Engineers Canada's Submission to the Government of Canada's Draft Federal Sustainable Development Strategy for Canada – 2019 to 2022

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Overview

The federal government is seeking the views of Canadians regarding the newly drafted Federal Sustainable Development Strategy for 2019 to 2022. The main priority of the draft strategy is to build on the commitments made in the Federal Sustainable Development Strategy for 2016 to 2019, as well as to outline sustainable development strategies and priorities for the coming years, establish targets and goals, and identify potential solutions and actions to achieve them.

The draft strategy for 2019 to 2022 has 13 goals, and each include measurable targets and action plans to support Canada's commitment to implement the environmental Sustainable Development Goals of the 2030 Agenda.

Through this submission, Engineers Canada highlights the need for certain goals of the draft strategy to be expanded to further strengthen and improve sustainability targets, milestones, and action plans. Engineers in Canada drive much of Canada's economy. Natural resources, manufacturing, transportation infrastructure, clean technology, and other sectors rely on the capability of licensed engineers. As one of the top five exporters of engineering services in the world, the expertise of Canada's engineers contributes to both Canadian and international sustainability goals[1]. Engineers Canada believes that there is a strong need to improve federal sustainability goals in a manner that will enhance the participation of several groups across Canada, particularly the engineering profession.

Engineers across Canada work to uphold public safety, the economy, and the natural environment. Given the unique perspectives of engineers in Canada, Engineers Canada recommends the following to improve upon and strengthen the draft Federal Sustainable Development Strategy for 2019 to 2022:

Goal 1: Effective action on climate change

- That section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include consultations with engineers in Canada.
- That Canada's national assessment titled, *Canada in a Changing Climate: Advancing our Knowledge for Action,* be expanded to include consultations with engineers in Canada.

Goal 4: Modern and resilient infrastructure

- That the *Impact Assessment Act* incorporates climate risk and resilience objectives into federal impact assessment processes.
- That engineers be consulted in the development of new standards for infrastructure projects across Canada; particularly in northern and remote communities.

Goal 5: Clean Energy

- That the new net-zero energy ready code requirements for 2020 be expanded to include existing builds.

Goal 10: Clean Drinking Water

- That the federal government support the increased participation of Indigenous peoples in the engineering profession to support better project outcomes; specifically, those related to water and wastewater infrastructure.

[1] Government of Canada. (2013). "Best practices of Canadian engineering and architectural firms." Retrieved February 25, 2019 from: https://www.ic.gc.ca/eic/site/si-is.nsf/eng/ai02291.html.

It is important that the federal government actively engages with and consults Engineers Canada to ensure that the perspectives of engineers are considered during the development of the draft Federal Sustainable Development Strategy for 2019 to 2022.

Goal 1: Effective action on climate change

The first goal of the draft Federal Sustainable Development Strategy for 2019 to 2022 highlights the importance of transitioning Canada to a low-carbon economy. The international community has articulated that addressing climate change is an urgent priority and an opportunity to transition to a global low-carbon economy. Effective action on climate change means reducing our greenhouse gas emissions while increasing our prosperity using renewable energy and green infrastructure.

Support for this endeavour comes from the Pan-Canadian Framework on Clean Growth and Climate Change; Canada's federal-provincial-territorial plan that works to reduce emissions and support resilience and clean growth during rapid climate changes. Engineers Canada remains supportive of the Pan-Canadian Framework on Clean Growth and Climate Change as it works to achieve Canada's international commitments on climate change, while supporting initiatives for a more prosperous economy for future generations. The Pan-Canadian Framework on Clean Growth and Climate Change will have a tremendous impact on major projects in Canada, both in the short- and long-term. However, amendments are required to strengthen this framework.

Recommendation #1: That section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change be expanded to include consultations with engineers in Canada.

Section 4.1 of the Pan-Canadian Framework on Clean Growth and Climate Change focuses on taking steps towards adapting core infrastructure to current and future climate impacts. Specifically, it places a focus on collaborating with stakeholders to build regional expertise and capacity for adaptation that is guided by scientific and Traditional Knowledge.

It is Engineers Canada's view that individuals performing assessments for designated projects under section 4.1 of the Framework must do so with high levels of technical skills and ethics and that they must be held professionally accountable for their actions. Translating knowledge and expertise into action requires resources as well as skilled, professional, and unbiased individuals. Public confidence and safety is at risk when engineers are not involved in the development and implementation of a wide range of legislation and regulations that require the application of engineering principles.

By designating that only professional engineers undertake assessments of engineering work under section 4.1 of the Framework, the federal government can provide assurance to the public that decisions will be made appropriately, and that evidence collected is unbiased and in the public interest. These levels of transparency and accountability will provide the best risk management process going forward to adapt Canada's infrastructure to changing climates. Engineers Canada therefore recommends that section 4.1 of the Framework be expanded to include consultations with engineers.

Recommendation #2: That Canada's national assessment titled, *Canada in a Changing Climate: Advancing our Knowledge for Action,* be expanded to include consultations with engineers in Canada.

The first goal of the draft Federal Sustainable Development Strategy articulates the need to work closely with partners and stakeholders, such as the provinces and territories, as well as Indigenous partners, to meet Canada's climate change objectives. One area of focus to achieve this is the federal government's desire to collaborate with subject-matter experts to develop *Canada in a Changing Climate: Advancing our Knowledge for Action*; a national assessment of how Canada's climate is changing, "the impacts of these changes, and how [Canada] is adapting to reduce risk."[2]

Canada in a Changing Climate: Advancing our Knowledge for Action works to collaboratively develop an understanding of the impacts of climate change and the ways that Canada can adapt to such changes. Engineers Canada believes that *Canada in a Changing Climate: Advancing our Knowledge for Action* should be expanded to include consultations with engineers in Canada. Experienced engineers are available to provide technical expertise and impartial advice on adaptation and mitigation requirements and are available to advise on and help develop sound policies, appropriate processes, and feasible technical implementation strategies that are required in the development of this national assessment.

Goal 4: Modern and resilient infrastructure

Modern and resilient public infrastructure is required to support productive societies, stable sectors, global competitiveness, and increased public confidence and accountability in civil infrastructure projects. The Canadian Infrastructure Report Card delineates that much of Canada's current infrastructure is vulnerable to the impacts of extreme weather events.[3] Extreme weather events such as flooding and wildfires on vulnerable infrastructure can have devastating and immediate impacts on both urban and remote communities, crucial sectors of the global supply chain, and public safety.

Goal 4 of the draft Federal Sustainable Development Strategy for 2019 to 2022 highlights the importance of investing in modern and resilient infrastructure. This includes investments in low-carbon transportation, climate-resilient infrastructure in Canada's northern and remote communities, and clean energy, all of which are intended to protect the natural environment, support healthy communities, and improve the quality of life for all Canadians. Building infrastructure today without adequately addressing and planning for future climate impacts creates vulnerability gaps that will later cause service disruptions and failures, thus increasing costs to government, the private sector, and the public. Engineers Canada is encouraged by the identified medium- and short-term targets in Goal 4 of the strategy; specifically, the investment of $9.2 billion through the *Investing in Canada Infrastructure Program*, as well as the intended investment of $26.9 billion in funding for "green infrastructure initiatives that reduce greenhouse gas emissions that improve climate resilience and environment quality."[4]

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[2] Government of Canada (2018). "Achieving a Sustainable Future: Draft Federal Sustainable Development Strategy or Canada 2019 to 2022" Retried January 8, 2019 from: http://fsds-sfdd.ca/downloads/Draft_FSDS_2019-2022.pdf.
[3] Canadian Infrastructure Report Card (2016). "Informing the future: Assessing the health of our communities' infrastructure." Retrieved January 9, 2019 from: http://canadianinfrastructure.ca/en/index.html.
[4] Government of Canada (2018). "Achieving a Sustainable Future: Draft Federal Sustainable Development Strategy or Canada 2019 to 2022" Retried January 8, 2019 from: http://fsds-sfdd.ca/downloads/Draft_FSDS_2019-2022.pdf.

However, to effectively support Goal 4 of the strategy, the federal government must remain committed to conduct robust and thorough impact assessments on vulnerable civil infrastructure across Canada; particularly in Canada's northern and remote communities.

Recommendation #3: That the *Impact Assessment Act* incorporates climate risk and resilience objectives into federal impact assessment processes.

It is Engineers Canada's view that to promote public confidence in impact assessments, the federal government must ensure that climate risk assessments are consistently applied throughout the life-cycle of a federal project. Assessed risks are dealt with by exploring all adaptation options available. A coherent, comprehensive, and planning-based approach to impact assessments is required within the *Impact Assessment Act*.

The proposed new *Impact Assessment Act* is currently undergoing review by Parliament. Engineers Canada strongly encourages that section 22(1) of the *Impact Assessment Act* be amended to include the requirement that "considerations related to climate resiliency and public infrastructure risk assessments use a methodology similar or equivalent to Engineers Canada's Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol with respect to the designated project." The Impact Assessment Agency of Canada should consider this while conducting an impact assessment.

Between August 2005 and June 2012, Engineers Canada, with funding from Natural Resources Canada and in collaboration with partners from all levels of government and other sectors, formed the Public Infrastructure Engineering Vulnerability Committee (PIEVC) Protocol. The PIEVC Protocol systematically reviews historical climate information and projects the nature, severity, and probability of future climate changes and events. It also establishes the adaptive capacity of an individual infrastructure as determined by its design, operation, and maintenance. It includes an estimate of the severity of climate impacts on the components of the infrastructure to enable the identification of higher risk components and the nature of the threat from the climate change impact. This information can be directly applied to make informed engineering decisions on what components require adaptation as well as how to adapt them; specifically, through design adjustments and changes to operational or maintenance procedures. The Protocol has been used more than 45 times across Canada and internationally.

The Government of Canada announced in June 2018 that as part of the *Investing in Canada Plan*, new major infrastructure projects that are seeking federal funding will be required to undertake an assessment of how their projects will contribute to or reduce carbon pollution, and to consider climate change risks in the location, design, and planned operation of a project. The Climate Lens lists Engineers Canada's PIEVC Protocol as one of the three methodologies for climate change resilience that is consistent with ISO 31000 and it is the only made-in-Canada protocol.

While this investment is an important first step, Engineers Canada recommends that regulations made under paragraph 112(a) include a climate risk assessment process, such as Engineers Canada's PIEVC Protocol, for an initial project description that proponents must file with the Impact Assessment Agency of Canada.

For project impact assessments and considerations to be appropriately reviewed, it is Engineers Canada's view that the Impact Assessment Agency of Canada provide greater flexibility when determining timelines

for project assessments. Timelines are necessary; however, time limits for project reviews should be determined on a project-by-project basis to allow for adequate data collection and analysis, proper consultation with engineers, project complexities to be discovered and addressed, and for potential impacts on the natural environment and public safety to be properly considered.

Recommendation #4: That engineers be consulted in the development of new standards for infrastructure projects across Canada; particularly in northern and remote communities.

Canada's most severe infrastructure gaps can be seen across northern, remote, and Indigenous communities. Although the frequency of climate related disasters is expected to increase, northern, remote, and Indigenous communities are far from prepared to adequately withstand climate related risks, further widening the infrastructure gap in these communities. Permafrost degradation and coastal erosion, as well as changing temperatures, are all negatively impacting communities in these regions of Canada.

Indigenous Services Canada's Departmental Plan for 2018-2019 delineates that the infrastructure deficit in First Nations communities is estimated to be as high as $30 billion dollars.[5] As much as $230 million has also been outlined as the estimated cost to adapt existing infrastructure to climate changes in the Northwest Territories alone.[6] The federal government has recently made historical investments towards Indigenous infrastructure however more work is required to safeguard vulnerable infrastructure in these communities.

Goal 4 of the draft Federal Sustainable Development Strategy for 2019 to 2022 outlines the federal government's support for investing in new standards that support northern infrastructure; specifically, northern transportation infrastructure. Support for this endeavour comes from the Standards Council of Canada's initiative that works to develop additional standards for northern infrastructure projects, known as Phase II of their Northern Infrastructure Standardization Initiative (NISI) (2016-2020), as well as from their Support Resilience in Infrastructure program that seeks to deliver over "30 standardized solutions to boost infrastructure resilience."[7]

It is Engineers Canada's view that the Standards Council of Canada leverage the expertise of the engineering profession in Canada to identify solutions to the critical issues facing northern infrastructure under both the NISI Phase II (2016-2020) initiative and the Support Resilience in Infrastructure program. In serving the public interest, engineers are uniquely qualified and positioned to ensure that Canada's infrastructure is designed and maintained to resist and recover from the impacts of extreme weather and long-term changes to our climate. Engineers are leaders in climate adaptation and infrastructure resilience. By engaging with engineers in Canada for these initiatives, the Standards Council of Canada can ensure that critical infrastructure issues facing Canada's most northern communities are adequately addressed.

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[5] Government of Canada (2018). "Indigenous Services Canada-Departmental Plan 2018-2019." Retrieved February 1, 2019 from: https://www.sac-isc.gc.ca/eng/1523374573623/1523904791460?wbdisable=true.

[6] Standards Council of Canada (2018). "Northern Infrastructure Standardization Initiative (NISI)." Retrieved February 8, 2019 from: http://www.scc.ca/en/nisi.

[7] Government of Canada (2018). "Achieving a Sustainable Future: Draft Federal Sustainable Development Strategy or Canada 2019 to 2022" Retried January 8, 2019 from: http://fsds-sfdd.ca/downloads/Draft_FSDS_2019-2022.pdf.

In Canada, engineering is regulated under provincial and territorial law by the twelve engineering regulators. The regulators are entrusted to hold engineers accountable for practising in a professional, ethical, and competent manner and in compliance with the applicable provincial or territorial engineering act, Code of Ethics, or legal framework in place. Technical and professional standards of conduct are set, revised, maintained, and enforced by the regulators for all engineers in their jurisdiction. Engineers are required to work with the public interest in mind and to uphold public safety.

For this reason, Engineers Canada strongly supports and encourages the direct involvement of engineers in the development of new standards for northern and remote infrastructure in Canada–not only to increase transparency and public confidence in infrastructure projects, but to uphold public safety and accountability on all northern and remote infrastructure projects in Canada. Our profession is ready to work collaboratively with the federal government to provide unbiased advice regarding climate change and its impact on public infrastructure.

Goal 5: Clean energy

Canada has become a leader in clean electricity systems and clean technology has made it easier to bring innovative energy solutions to the forefront. Goal 5 of the draft Federal Sustainable Development Strategy for 2019 to 2022 looks at continuing the progress that Canada has made in clean energy and clean technology and emphasizes the need to support the efforts already made to reduce energy consumption across the country.

In 2015, Canada's total greenhouse gas emissions were 722 megatonnes of carbon dioxide equivalent. One particular area that produced significant amounts of greenhouse gas emissions was Canada's built environment, which includes all forms of buildings. In 2015, it was outlined by Environment and Climate Change Canada that buildings accounted for approximately 12 per cent of Canada's greenhouse gas emissions–a percentage exceeding the greenhouse gas emissions in other sectors like agriculture, electricity, heavy industry, and waste.[8]

Recommendation #5: That the new net-zero energy ready code requirements for 2020 be expanded to include existing builds.

Engineers Canada supports the government's efforts in working towards a cleaner energy system to reduce Canada's greenhouse gas emissions and to achieve a low-carbon economy. To effectively reduce greenhouse gas emissions in the building sector, action needs to occur when it comes to both new and existing buildings. For new builds, policy direction from all levels of government suggests that net-zero energy ready standards could be reached by 2030.

The draft Federal Sustainable Development Strategy for 2019 to 2022 articulates that a short-term milestone in supporting this area of greenhouse gas reductions is to "publish net-zero energy ready code

[8] Environment and Climate Change Canada (2017). Canadian Environmental Sustainability Indicators: Greenhouse Gas Emissions." Retrieved February 15, 2019 from: http://www.ec.gc.ca/indicateurs-indicators/18F3BB9C-43A1-491E-9835-76C8DB9DDFA3/GHGEmissions_EN.pdf.

requirements in 2020, with the goal that provinces and territories adopt a net-zero energy ready model building code by 2030 to enable new buildings to consume as little energy as possible."[9] New builds account for a small portion of buildings in Canada, and addressing only this aspect of the building sector will not be sufficient to achieve a significant reduction in greenhouse gas emissions. Engineers Canada strongly recommends that Goal 5 of the draft strategy be expanded to include energy ready model building codes for both new and existing builds.

Goal 10: Clean drinking water

Goal 10 of the draft Federal Sustainable Development Strategy for 2019 to 2022 emphasizes the vital need for all Canadians to have access to safe drinking water as well as the immediate need to ensure safe drinking water across Indigenous communities. A key priority to support this goal is to "work with First Nations communities to improve on-reserve water and wastewater infrastructure, support repairs to high-risk systems…and support efforts to establish innovative First Nations-led service delivery models."[10]

Engineers Canada takes pride in working alongside First Nations communities and Indigenous engineers to develop local capacity to plan, design, construct, and operate climate-resilient infrastructure. One recent example was Engineers Canada's work alongside the Mohawk Akwesasne Reserve in Ontario to apply the PIEVC Protocol to assess climate risks to their water and wastewater infrastructure in collaboration with the Ontario First Nations Technical Services Corporation. This work included the development of a First Nations toolkit that incorporates climate risk assessments as a part of Indigenous community asset management plans.

Recommendation #6: That the federal government support the increased participation of Indigenous peoples in the engineering profession.

Engineers Canada strongly supports the federal government's efforts, through the draft Federal Sustainable Development Strategy for 2019 to 2022, to build the capacity for Indigenous communities to assess, plan, and manage their wastewater infrastructure. More specifically, Engineers Canada encourages the federal government to work with the provinces and territories to assist in efforts to recruit, train, and retain Indigenous water and wastewater operators and to support the increased participation of Indigenous peoples in the engineering profession.

Engineers Canada is actively working to attract and retain Indigenous peoples to post-secondary engineering education and the profession through several initiatives. Some of these initiatives include our report titled, *Indigenous Peoples' Access to Post-Secondary Engineering Programs: A Review of Practice Consensus*, which is intended to support the development of engineering access programs for Indigenous peoples across Canada at post-secondary institutions.

Including diverse peoples—specifically, Indigenous peoples—in both engineering education and in the profession fosters the capacity to solve complex problems. The benefits of improving the representation of Indigenous peoples and Indigenous ways of knowing in engineering are not limited to innovation. It

[9] Government of Canada (2018). "Achieving a Sustainable Future: Draft Federal Sustainable Development Strategy or Canada 2019 to 2022" Retried January 8, 2019 from: http://fsds-sfdd.ca/downloads/Draft_FSDS_2019-2022.pdf.
[10] *IBID*

includes the creation of a positive voice for the profession in indigenous communities, the development of engineering role models, and better project outcomes; specifically, those related to water and wastewater infrastructure.

Who we are:

Engineers Canada is the national organization of the 12 provincial and territorial associations that regulate the practice of engineering in Canada and license the country's 295,000 engineers. Together, we work to advance the profession in the public interest.