July 30, 2021

Hon. Monte McNaughton
Minister of Labour, Training and Skills Development
14th Floor, 400 University Avenue,
Toronto, Ontario M7A 1T7

RE: Consultation by Ontario's Workforce Recovery Advisory Committee (OWRAC)

Dear Minister McNaughton and esteemed members of the committee,

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.

As Ontario looks to adapt and thrive in a post-pandemic reality, we urge the province to consider the critical role that engineers play in fuelling economic growth while safeguarding the public interest. Engineers generate wealth for the province, through the development and commercialization of new technologies and by designing innovative and sustainable solutions for the benefit of all Ontarians. Engineers also ensure safety and stability, by designing resilient infrastructure and energy and water systems that Ontarians 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.

To build an economy that is strong and cultivates top talent it is imperative that the government focus on **building sustainability, investing in talent development and retention, and fostering innovation.**

OSPE would like to present the following recommendations to ensure economic recovery, competitiveness, and supporting workers.

1. **Make strategic investments in infrastructure and ensure all provincial projects adhere to the following principles:**

The Ontario Government will need to make significant investments in infrastructure in the coming years to ensure both renewal and growth. These investments will fuel job creation across multiple sectors, including the engineering sector. However, for the best possible

outcomes, both from a job creation and cost savings perspective, the following must be carefully considered:

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

Given Ontario'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 engineering consultants and other service providers, 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. Choosing an engineering 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 an engineering consultant through QBS ultimately provides the best value for money.

The Benefit to Ontarians:

i. Better value to taxpayers

QBS encourages quality and 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 time saving 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. Implement diversity and inclusion

The provincial government should implement supply chain diversity policies. This will enable the province 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. These policies will also enable job creation and the retention of top talent within the province of Ontario. For both competitiveness and economic recovery, it is imperative that the provincial 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.

2. 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 building sectors 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.

Prior to COVID-19, some of Ontario'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 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.

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 Ontarians, 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.**

Further investment in this sector, would not only help fight climate change, but would also stimulate the economy by creating more jobs for Ontarians. 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, we suggest the Government of Ontario:

a. **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.

b. **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.

c. **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 the 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.

d. **Create incentives to support a strong culture of lifelong learning across Ontario**, where employers and employees are provided with the tools and resources to up-skill and retrain local talent. OSPE launched 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. In addition, this will align with changes made by Professional Engineers Ontario, which will instate mandatory continuous professional development for engineers in the province.

e. **Provincial funding should mirror the type of funding that the government destined to preparing people for careers in the Auto and Advanced Manufacturing Sectors.**

3. **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.

Ontario has signed a Memorandum of Understanding with several different provinces committing to collaborate on the development of SMRs. SMR development in Ontario 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 Ontario should continue to include the development of SMRs as part of a long-term comprehensive energy strategy in partnership with other provinces and the federal government.

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.**

4. **Establish an Ontario Critical Minerals Research and Market Development Council within Ontario's Critical Minerals Strategy**

OSPE is pleased that the Ontario Government is moving forward with the implementation of a Critical Minerals Strategy. With an abundance of minerals, Ontario is well positioned to become a global supplier, producer and manufacturer of different minerals. The development of a robust critical minerals strategy has the opportunity of creating jobs, investment and economic development, while still supporting the transition to a low-carbon economy.

Ontario has a strong mining, materials and manufacturing industry and a well-developed chain of supply and service companies. Ontario must show the global investing community that it has

a serious, sustainable plan to develop these resources appropriately. This means having a framework that understands the need to consult appropriately and engage with Indigenous and non-Indigenous communities, as well as industry partners. This framework should also demonstrate capability to develop the required infrastructure to develop and process these critical mineral deposits.

Ontario's global competitiveness in the area would be strengthened by further investment in mining and exploration, ideally with the establishment of an **Ontario Critical Minerals Research and Market Development Council.** This council should be dedicated to matters pertaining to research, development, design, consultation, innovation, and investigation in, and commercialization of critical minerals. This would lead to value added products made in Ontario.

5. **Conduct an external review of any business-related professional regulators and/or designated authorities**

This review should be conducted to ensure that the 8 elements of Right-touch Regulation are being applied and these organizations are focused on their regulatory mandates. The United Kingdom's Professional Standards Authority established a standard for Right-touch Regulation. There are eight elements that sit at the heart of Right-touch regulation. These are:

- Identify the problem before the solution
- Quantify and qualify the risks
- Get as close to the problem as possible
- Focus on the outcome
- Use regulation only when necessary
- Keep it simple
- Check for unintended consequences
- Review and respond to change.

By requiring self-regulated and designated authorities to apply these 8 elements, the Government of Ontario is ensuring licenced professionals have been effectively vetted and assessed to be competent and in compliance with established best practices, standards, and codes of practice. This will increase business confidence when hiring licenced professionals and eliminate undue regulatory burdens on both individuals and businesses, to ensure that any funds paid to these regulators/designated authorities are uses solely to fulfill their regulatory duty.

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

All 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.

Since the onset of the COVID-19 pandemic, 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 also 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 the province'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.

We commend the government's recent announcement to develop a Made-in-Ontario Intellectual Property Action Plan, to ensure that the social and economic benefits of research and innovation are incentivized and retained within the province. 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

The Government of Ontario should:

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 in Ontario it must make this process more affordable by assisting with the cost of IP filing.**

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, the owner of the IP is dependant on the funding program used to engage the institution. This means that working with one research institution will not be the same as working with another leading to an initial lack of transparency regarding who will own the IP until the company is engaged in the process. The negotiation can also take time and resources that SMEs do not have the capacity to provide. A resource/tool should be developed to provide distinctions between research institutions that will enable companies to make informed decisions in the selection of their research partner and assist in navigating the negotiation process once it begins.**

c. **Work with the federal government to reduce cumbersome red tape that impedes access to public funding for R&D efforts by implementing the following:**

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 places on SMEs.**

d. Provide incentives for Canadian start-ups and SMEs to stay in Canada by supporting a robust funding ecosystem.

7. Invest in growing Ontario's commercial drone industry

Remotely Piloted Aircraft Systems (RPAS), also known as drones, represent an emerging trend in the development of aircraft and the use of our nation's airspace. While the basic technology of teleoperated flying devices has existed since the early 20th century, advances in electronic hardware, robotics software, and data analysis have created the drones we see today. Removing the need for a pilot, RPAS can be built in a much smaller form, allowing it to be dedicated to carrying payload or collecting data. Multi-rotor RPAS can tightly navigate around infrastructure or remain stationary for the purpose of data collection, while fixed wing RPAS can collect data or transport goods over large distances.

The development of RPAS presents a significant market opportunity due to their unique value. RPAS allow for the automation of aerial operations, while drastically reducing the required weight and complexity of aircraft by removing any crew. This can significantly reduce the cost of an aerial operation and enable new commercial services that would have previously been unprofitable. While currently Canada does not rank in the top markets for this emerging industry, there is widely untapped potential in providing services for the agricultural industry ($40 billion market), natural resource industries ($144 billion market), infrastructure and utilities ($220 billion market), construction & heavy industry ($143 billion market), as well as a host of other industries such as insurance, media, and public safety

Ontario has developed into an international hub in several fields such as landing gear, business jet aircraft, and avionics systems. The growth of the aerospace industry in the province will be predicated on leveraging current R&D to create new clusters of expertise in emerging technologies.

Ontario has several strengths that could one day make it a hub of RPAS expertise: world class academic research, a well-structured regulatory framework, and significant support and funding mechanisms for R&D.

Nonetheless, the province must adopt a forward-thinking approach to policy to support this nascent industry. As such:

a. **Government and industry-led non-profits must collaborate to build a shared vision focused on enabling the automation and increase in the capacity of RPAS.**

b. **Research efforts in Ontario should be coordinated, and the various adjacent technological fields categorized and mobilized towards the future needs of the industry, building expertise in niches such as AI enabled data analytics.**

c. **To further the technology transfer, RPAS should be better represented in province wide efforts such as the DAIR hub and OCE R&D programs.**

d. **Ontario's strong network of colleges should be mobilized to bridge the gap in the validation and integration of maturing drone technology.**

e. **Government-supported pilot programs should be developed to bring technology providers and clients together in developing advanced operations.**

f. **Commercial operations should be better standardized, and commercial operators qualified through a third-party with support from client industries and government.**

g. **Regulators should share with industry and the public a clear roadmap for the integration of automated aircraft into our national airspace.**

6. Support the growth of a diverse workforce to enable economic equity and recovery in Ontario.

The impact 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 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 12.8% of engineers in Ontario. *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. A competitive economic recovery will require the attraction and retention of top talent to key sectors of the economy such as engineering. Without diverse voices, Ontario is bound to fall behind, lagging on innovation and the ability to compete in new markers. Intercultural competence, creativity, innovation, and productivity are only some of the reasons that Ontario must ensure it has a diverse and inclusive economy.

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. Ontario has introduced robust legislation intended to tackle the gender wage gap through the *Pay Equity Act*, however, there is an insufficient accountability mechanism within this legislative tool. Further, the wage gap for other under-represented groups should also be assessed and mechanisms similar to those developed for gender, be introduced. The government must 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. Investing in access to affordable and quality childcare and eldercare could be an important factor in determining 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 government implement programs to support all caregivers.

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.

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 Andrea Carmona or Stuart Atkinson, OSPE Policy and Government Relations Leads at advocacy@ospe.on.ca.

Sincerely,

Mark Frayne, P.Eng.
President & Chair
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