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Environment and Climate Change Canada
National Adaptation Strategy

Comments submitted via email to adaptation@ec.gc.ca.

RE: Ontario environment industry's recommendations for Canada's first National Adaptation Strategy

On behalf of Ontario's more than 3,000 environment and cleantech firms, the Ontario Environment Industry Association (ONEIA) is pleased to provide our comments to Environment and Climate Change Canada as part of the Let's Talk Adaptation consultation to inform the development of Canada's first National Adaptation Strategy.

Adaption to climate change is a critical issue and ONEIA welcomes the Government of Canada's leadership in developing a National Adaptation Strategy. The need to adapt to the changes that climate change will inevitably bring and to ensure that Canada is resilient is an issue that ONEIA and its members have been working on for some time.

About ONEIA

Ontario is home to Canada's largest group of environment and cleantech companies. The most recent statistics from the federal government show that Ontario's environment sector employs more than 226,000 people across a range of sub-sectors. This includes firms working in such diverse areas as materials collection and transfer, resource recovery, composting and recycling solutions, alternative energy systems, environmental consulting, brownfield remediation, and water treatment – to name just a few. These companies contribute more than $25-billion to the provincial economy, with approximately $5.8-billion of this amount coming from export earnings.

ONEIA members are committed to engaging with governments as they develop policies and regulations that are consistent with our principles of sound science, sound environment, and a sound economy.

In 2021, ONEIA struck a special working group, under the oversight of our Climate Change Committee, to examine the issue of climate resilient infrastructure. This group was made up of a cross-section of leading experts drawn from the fields of consulting engineering, technology and related fields and included those with decades of experience in areas as diverse as building science, manufacturing, law and public policy, water/wastewater/stormwater, energy systems, mining, transportation, and climate science.

The group paid particular attention to generating specific, practical recommendations about what governments should do to mitigate the threats posed by climate change AND to maximize the economic opportunities that such mitigation presents. The culmination of the group's work, the comprehensive report "Resilient infrastructure. Resilient economy. Resilient future" which provides practical measures to address the challenge of building climate resilient infrastructure, was released in January 2022.

Given its congruence to the development of the National Adaption Strategy, especially in the areas of resilient natural and built infrastructure and strong and resilient economy, we wanted to share some of the insights and recommendations from the report as part of the Let's Talk Adaption consultation. The full report is available at ONEIA Climate Resilient Infrastructure Report.

ONEIA's Business Case for Adaptation:

Proactively addressing the challenge posed by a changing climate by making our infrastructure more resilient will not only safeguard Canadian citizens and communities, it can also deliver tangible additional benefits to Canada's society and economy, including the following:

Prevent economic disruption and higher future costs: Investing in resilient infrastructure will reduce disruptions to the activities that power our economy. Resilient infrastructure creates more secure supply chains, as essential elements such as energy grids, roads and bridges that can withstand or quickly recover from extreme weather events will take on increasing significance as the frequency of climate disruptions increases. Delaying action also comes at a cost, as a $1 investment now saves between $3 and $10 in recovery costs, if and when the infrastructure fails.

Boost investor confidence and competitiveness: A growing consideration for international investors will be whether the jurisdiction that receives their investment has taken measures to protect infrastructure from climate change – and this will be of particular importance to capital-heavy investment. Resilient infrastructure will be another factor in making Canada an attractive international investment destination – and lack of a climate resilient strategy may place us at a competitive disadvantage to those jurisdictions that have made their infrastructure more resilient.

Economic growth and export-ready innovation: Making investments in climate resilient infrastructure will grow Canadian companies, expand the economy and position those companies to export their resilience solutions to other global jurisdictions. Canada along with the provinces and territories can also use their existing procurement budgets to invest in homegrown innovations that support climate resilient infrastructure, giving innovative companies their first "market-making" customer. Canada and the provinces and territories can also reform their regulatory regimes to set standards that will drive investments in climate resilient infrastructure and give Canadian innovations and technological solutions a foothold in the marketplace.

Position Canada as a global leader: Climate resilience can fundamentally change the "brand" and orientation of Canada. Imagine a Canada with new innovative roads that allow for drainage and manage heat, decentralized energy sources and resilient transmission to maintain power, homes and business retrofitted with back-up power sources, or municipalities that have conducted vulnerability assessments and updated their infrastructure to withstand increased stormwater flooding. The path to climate resilience leads to economic benefits for individuals, businesses, and investors, as well as a reputation to support future generations of economic growth and prosperity.

ONEIA's Recommendations for Building Resilient Natural and Built Infrastructure:

Align Building Codes with the Reality of Climate Change

The National Building Code and provincial/territorial codes should be aligned towards the realities of climate change and its impact on building infrastructure to ensure that municipal jurisdictions are provided with the best information, so they in turn can develop policy for investors, builders and owners, and other key stakeholders.

It is significantly cheaper to properly design new builds for the changing climate than retrofitting. It costs 0-5% more in up-front costs to design climate resilient buildings than those not built to meet future challenges. This minimal additional cost will be offset by reduced insurance and recovery costs.

Support and Encourage Building Vulnerability Assessments

The Government of Canada should support the development and adoption of tools and approaches for conducting Building Vulnerability Assessments, and work with the provinces to incorporate these methods into applicable professional codes and practices in collaboration with key stakeholders such as industry and professional associations.

Canada's approach to promoting climate resilient infrastructure must consider the full life cycle of building infrastructure, including design, operations and maintenance. Much of the focus of the engineering community has been on the design and construction of new infrastructure, and there are a number of tools and approaches for mitigating the impacts of climate change, reducing vulnerability and improving climate resilience for new buildings. Canada needs to support the engineering community in integrating the use of more robust and inclusive tools and approaches for the assessment of climate vulnerability of existing infrastructure – enabling the adaptation of infrastructure to accommodate the potential impacts of a changing climate. Other stakeholders in infrastructure (such as owners and operators, tenants, lenders, insurers, investors, users, and neighbours) will benefit from increased certainty and confidence in the resilience and reliability of the asset. Infrastructure resiliency to climate change should be a mandatory disclosure. Transactional due diligence is evolving to include such mandatory disclosures. Engineers, consultants and other advisors need consistent direction (i.e., policy, guidelines, standards) on which all infrastructure stakeholders can consistently and reliably depend.

To provide building owners with the ability to meet the challenge of climate change, it is recommended that they consider undertaking climate resilience assessments on their building infrastructure. These studies include an estimate of the climate impacts on the ability of the building to continue to provide critical services, and on the components of the infrastructure, such as deterioration, damage and destruction. "Critical services" for buildings include but are not limited to power, telecommunications, transportation, fresh clean air, heating and cooling, water, clean and safe working conditions, and structural integrity.

Create Programs and Standards to Achieve a More Resilient Electricity System

Develop programs to support whole building energy consumption and peak demand improvements, including existing building energy audits and the recommissioning of building control systems. Customized programs should be developed to incentivize industrial energy efficiency projects which focus on continual improvement.

Standards setting bodies should improve equipment standards to require higher efficiency designs and technologies.

The National Building Code and provincial/territorial codes should be reviewed and adjusted to increase energy efficiency requirements in the design of new buildings.

The Government of Canada should work with provincial and territorial governments to strengthen the ability of the energy industry to anticipate the effects of climate change and integrate its impacts into its operational and infrastructure planning.

The creation of climate resilient energy infrastructure is critical to facilitating a stable environment in which businesses and industry can thrive. Increasing the energy efficiency of buildings, equipment and processes and helping businesses and industry reduce their energy consumption and peak demands,

would improve the reliability of energy supply. Further energy infrastructure improvements can safeguard power plants, energy storage and distribution systems, to reduce the impact of extreme weather events. Reducing businesses' dependence on energy not only increases their resilience during energy shortages, it also reduces their cost of doing business and enhances their competitiveness.

Support the Development of More Resilient Water Infrastructure Through Digitization Policy

The Government of Canada should work with provincial and territorial governments to create digitization policy for water infrastructure that supports municipal procurement and de-risks investment in new technologies.

A digitization policy for water infrastructure provides current and future benefits as systems face increasing stresses from climate change. These include efficient data collection for monitoring, forecasting and planning, better management of watershed systems (including in times of flooding), addressing sewage overflows, identifying and addressing emerging contaminants using sensor and monitoring systems, and the integration of intelligent systems that can use machine learning to identify abnormalities in operating conditions. All of these benefits will improve water management operations by integrating real-time data for impactful, evidence-based decision-making.

In addition to creating more effective, resilient systems, digitization can increase economic activity, by driving government and/or municipal investment and procurement in innovative Canadian made solutions. By providing support and programs for more education and demonstration of the digital products and what they can do for the operational inefficiency in a utility or industrial facility, Canada could establish itself as a leader by creating incentives through new short-term stimulus programs for decision makers and users to embrace digital infrastructure investment, regardless of any trepidation towards the use of technology.

Ideally, digitization policy should include the development of provincial/territorial guidelines for evidence-based decisions in real-time; which enables governments to spur innovation and technology uptake through regulation without picking winners. Policies for data security to de-risk these investments and help clarify how to implement this digital infrastructure are also needed.

Encourage the Development of More Resilient Transportation Infrastructure by Investing in Research and Data Collection

The Government of Canada should continue to study climate change adaptation interdependencies, invest in developing more robust historical records and climate modeling processes, and help train engineers in dealing effectively with climate uncertainty.

To ensure transportation infrastructure is resilient and adapted to the effects of climate change including extreme weather events, we must look beyond historical information to future trends and what they might mean for Canada. Further investment is required to study the potential impacts of a changing climate on our transportation infrastructure, recognizing that there is much inter-dependency between infrastructure and different regions, and different assets will be impacted in different ways. Work is also required to further develop and establish the tools, methods and guidance required to consistently incorporate climate change considerations in transportation infrastructure engineering design, operations and maintenance work.

Further Efforts to Incorporate Climate Resilience into the Design of Transportation Infrastructure

The Government of Canada should work with provincial and territorial governments to further the development of directives and guidance for incorporating climate resilience into engineering designs for transportation infrastructure projects.

Governments should support and encourage the development and adoption of tools and approaches that promote climate-resilient transport infrastructure, and work with industry and professional associations partners to incorporate these methods into applicable professional codes and practices.

A lack of defined engineering standard of care complicates the use of climate change data when planning and designing climate resilient transportation infrastructure. The absence of practice standards and methodologies for the use of localized climate projection data makes it harder for decision-makers to justify investment in adaptive infrastructure. In addition to defining the engineering standard of care for using climate data, remedies include maintaining and developing more robust historical records and climate modeling processes, and training engineers in dealing effectively with climate uncertainty.

Require Natural Infrastructure on Private and Public Lands

The Government of Canada should work with provincial and territorial governments to require the design and expansion of natural infrastructure on private and public lands to mitigate climate risks and the potential costs of natural hazards and climatic threats to water and existing infrastructure.

Investment opportunities today should aim to mitigate the issues of tomorrow, optimise benefits and efficiencies of the natural processes in question, and balance short-term needs with long-term goals.

Natural infrastructure strategies should improve community resilience to hazards and risks and build linkages between multiple benefits. Some examples might include soil stabilisation and wave attenuation (force dampening) and urban trees.

ONEIA's Comments on Building a Strong and Resilient Economy

Risks to infrastructure from a changing climate pose a challenge to industry, to our cities and dwellings, and to citizens. Yet the challenge posed by climate change offers an opportunity to develop new, resilient design and asset management practices. It also offers an opportunity to develop new ways of funding infrastructure that leverages traditional government spending against private contributions and investment markets.

To help us meet the climate change challenge, we need to unlock innovation and new investments in tools that allow for better understanding, mitigation, and management of climate change risks. Better risk assessments will allow for a systematic and replicable approach that highlights key interactions between key assets and climate. These tools can also be used to inform adaptation and mitigation strategies that provide opportunities for investment by both the government and industry to reduce future costs associated with extreme events and ensure strong supply chains.

While the Government of Canada and many provinces have undertaken work to develop climate risk assessments, they also must find ways to effectively utilize capital that will drive immediate economic growth, provide investment into business innovators and lay the groundwork for future prosperity. Investing in climate resilient infrastructure will have to be based on the proper data that aligns with pre-existing standards. Developing regulations that are not prescriptive but that guide procurement, while allowing businesses to prove their technologies and products, will be a key factor in this regard.

ONEIA's Recommendations for Building a Strong and Resilient Economy:

Incorporate International Guidance into Risk Assessment Work

The Government of Canada should work with provincial and territorial governments to incorporate international guidance into climate risk assessment work to better support climate risk assessment across different industry sectors.

The Institute for Catastrophic Loss Reduction, Climate Risk Institute and Deutsche Gesellschaft für Internationale Zusammenarbeit took ownership of Engineers Canada's Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol in early 2020. The PIEVC Protocol follows ISO 31000:2018 Risk Management standards to address climate risk to infrastructure and can be applied to any type of infrastructure or asset. New ownership of the Protocol will allow for extended training opportunities for engineers and designers to learn how to best handle climate risks in their work.

This international guidance helps to shape and develop climate risk assessment frameworks that are scalable to the various to financial, spatial, and temporal scales required by different industry sectors.

Drive Inter-industry Collaboration

The Government of Canada should work with provincial and territorial governments to establish provincial or regional communities and appropriate regulations to drive inter-industry collaboration to support the shift to more climate resilient infrastructure.

The drive towards improved infrastructure resilience will be most effective and efficient through inter-industry and intra-industry initiatives, rather than through initiatives of individual firms. Such multi-organizational innovation and integrated value chain management can result in selective competitive advantage and improve the overall efficiency of the industry. The implication is that one of the more significant challenges for sustainable infrastructure development will be the management of relationships and effective communication across value and supply chains of all involved organizations and industries. The power of collaboration is great and not often is it effectively utilized on both internal and external fronts. Internal collaboration brings together research, design, engineering and marketing functions. Researchers and designers need to be attuned to changing attitudes towards engineering products and services, and must feel the pulse of the economy, the regulatory environment and the competitive marketplace. This industry collaboration requires policy shift and the support of government.

Promote the Use of Performance-based Asset Management Planning

The Government of Canada should work with provincial and territorial governments to promote the use of performance-based asset management planning that prioritizes optimizations and efficiency of infrastructure systems.

Canada and the provinces and territories should support municipalities and utilities in asset mapping to support long-term investments to increase resiliency, sustainability and innovation. Asset mapping should include measuring asset performance including structural performance, capacity and functionality and relates to the mandated levels of service, community objectives and regulatory requirements including applicable codes and standards.

Unlock Funds and Align Funding with Climate Resilience Goals

The Government of Canada should work with provincial and territorial governments to unlock funds from Green Bonds and other provincial/territorial climate funding initiatives such as the Ontario Carbon Trust where short term investments are required to remedy any deficiencies for which short term risk is not acceptable and risk is assessed with respect to health, safety, economic and environmental impacts.

We have seen some recent investments in municipal infrastructure through new federal and provincial/territorial stimulus packages. Further investments could be made by unlocking these funds and aligning them with the goals of climate resilience. These investments should be based upon proper climate asset mapping and projects need to mitigate the effects of the changing climate.

Short-term investments should prioritize efficiency updates for all systems including water, energy and buildings, enhancing the sustainability of drinking water systems, and improving stormwater and sewage systems to minimize sewage by-pass events.

The Government of Canada should work with provincial and territorial governments to enact measures to unlock funds from Green Bonds and other provincial/territorial climate funding initiatives such as the Ontario Carbon Trust to invest in long-term plans to address future demands including service demand management, alternative innovative services and partnerships based on community growth and vision.

Make capital investments with the goal of robust, sustainable infrastructure for the next 30 years today that will allow us to meet the future challenges of climate change by taking full advantage of technological advancement in Ontario cleantech, environment and business sector innovations.

Once again, we thank the Government of Canada for its leadership in the creating a National Adaption Strategy and for proving this opportunity to provide input into its development. We welcome any additional opportunities to contribute to this initiative and to discuss our recommendations further. Please contact our office at info@oneia.ca or at (416) 531-7884 should you have any questions.

Yours truly,

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