ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

September 22, 2020

The Right Honourable Justin Trudeau
Prime Minister of Canada
Office of the Prime Minister
80 Wellington Street
Ottawa, ON K1A 0A2

RE: Canada's Post COVID-19 Economic Recovery Plan (Long-Term Recommendations)

Dear Prime Minister,

The Ontario Society of Professional Engineers (OSPE) is the advocacy body and voice of the engineering profession. Ontario currently has over 85,000 professional engineers, 250,000 engineering graduates, 6,600 engineering post-graduate students and 37,000 engineering undergraduate students. The engineering profession's commitment to safeguarding the public interest has always been extremely important, and in these uncertain times, there is no exception.

On May 14 and June 11, respectively, we provided you with immediate and short-term recommendations for consideration as part of Canada's post COVID-19 economic recovery plan. On this occasion we would like to present you with long-term recommendations to ensure the economic recovery of our province and country. The long-term actions outlined below are required to sustain the initial economic growth developed by government policy in the last several months. These measures should support technologies that drive efficiencies and sustainably maintain the initial progress achieved by immediate and short-term actions.

Engineers generate wealth for the country, through the development and commercialization of new technologies and by designing innovative and sustainable solutions for the benefit of all Canadians. Engineers also ensure safety and stability, by designing resilient infrastructure and reliable energy and water systems that Canadians rely on daily. During this pandemic, engineers have led the re-design of manufacturing processes to create much needed Personal Protective Equipment (PPE) and ventilators. Engineers use 3D printers to create tens of thousands of face shields and frames for our front-line workers. They are in the med-tech industry working diligently to bio-engineer new medications and a new vaccine to combat COVID-19. In times of crisis, you will always find engineers working tirelessly, in the background, without much accolade, diligently supporting the communities they serve.

Unfortunately, the engineering community has been severely impacted by this pandemic, as thousands of engineering jobs are directly linked to the infrastructure, manufacturing, technology and research and innovation sectors. This has not only affected engineers and engineering graduates, but the entire Ontarian and Canadian economies.

This letter includes several recommendations geared towards sustainable, long-term growth. The COVID-19 pandemic has disrupted virtually every facet of the economy. It has accelerated the pace of digital transformation and it is expected that disruptive technologies such as Artificial Intelligence, 5G, Internet of Things (IoT), and quantum computing, amongst others will play an even more significant role in the coming years. As governments determine how to fund innovation to remain competitive, and realize the benefits of these new technologies, it is imperative that government programs and policies have a strategic focus on equity, diversity, and inclusion.

To ensure preparedness for future events and build an economy that is strong and benefits all people, it is imperative that new funding allocations provide a sustainable benefit for diverse, future generations by ensuring a targeted focus on **building sustainability, investing in talent development and retention, and fostering innovation.**

A resilient economy can be supported by:

- Leveraging Canada's existing assets
- Building the assets that both businesses and workers of the future need to succeed
- Strengthening Canada's competitive advantage

The engineering community believes that Canada's economic recovery plan requires short and long-term investments in key sectors, to propel Ontario and Canada to continued growth in the next months and years to come. These measures should support technologies that drive efficiencies and reflect the work force reality post COVID-19.

OSPE would like to present the following recommendations:

Long-Term Actions

1. Invest in Ontario's Mining Infrastructure, including the Ring of Fire

Mining is the backbone of the Canadian economy, especially due to the resources found in Ontario. The materials and products delivered help Ontarians and Canadians stay safe, meet basic needs, and sustain northern communities. This industry produces around $10 billion in revenues for Ontario per year and employs over 75,000 Ontarians. Mining is also the largest private sector employer of Indigenous Ontarians.

Ontario is the largest producer in Canada of gold, platinum group metals and nickel, and the second largest producer of copper. The province is also a major producer of salt and structural materials. Mining produces key metals for the development of high-tech products, batteries, as well as medical devices, including ventilators and diagnostic COVID-19 test kits.

The Ring of Fire region of Northern Ontario is an immense and untapped economic opportunity. Research done by the Ontario Chamber of Commerce suggests that in the first 30 years of its development, this region could generate more than $25 billion in economic activity across several different sectors in Ontario, including mining, financial services, retail trade, manufacturing, and utilities.

The development of this region will also provide enormous long-term benefits to northern communities through increased economic activity and job creation. To realize the full economic potential of the Ring of Fire, the government must prioritize key investments in core infrastructure, as well as ways to address the needs of the labour market and Indigenous

communities.

The engineering community suggests that the Government of Canada:

a. **Work with the Provincial government to ensure that the Canadian Minerals and Metals Plan (CMMP) achieves all its goals under each of its six strategic directions.**
b. **Ensure resource development is sustainable, by establishing guidelines and frameworks that ensure corporations respect economic, environmental, and social needs of the communities.**
c. **Ensure Indigenous peoples are full partners in the development of the Ring of Fire, where consultations with Indigenous communities begin at the planning stage and continue throughout the mining exploration stages.**
d. **Develop a Youth Training Program, in partnership with OSPE, to teach Indigenous youth the engineering expertise and skills that will allow them to co-develop the different mining sites in ways that respect and integrate indigenous ways of knowing while serving the needs of the people of Canada.**

2. **Ensure all provincial infrastructure projects adhere to the following principles:**

a. Use of a Qualifications Based Selection (QBS) framework

Given Canada's current economic and fiscal situation, it is essential that all public infrastructure investments be transparent and return the greatest possible value for money. By adopting Qualifications-Based Selection (QBS) as its best practice for the selection of consultants, the government can realize the greatest possible value for investment in its infrastructure projects. QBS is a competitive, sound, and fair process that selects those that are the best qualified. Selecting a consultant is one of the most important decisions a client makes. To a great degree, the success of a project depends on securing the professional services firm with the most experience and expertise that best fits the project. Experience demonstrates that selecting a consultant through QBS ultimately provides the best value for money.

QBS was codified as part of the *Brooks Act*, passed into law by the United States Congress in 1972, to protect the interests of taxpayers. The Act stipulates that public owners negotiate engineering and architectural services contracts based on demonstrated competence and qualifications for the type of professional services required and at fair and reasonable prices. Its intent is to discourage public owners from contracting for professional services based exclusively on price. The *Brooks Act* requires a competitive process in which professional services firms submit their qualifications to the project owner. The owner selects the consultant from this pool based on their technical competence, experience on similar projects, managerial ability, personnel to be dedicated to the project, local knowledge, industry reputation and integrity.

This process provides the owner with a clearer and accurate understanding of overall project costs. This process also provides for vigorous and open competition among firms, assuring the owner they are selecting the most capable professionals, while at the same time obtaining a price that is "fair and reasonable."

The Benefit to Canadians:

i. Better value to taxpayers

QBS encourages innovation which in turn drives better value on the infrastructure investment. It provides accountability by ensuring that fees will directly correspond to the level of service and the value of deliverables to be provided. QBS also results in more realistic and predictable budgets and schedules for project expenditures.

ii. Significant life-cycle savings

QBS maximizes the value of the consultant's contribution to a project while reducing the project's life cycle costs. A recent American Public Works Association study shows that using QBS for professional services reduces construction cost overruns from an average of 10% to less than 3% - equivalent to a savings of up to $700K on a $10M capital project.

iii. Benefits small firms

QBS helps small firms compete by providing them a process through which to demonstrate the advantages that they often have over larger firms, including a greater degree of niche market expertise, greater knowledge of the local market and greater involvement of senior level management in the execution of the project.

iv. Promotes communication and technical innovation

Using QBS provides owners the opportunity to fully define the scope of work of the project during the selection process. This results in a project that is thoroughly thought out and fosters innovative, creative, cost-saving, and timesaving approaches to problems. It also fosters better communication and business relationships between owners and proponents as the process makes them partners in the job.

b. Effectively report life-cycle costing

It is essential that all infrastructure projects conducted by the province properly report and consider life-cycle costing. To gain the maximum value for money, all costs incurred over the whole life span of infrastructure projects must be estimated. This will ensure that taxpayer's money is used for infrastructure projects that are able to produce multigenerational benefits for most Canadians at a proper cost.

c. Consider diversity and inclusion

The federal government should continue to work towards the implementation of supply chain diversity policies. This will enable the government to use procurement to advance equity, diversity, and inclusion. The benefits of a diverse supply chain are well documented in research done by the Centre for Diversity and Inclusion and the Conference Board of Canada. Small to medium enterprises owned by women and members of other equity seeking groups provide value to large organizations, reduce the risk of streamlined supplier pipelines, and lead to economic growth. It is imperative that the federal government establish this to ensure that engineering companies led by women and members of equity seeking groups are provided with access to public procurement opportunities.

3. Train engineers for the skills required to succeed in the energy efficiency and green building sector

As Ontario and Canada transition towards a low-carbon future, the energy efficiency and buildings sector will be at the forefront of change. To accelerate this, we need to strengthen the capacity of the existing workforce and attract more people to work in these sectors, especially engineers. This is why OSPE has joined Workforce Coalition 2030, which is a broad cross-sectoral coalition of employers, educators, and practitioners across the construction ecosystem working to collectively impact government policy, business practice, and education.

Engineers believe that sustainability, investing in talent development and retention, and fostering innovation must be the priority of new government funding allocations. As COVID-19 has proven to be a major disruptor to the world order, causing rapid changes to the work force, this will ensure a strong economy that can withstand future catastrophes.

Prior to COVID-19, some of Canada's most strategic sectors, such as infrastructure and transportation were already facing a talent-gap in their engineering departments. Engineering jobs were being given to international firms because Ontario did not have the right talent to get the job done. This is deeply concerning to the economic recovery of the province and country as the success of the economy depends on the ability to match talent with job vacancies and to ensure that this talent can adapt to market demands. This concern has become magnified by immediate demands for more technologically equipped engineers due to changes caused by the current crisis.

The pandemic has also expedited trends such as digitalization and building information modelling that were already transforming building design and engineering. By aligning with Workforce 2030, OSPE looks to accelerate new approaches for rapid up-skilling, growing women's participation in STEM occupations, and emphasizing continuing professional education to build design capacity and deliver enhanced low-carbon building performance. Canada must invest in engineering talent across the country. One of the primary barriers to innovation and growth is the access to a talent pool that possesses the skills needed to adapt to the future economy. While the labour market has faced severe disarray from the pandemic, it also presents an opportunity to re-skill unemployed and under-employed Canadians, with a focus on sectors with sustainable long-term growth.

In 2018, the green building sector directly employed approximately 436,000 workers across 51,000 establishments in Canada within the following key industries: construction, manufacturing, wholesale trade, professional and business services and utilities, all of which employ engineers. Together, these generated $82.6 billion in estimated energy efficiency operating revenues in 2018. In the next 10 years, targeted investment and policies in support of green buildings can lead to 626,080 direct green building jobs in Canada. Engineers are key to planning and executing the green projects that will provide these jobs. Without engineers this sector will not flourish.

However, despite this growth, research from the Environmental Careers Organization of Canada reveals that **employers are generally experiencing difficulties hiring energy managers/directors/consultants, jobs which engineers can perform well.** Currently the energy efficiency workforce is also, on average, less diverse than the national workforce. Just 18% of workers were reported to be female, and 2% indigenous, both figures below the national

average. Proper government funding towards training in this sector can lead to an increase in diversity and equity seeking groups.

Further investment in this sector, would not only help fight climate change, but would also stimulate the economy by creating more jobs for Ontarians across the entire province. This is extremely important now more than ever, due to high unemployment rates experienced due to the COVID-19 pandemic. Ensuring an adequate supply of skilled workers is crucial to supporting the sector's growth.
Government policies that help the energy efficiency sector thrive will lead to a more productive and sustainable workforce, that will help grow the economy while protecting the environment.

Therefore, OSPE:

a. **Supports the call from the Canada Green Building Council and Efficiency Canada to allocate $500 million ($1000 per employee) to access existing training programs, and a further investment of $1 billion to attract and train new people to create energy efficient and green building careers.**

b. **Suggests the Government of Canada, in partnership with the province of Ontario:**

   i. **Ensures an in-depth skills gaps and needs assessment of the energy efficiency sector is conducted,** including the building sub-sector and occupations across the full ecosystem, from design and construction to building operation and management. This would identify the most effective education and training pathways and determine how to update this information regularly and expeditiously as markets and technologies evolve. Such assessment would lead to better understanding of current and future needs.

   ii. **Strengthen training provision** by increasing the capacity of educators and trainers, specifically with emphasis on green literacy basics, low-carbon skills and latest technologies training content.

   iii. **Support training uptake** by aiding new entrants and incumbent workers to build in-demand skills and rapidly up-skill for re-employment, especially work such as building retrofits for energy efficiency and indoor air quality improvements. It is recommended that design and engineering professionals, and skilled trades workers, who have been impacted by COVID-19 pandemic job losses, are given the opportunity for immediate skills training in areas already identified by employers and unions in order to meet urgent demand for low-carbon building skills and associated occupations. Some of these include energy modelling, low-carbon materials, mechanical/electrical and building automation systems, geothermal heat pumps, photovoltaic systems, plumbing and pipefitting, etc.

   iv. **Create incentives to support a strong culture of lifelong learning across Ontario and Canada**, where employers and employees are provided with the tools and resources to up-skill and retrain local talent. This year, OSPE is launching the Ontario Engineering Academy (OEA) to up-skill/re-skill engineering graduates exclusively to meet industry needs in Ontario. Your support of this initiative by mandating companies be responsible for the up-skilling of local

employees is critical for engineering graduates to adequately support Ontario's economic recovery. There is an opportunity for the government to incentivize engineering companies to invest in the professional development of their employees, to ensure that they are equipped with the knowledge and know-how to design and execute based on new realities.

4. **Invest in Small Modular Reactors (SMRs) to create jobs in the nuclear energy industry and provide additional sources of low carbon electricity and heat.**

Nuclear energy in Canada provides 60% of Ontario's electricity supply. The nuclear industry employs thousands of highly educated and skilled people. As new large, centralized nuclear projects are not being built, there is a growing acknowledgement of the need for smarter, simpler, and cheaper nuclear energy. SMRs, defined by the International Atomic Energy Agency (IAEA) as nuclear reactors that generate under 300 megawatts of electricity, are being developed around the world for that purpose.

The Canadian government, together with several provincial governments (Ontario, Alberta, Saskatchewan, New Brunswick) has formed a Small Modular Reactor Roadmap Steering Committee. Canada has long been a leader in developing new nuclear technology and SMR technology has the potential to provide emission free and affordable energy for a low-carbon future. SMRs require lower capital investment and so can potentially compete with other low-cost forms of electricity generation. Due to their efficient, safe, and modular design, SMRs present a real solution for remote energy needs which are currently provided by combustion of oil and gas.

SMR development in Ontario and Canada will create well-paying jobs. Design, manufacturing, servicing, and management of SMRs (along with the associated supply chain) represents a huge potential future industry that Ontario's scientific, manufacturing and engineering communities are ideally positioned to create, as well as export to other markets. The estimated total global export potential of SMRs is approximately $150 billion per year for 2030 to 2040.

There are still some challenges to address with SMRs. The World Nuclear Association has identified licensing costs and waste management concerns as issues to overcome for favourable economics of this technology. The Canadian Nuclear Safety Commission has also noted that more research is required before licensing this technology as reliable and safe.

The Government of Canada should continue developing a long-term comprehensive energy strategy in partnership with other provinces, that includes the development of SMRs.

This strategy should address:

a. **The limited supply of economically recoverable Uranium 235 needed to power SMRs.**
b. **Security and safety concerns.**
c. **Concerns regarding the disposal of long-lived used fuel and other nuclear waste.**
d. **Lack of public knowledge regarding SMRs.**
e. **The need for Indigenous engagement in advance of specific project proposals.**

f. **The unique challenges faced by northern communities due to access and remoteness.**

5. **Invest in 5G deployment through an efficient, flexible, and sustainable approach to spectrum management and network coverage, in consultation with the engineering community.**

COVID-19 has placed an unprecedented demand on communication networks. With more individuals working from home, network bandwidth and reliability have become key issues of concern for all levels of government. The demands on the network are only expected to increase as Canada progresses through its digital evolution in its effort to remain competitive.

The development and deployment of 5G-networks is expected to fuel Canadian innovation. The potential benefits will diffuse across various sectors including but not limited to manufacturing, transportation, agriculture, and healthcare. The features of 5G such as ultra-low latency, high bandwidth and improved machine-to-machine communication will enable a wide range of applications. According to the Canadian Wireless Telecommunications Association, 5G is expected to generate $40 billion of annual GDP by 2026 and create 250,000 new jobs. Disruptive technologies such as autonomous vehicles, artificial intelligence, smart city applications, and quantum computing will be maximized when combined with 5G networks.

In addition, 5G deployment has the potential to significantly improve the digital divide between rural and urban Canadians. The Canadian Government has committed to achieving 95% broadband coverage across the country by 2026. According to a report by Accenture 5G fixed wireless access technology is one way to improve rural connectivity, addressing the challenges related to last-mile network infrastructure, at a lower cost than Fibre-to-the-Premise (FTTP) deployment.

We commend the government for investments and collaboration through initiatives such as ENCQOR 5G and CENGEN to support SMEs to collaborate with the MNEs and 5G tech providers (Thales, Ericsson, etc.) to develop innovative solutions that leverage 5G. However, to materialize those benefits there are challenges regarding spectrum availability and cost, infrastructure, and regulation that must be addressed.

Here we focus on spectrum cost and availability as this is a major governing factor affecting capacity, coverage, and network rollout in most deployments. Deploying a 5G network, like all previous wireless network evolutions, is not just enhancing the existing system, but requires building out an entire new network from the core elements right out to every cell tower and radio. Besides core elements to provide 5G, there will be requirements for greater density of cell sites with backhaul capability and advanced antennas transmitting in specific frequency bands. While the service providers will have to invest massively to build the 5G network, they will also require the bandwidth to communicate with the end-use devices (spectrum) which is in very short supply and must be managed in the most optimal manner.

The Canadian Government has auctioned off spectrum to the highest bidders generating significant revenue. However, as equipment and expertise costs for newer technology grow, while revenues get squeezed due to competition and regulation, providers globally are increasingly challenged to finance the upgrade to 5G. Government spectrum auctions should be structured with these costs in mind.
Some countries have had auctions with time sensitive targets designed to provide opportunities for new and innovative entrants and guidelines on cooperation between providers to stimulate

innovation and provide the best possible service. Best practices that balance the different requirements with fact and science-based technology justification rather than pure commercial considerations must be utilized. A deep understanding of the underlying technology, such as how to slice spectrum across areas and providers, does indeed play a crucial role in how best to structure the regulatory requirement to stimulate 5G availability.

To make 5G a reality, the federal government must:

a. **Consult with the engineering community, who are the technical experts in the field. Without this expertise, 5G deployment will continue to hit various roadblocks and could impact Canada's ability to innovate and compete with other nations.**
b. **Support mobile operators in the deployment of 5G technology by generating cost effective options.**
c. **Work with provincial and municipal governments to facilitate critical infrastructure build as efficiently as possible.**

6. **Support the generation, protection, and commercialization of intellectual property (IP) in small to medium enterprises (SMEs).**

Small to medium-sized enterprises are integral to the economic recovery and long-term prosperity of Ontario and Canada. According to a recent report by the Ontario Chamber of Commerce titled *Small Business, Big Impact,* Canada is home to 1.2 million SMEs (426,490 are in Ontario). SMEs are responsible for employing 90% of Canada's private sector workforce.
As outlined in our short-term letter, due to COVID-19, SMEs are being forced to pivot their operations to adapt to new realities and remain competitive. These enterprises play an important role in fueling innovation through the creation and commercialization of new products, services, and processes. As a result, it has become increasingly important for these companies to invest in research and innovation. These investments are not only critical to the long-term sustainability of organizations but to the overall economic health of the province and its workforce.

A key driver of this innovation potential is the generation, protection, and commercialization of associated intellectual property (IP). As noted in Ontario's IP Report titled Intellectual Property in Ontario's Innovation Ecosystem, Ontario has fallen significantly behind other jurisdictions in its economic growth and prosperity. The report outlines the potential to recover Ontario's economic position through research and innovation with a specific focus on increasing intellectual property assets. As a significant contributor to Canada's GDP, Ontario is well positioned as a major force to drive the country towards economic prosperity through innovation potential.

We commend the federal government's commitment to help Canadian businesses to understand, protect and access intellectual property (IP) through a comprehensive IP strategy. Many engineers and engineering school graduates are either entrepreneurs involved in launching SMEs or otherwise associated with SMEs.

As such we recommend that the government address three key barriers currently preventing all types of SMEs from pursuing the generation, protection, and commercialization of IP:

- Limited access to IP professionals with practical expertise (patent agents or patent lawyers);
- Lack of transparency and uniformity in the process to engage research institutions in IP development and commercialization;

- Cumbersome administrative requirements that impact the access for funding.

Recommendations:

a. **Provide a dedicated fund for small to medium enterprises (SMEs) to access IP expertise alongside their R&D efforts. SMEs require practical IP advice at every stage of the R&D process. This includes providing a foundational understanding of the types of IP protections available for R&D, guidance on IP strategy, and how to capture and leverage IP protections to achieve business goals. The patent filing fee and legal fees associated with this are costly and a deterrent for companies to file. Current government funding programs either do not consider IP a fillable expense or do not encourage the expense as it may be a significant portion of the grant. If the government wants to increase the number of patents filed, especially in Ontario, it must reduce this cost.**

b. **Create a resource that effectively explains the process by which industry can engage with universities and other research institutions to access IP assets for commercialization. Currently, who owns the IP depends on the funding program used to engage with the institution. This means that working with one research institution will not be the same as working with another and there is no transparency regarding who will own the IP until the company is engaged in the process. The negotiation can take time and resources that SMEs do not have the capacity to provide. This resource/tool should provide distinctions between research institutions that enable companies to make informed decisions in the selection of their research partner and navigate the negotiation process once it begins.**

c. **Reduce cumbersome red tape that impedes access to public funding to support R&D**

   i. **Public disclosure of funds available to disperse for that year and an up-to-date version available regularly. This should avoid the filling of applications to programs where funding may no longer be available or become highly competitive as funding is closed to being fully committed. Submitting a funding application requires a time investment that organizations can spend on other activities with higher ROI if funding is no longer available.**
   ii. **Companies undertake strategic relationship building, with members from funding agencies, located within regional innovation hubs. This relationship building process is onerous creating an added burden on SMEs. At times, these relationships may not be well established by the end of the funding cycle, and companies miss the opportunity to access funding for the year. The government must examine this process and determine how best to streamline these activities considering the potential economic burden these place on SMEs.**

7. Support organizations that implement inclusive design principles and the growth of a diverse workforce to enable economic equity and recovery in Canada.

Inclusive Design:

In many ways, COVID-19 has highlighted the need for innovative solutions aided by the implementation of new technologies. Though this provides numerous recommendations regarding nuanced and innovative processes that can generate economic benefits for the nation, the federal government must emphasize and incentivize industry to ensure that the design of these new systems and processes is inclusive and benefits all Canadians.

Inclusion in design is an important component to ensuring that new products, services, and technological advancements serve the needs of all taxpayers. Engineering inclusive designs are a key component that embeds critical considerations/aspects of everyday life into solutions, and existing engineering talent in Ontario and across Canada, is beyond capable of leading industries in this initiative for the immediate, short- and long-term economic recovery of our province. Without this, monetary and discriminatory repercussions could ensue as solutions will likely fall short of objectives, serving some segments of the population well and overlooking others, ultimately negatively impacting the health and prosperity of our country.

As engineers also have an ethical mandate to safeguard the public interest, Canada should engage the engineering community as technological stewards to rebuild the engine that drives the economy.

The engineering community recommends that the Government of Canada:

a. **Require organizations to demonstrate a commitment to inclusive design to access funding. Projects must account for our diverse population, be flexible and adaptable, employ inclusive processes and tools, and have a broad beneficial impact. The requirements outlined in this funding framework should be measurable generating accountability from industry to advance a vibrant, thriving ecosystem across Canada.**

Diverse and Inclusive Workforce:

The impacts of the COVID-19 pandemic on the workforce continues to be assessed, however, it appears that groups that were historically under-represented in the workplace, have once again been most impacted by layoffs amid the pandemic. A report released by the Royal Bank of Canada shows that women's participation in the labour force is the lowest it has been in three decades, with 1.5 million Canadian women losing their jobs or choosing to quit to better support households in the first two months of the pandemic alone.

This is increasingly problematic throughout sectors of the economy, where women, racialized persons, and members of other equity seeking groups remained highly under-represented. For example, based on most recent data women accounted for only 18.1% of engineers in Canada. OSPE's report *Calling All STEM Employers: Why Workplace Cultures Must Shift to Change the Gender Landscape* demonstrated that women in STEM continued to face significant barriers to success. These barriers included being undervalued and disrespected in the workplace, lack of mentorship and sponsorship, and the existence of a gender-wage gap. These barriers were a contributing factor to the trends above and likely mirror the barriers to other under-represented groups. As a result, conditions are now exacerbated for those who remain in the labour market.

OSPE has been an avid advocate of building a diverse and inclusive engineering sector across Canada. We have seen incremental progress made across industry, academia, and government that is now being threatened by the disproportionate impact of COVID-19 on labour force participation. We can quantify the impact on women as this has historically been measured, however, the impact on other under-represented groups with diversity dimensions including race, ethnicity, ability, and sexual orientation cannot be determined, as these trends have not been widely analyzed and studied.

We urge the government to implement policies that encourage the participation of under-represented groups in the workplace by:

a. **Addressing the wage gap.**
OSPE's census analysis revealed that the wage gap between men and women working in engineering was 12% or $11,000 annually in Ontario alone. While the *Pay Equity Act* requires employers to examine compensation practices to ensure men and women receive equal pay for equal work, it is limiting as it only applies to federal regulated workplaces. Further, the wage gap for other under-represented groups should also be assessed and mechanisms similar to those developed for gender, should be introduced. The government must work with the provinces to create accountable and enforceable tools to truly address this issue.

b. **Reducing the burden of unpaid care.**
Research shows that caregivers continue to face the brunt of responsibilities in Canadian homes and has been cited as one reason for women leaving the workforce during the COVID-19 pandemic. Since women's inclusion in the workforce began during the last century, caregiving responsibilities now impacts all professionals regardless of gender – including engineering graduates and engineers – limiting career progression. Work with provinces to improve access to affordable and quality childcare and eldercare to facilitate the participation, attachment, and retention of professionals in the labour market. Specifically, as the population of senior citizens is expected to double to 4.5 million in Canada by 2041, it is important that the governments implement programs to support all caregivers, perhaps through tax credits, that facilitate household outsourcing of child and elder care.

c. **Investing in robust labour market analysis.**
In a data driven economy it is imperative that the provincial government continue to make investments in data collection, analysis, and evaluation. For the Science, Technology, Engineering, and Math (STEM) sectors, most data pertaining to the unique experiences of equity seeking groups in the Canadian labour market focuses on gender. This remains consistent during the current crisis. It is therefore important to expand labour market analysis to be more inclusive and to ensure that reliable data is available to inform both private and public sector responses to the barriers impacting all underrepresented groups in engineering and other STEM professions. The federal government can facilitate this through funding departments to address data gaps.

d. **Encouraging diverse and inclusive workplace practices.**
Organizations must demonstrate a real commitment to diversity and inclusion through their workplace practices to access public funding. A revision of current funding

frameworks to include specific measurable requirements from organizations seeking to access public funding should be included to ensure accountability. We encourage the government to look at workplace policies and practices, representation, commitment to inclusive design and/or diverse supply chains when determining eligibility.

OSPE believes that these recommendations are essential for the economic recovery of our province. We look forward to working with the government to further develop these recommendations. If you have any additional questions please contact Stuart Atkinson, OSPE Policy and Government Relations Lead at satkinson@ospe.on.ca or 416-223-9961 ext. 225.

Yours sincerely,

Réjeanne Aimey, P.Eng.
Chair and President
Ontario Society of Professional Engineers

Sandro Perruzza
Chief Executive Officer
Ontario Society of Professional Engineers

2020033

CC:

Hon. Chrystia Freeland, Deputy Prime Minister and Minister of Finance
Hon. Mona Fortier, Minister of Middle-Class Prosperity and Associate Minister of Finance
Hon. Catherine McKenna, Minister of Infrastructure and Communities
Hon. Seamus O'Regan, Minister of Natural Resources
Hon. Jonathan Wilkinson, Minister of Environment and Climate Change
Hon. Navdeep Bains, Minister of Innovation, Science and Industry