



Environmental, Social, and Governance

Atomic Energy of Canada Limited
2023 ESG and Climate Resilience Report





As a federal Crown corporation, we recognize the significant role we play in helping to achieve Canada's net-zero objectives by 2050, through driving real progress in nuclear innovation, and delivering on our commitments to help shape a more sustainable future.

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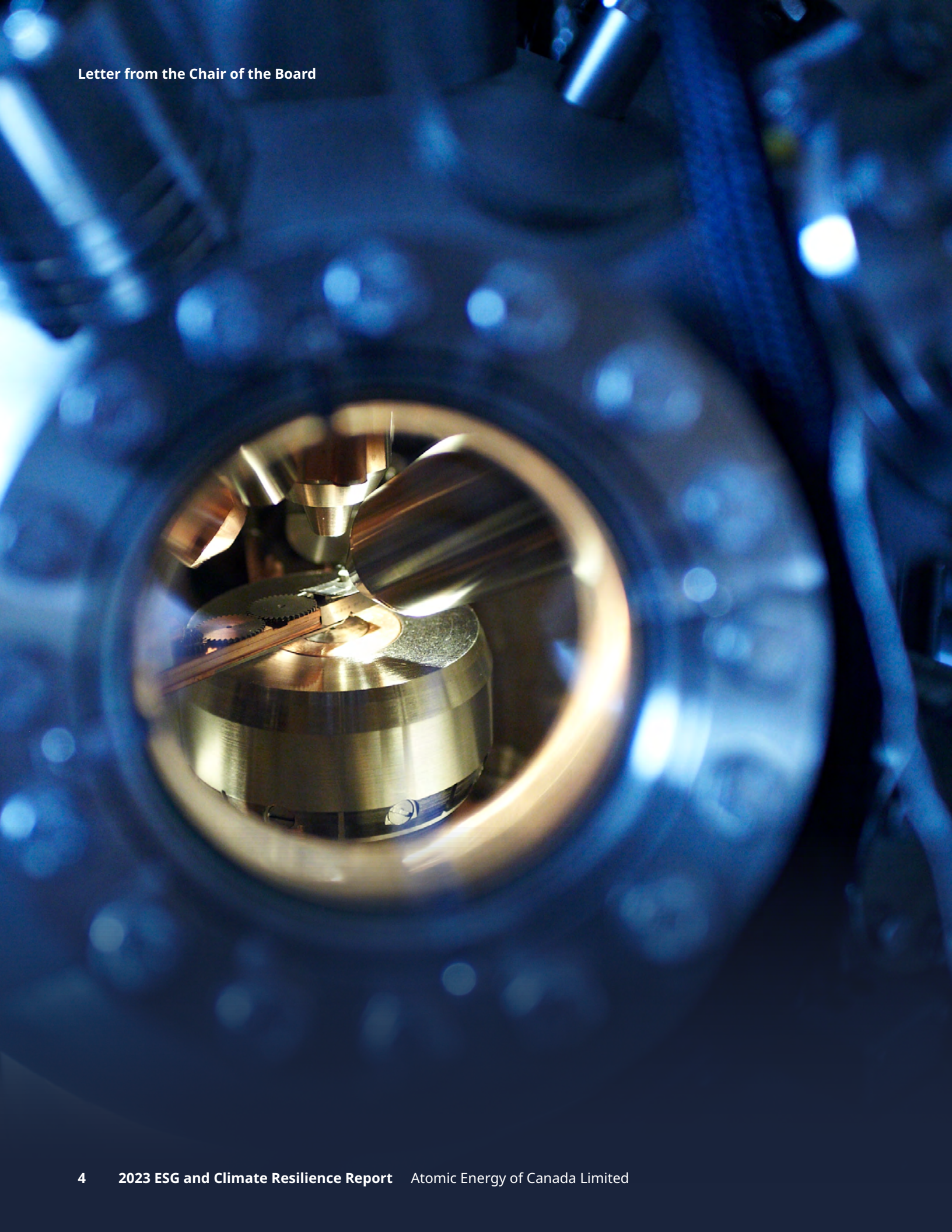
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Letter from the Chair of the Board

I am pleased to present this report on AECL's progress in advancing Environmental, Social, and Governance objectives, as well as building climate resilience, on behalf of the AECL Board of Directors.

In AECL's second year of formal ESG and Climate Resilience reporting, our progress is demonstrated by our commitment to ESG and climate resilience objectives, which are at the core of what we do. From the perspective of the AECL Board of Directors, these goals are fundamental to AECL's performance, and are built into how the Board oversees and directs the corporation. AECL has made significant progress in its ESG and climate resilience journey. To date, there are many notable achievements to highlight, including building ESG into the governance structure through formal obligations under the Board Charter, establishing a management ESG Committee, and aligning reporting to ESG and climate resilience goals, allowing for more transparent insight into how AECL is meeting these important commitments. We are also continuing efforts to increase diversity throughout senior leadership levels, including on the Board of Directors. Our evolving relationship with the Sagkeeng First Nation, through the Niigan Aki program, is a notable step forward in advancing reconciliation. Additionally, we have made progress in greening AECL and CNL operations, especially during a time of significant expansion at the Chalk River Laboratories site.

I am proud of AECL's advancements against each of our Strategic Differentiators, in line with AECL's strategic approach. The 2023-24 fiscal year will bring exciting progress in Decarbonization, Engagement and Reconciliation with Indigenous Peoples, and Nuclear Medicine, based on partnership plans currently in development. I am confident that AECL will continue to deliver meaningful ESG and climate resilience results as part of its core business of advancing nuclear innovation, as well as in how it achieves its business objectives: engaging communities, focusing on strong governance, and establishing partnerships with Indigenous peoples based on trust and meaningful collaboration.

A handwritten signature in black ink, appearing to read 'J. Burpee', written in a cursive style.

James Burpee, *Chair of the Board*



Letter from the President and CEO

AECL acknowledges, with gratitude, that we operate on territories that have, since time immemorial, been the traditional lands of Indigenous peoples in Canada. We pay our respects to the First Nation, Métis, and Inuit peoples across Canada. We acknowledge the traditional knowledge keepers, both young and old, and we honour their courageous leaders of the past, present, and future. AECL is committed to achieving reconciliation through a renewed relationship based on recognition of rights, mutual understanding and respectful engagement, collaboration, and partnership.

In our second year of annual ESG and Climate Resilience reporting, AECL is proud to share the strides we have made as a corporation and our efforts to advance our strategic ESG goals. As a federal Crown corporation, we recognize the significant role we play in helping to achieve Canada's net-zero objectives by 2050, through driving real progress in nuclear innovation, and delivering on our commitments to help shape a more sustainable future.

AECL's ESG strategy, developed in line with Canada's Greening Government Strategy and the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), has been instrumental in shaping how we will continue to advance Canada's interests through leading edge nuclear science and technology and environmental stewardship. We are committed to achieving these plans, evolving them, and continuing to operate in a socially responsible manner. In our role of driving scientific and technological advancement, AECL recognizes the importance of engagement and collaboration with industry partners, government stakeholders, academia, local communities, and Indigenous peoples to leverage collective expertise and advance shared priorities.

This collaborative approach forms the foundation on which we have identified and prioritized AECL's Strategic Differentiators, which aligns with the United Nation's Sustainable Development Goals (UN Sustainability Goals), building a clear path to achieving our ESG strategy.

AECL's decarbonization and climate resilience efforts, as aligned with the UN Sustainability Goals relating to Industry, Innovation and Infrastructure, and Affordable and Clean Energy, strongly position AECL as a "net-zero accelerator" in decarbonizing the Canadian economy. We continue to demonstrate our capabilities in nuclear while also leveraging our expertise in a broader array of technologies, including hydrogen and fusion. As innovation and technology continue to advance at a rapid pace, AECL has established innovation hubs at the Chalk River Laboratories that have included focus areas such as hydrogen safety, the medical isotope ecosystem, and roadmaps for fusion technology. AECL continues to drive a path forward to position Canada as a leader in both clean energy and nuclear medicine.

An important part of achieving our ESG strategy, and aligning with the UN Sustainability Goals relating to Affordable and Clean Energy, are our radioactive waste management and decommissioning efforts. Our work in this area has led to the development of world-renowned waste management technologies and practices, which have enabled the successful decommissioning, remediation, and clean-up of numerous nuclear projects in Canada. We strongly believe that nuclear energy can only achieve its full potential when there is a clearer pathway to nuclear waste management that is accepted by the regulators and the general population. As the use of nuclear technology and energy continues to expand, effective radioactive waste management and decommissioning remain critical to ensuring nuclear systems can provide a sustainable, safe, and clean future.

Engagement and reconciliation with Indigenous peoples and broader community engagement is central to the work we do at AECL, and forms a key pillar of our ESG strategy and our alignment with the UN Sustainability Goals. A notable step this year in our engagement and reconciliation efforts is the launch of Niigan Aki, meaning 'land first', an independent environmental monitoring program led by Sagkeeng First Nation and funded by AECL and CNL. We are also proud to have signed a long-term relationship agreement (LTRA) to formalize relations between AECL, CNL, and the Algonquins of Pikwàkanagàn First Nation (AOPFN). As part of this agreement, a working group will support ongoing collaborations, and create a Neya Wabun (Guardian) Program that will establish a regular, AOPFN-led monitoring presence at designated AECL sites. We are building upon our progress thus far and continuing to pursue relationship agreements with other Indigenous nations and organizations. AECL's relationships with the local communities where we operate directly impact the success of our objectives and business activities. We value the perspectives, interests, and contributions of local communities and are working with CNL to foster their integration into our strategic decisions and operations.

AECL will continue working with reputable ESG subject matter advisors as we mature in our approach to ESG. The achievements we have made to date are rewarding, and we are prepared and energized to forge ahead in helping to build Canada's sustainable future.



Fred Dermarkar, *President and CEO*

Who We Are

As a federal Crown corporation, Atomic Energy of Canada Limited (AECL) advances Canada's interests through leading edge nuclear science and technology and environmental stewardship. This includes combating climate change, fostering clean energy growth and decarbonization strategies, pioneering new treatments for cancer and other diseases, and accelerating Canada's environmental remediation projects. AECL's mandate is to enable nuclear science and technology and to protect the environment by fulfilling the Government of Canada's radioactive waste and decommissioning responsibilities.

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), operates AECL's sites. Under this GoCo model, AECL owns the sites, facilities, assets, and intellectual property, while CNL is responsible for the day-to-day operations as a contractual counterparty under AECL's oversight. This model allows AECL to leverage international knowledge and skills to advance work and priorities while bringing private-sector experience and expertise to the operation of our sites.

Both AECL and CNL remain committed to working with Indigenous communities, organizations, and other stakeholders in an open, respectful, and cooperative manner to foster mutual understanding, build long-term relationships, advance reconciliation, and achieve our overall objective of protecting the environment.

ESG, climate resilience, and reconciliation with Indigenous peoples are core tenets of our strategic approach, which includes commitments to invest in our capabilities and environmental responsibilities, drive the future of nuclear in Canada, and facilitate nuclear innovation to benefit the public good.

AECL's Vision

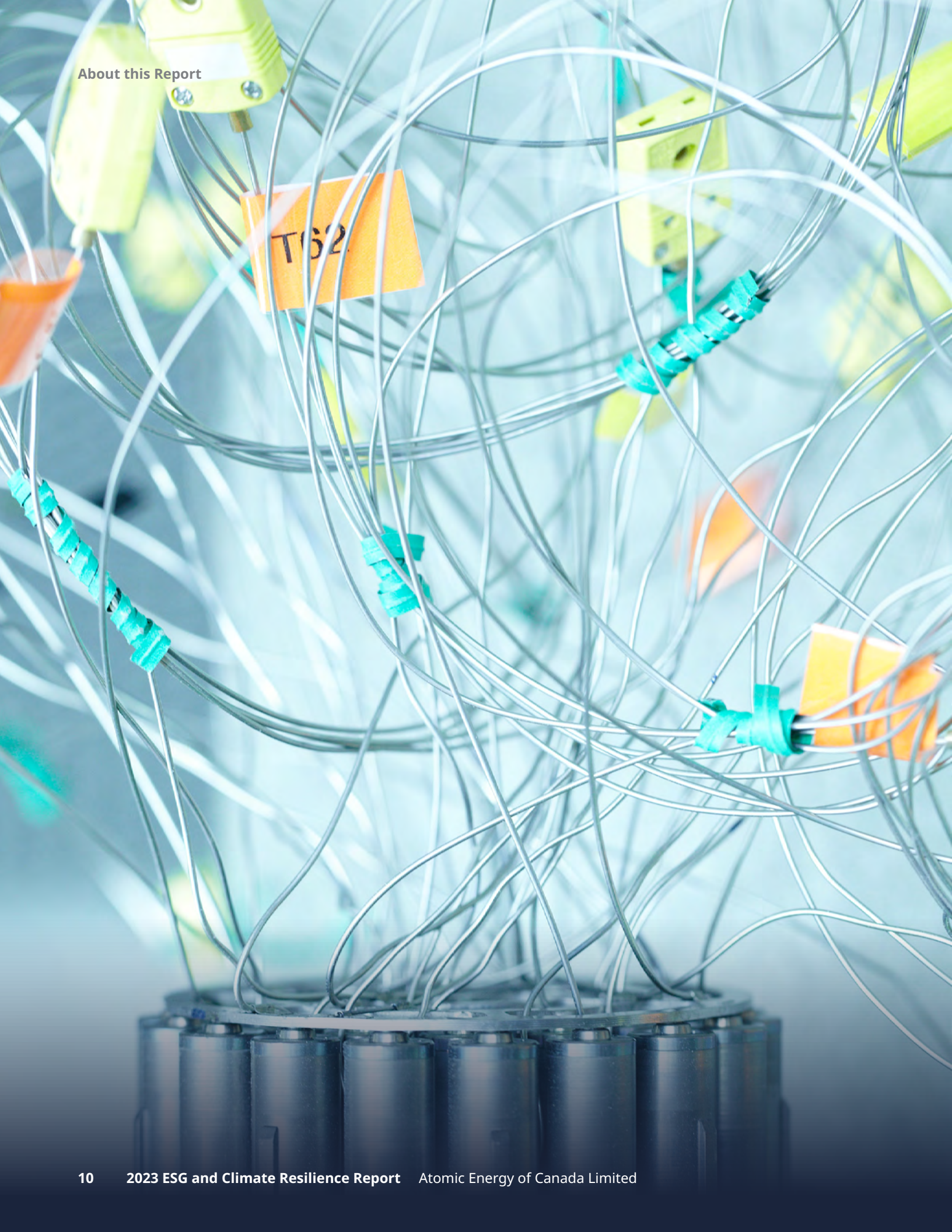
Leveraging the full potential of Canada's expertise in nuclear technology to achieve a better future for Canada and the world.

AECL's Mission

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



AECL's current strategic approach presents a vision and mission that reflect the broader context of today's global and domestic challenges and opportunities, and, accordingly, the significant role AECL is continuing to play in driving a sustainable future for Canada.



About this Report

AECL's 2023 ESG and Climate Resilience Report provides an overview of our progress, ambitions, and commitments toward sustainability, nuclear innovation, and climate resilience. Starting this year, AECL's ESG and Climate Resilience reports and disclosures are consolidated into an annual "ESG and Climate Resilience Report" to demonstrate our inherent commitment to sustainability and climate action.

This ESG and Climate Resilience Report has been prepared in alignment to the recommendations of the Task Force on Climate-Related Financial Disclosures (TCFD), and with reference to the Sustainability Accounting Standards Board (SASB) industry standard for Electric Utilities & Power Generators and the Global Reporting Initiative (GRI) Standards. See the [Reporting Framework Standards Alignment](#) section at the end of this report for details.

The data in this ESG and Climate Resilience Report covers our performance in Canada from April 1, 2022, to March 31, 2023. To align with government reporting requirements, GRI data reflects the reporting period from January 1, 2022, to December 31, 2022. These data are marked with an asterisk (*). This Report also occasionally refers to activities beyond this reporting period in an effort to provide a clearer and more current snapshot of our activities as of the time of this Report. References to "AECL", "we", "our" or "Corporation" refer to Atomic Energy of Canada Limited. All dollar amounts are in Canadian dollars.

This ESG and Climate Resilience report has been reviewed and approved for publication by our executive leadership team and Board of Directors, including AECL's ESG Committee, ESG co-leads, and executive ESG champions. It is available in both English and French.

Highlights

AECL's ESG Strategy guides our ambitions and commitments to integrate ESG into our organization, and to contribute to a more sustainable future for Canada and the world. We're committed to collaborating with our stakeholders in driving the vital scientific and technological advancement needed for a more sustainable future.

Data marked with an asterisk (*) reflects the reporting period from January 1, 2022, to December 31, 2022.

Reflecting on our ESG Progress



Initiated Scope 3 emissions calculations

for certain assets, including upstream and downstream leased assets, CNL's employee commuting, and both AECL and CNL's business travel

Industry-leading health and safety record across AECL sites



Increasing diversity on the Board of Directors and the Executive team

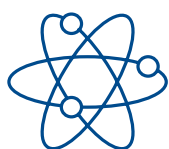
including diversity in gender, ethnicity, Indigenous representation, and geography

\$217 million

spent on local suppliers including Indigenous suppliers



Supporting our Current ESG Ambitions



Construction of the Science Collaboration Centre nearly complete

which will serve as a business hub to support collaboration, business development, and potential expansion of programs at the Chalk River campus

Officially began construction on the Advanced Nuclear Materials Research Centre (ANMRC)



Development of Niigan Aki, meaning 'land first'

an independent environmental monitoring program led by Sagkeeng First Nation



Innovation hubs established at the Chalk River Laboratories

that have included focus areas such as hydrogen safety, the medical isotope ecosystem, and a roadmap for fusion innovation in Canada

Our Meaningful, Measurable Targets



Increased electric vehicle fleet from 5 to 6 vehicles

progressing toward our objective of achieving 80% zero-emission vehicles in the light-duty fleet by 2030

30%* reduction in GHG emissions at Chalk River Laboratories

relative to 2005 baseline levels, progressing toward our target of achieving net-zero emissions by 2040

16%* reduction in energy intensity at Chalk River Laboratories

relative to 2015 baseline levels, marking significant progress toward our target of achieving a 30% reduction in energy intensity by 2035

117 obsolete buildings (42%) have been demolished to date

and we are planning to demolish 65% of obsolete buildings by 2035-36

Our ESG Strategy

Our ESG Strategy is foundational to our strategic plan, which articulates how AECL drives research, innovation, and technological advancements to deliver real and impactful progress on Canada's nuclear and net-zero commitments.

AECL’s ESG Strategy guides our ambitions and commitments to integrate ESG into our organization internally, and to leverage AECL’s opportunities to support ESG objectives that will contribute to a more sustainable future for Canada and the world.

As a federal Crown corporation, AECL has an important role in helping Canada achieve its objectives in environmental sustainability, climate resilience, and social impact.

AECL’s ESG Strategy is driven by our “strategic differentiators” and supported by our “baseline expectations”, identified through the ESG materiality assessment we conducted in 2022.

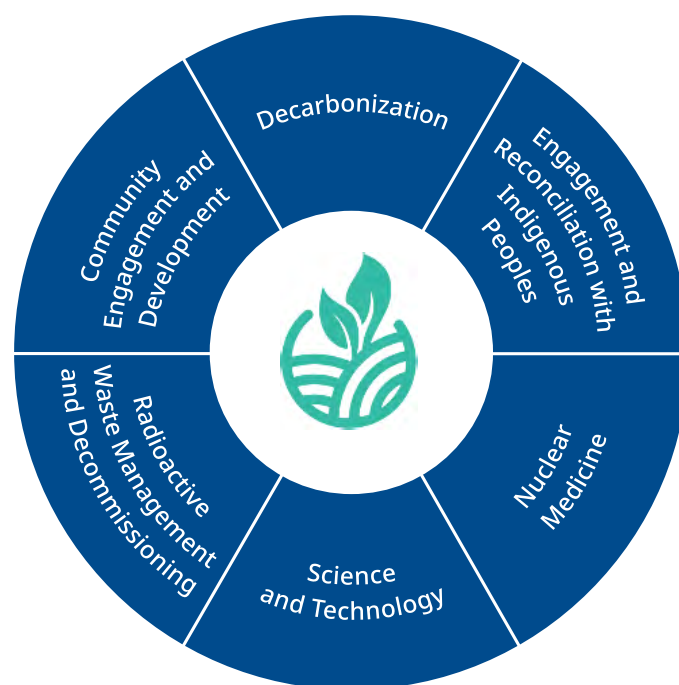
Our strategic differentiators indicate areas where AECL is uniquely positioned to influence and lead a sustainable, climate-resilient future.

Baseline expectations do not lead AECL’s ambition setting, but are integral to AECL’s ability to manage risk, meet stakeholder expectations, and achieve meaningful change. In 2023, AECL made the decision to elevate the topic of ‘climate resilience’ from a baseline expectation (as identified in prior year) to be integrated with our reporting under TCFD. As AECL works to integrate climate-related risks and opportunities into our ESG strategy, climate resilience forms an important part of this strategy.

AECL’s Strategic Differentiators

Since setting the foundation of AECL’s ESG Strategy in the inaugural ESG Report, AECL is now focusing on ambition setting for each strategic differentiator. Looking forward, AECL will build on the progress made in its first ambition-setting workshop and develop specific target state ambitions and action plans for each strategic differentiator.

In 2023, AECL’s executive team engaged in a workshop to validate the current state for each strategic differentiator, align on the target future state for each, and collaboratively discuss next steps to achieve AECL’s ambitions.



Our Governance Structure

AECL is deeply committed to integrating sustainability throughout our organization, and that includes embedding ESG and climate resilience into our overall business, strategy, and operations.

Board Governance

AECL's Board of Directors oversees our organization's strategy and direction, including ESG and climate-related matters.

AECL is a Crown corporation of the Government of Canada, its sole shareholder. As a Schedule III Crown corporation, AECL operates in accordance with the governance-related provisions outlined in the Financial Administration Act (FAA), including the appointment of Board members and the Chief Executive Officer. The Government of Canada appoints AECL's Board of Directors by an Order in Council. The Board Charter and annual work plan establish the Board's responsibilities and key issues of focus for scheduled meetings, which typically occur more than 12 times throughout the fiscal year. The Board is responsible for overseeing the implementation of AECL's mandate.

The Board has two established committees:

The Audit Committee and the Human Resources & Governance Committee (HRGC). Both committees have Charters that are regularly reviewed, updated, and approved by the Board on an annual basis. The Audit Committee and HRGC both consist of all Board members, with the exception of the President & CEO. All Board members are independent members, except for the President & CEO.

ESG Governance

As part of our commitment to integrating ESG within AECL's governance structure, an ESG Committee has been established to manage ESG issues and implement, monitor and refine our ESG Strategy.

The ESG Committee is made up of AECL employees who represent diverse functions across the organization, including (but never limited to) executive members. Some aspects of AECL's performance on ESG objectives are linked to executive compensation. To continue to advance our governance of ESG matters, we are working towards identifying opportunities to further integrate ESG matters into the Board governance structure. The ESG Committee is responsible for reporting ESG matters to the Board.

Our Governance Structure

The Board Charter includes specific responsibilities regarding the oversight of the organization's ESG activities, including strategy formulation and implementation, as well as ESG disclosures. Our commitment to fully integrating ESG initiatives into our corporate governance structure includes regular reporting on our ESG Strategy to both the management Executive Committee and the Board of Directors.

ESG matters are also incorporated into AECL's Enterprise Risk Management (ERM) Register, which is monitored by the Audit Committee. The risk register is updated quarterly in environment, and Indigenous reconciliation,

with governance matters also considered in the risk register. All risks are scored, with the highest risks reported to the Board. The Board oversees, reviews, and approves or accepts AECL's Risk Management Framework, the Risk Based Audit Plan of Internal Audit, and the Annual Incentive Plan of AECL employees. In addition, the Board also oversees the Annual Plan of Work and Budget for CNL, and the Performance Evaluation Measurement Plan for CNEA (Canadian National Energy Alliance).

Oversight of CNL

AECL's governance extends to our oversight of CNL's activities. Through the GoCo model, AECL provides strategic guidance and approves CNL's long-term plans.

CNL's performance is evaluated based on the activities outlined in these plans, which include specific milestones and deliverables with ESG and climate implications.



Our Strategic Differentiators

Strategic differentiators are areas where AECL is uniquely positioned to influence and lead a sustainable, climate-resilient future.

Decarbonization

AECL's commitment to enabling a net-zero transition in Canada encompasses both AECL's ability to accelerate the advancement of decarbonization technologies, and our responsibility to decarbonize our own operations.

Along with the greenhouse gas (GHG) emissions targets of countries around the world, meeting Canada's target of net-zero emissions by 2050 will be integral to slowing the climate crisis and mitigating severe, irreversible impacts of climate change.

In 2022, the Government of Canada announced its support in advancing nuclear energy technology and leveraging these technologies in its decarbonization plans. Recently, the Government of Ontario announced the decision to build another large-scale nuclear unit with Bruce Power that can provide 4,800 megawatts of emission-free electricity to the grid, while Ontario Power Generation has announced its intention, partially funded through Canada Infrastructure Bank, to build four Small Modular Reactors at its Darlington site. While other partners are leading these initiatives, AECL will be a key enabler.

AECL is strongly positioned as a "net-zero accelerator" in decarbonizing the Canadian economy, demonstrating our capabilities in nuclear and leveraging our experience in a broader array of technologies to advance decarbonization, including hydrogen and hydrogen-based fuels, and fusion in addition to nuclear. AECL's strategy outlines our commitment to building a sustainable energy system complemented with significant renewables. Canada's emissions reduction targets will not be achievable without the baseload power provided by nuclear energy, and AECL will continue to advance the capabilities, technologies, and relationships needed to support these goals.

As part of Canada's 2030 Emissions Reduction Plan, the federal government has set a goal to increase its share of zero-emitting energy sources to 90 percent by 2030, and aiming to achieve a non-emitting electricity grid by 2035. To achieve Canada's objectives, a reliable, stable, and clean energy grid will be required to decarbonize the Canadian economy, and nuclear energy, having already accomplished this to great effect in Ontario and New Brunswick, presents proven outcomes and an achievable opportunity to enable this transition at a national level. Nuclear energy currently makes up approximately 15 percent of Canada's electricity grid. Further adoption would allow for Canada to meet its targets.

CANDU Technology

The development of the CANDU reactor technology is one of the many noteworthy advancements in nuclear technology pioneered by AECL at the Chalk River Laboratories. CANDU is a safe, reliable, low-cost, and clean-energy option that has the ability to produce medical isotopes while also generating electricity. CANDU reactor technology is continuing to propel Canada's nuclear industry, powering approximately six out of ten homes in Ontario, and with 19 reactors currently deployed in Canada. With safety built into the design of CANDU reactors, it is a safe, reliable, and low-cost option for clean energy. CANDU technology is also a technology of choice internationally, with 30 reactors in other countries around the world contributing to international achievements in emissions reductions. Recently, the Government of Canada announced up to \$3B in export financing support, through the Export Development Corporation, for the refurbishment of existing, and construction of additional, CANDU reactors in Cernavoda, Romania. AECL continues to dedicate efforts at CNL towards increasing improvement of the long-term reliability and life of CANDU reactors in Canada and internationally, including through supporting ageing management, life extensions and refurbishments, product improvements, services, and training and development of scientists and engineers.

Small Modular Reactors

While continuing to support CANDU, we are building on our capabilities and expertise in nuclear technologies to explore additional emerging technologies with significant potential to decarbonize the Canadian economy, including Small Modular Reactor (SMR) technology.

As outlined in Canada's SMR Action Plan, SMRs are nuclear reactors with applications that can be used for on-grid applications, district heating, co-generation, energy storage, desalination, and hydrogen production. As such, SMRs offer promising clean energy options to remote off-grid applications in communities or industrial sites where consistent, reliable, and low-carbon energy is needed.

To support SMR advancement, SMR developers were invited to demonstrate their technology at an AECL site. Since 2018, the invitation process has seen several technology companies engage with CNL on the opportunity to site their technology at one of our sites. Most notably, in the spring of 2023, it was announced that AECL's Chalk River Laboratories site has been selected for Global First Power's proposed Micro-Modular™ Reactor (MMR®) project. This would be the first off-grid SMR to operate in Canada, marking a significant step for future SMR deployments and applications. As Canadian provinces and territories progress to decarbonize their electricity grids and fulfill their energy needs, they are increasingly looking to the development of SMRs as a viable option, with the support of federal government funding in certain geographies. AECL is supporting science-based decision making via funding research and development of materials, fuels and other core needs to support the safe, secure, and responsible use and development of advanced reactors and SMRs.

Advancing Alternative Technologies for Decarbonization

A diverse combination of clean-energy technologies will be required to achieve Canadian and international emissions reduction targets.

AECL is leveraging its expertise at CNL to support the creation of a clean, safe, and thriving economy by developing advanced technologies in hydrogen sciences and chemical analyses. This includes support for large-scale hydrogen based clean fuels production, carbon dioxide utilization to decarbonize industry and transportation, as well as exploring new concepts using electricity and heat to produce hydrogen and hydrogen-based fuels. It also includes enhancing tritium infrastructures, utilization of tritium technologies, and supporting advanced energy applications such as fusion.

As outlined in the Hydrogen Strategy for Canada, interest in hydrogen as a contributor to net-zero economies is increasing globally. Canada has the opportunity and ability to lead the charge in driving a clean hydrogen economy. Leveraging Canada's natural resources, skilled labour force, and existing hydrogen and energy technologies, hydrogen advancement and deployment could contribute to up to 30% of Canada's energy by 2050¹. CNL is advancing hydrogen research through exploring areas such as hydrogen production, storage, safety, and utilization. This year, CNL introduced the concept of a Canadian Hydrogen Safety Centre, which would aim to collaborate with industry and academia to address the need for hydrogen safety solutions across multiple industrial sectors and regions. More information on the Canadian Hydrogen Safety Centre can be [found here](#).

Researchers at Chalk River Laboratories are also enabling the advancement of fusion technologies, which have significant potential to contribute to a clean, safe, and reliable energy system. This year, CNL created and led a collaborative effort with an ecosystem of fusion developers and interested partners to establish a roadmap for fusion in Canada. Additionally, unique partnerships to advance R&D and/or technology demonstrations were also significantly advanced over the past year.

¹ [The Hydrogen Strategy](#)

Our Strategic Differentiators

In addition to advancing the research and development of individual clean-energy technologies, we are researching the optimal combination of renewable energy sources to establish a hybrid energy system capable of achieving and sustaining Canada's net-zero objectives. CNL is continuing to explore the Clean Energy Demonstration, Innovation, and Research (CEDIR) initiative, a vision to build a clean energy park at Chalk River Laboratories that will build upon CNL's research and development in clean energy, exploring the synergies between nuclear technologies and other renewable energy sources to establish a hybrid-energy system. More information on the CEDIR initiative can be found on [page 32](#).

AECL and CNL are well equipped to assist in the advancement of a diverse range of clean-energy technologies, including supporting the longevity and reliability of CANDU reactors, enabling the development and implementation of small modular reactors, advancing hydrogen and hydrogen-based fuels research, and contributing to the advancement of fusion technology. We will leverage our expertise and capabilities to achieve a transition to net-zero and contribute to a sustainable future.

Decarbonizing AECL's Operations

While leveraging our expertise and capabilities to advance Canada's decarbonization objectives, we understand the responsibility we hold to decarbonize our own operations. Our ambition is demonstrated by our aggressive target to be net-zero emissions by 2040², which includes

our interim target to achieve a 40% reduction in GHG emissions by 2025, compared to the 2005 baseline. After 2025, we are targeting an additional 20 percent reduction every five years in effort to achieve at least a 90 percent reduction in Scope 1 and Scope 2 GHG emissions by 2040 (Scope 1 emissions are direct emissions that occur from sources owned or controlled by AECL. Scope 2 emissions are indirect emissions from the generation of purchased electricity, steam, heating, or cooling consumed by AECL and CNL). Emissions that cannot be reduced by internal energy efficiency improvements and emissions reductions initiatives will be offset to achieve our net-zero targets.

At the end of 2022, we had achieved a reduction in GHG emissions at Chalk River Laboratories by 30 percent* relative to 2005 levels. However, this represents an 8% increase from emissions reported in the prior reporting period. The increase in emissions resulted primarily from an increase in the natural gas use and additional construction in 2022 compared to 2021. AECL acknowledges the importance of remaining accountable in meeting our reductions commitments, and we are continuing efforts to meet our target of a 40% reduction in GHG emissions by 2025. This year, AECL's total GHG emissions amounted to 40,419 tonnes of carbon dioxide equivalent (tCO₂e)*, with Scope 1 emissions contributing 30,496 tCO₂e*, and Scope 2 emissions 1,623 tCO₂e*. AECL is working with CNL to calculate Scope 3 emissions (Scope 3 emissions are indirect emissions that occur in AECL's value chain through upstream and downstream activities). This year,

² GHG reduction efforts are focused on Chalk River Laboratories, as all other current AECL sites will be non-material by 2040.

CNL began calculating some Scope 3 emissions for categories with accurate, available data, including upstream and downstream leased assets, and commuting and business travel for CNL employees based at our Chalk River Laboratories. In 2022, calculated Scope 3 emissions totalled approximately 8,300 tCO₂e*. In addition to CNL's employee travel, AECL calculated business travel for our own employees, which totalled approximately 61 tCO₂e for the 2022-23 fiscal year. To build on our initial Scope 3 calculations, additional Scope 3 categories will be screened for materiality, and we are working with CNL to establish a future Scope 3 emissions reduction target.

Under AECL's oversight, CNL is developing a consolidated carbon neutral strategy to guide the approach needed to achieve net zero at the Chalk River Laboratories.

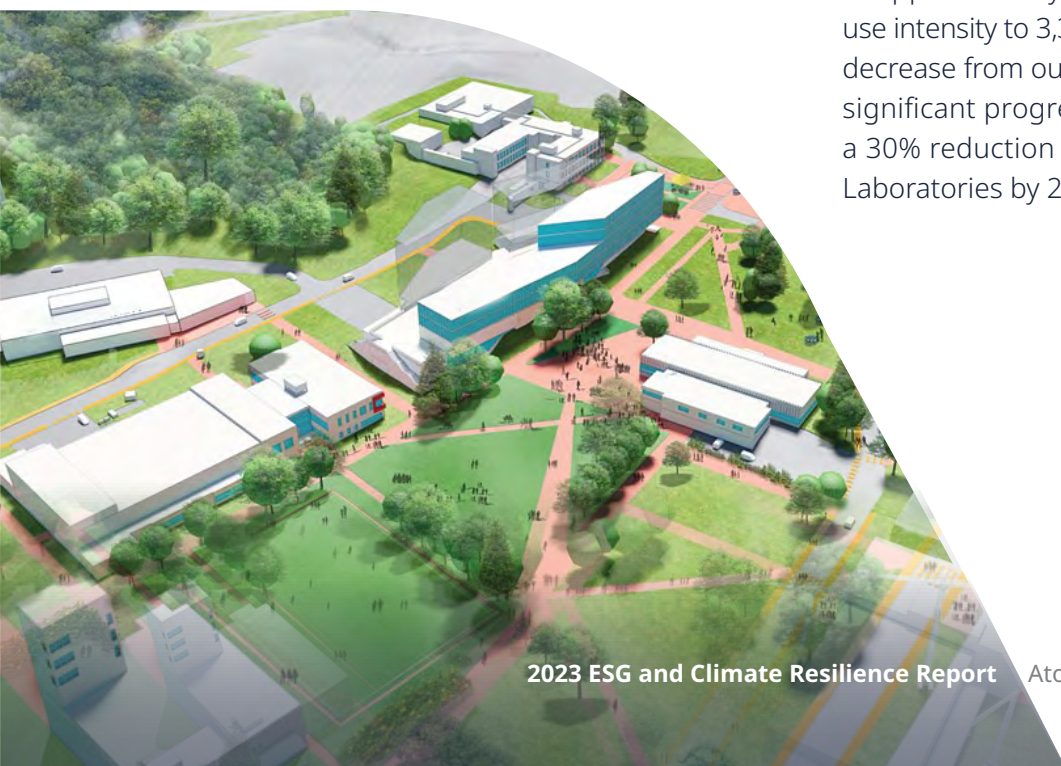
The strategy includes plans to implement significant conservation measures, require net-zero design for new construction and major retrofits, construct and leverage on-site SMR(s) for

clean energy sources, and decommission inefficient facilities.

We are continuously striving to make energy efficiency improvements throughout our operations, and recent progress included installing smart building technologies and meters, retrofitting interior lighting to LEDs in various site buildings, replacing existing inefficient equipment, decommissioning old and inefficient buildings and infrastructure, and adding to CNL's electric vehicle (EV) fleet.

This year, the number of EVs on site at Chalk River Laboratories increased to six, growing the mobile fleet to five percent electric or hybrid vehicles. This resulted in the Minwamon Building achieving a fleet of 100% electric vehicles.

Altogether, energy efficiency projects at the Chalk River Laboratories site achieved emissions savings of approximately 530 tCO₂e*, and reduced energy use intensity to 3,334 MJ/m³*, representing a 16% decrease from our baseline year of 2015. This marks significant progress toward our target to achieve a 30% reduction in energy intensity at Chalk River Laboratories by 2035.



Engagement and Reconciliation with Indigenous Peoples

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

AECL has established plans and objectives to support these commitments, and we acknowledge that it takes time, resources, and tangible actions to build trust and work towards reconciliation. We are continuing to pursue relationship agreements with Indigenous nations, to strengthen engagement, increase capacity and participation, and integrate Indigenous knowledge into all aspects of our mandate. In the next one to two years, we are striving to develop or renew between three to five agreements or memoranda of understanding with Indigenous nations. AECL also has plans to develop a Reconciliation Action Plan by 2025 in consultation with Indigenous nations and organizations.

As a federal Crown corporation, it is AECL's responsibility to align with the Government of Canada's broader reconciliation objectives in our engagement and relationships with Indigenous peoples.

We have made four commitments related to reconciliation:

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

We are committed to strengthening our relationships with Indigenous peoples and communities and to continuing to establish new relationships based on Indigenous perspectives and values, healing and reconciliation, and meaningful engagement and collaboration.

A notable step is the launch of Niigan Aki, meaning ‘land first’, an independent environmental monitoring program led by Sagkeeng First Nation and funded by AECL and CNL. This program is being developed by Sagkeeng as part of a collaborative long-term environmental and rights-based monitoring program for the Whiteshell Laboratories site in Manitoba. Niigan Aki will promote trust, transparency and healing by supporting reconnection to the land and traditional ways of stewardship. While independent, the program will run alongside and be interconnected with existing CNL-led monitoring activities at and around Whiteshell Laboratories.

We are also proud to share the development of an LTRA to formalize relations between AECL, CNL, and the Algonquins of Pikwàkanagàn First Nation (AOPFN). As part of this agreement, a working group will support ongoing collaborations, and create a Neya Wabun (Guardian) Program that will establish a regular, AOPFN-led monitoring presence at designated AECL sites, in addition to other environmental, cultural and economic protection and promotion activities and programs. The Neya Wabun program will provide AOPFN with the opportunity to monitor, participate, and communicate progress back to the AOPFN community. We are looking forward to continuing to work together, build our relationship, and maintain trust between AECL, CNL, and AOPFN.

Our Port Hope Project also involves continuous engagement with Indigenous communities, including the Mississaugas of the Williams Treaties First Nations, the Anishinabek Nation, the Métis Nation of Ontario, Mohawks of the Bay of Quinte, and local Métis Councils.

Under AECL’s guidance, CNL is responsible for providing training to employees so they understand and demonstrate efforts to strengthen collaboration and relationship building with Indigenous peoples.

AECL's Indigenous Engagement Strategy outlines and guides our commitment to reconciliation with Indigenous peoples through the following objectives:

- Identifying shared priorities and opportunities for mutual benefit.
- Co-developing engagement and risk communication strategies.
- Integrating Indigenous knowledge, perspectives, practices, and ceremony.
- Prioritizing capacity-building initiatives, e.g., community-led monitoring and stewardship programs.
- Finding creative and collaborative ways to broaden, strengthen, and formalize First Nation, Métis and Inuit participation in AECL sites and activities.
- Supporting initiatives and accommodations that reduce and overcome harm at the community level.

We understand that establishing a new relationship with Indigenous peoples rooted in understanding, learning, and trust takes time. Our continued efforts will be guided by the principles, best practices, and approaches outlined in our Indigenous Engagement Strategy, and we will continue to adapt our approach as we improve our understanding of the needs and expectations of the Indigenous nations and communities with which we engage.



Nuclear Medicine

AECL is driving nuclear research and development to achieve a better future and improve the quality of life for Canadians, and this includes contributing to better health outcomes.

Nuclear medicine provides immense potential to revolutionize the diagnosis and treatment of diseases, and save the lives of Canadians and people around the world. Alongside CNL, we are leveraging the world-class expertise and capabilities at the Chalk River Laboratories to support the pursuit of new opportunities in medical isotopes, radiotherapies, and low dose radiation understanding, modelling, and treatments.

Actinium-225

CNL has been working to advance the research and development of targeted alpha therapies, including the Actinium-225 isotope. Targeted alpha therapy delivers radiation directly to cancerous cells while protecting non-cancerous cells, unlike many other radiation treatments that damage healthy cells and tissues. Actinium-225 offers promising potential for the treatment of many cancers, but quantities worldwide are currently limited and difficult to produce.

Through AECL's Federal Nuclear Science and Technology Work Plan, CNL first demonstrated research-quantity production of Actinium-225. Over five years ago, CNL fulfilled the first successful shipment of Actinium-225 from Chalk River Laboratories. To date, CNL has completed over 100 shipments of the isotope and is one of the only companies in the world with a successful and reliable supply of Actinium-225 to the market for research purposes. Recently, CNL completed the first production run of Actinium-225 in partnership with TRIUMF, Canada's particle accelerator centre. Additionally, CNL has developed a generator to produce Actinium-225 from its available waste nuclear materials.

The generator was successful in pre-clinical trials, and CNL is now testing the efficacy of the generator and its applications in clinical trials. Moving forward, CNL will aim to demonstrate commercial viability of Actinium-225 with other strategic partners and via new and novel production methods, again using waste materials to bring this treatment closer to supporting the health of Canadians, and at the same time recycling and finding new uses for waste materials currently stored at AECL sites. To advance this project, CNL has explored partnerships to increase production of Actinium-225 to further support clinical trials and more widespread use in treatment across Canada and internationally.

As part of its continual innovation mandate, CNL is developing a partnership with a German-based radiopharmaceutical biotech company to advance the production capabilities of Actinium-225 and increase international supply.

Collaboration

As innovation and technology continue to advance at a rapid pace, the nuclear medicine ecosystem has evolved to include many different groups, including Chalk River Laboratories, academia, advocacy groups, and private industry. With so many stakeholders contributing to the nuclear medicine industry, the landscape can be far-reaching yet complex. AECL's central role in the nuclear industry provides us with the opportunity to bring these groups together and create a collaborative medical isotope industry that represents Canada as a whole. We recognize our unique opportunity and responsibility to guide the path forward, and to play a role in identifying and driving policy changes that could position Canada as a leader in nuclear medicine. In coordination with Health Canada, AECL has an opportunity to shape the next steps required to address the needs for medical isotopes, including gaps in supply or availability.

AECL has partnered with the Canadian Nuclear Isotopes Council (CNIC) to engage communities in the medical isotope space to discuss common issues and strategic opportunities. AECL and the CNIC jointly host the annual Leaders' Summit, which brings together representatives from the nuclear isotope supply chain and research sector, business and government leaders, Not-for-Profits, nuclear medicine and imaging sectors, and academia.

The Leaders' Summit offers an opportunity for the isotope community to provide knowledge and expertise about challenges and risks to the isotope sector, and contribute to the development of coordinated industry actions to address these challenges.

Canada has always recognized that the benefits of nuclear extend beyond clean energy. To support innovation through collaboration, AECL continues with its legacy of integrating the capabilities of nuclear by now bringing together the pharmaceutical industry, academia, and the health sector to capitalize on the diverse advantages of nuclear. The medical and health applications of nuclear innovation are continuously explored by scientists at Chalk River Laboratories

under the guidance of AECL's Federal Nuclear Science and Technology Workplan, focusing on priorities such as improving understanding of radiological health risks caused by exposure to radiation, quantifying exposure to ionizing radiation, and developing medical applications such as better methods for diagnosis and treatment using biological applications of nuclear research.



Science and Technology

Leveraging world-class expertise and capabilities, our central position in the nuclear industry, and a strong foundation in driving nuclear innovation, AECL has a unique opportunity to help shape the future with the use and application of nuclear science and technology.

The Chalk River Laboratories, our flagship site and Canada's largest science and technology facility, is central to our ability to deliver on federal nuclear science and technology priorities and shape the future of nuclear in Canada. Scientific achievements at the Chalk River Laboratories have included the development of the CANDU reactor technology, many breakthroughs in the life-saving application of medical isotopes, and two Nobel Prize winners.

AECL's work in nuclear science and technology is driven by the Federal Nuclear Science and Technology Workplan, which AECL is responsible for managing and overseeing. AECL's Federal Nuclear Science and Technology Workplan focuses on four priorities:

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

Under AECL's oversight, CNL is revitalizing the Chalk River Laboratories into a modern, world-class nuclear science and technology campus to ensure the site can support AECL's ambitions to position Canada as a leader in nuclear research and innovation. AECL and CNL are pursuing the following projects to transform the Chalk River Laboratories site:

Advanced Nuclear Materials Research Centre

AECL is investing in the Advanced Nuclear Materials Research Centre (ANMRC) with the objective of combining the capabilities of outdated facilities at the Chalk River site into a modern facility and laboratory research complex that will support Canada's CANDU fleet, federal nuclear priorities, and science and technology areas such as small modular reactors and the associated fuel development technology. Construction of the ANMRC started in 2022 and is expected to be completed in 2028.

Science Collaboration Centre

The Science Collaboration Centre is under construction to consolidate office space and serve as a business hub to support collaboration, business development, and potential expansion of programs at the Chalk River campus. Construction is nearing completion and is expected to be completed by the end of 2023.

Clean Energy Demonstration, Innovation, and Research (CEDIR) Initiative

CNL is continuing to explore the CEDIR initiative, a vision to build a clean energy park at Chalk River Laboratories. The CEDIR initiative will build upon CNL's significant research and development in clean energy, exploring the synergies between nuclear technologies and other renewable energy sources to establish a hybrid-energy system. The research and innovation that will occur through the CEDIR initiative will play a vital role in helping Canada reach its target of achieving net-zero emissions by 2050. It will also support policy and regulation development, feasibility studies, engagement with stakeholders, and demonstration of the technological readiness of a hybrid energy system. CNL has already driven new innovation through the concept of CEDIR, such as the Hybrid Energy System Optimization (HESO) model, an assessment tool that can support government and industry in identifying the optimal combination of clean-energy options for communities, geographical areas, or industries. The HESO model will minimize costs and support the achievement of GHG emissions-reduction targets.

Innovation

As part of AECL's strategic approach, we are committed to building a sustainable, healthy, and safe future for Canadians through innovation. Nuclear technology is advancing at a rapid pace, and AECL will continue to evolve our efforts to remain a leader in the nuclear sector, and enable Canada to be a leader in the international nuclear landscape. In collaboration with CNL and other partners, we will leverage the capabilities and develop the technologies needed to achieve shared objectives and priorities.

The expertise, capabilities, and unique research assets at Chalk River Laboratories, Canada's only national nuclear laboratories, are essential to supporting existing and future nuclear technologies and advancements for the benefit of Canadians. The Technology Advancement and Commercialization program at Chalk River Laboratories enables projects to bring capabilities and technologies from the research development stage through to commercialization, and demonstrate safety and technology readiness.

AECL's nuclear laboratories support Canada's current nuclear fleet, as well as the advancement of new clean energy technologies such as SMRs, fusion, and hydrogen. In partnering with academia and the private sector, research and innovation at AECL's Chalk River Laboratories is contributing to cutting-edge advancements in many areas, including:

- Accelerating the deployment of SMRs through jointly funded research with the private sector and pursuing the siting of an SMR at an AECL site
- Accelerating fusion technology development through tritium handling research and by bringing together the Canadian nuclear ecosystem to advance fusion
- Evaluating hydrogen production and storage applications, as well as production using thermal and electrical energy from nuclear and other clean energy sources

Our Strategic Differentiators

AECL is enabling the Chalk River Laboratories to create innovation hubs that work towards accelerating net zero and advancing the diverse capabilities of nuclear. The hubs are driving innovation in the nuclear sector, and have included focus areas such as hydrogen safety, the medical isotope ecosystem, and roadmaps for fusion technology.

We recognize that the innovation and advancement needed in science and technology to achieve a more sustainable future for Canadians will require collaboration and the use of multidisciplinary approaches across the industry. AECL has made significant progress in advancing themselves and the Chalk River Laboratories as a place for driving innovation through collaboration. AECL has continued this momentum at the 2023 Federal Nuclear Science and Technology Workshop, where AECL brought together government, industry, and

academia to collaborate in discussions relating to nuclear innovation, including the medical applications of nuclear, waste management, nuclear safety and security, hydrogen tritium, and advanced reactors. AECL also actively engages with Canadian universities and the academia community through three main tenants for collaboration - (i) leveraging collaborative research opportunities to advance science and technology, in line with corporate and national objectives; (ii) facilitating access to unique infrastructure, facilities and expertise; and (iii) developing highly qualified talent and creating an engaged talent pipeline to satisfy future AECL, CNL and wider industry needs. AECL will continue to pursue partnerships with industry, academia, governments, communities, and Indigenous peoples to advance our shared priorities.

Radioactive Waste Management and Decommissioning

Radioactive waste management and decommissioning is a core function of our mandate, and an important enabler for nuclear science and technology. The waste generated and stored at AECL sites is a by-product of important research and development efforts that have led to significant innovations for the benefit of Canada, such as the development of CANDU technology and nuclear isotope research. Both our mandate and mission incorporate our responsibility to protect the environment by fulfilling the Government of Canada's radioactive waste and decommissioning

responsibilities. We have a commitment to advance key decommissioning, remediation, and radioactive waste management projects and protect the environment in collaboration with Indigenous groups and local communities. Our efforts in radioactive waste management and decommissioning have led to the development of world-renowned waste management technologies and practices, which have enabled the successful decommissioning, remediation, and clean-up of numerous nuclear projects in Canada with direct applicability to ongoing international challenges and opportunities.

Nuclear energy will not be successful without a clear pathway to nuclear waste management that is accepted by the public and regulators. As the use of nuclear technology and energy continues to expand, effective radioactive waste management and decommissioning will be critical to ensuring nuclear systems can provide a sustainable, safe, and clean future.

Globally, AECL has agreements with the U.S., the U.K., France, and Australia to learn and share best practices for managing waste sustainably. At our sites, AECL and CNL are demonstrating that the decommissioning and remediation of nuclear sites, and the management and disposal of radioactive waste, can be achieved in a safe and effective manner.

Chalk River Laboratories

Radioactive waste management, remediation, and decommissioning activities are a critical part of our mandate and our plan to revitalize the Chalk River Laboratories site.

There are 278 numbered buildings and structures at Chalk River Laboratories that AECL intends to demolish as part of our efforts to replace these old buildings with new modern facilities that are more energy and resource efficient. 117 obsolete buildings (42%) have been demolished to date, and we are planning to demolish 65% of obsolete buildings by 2035-36. In 2022-23, four buildings were demolished at the Chalk River Laboratories. Under AECL's oversight, CNL has been developing an updated Overview Decommissioning and Cleanup Plan (ODCP) for Chalk River Laboratories with extensive

involvement from stakeholders, government, and regulatory bodies. The plan will implement an improved approach to the decommissioning and remediation plans for the site's buildings, infrastructure, and contaminated lands, while coordinating these plans with other site priorities and projects. The ODCP was accepted by the Canadian Nuclear Safety Commission (CNSC) in June 2023 and will be implemented at Chalk River Laboratories over the next year.



Our Strategic Differentiators



AECL and CNL are working to develop long-term management and disposal solutions to enable the remediation of contaminated buildings, lands, and soils, and replace temporary storage methods at the Chalk River Laboratories. To accelerate these efforts, CNL has proposed to build a Near Surface Disposal Facility (NSDF) for the disposal of AECL's low-level radioactive waste. The NSDF would allow for the permanent, safe disposal of waste that is currently in temporary storage. It would also provide a more reliable disposal solution for future waste generated as a result of AECL's contaminated land remediation activities, decommissioning activities, and continued operations of the nuclear laboratories. This year, public hearings were held by the CNSC to consider CNL's application for the NSDF. The hearings identified a need for further engagement with the local Indigenous communities who would be impacted by the project. As a result, the CNSC, AECL, and CNL are continuing to work diligently to engage and consult with Kebaowek First Nation and Kitigan Zibi First Nation to address project concerns and build relationships centered on trust, understanding, and leading to mutually beneficial outcomes.

Port Hope Area Initiative

The Port Hope Area Initiative represents both the Port Granby Project and the Port Hope Project, which serve to address the shared objective to safely relocate and manage roughly 2.1 million cubic meters of historic low-level radioactive waste and contaminated soils in the municipalities of Port Hope and Clarington, in Ontario.

Both the Port Granby Project and the Port Hope Project involve remediating contaminated land and constructing near-surface long-term waste management facilities (LTWMF). Remediation at the Port Granby Project was completed in 2020, and the LTWMF was closed in 2021. At closure, 1,315,059 metric tonnes of total waste was placed in the LTWMF in Port Granby. The LTWMF at the Port Hope Project continues to receive waste and contaminated soils from facilities in remediation, totalling 1,419,661 metric tonnes* of waste received at the end of 2022. The Port Hope nuclear license has been renewed to continue operating for a 10-year period.

Whiteshell Laboratories

Under the GoCo model, decommissioning activities at Whiteshell Laboratories are being accelerated by CNL to target site closure by 2027, approximately 30 years ahead of schedule. To accelerate decommissioning safely and effectively, CNL has proposed decommissioning the WR-1 reactor at the site in-situ, meaning that it would be immobilized in place. CNL's efforts to advance this project have included environmental and technical assessments and engagement with regulators, Indigenous nations, local municipalities, and the public. Through the engagement process, stakeholders had the opportunity to receive additional information about in-situ disposal, provide input, and discuss questions and comments. Information requests are currently being addressed as part of the final review process for the Environmental Impact Statement for the project, which highlights broadened understanding of municipal and Indigenous perspectives through collaborative capacity-building initiatives, traditional knowledge studies, and community participation in site monitoring activities.

Nuclear Power Demonstration Site

At our Rolphton, Ontario site, CNL is advancing plans to safely decommission the Nuclear Power Demonstration (NPD) reactor, which has been in a safe shutdown state for 30 years. CNL is proposing to decommission the NPD in-situ. This year, CNL will re-submit a final draft Environmental Impact Statement for the project, which was developed based on scientific studies, traditional knowledge studies, and extensive engagement with stakeholders and Indigenous communities, enabling Indigenous communities to engage technical experts to comment on the Environmental Impact Statement.

Prototype Reactors

The Gentilly-1 and Douglas Point nuclear reactors, owned by AECL, were experimental prototype reactors located in Bécancour, Quebec, and Kincardine, Ontario. These reactors were operational from the late 1960s to the mid-1980s. Currently, both reactors are in a safe shutdown state as they await full decommissioning. The decommissioning plans for these prototype reactors were not scheduled until after 2050. However, CNL has accelerated the decommissioning plans for these sites to reduce costs, and preparations for their decommissioning are now underway.

Community Engagement and Development

AECL's relationships with the local communities where we operate directly impact the success of our objectives and business activities. We value our local communities and are working with CNL so that their perspectives are considered in our decisions and operations.

Our approach to engaging key stakeholders is guided by our Communications and Stakeholder Engagement Strategy, which outlines our commitment to understanding different perspectives, sharing information, discussing questions and concerns, and creating opportunities for partnership. Under the GoCo model, AECL collaborates with CNL in leading communication and engagement with local communities, in alignment with our strategies and objectives.

AECL is continuing to work with local communities and Indigenous nations to discuss the future of AECL's lands. At the Port Granby remediation project, AECL is collaborating with the communities of Clarington and Port Hope, and the Michi Saagiig Anishinaabeg, which includes the Mississaugas of Scugog Island First Nation, Curve Lake First Nation, Hiawatha First Nation and Alderville First Nation, for the purposes of creating a nature reserve along the shore of Lake Ontario. At the Whiteshell Laboratories site,

we recognize and are mindful of the impact the final site closure can have on the local community, and are involving stakeholders, First Nations, and the Red River Métis in future land-use planning to identify opportunities to achieve shared goals, which could include consideration for siting a small modular reactor.

In addition to land-use planning, our operations provide economic opportunities and benefits to the small, remote communities that host our operations. Approximately 3,500* local people are employed by CNL in the local communities in which we operate. This year, site development and investment drove nearly \$165 million* in community investment, and CNL donated over \$274,000* to local causes and initiatives. AECL also contributed nearly \$100,000 in sponsorships for events and conferences.

AECL and CNL's engagement and development is key to enabling and maintaining the support of local communities. We recognize the impact our activities and business decisions can have on the communities where we operate, and are committed to providing opportunities for positive impact on local communities through our operations.



Climate Resilience under the Task Force on Climate-related Financial Disclosures (TCFD)

Climate resilience is inherently integrated in AECL's mandate and mission. Our approach to climate resilience aligns with our ESG strategy, and encompasses our opportunity to support Canada's decarbonization efforts, our internal decarbonization efforts, and the resilience of our operations to climate-related risks.

As a federal Crown corporation, AECL is committed to aligning to the recommendations of the TCFD. In this report, AECL provides an overview of our current progress and alignment to the TCFD framework, which is a reporting framework with 11 disclosure recommendations to support companies in articulating their climate resilience through four pillars: governance, strategy, risk management, and metrics and targets. For more information on the TCFD framework and AECL's alignment to the recommendations, please see the Reporting Framework Standards Alignment section and the Appendix.

Climate Governance

AECL's commitment to managing climate-related risks and opportunities and instilling climate resilience throughout all operations is integrated within AECL's governance structure.

Board Governance

AECL's Board of Directors holds the responsibility of overseeing AECL's strategy, planning, and business decisions, including the management of climate-related risks and opportunities. High-priority risks that are identified by AECL's risk management processes are reported to and discussed by the Board, including the climate-related risks and opportunities AECL has identified in accordance with TCFD recommendations. The Board continues to be highly involved in AECL's alignment to TCFD,

including through approving AECL's internal plans to align to the TCFD recommendations, AECL's annual climate resilience reporting, and AECL's identified climate-related risks and opportunities. The Board also oversees and approves broader processes and documents that consider climate-related issues, including AECL's risk framework, CNL's annual work plans, the contractor's performance plan, and AECL's employee incentive plan.



Executive Governance

Climate resilience, including the management of climate-related risks, opportunities, and objectives, are accounted for at the executive level. To advance TCFD alignment and executive governance over climate-related issues, AECL has established an internal roadmap which outlines key activities, responsibilities, and timelines to further integrate the TCFD recommendations.

As part of the roadmap, TCFD responsibilities have been articulated in a Responsible, Accountable, Consulted, and Informed (commonly referred to as RACI) model. Executive members have been assigned the responsibility of key activities that require executive ownership.

Operational Governance

Under the GoCo model, CNL is responsible for managing climate-related risks to AECL's assets, including its operational sites. AECL is responsible for overseeing CNL's climate-related risk management processes, strategies, and initiatives. Through CNL's annual work plans, long-term plans, and annual performance incentives, AECL approves and oversees CNL's climate-related risk management initiatives and performance.

ESG and TCFD are incentives in the performance evaluation agreement between AECL and CNL. From a high level narrative the incentivization is across all missions from operations, S&T, ERM, and corporate oversight. It is built into all parts of the business.



Climate Strategy

Our ability to enable and influence the transition to net-zero through the advancement of nuclear science and technology uniquely positions AECL to capture our own climate-related opportunities, and to contribute to broader transition opportunities in Canada and globally.

For more information on AECL's decarbonization initiatives and objectives, please refer to the Decarbonization section on pages [21](#) to [25](#) of this report, and the Science and Technology section on pages [31](#) to [34](#).

While actively supporting national and global emissions reductions, AECL also remains dedicated to climate action and resilience by mitigating the risks and impacts of our own

operations. By leveraging climate-scenario analysis, AECL is identifying and assessing climate-related risks, considering both physical and transition risks, and opportunities to our business.

Climate-related Physical Risks

Physical risks to AECL's sites are identified, managed, and updated through CNL and overseen through AECL's risk management processes and climate-resilience approach .

For physical risks, three climate scenarios were considered over three timeframes, as shown on the right:

The physical climate-related risks identified in 2023 that may have a material impact on AECL remain consistent with those identified in 2022. Given the nature of AECL's business and the environment in which it operates, AECL may be exposed to the following physical climate-related risks.

Climate scenarios:

1. Low: <2°C
2. Medium: 2 - 3°C
3. High: >4°C

Time frames:

1. Short term: 2030
2. Medium term: 2050
3. Long term: 2080

Physical Risk	Definition	Magnitude (high, low) ³	Impact to AECL
<p>Flooding (fluvial and pluvial)</p>	<p>Projected increases in both pluvial and fluvial flooding events may damage facilities, above-ground infrastructure, equipment, and power infrastructure, leading to power outages, operational/service disruptions and blocked access roads, causing supply chain disruptions and exacerbating erosion on site, and/or may lead to an increase in maintenance of retention ponds as a result of the accumulation of sediment.</p>	<p>High</p>	<p>Exposure: Flooding events have occurred at AECL’s Chalk River Laboratories site, though none of the infrastructure has been damaged, nor have operations been impacted. However, there is an increase in maintenance costs for retention ponds that are experiencing an increased accumulation of sediment.</p> <p>Key risk: Flooding impacts in terms of runoff causing erosion and overwhelming water management infrastructure.</p> <p>Mitigation strategies: CNL is managing flooding as a key material risk at AECL’s sites. Chalk River Laboratories’ infrastructure is located 20m above the Ottawa River, higher than a 1-in-100-year flood event. The topography at Chalk River Laboratories provides further protection from the river, minimizing flood risk. Chalk River Laboratories has also implemented soil erosion prevention practices such as discharging runoff into ditches, dry wells, empty grass fields and water diversion channels, as well as discharging at low flows or ensuring terrain slope is minimal to accommodate higher flows and encourage ground seepage. Chalk River Laboratories also conducts a scenario exercise to prepare for a potential event in which a failure/break in three upstream dams occurs. This helps to increase Chalk River Laboratories’ preparedness for an extreme event that could lead to significant flooding.</p>

³ Magnitude of physical risks are assessed by CNL on a scale of exposure and vulnerability, using a scoring method.

Climate Resilience under the Task Force on Climate-related Financial Disclosures (TCFD)

Physical Risk	Definition	Magnitude (high, low) ³	Impact to AECL
Increasing wildfires	Projected increases in fire frequency and intensity may damage facilities, above-ground infrastructure, equipment and power infrastructure, leading to power outages, operational/ service disruptions, and blocked access roads causing safety concerns and supply chain disruptions, and/or may pose human health impacts to workers on site.	High	<p>Exposure: Large fires have occurred adjacent to AECL's sites (including Chalk River Laboratories) in the past, however, no infrastructure has been damaged, nor have operations been impacted. AECL sites are located adjacent to heavily-forested areas, therefore, the exposure rating has been upgraded to high.</p> <p>Key risk: Increased vulnerability of the Whiteshell Laboratories and Chalk River Laboratories sites due to location in heavily-forested areas and near the Garrison Petawawa which have experienced fire activity in the past.</p> <p>Mitigation strategies: Forests adjacent to AECL sites are generally mixed deciduous forests, which usually do not burn as rapidly or as intensely as forests composed of coniferous trees. Chalk River Laboratories' Forest Management Plan considers suitable habitats that mimic natural disturbance cycles of forests of the Great Lakes St. Lawrence, and can lower fire risk (e.g., planting mixed deciduous trees that are less flammable than coniferous trees). In addition, CNL has a fire response crew, and as part of their emergency response and preparedness planning, on-site staff at Chalk River Laboratories are tested and trained on fire safety.</p>
Extreme temperatures – heat	Projected increases in extreme temperatures (heat) may increase the demand on HVAC systems and/or other mechanical and electrical systems, as well as impacts to worker health and safety and disruptions to laboratory work.	Moderate	<p>Exposure: All AECL sites experience moderate exposure to extreme heat under all climate scenarios, with some experiencing high exposure under a high-emission scenario.</p> <p>Key risk: Laboratories are unable to complete analytical chemistry if indoor temperatures exceed a certain threshold, which could impact project schedules due to further delays. Indoor and outdoor air quality can be impacted by increased incidents of extreme heat (e.g. increased smog) with negative impacts on the health and safety of staff.</p> <p>Mitigation strategies: CNL has implemented mitigation strategies to minimize the health and safety risk to outdoor staff by updating their work and rest requirements. CNL will consider upgrading or retrofitting HVAC systems in the future to increase the capacity of facility cooling systems to withstand events of extreme heat.</p>

³ Magnitude of physical risks are assessed by CNL on a scale of exposure and vulnerability, using a scoring method.

Physical Risk	Definition	Magnitude (high, low) ³	Impact to AECL
Extreme wind speeds	Projected increases in extreme wind events (e.g., cyclones) may damage facilities, above-ground infrastructure and power distribution, leading to power outages.	Moderate	<p>Exposure: High wind-speed events (e.g., microbursts) have occurred at the Chalk River Laboratories site in the past. Tornadoes have also occurred in Ontario.</p> <p>Key risk: Damage to infrastructure could also occur as a result of a tornado event. Potential loss of power can also occur which affects building ventilation.</p> <p>Mitigation strategies: AECL's high-risk facilities are built to withstand more severe and infrequent weather events. Regulations require AECL to consider severe weather events in new nuclear builds. Back-up generators are in place in the event that power is disrupted or lost.</p>
Freeze thaw	Projected increases in wide-ranging diurnal temperature ranges and rapid fluctuations in temperatures may lead to increased repair and maintenance of infrastructure and pavement/roads.	Moderate	<p>Exposure: Extreme cold temperatures are projected to decrease, however, extreme fluctuations in temperatures are currently occurring at some sites, such as at Chalk River Laboratories.</p> <p>Key risk: More extreme fluctuations in temperature can lead to an increase in maintenance of infrastructure, including underground fire water and service water distribution system pipes. Extreme cold can impact both operational and decommissioned sites.</p> <p>Mitigation strategies: CNL has used temporary heating of decommissioned sites during periods of extreme cold.</p>

³ Magnitude of physical risks are assessed by CNL on a scale of exposure and vulnerability, using a scoring method.

Climate-related Transition Risks and Opportunities

Transition risks and opportunities are related to the transition to a lower-carbon economy, which may entail extensive policy, legal, technology, and market changes to address mitigation and adaptation requirements related to climate change¹. These risks and opportunities are identified and managed by AECL and integrated into our ESG strategy and planning. This year, AECL's executive team engaged in a workshop to identify and assess AECL's climate-related transition risks and opportunities, based on the TCFD Implementation Guidance. Climate-related transition risks and opportunities are considered under scenarios that project a transition to a lower-carbon or net-zero economy and limited global warming. Transition risks and opportunities to AECL were considered under two climate scenarios: 1.8°C and >4.4°C.

We recognize that the transition to net-zero presents a wide-ranging multitude of risks and opportunities that may evolve over time. AECL will continue to build and reassess our analysis of climate-related risks and opportunities to our business. We plan to continue to deepen our understanding of climate-related risks and opportunities, including by further assessing the magnitude of transition risks and opportunities and their impact to AECL.

Climate Scenarios:

1. 1.8°C global average temperature increase by 2100

Under Scenario 1, significant decarbonization is achieved and the economy transitions to net-zero.⁴

2. >4.4°C global average temperature increase by 2100

GHG reduction targets are not met, and the transition to net-zero does not happen. Climate warming to exceed 4.0°C by 2100.⁵



⁴ Reference scenarios: Canadian Energy Outlook: NZ50; Bank of Canada: Net-Zero 2050 1.5°C; IPCC AR6 SSP1-1.9

⁵ Reference scenarios: Bank of Canada: Business As Usual scenario; IPCC AR6 SSP5-8.5

AECL identified the following climate-related transition risks to the corporation under a net-zero scenario (1.8°C).

Transition Risk	Impact to AECL
Pace of regulatory change	There is a risk that the regulatory change that is needed to deliver on AECL's strategy may not evolve at a sufficient pace. Regulatory change and permit approvals may be too slow and insufficient to support AECL's ambitions in technology advancements that enable a transition to net zero on the targeted timelines.
Funding constraints	With significant and competing funding demands, the government's support for science and technology, including for nuclear, may not necessarily translate into increased funding for AECL. As AECL is funded by the federal government to oversee CNL, the extent to which AECL can influence CNL and support the transition to a low carbon economy is limited by the level of government funding it receives.
Resources / capacity management	The ability for AECL to attract and retain the right talent in an increasingly competitive market, in order to build the appropriate human resources and experience capabilities to meet AECL's specific needs, will be necessary to mitigate transition risks and capture opportunities. If talent capacity is not sufficient, AECL may not be able to meet the new demands for its services in the transition to net zero, or the meeting of the new demands may be delayed.
Enhanced obligations and regulations around emissions reductions and climate disclosures	Disclosure requirements around emissions reductions and reporting are expected to continue to develop and advance. AECL may face increased requirements to advance its GHG emissions reporting and disclosures and reduce emissions to meet its GHG reduction targets. An inability to calculate and meaningfully disclose emissions and/or meet required emission reductions could have adverse impacts on AECL's reputation.
Access to capital becoming increasingly competitive	The ability of CNL to access private capital through its joint ventures to augment AECL funding may become more competitive in the near future as capital providers become more selective about capital allocation. With rising interest rates and quantitative tightening, the market is taking a longer-term outlook, and requiring more and better disclosures on ESG performance (among other factors) to help select investments that can generate better long-term returns.
Change in social license to operate / reputational risk	As demand for nuclear energy sources continues to rise, increased public support follows. However, public opinion, among other things, may be in part dependent on AECL's ability to manage the safety of nuclear developments (e.g., nuclear waste, decommissioning, land restoration). Although there is the risk of incidents causing reputational damage, AECL's proven ability to manage this risk allows the impact and likelihood of this risk to be mitigated.

AECL identified the following climate-related transition opportunities to the corporation under a net-zero scenario (1.8°C).

Transition Opportunity	Impact to AECL
Leveraging AECL's expertise in a broader array of technologies to advance decarbonization	AECL is demonstrating its capabilities beyond nuclear and leveraging its experience in a broader array of technologies to advance decarbonization, including hydrogen and fusion technologies.. This allows AECL to be seen as an accelerator in new clean energy sources.
Opportunity for AECL to position Canada as a global leader in decarbonization	AECL has a significant role to play in advocating for the support of nuclear, and demonstrating Canada's leading capabilities with its local and global partners, to help accelerate nuclear innovation and the transition to net zero.
Opportunity to continue to be, and increase our outreach as, a trusted advisor to government	AECL is in a position to continue to provide sound and robust advice with respect to the national conversation on nuclear technologies and their continuing benefits to Canada to contribute to decision making within government.
Increasing market demand for nuclear energy sources to power net-zero economy	As Canada transitions to a net-zero electric grid by 2035, some provinces will require significant support in creating a reliable, stable, and clean energy grid. Nuclear is expected to be a key technology to support these provinces, and AECL is well-positioned to expand its efforts in research and development.
Land management planning and improvement	AECL's land can be leveraged to capitalize on new market demands needed to support the transition to a low carbon economy (e.g., carbon capture and sequestration, wind, and solar technologies).





Risk Management

AECL's ability to identify, assess, and mitigate climate-related risks is critical to our ability to enable a transition to net zero. AECL is currently managing and preparing for climate-related risks using formalized risk processes, such as through the inclusion of climate change as a risk in AECL's enterprise risk register, and the consideration of severe weather incidences in emergency response plans.

In addition, CNL has rolled out a climate resilience building standard and a life-cycle carbon analysis standard which require all major infrastructure projects on AECL sites to consider carbon emissions in material choices, establish climate resilience plans, describe the environmental impact of the project, and identify applicable mitigation measures used to manage climate impacts.

Under the GoCo model, AECL oversees CNL's management of climate-related risks. Risks are accounted for across our projects and sites through CNL's Hazard Identification Risk Assessment tool, which evaluates the impact of various risk factors, including climate change,

by analyzing their frequency, changes, and potential consequences. CNL also conducts environmental reviews to identify, assess, and manage environmental and climate-related risks. Overseen by AECL, CNL's gating and sanctioning process includes climate resiliency and life cycle cost-benefit analysis.

AECL plans to continue building on efforts to further integrate climate-related risks and opportunities into enterprise risk management (ERM) processes, strategy, and financial planning. Looking ahead, AECL will seek opportunities to further assess the impact, including financial implications, of climate-related risks and opportunities.

Metrics and Targets

AECL is making meaningful progress towards achieving climate-related objectives and targets set to decarbonize AECL's operations and enable a successful transition to net zero.

Objective	Targets	Performance
Achieve net-zero operations at all AECL sites by 2040.	<ul style="list-style-type: none"> By 2025, achieve a 40 percent reduction in Scope 1 and Scope 2 GHG emissions against the 2005 Chalk River Laboratories baseline. <ul style="list-style-type: none"> After 2025, achieve an additional 20 percent reduction in Scope 1 and Scope 2 GHG emissions against the 2005 baseline every five years. By 2040, achieve at least a 90 percent reduction in Scope 1 and Scope 2 GHG emissions relative to the 2005 baseline, and offset the remaining emissions to achieve carbon neutral. Develop, execute, and maintain a sitewide ten-year plan to integrate clean-energy solutions to all buildings that have a defined mission greater than 15 years, with a focus on recommissioning large energy-intensive buildings and/or implementing smart building technology by a) reducing building energy consumption, b) converting GHG-heating and -cooling source(s) to clean-energy options, and c) developing and executing plans to retrofit buildings. 	<ul style="list-style-type: none"> In 2022, a 30 percent* reduction in GHG emissions was achieved at the Chalk River Laboratories from the 2005 baseline. Scope 1 emissions in 2022 calendar year: 30,496 CO₂e tonnes* Scope 2 emissions in 2022 calendar year: 1,623 CO₂e tonnes* Scope 3 emissions in 2022 calendar year: 8,300 CO₂e tonnes*⁶ Long-term plans are currently in draft to be completed by the end of March 2024, and include plans to reduce building energy consumption, convert GHG-heating and -cooling source(s) to clean-energy options, and develop and execute plans to retrofit buildings.
Minimize energy use.	<ul style="list-style-type: none"> Reduce energy-use intensity by 30 percent by 2035 from the 2015 baseline. Energy use will be metered by 2024 for the Chalk River Laboratories site "keeper"⁷ buildings over 1,000 square meters with significant energy consumption. The priority for metering will be used to inform sound energy-reduction targets, smart-campus initiatives, and future retrofits. By 2025, all keeper buildings will be incorporated in the RETScreen Clean Energy Management Software, or equivalent. 	<ul style="list-style-type: none"> In 2022, energy intensity at Chalk River Laboratories was reduced by 16% from the 2015 baseline. Energy and GHG emissions savings projects at the Chalk River Laboratories site achieved emissions savings of approximately 530 tCO₂e*.

⁶ Scope 3 emissions are based on CNL's calculation for certain categories including upstream and downstream leased assets, employee commuting and business travel.

⁷ Keeper building is defined as a building that has been deemed part of the revitalized Chalk River Laboratories campus and has a defined mission greater than 15 years.

Objective	Targets	Performance
<p>Light-duty fleet composition of 80 percent zero-emission vehicles by 2030, where supply permits.</p>	<ul style="list-style-type: none"> At least 75 percent of new light-duty unmodified fleet vehicle purchases will be zero-emission vehicles or hybrids, with the objective being that light-duty fleet comprises at least 80 percent zero-emission vehicles by 2030. Priority is to be given to purchasing zero-emission vehicles. 	<ul style="list-style-type: none"> To date, CNL's fleet is comprised of five percent* hybrid or electric vehicles.
<p>New construction and major retrofits to prioritize low carbon emissions and climate resilience.</p>	<ul style="list-style-type: none"> To prioritize low carbon and climate resilience in new construction and major retrofits, prepare both a life-cycle assessment and a life-cycle cost analysis. 	<ul style="list-style-type: none"> CNL has rolled out a climate resilience building standard and a life-cycle carbon analysis standard (which follows the Government of Canada's life-cycle cost analysis for carbon accounting) which require all major infrastructure projects on AECL sites to consider carbon emissions in material choices, establish climate resilience plans, describe the environmental impact of the project, and identify applicable mitigation measures used to manage climate impacts.
<p>Reduce the environmental impact of structural construction materials.</p>	<ul style="list-style-type: none"> By 2022, disclosing the amount of embodied carbon in the structural materials of major construction projects, based on material carbon intensity or a life-cycle assessment. Starting in 2025, reduce the embodied carbon of the structural materials of major construction projects by 30 percent using recycled and lower carbon materials, material efficiency, and performance-based design standards. By 2025 latest, conduct whole-building (or asset) life-cycle assessments for major buildings, retrofits, and infrastructure projects with a focus on keeper facilities. 	<ul style="list-style-type: none"> CNL's life-cycle assessment standard has been issued and is being used to account for embodied carbon on some AECL projects. To date, AECL has sequestered nearly 2,500 tCO₂e and avoided nearly 1,000 tCO₂e by using mass timber in the construction of three buildings.

Objective	Targets	Performance
<p>Net-zero, climate-resilient lease facilities.</p>	<ul style="list-style-type: none"> Starting in 2030 and fully achieved by 2040, 75 percent of domestic office new lease and lease renewal floor space must be in net-zero carbon, climate-resilient buildings. Starting in 2023, all new domestic office leases and lease renewals for space over 500 m² must report building energy and water usage, GHG emissions, and waste generated using ENERGY STAR Portfolio Manager or equivalent tool, and disclose at the building level. GHG emissions from the majority of office-floor space leased will be reported by 2025. 	<ul style="list-style-type: none"> This year, the emissions and climate resiliency of lease facilities were considered in CNL's Scope 3 emissions calculations of the upstream and downstream leased assets category.
<p>Consider climate resilience in decision making for all major infrastructure and operational decisions.</p>	<ul style="list-style-type: none"> Apply climate-resilient building guidance being developed by National Research Council Canada or other best practice options where available. Develop climate-resilience plans for all material ongoing operations by the end of 2022, with practical implementation plans. Increase training and support for employees on assessing climate change impacts, undertaking climate change risk assessments, developing adaptation actions, and sharing best practices and lessons learned. 	<ul style="list-style-type: none"> This year, CNL rolled out a Climate Resilience building standard. CNL implements climate-resilience planning standards into the decision-making process for all major infrastructure projects. Climate resilience is also part of CNL's gating and sanctioning process. In 2023, AECL's Board of Directors were engaged in an education session that focused on TCFD recommendations and regulatory developments on climate reporting matters. The executive team engaged in a workshop to identify and assess AECL's climate-related transition risks and opportunities.

Objective	Targets	Performance
<p>Adopt low-carbon mobility solutions</p>	<ul style="list-style-type: none"> • Encourage employees to use low-carbon forms of transportation to reduce emissions from employee commuting, and track emissions within the 2023 fiscal year (AECL would be covered in CNL's metrics). • Facilitate opportunities for flexible-work arrangements, such as remote work, by enabling remote computing telecommunications and by supporting information-technology solutions to reduce transportation-related emissions. Promote and incentivize lower carbon alternatives to work-related air travel. 	<ul style="list-style-type: none"> • AECL employees have access to EV charging stations on site. • AECL offers flexible hybrid work options, including remote work.





Our Baseline Expectations

Baseline expectation topics are important to our operations at AECL. Managing these topics well is integral to our ability to manage risk, meet stakeholder expectations, and drive meaningful change.

Health and Safety of Public and Workforce

AECL places great importance on ensuring the well-being and safety of both our staff and the communities where we operate. Being safety and security focused is a fundamental value at AECL, ingrained within our organization, and we foster a strong safety culture where everyone maintains a positive mindset and values workplace safety with utmost importance. All employees and contractors are held accountable to rigorous health and safety standards and play an important role in contributing to a strong safety culture.

Public Health and Safety

Ensuring and maintaining public safety is of paramount importance to both AECL and the Government of Canada when advancing nuclear objectives. We acknowledge the inherent risks associated with our work, and, in alignment with federal priorities, we are committed to making the safety and security of our nuclear sites a top priority. AECL's Federal Nuclear Science and Technology Work Plan guides Canada's safe, secure, and responsible utilization and advancement of nuclear technologies. We are dedicated to strengthening national and global nuclear security, enhancing nuclear preparedness, and improving emergency response capabilities. Our sites operate with stringent emergency preparedness plans and resources. Consistent with last year, we are proud to maintain a record of zero events that impacted public safety this year.



Employee Health and Safety

At AECL, safety is a top priority, and the well-being and safety of our workforce is no exception. As exemplified by our Employee Health and Safety Policy, which underscores our unwavering dedication to safeguarding the health and safety of all employees, we continuously strive for improvement in our health and safety practices, including physical and mental health. Given the risks associated with working in the nuclear industry, we also incorporate nuclear safety protocols into our Health and Safety Policy to ensure the protection of our employees. The AECL

Code of Conduct, AECL Occupational Safety and Health (OSH) Procedure, site-specific emergency procedures, and the zero-tolerance policy sets the procedures for reporting and resolving any incidents of harassment and violence in our workplace. It is our shared responsibility to cultivate a safe and healthy environment for the benefit of our employees and the public at large, and we are committed to integrating that responsibility across our organization.



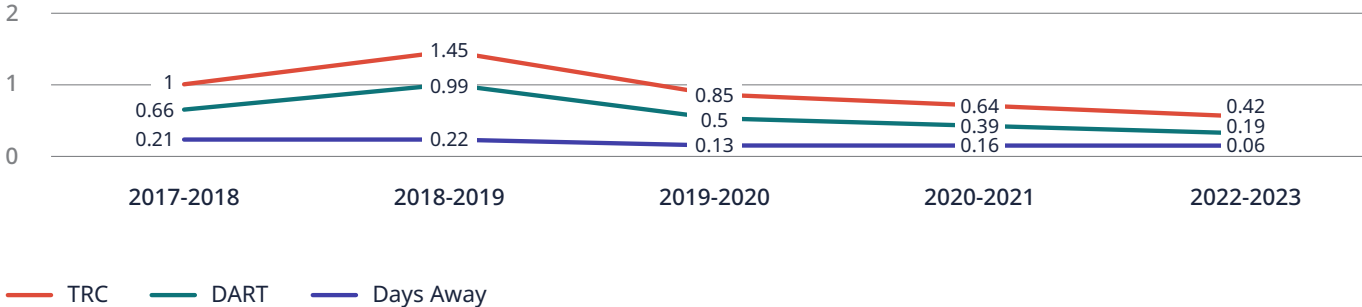


Contractor Health and Safety

Our collaborative relationship with CNL under the GoCo model is fundamental to our success in driving nuclear innovation and achieving a better future for Canadians. The health and safety of our contractor, CNL, is of equal importance to the health and safety of our own employees. Under AECL's oversight, CNL's Health, Safety, Security and Environmental management system

supports injury and incident prevention. AECL assesses CNL's health and safety performance based on health and safety metrics, including occupational injuries or illnesses resulting in days away from work or temporary job restrictions or transfers (DART), days away from work (DA), and total recordable cases (TRC).

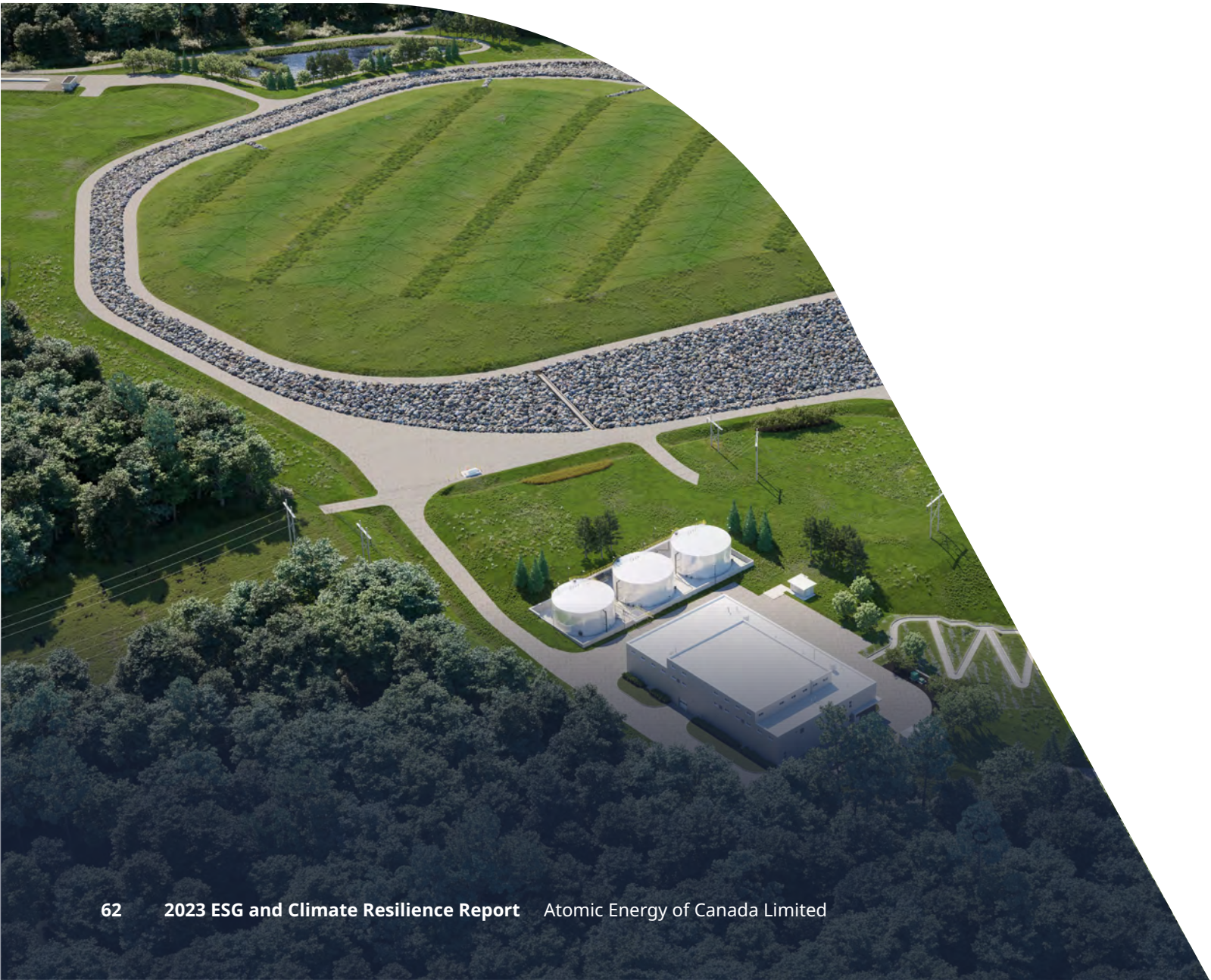
Annual* Recordable Injury Rates (Excludes Absences Related to COVID-19)



Enterprise Risk Management (ERM)

AECL's dedication to transparency and accountability is formalized by our robust ERM processes. Our risk management practices are exhaustive and integrated throughout the entire organization. Comprehensive risk management processes enable the achievement of strategic objectives, strong corporate governance, cost savings, improved business decisions, and safety and security across the organization.

ESG and climate-related risks are managed through AECL's ERM processes, which currently considers risks such as physical and cyber security, climate change, environmental risks, and governance matters. We are continuing to work towards formally incorporating additional ESG and climate-related risks into AECL's risk register.



Environmental Management

AECL prioritizes and invests in our capabilities and our environmental obligations to all Canadians, working continuously to protect the health and safety of Canadians, contributing to the fight against climate change, and protecting the environment.

We are proud of our efforts to date, spanning sustainable procurement, water and wastewater management, biodiversity, and non-radioactive waste management. We will continue to build upon the progress we have made thus far, in our dedication to ESG initiatives throughout our operations.

Water and Wastewater Management

AECL recognizes that our withdrawal, consumption, and release of water can have an impact on the health and wellbeing of the local ecosystems and on the quality of life in areas surrounding our sites. We continue to work with CNL to optimize the use of water and enhance wastewater management practices, and are working towards establishing a quantitative reduction target in the future.

Work is currently underway to install water meters at buildings across our operating sites, which will support our monitoring and conservation efforts. Our goal is to track and disclose our potable water consumption by 2024 from all major buildings that have been deemed part of the revitalized CNL campus.

The vast majority of the water CNL withdraws for its operations is used by the Chalk River Laboratories⁸ and the Whiteshell Laboratories⁹. In 2022, total water intake across all sites increased by 46%, compared to 2021. This significant increase in water intake is largely due to a water main break on a

fire water line at Whiteshell Laboratories, in which a large quantity of clean water was released to the ground. Capacity remained available to mitigate the risk of fire to the site, and AECL is working with CNL on prevention mechanisms for incidents of this nature, including investing in aging infrastructure systems and facilities such as potable water systems on our sites.



⁸Water used at Chalk River Laboratories is returned to the Ottawa River.

⁹ Water used at Whiteshell Laboratories is returned to the Winnipeg River. At this site, water is used for various fire-suppression systems, and for misting to suppress dust during decommissioning.

Non-Radioactive Waste Management

With AECL's oversight, the development of CNL's Integrated Waste Management Strategy provides a comprehensive approach to waste management across CNL's operations, using a lifecycle approach to ensure alignment with our goals, obligations, and commitments to our core stakeholders.

We are focusing our efforts on upfront waste planning, minimizing waste generated, segregating waste, and appropriate routing of clean waste to recycle and/or reuse wherever practical, as our sites shift from waste storage to planning for waste disposal. To align with AECL's ESG strategy, we have supported CNL in developing sustainable waste targets:

- Diverting at least 75% of non-hazardous operational waste from landfills by 2030 (in 2022, 66%* of non-hazardous operational waste was diverted from landfills)⁹
- Diverting at least 75% of plastic waste from landfills by 2030 ⁹
- Diverting at least 90% of all construction and demolition waste from landfills by 2030 ⁹

Data collection efforts are underway to begin tracking progress toward the plastic waste and construction and demolition waste targets.

AECL will continue to monitor the effectiveness of these initiatives and continue to revisit our strategic targets and new initiatives in order to further strengthen our non-radioactive waste management practices.

In order to meet these targets, we have overseen three targeted projects initiated by CNL throughout this year:

- Recycling Awareness Campaign: Development of a volunteer recycling network and a targeted recycling communication campaign to educate staff about our waste diversion targets and methods to divert waste.
- Review of cafeteria waste contract: Implementing changes such as incorporating organics, moving to compostable food packaging, eliminating single-use plastics and paper cups, and incorporating dishwashing.
- Investigating alternative recycling pathways: Performing benchmarking and data gathering, including engaging with municipal vendors, cities, and other nuclear organizations to identify and develop a list of recommendations to further our recycling efforts.

¹⁰ The diversion rate (by mass) metric represents the ratio of the total weight of non-hazardous operational waste that is diverted (including prevention) from disposal in landfills versus the total weight of non-hazardous operational waste generated. This includes conventional recycling, composting, electronics recycling, secure paper shredding, and diversion through asset management (sale or internal reuse).



Biodiversity

AECL recognizes that we have an active responsibility to protect and reduce our impact on the wildlife and habitats present on our site locations and in the surrounding areas. The Environment Policy developed by CNL with oversight from AECL guides our business-planning and operations, with plans to maximize the use of natural infrastructure and other nature-based solutions to protect physical assets on our sites, and implement climate-resilient groundskeeping using native species where possible.

It also considers opportunities to foster climate resilience at Chalk River Laboratories, such as through mitigating climate risks and increasing carbon sequestration capacity. The Sustainable Forest Management Plan supports AECL and CNL's objective to restore the forest at Chalk River Laboratories to pre-industrial conditions.

Under AECL's oversight, CNL is protecting and promoting biodiversity on AECL sites through numerous additional projects, including:

- Documenting the presence of Eastern Wolves on the Chalk River site
- Constructing pathways to support safe migration for reptiles and amphibians
- Supporting research on blanding turtles, an endangered species under the Federal Species at Risk Act
- Posting turtle crossing signs at three species-at-risk hotspots located in the local Chalk River areas

In early 2023, CNL completed a Sustainable Forest Management Plan for our Chalk River Laboratories site, overseen by AECL. The plan guides efforts to manage and remediate the land on which the Chalk River Laboratories are situated, and includes the conservation of species, habitats, and biodiversity.

Sustainable Procurement

Understanding and addressing the environmental and social aspects in AECL's procurement supply chains continues to be a focus in our work with CNL. Over the past year, supply chain stakeholder surveys were administered by CNL to evaluate environmental and social data readiness of our suppliers, and updates have been made to CNL's Supply Chain Policy and Sustainable Procurement Plan under AECL's oversight to encourage our major suppliers to adopt science-based targets and disclose their GHG emissions and environmental performance. AECL has incentivized CNL to develop an Indigenous Procurement Strategy to promote the engagement of Indigenous businesses within their supply chain. The Strategy is currently under development and scheduled for implementation by the end of the 2023-24 fiscal year.

A Procurement Checklist has also been implemented by AECL this year to include considerations for both environmental and social impacts.

Under AECL's oversight, CNL has provided sustainable procurement training for staff to increase awareness and education of sustainable procurement policies and practices.





Cybersecurity

As part of the Federal Nuclear Science and Technology Workplan, AECL is working to enhance nuclear security, preparedness, and emergency response to address the ever-evolving risks associated with cybersecurity. AECL's role in overseeing and managing cybersecurity presents opportunities for safeguarding both our assets and those of nuclear operators. Our commitment lies in continuously improving cybersecurity and protecting Canada's critical nuclear infrastructure from cyber threats.

CNL is actively exploring technologies to detect and manage cyber threats, ensuring the long-term security of our business. The nuclear landscape presents unique cybersecurity challenges that are

not adequately addressed by most commercial systems. CNL is dedicated to developing nuclear industrial cybersecurity technologies specially designed to protect Canada's nuclear systems. As part of these efforts, CNL has already commissioned a nuclear cyber security test facility located in New Brunswick and developed a deployable nuclear industrial control cyber intrusion detection and mitigation system. Leveraging a state-of-the-art cybersecurity research facility, CNL's cybersecurity team will continue to be actively involved in researching, developing, and deploying cutting-edge cybersecurity technologies that align with the Government of Canada's nuclear and security priorities.



Diversity, Equity, and Inclusion

Diversity, equity, and inclusion (DE&I) at AECL is more than just a policy. It is the active way in which we build our workforce, made up of individuals with different backgrounds, experiences, and skills. It is inherent in our desire to have a psychologically safe and inclusive workplace. This allows for a broader and more vibrant exchange of perspectives and ideas, making us stronger and enabling us to achieve more as a corporation.



DE&I at AECL is guided by our Diversity & Inclusion Strategy, which encompasses three overarching goals:

1. Workplace inclusion: Promote a culture that encourages collaboration, flexibility, and fairness to enable individuals to contribute to their highest potential.
2. Workplace diversity: Attract, retain, and develop a talented and diverse workforce.
3. Employee capability: Enable employees' knowledge and understanding of what is meant by diversity and inclusion.

DE&I are fundamental principles that underpin our capacity to innovate and achieve our goals. AECL is deeply dedicated to fostering an environment that embraces diversity and promotes equity and inclusion.

Our workforce is made up of 54% women, and 8% visible minorities. AECL contributes to many key initiatives to demonstrate and enhance our commitment to diversity, equity, and inclusion, including:

- Participation in the Equality in Energy Transition Initiative's Equal by 30 commitment
- Establishment of an AECL employee-led, executive sponsored, DE&I Working Group
- Completed an organization-wide Cultural Competency Assessment, and established plans for the DE&I working group to draft a roadmap with associated action plans to address some of the key items that were highlighted by employees
- Addition of bi-weekly "DE&I Corner" to AECL's ESG and Sustainability update at all-staff alignment meetings
- Membership and involvement in the Women in Nuclear (WiN) Canada association
- Promoting diversity at the leadership level. Over the last two fiscal years, two out of four external candidates hired onto the executive team have been women. Notably, these two hires are leading the Science, Technology & Commercial Oversight and Nuclear Operations Oversight missions
- Anonymous reporting tool launched, providing an internal reporting mechanism in support of confidential workplace violence, harassment and disclosures
- Creation of AECL's first "Accessibility Plan"
- Offer French language training to all employees, with a core group of employees continuing to participate in Beginner and Intermediate training and promote the use of French in the workplace
- Launched Employee Engagement Survey with the addition of new DE&I questions
- Initiated organization-wide Pay Equity Review

AECL is continuing to make meaningful progress in our diversity, equity, and inclusion initiatives, and the highlights here are built upon the strong foundations we have created within the corporation, as detailed in our [2022 ESG Report](#).

Employee Attraction

AECL recognizes that the success of our operations and objectives is dependent on the expertise, capabilities, and contributions of our employees and contractors. It is crucial for us to attract and retain highly qualified individuals who align with our values and goals.

At AECL, we conduct regular reviews of our total compensation package to ensure competitiveness on both national and international scales. This includes offering a comprehensive benefits package, such as health and wellness benefits and a defined benefit pension plan through the Public Service Pension Plan.

Furthermore, we prioritize the well-being of our employees by providing continuous support through various programs that promote physical, mental, and psychological wellness, including:

- Employee Wellness and Family Assistance Program.
- Virtual health care provider.
- Subscription to a meditation and wellness app.
- Mental Health Action Plan.
- Mental health awareness campaigns, trainings, and awareness sessions.
- Support provided for ergonomic equipment when working from home.
- Flexible hybrid work options.

Our overarching goal is to foster a workplace culture that values and prioritizes psychological health, safety, and well-being by promoting collaboration, inclusivity, and respect.

Reporting Framework Standards Alignment

As AECL continues to improve our ESG performance and disclosures, we keep informed of the rapidly evolving regulatory landscape of ESG reporting and disclosure requirements, in order to better align our reporting with the current requirements that fit our stakeholders' needs.

This includes monitoring and assessing the applicability and impact of the IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and IFRS S2 Climate-related Disclosures standards issued by the International Sustainability Standards Board (ISSB), on AECL’s current and future sustainability reporting strategy.

As a federal Crown corporation, we also continuously monitor the developments in sustainability reporting and disclosure standards specific to the public sector, through the International Public Sector Accounting Standards Board (IPSASB) and Canada’s Public Sector Accounting Board (PSAB).

Progressing in the completeness of our alignment with these standards builds the foundation for AECL to continually improve its ability to adapt and respond to heightened stakeholder expectations, and the changing physical and market environments.

In 2023, we continue to further align our reporting with the Sustainability Accounting Standards Board (SASB) principles and recommendations, and with the Task Force on Climate-related Financial Disclosures (TCFD), while continuing to leverage Global Reporting Initiative (GRI) metrics for additional specific disclosures complementary to SASB or TCFD.

Sustainability Accounting Standards Board

AECL continues to report with reference to the voluntary SASB framework, as outlined under the International Sustainability Standards Board (ISSB) of the IFRS Foundation, for this ESG reporting period. Through a robust analysis of our business model and stakeholder needs, we have determined the industry standard and disclosure topics that are most relevant to our business and have disclosed metrics which we identified as likely to be useful to our stakeholders. As such, this report discloses metrics from the SASB industry standard “Electric

Utilities & Power Generators”, as this is the SASB industry standard most closely aligned with our industry sector. SASB metrics disclosed in this year’s report were prioritized based on relevance to our business model. We understand enhancing our alignment with SASB and ISSB reporting is an important step in our ESG maturity, and AECL is committed to continuing our improvement of data collection and analysis across the organization, to support increasing transparency and standardization of our reporting for our stakeholders.

Task Force on Climate-related Financial Disclosures

AECL is committed to full alignment with the TCFD recommendations, which also forms the foundations for the newly issued IFRS S2: Climate-related Disclosures by ISSB (i.e. both are structured around four key themes: governance, strategy, risk management, and metrics and targets. Read more on the comparison between IFRS S2 and TCFD [here](#). Last fiscal year, we published our inaugural TCFD Climate Resilience report, capturing our progress from 2022. This aligns with the Government of Canada's requirement for all Crown corporations to adopt TCFD standards as part of corporate reporting, with Crown corporations holding more than \$1 billion in assets required to start reporting on their climate-related financial risks by March 2023. AECL has consolidated our TCFD reporting with our ESG reporting in the current year, through integration of Climate Resilience under the TCFD section, as part of our progression in reporting maturity.

Global Reporting Initiative

Our ESG reporting continues to follow GRI metrics for additional specific disclosures complementary to SASB or TCFD, for metrics we deem to be most relevant to our multi-stakeholders. Our approach in selecting GRI metrics achieves alignment with our ESG strategy and our on-going management of each 'strategic differentiator' and 'baseline expectation'. As we continue to mature in our ESG journey, we aim to review and refine these metrics, to reflect updates in the regulatory landscape.



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Abbreviations

Abbreviation	Meaning
AC	Audit Committee
AECL	Atomic Energy of Canada Limited
AOPFN	Algonquins of Pikwàkanagàn First Nation
ANMRC	Advanced Nuclear Materials Research Centre
CANDU	Canadian deuterium uranium
CEDIR	Clean Energy Demonstration, Innovation, and Research
CEO	Chief Executive Officer
CNL	Canadian Nuclear Laboratories
CNIC	Canadian Nuclear Isotopes Council
CSA	Canadian Standards Association
DA	Days away from work
DART	Days away from work or temporary job restrictions or transfers
DE&I	Diversity, equity, and inclusion
ERM	Enterprise risk management
ESG	Environmental, social, and governance
EV	Electric vehicles
FAA	Financial Administration Act
GHG	Greenhouse gas emissions
GoCo	Government-owned, contractor-operated
GRI	Global Reporting Initiative
HESO	Hybrid Energy System Optimization
HRGC	Human Resources & Governance Committee
IFRS	International Financial Reporting Standards

Abbreviation	Meaning
IPSASB	International Public Sector Accounting Standards Board
ISSB	International Sustainability Standards Board
LED	Light-emitting diode
LTRA	Long-Term Relationship Agreement
LTWMF	Long-term waste management facility
MMR®	Micro-Modular™ Reactor
MWh	Megawatt-hour
NMFR	Near miss frequency rate
NPD	Nuclear Power Demonstration
NSDF	Near Surface Disposal Facility
ODCP	Overview Decommissioning and Cleanup Plan
OSH	Occupational Safety and Health
RACI	Responsible, Accountable, Consulted, and Informed
SASB	Sustainability Accounting Standards Board
SMR	Small modular reactor
TCFD	Task Force on Climate-related Financial Disclosures
tCO ₂ e	Tonnes of carbon dioxide equivalent
TRC	Total recordable cases
TRIR	Total recordable incident rate
WiN	Women in Nuclear
ZEV	Zero-emission vehicle

Data Performance Tables

TCFD Index

TCFD Recommended Disclosures		Page #
Governance	Describe the Board's oversight of climate-related risks and opportunities.	41
	Describe management's role in assessing and managing climate-related risks and opportunities.	41-42
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	43-50
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	43-50
	Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C, 1.5°C or lower scenario.	43-50
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	52
	Describe the organization's processes for managing climate-related risks.	52
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	52
Metrics and Targets	Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	53-56
	Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions and the related risks.	53
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	41-42, 52



SASB Industry Standard “Electric Utilities & Power Generators”

Accounting Metric	Category	Unit of Measure	Code	Disclosure
SASB Topic: Greenhouse Gas Emissions & Energy Resource Planning				
(1) Gross global Scope 1 emissions, percentage covered under (2) emissions-limiting regulations, and (3) emissions-reporting regulations	Quantitative	Metric tons (t) CO ₂ e Percentage (%)	IF-EU-110a.1	(1) Total of 30,496 tCO ₂ e* across all sites (2) n/a (3) n/a

Appendix - Data Performance Tables

Accounting Metric	Category	Unit of Measure	Code	Disclosure
SASB Topic: Greenhouse Gas Emissions & Energy Resource Planning				
<p>Discussion of long- and short- term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets</p>	<p>Discussion and Analysis</p>	<p>n/a</p>	<p>IF-EU-110a.3</p>	<p>AECL's commitment to enabling a net-zero transition in Canada encompasses both AECL's ability to accelerate the advancement of decarbonization technologies, and our responsibility to decarbonize our own operations. AECL has a target to be net-zero emissions by 2040, which includes our interim target to achieve a 40% reduction in GHG emissions by 2025, compared to the 2005 baseline. After 2025, we are targeting an additional 20 percent reduction every five years in effort to achieve at least a 90 percent reduction in Scope 1 and Scope 2 GHG emissions by 2040.</p> <p>GHG reduction efforts are focused on Chalk River Laboratories, as all other current AECL sites will be non-material by 2040. Under AECL's oversight, CNL is developing a consolidated carbon neutral strategy to guide the approach needed to achieve net zero at the Chalk River Laboratories. The strategy includes plans to implement significant conservation measures, require net-zero design for new construction and major retrofits, construct and leverage on-site SMRs for clean energy sources, and decommission inefficient facilities. Emissions that cannot be reduced by internal energy efficiency improvements and emissions reductions initiatives will be offset to achieve our net-zero targets. At the end of 2022, we had achieved a reduction in GHG emissions at Chalk River Laboratories by 30 percent* relative to 2005 levels.</p>

Accounting Metric	Category	Unit of Measure	Code	Disclosure
SASB Topic: Air Quality				
Air emissions of the following pollutants: (1) NOx (excluding N2O), (2) SOx, (3) particulate matter (PM10) (4) lead (Pb), and (5) mercury (Hg); percentage of each in or near areas of dense population	Quantitative	Metric tons (t), Percentage (%)	IF-EU-120a.1	(1) NOx: 94,807 metric tons* (2) SOx: Not reportable (3) PM10: 30,686 metric tons* (4) Pb: 0.00008 metric tons* (5) Hg: Not reportable
SASB Topic: Water Management				
(1) Total water withdrawn (2) Total water consumed, percentage of each in regions with high or extremely high baseline water stress	Quantitative	Thousand cubic meters (m ³), Percentage (%)	IF-EU-140a.1	(1) Water withdrawn: 16217.7 m ³ * (2) Water consumed: 41.62 m ³ *
Number of incidents of non-compliance associated with water quality permits, standards and regulations	Quantitative	Number	IF-EU-140a.2	56 incidents*
Description of water management risks and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	IF-EU-140a.3	Through the oversight of CNL, we are working to optimize the use of water and wastewater management practices. Based on 2020-2021 water consumption data at the Chalk River Laboratories site, we will continue to work towards establishing a future reduction target. Our goal is to track and disclose our potable water consumption by 2024 for all major buildings that have been deemed part of the revitalized CNL campus with a defined mission greater than 15 years.

Appendix - Data Performance Tables

Accounting Metric	Category	Unit of Measure	Code	Disclosure
Workforce Health & Safety				
(1) Total recordable incident rate (TRIR), (2) fatality rate, and (3) near miss frequency rate (NMFR)	Quantitative	Rate	IF-EU-320a.1	(1) TRIR: 0.42* (2) Fatality Rate: 0% (3) NMFR: 1.59*
SASB Topic: Nuclear Safety & Emergency Management				
Description of efforts to manage nuclear safety and emergency preparedness	Discussion and Analysis	n/a	IF-EU-540a.2	We recognize the risks of our work, and in line with federal priorities, are committed to managing our nuclear sites with public safety and security taking precedence. AECL is responsible for managing the Federal Nuclear Science and Technology Work Plan on behalf of the federal government, and CNL has also developed two nuclear detection and forensics projects, leveraging work from this program with Defence Research and Development Canada.

Global Reporting Initiative Index

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 2 – General Disclosures		
2-1 Organizational details	<ul style="list-style-type: none"> a. Report its legal name b. Report its nature of ownership and legal form c. Report the location of its headquarters d. Report its countries of operation 	<ul style="list-style-type: none"> a. Atomic Energy of Canada Limited b. 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. c. Chalk River, Ontario, Canada d. Canada
2-2 Entities included in the organization's sustainability reporting	<ul style="list-style-type: none"> a. List all its entities included in its sustainability reporting 	<ul style="list-style-type: none"> a. AECL, CNL
2-3 Reporting period, frequency and contact point	<ul style="list-style-type: none"> a. Specify the reporting period for, and the frequency of, its sustainability reporting b. Specify the reporting period for its financial reporting and, if it does not align with the period for its sustainability reporting, explain the reason for this c. Report the publication date of the report or reported information d. Specify the contact point for questions about the report or reported information 	<ul style="list-style-type: none"> a. 1st April 2022 to 31st March 2023, annually b. 1st April 2022 to 31st March 2023, annually c. December 2023 d. Jeremy Latta, Director Communications and Director of Reporting
2-7 Employees	<ul style="list-style-type: none"> a. Report the total number of employees, and a breakdown of this total by gender and by region 	<ul style="list-style-type: none"> a. Total number of employees: 48 Number by Gender Female: 26 Male: 22 Number by Region Chalk River Laboratories: 27 Ottawa: 16 Port Hope: 1 Whiteshell Laboratories: 3 Remote: 1

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 2 – General Disclosures		
<p>2-9 Governance structure and composition</p>	<p>a. Describe its governance structure, including committees of the highest governance body</p> <p>b. List the committees of the highest governance body that are responsible for decision- making on and overseeing the management of the organization’s impacts on the economy, environment, and people</p> <p>c. Describe the composition of the highest governance body and its committees</p>	<p>a. As a Schedule III Crown corporation, AECL is subject to the Financial Administration Act (Canada) (FAA) which has governance related provisions, including with respect to the appointment of Board members and the Chief Executive Officer who are appointed by the Government under the FAA.</p> <p>b. The Board, and the Audit Committee and Human Resources & Governance Committee, operate pursuant to Charters which are generally reviewed, updated as appropriate, and approved annually.</p> <p>c. All members of the Board are members of the Audit Committee and Human Resources & Governance Committee — except the President & CEO. Other than the CEO, there are no members of the executive team on the Board. All Board members other than the CEO are considered independent (i.e., not part of management).</p>
<p>2-10 Nomination and selection of the highest governance body</p>	<p>a. Describe the nomination and selection processes for the highest governance body and its committees</p> <p>b. Describe the criteria used for nominating and selecting highest governance body members, including whether and how the following are taken into consideration:</p> <ul style="list-style-type: none"> i. views of stakeholders (including shareholders) ii. diversity iii. independence iv. competencies relevant to the impacts of the organization 	<p>a. AECL is subject to the Financial Administration Act (Canada) (“FAA”) which has governance related provisions, including with respect to the appointment of Board members and the Chief Executive Officer. AECL has a Board of Directors each of whom is appointed by the Government, specifically the Governor in Council (Cabinet) by an Order in Council.</p> <p>b. AECL and its Board maintains a skills/ experience matrix which identifies (i, iii) the skills and experiences of the Board members, in addition to gaps. The matrix also considers (ii) language capabilities, diversity and (iv) competencies. This information is provided to Government as part of its formulation of the criteria for selecting the CEO and Chair of the Board, as well as Board members.</p>

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 2 – General Disclosures		
2-11 Chair of the highest governance body	<p>a. Report whether the chair of the highest governance body is also a senior executive in the organization</p> <p>b. If the chair is also a senior executive, explain their function within the organization's management, the reasons for this arrangement, and how conflicts of interest are prevented and mitigated</p>	<p>a. The Chair of the Board is not a senior executive in the organization.</p> <p>b. n/a</p>
2-12 Role of the highest governance body in overseeing the management of impacts	<p>a. Describe the role of the highest governance body and of senior executives in developing, approving, and updating the organization's purpose, value or mission statements, strategies, policies, and goals related to sustainable development</p> <p>a. Describe the role of the highest governance body in overseeing the organization's due diligence and other processes to identify and manage the organization's impacts on the economy, environment, and people, including:</p> <p>i. whether and how the highest governance body engages with stakeholders to support these processes</p> <p>ii. how the highest governance body considers the outcomes of these processes</p>	<p>a. AECL's mission is set by the Government of Canada and is implemented by Management under the oversight of the Board. This oversight includes overseeing the development and implementation of the Corporate Strategy, the ESG Strategy, as well as key policies.</p> <p>b. The Board has oversight of AECL's ESG and climate disclosures and reporting, Risk Management Framework, the Risk Based Audit Plan of Internal Audit, and multiple other documents, all of which have sustainability implications.</p> <p>i. The Board engages with the executive team to support these processes.</p> <p>ii. The Board meets several times throughout the fiscal year to consider and influence these processes.</p>
2-13 Delegation of responsibility for managing impacts	<p>a. Describe how the highest governance body delegates responsibility for managing the organization's impacts on the economy, environment, and people, including:</p> <p>i. whether it has appointed any senior executives with responsibility for the management of impacts</p> <p>ii. whether it has delegated responsibility for the management of impacts to other employees</p> <p>b. Describes the process and frequency for senior executives or other employees to report back to the highest governance body on the management of the organization's impacts on the economy, environment, and people.</p>	<p>a. i. At the management level, AECL has an ESG Committee which is led by two executive Co-Champions.</p> <p>ii. Management is responsible for managing the impacts of the organization on the economy, environment and people with the oversight of the Board.</p> <p>b. The ESG Committee reports to the Board as needed and no less than annually.</p>

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 2 – General Disclosures		
<p>2-14 Role of the highest governance body in sustainability reporting</p>	<p>a. Report whether the highest governance body is responsible for reviewing and approving the reported information, including the organization’s material topics, and if so, describe the process for reviewing and approving the information.</p> <p>b. If the highest governance body is not responsible for reviewing and approving the reported information, including the organization’s material topics, explain the reason for this.</p>	<p>a. The Board reviews and approves AECL’s ESG and climate-related disclosures and reporting, including material topics. These matters are raised to the Board by the ESG Committee.</p> <p>b. n/a</p>
<p>2-15 Conflicts of interest</p>	<p>a. Describe the processes for the highest governance body to ensure that conflicts of interest are prevented and mitigated</p> <p>b. Report whether conflicts of interest are disclosed to stakeholders, including, at a minimum, conflicts of interest relating to:</p> <ul style="list-style-type: none"> i. cross-board membership ii. cross-shareholding with suppliers and other stakeholders iii. existence of controlling shareholders iv. related parties, their relationships, transactions, and outstanding balances 	<p>a. Critical concerns are overseen by the Board through Board meetings which occur quarterly. AECL’s disclosure officer reports quarterly to the Board on matters relating to compliance with the company’s Code of Conduct, including conflicts of interest, and the Public Servants Disclosures Protection Act.</p> <p>b. All Board members are covered by the Conflict of Interest Act (Canada) which is extensive and contains obligations relating to the disclosure and avoidance of conflicts of interest. In addition, Board members are subject to AECL’s Code of Conduct which also addresses the topic.</p>
<p>2-16 Communication of critical concerns</p>	<p>a. Describe whether and how critical concerns are communicated to the highest governance body.</p>	<p>a. Critical concerns are typically communicated via Board meetings which occur quarterly. In addition, there are set recurring annual Board meetings to address items on an off-quarter cycle basis as needed.</p>
<p>2-17 Collective knowledge of the highest governance body</p>	<p>a. Report measures taken to advance the collective knowledge, skills, and experience of the highest governance body on sustainable development.</p>	<p>a. The Board receives education and training periodically as a member of AECL and on its own. The Board has received significant reports on the progress of engagement with Indigenous peoples, as well as training provided internally and from external providers.</p>

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 2 – General Disclosures		
<p>2-18 Evaluation of the performance of the highest governance body</p>	<ul style="list-style-type: none"> a. Describe the processes for evaluating the performance of the highest governance body in overseeing the management of the organization's impacts on the economy, environment, and people b. Report whether the evaluations are independent or not, and the frequency of the evaluations c. Describe actions taken in response to the evaluations, including changes to the composition of the highest governance body and organizational practices. 	<ul style="list-style-type: none"> a. The Government of Canada does not undertake any formal or prescribed evaluation of the Board and its appointed members. However, consistent with good governance practices, the Board and its Committees undertake an annual self assessment of their respective performance with opportunities for open feedback. This assessment is for the benefit of the Board and its functioning. b. The evaluation is not independent as it is a self evaluation, but does allow for independent comments about the participation and performance of Board members. c. The outcome of the evaluation is discussed among the Chair and each Board member, and then overall results are discussed by the Board.

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 3 – Material Topics 2021		
<p>3-1 Process to determine material topics</p>	<p>a. Describe the process it has followed to determine its material topics, including:</p> <ul style="list-style-type: none"> i. how it has identified actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights, across its activities and business relationships ii. how it has prioritized the impacts for reporting based on their significance <p>b. Specify the stakeholders and experts whose views have informed the process of determining its material topics.</p>	<p>a. i. AECL’s materiality assessment involved extensive engagement with AECL’s key stakeholders, both internal and external to the organization. This supported the identification of actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights, across its activities and business relationships.</p> <p>ii. The materiality assessment supported AECL in prioritizing the impacts for reporting based on their significance. To conduct the materiality assessment in an objective manner in alignment to leading practice, AECL worked with a reputable third party, Ernst & Young LLP, to engage stakeholders and report the findings anonymously.</p> <p>b. AECL executives, AECL management, AECL employees, CNL executives, regulatory stakeholders, municipality stakeholders, and private-sector stakeholders were engaged.</p>
<p>3-2 List of material topics</p>	<p>a. List its material topics</p>	<p>a. AECL’s material topics are</p> <ul style="list-style-type: none"> • Decarbonization • Engagement and Reconciliation with Indigenous peoples • Nuclear Medicine • Science and Technology • Radioactive Waste Management and Decommissioning • Community Engagement and Development • Climate Resilience • Health and Safety of Public and Workforce • Enterprise Risk Management • Environmental Management • Cybersecurity • Diversity, Equity, and Inclusion • Employee Attraction

GRI Disclosure	Description	Disclosure
GRI Standard: GRI 3 – Material Topics 2021		
3-3 Management of material topics	<p>a. Describe the actual and potential, negative and positive impacts on the economy, environment, and people, including impacts on their human rights.</p> <p>b. Report whether the organization is involved with the negative impacts through its activities or as a result of its business relationships and describe the activities or business relationships.</p> <p>c. Describe its policies or commitments regarding the material topic.</p> <p>d. Describe actions taken to manage the topic and related impacts, including:</p> <ul style="list-style-type: none"> i. actions to prevent or mitigate potential negative impacts. ii. actions to address actual negative impacts, including actions to provide for or cooperate in their remediation; iii. actions to manage actual and potential positive impacts; <p>e. Report the following information about tracking the effectiveness of the actions taken:</p> <ul style="list-style-type: none"> i. processes used to track the effectiveness of the actions; ii. goals, targets, and indicators used to evaluate progress; iii. the effectiveness of the actions, including progress toward the goals and targets; iv. lessons learned and how these have been incorporated into the organization's operational policies and procedures; <p>f. Describe how engagement with stakeholders has informed the actions taken (3-3-d) and how it has informed whether the actions have been effective (3-3-e).</p>	<p>a.b. ESG, Climate Resilience, and Reconciliation with Indigenous peoples are core tenets of AECL's strategy, which outlines AECL's ambition to invest in its capabilities and environmental duties, drive the future of nuclear in Canada, and facilitate nuclear innovation to benefit the public good.</p> <p>c. AECL has a defined ESG strategy that contains objectives, outcomes and key performance indicators aimed at further integrating sustainability into every aspect of the organization. This strategy was developed in line with the federal government's Greening Strategy and the recommendations of the Task Force on Climate Related Financial Disclosures. AECL will continue to monitor emerging ESG reporting guidance and align to best practice to support the transparent disclosure of its environmental and social efforts, including emissions reductions.</p> <p>d.e.f. Please refer to Our Strategic Differentiators sections of the report, which outlines in detail the actions taken by AECL on Decarbonization, Engagement and Reconciliation with Indigenous Peoples, Nuclear Medicine, Science and Technology, Radioactive Waste Management and Decommissioning, and Community Engagement and Development.</p>

Appendix - Data Performance Tables

GRI Disclosure	Description	Disclosure
GRI 204: Procurement Practices 2016		
204-1 Proportion of spending on local suppliers	<p>a. Percentage of the procurement budget used for significant locations of operation that is spent on suppliers local to that operation (such as percentage of products and services purchased locally)</p>	a. 58%*
GRI 302: Energy 2016		
302-1 Energy consumption within the organization	<p>a. Total fuel consumption within the organization from non-renewable sources, in joules or multiples, and including fuel types used</p> <p>b. Total fuel consumption within the organization from renewable sources, in joules or multiples, and including fuel types used.</p> <p>c. In joules, watt-hours or multiples, the total:</p> <p>i. electricity consumption</p>	<p>a. Non-renewable fuel consumed: 42,600,000 GJ*</p> <p>b. n/a</p> <p>c. i. Electricity consumption: 267,000 GJ*</p>
302-3 Energy intensity	<p>a. Energy intensity ratio for the organization</p> <p>b. Types of energy included in the intensity ratio; whether fuel, electricity, heating, cooling, steam, or all.</p>	a.b. Energy intensity ratio is calculated for all CNL sites and is based on energy consumption within the organization only (not outside of it). A ratio of MJ/m ² was determined by dividing total energy consumption by floor space, with the energy consumption focused on that used within the buildings for heating, cooling, lighting, and processes.
302-4 Reduction of energy consumption	a. Amount of reductions in energy consumption achieved as a direct result of conservation and efficiency initiatives, in joules or multiples.	a. 16 percent* reduction in energy use intensity for Chalk River Laboratories. Energy efficiency projects at the Chalk River Laboratories site achieved emissions savings of approximately 530 tCO ₂ e*

GRI Disclosure	Description	Disclosure
GRI 303: Water and Effluents 2018		
<p>303-1 Interactions with water as a shared resource</p>	<p>a. A description of how the organization interacts with water, including how and where water is withdrawn, consumed, and discharged, and the water-related impacts the organization has caused or contributed to, or that are directly linked to its operations, products, or services by its business relationships (e.g., impacts caused by runoff).</p> <p>b. A description of the approach used to identify water-related impacts, including the scope of assessments, their timeframe, and any tools or methodologies used.</p>	<p>a. The use of water is spread out through numerous buildings and facilities at AECL locations, but can largely be grouped into Service Water (includes domestic use), Process Water, and Fire Water use. Through water use in various nuclear facilities, and radioisotope, chemical and biological laboratories, some level of radiological or non-radiological contamination may occur.</p> <p>b. Stakeholders are brought on as needed. For example, at Whiteshell Laboratories, stakeholders are actively involved in the sampling and monitoring process.</p>
<p>303-2 Management of water discharge-related impacts</p>	<p>a. A description of any minimum standards set for the quality of effluent discharge, and how these minimum standards were determined, including:</p> <ul style="list-style-type: none"> i. how standards for facilities operating in locations with no local discharge requirements were determined ii. any internally developed water quality standards or guidelines iii. any sector-specific standards considered iv. whether the profile of the receiving waterbody was considered 	<p>a. Minimum standards (i, ii, iii, iv) for the operating facilities were established by implementing the requirements of CSA N288.8. Administrative and Action Levels were developed for each site. In addition, non-radiological effluent levels are compared to the Wastewater Systems Effluent Regulations and the CNSC Regulatory Document – 2.9.1. The Guideline targets are also developed from multiple guidelines.</p>

GRI Disclosure	Description	Disclosure
GRI 306: Effluents and Waste 2016		
<p>306-1 Waste generation and significant waste-related impacts</p>	<p>a. For the organization's significant actual and potential waste-related impacts, a description of:</p> <ul style="list-style-type: none"> i. the inputs, activities, and outputs that lead or could lead to these impacts ii. whether these impacts relate to waste generated in the organization's own activities or to waste generated upstream or downstream in its value chain 	<p>a. Waste-related impacts (i, ii) are realized in AECL's and CNL's operations, such as those generated at office, buildings, and laboratories. As AECL's work in Science and Technology increases, new waste management enabling capabilities and facilities are being realized as waste management continues to grow and evolve.</p>
<p>306-2 Management of significant waste-related impacts</p>	<p>a. Actions, including circularity measures, taken to prevent waste generation in the organization's own activities and upstream and downstream in its value chain, and to manage significant impacts from waste generated</p>	<p>a. CNL's Integrated Waste Strategy provides the framework for the lifecycle management of all waste types across AECL sites, with a focus on lifecycle planning and optimization. The Integrated Waste Strategy also ensures that strategies, and associated underpinning for all waste, are maintained to manage waste-related impacts.</p>
<p>306-3 Waste generated</p>	<p>a. Total weight of waste generated in metric tons, and a breakdown of this total by composition of the waste</p> <p>b. Contextual information necessary to understand the data and how the data has been compiled</p>	<p>a. Total weight of waste generated: 7,217.35 metric tons*</p> <p>Total weight of non-hazardous waste generated: 6,958.06 metric tons*</p> <p>Total weight of hazardous waste generated: 259.29 metric tons*</p> <p>b. The waste data for the sites were obtained through direct measurement reports from external service providers, as well as internal waste data forms and logs from site subject matter experts, which are tracked by a waste data tracking system.</p>
<p>306-4 Waste diverted from disposal</p>	<p>a. Total weight of waste diverted from disposal in metric tons, and a breakdown of this total by composition of the waste</p> <p>b. Total weight of hazardous waste diverted from disposal in metric tons</p> <p>c. Total weight of non-hazardous waste diverted from disposal in metric tons</p>	<p>a. Total weight of waste diverted from disposal: 4572.05 metric tons*</p> <p>b. Total weight of hazardous weight diverted from disposal: 0 metric tons*</p> <p>c. Total weight of non-hazardous waste diverted from disposal: 4572.05 metric tons*</p>

GRI Disclosure	Description	Disclosure
GRI 306: Effluents and Waste 2016		
306-5 Waste directed to disposal	<p>a. Total weight of waste directed to disposal in metric tons, and a breakdown of this total by composition of the waste.</p> <p>b. Total weight of hazardous waste directed to disposal in metric tons</p> <p>c. Total weight of non-hazardous waste directed to disposal in metric tons</p>	<p>a. Total weight of waste directed to disposal: 2,645.30 metric tons*</p> <p>Hazardous waste directed to disposal: 259.29 metric tons*</p> <p>Non-hazardous waste directed to disposal: 2386.01 metric tons*</p> <p>b. Total weight of hazardous weight diverted from landfill: 0</p> <p>c. Total weight of non- hazardous waste directed to landfill: 2386.01 metric tons*</p>
GRI 401: Employment 2016		
401-1 New employee hires and employee turnover	<p>a. Total number and rate of new employee hires during the reporting period, by age group, gender, and region</p>	<p>a. Total Number: 6</p> <p>Number by Age Group</p> <p>Under 30: 2</p> <p>30-50: 3</p> <p>Over 50: 1</p> <p>Number by Gender</p> <p>Female: 6</p> <p>Male: 0</p> <p>Number by Region</p> <p>Chalk River Laboratories: 3</p> <p>Ottawa: 3</p>
401-2 Benefits provided to full-time employees that are not provided to temporary or part-time employees	<p>a. Benefits which are standard for full-time employees of the organization but are not provided to temporary or part-time employees, by significant locations of operation.</p>	<p>a. AECL employees are covered under Treasury Board benefits through the Public Service Health Care Plan (PSHCP). These benefits are not controlled by AECL.</p>
401-3 Parental leave	<p>a. Total number of employees that were entitled to parental leave, by gender</p> <p>b. Total number of employees that took parental leave, by gender</p>	<p>a. All regular full-time and part-time employees are eligible for maternity and/or parental leave. Term employees are also eligible for maternity and/or parental leave. Therefore, all employees are eligible.</p> <p>b. Total Number: 1</p> <p>By Gender</p> <p>Female: 1</p> <p>Male: 0</p>

Appendix - Data Performance Tables

GRI Disclosure	Description	Disclosure
GRI 403: Occupational Health and Safety 2018		
<p>403-1 Occupational health and safety management system</p>	<p>a. A statement of whether an occupational health and safety management system has been implemented, including whether:</p> <ul style="list-style-type: none"> i. the system has been implemented because of legal requirements and, if so, a list of the requirements ii. the system has been implemented based on recognized risk management and/or management system standards/guidelines and, if so, a list of the standards/guidelines <p>b. A description of the scope of workers, activities, and workplaces covered by the occupational health and safety management system, and an explanation of whether and, if so, why any workers, activities, or workplaces are not covered</p>	<p>a. The OSH Program is a legal requirement which AECL complies with (its requirements are set out in Canada Labour Code). It includes our OSH Procedure, Preventing Injuries and Illness, Hazard Prevention, Workers' Health and Safety Centre, and Mental Health Action Plan.</p> <p>b. AECL's OSH Program covers all locations and employees. Activities include training, Workers' Health and Safety Centre meetings and inspections, creating and updating procedures. Reporting requirements include Employer's Annual Hazardous Occurrence Report (injury reporting, and in future will include occurrences of harassment and violence in workplace), and Safety & Health Committee Report (commentary on meetings, issues raised, inspections).</p>
<p>403-7 Prevention and mitigation of occupational health and safety impacts directly linked by business relationships</p>	<p>a. A description of the organization's approach to preventing or mitigating significant negative occupational health and safety impacts that are directly linked to its operations, products, or services by its business relationships, and the related hazards and risks</p>	<p>a. Our approach is covered in the AECL Employee Health & Safety Policy, OSH Procedure, Workplace Harassment & Violence Prevention Policy.</p>

GRI Disclosure	Description	Disclosure
GRI 404: Training and Education 2016		
404-2 Programs for upgrading employee skills and transition assistance programs	<p>b. Transition assistance programs provided to facilitate continued employability and the management of career endings resulting from retirement or termination of employment.</p>	<p>b. AECL does not currently have a transition assistance program. AECL provides transition assistance through third party support on an as required basis.</p>
GRI 405: Diversity and Equal Opportunity 2016		
405-1 Diversity of governance bodies and employees	<p>a. Percentage of individuals within the organization's governance bodies in each of the following diversity categories:</p> <ul style="list-style-type: none"> i. Gender ii. Age group: under 30 years old, 30-50 years old, over 50 years old iii. Other indicators of diversity where relevant (such as minority or vulnerable groups) <p>b. Percentage of employees per employee category in each of the following diversity categories:</p> <ul style="list-style-type: none"> i. Gender ii. Age group: under 30 years old, 30-50 years old, over 50 years old iii. Other indicators of diversity where relevant (such as minority or vulnerable groups) 	<p>a. i) Gender: Female 60%, Male 40% ii) Age Group : 100% Over 50 iii) Minority/Vulnerable Groups : 40%</p> <p>b. i) Gender: Female: 54%; Male: 46% ii) Age group: Under 30: 4%; 30-50: 48%; Over 50: 48% iii) Other Indicators of Diversity: 8%</p>
GRI 418: Customer Privacy 2016		
418-1 Substantiated complaints concerning breaches of customer privacy and losses of customer data	<p>a. Total number of substantiated complaints received concerning breaches of customer privacy, categorized by:</p> <ul style="list-style-type: none"> i. Complaints received from outside parties and substantiated by the organization ii. Complaints from regulatory bodies <p>b. Total number of identified leaks, thefts, or losses of customer data</p> <p>c. If the organization has not identified any substantiated complaints, a brief statement of this fact is sufficient</p>	<p>a. Zero b. Zero c. Zero</p> <p>Note: AECL's customers are defined as business-to-business customers.</p>

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