

# Climate Resilience

## Atomic Energy of Canada Limited 2022 Climate Resilience Report

*In alignment to the Task Force on Climate-related  
Financial Disclosures (TCFD) disclosure recommendations.*



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## Message from the President and CEO

I am proud to introduce Atomic Energy of Canada Limited (AECL)'s inaugural Climate Resilience Report. As a federal Crown corporation, AECL is taking action to support Canada in achieving its decarbonization objectives. Our climate-resilience strategy not only considers the impact that different climate scenarios may have on our operations, but also looks at how we can contribute to achieving net-zero emissions by further advancing and enabling existing and future nuclear technologies and innovation.

We have set our own ambitious goals to achieve net-zero emissions by 2040, and are on track to meet our target of a 40 percent reduction in emissions relative to the 2005 baseline at the Chalk River Laboratories (our largest asset and Canada's largest science and technology campus) by 2025.

We operate on the unceded traditional land and territories of Indigenous peoples across the country, and acknowledge with gratitude the importance of developing meaningful, trusting relationships with these communities. We continue to look for opportunities to collaborate, share learnings, embrace traditional Indigenous knowledge and practices, and work towards shared priorities, such as advancing reconciliation and caring for the land, the water, the air, and the creatures that inhabit them.

A carbon-neutral or net-zero future will not be achievable in Canada without nuclear power. By advancing Canada's interests through leading-edge nuclear science and technology, AECL has an important role to play in supporting Canada's decarbonization and net-zero emissions goals. As Canada moves toward a cleaner energy system with greater electricity demands, electricity grids will need an increased supply of stable, reliable, dispatchable energy sources such as hydro, nuclear, and energy storage to complement the expected large increase in intermittent renewable sources such as wind and solar.

Since its inception seven decades ago, AECL has been a recognized global leader in clean energy, especially through its development of Canadian deuterium uranium (CANDU) nuclear reactors, which are deployed in six countries and account for about ten percent of all nuclear reactors worldwide. AECL will continue to support CANDU technology and innovate new technologies in nuclear energy, including small modular reactors (SMRs) and nuclear fusion, as well as hydrogen technologies. As nuclear energy is a stable, reliable energy source, it will also play a critical role in maintaining energy security and supporting communities and countries in achieving energy independence.

Canada is a Tier One nuclear nation. This is a key strategic asset for our country. Few nations have the full spectrum of capabilities and resources in nuclear technology, from mining and fuel manufacturing to world-class research facilities, to decommissioning and disposal expertise. Also, few nations have the regulatory and operating experience to become a leader internationally in nuclear governance in safety, security, and safeguards. AECL is well positioned to help Canada leverage its status as a Tier One nuclear nation to support Canada's, and the world's, climate, and energy security priorities.

**I am pleased to share with you our plans and progress toward climate action and resilience in our inaugural Climate Resilience Report.**



**Fred Dermarkar**, *President and CEO*

About this Report



## About this Report

AECL is a federal Crown corporation responsible for enabling nuclear science and technology, and managing the Government of Canada's radioactive waste liabilities. To deliver on its mandate, AECL works with a private-sector organization, Canadian Nuclear Laboratories (CNL), through a Government-owned, Contractor-operated (GoCo) contracting model. Through the GoCo model, CNL is responsible for managing AECL's sites, while AECL remains the owner of the facilities, assets, intellectual property, and liabilities. This model brings private-sector experience and expertise to AECL's operations.

As the inaugural TCFD report, this document provides an overview of AECL's current progress and alignment to the [TCFD framework](#). TCFD is a reporting framework that includes 11 disclosure recommendations to support companies in articulating their climate resilience through four pillars: governance, strategy, risk management, and metrics and targets.

The data in this TCFD report covers AECL's performance in Canada from April 1, 2021, to March 31, 2022. To align with government-reporting requirements, data gathered to support the Global Reporting Initiative reflects the reporting period from January 1, 2021, to December 31, 2021. These data are marked with an asterisk (\*). References to "AECL", "we", "our" or "Corporation" refer to Atomic Energy of Canada Limited.

This TCFD report has been reviewed and approved for publication by the executive leadership team and AECL's Board of Directors. It builds upon AECL's commitment to advancing its performance with respect to environmental, social, and governance (ESG), with a focus on decarbonization and climate resilience. To learn more about AECL's ESG approach and ambitions, please refer to the [2022 ESG Report](#).

# The Strategic Imperative for Addressing Climate Change

Climate change is one of the most pressing challenges of our time. An effective response to climate change requires collaboration and action across all levels of government, industry, and society. As a federal Crown corporation working to advance Canada's interests through leading-edge nuclear science and technology, AECL recognizes the importance of its role in helping Canada meet its climate objectives.

Globally, the use of nuclear energy has resulted in the avoidance of over 60 gigatonnes of CO<sub>2</sub> over the past 50 years (of which 2.3 gigatonnes were avoided in Canada), totalling the equivalent of nearly two years of global energy-related CO<sub>2</sub> emissions.<sup>1</sup> [Canada's Climate Plan](#) is built to support the Government of Canada's target of net-zero emissions by 2050. The actions the Government of Canada plans to take to achieve this objective include transforming the electricity sector toward one that is entirely comprised of non-emitting sources, including but not limited to nuclear and hydrogen.

The Government of Canada has recently announced its support in advancing nuclear energy technology, and leveraging these technologies in its decarbonization plans.<sup>2</sup> As Canada moves forward on addressing climate change, AECL recognizes the important role that it plays in advancing, demonstrating, and deploying effective energy solutions. AECL's objective is to continue to innovate and advance solutions to provide safe, reliable, and clean energy within Canada and beyond.

<sup>1</sup>[International Energy Agency, 2019](#)

<sup>2</sup>[Natural Resources Canada, 2022](#)







## Governance

AECL is committed to acting on climate-related risks and opportunities, and recognizes its responsibility to reduce the impact of climate-related risks to its operations, and to act upon the opportunities. This responsibility is embedded within AECL's governance structure, and integrated throughout all levels of the organization.

## Board Governance

**AECL's Board of Directors is responsible for overseeing the strategy and direction of the organization, including the management of climate-related risks.**

The Board oversees and approves processes and documents that consider climate-related risks, opportunities, and objectives, such as the risk framework, CNL's annual work plans, the contractor's performance plan, and AECL's own employee-incentive plan. The highest risks are identified by AECL's risk-management processes and reported up to the Board, which has quarterly meetings throughout the year and typically meets ten or more times annually. The Board has played an integral role in AECL's ESG journey, and will continue to be involved throughout the next step of aligning with TCFD. AECL will continue to integrate ESG and climate-related risks into the Board governance structure by confirming and defining Board roles and responsibilities. In 2022, the Board Charter was amended to formally include oversight of AECL's ESG strategy and disclosures, which includes climate-related implications.

## Executive Governance

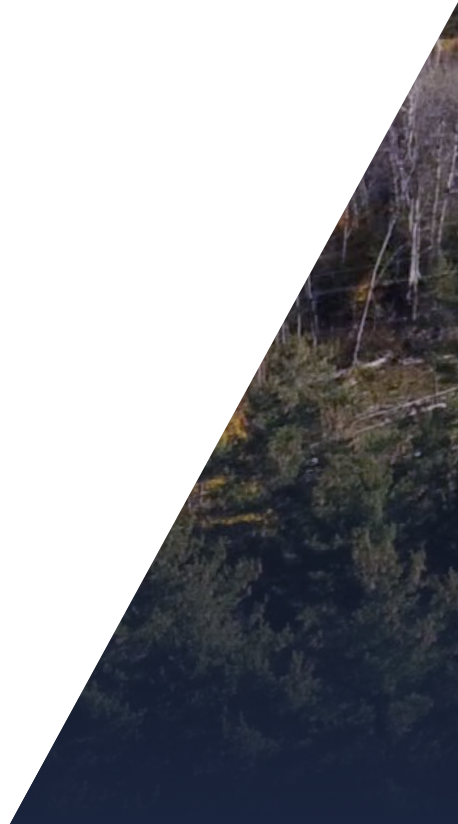
Climate matters are reported to the Board by management drawing on the work of the ESG Committee, which is managed by two executive Co-Chairs appointed by the President & CEO.

The responsibility of climate-related risk management, opportunities, and performance targets are held at the executive level. To further enable climate-related governance and TCFD alignment, AECL has established an internal roadmap which covers key activities, responsibilities, and timelines. It outlines governance milestones related to climate, such as integrating TCFD responsibilities into a Responsible, Accountable, Consulted, and Informed (commonly referred to as RACI) model in 2023, providing climate-specific training to strategy and risk teams in 2023, and intending to expand executive and employee performance-based remuneration to include climate metrics throughout 2023 to 2025.

## Operational Governance

Through the GoCo model, AECL is responsible for overseeing CNL's climate-related risk management processes, strategies, and initiatives.

AECL oversees and provides guidance over CNL's management and operation of AECL-owned assets, including CNL's strategic direction on climate-risk management via AECL's approval of CNL's annual work plans and long-term plans. Through the GoCo model's contractual structure, the achievement of sustainability objectives is connected to annual performance incentives and to the compensation of CNL executives.







## Strategy

Clean energy sources such as nuclear and hydrogen technologies are integral components in reaching net-zero emissions as they are stable, reliable, and secure sources of non-greenhouse gas (GHG) emitting energy.

Nuclear energy, including large nuclear reactors such as AECL's CANDU technology and SMRs, plays an important role in Canadian and global decarbonization strategies, which is why climate-related opportunities and risks are fully embedded into AECL's corporate strategy. AECL's approach to climate action and resilience is centered around the opportunity to support Canada's decarbonization efforts, its respective internal decarbonization efforts, and the resilience of its strategy and operations to climate-related risks.

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## Supporting Canadian Decarbonization Efforts

As Canada transitions to a low-carbon economy to mitigate and prevent further impacts of climate change, nuclear energy will be fundamental. Nuclear energy in Canada, which has to date been produced exclusively through AECL's CANDU reactor technology, currently makes up 14 percent of Canada's energy supply<sup>3</sup> and 59 percent of the energy supply in Ontario.<sup>4</sup> AECL believes that a decarbonization solution for Canada will need to draw upon a wide variety of technologies including large-scale nuclear reactors (such as CANDU reactors), SMRs, and hydrogen technologies. Fulfilling AECL's mandate of successful remediation and decommissioning is also imperative to advancing nuclear energy in Canada. AECL's opportunity to lead in the energy transition relies on its ability to continue to demonstrate effective remediation, safety, and reliability practices.

AECL is uniquely positioned within the nuclear industry to enable and shape the future of the clean energy landscape through the use and application of nuclear science and technology. AECL is pursuing collaboration opportunities with academia, government, and industry peers to support fundamental research and innovation within the nuclear industry. AECL will continue to enable CNL to research and develop nuclear technologies that will contribute to a clean, reliable, and sustainable Canadian electricity grid. These technologies include CANDU reactors, SMRs, and hydrogen technologies.

AECL's Chalk River Laboratories is dedicated toward advancing and innovating nuclear and clean energy alternatives. AECL's role in the nuclear industry is built upon years of experience as a leader in nuclear science and technology. AECL is committed to achieving and delivering on Canada's collective

<sup>3</sup>Statistics Canada (2022) [Electric power generation, monthly generation by type of electricity](#)

<sup>4</sup>CER (2022) [Provincial and Territorial Energy Profiles](#)

interests, needs, and priorities by leveraging its assets and expertise. AECL is enabling CNL to explore the Clean Energy Demonstration, Innovation and Research initiative, a clean energy park at the Chalk River Laboratories which will build upon CNL's clean energy research and advancement to help Canada achieve its net-zero targets. For additional information on AECL's decarbonization and nuclear science and technology initiatives, please refer to pages 15 and 25 of its [2022 ESG report](#).

To continue to strive toward a low-carbon, energy-rich future, AECL is aligned to the following strategies set by the Government of Canada:

### Canada's Climate Plan

Canada's Climate Plan supports the Government of Canada's climate goals, including the objective to transform the electricity sector to entirely non-emitting energy sources. AECL enables CNL to research, develop, and deploy clean energy sources, such as nuclear and hydrogen to support Canada's objectives.

### Canada's SMR Action Plan

The SMR Action Plan strives to fulfill Canada's vision of enabling SMRs to act as a source of safe, clean, resilient, and affordable energy to help Canada and other countries realize a net-zero future. In line with the Government of Canada's SMR Action Plan, AECL is enabling CNL to advance and develop SMR research and technology. CNL is currently working with SMR developers to site a demonstration reactor at an AECL site before 2030. In collaboration with CNL, Global First Power is working toward constructing and operating an SMR at AECL's Chalk River Laboratories site, striving to build the first off-grid SMR in Canada.

### Hydrogen Strategy for Canada

Hydrogen also has the potential to be an integral contributor to Canada's net-zero goals, and the Government of Canada has developed a Hydrogen Strategy to position Canada as a leader in clean hydrogen production, use, export, and technology. To support the Government of Canada's Hydrogen Strategy, CNL is leveraging its decades of knowledge and expertise in nuclear-based hydrogen production and hydrogen-isotope technologies to enhance and expedite hydrogen production and infrastructure projects across the country.





## AECL's Journey to Net Zero

**While continuing to support national decarbonization efforts, AECL remains committed to climate action by reducing the impact of its own operations.**

Targets have been established to achieve net-zero operations at all AECL sites<sup>^</sup> by 2040. Within this objective, AECL is aiming to accomplish a 40 percent reduction in GHG emissions by 2025 from the 2005 baseline established for the Chalk River Laboratories site, and has already achieved a 38 percent reduction\*. AECL recognizes that there is still a long way to go to reach net-zero emissions, and has established and implemented plans to get there. After 2025, the objective is to achieve an additional 20 percent reduction in Scope 1 and 2<sup>+</sup> GHG emissions every five years. The goal is to reduce these emissions by 90 percent by 2040, offsetting the remaining ten percent to reach net zero. AECL intends to do this by implementing an energy and carbon-management system, implementing energy-efficiency initiatives, using more sustainable materials in new buildings, and procuring electric or hydrogen-powered vehicles. AECL is also aligned to the Greening Government Strategy, which outlines the steps and objectives necessary for the Government of Canada to reduce its environmental impact and become a leader in

net-zero, climate-resilient government operations. The Greening Government Strategy is integrated within AECL's operations, including fully aligning the AECL ESG Strategy with the commitments set by the Government of Canada where applicable, such as the commitment toward net-zero emissions.

The carbon emissions of construction material are accounted for when planning and constructing new major infrastructure projects. To date, three AECL buildings have been structurally built with mass timber, a construction material that reduces and sequesters carbon emissions. Moving forward, AECL is prioritizing the use of mass timber in the construction of new buildings where possible. In addition to materials, AECL is overseeing CNL's progress in performing life-cycle assessments and life-cycle cost analyses to manage and reduce carbon emissions at the project level through the Lifecycle Carbon Accounting Standard. The Lifecycle Carbon Accounting Standard is part of the project-gating and -sanctioning process, and will be used as a decision-making tool to manage the emissions of materials chosen for buildings.

<sup>^</sup> Investments are currently targeted at the Chalk River Laboratories site only as it is the most material and GHG-intensive enduring site. To achieve carbon neutrality, emissions will be reduced as close to zero as possible (i.e., to at least 90 percent reduction in Scope 1 and 2), and the remaining emissions will be balanced out with carbon offsetting.

\* Data marked with an asterisk (\*) reflects the reporting period from January 1, 2021, to December 31, 2021.

+ Scope 1 emissions are direct emissions that occur from sources owned or controlled by AECL, and Scope 2 emissions are indirect emissions from the generation of purchased electricity, steam, heating, or cooling consumed by AECL and CNL.

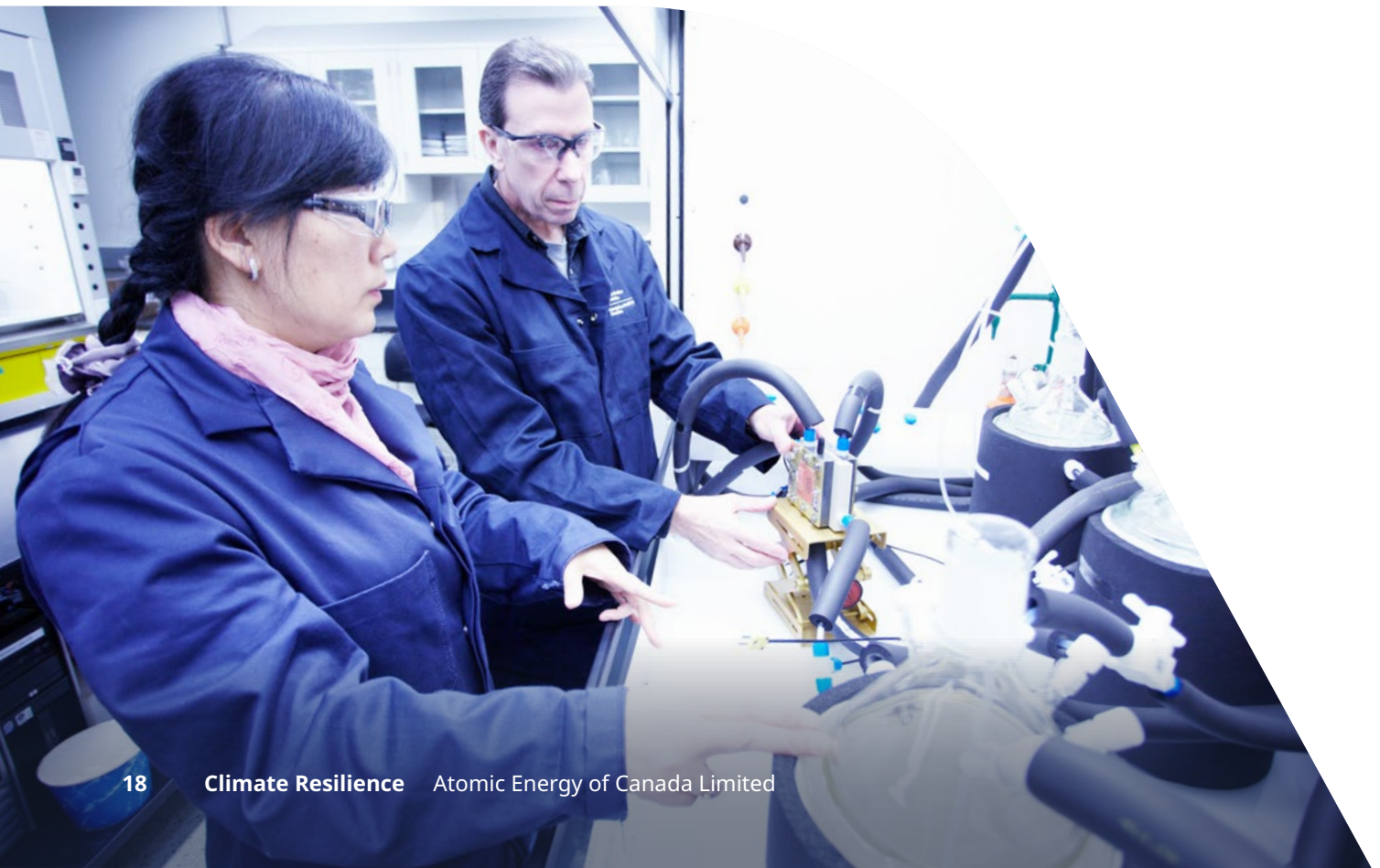
## Climate-scenario Analysis

**AECL is considering the impact and magnitude of climate-specific risks and opportunities through climate-scenario analysis.**

Transition risks and opportunities are integrated within AECL's corporate strategy and decision making, whereas physical risks are managed through CNL. This year's TCFD report largely focuses on the impact and magnitude of physical climate risks, and AECL will continue to advance the depth of analysis over the coming years, in alignment to regulations.

For the purposes of strategic planning, the impact of three climate scenarios for physical risks (low:  $<2^{\circ}\text{C}$ , medium:  $2 - 3^{\circ}\text{C}$ , and high:  $>4^{\circ}\text{C}$ ) and two climate scenarios for transition risks and opportunities ( $1.5^{\circ}\text{C}$  and  $>4^{\circ}\text{C}$ ) over three

timeframes (short term: 2030, medium term: 2050, and long term: 2080) have been considered. Risks include (but are not limited to) flooding, heat, freeze thaw, wind, and wildfire. More analysis needs to be conducted to fully understand and articulate AECL's transition risks. The initial analysis indicates that transition opportunities include technological developments, increasing demand for nuclear energy and hydrogen, and opportunities associated with land management and carbon sequestration. AECL intends to build off this analysis in the coming years, deepening its understanding of its climate-related risks and opportunities.



## Climate-related Risks and Opportunities

AECL has worked with CNL to identify the following climate-related risks to support its climate-resilience approach.

Physical risk	Definition	Magnitude (high, moderate, low)	Impact to AECL
<b>Flooding (fluvial and pluvial)</b>	Increase in flooding events may damage facilities, above-ground infrastructure, equipment, power infrastructure leading to power outages, block access roads causing supply-chain disruptions, and/or may lead to increased maintenance of retention ponds.	High	<p>Some AECL sites have high exposure to flooding under all scenarios. Flood risk is minimized by infrastructure being located 20 meters above the river, and the topography at the Chalk River Laboratories also provides protection.</p> <p>Retention ponds are already experiencing impacts such as faster accumulation of sediment, resulting in increased maintenance requirements.</p> <p>CNL is already managing flooding as a key material risk at AECL sites. As part of its emergency preparedness, a scenario exercise is conducted at the Chalk River Laboratories to prepare for a potential event in which a failure/break in three upstream dams occurs. This helps to increase preparedness for an extreme event that could lead to significant flooding. For instance, the proposed Near Surface Disposal Facility for the disposal of AECL's low-level radioactive waste will be sited well above flood levels (50 meters above the current water levels of the Ottawa River). Its design also considers the risks associated with other natural hazards and extreme events.</p>
<b>Increasing wildfires</b>	Increases in fire frequency and intensity may damage infrastructure and equipment, block road access to sites, and/or may pose human health impacts.	Moderate	Fires have already occurred in areas adjacent to AECL sites. There are many mitigation measures in place, including interventions within the Forest Management Plan, and site staff test and train frequently.

Physical risk	Definition	Magnitude (high, moderate, low)	Impact to AECL
<p><b>Extreme temperatures – heat</b></p>	<p>Increasing demand on heating, ventilation, and air conditioning systems and/or other mechanical/electrical systems, impacts to worker health and safety, and disruptions to laboratory work.</p>	<p>Moderate</p>	<p>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>Impacts of extreme heat events are already occurring, such as implications for worker health and safety, air quality, and insufficient cooling abilities of older buildings. CNL has implemented protocols to ensure worker health and safety is maintained under extreme temperatures – especially for outdoor workers.</p> <p>When laboratories exceed a certain temperature, delays could be caused by an inability to complete analytical chemistry.</p>
<p><b>Extreme wind speeds</b></p>	<p>Projected increases in extreme wind events (e.g., tornados, cyclones) may damage infrastructure, disrupt power distribution and/or cause power outages, and/or impact security systems.</p>	<p>Moderate</p>	<p>Damage to infrastructure could occur as a result of high wind speed or tornado events. AECL's high-risk facilities are built to withstand more severe and infrequent weather events.</p> <p>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>
<p><b>Freeze thaw</b></p>	<p>More wide-ranging diurnal temperature ranges and rapid fluctuations in temperatures may lead to increased maintenance of infrastructure.</p>	<p>Moderate</p>	<p>Extreme cold temperatures are projected to decrease, however, extreme fluctuations in temperatures are currently occurring at some sites, such as the Chalk River Laboratories.</p> <p>Pipe breaks have occurred in the past due to extreme fluctuations in temperatures and extreme cold temperatures, and more extreme fluctuations in temperature can lead to an increase in maintenance of aging infrastructure. Controls are put in place to account for this increase in monitoring and maintenance.</p>

AECL has worked with CNL to identify the following climate-related opportunities as the economy transitions to low-carbon energy sources.

Transition opportunity	Definition	Magnitude (high, moderate, low)	Impact to AECL
<b>Introduction of new technology</b>	Introduction of advancements in nuclear technology including SMRs and other types of reactors.	High	AECL has identified this opportunity as a material ESG topic. It is fundamental to AECL's business, strategy, and mission.
<b>Increasing demand for nuclear energy sources</b>	Increasing funding/pricing on carbon would increase demand for AECL's technologies.	Moderate	There is a growing demand for nuclear energy. AECL will support and enable CNL and other industry and government peers and partners, to continue to research, develop, and deploy nuclear technologies to meet Canadian and global energy needs and decarbonization efforts.
<b>Land-management planning and improvement</b>	Management of AECL's land banks would enhance biodiversity and/or sequester carbon (e.g., forest management, carbon sinks, habitat enhancement).	Moderate	There is an increased focus on biodiversity from stakeholders and recent standard developers.



# Risk Management

Due to the nature of AECL's projects and industry, climate risks are a matter of great importance.

AECL's approach to climate risk and resilience is adapted with CNL from guidance by National Research Council Canada. Climate resilience has already been incorporated into the design and construction of many of AECL's sites and infrastructure projects, and climate-resilience plans are currently being developed for all major projects.

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## Climate-related Risk Management

In the nuclear industry, all risks must be managed with utmost caution, and climate risks are no exception. AECL's enterprise risk management process and risk register are integrated throughout all levels of the organization, with accountability and ownership at the executive level. A comprehensive enterprise risk management process enables AECL to identify, mitigate, and remain informed on risks. Collaboratively with the risk owners, risk processes are reviewed and updated on a quarterly basis. Climate risks are considered in various areas of the current risk-management process, including the incorporation of a specific climate-change risk in the enterprise risk register. AECL is working toward developing a framework to identify, prioritize, and manage climate-related risks in 2023, which will enable further integration of climate-related risks into the risk register and enterprise risk management.



## Oversight of CNL's Risk Management

AECL is responsible for overseeing CNL's risk-management practices. CNL uses the Hazard Identification Risk Assessment tool that assesses changes, frequency, and consequences of risk factors including climate change, as well as environmental reviews that identify and assess environmental and climate-related risks. Climate resiliency is also built into CNL's gating and sanctioning process. CNL implements climate-resiliency planning standards into the decision-making process for all AECL's major infrastructure projects. CNL has also included climate change in the threats/opportunities section of its long-term plan. To identify climate risks and opportunities in the value chain, AECL oversees CNL's adherence to sustainable procurement standards. CNL has established a plan to identify climate-related risks for AECL's Chalk River Laboratories. This is currently specific to the Chalk River Laboratories site, but will support future risk-identification efforts at other AECL locations.

Across all sites and operations, physical climate risks are closely monitored and identified on a project-by-project basis. The Canadian Nuclear Safety Commission, Canada's independent nuclear regulator, requires that severe weather incidences be considered in all emergency response plans. The nuclear industry operates under stringent regulations, requiring that all risks are covered in depth. Any new construction or project is assessed by CNL to identify and address financial impacts, safety impacts, and environmental impacts.



## Climate-related Stakeholder Engagement

Risk management is an integral component of protecting and maintaining the safety of the communities we operate in. AECL supports CNL's Environmental Stewardship Council that brings the Chalk River Laboratories' community stakeholders and CNL representatives together three times a year to discuss and suggest solutions for issues of concern in the community. Community stakeholder engagement at our other sites is supported by host-community committees, such as the Whiteshell Public Liaison Committee and the Port Hope Community Committee. In 2022, AECL engaged eight external stakeholder entities, including host communities to facilitate an ESG materiality assessment, through which climate change was discussed and prioritized.



## Metrics and Targets

Real action is required to address climate change, and AECL is committed to supporting the Government of Canada's climate objectives.

**AECL has set the following climate-related objectives and targets to decarbonize its operations and enable a successful transition to net zero.**

Objective	Targets	Performance
<p><b>Achieve net-zero operations at all AECL sites by 2040</b></p>	<ul style="list-style-type: none"> <li>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"> <li>After 2025, achieve an additional 20 percent reduction in Scope 1 and Scope 2 GHG emissions against the 2005 baseline every five years.</li> <li>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.</li> </ul> </li> <li>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                             <ul style="list-style-type: none"> <li>a) reducing building energy consumption,</li> <li>b) converting GHG-heating and -cooling source(s) to clean energy options, and</li> <li>c) developing and executing plans to retrofit buildings.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>In 2022, a 38 percent reduction in GHG emissions was achieved at the Chalk River Laboratories from the 2005 baseline.</li> <li>Scope 1 emissions in 2021 calendar year: 28,336.12 CO<sub>2</sub>e tonnes*</li> <li>Scope 2 emissions in 2021 calendar year: 1,558.2 CO<sub>2</sub>e tonnes*</li> <li>Long-term plans are currently in draft to be completed by the end of March 2023, 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.</li> </ul>
<p><b>Minimize energy use</b></p>	<ul style="list-style-type: none"> <li>Reduce energy-use intensity by 30 percent by 2035 from the 2015 baseline.</li> </ul>	<ul style="list-style-type: none"> <li>Energy and GHG emissions savings projects at the Chalk River Laboratories site achieved electricity savings of 1,970 MWh/year* (equivalent to 60.03 tonnes of CO<sub>2</sub>e), and natural gas savings of 237,893 m<sup>3</sup>/year* (469.67 tonnes of CO<sub>2</sub>e).</li> <li>Energy use will be metered by 2024 for the Chalk River Laboratories site “keeper”<sup>x</sup> 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.</li> <li>By 2025, all keeper buildings will be incorporated in the RETScreen Clean Energy Management Software, or equivalent.</li> </ul>

<sup>x</sup> 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.

## Metrics and Targets

Objective	Targets	Performance
<b>Light-duty fleet composition of 80 percent zero-emission vehicles by 2030, where supply permits</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>To date, CNL's fleet is comprised of four percent hybrid or electric vehicles. Additional performance information will be disclosed in future reporting.</li> </ul>
<b>New construction and major retrofits to prioritize low carbon emissions and climate resilience</b>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>CNL has issued a standard on life-cycle assessment, which follows the Government of Canada's life-cycle cost analysis for carbon accounting.</li> </ul>
<b>Reduce the environmental impact of structural construction materials</b>	<ul style="list-style-type: none"> <li>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.</li> <li>By 2022, disclose the amount of embodied carbon in the structural materials of major construction projects, based on material carbon intensity or a life-cycle assessment.</li> <li>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.</li> <li>By 2025 latest, conduct whole-building (or asset) life-cycle assessments for major buildings, retrofits, and infrastructure projects with a focus on keeper facilities.</li> </ul>	<ul style="list-style-type: none"> <li>CNL has issued a standard on life-cycle assessment, which follows the Government of Canada's life-cycle cost analysis for carbon accounting.</li> <li>CNL's life-cycle assessment standard has been issued and is being used to account for embodied carbon on some AECL projects.</li> <li>To date, AECL has sequestered and avoided carbon in the construction of three new buildings using mass timber.</li> </ul>

Objective	Targets	Performance
<p><b>Net-zero, climate-resilient lease facilities</b></p>	<ul style="list-style-type: none"> <li>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.</li> <li>Starting in 2023, all new domestic office leases and lease renewals for space over 500 m<sup>2</sup> 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.</li> <li>GHG emissions from the majority of office-floor space leased will be reported by 2025.</li> </ul>	<ul style="list-style-type: none"> <li>In 2023, the emissions and climate resiliency of lease facilities will be accounted for during the process of calculating Scope 3 emissions.</li> </ul>
<p><b>Consider climate resilience in decision making for all major infrastructure and operational decisions</b></p>	<ul style="list-style-type: none"> <li>Apply climate-resilient building guidance being developed by National Research Council Canada or other best practice options where available.</li> <li>Develop climate-resilience plans for all material ongoing operations by the end of 2022, with practical implementation plans.</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>CNL implements climate-resilience planning standards into the decision-making process for all major infrastructure projects. Climate resilience is also part of its gating and sanctioning process.</li> <li>Climate resilience planning that expands beyond national building code standards is underway and nearly complete for asset-management groups.</li> <li>In 2023, AECL plans to provide climate-specific training to strategy and risks teams.</li> </ul>
<p><b>Adopt low-carbon mobility solutions</b></p>	<ul style="list-style-type: none"> <li>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).</li> <li>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.</li> </ul>	<ul style="list-style-type: none"> <li>Performance update to be provided in subsequent TCFD reporting as the target is centered around tracking performance.</li> </ul>

# Looking Forward

AECL is proud of the progress it has made toward Canada's climate goals and in becoming a climate-resilient corporation.

In overseeing and collaborating with CNL, AECL has achieved significant emission reductions, supported fundamental research and innovation within the nuclear industry, and continues to develop nuclear and hydrogen technologies that will support a net-zero future for Canada. At the same time, AECL recognizes that this is only the beginning of the journey to support Canada's climate and decarbonization objectives.

In this inaugural Climate Resilience Report, AECL has focused on the climate-related operational and physical risks and opportunities it has identified to date. Looking forward, AECL plans to identify and assess additional risks and opportunities, such as transition risks and opportunities that are material to the Corporation. AECL will continue to advance the depth of its climate-scenario analysis. In the coming years, and in alignment to evolving regulations, AECL is also looking to quantify its climate-related risks and opportunities. AECL plans to further integrate climate resilience into its operations, including in its governance structure, its formal risk register, and its decision-making processes. Ultimately, AECL strives to embed the financial impact of its climate-related risks and opportunities within its strategic planning and annual planning processes.



# Appendix

## Abbreviations

Abbreviation	Meaning
AECL	Atomic Energy of Canada Limited
CANDU	Canadian deuterium uranium
CNL	Canadian Nuclear Laboratories
ESG	Environmental, social, and governance
GHG	Greenhouse gas
GoCo	Government-owned, Contractor-operated
RACI	Responsible, Accountable, Consulted, and Informed
SMR	Small Modular Reactor
TCFD	Task Force on Climate-related Financial Disclosures



## TCFD Index

Recommended Disclosures		Page
Governance	Describe the Board's oversight of climate-related risks and opportunities.	11
	Describe management's role in assessing and managing climate-related risks and opportunities.	12
Strategy	Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	14-18
	Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	19-21
	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.	18-21
Risk Management	Describe the organization's processes for identifying and assessing climate-related risks.	23-25
	Describe the organization's processes for managing climate-related risks.	23-25
	Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	23-25
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.	27-29
	Disclose Scope 1, Scope 2 and, if appropriate, Scope 3 GHG emissions and the related risks.	27
	Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	27-29

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