than sixty-five buildings and structures have been demolished at the Chalk River site, ground has been broken for the construction of new facilities, numerous infrastructure upgrades have been completed or are underway, and CNL's efforts to position itself as a key player in small modular reactors has placed it – and Canada – at the forefront of the global efforts to advance this technology on the international scene.

Nuclear science and technology activities performed at the Chalk River Laboratories are benefiting both the Government of Canada and the broader nuclear industry. Through the Federal Nuclear Science and Technology Work Plan, AECL oversees research and scientific activities that serve the needs of thirteen federal departments and agencies in the areas of health, energy and climate change, the environment, safety and security. Furthermore, CNL is a key player in the area of nuclear science internationally, including through multi-lateral initiatives such as the Generation IV International Forum.

Progress has not been without its challenges. As part of AECL's environmental stewardship responsibilities, there are currently three projects undergoing Environmental Assessments. This includes the proposal by CNL to build a near surface disposal facility at the Chalk River site that will enable better protection of the environment by moving existing low-level radioactive waste from temporary storage (including soils which have been contaminated) into an engineered facility designed to contain contaminants. All three projects have experienced delays, which has allowed for further engagement of stakeholders and Indigenous groups. Both AECL and CNL remain committed to working with stakeholders and Indigenous groups in order to achieve the overall objective of protecting the environment.

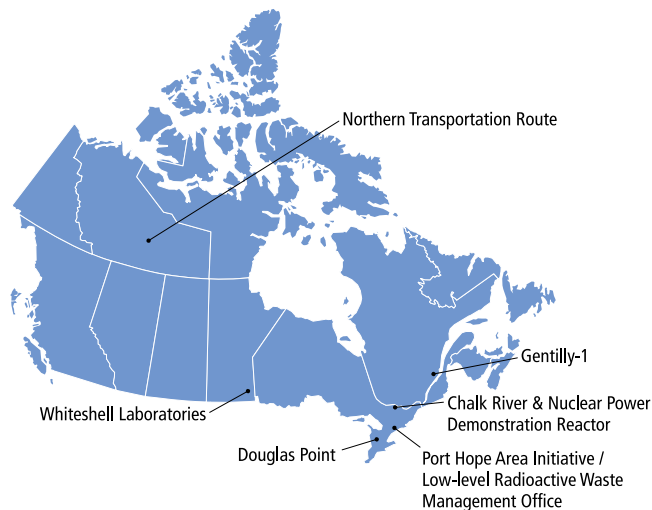
This Corporate Plan Summary outlines AECL's activities, objectives and plans in two main areas: environmental stewardship and nuclear science and technology. The Plan also sets out AECL's objectives and role under the GoCo model, including accelerating environmental stewardship and remediation activities and building a world-class nuclear laboratory at Chalk River that fulfills government requirements and grows commercial revenues while reducing costs and risks to Canada through increased efficiencies and effectiveness.

This 2019-20 Corporate Plan Summary presents AECL's vision for continued transformation to meet these ultimate objectives, informed by long-term plans prepared by CNL and accepted by AECL.

OVERVIEW

AECL is a federal Crown corporation that has a mandate to enable nuclear science and technology and to protect the environment by fulfilling the Government of Canada's radioactive waste and decommissioning responsibilities. This work is undertaken at eight 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:

AECL Sites Across Canada



ENVIRONMENTAL STEWARDSHIP (DECOMMISSIONING AND WASTE MANAGEMENT)

The objective is to safely and responsibly address the environmental responsibilities and liabilities which have resulted from legacy activities at AECL sites. This requires the decontamination and decommissioning of redundant structures and buildings, the remediation of contaminated lands and the management and disposal of radioactive waste at AECL sites, primarily at the Chalk River Laboratories, Ontario and the Whiteshell Laboratories in Manitoba. 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, most notably as part of the Port Hope Area Initiative.

Responsible decommissioning and radioactive waste management is necessary in order 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.

NUCLEAR LABORATORIES

The Chalk River Laboratories are Canada's largest science and technology complex. The work undertaken at the laboratories supports Canada's federal roles, responsibilities and priorities 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. The Chalk River site is undergoing an important renewal that will transform the site into a modern, world-class nuclear science and technology campus, thanks to an investment of \$1.2 billion over ten years by the federal government, which commenced in 2016.

AECL receives funding from the Government of Canada and earns commercial revenues to deliver on its mandate. As a federal Crown corporation, AECL reports to Parliament through the Minister of Natural Resources. AECL's most recent Annual Report (2017-18) can be found on our website (www.aecl.ca).

AECL delivers its mandate through long-term contracts with the private-sector for the management and operation of its sites under a Government-owned, Contractor-operated (GoCo) model.

MISSION

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

VISION

Driving nuclear opportunity for Canada



Introduction port to CNL's Secondary Ion Mass Spectrometer. Instrument has been configured for analysis of radioactive samples, used for material performance studies and corrosion studies.

CORPORATE PROFILE

A significant restructuring of AECL was completed in 2015 that saw the management and operation of AECL's sites move to a GoCo model. Whereas previously AECL was directly responsible for the management and operation of its sites, today, a private-sector contractor – Canadian Nuclear Laboratories (CNL) – is responsible for the day-to-day management. AECL remains the owner of the facilities, assets, intellectual property and liabilities.

Through the restructuring, the Government of Canada confirmed AECL's mandate, namely to enable nuclear science and technology and to protect the environment by fulfilling the Government of Canada's radioactive waste and decommissioning responsibilities. AECL was also given a mandate to leverage the assets and capabilities at the Chalk River Laboratories to support industry on a commercial basis.

AECL's environmental stewardship activities are in line with the Government of Canada's goals to protect the environment. AECL-funded nuclear science and technology activities contribute to science and innovation goals, which benefit Canada's economy through the development of a highly-skilled workforce, support for industry, and technology development.

Furthermore, we are supporting efforts to meet Canada's climate change goals by funding work to help Canada's utilities to operate power reactors safely and for longer periods of time, and through our efforts to advance small modular reactors. Nuclear power is an important part of Canada's low-carbon energy production – more than 60% of Ontario's electricity and 30% in New Brunswick comes from nuclear power. Similarly, Small Modular Reactor technologies offer a promising opportunity to bring low-carbon energy to the existing grid and to remote locations and communities.

AECL funded activities in nuclear science and technology also support Canada's target to double research, development and demonstration funding for clean energy and clean technology research to \$775 million by 2020 as part of the 23-nation Mission Innovation partnership.

OPERATING MODEL

The GoCo model allows AECL to leverage the expertise and experience of the private sector to accelerate the decommissioning and radioactive waste management program and build a world-class nuclear laboratory at Chalk River that fulfills Government requirements, while reducing costs and risks to Canada. As an agent of Government, AECL brings value to Canada by overseeing the GoCo arrangement and supporting the Government's development of nuclear policy. AECL plays a challenge function with a view to advancing its priorities in the most effective and efficient manner, whilst seeing that CNL maintains safety, security and the protection of the environment.

A key element of AECL's role under the GoCo model is to set priorities for CNL, and to oversee and assess its performance against the contracts in order to provide value for Canada. In other words, AECL sets out "what" needs to be achieved with CNL deciding "how" it is best executed. This is achieved by having a small organization, staffed by experts, in order to provide oversight of the GoCo agreements.



On an annual basis, AECL provides strategic guidance to CNL for the development of its annual plans, which in turn are supported by, and aligned with, longer-term plans which are accepted by AECL. CNL's performance is tracked based on the activities set out in these plans, including specific project milestones and deliverables.

To systematically monitor and assess contractor performance, a Performance Evaluation and Measurement Plan is issued by AECL annually. The Plan is based on, and developed in parallel with, the annual plan. It 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. Two specific projects, the closure of the Whiteshell Laboratories and the Nuclear Power Demonstration reactor site, are managed separately under target-cost contracts.

AECL leverages other project management and performance measurement tools to track the performance of CNL, including an Earned Value Management System (an internationally-recognized tool that allows for the simultaneous tracking of work scope, schedule and cost) and a Contractor Assurance System (a comprehensive and integrated performance assurance regime that allows for the capture of performance metrics across a wide array of work areas).

For more information on the GoCo model visit our website www.aecl.ca.

INTERNAL ENVIRONMENT

AECL oversees an important portfolio of work. Sound management underpinned by a comprehensive contract management approach is at the core of the organization's strategy to deliver results for Canada in the most effective and efficient manner. Amongst key internal challenges and strategic issues being managed by AECL, three are notable and presented below.

Human resources: AECL is a small organization that relies on a small complement of national and international experts, many of whom bring experience in the management of similar GoCo arrangements, both from a government and contractor perspective. In 2018-19, AECL had 45 employees. AECL's goal is to maintain the necessary expertise and capabilities to oversee the GoCo contract and play an appropriate oversight and challenge function to achieve value for money for Canada.

Given AECL's small size, an ongoing challenge is to adapt to fluctuating resourcing requirements across different areas of the organization and backfill those on short-term leave. To manage this, AECL strives to be adaptable and flexible, deploying a handful of third-party service contracts to bolster resourcing when and where required and cross-training employees when the opportunity arises. A succession plan has also been developed and is reviewed on an annual basis at a minimum. Furthermore, AECL regularly reviews its total compensation package in order to remain competitive amongst similar employers nationally and internationally.

State-of-the-art laser flash apparatus utilized to determine the thermal diffusivity of unirradiated nuclear fuel. Thermal diffusivity is used to calculate thermal conductivity, which is a key performance parameter for nuclear fuel. CNL's laser flash apparatus generates data under a variety of controlled atmospheres from ambient temperatures to 1800°C simulating diverse operational conditions and accident scenarios.

Contractor performance: As AECL relies on a private-sector contractor to execute scope related to its mandate, an inherent internal risk is failure of the contractor to execute and perform, based on agreed-upon plans. To mitigate this risk and drive the appropriate behaviour, the contract with CNL is carefully structured to include several mechanisms for AECL to track CNL's performance, as discussed in the Operating Model section above. On an annual basis, AECL sets priorities supported by achievable stretch targets in order to drive value for money for Canada. Ongoing evaluation of the contractor throughout the year provides AECL the opportunity to highlight strengths and weaknesses and the contractor the opportunity to correct course where needed. This cumulative performance monitoring will provide a key part of the information necessary for AECL to make its decision as to the extension of the initial GoCo contract period of six years for an additional four years into 2025.

Costs to operate Chalk River Laboratories: The shutdown of the National Research Universal (NRU) reactor in March 2018 is creating cost pressures going forward. The combination of lost revenue from the activities of the reactor (including isotope sales) and diminishing funding for NRU, together with site costs that have not proportionally decreased, will create increasing funding pressures going forward. As this was anticipated at the time of the restructuring of AECL, the GoCo contract includes requirements for CNL to look at all options for how to lower costs and manage the cost pressures to mitigate this risk, which is actively being pursued, with a view to ensuring a sustainable and science-focused organization in the long-term.

AECL continues to improve upon its existing management practices, supported by an internal audit program and through oversight provided by its Board of Directors.

EXTERNAL ENVIRONMENT

Environmental Stewardship

As part of AECL's environmental stewardship responsibilities, three CNL projects are currently undergoing Environmental Assessments to be reviewed by the Canadian Nuclear Safety Commission:

- Construction of a Near Surface Disposal Facility at the Chalk River Laboratories.
- In-situ decommissioning of the WR-1 research reactor at the Whiteshell site.
- In-situ decommissioning of the Nuclear Power Demonstration facility in Rolphton, Ontario.

The regulatory environment, as well as engagement of the public and Indigenous groups are key to the success of these projects. Already, timelines have been revised to ensure that all comments and concerns from the public and Indigenous groups have been considered for all three projects, as well as requests from the Canadian Nuclear Safety Commission to provide additional technical studies. As a result, additional time has been needed to build the safety case for each project, which includes: making adjustments based on feedback and comments received by the regulator, other government organizations, the public and Indigenous groups and; continuing engagement with key stakeholder and Indigenous groups. Overall, while these schedule changes have impacted CNL's ability to commence large-scale cleanup and remediation activities at AECL sites, they are allowing for more public and Indigenous engagement, and the development of additional studies in support of the projects' safety cases.

Nuclear Laboratories

CNL continues to pursue work to grow its commercial activities in the area of nuclear science and technology. The objective is to leverage the capabilities and facilities at the Chalk River Laboratories in order to support industry, retain and attract expertise at the laboratories and grow commercial revenues.

To achieve its commercial growth objectives, CNL is using established commercial business management and market development strategies for maintaining existing market share. Its strategy is to maximize revenue from existing customers, expand revenue in target growth markets, maintain an opportunistic posture, and lead the development of new capabilities, products and services to access new sources of revenue. The basic principle in CNL's commercial revenue strategy is to derive maximum benefit from existing capabilities. There is also a recognition that there is, worldwide, a limited number of highly-specialized nuclear science and technology facilities. It is therefore more advantageous for CNL to focus on areas where it can leverage its unique skills, capabilities and facilities, and to enhance its capabilities through collaboration with industry, academia and other national laboratories, in Canada and abroad where appropriate.

This is particularly important given the National Research Universal (NRU) reactor shutdown in the spring of 2018. Located at the Chalk River Laboratories, the NRU reactor operated for more than 60 years and was Canada's largest research reactor and one of the most versatile high-flux research reactors in the world. Over the years, the reactor enabled the development of the CANDU reactor technology, produced medical isotopes which were used in more than a billion medical diagnostic and treatment procedures worldwide, and led to the expansion of materials science and innovation in Canada. The shutdown of the NRU means that CNL no longer has access to a neutron source, which is an important component of most nuclear laboratories worldwide and enables a wide array of science and technology activities.

To compensate, CNL has assessed its needs for irradiation and has put in place measures that include leveraging facilities elsewhere in the world. While important nuclear science and technology work continues to be delivered, there is a loss of national capability without a research reactor. Activities will be undertaken in the coming years to assess options for a new research reactor, given that this would help to maintain Canada's nuclear expertise, retain the geopolitical advantage that comes from being a Tier 1 nuclear nation, support the established nuclear industry and supply chain, spur innovation, enable further commercial growth and help attract and maintain highly-qualified personnel at the laboratories.

Small Modular Reactors

In the short term however, CNL is pursuing opportunities related to small modular reactors, which are nuclear reactors that are being designed to be built at a smaller size but in larger numbers than most of the world's current nuclear fleet. In Canada, small modular reactors have the potential for three major areas of application:

- On-grid power generation, especially in provinces phasing out coal in the near future. Utilities want to replace end-of-life coal plants with non-emitting, base-load nuclear plants of similar size.
- On- and off-grid combined heat and power for heavy industry. Oil sands producers and remote mines have expressed interest in medium-term options for bulk heat and power that would be more reliable and cleaner than current energy sources, and small modular reactors represent a potential opportunity in this regard.
- Off-grid power, district heating, and desalination in remote communities. These communities currently rely almost exclusively on diesel fuel, which has limitations such as cost and emissions. Very small modular reactors have potential to be a 'game changer' in regard to development in the North, contributing to national sovereignty, energy security and the economy.

The opportunity related to small modular reactors is noteworthy given Canada's expertise in nuclear technology, including its existing supply chain and potential markets. Economic benefits for Canada derived from the development and deployment of small modular reactors include an estimated 6,000 new jobs (directly and indirectly) supporting a high-skill labour force and an estimated \$10 billion in direct impacts and \$9 billion in annual indirect impacts between 2030 and 2040.¹ There is also significant export potential for technology and services related to this industry, should Canada be at the forefront, including an estimated total global export potential of approximately \$150 billion per year for 2030 to 2040.²

As part of its long-term vision, CNL seeks to become a platform for small modular reactor research and technology and aims to have a demonstration unit built by third parties at an AECL site by 2026. CNL has already taken steps to further explore this opportunity, including through its ongoing Invitation for Application process for proposals for small modular reactor demonstration projects.



Conceptual image of a small modular reactor:
Third Way <https://www.thirdway.org>

¹ A Call to Action: A Canadian Roadmap for Small Modular Reactors. Small modular reactor Roadmap Steering Committee, November 2018. Available online at smrroadmap.ca.

² Ibid.

These activities are consistent with the Government's 'A Call to Action: A Canadian Roadmap for Small Modular Reactors,' which was convened by Natural Resources Canada and developed by interested provinces, territories, power utilities and other stakeholders. Specifically on demonstration technologies, the small modular reactor Roadmap Steering Committee recommended that "Governments, utilities, industry, and the national laboratory support demonstration of small modular reactor technologies, preferably more than one, at appropriate sites in Canada." Also, AECL and CNL are responding to all four recommendations specific to AECL and CNL, including doing preliminary site identification work, undertaking small modular reactor research and development, continuing the Invitation process and collaborating with international partners on small modular reactors.

FUNDING REQUIREMENTS

Federal funding for the next five years is required to achieve the aims of this Corporate Plan Summary. The following sections of the Corporate Plan Summary provide more information on work planned for environmental stewardship and the nuclear laboratories.

Total AECL Five-Year Projection of Federal Funding Requirements (excluding Discontinued Operations)

(millions of Canadian dollars)	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
Funding Requirements								
Environmental Stewardship	450	593	737	828	688	617	405	3,275
Nuclear Laboratories – Operating	259	304	260	213	180	187	166	1,007
Nuclear Laboratories – Capital	117	147	200	183	165	80	35	663
Federal Funding Requirements AECL	827	1,044	1,197	1,225	1,033	884	606	4,946

AECL's detailed financial performance information and annual report can be found on our website www.aecl.ca.

OBJECTIVES AND PLANS – ENVIRONMENTAL STEWARDSHIP

AECL's objectives under the GoCo model include accelerating decommissioning, site remediation and waste management activities in order to protect the environment, and build a world-class nuclear laboratory that fulfills government requirements and grows commercial revenues while reducing or containing costs and risks to Canada.

ENVIRONMENTAL STEWARDSHIP (DECOMMISSIONING & WASTE MANAGEMENT)

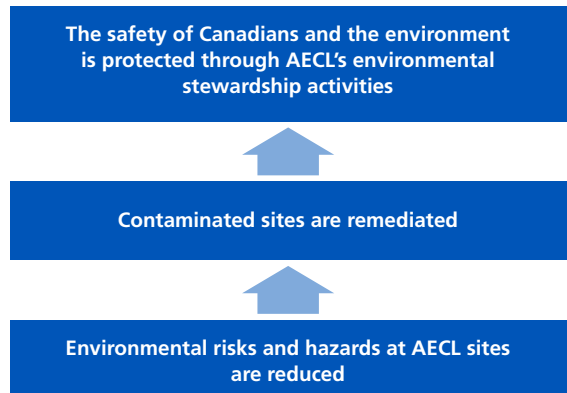
AECL's objective is to protect the environment by advancing key decommissioning, remediation and radioactive waste management projects in order to address risks and hazards.

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.

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.

AECL's objective is to protect the environment by advancing key decommissioning, remediation and waste management projects in order to address risks and hazards. With the implementation of the GoCo model, AECL was given a mandate to accelerate these activities in order to reduce risks and costs for Canada in a safe manner, consistent with international leading practices. Specifically, AECL has asked CNL to propose projects for the long-term management of radioactive wastes and to advance other decommissioning activities in order to reduce its environmental liabilities.

WHAT WE ARE TRYING TO ACHIEVE



This work is well underway, with significant progress having been made at the Chalk River Laboratories where already more than 70 old and outdated buildings and structures have been demolished. This not only reduces AECL's environmental liabilities and overall site maintenance costs, but it also paves the way for new facilities to be constructed as part of the site's revitalization.

AECL's planned results under Environmental Stewardship include working safely to reduce environmental risks and hazards in the short-term, working towards environmental remediation and closure of four nuclear sites, and ultimately protecting Canadians and the environment through decommissioning and waste management activities.

Activities in Environmental Stewardship are focused into seven areas, the scopes for which are set out below:

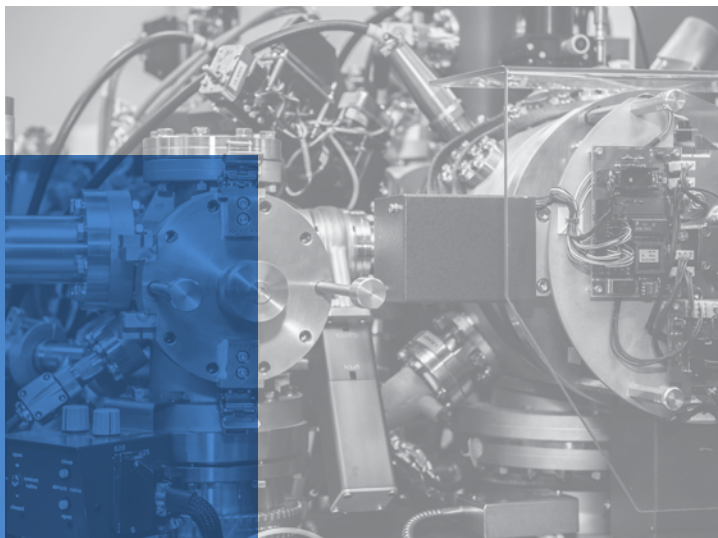
Environmental Stewardship: Five-Year Projection of Funding Requirements

(millions of Canadian dollars)	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
Environmental Stewardship								
Total environmental stewardship	451	594	738	829	689	618	406	3,280
Revenue	1	1	1	1	1	1	1	5
Federal Funding Requirement	450	593	737	828	688	617	405	3,275

1 Assumed Third Party Waste Costs and offsetting Revenue of \$1 million per year.

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

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



CNL's new focussed ion beam instrument which has been configured for analysis of radioactive samples, used to study performance and degradation of materials.

Activities in this area include:

Waste management and disposal at the Chalk River site

Overview: Existing radioactive waste is safely stored at the Chalk River site. However, long-term management solutions must be developed for various types of wastes to allow for the remediation of contaminated buildings, lands and soils and to move away from continuous temporary storage. As such, CNL has proposed to build a near surface disposal facility for the permanent disposal of AECL's low-level radioactive waste, as well as small amounts of waste from other Canadian producers such as hospitals and universities. Near surface disposal is an internationally-proven method of disposing of such wastes. The facility would allow for the permanent disposal of the vast majority of AECL wastes 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. This project is critical to advance decommissioning and remediation activities at AECL sites.

With respect to AECL's intermediate-level waste, it is currently safely stored at the Chalk River Laboratories. In the coming years, CNL will be exploring options for its long-term management and disposal. Of note, most of AECL's high-level waste (used fuel) is destined to be disposed of in the proposed repository that is currently being explored by the Nuclear Waste Management Organization. Projects to manage used fuel are discussed in more detail in the section on *Management of used fuel and repatriation of highly-enriched uranium* below.

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

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

Status: The Environmental Impact Statement for the Near Surface Disposal Facility was submitted to the Canadian Nuclear Safety Commission in the summer of 2017. Since then, CNL has been discussing with the regulator and meeting with stakeholders and Indigenous groups, responding to comments, funding traditional knowledge studies and undertaking additional studies, work and design changes in order to respond to questions and concerns raised. As noted above, higher-than-anticipated public and Indigenous engagement, as well as requests from the Canadian Nuclear Safety Commission to provide additional technical studies, have led to timeline extensions in the project of almost two years. While these have impacted CNL's ability to commence large-scale cleanup and remediation activities at AECL sites, they are allowing for more public and Indigenous engagement, and the development of additional studies in support of the project's safety case.

Extensive outreach activities have taken place, including meetings with Indigenous groups, site tours and community meetings. It is hoped that this engagement will also pave the way for the development of long-term relationships that go beyond the Environmental Assessment process.

Plans for the 2019-20 fiscal year include finalizing the Environmental Impact Statement and working with the regulator to establish a public hearing date, expected sometime in 2020. Engagement with stakeholders and Indigenous groups will continue as the project progresses. In the meantime, interim waste storage was expanded again in 2018-19 to allow for continued progress in building decontamination and decommissioning and capital new-build projects.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Implement characterization and certification processes for waste destined for the Near Surface Disposal Facility.	Develop a program for radioactive waste that does not currently have a disposition route (where there are no plans for disposal).	Determine the disposal path for intermediate level waste. Explore options and engage with appropriate stakeholders regarding clean-up criteria for certain areas that need to be remediated at the Chalk River site.
Prepare the Chalk River site to receive waste from other AECL sites.	The Chalk River site is ready to receive low-level radioactive waste from the Whiteshell site for storage and/or disposal. Ready to receive intermediate-level radioactive waste from the Whiteshell site for storage.	
Near Surface Disposal Facility: regulatory approval received to begin construction.	First waste emplacement at the near surface disposal facility.	

Environmental restoration at the Chalk River site

Overview: For more than 60 years, nuclear science and technology activities at the Chalk River site have led to the production of radioactive and other hazardous wastes. Such wastes have been carefully managed at 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 been contaminated to varying degrees. As there remains a significant amount of buried waste soil contamination and associated plumes, remedial actions are required to further protect the environment. Until such a time, legacy waste is being safely managed and closely monitored.

Status: Activities in the short term are mostly focused on site characterization, assessment and remedial planning. Large-scale remediation of contaminated lands and soils is required to further protect the environment; however this can only be achieved if the contaminated material has a place to go. The Near Surface Disposal Facility, which is currently undergoing an Environmental Assessment, is meant to provide a solution for these materials. In the interim, enhanced monitoring programs and the execution of targeted remedial actions, such as the removal of approximately 1.3km of contaminated pipeline and the replacement of an outdated groundwater treatment system, improve environmental conditions and continue to provide the necessary environmental protection.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Characterization and remediation plans for various Waste Management Areas at the Chalk River site are completed.	Remediation of Waste Management Areas begins once the Near Surface Disposal Facility is available.	Waste Management Areas and site remediation activities are completed.

Decommissioning of buildings at the Chalk River site

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

Status: Since 2015 there has been significant acceleration of decommissioning work at the Chalk River site, with over 70 buildings and structures having been decontaminated, decommissioned and demolished.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Demolition of 10 buildings and structures.	Approximately 65 structures are decommissioned between 2017 and 2022 (cumulative). A program of works is developed and implemented to reduce the liability associated with the inventory of waste and assets in the NRU rod bays.	Long-term liabilities are reduced through the safe and environmentally responsible removal of redundant facilities and structures. With the exception of NRU, 122 structures have been eliminated and NRX has been decommissioned to an agreed end-state, helping reduce the site footprint.

Management of used fuel and repatriation of highly-enriched uranium

Overview: Highly-enriched uranium originating in the United States was used at the Chalk River site as reactor fuel and in the production of the key medical isotope molybdenum-99. This material requires high levels of security as well as costly and complicated storage. As part of the Global Threat Reduction Initiative (an initiative which aims at reducing proliferation risks by consolidating highly-enriched uranium inventories in fewer locations around the world), AECL is working with the United States Department of Energy and CNL to return (repatriate) this material to the United States for conversion and reuse. This initiative provides for a safe, secure, timely and permanent solution to Canada's long-term management of this material.

CNL also manages AECL's used fuel inventory. The Fuel Packaging and Storage facility is used to remove fuel from existing tile holes that show signs of corrosion and place it in a state-of-the-art, above-ground storage facility for continued storage until a final repository for the used fuel is available.

Status: The fuel repatriation program continues as per plans and the shipping campaign will continue into 2020.

The project to remove and transfer used fuel has reached a significant milestone – 96 out of 97 tile holes have been successfully moved to the Fuel Packaging and Storage facility. This project has been accelerated two years ahead of schedule due to innovation and efficiencies brought about by CNL.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Target residue material shipments continued as per plans and fuel rod shipments completed.	Target residue material shipments completed.	AECL continues to investigate and pursue the disposition or repatriation of fresh and irradiated fuel material in order to further reduce liabilities for Canada.
Remaining tile hole stabilized to enable safe transfer to the Fuel Packaging and Storage Facility.	Drying operations at the Fuel Packaging and Storage Facility are complete, with only surveillance activities remaining.	

Port Hope Area Initiative

Overview: 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 manage roughly 1.7 million cubic metres of historic low-level radioactive waste and contaminated soils. Two long-term waste management facilities have been constructed, one in each municipality, and have started receiving waste from existing waste management facilities, as well as other wastes which are dispersed in the local area.

Status: Significant progress was made throughout the year on construction of the Port Hope Long-term Waste Management Facility; Port Hope harbor remediation is underway; historical temporary storage sites are now cleared and various industrial remediation projects have been initiated across Port Hope. Perhaps most significantly, the project began field work on ‘small-scale site’ remediation (mostly residential properties). As small-scale site characterization activities have advanced, the number of individual properties requiring remediation work has risen.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Port Granby Long-term Waste Management Facility closed and capped.	Port Hope Project: The large scale industrial remediation projects are completed. Port Granby Long Term Waste Management Facility in long-term surveillance.	Port Hope remediation of low level radioactive waste is completed. Port Hope Long Term Waste Management Facility is closed and capped and in long term surveillance.

Closure of the Whiteshell Laboratories

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

In 1998, the Government announced the closure of the Whiteshell Laboratories, and decommissioning activities have been underway since then. With the implementation of the GoCo model and the increased emphasis placed on tackling its environmental and decommissioning responsibilities, AECL has asked CNL to accelerate and complete the decommissioning and closure of the site. As a result, CNL is proposing to decommission and close the site by 2024, approximately 30 years ahead of the previous schedule. The acceleration of the decommissioning of the site is based on the bid that was accepted by Canada as part of the procurement process, and includes a proposal to decommission the WR-1 reactor in situ. That specific project is currently undergoing an Environmental Assessment.

Status: In 2018-19, CNL continued its efforts on the design and safety case for the proposed approach of in situ disposal of the WR-1 reactor. Significant efforts were placed on engaging with the public and Indigenous groups following the submission of a draft Environmental Impact Statement. CNL has held multiple meetings with Indigenous groups, site tours, community meetings, industry days and a benchmarking trip to a reactor in the United States which has been disposed of in situ.

Similar activities are expected to continue in 2019-20, leading up to a public hearing to be held by the Canadian Nuclear Safety Commission. Other decommissioning activities are continuing at the site.

Looking to the final site closure and being mindful of the impact on the local community, AECL will continue to work with CNL, local and Indigenous communities with a view of finding acceptable end-states which support regional economic development.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
<p>The Canadian Nuclear Safety Commission approves the renewal of CNL's decommissioning licence for the Whiteshell site.</p> <p>Regulatory approval received for the in situ decommissioning of the WR-1 reactor.</p>	<p>Waste retrieval completed for all the standpipes in the waste management area.</p> <p>All high-level radioactive waste and used fuel are removed and transported to the Chalk River Laboratories.</p>	<p>The Canadian Nuclear Safety Commission issues a licence to abandon or otherwise accepts as completed all active decommissioning and waste management activities, with only long-term monitoring and surveillance activities remaining.</p>

Closure of the Nuclear Power Demonstration reactor site

Overview: 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, including the removal of all fuel from the site and the draining of the systems. The site has been in a safe shutdown state for the last 30 years.

As part of its objectives to protect the environment and address its environmental and decommissioning responsibilities, AECL has asked CNL to propose plans to safely decommission and close the 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 grouting (i.e. cementing) the reactor which is located below the surface. The project is currently undergoing an Environmental Assessment.

Status: In 2017-18 CNL submitted a draft Environmental Impact Statement to the regulator. Subsequently, it has undertaken additional work and studies with a view to providing all necessary supplemental documentation. Similar to the other projects currently undergoing an Environmental Assessment, this has led to schedule extensions. That said, this has allowed for additional engagement of stakeholders and Indigenous groups on the project in order to gather input and adjust the proposed approach, as necessary. Activities included multiple meetings, site tours and outreach to Indigenous groups, including providing funding for capacity building and traditional knowledge studies, and to enable Indigenous groups to engage technical experts to comment on the Environmental Assessment.

The engagement process is expected to continue into 2019-20. CNL will continue its work to characterize radioactivity and contamination, decommission and decontaminate other hazards and maintain the facilities. CNL will also continue to actively engage with local stakeholders and Indigenous groups on its proposal.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Regulatory approval received for the in situ decommissioning of the Nuclear Power Demonstration reactor.	Canadian Nuclear Safety Commission issues licence to abandon or otherwise accepts as completed all active decommissioning and waste management activities, with only long-term care activities remaining.	Ongoing long term monitoring and surveillance.

Decommissioning of prototype reactors

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

Status: Full decommissioning plans for the reactors have not yet been determined, and any decommissioning activities will have to be approved by the Canadian Nuclear Safety Commission. The first step towards more extensive decommissioning was implemented with each site being granted an individual licence (this represents an administrative change only). As CNL prepares detailed decommissioning plans, it will work with local stakeholders as appropriate and secure all necessary regulatory approvals. In the meantime, CNL continues to maintain the facilities, perform approved hazard reduction activities and progress the demolition of redundant facilities with a view to reducing the overall site operating costs.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Supporting and/or redundant facilities at the Douglas Point and Gentilly-1 reactors are demolished.	Review options for Douglas Point and Gentilly-1 for transport of fuel to the Chalk River Laboratories.	Plans are in place for the decommissioning of the Douglas Point and Gentilly-1 reactors.

Low-level Radioactive Waste Management Office

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

Status: In 2018-19 progress was made in planning for remediation of sites along the Northern Transportation Route in the Northwest Territories and Alberta, an outcome of AECL's close engagement with local communities and CNL to find safe, suitable, cost-effective and accepted solutions for waste disposal. In 2019-20 planning, as well as stakeholder and Indigenous engagement, will continue with efforts underway to significantly accelerate remediation activities.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Engagement of local and Indigenous stakeholders to agree on clean-up plans for the Northern Transportation Route.	Engagement of local and Indigenous stakeholders (continued).	Remediation completed for all sites along the Northern Transportation Route.
Remedial Action Plans agreed for select South Slave sites along the Northern Transportation Route.	Remediation commences for Sahtu sites along the Northern Transportation Route.	

Third-party waste

AECL's sites and waste management capabilities are unique in Canada. Historically, AECL has accepted small amounts of radioactive waste from Canadian facilities, most notably hospitals and universities. CNL continues to provide these services to third parties for the handling, storage and disposal of radioactive waste. These activities are delivered on a full cost-recovery basis and do not require government funding.

TARGETS (ONGOING)
CNL accepts radioactive waste from small waste generators on a fee-for-services basis.

OBJECTIVES AND PLANS – NUCLEAR LABORATORIES

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

The restructuring of AECL and the implementation of the GoCo model have brought new opportunities for building on this important scientific legacy. This has been further enabled by an investment of \$1.2 billion for new and renewed science and site support infrastructure at the Chalk River Laboratories, with the objective of building a world-class, state-of-the-art nuclear science and technology campus.

Through the GoCo model, AECL's objective is to leverage the vast experience and expertise at the Chalk River Laboratories to contribute to the Government's science, innovation and clean energy objectives. Nuclear science and technology activities at the Chalk River Laboratories, supported by the Federal Nuclear Science and Technology Work Plan, help the Government of Canada deliver on its responsibilities in the areas of health, nuclear safety and security, energy and the environment. To further grow the science expertise and capabilities at Chalk River, AECL has asked CNL to provide technical services and research and development products for third parties on a commercial basis.

AECL's planned results in this area include servicing the nuclear science and technology needs of federal departments and agencies and advancing nuclear knowledge, innovation, job creation, and the use of clean technologies. AECL is focused on increasing collaboration and partnership with other nuclear industry members, academia and other national laboratories. As well, the advancement of nuclear technologies, such as small modular reactors, for the benefit of Canadians.

CNL has developed a 10-year plan outlining its strategic approach to delivering a science and technology mission that serves the needs of the federal government as well as those of external customers. Based on an assessment of existing capabilities, external environment and market opportunities, CNL has identified eight strategic initiatives:

WHAT WE ARE TRYING TO ACHIEVE

Nuclear science and technology benefits Canadians



Continued new knowledge, innovation, job creation, and the use of clean technologies



The Federal Nuclear Science and Technology Work Plan serves the needs of federal departments and agencies & the Chalk River Laboratories are leveraged to serve the needs of industry



Control panel for CNL's newly replenished autoclave systems, used to study material performance at high temperature and pressure while being able to monitor and control water chemistry conditions within the autoclaves.

- **Long-term reliability of existing reactors:** Support is provided for Canada's fleet of existing reactors through work on life extension and long-term reliability of the existing fleet of CANDU reactors domestically and internationally, and expansion to include support for other reactor designs, advanced nuclear materials, fuels research and nuclear chemistry applications.
- **Advanced fuel fabrication:** This work is focused on the development of advanced nuclear fuel concepts in order to support the long-term reliability of existing reactors and the development of advanced reactors. These advanced fuels offer higher performance, improved failure tolerance, increased safety, proliferation resistance and accident tolerance, and are recycled or recyclable.
- **Small modular reactors:** CNL's goal is to demonstrate the commercial viability of the small modular reactor by 2026, with a view to positioning Canadian companies to take a leadership role in this emerging nuclear technology, with CNL recognized globally as a leader in small modular reactor prototype testing and science and technology support. The objective is for Canada and CNL to best leverage that position to enable the private sector to offer low-carbon, reliable, load-following, scalable and cost-effective energy options to remote communities, mining and oil and gas applications, and to fill other energy gaps and needs that often have unique Canadian interest.
- **Decarbonizing the transportation sector:** The strategic initiative builds on capabilities developed to support hydrogen safety and heavy water and tritium management in CANDU reactors, and is leveraging recent capital investment in modern hydrogen laboratories. As hydrogen technologies have matured, costs have dropped to the point that hydrogen solutions are financially competitive with similar energy technologies. Hydrogen technology offers low-carbon options for the energy and transportation sectors, which supports Canada's international commitments for carbon reduction.
- **Targeted alpha research:** Targeted alpha therapy is a new area of research in the treatment of cancer and other diseases. The benefit of this therapy is that the radiation is targeted at just the cancer cell, unlike existing treatments that often involve radiation of all cells in the vicinity of a tumor - healthy and cancerous. There is currently an international shortage of key nuclides for this research. The result is severely restricted research in this area, which delays and puts at risk the availability of effective treatment. CNL aims to become the center of international research

efforts and a key supplier for these alpha-emitting isotopes by applying its expertise in isotope separation, scaling up of processing and handling radionuclides. Strategic partnerships are being pursued with the academic and commercial sectors to leverage CNL's radiobiology, animal studies and isotope separation capabilities and grow revenues in the pharmaceutical market.

- **Nuclear cyber security:** Cyber security of industrial control systems is a growing concern in all industries, and particularly in the nuclear industry where it represents a multibillion-dollar worldwide market. While a large commercial industry caters to the cyber security of information technology systems, most solution providers are focused on conventional hacking and data theft. CNL has already commissioned a nuclear cyber security test facility located in New Brunswick, and is now working to develop, commercialize and deploy a nuclear industrial control cyber intrusion detection and mitigation system.
- **Nuclear forensics, detection and response:** The need for science and technology activities in nuclear security continues to grow in Canada, as evidenced by the Government's renewed commitments to nuclear threat reduction, both domestically and abroad. There is a growing demand from government departments and agencies for nuclear science and technology expertise to inform their response to emergent national and international issues concerning nuclear safeguards, safety and security. CNL is working to establish a centre for government agencies and commercial partners to develop, test, calibrate and validate nuclear forensics, non-proliferation, security and response technologies and materials. Furthermore, CNL is supporting work to safeguard and secure nuclear material and improve Canada's border security.
- **Decommissioning and waste research and development:** CNL is working to expand the understanding of the behaviour of contaminant radionuclides, and further develop safe, economical nuclear waste management technologies. The environmental technology capability will also continue to support the Government in monitoring for the presence and spread of low levels of contamination.

The scope for activities relating to nuclear laboratories is set out below:

Nuclear Laboratories Five-Year Projection of Funding Requirements

(millions of Canadian dollars)	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
Nuclear Laboratories								
Nuclear Laboratories –								
Operating	330	373	325	284	254	262	241	1,366
Revenue	71	69	65	71	74	75	75	359
Capital	117	147	200	183	165	80	35	663
Federal Funding Requirement	376	451	460	396	345	267	201	1,670

Science and technology

Federal Nuclear Science and Technology Work Plan

Overview: AECL oversees the delivery of the Federal Nuclear Science and Technology Work Plan for nuclear research and development to support the Government's priorities and core responsibilities in the areas of health, nuclear safety and security, energy, and the environment. The Federal Nuclear Science and Technology Work Plan serves to build, maintain and maximize those capabilities that are unique to CNL. AECL engages with thirteen 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, whilst supporting Canada's international partnerships, commitments, and obligations.

AECL's Federal Nuclear Science and Technology Work Plan focuses on five research themes:

1) Supporting the development of biological applications and understanding the implications of radiation on living things. This includes:

- Improving the understanding of radiological health risks caused by exposure to radiation at levels found in occupational and public environments;
- Contributing to the body of evidence that informs the international radiation protection framework (e.g., United Nations Scientific Committee on the Effects of Atomic Radiation, International Commission on Radiological Protection, International Atomic Energy Agency);
- Collecting or generating evidence to inform the application of international recommendations in Canada and incorporation into Canadian regulations and national guidance;
- Increasing knowledge of the uncertainties in low-dose risk assessment to address challenges in regulatory policy, health assessment and public communication; and
- Quantifying radiation health risks.

2) Enhancing national and global security by supporting non-proliferation and counter-terrorism. This includes:

- Improving Canadian global leadership in science and technology development to support nuclear non-proliferation, security and counter-terrorism objectives as part of Canada's broader aim to advance its security interests around the world;
- Supporting Canada's international commitments on the peaceful use of nuclear energy and its interests in the Comprehensive Nuclear-Test-Ban Treaty, Fissile Material Cut-off Treaty and the International Partnership for Nuclear Disarmament;
- Improving cyber security and protecting our nuclear critical infrastructure from cyber-threats; and
- Enhancing Canada's capability in nuclear forensics.

3) Nuclear preparedness and emergency response. This includes:

- Making sure that Canada is ready to respond in the event of a radiological or nuclear emergency, in Canada or abroad; and
- Increasing the understanding of accident phenomena for regulatory and emergency management purposes.

4) Supporting safe, secure and responsible use and development of nuclear technologies.

This includes:

- Implementing the Pan-Canadian Framework and helping to achieve Canada's international greenhouse gas targets by reducing the environmental impacts of energy production, bringing clean electricity onto the grid, reducing industrial emissions, and reducing diesel use in remote communities;
- Increasing competitiveness and promoting the use of clean technology—including in Canada's natural resource sectors—through research, development, and demonstration of innovative nuclear energy technologies;
- Supporting the Government of Canada's small modular reactor initiatives;
- Delivering on Canada's commitment under Mission Innovation to advance clean energy research, development and demonstration, while encouraging private-sector investment and increasing domestic and international partnerships; and
- Informing potential programs, regulations, and policies for new nuclear energy technologies.

5) Supporting environmental stewardship and radioactive waste management.

This includes:

- Supporting Canada's national and international leadership to reduce environmental impact of nuclear energy; and
- Enabling Canada's environmental stewardship by seeing that nuclear energy is developed within a robust framework that addresses environmental and waste management concerns.

Status: In 2018-19 the program included the federal interdepartmental committees, representing 13 departments and agencies, continued to work with 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 included work to:

- develop and demonstrate innovative nuclear energy technologies and applications such as the production of hydrogen without greenhouse gas emissions and working with federal departments and agencies to advance small reactor technologies and deployment for Canada in order to inform regulatory guidance, assessments and policies;
- develop improved biodosimetry techniques for rapid triage in emergency response;
- develop new medical applications in targeted alpha therapy with the development of Actinium-225 for cancer treatments;
- develop technologies to advance the detection of special nuclear materials;
- reducing uncertainties in low-dose risk assessment to address challenges in regulatory policy, health assessment and public communication as well as investigations of its medical applications; and,
- support Canada's interests, commitments and arrangements in non-proliferation, counter-terrorism and disarmament priorities such as the International Partnership for Nuclear Disarmament Verification and the Comprehensive Nuclear-Test-Ban Treaty Organization.

As in 2018-19, the measures of success are related to meeting federal priorities through delivering on milestones and targets set out in CNL's annual plan.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Research projects as set out in the Federal Nuclear Science and Technology Work Plan are delivered on time and with high quality, as per milestones and targets included in CNL's annual plan.	Project objectives identified are met and the results are disseminated with uptake from the stakeholders.	<p>Canada's position as a global player in areas of security, health, energy and nuclear regulation is supported.</p> <p>Highly-qualified personnel for the next generation of nuclear workers and scientists are developed.</p> <p>Unique technical knowledge and understanding is advanced to support nuclear policy and regulation; and Canada's ability to actively and effectively participate in international fora, and to meet international obligations with respect to energy technology, safety, security and nonproliferation is maintained.</p>

CNL as a Federal Laboratory

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

Status: In 2018-19, CNL continued to work with various Government departments and agencies on nuclear research in safety and security including in particular with Defence Research and Development Canada through its Canadian Safety and Security Program and the Canadian Nuclear Safety Commission. Services for independent verification and training will continue to be provided to the Canadian Nuclear Safety Commission. Through the Canadian Safety and Security Program and leveraging funding from the Federal Nuclear Science and Technology Work Plan, CNL installed a radiation portal monitor as part of the facility for special nuclear material detection and detector development applications to strengthen applications in border security.

Canadian Safety and Security Program projects in cyber security and nuclear forensics have advanced Canada's capabilities in nuclear security including: developing advance detection capabilities of cyber security intrusion for industrial control systems, developing novel nuclear forensics techniques, and contributing to the nuclear forensic library led by the Canadian Nuclear Safety Commission.

In 2019-20, CNL will continue to successfully leverage research from the Federal Nuclear Science and Technology Work Plan to advance new projects from the Canadian Safety and Security Program in nuclear detection techniques for opioids, explosives and special nuclear materials, and in technology demonstration for nuclear disarmament verification.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Between 3 and 5 collaborative agreements, memoranda of understanding or other agreements with organizations are being proposed and developed.	Between 3 and 5 collaborative agreements, memoranda of understanding or other agreements with organizations are signed.	Science and technology activities are leveraged to increase collaboration and work at the Chalk River Laboratories, and the capabilities are maintained as outlined in the signed agreements.

New Technology Initiative Fund

Overview: The New Technology Initiatives Fund allows CNL to undertake science and technology activities to build expertise and capability at the Chalk River Laboratories, with a long-term view to attracting and retaining world-class expertise and, building skills and knowledge that are anticipated to be needed for future or emerging opportunities. Consistent with similar programs at national laboratories around the world, providing funding to support work 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.

Status: In 2019-20, research to support Strategic Initiatives in small modular reactors, including developing molten salt research capabilities, will continue. New capabilities are also being developed to support CNL’s work on reactor life extension and long-term reliability, and expand CNL’s capabilities to support operations of the world’s fleet of more than 400 light-water nuclear power reactors. Work to attain ‘Good Laboratory Practice’ readiness for the Biological Research Facility will also be pursued to advance its Strategic Initiatives in Alpha Therapy.

CNL will also continue with its new Strategic, Enabling, Engaging, Development (SEED) Crowd Sourcing Initiative launched in 2018-19 to allow CNL personnel to submit and vote on research ideas that they believe would be worth pursuing. In 2018-19, SEED included projects to improved products such as the steam generator inspection tool, advance its strategic initiatives and improved facilities including open air laboratory.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Expertise and capabilities are maintained and enhanced.	Expertise and capabilities are maintained and developed.	World-class expertise, new capabilities, and building skills and knowledge are developed for future or emerging opportunities.

Science and technology for commercial purposes

Overview: CNL will continue to provide commercial services to third parties, and to continue to build a strong, vibrant and sustainable nuclear science and technology mission.

Status: In 2018-19, CNL engaged with and responded to existing customers' requests and explored new markets. A detailed five-year business development sales and marketing plan was developed to outline commercial opportunities and risks over the period. Going forward, CNL will continue to expand commercial opportunities based on the strategic directions and initiatives set out in this plan, with growth expected in the areas of light-water and small modular reactors.

Commercial science and technology service opportunities to federal and industry customers continue to be pursued in the areas of health, safety and security, energy, and environment – with energy being the single largest area of current work and the largest growth area. Work for industry customers included energy-related services to the CANDU Owners Group, Candu Energy and major utility companies.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Revenues are more than \$61M.	3%-5% growth year-over year.	2%-3% growth year-over year.

National Research Universal Reactor

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

Leading up to March 2018, the use of the National Research Universal reactor was maximized for a variety of science and technology activities and the production of isotopes other than molybdenum-99.

Status: Activities in 2018-19 were focused on implementing the safe shutdown of the reactor, including its defueling, the removal of heavy water and of non-fuel assemblies requiring cooling. By 2021, the reactor and 30 ancillary buildings will be placed into storage with surveillance awaiting final decommissioning. The reactor fuel will subsequently be transferred to dry storage and the rod bays (the large pools which were used to store the fuel after it was taken out of the reactor) will be drained and processed. To date the shutdown plan has progressed to schedule.

The shutdown of the National Research Universal reactor has significant impacts on the CNL workforce. CNL has been working over the past few years to retain, retrain and redeploy its staff in order to retain talent and expertise where possible.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Safe shutdown activities are completed and the NRU reactor facility and associated buildings are ready to be turned over to the Facilities Decommissioning group at CNL.	Continue to progress storage with surveillance activities.	Continue to progress storage with surveillance activities.

Revitalization of the Chalk River Laboratories

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

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

AECL has also asked CNL to transform its operations to increase value for money and reduce costs and risks to Canada. The overall objective is to have in place a cost-effective, modern campus-like site with new and refurbished facilities to support the future growth of CNL. Any capital investments at AECL sites will take into consideration best practices with respect to sustainability and green building standards, with due consideration for cost, schedule and feasibility. Details on capital plans are provided in Annex 2.

TARGETS		
Short-term 1-2 years	Medium-term 3-4 years	Long-term 5+ years
Approval received to enter implementation phase and start construction of the new non-nuclear facilities.	Business case and detailed design completed for the new Advanced Nuclear Material Research Centre. Completion and commissioning of the new non-nuclear facilities.	Construction and commissioning complete for Advanced Nuclear Material Research Centre.
Stability in health, safety, security and environmental industry-standard metrics against industry standard benchmarks.	Continued improvement in health, safety, security and environmental metrics.	
Implementation of actions to achieve CNL's objectives to manage operating costs while maintaining safety and the protection of the environment pressures, with a view to ensuring a sustainable and science-focused organization in the long-term.	Continued achievement of industry best practices for the management of all of AECL's sites and the Chalk River Laboratories.	

Other Areas of Focus

Heavy Water

AECL currently owns heavy water assets which can be used either in a CANDU reactor or for non-nuclear purposes. Through the GoCo model, CNL acts as an agent for AECL for the marketing, sale and distribution of AECL's heavy water inventory. CNL also manages AECL's inventory of heavy water at AECL's facility in Laprade, Québec. CNL is also examining how to treat inventories of heavy water with small amounts of tritium and other contaminants, such that it could also be sold.

In 2019-20, AECL will be looking to CNL to continue its work to optimize the management and sales of heavy water. Revenues from heavy water are retained by AECL to fund historic liabilities and strategic initiatives.

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 which had been dedicated to resolving matters related to outstanding liabilities from AECL's former CANDU Reactor Division. The few remaining claims and litigations that comprise the business of the Wrap-up Office are now being managed by AECL's legal team, supported by external counsel.

ANNEX 1 – FINANCIAL OVERVIEW

STATEMENTS AND BUDGETS

FINANCIAL STATEMENTS AND NOTES

This section presents AECL's financial statements reflective of AECL's role under the GoCo model, which include payments to CNL and its parent company, Canadian National Energy Alliance. The CNL-related mission budgets (e.g. science and technology, environmental stewardship and capital) include both direct and indirect costs.

Under the GoCo model, AECL receives funding from the Government of Canada to deliver on 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). CNL manages and operates AECL's sites and undertakes the necessary activities to respond to AECL priorities as per its contractual arrangement with AECL. Revenue from third-party work performed by CNL using AECL sites, facilities and assets is recognized by AECL. Revenue generated comes from work to support the nuclear energy industry, the sale or lease of heavy water, and research and development services provided to third-parties.

Statement of Financial Position

(millions of Canadian dollars)	Actual 2017-18	Budget 2018-19	Plan				
			2019-20	2020-21	2021-22	2022-23	2023-24
Financial Assets							
Cash	38	38	38	38	38	38	38
Long-term disposal of waste fund	26	36	47	58	68	78	88
Investments held in trust	51	53	55	57	59	61	63
Trade and other receivables	41	40	40	42	42	44	44
Appropriations receivable	104	115	130	135	115	100	100
Inventories held for resale	193	186	179	172	165	158	151
	451	467	488	501	486	478	483
Liabilities							
Accounts payable and accrued liabilities	77	39	37	36	39	37	37
Employee future benefits	23	20	17	14	10	8	6
Due to Canadian Nuclear Laboratories	117	125	130	130	100	80	70
Deferred decommissioning and waste management funding	288	–	–	–	–	–	–
Decommissioning and waste management provision	6,473	6,302	6,026	5,687	5,354	5,073	4,896
Contaminated sites liability	988	845	653	420	300	184	163
	7,967	7,331	6,863	6,286	5,803	5,382	5,172
Net Debt	(7,515)	(6,863)	(6,375)	(5,785)	(5,317)	(4,903)	(4,689)
Non-Financial Assets							
Tangible capital assets	644	748	902	1,042	1,156	1,185	1,178
Prepaid expenses	2	2	2	2	1	1	1
	646	750	904	1,044	1,157	1,186	1,179
Accumulated Deficit	(6,869)	(6,114)	(5,471)	(4,741)	(4,160)	(3,718)	(3,510)
Accumulated deficit is comprised of:							
Accumulated operating deficit	(6,869)	(6,114)	(5,471)	(4,741)	(4,160)	(3,718)	(3,510)
Accumulated remeasurement (losses) gains	–	–	–	–	–	–	–
	(6,869)	(6,114)	(5,471)	(4,741)	(4,160)	(3,718)	(3,510)

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.

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 ramps up in the coming years, the liability will be decreasing commensurate with the liabilities being settled. The above projections for these two liabilities do not attempt to capture the impact of potential future changes in the interest rate used to derive the net present value of the reported liabilities.

Deferred decommissioning and waste management funding represents the proceeds of the long-term receivable pertaining to the Qinshan heavy water lease. The Deferred Decommissioning Funding balance reported in the 2017-18 Actuals represents the post-2005 proceeds of a heavy water lease. Additionally AECL had accrued a liability to Government for the proceeds of other sales of Government funded heavy water. As a result of recent confirmation from Natural Resources Canada and Treasury Board of Canada Secretariat that there is no obligation associated with the Government funded heavy water proceeds, AECL has eliminated these balances in the 2018-19 budget year. Going forward no liability to Government will be recorded for future sales of Government funded heavy water.

Tangible capital assets are expected to increase in line with increased investment in infrastructure at the Chalk River site, as reflected by the important 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

				Plan					
(millions of Canadian dollars)	Notes	Actual 2017-18	Budget 2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	5 Year Total
Revenues									
Parliamentary appropriations		826	1,044	1,197	1,225	1,033	885	607	4,946
Commercial revenue		87	75	76	82	86	87	87	417
Interest income		4	3	3	3	3	3	3	15
		917	1,122	1,276	1,310	1,122	974	697	5,379
Expenses									
Cost of sales		65	53	53	57	60	61	61	292
Operating expenses	1	101	65	66	63	72	72	62	334
Contractual expenses	2	322	304	251	211	179	186	165	992
Decommissioning, waste management and contaminated sites expenses	3	295	272	263	248	230	214	201	1,155
		783	694	633	580	540	532	489	2,774
Surplus for the year prior to elimination of reported obligation related to government funded heavy water proceeds									
	4	134	428	643	730	582	442	208	2,605
Elimination of reported obligation related to government funded heavy water proceeds	5	—	327	—	—	—	—	—	
Surplus for the year after elimination of reported obligation related to government funded heavy water proceeds									
		134	755	643	730	582	442	208	2,605
Accumulated operating deficit, beginning of year									
		(6,983)	(6,869)	(6,114)	(5,471)	(4,741)	(4,160)	(3,718)	
Transfer to deferred decommissioning and waste management funding		(18)	—	—	—	—	—	—	
Transfer to repayable contributions		(2)	—	—	—	—	—	—	
Accumulated operating deficit, end of year									
		(6,869)	(6,114)	(5,471)	(4,741)	(4,160)	(3,718)	(3,510)	

1 These amounts represent AECL's operating expenses.

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

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.

5 This adjustment is the removal of the deferred decommissioning and waste management funding and amounts due to related parties (recorded under accounts payable and accrued liabilities) on the Statement of Financial Position.

Parliamentary appropriations are aligned with projected expenditures.

The projected initial decrease in revenues is related to the decline of sales of medical isotopes given that the National Research Universal reactor ceased routine production of the medical isotope Mo-99 in October 2016, and was subsequently shut down in March 2018.

Operating expenses are comprised of AECL oversight operations and amortization of tangible capital assets.

Reported Contractual expenditures are expected to decrease over the planning period as a result of decreased spending for the National Research Universal reactor, as the reactor is being decommissioned.

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.

The Deferred Decommissioning Funding balance reported in the 2017-18 Actuals represents the post-2005 proceeds of a heavy water lease. Additionally AECL had accrued a liability to Government for the proceeds of other sales of Government funded heavy water. As a result of recent confirmation from Natural Resources Canada and Treasury Board of Canada Secretariat that there is no obligation associated with the Government funded heavy water proceeds, AECL has eliminated these balances in the 2018-19 budget year. Going forward no liability to Government will be recorded for future sales of Government funded heavy water.

Statement of Cash Flows

(millions of Canadian dollars)	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
Operating transactions								
Cash receipts from								
Parliamentary appropriations	817	1,033	1,182	1,220	1,053	900	607	4,962
Cash receipts from customers	113	75	76	82	86	87	87	417
Cash paid to suppliers	(380)	(348)	(300)	(269)	(264)	(268)	(232)	(1,333)
Cash paid to employees	(15)	(12)	(12)	(13)	(13)	(14)	(14)	(66)
Cash paid for decommissioning, waste management and contaminated sites activities	(407)	(593)	(737)	(828)	(688)	(617)	(405)	(3,275)
Cash invested for waste management and disposal activities	(10)	(11)	(12)	(12)	(11)	(11)	(11)	(57)
Interest received	2	3	3	3	3	3	3	15
Cash provided by operating transactions	120	147	200	183	165	80	35	663
Capital transactions								
Acquisition of tangible capital assets	(119)	(147)	(200)	(183)	(165)	(80)	(35)	(663)
Cash applied to capital transactions	(119)	(147)	(200)	(183)	(165)	(80)	(35)	(663)
Increase in cash	1	–	–	–	–	–	–	
Cash at beginning of year	37	38	38	38	38	38	38	
Cash at end of year	38	38	38	38	38	38	38	

OPERATING BUDGET AND NOTES

Government of Canada Funding – Operating

<i>(millions of Canadian dollars)</i>	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
AECL								
Environmental stewardship	450	593	737	828	688	617	405	3,275
Nuclear Laboratories – Operating	259	304	260	213	180	187	166	1,007
Total Government Funding – Operating	709	897	997	1,041	868	804	571	4,283

Environmental stewardship funding has increased due to a ramp up of activities at the Port Hope Area Initiative and accelerated decommissioning and waste management at the Chalk River Laboratories. Funding for the Nuclear Laboratories is expected to decline as a result of the shutdown of the National Research Universal reactor which occurred in March 2018.

CAPITAL BUDGET AND NOTES

Government of Canada Funding – Capital

<i>(millions of Canadian dollars)</i>	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
AECL								
Capital	117	147	200	183	165	80	35	663
Total Government Funding – Capital	117	147	200	183	165	80	35	663

ANNEX 2 – CAPITAL PLAN

AECL's plan to revitalize the Chalk River Laboratories is based on CNL's ongoing assessments of infrastructure needs, including consideration for health, safety, security and environmental risks, current facility conditions, regulatory requirements and ongoing business needs. All investments are in support of the renewal and revitalization of the Chalk River site, in order to create a world-class nuclear science and technology campus that serves the needs of the Government of Canada and of commercial customers. Revitalization activities are meant to address two main areas:

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

Further details on specific projects for 2019-20 are presented below. The projected capital expenditures reflect the estimated inflation adjusted expenditures for the portfolio and is based on the best current estimates for each planned project.

Capital Five-Year Projection of Funding Requirements

(millions of Canadian dollars)	Actual 2017-18	Budget 2018-19	Plan					5 Year Total
			2019-20	2020-21	2021-22	2022-23	2023-24	
Capital								
Capital	117	147	200	183	165	80	35	663
Federal Funding Requirement	117	147	200	183	165	80	35	663

New and Renewed Science Infrastructure

Projects in this category include modern, low-carbon, world-class science facilities and infrastructure to enable delivery of CNL's commitments set out in its long-term plan. The projects to be undertaken are aligned with the strategy to revitalize the Chalk River site and include:

Advanced Nuclear Materials Research Centre

Overview: This is Chalk River Laboratories' most significant capital investment, with the objective to combine the capabilities of existing but outdated facilities 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 research, small modular reactors, advanced fuels fabrication, nuclear forensics and response, as well as ongoing work in support of utilities and their reactor life extension and reliability.

Status: Work to date has focused on planning, including options analysis and conceptual designs based on extensive benchmarking of similar projects in other jurisdictions, as well as selection of an integrated design/build team. The project is being delivered through an Integrated Project Delivery approach, whereby the design and construction teams collaborate at all stages of the project and share risks and incentives.

Conventional New Builds

Conventional or non-nuclear new build projects are needed to support the long term vision for Chalk River Laboratories as a state-of-the-art nuclear campus.

Status: The Conventional New Builds are a part of the Integrated Project Delivery approach to create efficiencies and incentivizing the construction and design teams to work together. In 2018-19 the detailed designs and required approvals were completed.

Revitalization

Overview: Numerous facilities at the Chalk River site require revitalization to enable long-term reliability and continued compliance with regulatory and licensing requirements. During 2018-19, efforts were focused on the refurbishment of the Chemistry and Radio Analytical Lab (exterior work), Biological Research Facility, Nuclear Fuel Fabrication Facility and Waste Treatment Center, while seeing that fume hoods across the site remain compliant with applicable safety, and environmental requirements.

Status: During 2019-20, design and construction work will be ongoing in facilities such as the Chemistry and Radio Analytical Lab (with a focus on interior work) and continued work in the Biological Research Centre, Nuclear Fuel Fabrication Facility and on fume hoods upgrades across the site. These projects are focused on eliminating known safety hazards, improving working conditions and enabling the ongoing availability of facilities.

Site Support Infrastructure

Part of the revitalization of the Chalk River site includes the implementation of new utilities and services as a key enabler to the site's transformation. These are necessary to respond to regulatory requirements, address risks and hazards and reduce overall site operating costs. Projects include:

Information Technology (IT) Investment Projects

Overview: Investments in IT infrastructure include upgrades, replacements and implementation of hardware, software, applications, networks, and communications technologies throughout the CNL organization. The multiple improvements being implemented are broken down as follows:

- Base infrastructure – to upgrade current hardware and software company-wide.
- Business enablement – mostly focused on business intelligence solutions to provide dynamic reporting capability in the areas of finance, procurement and human resources.
- Collaboration – mostly focused on providing collaborative IT workspace.
- Security – the outcome of a comprehensive cyber program assessment, this project is focused on delivering a strong cyber security framework.

Status: In 2018-19 the focus was on modernizing and integrating IT applications and systems, automating business system processes and improving reporting capabilities. Significant progress was made in the development of a new business intelligence system, the integration of applications and the closing of cyber security gaps. Work will continue in these areas in 2019-20, with additional activities associated with relocating the data center and reconfiguring site communications cabling as any new facilities are constructed.

Domestic Water System

Overview: The construction of the domestic water system addresses current deficiencies with the supply of potable water for food preparation, sanitary and personal facilities and safe drinking water at the Chalk River site. The objective is to conform to current provincial and/or federal standards by bringing potable water to the Chalk River Site. This involved extending potable water supply from the town of Deep River to the Chalk River site, which was completed in 2017-18.

Status: With potable water brought to site in 2017-18, work has been ongoing to make this water available throughout the Chalk River site, extending the water main throughout the site and beginning to make potable water available to facilities. Activities in 2019-20 will be focused on connecting the proper distribution infrastructure to bring the potable water to appropriate buildings at the Chalk River site.

Sanitary Sewage Treatment Facility

Overview: The new sanitary sewage treatment facility replaces the existing facility so that the Chalk River site's sanitary effluent discharge water quality complies with federal and provincial wastewater quality requirements.

Status: In 2018-19 construction was completed and a one-year demonstration period began. In 2019-20 the demonstration period will be completed, the facility handed over to operations and the project closed out.

Site Utilities Revitalization

Overview: The purpose of this project is to provide the Chalk River site with the required electrical system for it to have access to adequate and reliable class IV power and reduce operational costs.

Status: Activities in 2018-19 focused on detailed planning, including concept development, and the preparation of detailed project cost estimates and schedules. In 2019-20 work will continue to explore possibilities for alternative financing models such as Public Private Partnerships for new energy infrastructure.

www.aecl.ca