



Pre-Budget Submission to the
Standing Committee ~ Finance and Economic
Affairs Department
Ministry of Finance
January 29, 2015

ABOUT OSPE

The Ontario Society of Professional Engineers (OSPE) is a member-interest, advocacy organization. We are the voice of Ontario's engineers, supporting, representing and advancing their interests and promoting engineering excellence for the benefit of the public. We represent engineers who work in several of the most strategic sectors of Ontario's economy.

OSPE was formed in 2000 after members of Professional Engineers Ontario (PEO) voted to separate regulatory and advocacy functions into two separate organizations. Thus, PEO continues to conduct strictly regulatory activities and OSPE advocates for issues impacting engineering on behalf of all Ontario engineers.

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EXECUTIVE SUMMARY

The Ontario Society of Professional Engineers (OSPE) appreciates the invitation to participate in the 2015 Standing Committee on Pre-Budget Consultations. Engineers, and the work that OSPE does, plays a central role in virtually every aspect of modern life- from the phones we communicate with, to the highways and roadways that we travel on, to the buildings that we work in. OSPE believes that we should have a voice at the table that reflects that central role. Engineers bring an innovative, evidence-based perspective to problem-solving and our submission reflects the profession's broad importance to the economic well-being of the province.

At a glance, key points from our submission include:

Infrastructure

- OSPE supports the continuation of over \$130 billion in investment to support roads, bridges, transportation, transit, health centres, educational institutes and all aspects of infrastructure, as mentioned in last year's budget.
- The intersection of climate change and public infrastructure represents a critical issue that cannot be ignored by policy makers.

Environment – Climate Change

- OSPE believes that prioritizing economic growth and addressing climate change are not mutually exclusive options.
- We strongly recommend that government take decisive action to bring to reality the climate change vulnerability assessments that were a central component of the Ontario government's 2011 report, *Climate Ready Adaptation Strategy and Action Plan*.

Energy

- The provincial government should strive to achieve a reduction in per Kwh costs by increasing system capacity utilization. This can be accomplished by inducing consumption that is timed, so that the incremental generation and delivery costs register at a fraction of the peak costs.

Labour Market Conditions

- Underemployment is one of the most important issues facing the Ontario government. OSPE advocates to government and industry to provide more incentives for coop positions, bridging programs and on-the-job training as just a few examples of opportunities to alleviate this condition.

Advanced Manufacturing / Research and Innovation

- The 2015 Budget needs to capitalize on the recent momentum to re-invigorate the advanced manufacturing sector.
- Research and Innovation go hand-in-hand with this re-invigoration. As a result, programs and incentives should recognize the partnership opportunities this creates.

Ring of Fire

- Engineers should play a central role in the successful development of a complex project of this magnitude.
- OSPE is well-positioned to be the go-to organization for trusted, technical and independent advice, especially in the development and early stages of the project.

INTRODUCTION

As Ontario moves forward, it is clear that jobs and employment are the cornerstones of the provincial government's strategy to strengthen the economy. Mandate letters sent by the Premier to Ministers and Parliamentary Assistants emphasized this as a guiding force, supported by recent initiatives such as the *Jobs and Prosperity Fund*. Ontario has the capacity and potential to regain its stature as an economic powerhouse in Canada and the world. We have an excellent education system, diverse population base, access to natural resources and a well-developed transportation system. Can we do better? Yes, and we must do better. With careful, well-thought, and evidence-based planning, Ontario can achieve its goals of building its economy, creating jobs and fostering prosperity.

Engineers must be part of the solution! They bring an analytical approach to problem-solving that is based on evidence, quality and public safety. In the design and development of projects, we conduct cost-benefit analysis in the context of a long-term framework that takes into account sustainability considerations and the complete life-cycle of any given initiative. When awarding contracts, funding programs and new innovations, quality should be at the forefront of any government. In formulating the 2015 budget, OSPE trusts the Minister will allocate funding based on sound evidence of what is best for Ontario, coupled with a long-term viewpoint that will sustain future generations.

With this in mind, OSPE is pleased to submit commentary on several key issues of critical importance to the government and of direct relevance to engineers. All issues have the foundational thread of economic growth and generating jobs. The major issues discussed in this submission are:

- Infrastructure;
- Environment – Climate Change;
- Energy;
- Labour Market Conditions;
- Advanced Manufacturing / Research and Innovation; and
- Ring of Fire.

INFRASTRUCTURE

The World Economic Forum estimates that an investment of \$40 trillion USD is needed over the next ten years to address a worldwide infrastructure deficit.¹ This type of investment underpins modern growth. OSPE therefore supports the government's commitment to heavily invest in a clear and credible plan over the next ten years, including *Moving Ontario Forward* and the new *Ontario Community Infrastructure Fund*. OSPE applauds Premier Wynne's message to the federal government that 5% of GDP is necessary for infrastructure investment to achieve optimum growth in jobs and the economy. This level of investment was recommended in a 2013 report by the Residential and Civil Construction Association of Ontario (RCCAO) report entitled, *Ontario Infrastructure Investment: Federal and Provincial Risks & Rewards*.²

For specific aspects of infrastructure that should be included in the 2015 Budget, OSPE supports the continuation of over \$130 billion in investment over the next ten years as outlined in the 2014 budget. We strongly support the investment in roads, bridges, transportation, transit, health centres, educational institutes and all aspects of infrastructure as mentioned in last year's budget.

The robust link between the stock of public infrastructure and performance of an economy has been well-documented and comes as no surprise. The Conference Board of Canada found that each dollar of real public infrastructure spending added \$1.11 to Ontario's real GDP. And if it wasn't for those critical infrastructure investments during the economic downturn, Ontario would have shed an additional 70,000 jobs in 2009.³ More recently, The Conference Board concluded in 2013 that public infrastructure spending spurs a range of direct, indirect and induced impacts that "have important repercussions on the provincial economy, employment, and the income of its residents." Specifically, spending between 2006 and 2014 has lifted the provinces real productive capacity by 2.1%, while adding \$1,044 (in 2012 dollars) to the average income per resident.⁴

As an active member of the Construction and Design Alliance of Ontario (CDAO), our collective and individual voices have been heard at Queen's Park on numerous occasions. OSPE and CDAO members are clear – **we support infrastructure investment**.

Ontario's engineers serve on the front lines of safeguarding and maximizing the province's investments in infrastructure. It is our responsibility to "design, build, and operate infrastructure systems that are resilient to the environments where they are intended to operate, while satisfying our obligation as engineers to protect the public's health and safety."⁵

¹ World Economic Forum. *Infrastructure Investment Blueprint: Preliminary Draft*, October 2013, pp. 4.

² Residential and Civil Construction Association of Ontario. *Ontario Infrastructure Investment: Federal and Provincial Risks & Rewards*: http://www.rccao.com/news/files/RCCAO_Ontario-Infrastructure-Investment_July2014-WEB.pdf

³ Antunes, P., K. Beckman, and J. Johnson. *The Economic Impact on Public Infrastructure in Ontario*. Ottawa: The Conference Board of Canada, March, 2010.

⁴ Antunes, P., and J. Palladini. *The Economic Impact of Ontario's Infrastructure Investment Program*. Ottawa: The Conference Board of Canada, April, 2013.

⁵ Rempel, R. and J. Nodelman. 'Consultants must respond to climate change impacts on infrastructure design.' *Environmental & Science Engineering Magazine*. November/December 2014, pp. 38.

OSPE would like to take this opportunity to highlight a critical linkage in the infrastructure investment discussion that is not usually at the forefront of these types of presentations and one, that if ignored, could have a range of have catastrophic consequences. This critical infrastructure linkage is that climate change intersects with public infrastructure, and perhaps most directly with storm and wastewater management, infrastructure that is not the focus of the public's eye or government's agenda.

The recent trend of extreme storm patterns intensifies the need for smart-planning in this area. In June 2013, Toronto was hit with nearly twice the monthly average of precipitation over a two hour period, resulting in an estimated \$940 million worth of insured property damage. Just 14 months later, the City of Burlington was hit with a similar incidents 200 millimeters fell in under five hours, which was equal to the total rainfall usually received in both July and August. The result was millions of dollars in damages as streets, highways, and over 3,000 homes were flooded. A number of other municipalities have also been hit with multiple once every 100-year storms over the past 15 years. Sanitary sewers and treatment facilities represent a huge portion of Ontario's investment in infrastructure. Furthermore, they are incredibly vulnerable to electrical power interruptions, and storm-water runoff is a major cause of water pollution in urban areas. The staggering costs associated with doing nothing, both financial and political, should not be considered as a viable option for government.

There are, however, two potential hurdles standing in the way of concrete action on this type of infrastructure. To begin, underground infrastructure is owned and managed by municipalities. Relatedly, these 'invisible services' are often at risk of taking a backseat to projects that are more politically advantageous, but are best described as 'wants'.

With this in mind, OSPE urges the provincial government to work more closely and openly with municipalities to provide strong leadership immediately to avoid potential hundreds of millions of dollars in expenses due to the imminent impact of climate change.

The province could raise the bar on this issue in a number of ways. One way to ensure that we aren't just building 'things' but the 'right things' would be to develop a standardized asset management system across the province. This approach would use the same metrics to prioritize 'needs' for each community that will not be treated less preferential than 'wants'. Using a standardized approach and measurements should then be directly tied to infrastructure funding for priority plans for municipalities. Adopting this type of approach should also help safeguard against the very plausible scenario where hundreds or thousands of basements are flooded in a community.

A second approach would be to tie infrastructure funding to meet certain environmental standards, whether it be that new storm and wastewater systems are compliant with prescribed assessments or that proposed projects meet performance targets set out in the *Water Opportunities Act*, or related legislation.

The government could also look at advancing a province-wide infrastructure budgeting mechanism that is specific to storm-water trends. Currently, both Toronto and Richmond Hill are looking at imposing a storm-water cost on residents, which is potentially a trend that will spread. Consequently, it is beneficial for the provincial government to look at various ways to creatively encourage cities to build dedicated funding reserves for future water infrastructure needs. Adopting this approach will not only help ensure that municipalities are ready to meet challenges as they arise, but will also mitigate the provincial government's costs of providing 'emergency funding' every time these types of disasters take place.

As engineers we are continually looking for evidence-based, forward-looking and solution-based approaches to problems, wherever they may be taking place. This is an especially pertinent approach to tackling climate change because a number of other regions are developing novel solutions (e.g. Wastewater modelling, Auckland⁶). We urge the provincial government to bring these issues forward in the 2015 Budget so that all relevant ministries work together to proactively find solutions before becoming reactive to emergencies.

⁶ Wastewater Modelling, Auckland. National Institute of Water and Atmospheric Research (New Zealand). <https://www.niwa.co.nz/climate/urban-impacts-toolbox/case-studies/wastewater-modelling-auckland>

ENVIRONMENT – CLIMATE CHANGE

OSPE recognizes that policy makers find themselves at a critical juncture with respect to taking action on climate change. It has been said that with each year of delay “it becomes increasingly difficult, or even infeasible, to hit a climate target that is likely to yield only moderate temperature increases.”⁷

The Professional Engineer Code of Ethics compels us to be involved in meeting this challenge. OSPE urges the government to work closely with engineers to address the risk climate change causes society to minimize service disruptions, protect people, property and the environment, and to proactively ensure that infrastructure has the necessary load and adaptive capacities to maintain resiliency in the face of changing weather patterns.⁸ The 2015 Budget can serve as the impetus to bring about a proactive approach to climate change and, in so doing, create investment opportunities that leads to economic growth, jobs and prosperity.

As noted in last year’s *Looking for Leadership, The Costs of Climate Inaction* report⁹, Ontario needs to be increasingly proactive to meet its 2020 target for reducing greenhouse gas (GHG) emissions, and OSPE supports the government’s commitment to meet this target. The need for action comes not only from the escalating costs associated with taking a ‘business as usual approach’, but also because well-designed policies and strategic investments will allow Ontario to become a global leader in building a low-carbon economy while seizing opportunities to create jobs and drive economic growth. In short, OSPE believes that prioritizing robust economic growth and addressing climate change are not mutually exclusive options; while we face unprecedented hazards stemming from climate change, we are also face unprecedented opportunity. Because engineers possess expert and strategic knowledge across key areas that will drive change, we are well-suited to help capitalize on that opportunity.

One of the key findings of a recent report from The Global Commission on the Economy and Climate was that stimulating innovation in the ‘new economy’ can drive both growth and emission reductions.¹⁰ OSPE was encouraged by the recent announcement of the *Jobs and Prosperity Fund*, not only because it builds on Ontario’s strengths to stimulate a globally competitive business climate, but also because one of the key pillars was a focus on this stream of growth.

Without question, building a green economy and investing in “clean technology” will make up a significant part of any “new economy” initiative, both of which are hot topics right now. For example, the U.S. solar industry saw growth of nearly 22% in the past year, which outpaced

⁷ The Council of Economic Advisors - Executive Office of the United States of America. *The Cost of Delaying Action to Stem Climate Change*. 2014, pg. 3: http://www.whitehouse.gov/sites/default/files/docs/the_cost_of_delaying_action_to_stem_climate_change.pdf

⁸ Canadian Council of Professional Engineers. *Adapting to Climate Change: Canada’s First National Engineering Vulnerability Assessment of Public Infrastructure*. 2008, pp. 5: http://pievc.com/e/Adapting_to_climate_Change_Report_Final.pdf

⁹ Environmental Commissioner of Ontario. *Looking for Leadership, The Costs of Climate Inaction: Annual Greenhouse Gas Progress Report*. 2014: <http://www.eco.on.ca/uploads/Reports-GHG/2014/GHG2014%20Looking%20for%20Leadership.pdf>

¹⁰ The Global Commission on the Economy and Climate. *Better Growth, Better Climate: The New Climate Economy*. 2014: <http://newclimateeconomy.report>

national employment growth by nearly 20 times.¹¹ In *Sizing the Clean Economy*,¹² the Brookings Institution advocated embracing the clean economy because it was found to be manufacturing and export intensive¹³ and offered more opportunities, and greater pay, for low and middle-skilled workers than the national economy as a whole.¹⁴

Building this type of economy, while simultaneously focusing on reducing GHG emissions are objectives that span several ministries. For that reason, OSPE urges the government to encourage or incentivize ministries to work together to ensure that new investments and technologies will effectively lower emissions. As far as engineers are concerned, the adoption of the clean economy in Ontario should go hand-in-hand with an increased focus on advanced manufacturing, including nuclear, aerospace and tool and machine manufacturing. The 2015 Budget could be the catalyst to increase inter-ministry consultation to identify areas of opportunity to implement ideas and policies that contribute to economic growth while mitigating the impact of climate change. For example, the Ministry of the Environment and Climate Change should aim to work closely with the Ministry of Economic Development, Employment and Infrastructure and other government stakeholders to ensure that a focus on reduced emissions is a key part of any strategy to create demand for a clean economy that is centred on advanced manufacturing.

Building infrastructure today without considering the future impact of climate change incorporates vulnerabilities that will eventually cause service disruptions and failures, along with increased costs to government, the private sector and users. Consequently, we need to ensure that engineering codes and standards are equipped to assess the structure, the climate and the historic and forecast responses of the infrastructure to climate.

To meet this challenge, Engineers Canada created the Public Infrastructure Environmental Vulnerability Committee (PIEVC), an internationally-leading steering agency, in 2005. PIEVC developed an Engineering Vulnerability Assessment Protocol¹⁵, which is a formal, documented, 5-step framework that allows for a detailed assessment of the susceptibility of infrastructure to climate shifts. One of the primary benefits of this approach is that, by applying a structured identification of risks and optimizing more detailed engineering analysis, consistency and accountability is ensured. PIEVC also allows for multiple modes of adaptation techniques, including structural, operational and maintenance and policy-related.

¹¹ The Solar Foundation. *Factsheet: National Solar Jobs Census 2014*: <http://thesolarfoundation.org>

¹² The Brookings Institution. *Sizing the Clean Economy: A National and Regional Green Jobs Assessment*. 2011: http://www.brookings.edu/~media/research/files/reports/2011/7/13%20clean%20economy/0713_clean_economy.pdf

¹³ In the U.S., roughly 26% of all clean economy jobs were in manufacturing, compared to just 9% in the broader economy. On a per job basis, clean economy establishments exported roughly twice the value of a typical U.S. job. *Supra* note 5, pp. 22.

¹⁴ Median wages in the clean economy were found to be 13% higher than national averages, and employees in this sector had disproportionately lower levels of education than in the broader economy. *Supra* note 5, 23.

¹⁵ Public Infrastructure Engineering Vulnerability Committee website. http://www.pievc.ca/e/index_cfm

OSPE recommends that government take decisive action to bring to reality the climate change vulnerability assessments that were a central part of the 2011 *Climate Ready Adaptation Strategy and Action Plan*.¹⁶

¹⁶ Climate Ready: Adaptation Strategy and Action Plan 2011-2014. <https://www.ontario.ca/environment-and-energy/climate-ready-adaptation-strategy-and-action-plan-2011-2014>

ENERGY

OSPE believes that the provincial government should strive to accomplish a reduction in per Kwh costs by increasing system capacity utilization. This can be accomplished by inducing consumption that is timed such that the incremental generation and delivery costs register at a fraction of the peak costs.

Currently the system (both generation and distribution) is required to significantly overbuild to satisfy seasonal peak needs that can occur during unusual situations (extreme cold or heat periods, for example). While this redundancy provides a lot of insurance, customer incentives and new technology have the ability to significantly accommodate additional load without the need for corresponding massive, new investments.

Ontario currently has a surplus capacity of both base-load energy and peak-load energy. Adding more capacity, as we are doing, simply means some of that energy has to be exported at relatively low prices relative to the contract price, which results in a loss that needs to be paid for by Ontario consumers through higher rates.

The following observations provide an engineering perspective that will assist in the development of Budget 2015 directions towards energy management.

a. Use pricing to better incent demand/load shifting. Currently the rate charged during the night is too high and actually dis-incent investment in load shifting technologies. The reason is simple- the system needs the revenue dollars and having true peak costs is deemed to be politically unacceptable. Consequently, peak energy costs are too low and evening/off peak are too high.

Directly related to this is that the current Time-Of-Use rate plan is fundamentally flawed and unable to deliver much in the way of savings to consumers who successfully shift their energy consumption to off-peak periods. Although the current plan rewards consumers for eliminating their peak loads, they do not adequately incentivize consumers for shifting their loads to off-peak periods, so we can utilize Ontario's Base-load energy.

b. Rethink the global adjustment (GA) pricing. Global adjustment as practiced in Ontario has become a political catch-all that is removed from actual costs. The fact that the GA is multiples of actual generation costs indicates how out-of-synch this catch basis has become. The problem is that it masks and dis-incentivizes solutions by precluding typical free market adjustments. For example, as noted above the variance between peak and off-peak rates is considerably narrower in large measure because of the GA.

The solution is to reduce the GA to something less based on consumption and more of a fixed fee for system access. Regulatory costs similarly should be recouped by a fixed-fee rather than a per Kwh fee.

c. Continue to eliminate the Feed-In-Tariff (FIT). At the start, the FIT program made sense and current contracts must be continued. OSPE supports the government's decision to not seek new FIT agreements.

d. Importing large amounts of energy from Hydro Quebec is not economically viable because it would require significant upgrades to the transmission infrastructure and Quebec's dam generating capacity. Quebec will not do that unless Ontario commits to long-term contracts at much higher prices than the current spot market rates. If we had to invest that money, OSPE would prefer to see it spent on Ontario's nuclear facilities that would create far more permanent operating and maintenance jobs for Ontario residents for the next 60 years. The advantage that modern nuclear facilities have is that they have the capability to maneuver, that being, to adjust the amount of electricity they generate, so that during low peak periods, they can lower their production, thus decreasing the amount of excess energy which needs to be sold off at a loss.

e. Efficiencies and cost savings would be gained by establishing more facilities modelled after Toronto's ENWAVE heating and cooling systems. These utilize steam and deep lake water from Lake Ontario, respectively, to keep the downtown core warm in winter and cool in summer.

LABOUR MARKET CONDITIONS

Earlier in January 2015, OSPE released a ground-breaking report based on the 2011 Canada Census, *Crisis in Ontario's Engineering Labour Market: Underemployment Among Ontario's Engineering Degree Holders*, which identifies that a significant number of Ontarians with an engineering degree do not work in engineering¹⁷.

The report identifies that a significant number (33%) of individuals in Ontario with engineering degrees work in jobs that don't necessarily require a university degree. OSPE deems this condition as "underemployment" as it demonstrates a vast underutilization of people who obtained a rigorous university degree at great cost to the individual, as well as society, only to end up working in jobs that likely wastes their education, skills and talent.

Among its many findings, the report also found that:

- Only about 30% of employed individuals in Ontario who held a bachelor's degree or higher in engineering were working as engineers or engineering managers;
- Just over 20% of women and internationally trained engineers (ITEs) with engineering degrees actually work as engineers or engineering managers.

The report further finds that by a wide margin, employed individuals with bachelor's degrees or higher in engineering did not work in their field of study compared with those with medical, law, nursing or education degrees (Figure 1).

OSPE considers this situation unacceptable and an indicator of significant underemployment of those who hold valuable engineering degrees. The report raises many questions, including what can be done to reduce the level of underemployment.

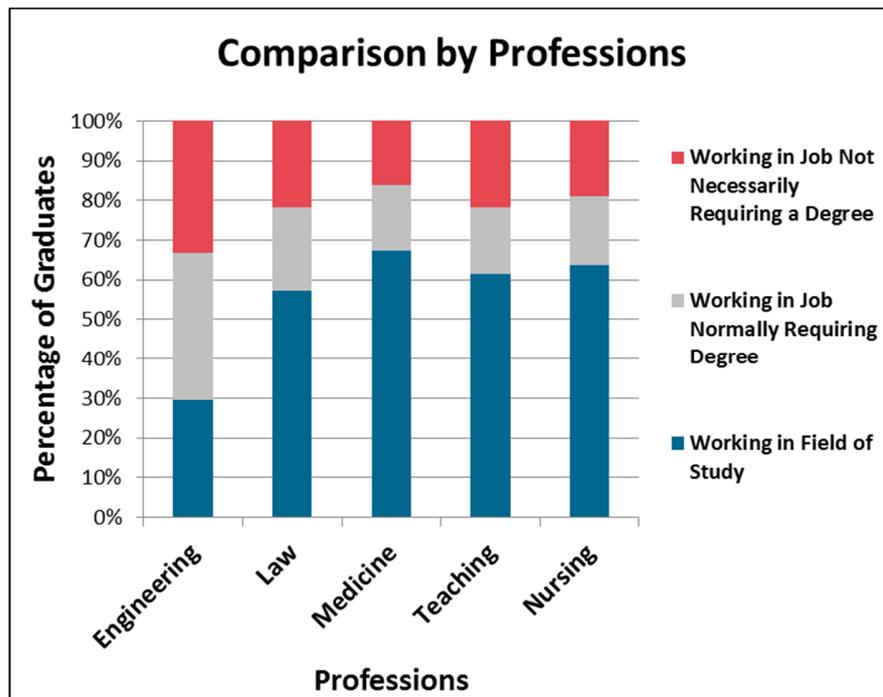
We believe the underemployment crisis is an important policy area for Ontario because of the negative impact it has on engineers, industries and the economy. OSPE is therefore committed to collaborating with governments, industry leaders, universities and OSPE members to find solutions to alleviate the underemployment situation among the province's engineers.

Tackling underemployment, no matter what degree the individual obtained, is one of the most important issues facing the Ontario government. It also opens vast opportunities for ministries to work with each other and with industry, post-secondary institutions and professional associations, not to mention the federal government.

OSPE offered a number of suggestions to alleviate the underemployment situation facing Ontario's engineers. Although they are specific to engineering, they are applicable across the board for college and universities and can be viewed as background to the formulation of the 2015 Budget.

¹⁷ Ontario Society of Professional Engineers. *Crisis in Ontario's Engineering Labour Market: Underemployment Among Ontario's Engineering Degree Holders*. 2014:
http://c.yimcdn.com/sites/www.ospe.on.ca/resource/resmgr/DOC_advocacy/2015_REPORT_Underemployment_.pdf

Figure 1: Comparisons of employed holders of bachelor's degrees or higher and types of job in selected regulated professions requiring a degree in Ontario.



Firstly, OSPE advocates that provincial and federal governments improve the quality and availability of labour market information. OSPE therefore strongly urges the federal government to reinstate the mandatory long-form census for 2016 to alleviate a lack of data. The Ontario government should join the chorus of voices advocating for the return of the long-form census to allow for evidence-based decisions on future programs and initiatives that support the labour market.

Secondly, universities need to evaluate their programs to ensure students graduate with the skills industry needs, without diminishing academic rigour and theoretical foundations. Furthermore, prior to opening new engineering schools or expanding existing programs, universities should be required to provide evidence that there exists a need to increase capacity based on current and projected labour market data.

Third, industry needs to provide more on-the-job training and co-op opportunities to university students because universities cannot hope to match the real-life learning environment offered in the workplace.

Fourthly, companies also need to be more culturally aware of cues given by ITEs during job interviews. These may be interpreted differently by an employer and applicant, resulting in qualified individuals losing out on job offers due to misunderstandings. Bridging programs that address the conditions and circumstances leading to severe underemployment for ITEs need to be expanded and concerted effort needs to be made to alleviate the situation in the first place.

As mentioned above, the Ontario government needs to do more to encourage industry to provide more co-ops and create more programs to increase innovation and economic growth within industries poised for growth. As well, communication with potential immigrants needs to be improved so that ITEs have a greater awareness of the challenges they will face when seeking employment in Canada, but also obtaining accreditation or licensing in their prospective field. Data on underemployment must be made available to federal and provincial officials for them to take into consideration when setting immigration policies.

Fifthly, professional associations need to increase advocacy and lobbying efforts to effect change in all of these areas. Finally, students, parents and potential immigrants need to truly assess whether entering an engineering program or moving to Canada is the best fit for the student or immigrant.

ADVANCED MANUFACTURING / RESEARCH AND INNOVATION

Ontario is poised to again become the economic engine of the country. With a lower dollar, lower gas prices and the proper incentives and planning, we should become the envy of other provinces. As pointed out by Canadian Business, “with the rapid fall of oil prices, the tumbling loonie and renewed U.S. demand, there are expectations the country’s economic strength could once again shift back to Central Canada if conditions persist”¹⁸.

Ontario manufacturers make about \$275-billion worth of goods — advanced goods — each year. These goods account for 81% of the province’s total exports and 47% of all Canadian manufacturing activity. In November, when overall employment in Ontario dropped by 34,000 jobs, the manufacturing sector added 11,600 new jobs¹⁹.

The 2015 Budget needs to capitalize on the recent momentum to re-invigorate the advanced manufacturing sector. Research and Innovation go hand-in-hand with this re-invigoration and programs and incentives should recognize the partnership opportunities this creates.

As mentioned in this submission, Ontario has a highly skilled, talented and motivated workforce, an abundance of energy and an extensive multi-modal transportation system. With the right investments and low cost of the Canadian dollar, Ontario is well-positioned to be an attractive, viable and profitable location for advanced manufacturing and high-tech assembly industries to establish their operations. The Ontario government should be actively recruiting world class firms to relocate in Ontario through a proactive and aggressive marketing campaign that highlights the following benefits that Ontario has to offer in comparison to other jurisdictions, specifically:

- a. Excellent education system;
- b. Diverse Population base ;
- c. Access to Natural resources (water, power, mineral wealth, etc.); and
- d. First World Economy Advantages:
 - i. Excellent social welfare system
 - ii. Safety and security of the population
 - iii. Ease of transportation (goods and people).

The support of clusters of innovation should be continued. As the aerospace sector demonstrates, the development of hubs of expertise and manufacturing around this industry, coupled with educational partnerships with colleges and universities, was a proven success.

Clusters of innovative industry support highly skilled workers and open job opportunities. MaRS and the Waterloo ICT clusters are globally recognized leaders in this area. The power sector has an engineering consortium between UOIT, Western, Waterloo and other universities. The key to cluster development is to understand the key economic drivers that support technology

¹⁸ Blatchford, Andy. ‘How prepared is Ontario to take back its old job as Canada’s economic engine?’ *Canadian Business*. January 18, 2015: <http://www.canadianbusiness.com/business-news/how-prepared-is-ontario-to-take-back-its-old-job-as-canadas-economic-engine/>

¹⁹ Bitti, Mary Teresa. ‘Looking for a new job in 2015? Advanced manufacturing is hiring.’ *Financial Post*. January 1, 2015: http://business.financialpost.com/2015/01/01/looking-for-a-new-job-in-2015-advanced-manufacturing-is-hiring/?__lsa=22b2-0877

and commercialization development in these clusters. To sustain them and create more, government economic policy must link to priority education initiatives

In working with industry and developing clusters of innovated thinking, the government must also not lose sight of encouraging and, in certain cases, providing incentives for more co-op positions, paid internships and on-the-job training. Directly linked to the underemployment situation facing engineers, the more skills Ontario students, new graduates and new immigrants gain from on-the-job work experience, the greater the chance that Ontario will re-establish itself as an economic powerhouse with high employment levels.

RING OF FIRE

Estimates are that the Ring of Fire will contribute up to \$30 billion to the Ontario economy, generating up to \$9.4 billion and up to 5,500 jobs annually according to the Ontario Chamber of Commerce. Despite the need to work with the private sector to develop these lands, companies have shown to be risk averse since they do not want to provide up-front funding needed to kick-start the initiative.

For a mining opportunity of this magnitude that has an array of stakeholders spread out over a vast, remote area of the province, government leadership is needed to front-end the cost of installing the necessary infrastructure before the private sector will commence resource development plans.

An investment of almost \$2 billion is estimated to be necessary to establish the required infrastructure before the private sector will move forward with resource development plans. OSPE considers this an appropriate investment for projects that will ultimately contribute \$30 billion to the economy and provide employment and other benefits to a wide variety of stakeholders including municipalities, businesses and First Nations.

OSPE is pleased that the provincial government allocated \$1 billion in funding to the Ring of Fire development corporation in Budget 2014. Since then, one major private partner has withdrawn from any association with the initiative. With this said, there are many other organizations waiting to see if the government is committed to investing in this opportunity before stepping forward to establish partnerships. OSPE recognizes the challenges facing the government but encourages it to continue to find new private investments and, equally importantly, secure at least equal funds from the federal government.

OSPE believes that engineers should play a central role to play in the successful development of complex project of this magnitude. Through our Ring of Fire Working Group, made up of industry experts, OSPE is well-positioned to be the go-to organization for trusted, technical and independent advice, especially in the development and early stages of the project.

HOW CAN OSPE HELP?

OSPE would encourage government to view the province's engineers as a key stakeholder in the formulation and execution of sound public policy in numerous key areas. Given how pervasive the impact of our work is on society, we see it as only being prudent that engineers have a voice at the table in helping shape the various policy areas that we have touched on in our submission.

Not only are we compelled to play this role due to our Professional Engineer Code of Ethics, but also because of our position on the front lines of safeguarding and maximizing the province's many investments. In addition, OSPE has a dedicated group of industry experts that sit on Task Forces in each of the areas highlighted in our submission. These Task Forces can help provide policy makers with tangible solutions to many of the challenges Ontario will be face in the future.

OSPE looks forward to ongoing discussions with Ministers, MPPs from all parties and public servants in all pertinent ministries.

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