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PUBLISHER

Sandro Perruzza

EDITORS

Bajjul Shukla

Matt Wiesenfeld

Rachael Masih

CONTRIBUTORS

Lee Weissling, Ph.D.

Dr. Medhat Shehata, P.Eng.

Michael Wiggin, P.Eng.

Yash Vyas, MASC, BASc

Nika Zolfaghari, MASC, BEng

DESIGN & PRODUCTION

Lia Forgione

ADVERTISING INQUIRIES

Jason Di Tommaso, Business Development

– Eastern and Northern Region

jdtommaso@ospe.on.ca | 613-986-1437

Michael Sofroniou, Business Development

– Central and Western Region

msofroniou@ospe.on.ca | 416-880-1649

Jamie Gerson, P.Eng., Group Memberships

jgerson@ospe.on.ca | 647-515-5281

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Dear OSPE Members,

Happy Holidays...I hope you have had a successful 2023!

Once you read this, we will be very close to the end of the year, a natural point of reflection for all of us. Especially so for me as my term as Chair is now more than half complete, including a very successful series of fall events last month.

Those events were our annual **Engineering Conference** and the **Ontario Professional Engineers Awards (OPEA) Gala**. I know not all of you can attend these events in person, so please allow me to summarize them in brief... they were **AWESOME!**

Beginning with **#EngCon** on November 2, OSPE hosted more than 5000 guests at the Metro Toronto Convention Centre, making it truly the largest engineering event in Canada. Our community came together to learn from subject matter experts and network amongst each other and more than 120 engineering employers seeking talent of all levels of experience. The discussions and panels were progressive, innovative, and grounded in solid engineering expertise. Equity, diversity, and inclusion were important themes throughout the day. Events like **#EngCon** can only be put on by those who understand the engineering community and work to serve it. That description suits OSPE perfectly. (For more about [#EngCon click here.](#))

Our annual OPEA Gala the next night was a very different kind of event. That evening we celebrated engineering excellence, and I was truly humbled by some of the achievements of my fellow professional engineers here in Ontario. **Dr. Alex Wong, P.Eng.**, an expert in Artificial Intelligence stole the show with his unexpected comedy, but the real highlight for me was the presentation of the Lifetime Achievement Award to **Danny Young, P.Eng.**, who was so critical in establishing OSPE at its birth. Without him, OSPE would not be in the strong position it is today. (For more about the [OPEA click here.](#))

Both of these events were reminders that one of the most meaningful benefits of OSPE is the community it creates. Our engineering community is diverse, there is more that unites us than divides us, and the opportunity to indulge in the company of other talented engineers always energizes me and makes me hopeful for the future.

Speaking of the future, there are a lot of exciting things coming up for OSPE in 2024. We might ease into the New Year in January, but by the time **National Engineering Month** rolls around in March we will be in

full swing. I have always considered NEM as a bit of a sleeper hit for OSPE and our community. It has a student focus, but there is so much we all can do to make sure the public understands the value of a strong and skilled engineering community. Please think about how you can bring an audience to the important contributions that engineers make every day and their critical role in a safe and prosperous Ontario.

As a final note, since this will be my last opportunity to address OSPE members in this forum, I want to thank you for the opportunity to help guide the organization in the role of Chair. It has been enriching beyond my expectations in terms of working closely with my talented board colleagues, appreciating the work of our dedicated staff, and understanding the very real and critical role that OSPE plays in ensuring the health and safety of our communities and the future of our profession.

Joining the OSPE Board is a big commitment, so I do not expect that all my fellow engineers will jump into a role like this one. I do suggest that we can all do a little more with the skills and tools we have developed, the power of which can be measured tenfold. **Karen Webb, P.Eng.** was honored with our Citizenship Award this year and she is a thriving example of how engineers can make a difference both within the profession and in the community by leaning into what we were trained to do – solve problems.

Don't follow my lead in 2024...follow hers. We will all be better for it!

Happy Holidays.



Stephanie Holko, P.Eng., MBA
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NEWS FROM THE FRONT

The OSPE advocacy team has been hard at work this quarter. We've conducted several meetings with key players in Ontario's engineering space and written five distinct submissions to government bodies advocating on behalf of OSPE's membership. We've spoken at two major conferences and debated changes to a bill at a standing committee meeting. We can also happily say we saw a policy win as a result of the ongoing work done by OSPE's Indoor Air Quality team.

POLICY WIN – Release of Air Quality Private Members Bill

MPP Chandra Pasma announced the official release of her private members' bill on air quality in schools. **Joey Fox, P.Eng.**, Chair of the **Indoor Air Quality (IAQ) Advisory Group**, delivered a speech in support of the Bill. The IAQ Advisory Group was instrumental in the development of the Bill.

OSPE staff attended the press conference. The **Improving Air Quality for Our Children Act, 2023** motions that every publicly funded school and every childcare provider licensed under the **Child Care and Early Years Act, 2014** shall install carbon dioxide monitors in every classroom and congregate space, including portables, gymnasiums, change rooms, auditoriums, cafeterias, music rooms, libraries, staff rooms, and main offices. The Act also sets out a maximum carbon dioxide threshold of 600 parts per million above outdoor carbon dioxide levels.



OSPE's Government Relations Coordinator, Stefanie Black (left) and Joey Fox, P.Eng, Chair of the Indoor Air Quality Advisory Group (right) at MPP Chandra Pasma's press conference regarding the Improving Air Quality for our Children Act, 2023.



MPP Chandra Pasma and her team, representatives from Ontario School Safety, and Joey Fox, P.Eng. at MPP Chandra Pasma's press conference regarding the Improving Air Quality for our Children Act, 2023.

Meeting with the Fairness Commissioner – International Engineering Graduates (IEGs)

OSPE’s advocacy department along with OSPE CEO **Sandro Perruzza** met with the **Ontario Fairness Commissioner** to advocate for increased funding to the **Ontario Bridge Training Program (OBTP)** so that OSPE can resume our training programs for International Engineering Graduates (IEGs) and support them in the process of applying for the P.Eng. licence. We raised the point that, since the removal of the Canadian experience requirement, IEGs need more support to be able to demonstrate the required competencies to be licensed by the **Professional Engineers Ontario**.

Internationally Educated Professionals (IEPs) Conference

OSPE participated in a discussion panel at the **Internationally Educated Professionals Conference** and spoke about what OSPE offers to internationally trained engineers. We also participated in a panel discussion on the challenges IEPs face in the engineering context in Ontario.



OSPE’s Public Affairs Manager, Paola Cetares, speaking on a panel at the IEP Conference alongside Mehemed Delibasic, P.Eng., Ayman Shash, Pritam Shrestha, and Ian Tolliver.

Submission and Presentation to the Standing Committee on Justice Policy

Bill 139 – Less Red Tape, More Common-Sense Act was referred to the **Standing Committee on Justice Policy** for debate. OSPE submitted a request to appear as a guest and presented a written submission to the members. We offered our support to this Bill, as it affects the **Professional Engineers Act**, and advocated for further changes to the Professional Engineers Act that would increase the regulatory performance of **Professional Engineers Ontario**.



OSPE’s Public Affairs Manager, Paola Cetares, presenting at the Standing Committee meeting on Bill 139.



Standing Committee on Justice Policy meeting regarding Bill 139.

First Year Integration Conference (FYIC)

This conference, run by the **Engineering Student Societies’ Council of Ontario (ESSCO)**, was held at Ontario Tech University. OSPE, as the official sponsor, attended the conference and held a session with approximately 80 first-year engineering students to discuss membership and the role of the advocacy department within OSPE.



OSPE’s Government Relations Coordinator, Stefanie Black making the opening speech at the First Year Integration Conference 2023.



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Ontario Network of Women in Engineering (ONWiE) Summit

The advocacy team and Sandro Perruzza, CEO, attended the ONWiE Summit themed ‘Diversity through Inclusion.’ Sandro presented our **WAGE (Women and Gender Equality Canada)** sponsored project on increasing women in engineering through sustainable procurement policies to the conference attendees. Around 200 people were in attendance.



OSPE CEO, Sandro Perruzza presenting at the ONWiE Summit.



OSPE’S SUBMISSIONS

Letter to the Ontario Fairness Commissioner – International Engineering Graduates

This letter was sent to the **Ontario Fairness Commissioner** to advocate for increased funding to the **Ontario Bridge Training Program (OBTP)**.

Letter to the Minister of Finance – ISSB Standards

This letter, developed with the support of the **Climate Crisis Task Force**, advocated for the need for the **Ministry of Finance** to develop legislation that mandates Professional Engineers be responsible for the technical aspects of reporting required under the **International Sustainability Standards Board (ISSB)** sustainability disclosure standards.

Letter to the Ministry of Energy and CEO, Ontario Energy Board (OEB)

OSPE sent a letter raising our concerns that the *Power Advisory Study* prepared for the OEB titled: *Electric Delivery Rates for Electric Vehicle Charging* is too narrow in focus for the challenges of accommodating fast Electric Vehicle (EV) chargers.

Letter to the Minister of Energy and CEO, Ontario Energy Board (OEB)

OSPE has worked closely with the **Ministry of Energy** and the **Ontario Energy Board (OEB)** on Ontario’s electricity grid and consulted with the Ministry on the **Ultra-Low Overnight (ULO) Rate Plan**. This letter requested that the OEB conduct a consumer survey to evaluate the effectiveness of the ULO rate plan and requested a review of the design of the ULO price plan.

Letter to the Health Canada, Water and Air Quality Bureau

This letter was sent to **Health Canada** to request a reconsideration of Health Canada’s current stance on fine particulate matter (PM2.5) exposure limits. We believe that the recent wildfires in Canada, which have led to devastating health consequences, necessitate a re-evaluation of the existing guidelines, with a stronger emphasis on enhanced filtration measures for buildings.

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Time to Support our Forestry Communities

Michael Wiggin, P.Eng.



For many years I have worked on ways to create sustainable communities using technologies like district heating, also known as thermal energy networks. These energy networks displace fossil fuels by harvesting otherwise wasted energy, like wood waste and garbage, as well as locally available renewable energy sources. My work has shown that the use of wood residue, which would otherwise be rotting in the forest or burning up in a forest fire, can be used to displace fossil fuels and help decarbonize energy consumption.

Such networks serve about 60 per cent of the heating needs in Denmark and Sweden and over 98 per cent of the heating needs in Copenhagen, Helsinki, and Stockholm. In Sweden over 60 per cent of the energy supplied to these networks comes from biomass including residues from forest management and lumber operations. After I visited wood harvesting operations and many district heating systems in Scandinavia, I felt that it was time to explore the wood industry in Canada.

My wife and I visited Opeongo Forestry Service, a private family-held company in the Ottawa Valley. The experience was both amazing and long overdue. It struck me how uninformed many urban citizens are about how the lumber used to make our buildings, the paper that we read, the cardboard in our packaging, and even the firewood in our fireplaces comes to be.

As part of their timber business, Leo Hall and his spouse and business partner Susan, manage several thousand acres of woodlands. Leo, who trained as a Mechanical Engineer at Queens, has taken over from his father as a second-generation forest manager, which is kind of like being a long-term gardener. He took me through natural and planted forests established by his father in 1968. He spoke about them with tenderness. The natural areas have trees that existed well before Leo was born in 1962 and they will still be cared for by generations to come.

Leo went through the woods and marked trees to be cut and trees to be protected. He showed me areas that were being harvested, others that were harvested a year ago, and some harvested several years ago. To the untrained eye, everywhere looked like healthy forest, but below the eyeline, there were stumps sprinkled amongst the large bold trees.

The reason for these stumps? Some trees are thinned to enhance the growth of other trees; their absence makes room for others to receive more light. The rest are removed for lumber. This is an example of modern forest management, a far less troubling image than the ones of clear-cutting that many assume is normal.

In reality, the forests look full and the need for planting is minimal as preserved mature trees seed and replenish the woodlands. The forest goes on much as it would naturally, but there is a difference.

Unmanaged forests can be very crowded with fast-growing birch and poplar shading and slowing the growth of both pine, spruce, and fir as well as slower-growing hardwoods like maple. Eventually, the shaded trees die from age or lack of sunlight and the larger conifers and hardwoods emerge, still crowded. Some die and rot, releasing methane and other greenhouse gases (GHGs) into the atmosphere.

Forest management accelerates the natural process and thins out the forest so that trees grow faster, absorb, and store more GHGs from the atmosphere. Sweden, with world-leading forest management practices, has forests that, per hectare, store about 40 per cent more greenhouse gases than our Canadian forests. Counterintuitively, well-managed forests with fewer but larger trees contain more wood and have more carbon dioxide stored than the crowded and dense forests that they replaced.



The real eye-opener was my walk through a forest plot being cut. Leo marked the trees to be cut and specialized harvesting equipment took out only the marked trees. It took care to avoid damaging other trees that were delimbed and cut to length. Then another machine came around and took the cut-down logs that could be used for lumber (sawlogs) to a central area to be sorted and taken to sawmills. At this stage, I saw that the process was more complicated than I thought. Viable sawlogs were sorted and sent to different sawmills depending on the species. Some, like smaller cedars, went for fence posts and others, often crooked, went in a separate pile for firewood.

Other logs were partially rotten or otherwise unsuitable for sawlogs. These would have been suitable for pulp chips, but since 2012 three large mills in the area, Portage du Fort, Thurso, and Cornwall have closed and a 100-year-old market for over 3 million tons of unusable wood a year disappeared. Now the wood lies in the forests to rot.

This is where we can do something. Instead of burning fossil fuel to heat our homes, we could support the creation of more thermal networks. Such networks would harvest a variety of otherwise wasted energy and host bioenergy plants, like much of Scandinavia. Leo told me that, after several presentations to the province, he was taken aside by a Deputy Minister who said the reality is that most voters live in cities and are indifferent to forestry operations, while forestry interests represent only a handful of votes.

It's time for us in the cities, to step up and demand better use of these critical resources.

The Government of Canada's district heating system has recently been renovated to explore the use of bioenergy as a principal source of energy. Modern biomass heating plants can be architecturally attractive and meet or exceed all emissions standards, yet their efforts may be stymied by those who do not understand the carbon cycle.

We in the cities have a chance to educate ourselves and support our rural neighbours who do so much to provide us with the products that we need to build and run our cities. Proper forest management can create renewable materials and produce healthier and denser forests to store GHGs.

In this time of escalating climate concern, we need to focus on this valuable approach to the struggle that we all have a stake in. Something big is being missed here.

Written by:

Michael Wiggin, P. Eng.
Director, The Boltzmann Institute
Member, The Ontario Society of Professional Engineers (OSPE)
Energy Task Force



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Networks for Decarbonization

Michael Wiggin, P.Eng.



The consequences of climate change are getting increasingly apparent and, globally, societies are tabling plans to discontinue the use of fossil fuels as a key measure to reduce greenhouse gas (GHG) concentrations in the atmosphere.

In our efforts to decarbonize our energy systems, a major challenge is the decarbonization of building heating. Heating loads are seasonal. They are very high during the coldest days of winter and virtually disappear during the summer. The choices for most urban areas, if they choose to move off natural gas, are to switch to either electricity or thermal networks if available.

Currently, Canada has many well-established electricity systems that provide reliable and affordable service. Supplies vary from hydroelectricity to fossil fuel to nuclear energy with increasing portions of renewable wind and solar generation. The emissions related to electricity use vary greatly. They are near zero for hydroelectric-based systems (BC, Manitoba, Quebec, and Newfoundland), and very low for provinces with a wider mix of clean resources (Ontario, New Brunswick, and PEI). Other provinces have limited hydro resources and have chosen not to invest in nuclear energy. This leads to higher emissions from continued and significant reliance on fossil fuels (Alberta, Saskatchewan, and Nova Scotia). The Territories have a mix of options, but many communities are powered by diesel electric.

While the gas utilities are exploring alternatives to natural gas, it would be prudent to explore other options that would serve the end consumer more economically. In urbanized or higher-density settlements, natural gas is the utility network of choice for heating requirements. If we are to move from this fossil fuel network, what will we replace it with? While some buildings may focus on building-based solutions including deep retrofits and building-based energy production like solar PV and/or biomass, the real choice is between electricity and thermal networks. While thermal networks are not as extensive here in Ontario as in Scandinavia, for example, they may be worthy of consideration and development and should not be ruled out.

This article will cover different options for the electrification of building space heating and the potential consequences associated with each one. It will also

explore the potential of thermal networks to serve urban areas with heat from renewable or non-GHG emitting sources as an option for peak reduction and decarbonization.



TESTING SOLUTIONS – WHAT IF EVERYBODY DOES THE SAME THING?

When the options are considered, decisions are made based on today's costs and emission factors and often buildings are considered individually. However, it is necessary to look at the full system cost of a decision and consider what happens if that choice is widely deployed. In the electrification of building heating, electricity systems need to have adequate generation and distribution system capacity and the revenue to cover those investments. With more variable supply or demand, there may be a need for more dispatchable power for peaking and back-up and the generation technology that provides the additional electricity may need to change as well.

Currently, space heating and electricity utilities will use natural gas turbines or electricity storage to meet their lower demand more economically rather than build high capital cost hydroelectric or nuclear generation. New electric loads for space heating will force the use of more natural gas generation, then that additional electricity source should be included when calculating the environmental impact. The problem is that the most efficient combined cycle natural gas plants operate at

about 50 per cent efficiency whereas the most efficient natural gas furnaces operate at above 90 per cent efficiency. Electrically powered air source heat pumps (ASHPs) can be used to increase the effective efficiency of electricity to provide space heating but there are limits to that improvement on the coldest winter days. Ground source heat pumps (GSHPs) are more efficient in colder temperatures, but their cost is substantially higher than air source heat pumps.

THE ELECTRIC NETWORK OPTIONS

To illustrate the impact of electrification, electric and heating loads for the Province of Ontario have been tracked over two years.

The recorded electricity demand is shown in Figure 1. While Ontario has been summer peaking because of cooling loads, winter peaks are also increasing as people deploy air source heat pumps. Now winter and

summer peaks are not very different and annual average demand is fairly level with a power system operating capacity factor of about 65 to 70 per cent. This is good for utilities because they have to be able to supply the peak load (MW - which determines system investment) while their revenue is more closely aligned with the energy sold (MWhs) because of the design of our current retail electricity plans. The more level the electricity demand, the higher the operating capacity factor and the more efficiently we use the electricity system network investments.

Currently, most people are familiar and comfortable with electricity service, and, in Ontario, the electricity is affordable and has a very low emissions factor. As a result, the easiest decarbonization appears in the short term to be heating with electricity. In Figure 2 we took hourly heating loads from that same two year period and converted them into the hourly electricity demand if the heating were performed by resistance heaters. The impact is shown in Figure 2.

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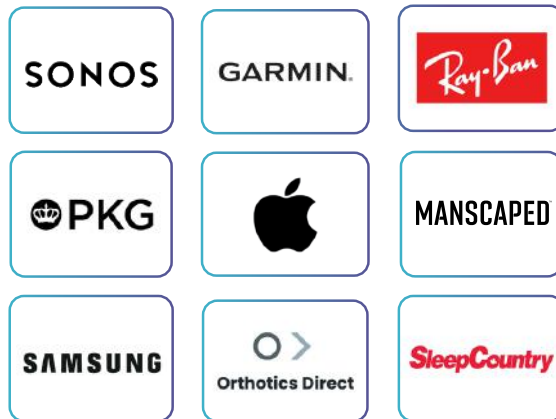
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Figure 1 – Ontario Electricity Demand (2-year plot)

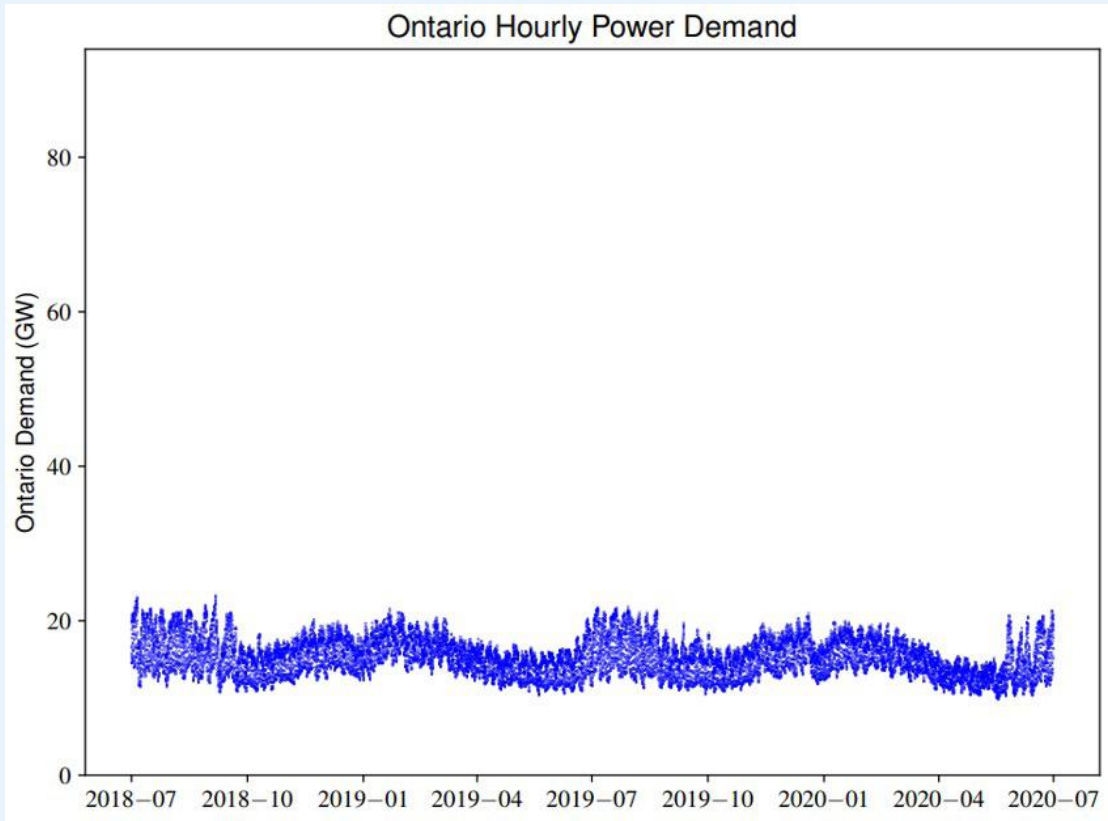
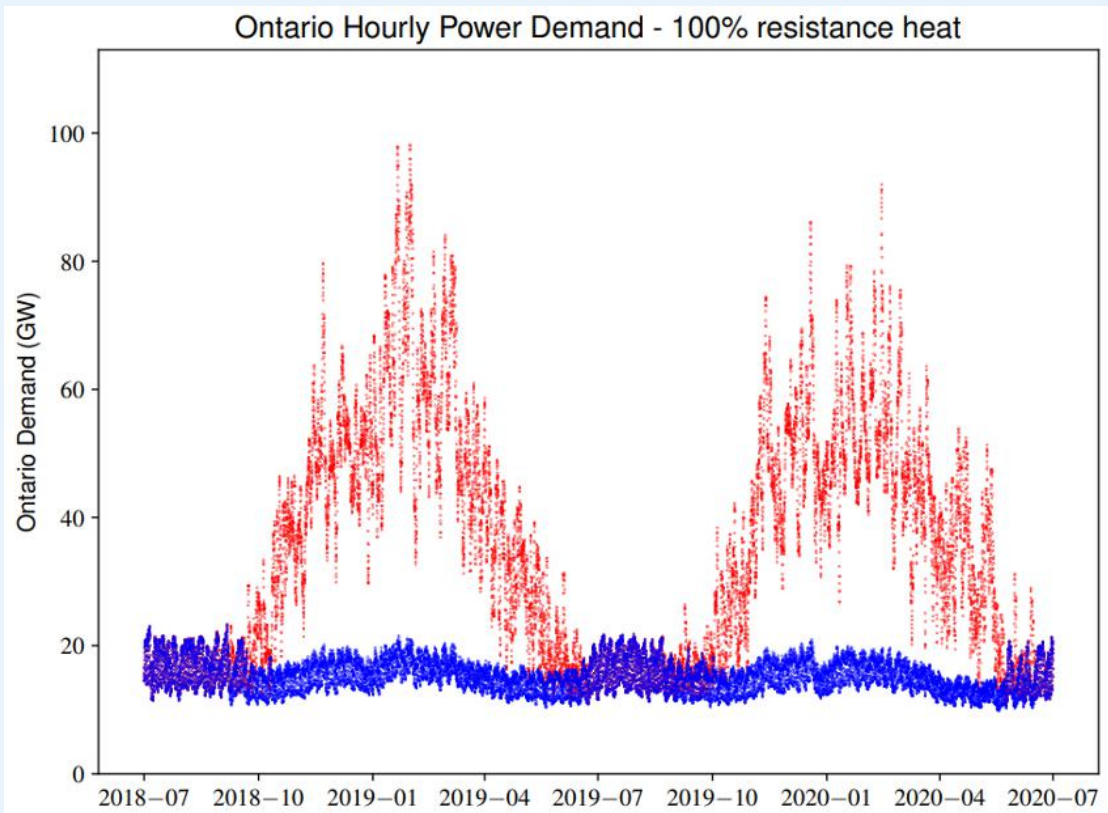


Figure 2 – Impact on Electricity Demand if Resistance Heaters are Used for Space Heating



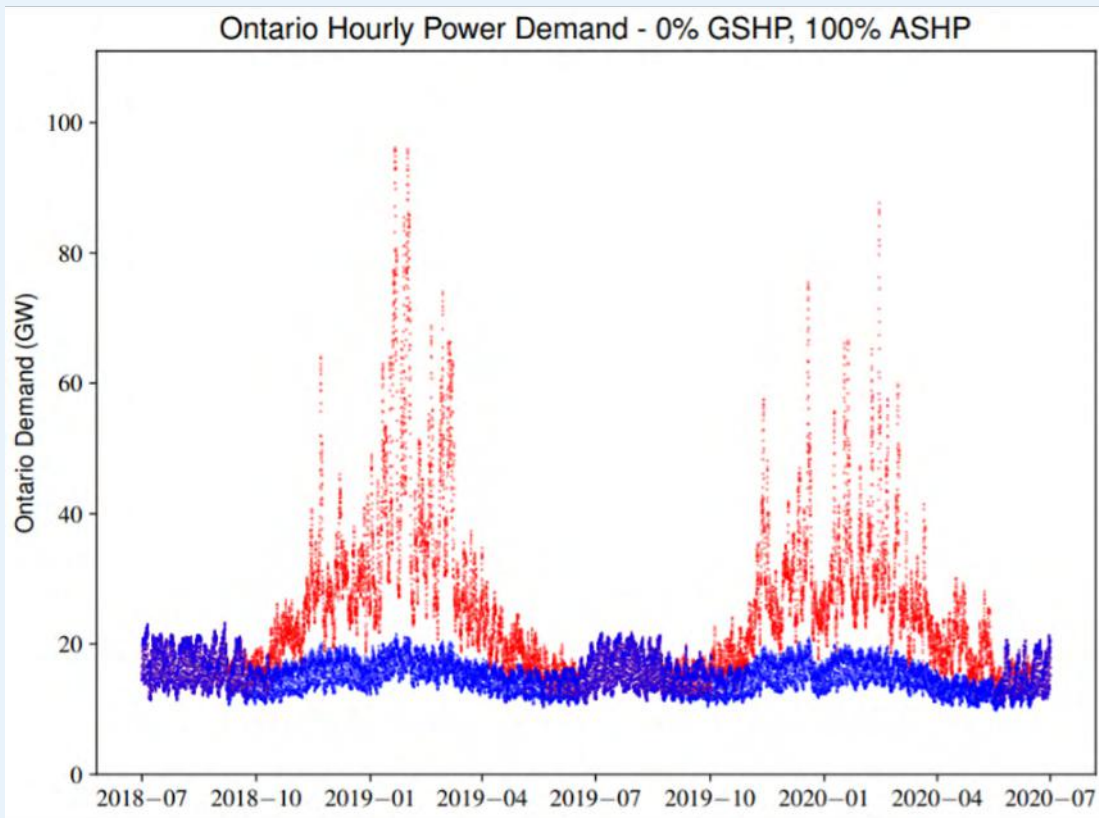
The simulation shows that the peak electricity load grows from about 23 GW to a combined total of about 96 GW. The peak load would increase by 73 GW. It would cost about \$10 billion/GW to install additional dependable clean generation to supply that additional load. This would require an investment of \$730 billion in generation and distribution systems. That additional fixed cost would have to be recovered by increasing electricity rates to all consumers dramatically because the new operating capacity factor of the electricity system would drop significantly below the current 65-70 per cent.

The next electrification option might be the use of air source heat pumps. Figure 3 shows the electricity demand if air source heat pumps were used for space heating.

Given that the coefficient of performance (COP) at peak load during the coldest days of winter is close to 1, the peak is similar to the option of using resistance heating,

but the energy demand, with a seasonal COP (SCOP) of 2.4, is reduced by about 60 per cent. This appears, on the surface, to be a good deal for consumers, unfortunately, the utility has its revenue reduced substantially at current electricity rates. Therefore, electricity rates would have to rise dramatically to recover the total costs of the additional installed capacity. The rise in fixed costs for the additional installed capacity would be greater than the reduction in total energy used. The reason is that clean electricity systems typically have 90 per cent of their total cost associated with installed capacity and less than 10 per cent of their costs are associated with fuel costs. Therefore, consumers could not escape from a much higher energy bill.

Figure 3 – Impact on Electricity Demand if Air Source Heat Pumps are Used for Space Heating





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To improve on this, let's examine a case where 70 per cent of the heat pumps were ASHPs and 30 per cent were ground source heat pumps with a COP of 4. This assumption reflects the fact that GSHPs are not practical for single homes in urban areas but could be used in lower-density suburban or rural areas. The results are shown in Figure 4.

The 70/30 per cent split of ASHPs/GSHPs brought the peak down to about 79 GW and further reduced energy use. This is an incremental electricity load of about 56 GW and would cost about \$560 billion in capital cost compared to the \$730 billion investment it would take to transition to resistance heaters.

If the electrification of heating option were pursued, energy-efficient retrofits would be useful to lower peak loads and energy use. Figure 5 shows the electricity system demand if there was a 40 per cent reduction in energy intensity of homes and 70 per cent ASHPs and 30 per cent GSHPs were used for space heating.

A 40 per cent reduction in energy intensity of homes, with a major retrofit program was simulated. This would reduce the incremental peak to about 24 GW (combined peak of about 57 GW) at a cost of \$240 billion in capital cost. Further work is required to provide a retrofit cost estimate so that it can be evaluated.

Less expensive ways to lower the peak could also be attractive. The use of hybrid heating solutions has been suggested where a natural gas furnace was retained and used during colder weather days – below -8°C . A reduction in peak could be achieved and then natural gas would supply only about 3 per cent of the annual energy. This would considerably reduce the cost of required electricity system capacity. The incremental peak load for heating would be reduced to about 12 GW at an incremental capital cost for the electricity system of about \$120 billion. Natural gas would still be used but with a reduction of about 97 per cent in gas use compared to only natural gas heating. This may not be sustainable business for the gas utility and natural gas rates would likely rise to pay for the residual cost of the existing natural gas system.

Figure 4 – Impact on Electricity Demand Using 70 per cent ASHPs and 30 per cent GSHPs for Space Heating

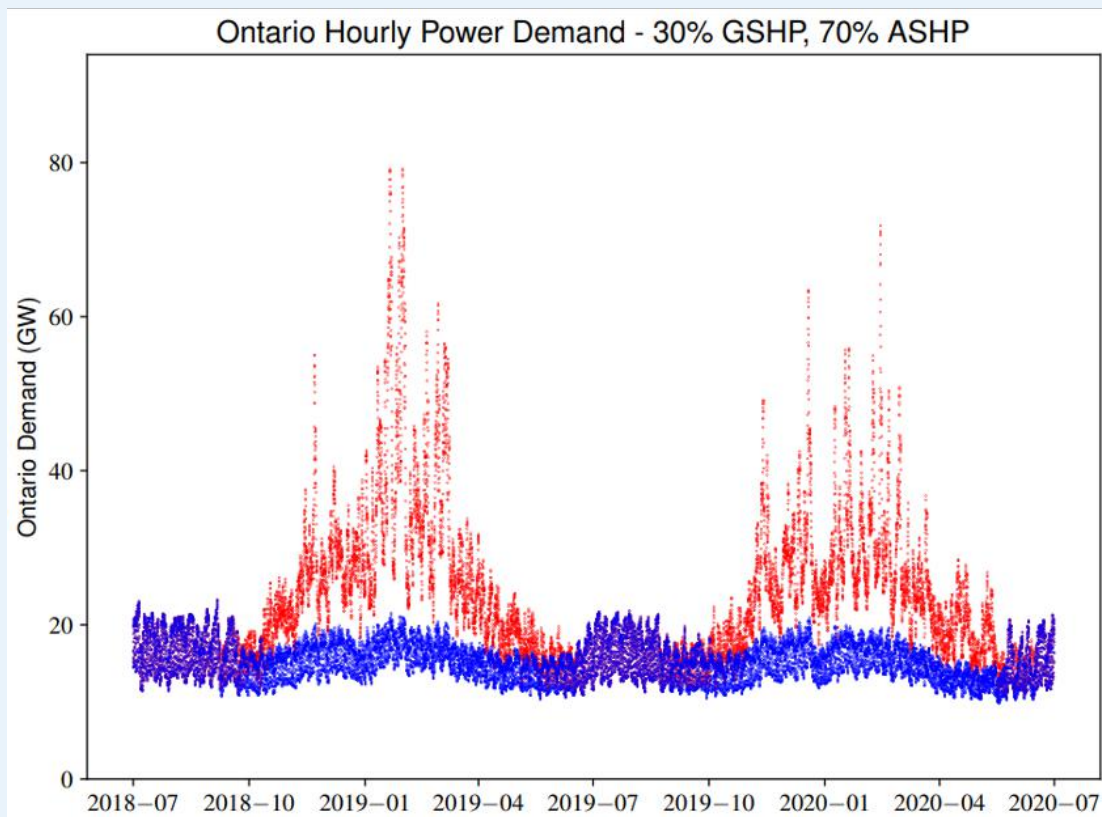


Figure 5 – Impact on Electricity Demand Using 70 per cent ASHPs and 30 per cent GSHPs for Space Heating

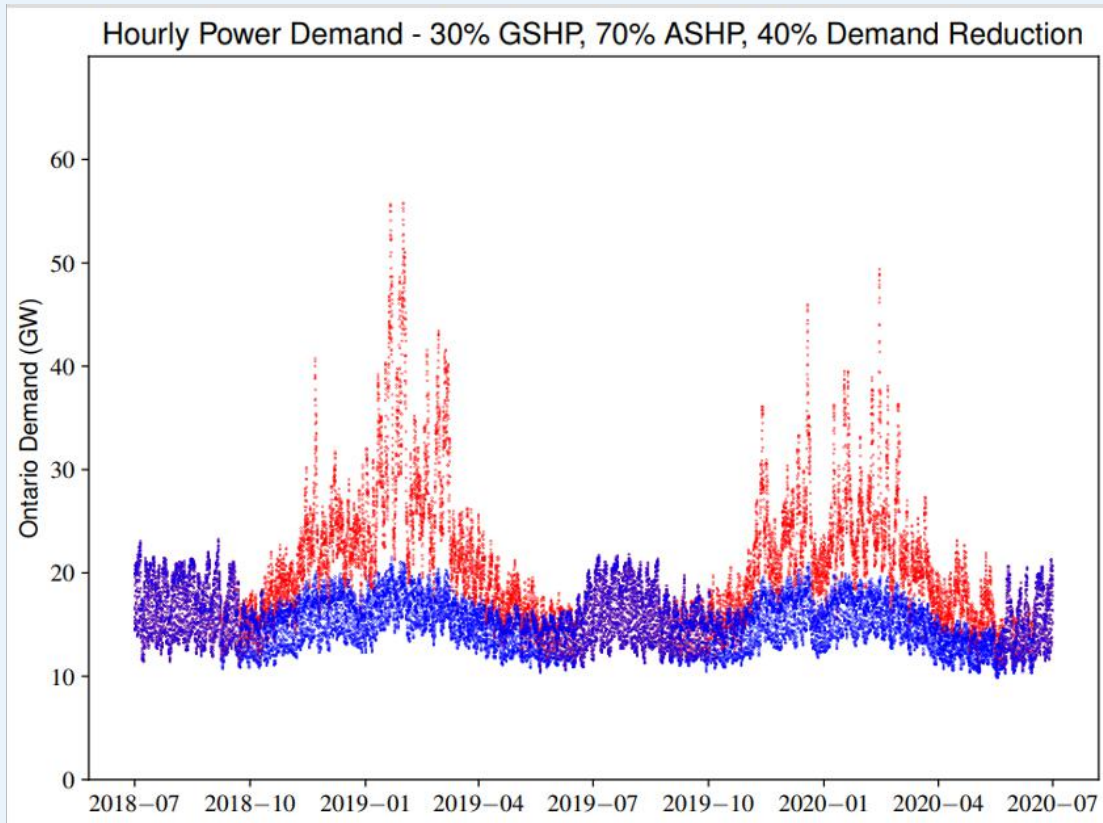
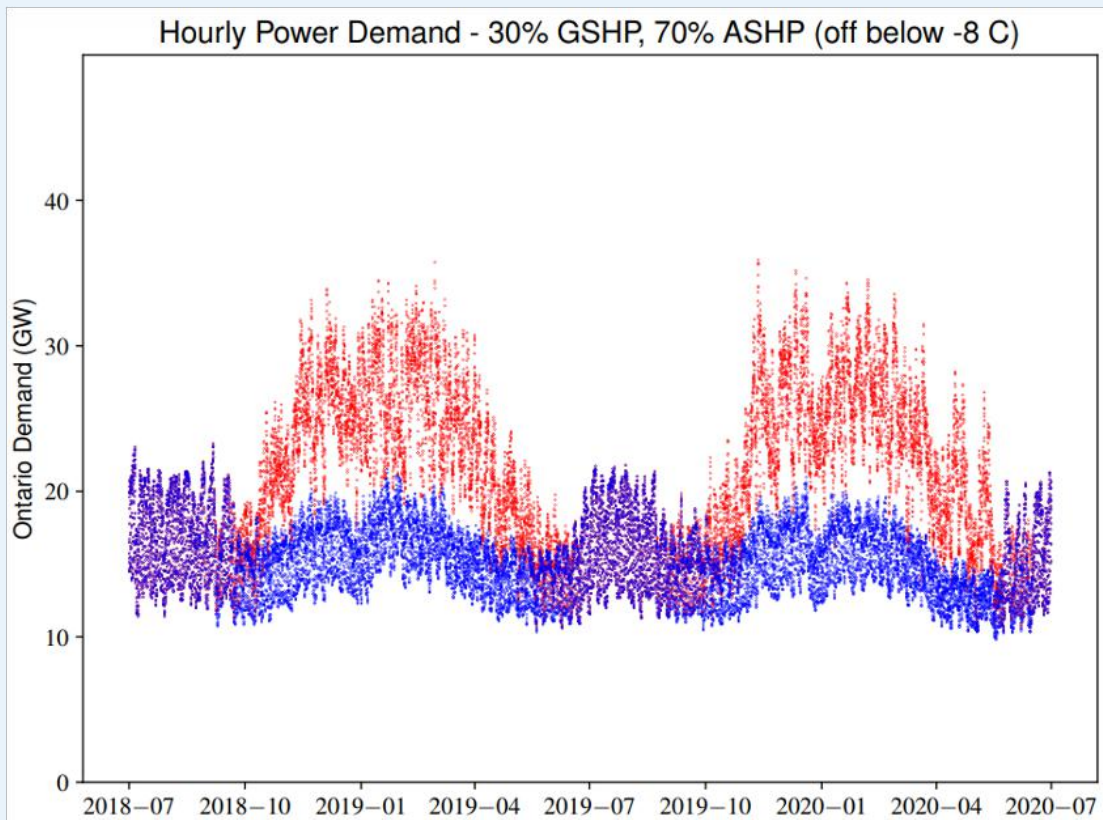


Figure 6 – Impact of Using Natural Gas for Peak Loads of ASHPs below -8° C



Optimization might reveal a cost-effective combination of choices to minimize cost and to look at the trade-offs between cost and GHG reduction.

THE THERMAL NETWORK OPTION

If we wish to evaluate the impact of using thermal networks to enable the use of GHG-free energy sources for heating in urban areas, the ASHPs would be replaced by district heating and the electricity consumption might drop to about 5 per cent of the heating load to cover fluid pumping. However, this pumping energy is not a loss as much of it will be dissipated as heat from friction and will become part of the heating value of the hot water that is circulated. Figure 6 shows the resulting electricity demand.

GSHPs would still be used in lower density areas and that would reduce the incremental peak load to about 6 GW or a total of 29 GW.

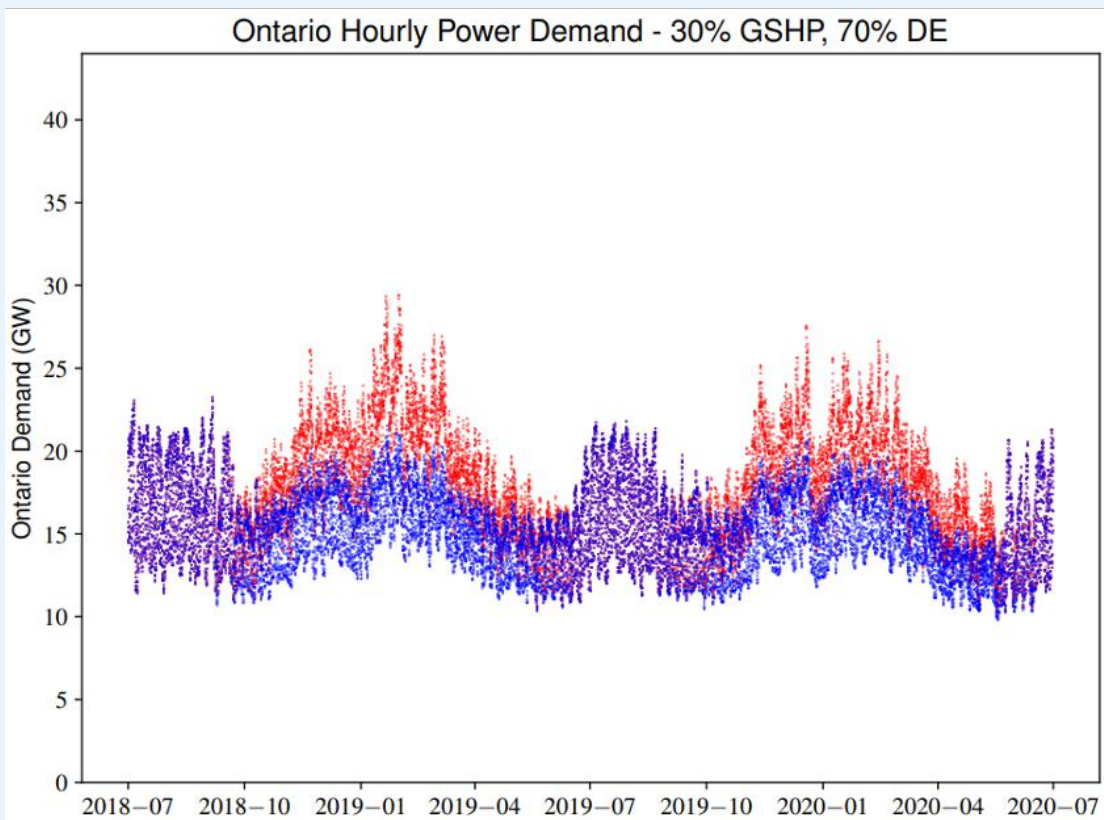
This would require an investment of about \$60 billion in the electricity system.



Written by:

Michael Wiggin, P. Eng.
 Director, The Boltzmann Institute
 Member, The Ontario Society of Professional Engineers (OSPE)
 Energy Task Force

Figure 7 – Impact on Electricity Demand Using District Heating and 30 per cent GSHPs for Space Heating





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Most Engineering Graduates Aren't Becoming Engineers

See how engineering grad employment trends compare to other professional disciplines

Lee Weissling, Ph.D.



While 40 per cent of engineering graduates with degrees from inside Canada work in their field of study, this is a lower proportion than other professional disciplines such as Math/Computer/Information Science (Math+), Business, Education, and Law. How do we know this? OSPE has reviewed 2021 Canada Census data and has conducted in-depth analysis of what types of jobs engineering graduates work in and their income (see the June 2023 and September 2023 Voice Magazines) and now, comparisons of types of jobs with other professions. A more in-depth analysis of jobs deemed underemployed is also presented.

The analysis was limited to individuals who were employed at the time of the census and aged between 25 and 64 years. The census does not distinguish between licensed engineers or non-licensed engineering graduates nor certifications or credentials of other professions and thus all findings reported are based solely on individuals having a bachelor's degree or higher in engineering, math+, business, education, and law.

Comparisons between people who earned degrees from inside and outside Canada are also offered.

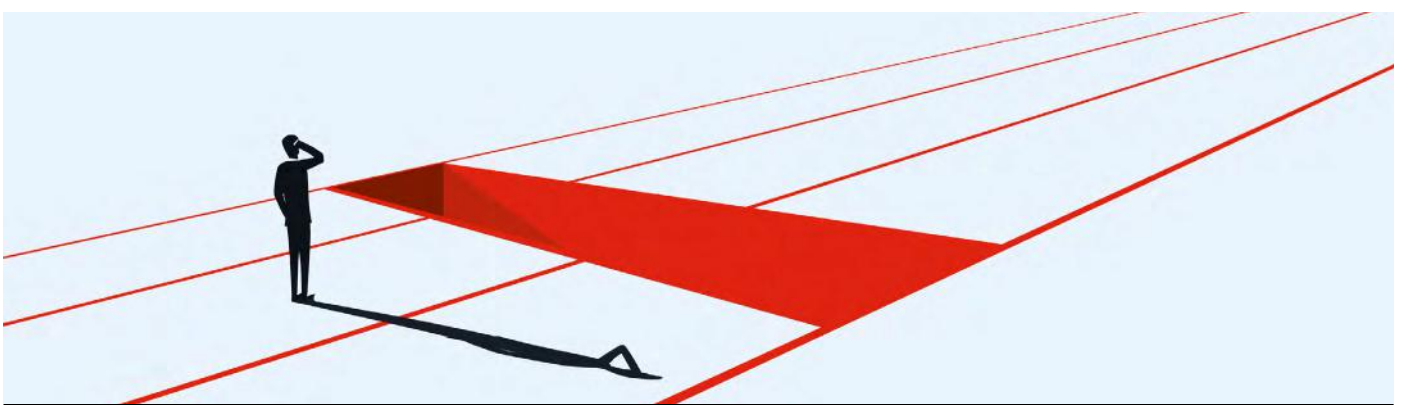
The types of jobs are defined as:

- **Work in Field:** Those who identify as working in a career requiring a degree and that is the same as the discipline of their degree.
- **Non-Field Science Technology Engineering Mathematics (STEM):** STEM graduates working in other STEM professions than their discipline and which normally require a degree. The professions in this category include all forms of software development, cybersecurity, information management, mathematics, etc. Collectively we refer to them as math+.
- **Professionals:** Those working in non-STEM jobs normally requiring a university degree.
- **Underemployed:** Those working in jobs that do not *necessarily* require a university degree.

Note that being classified as underemployed does not reflect whether the occupation is lower paying or lower status. For example, engineering technologist positions do not normally require a university degree. A college diploma qualifies one to work in the profession and thus a graduate with an engineering degree working as an engineering technologist is deemed underemployed. Engineering technologists are certainly viewed as professionals by OSPE. Similarly, graduates with a business degree may indeed work in related professions, but the census lists those as administrative or support jobs and thus may not necessarily require a university degree.

Major Observations

- At 40 per cent, engineering graduates working in engineering *and* having a degree from inside Canada, is the lowest proportion of disciplines working in their field of study compared to the other professions analyzed.
- Unsurprisingly, education and law degree holders have the highest proportions of graduates working in their field or study.
- Except for math+, IEGs are far more likely to be underemployed than those with degrees from inside Canada.
- The bright spot for IEG math+ degree holders is that a higher proportion of them work in their field than are underemployed, with 51 per cent working in math+ fields and only 34 per cent underemployed. In fact, IEGs with math+ degrees show the lowest proportion of underemployed than all other types of degree holders in this analysis.



TYPES OF JOBS BY PROFESSION AND DISCIPLINE:

All data presented here represent Ontarians between 25 and 64 years old with degrees in the aforementioned disciplines. This means all statistics presented about, for example, business, are people with their degree being a bachelor's or higher in business.

Figure 1 shows the percentage of people with respective degrees from inside Canada who work in different types of jobs.

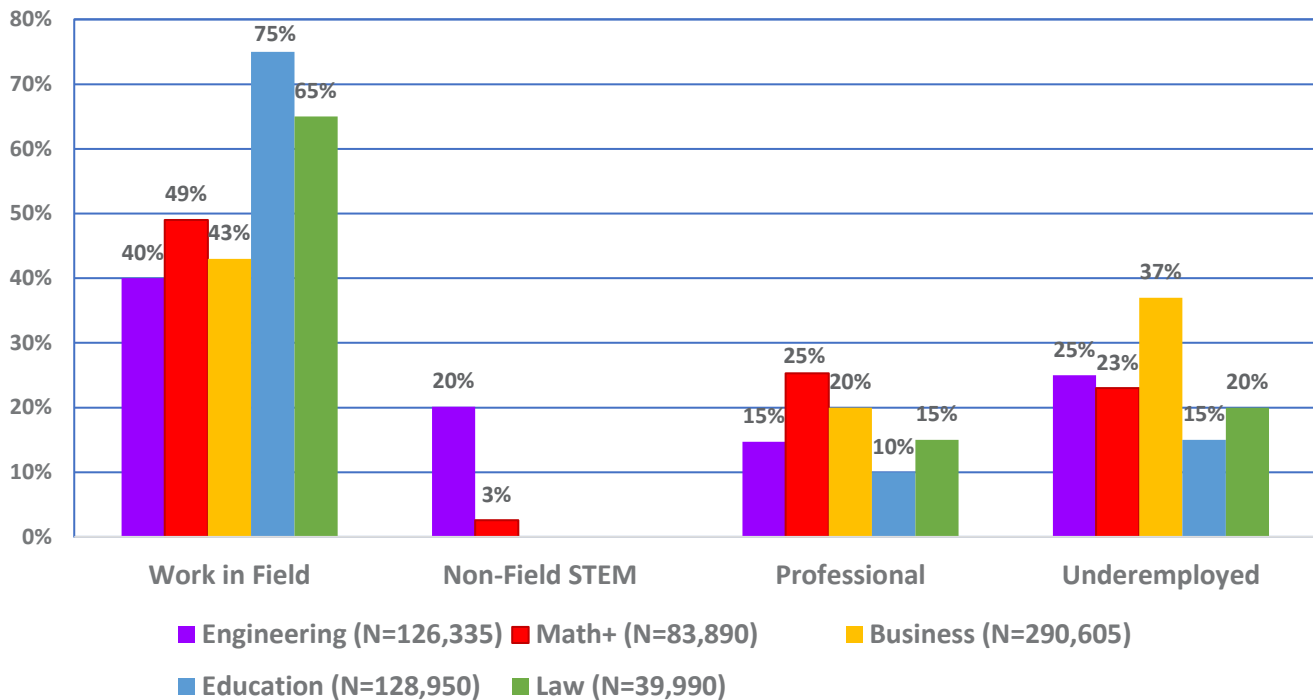
Key Observations: Inside Canada Degree Holders

With 40 per cent of engineering graduates working in engineering, the discipline has the lowest proportion of graduates working in their field of study. Business degree holders have slightly more graduates (43 per cent) working in their field of study and almost half of math+ degree holders (49 per cent). The professions with by far most of their graduates working in their fields are education (75 per cent) and law (65 per cent). If non-engineering STEM positions are looked at, 60 per cent of engineering graduates work in STEM, which is approaching comparability with law.

There is a greater range of proportions for those underemployed. Only 15 per cent of education degree holders work in jobs deemed underemployment. Law, math+, and engineering are in similar proportions ranging from 20 per cent for law graduates to 25 per cent for engineering graduates. Much higher proportions of business degree holders are underemployed (37 per cent). See section below for a more in-depth discussion of what is meant by underemployment.

Figure 1: Proportion of Canadian Degree Holders from Different Disciplines in Types of Jobs (N=total number of degree holders in that discipline).

Comparisons of Professions - Inside Canada Degree Holders



Source: 2021 Canada Census

Key Observations: Internationally Educated Graduates

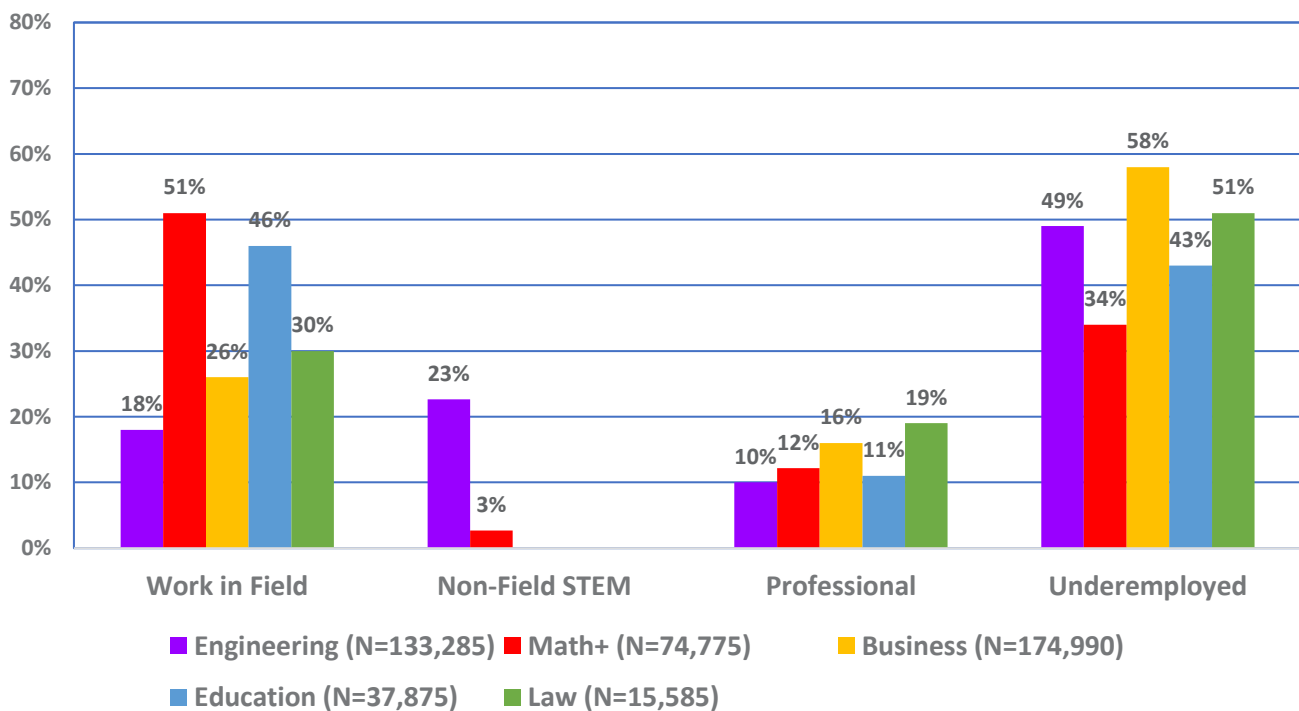
Figure 2 shows the percentage of people with respective degrees from outside Canada who work in different types of jobs.

Discussion of IEGs with engineering degrees was presented in the June 2023 Voice. We emphasized that a greater proportion of IEGs work in non-engineering STEM professions than in engineering. This was attributed to many IEGs working for IT companies. Emphasis was also placed on showing that just about half of IEGs were underemployed.

When compared with other professions, at only 18 per cent, IEGs with engineering degrees have the lowest proportion working in their field of study than other disciplines. IEGs with math+ (Math/Computer/Information Science) fare much better than all other IEGs with degrees in the disciplines studied. Over half of math+ IEGs work in their field of study. Close behind are IEGs with education degrees (46 per cent), largely attributable to the high number of teachers/professors in post-secondary institutions. Far fewer IEGs with law (30 per cent) and business (26 per cent) work in their field of study.

Figure 2: Proportion of Outside Canada Degree Holders from Different Disciplines in Types of Jobs (N=total number of degree holders in that discipline).

Comparisons of Professions - Outside Canada Degree Holders



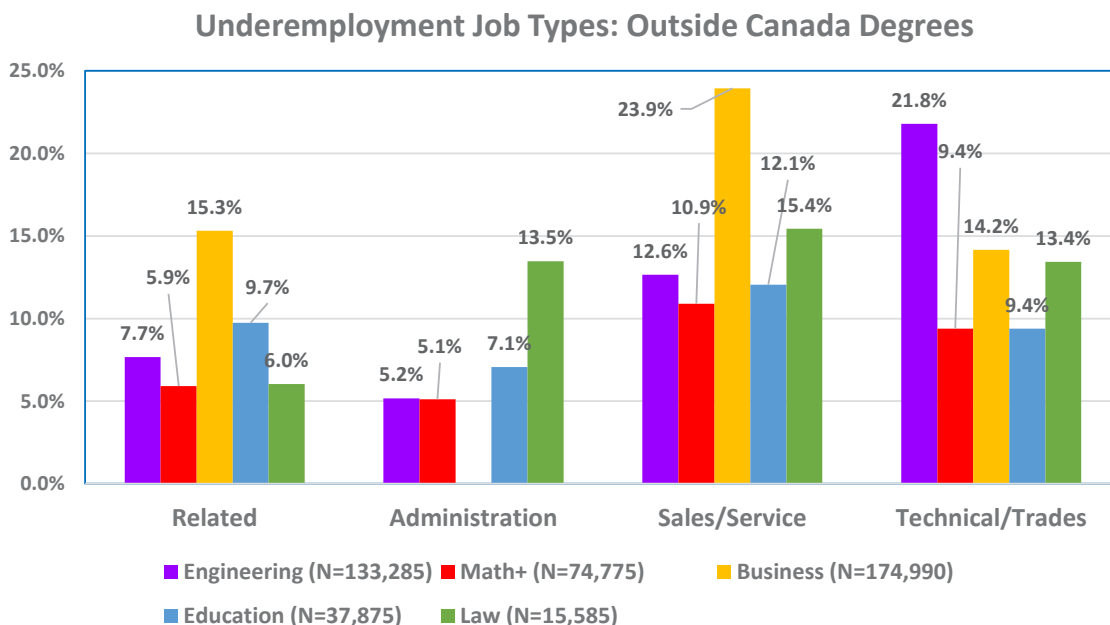
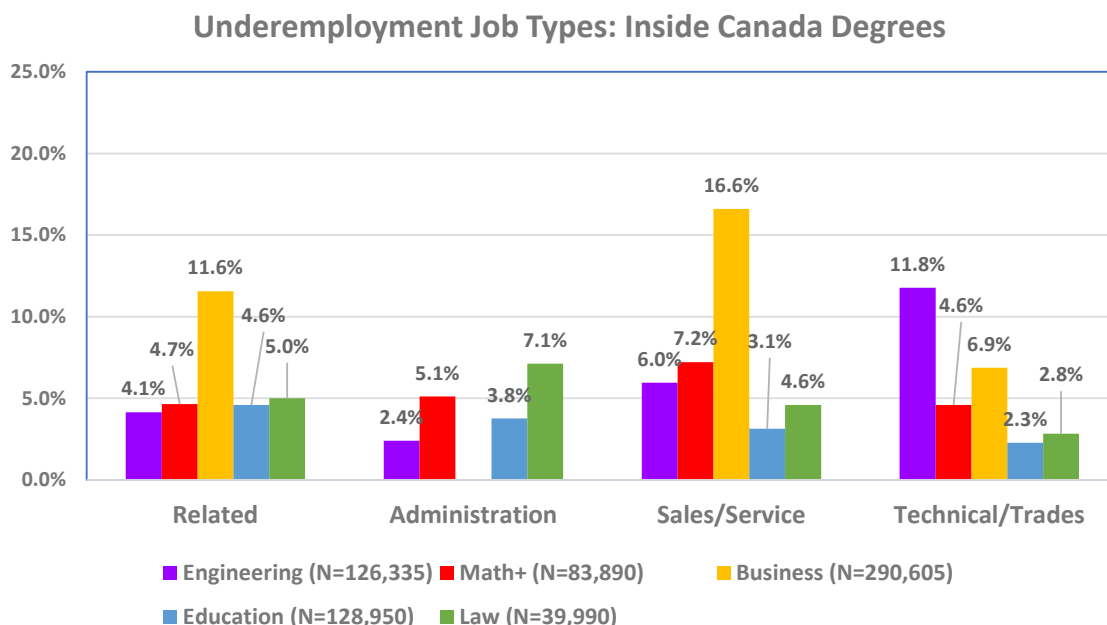
Source: 2021 Canada Census

IEGs with business degrees have the highest rate of underemployment (58 per cent), but law (51 per cent) and engineering (49 per cent) degree holders are not far behind. Those with math+ degrees have the lowest proportion of underemployed (34 per cent) than any other discipline. The following section goes in more detail about underemployment.

WHAT DO WE MEAN BY UNDEREMPLOYMENT?

As discussed previously (June and Sept. 2023 editions of the Voice) for engineering degree holders with degrees from Canada being underemployed does not infer making a low income or not being in a career-oriented job. Underemployed but Canadian educated graduates with the degrees analyzed for this article are likely in career-oriented and generally well-paying jobs, but which do not necessarily require an engineering degree. For example, senior level supervisors in utilities. Whereas IEGs may be stuck in ‘survival’ jobs to just make enough money to get by. This has been the case with many IEGs that have taken courses for IEGs at OSPE. Comparisons of types of jobs deemed underemployed by discipline and location of degree are offered in Figure 3.

Figure 3: Types of Underemployment Jobs Held by Discipline and Location of Degree (N=total number of degree holders in that discipline).



Source: 2021 Canada Census

In Figure 3, 'Related' jobs are those within the same category (e.g., business) but in positions not necessarily requiring a degree. For engineering, this would be engineering technicians/technologists. 'Administration' jobs are those under business and includes business support. 'Sales/Service' include retail and wholesale trade as well as restaurant workers and sales managers. Technical/Trades are all types of technical, transportation, utilities, and trades (both skilled and unskilled) jobs but those not classified under the same name as the respective discipline. These include labourers but also senior level supervisors, all of whom do not necessarily require a degree.

For engineering graduates with degrees from inside Canada, most of those underemployed have found work in technical industries. There is a wide range of these types of jobs and include construction, manufacturing, transportation, and utilities. As demonstrated in the September 2023 Voice, many of these are well-paying positions.

For other disciplines, except for business degree holders, if underemployed, are relatively evenly spread proportionately in other types of jobs. The exception is business, which has a relatively high percentage of degree holders working in related or sales/service jobs. Note 'Administration' is blank for business degree holders as those who are underemployed are counted, by definition, as 'Related'.

The most impactful observations come from review of IEG underemployment. IEGs in all types of jobs and over all disciplines have higher rates of underemployment than engineering graduates with degrees from inside Canada. For engineers, the proportion of IEGs is around twice as much as those who are Canadian educated. Most underemployed IEGs work in sales/services (13 per cent) and especially in technical/trades (22 per cent). Many of these jobs are in management but many are likely not related directly to an engineering education. Many other jobs IEGs work in are 'survival' jobs such as food couriers, machinery technicians, or general labourers. The bottom line is that there is a lot of wasted talent, and many companies are missing out on the skills IEGs bring to Canada at a time when industry is calling out that there is a significant skills shortage in the workforce.



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CONCLUSION

For engineering graduates with degrees from inside Canada, the employment rate in engineering or non-engineering STEM positions, at 60 per cent, is quite favourable. Having said this, there are other professions that have higher proportions of graduates working in their field of study, such as education and law.

As concluded in the June and September 2023 Voice articles, there are not many positive comments to make about labour market conditions for Internationally Educated Graduates. Across the board (almost) far fewer proportions of IEGs work in their field of study and mainly earn far less than their inside Canada degree counterparts. The exception and bright spot are for those with math+ degrees working in their field. They even have a slightly higher percentage of working in the field than inside Canada degree holders. This is reflective of the high demand for high-tech skilled workers and bodes well for immigrants to Canada with those types of degrees and/or skills. Indeed, a higher proportion of IEG engineering graduates work in non-engineering STEM professions than in engineering.

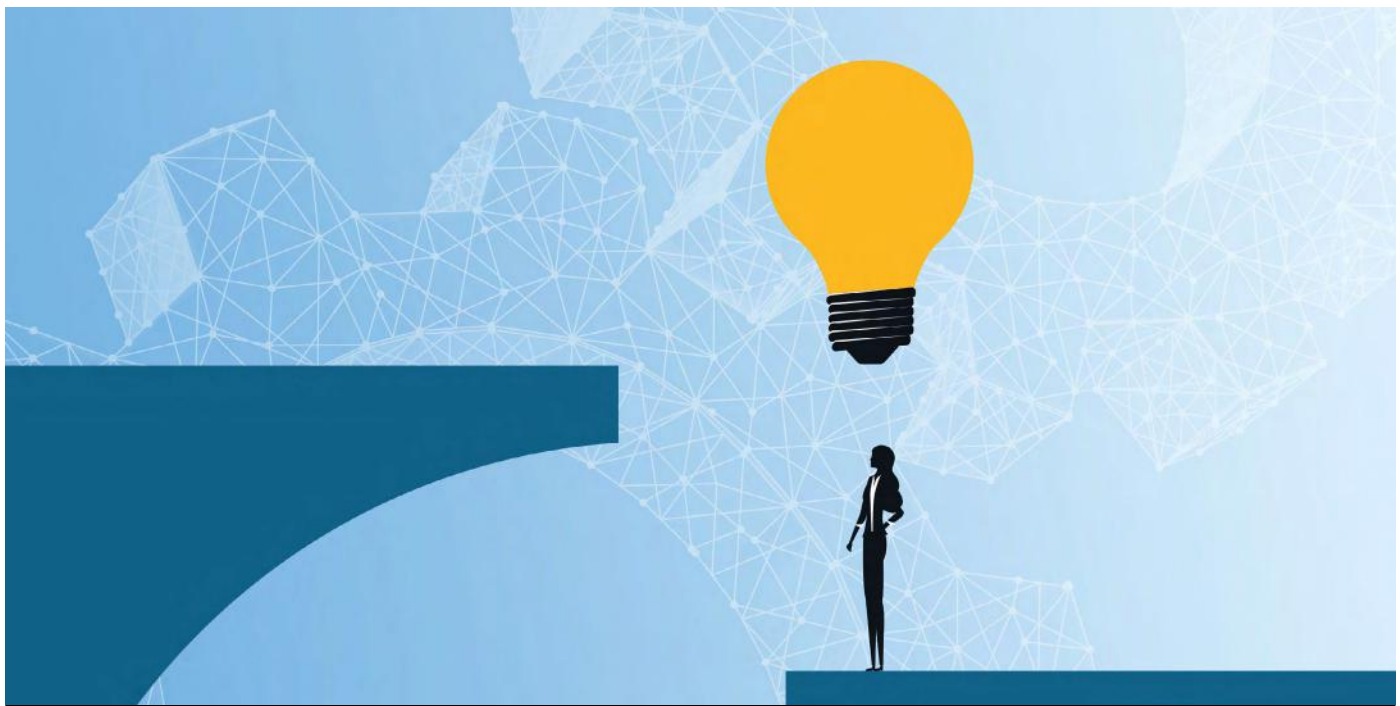
All disciplines analyzed for this paper demonstrate high levels of underemployment, although a greater proportion of math+ and education degree holders work in their field of study than are underemployed. Engineering, business, and law IEG degree holders have especially high levels of underemployment. It would be interesting to look at medical doctors and nurses as well, but the census data reviewed does not distinguish between nursing and all other health disciplines, including physicians – they are all combined under one category.

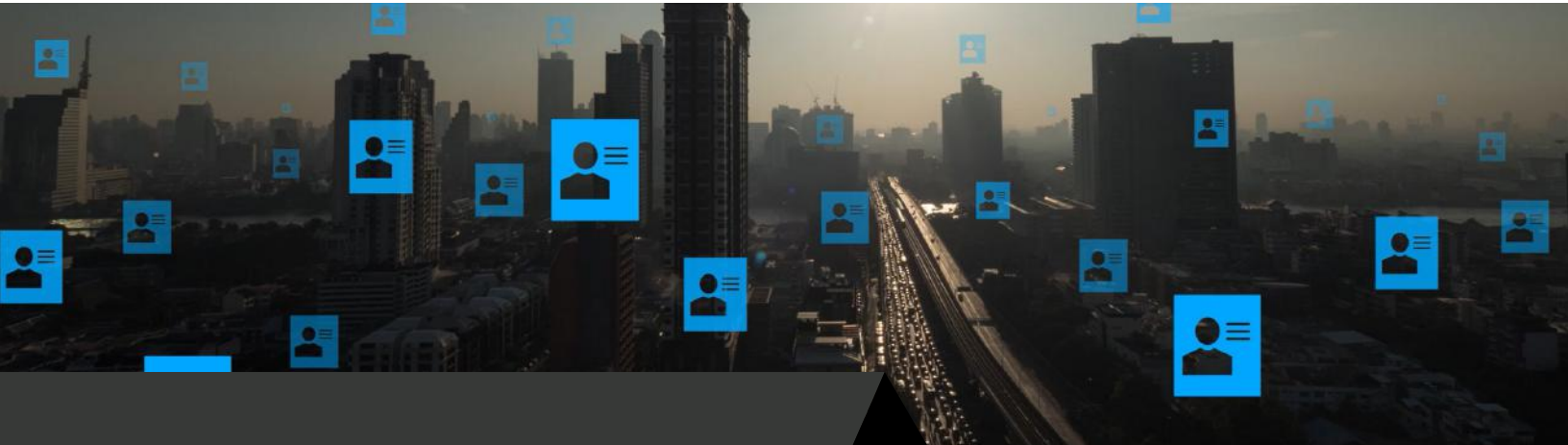
It again is clear that immigrants in most all types of professions and skill sets face severe barriers in finding work in their field after moving to Canada. OSPE hopes to receive new funding in 2024 to provide job search training for IEGs, but there is no guarantee this will occur. In the meantime, OSPE encourages IEGs to become members and avail themselves to OSPE's career services and professional development open to all members.

Look for a complete report in 2024 on OSPE's website that combines all themes from Voice articles about the census plus income comparisons with the disciplines covered in this article.

Written by:

Lee Weissling, Ph.D.
Senior Research Officer at Ontario Society of Professional Engineers.





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Sustainability Policies within the Building Sector in Ontario

Yash Vyas, MAsc, BAsc, Dr. Medhat Shehata, P.Eng., Dr. Lee Weissling, and Nika Zolfaghari, MAsc, BEng



With the rise of climate change, many Canadian provinces and territories are adopting sustainability plans and making commitments to reduce greenhouse gas (GHG) emissions. As a result, sustainability has become a crucial topic in various sectors, especially the construction industry.

In addition to significant environmental benefits, sustainability initiatives will also create new employment opportunities. In fact, the green building industry provided over 460,000 jobs in 2018, which was a 55

per cent increase from 2014. According to the Canadian Green Building Council, an increase in progressive sustainability policies could result in 1.5 million new jobs by 2030.

Amidst the rise of sustainability initiatives (and related employment opportunities), Ontario is also home to a growing and increasingly diverse population. Many sustainability plans incorporate inclusion policies, which state that regions must provide healthier and more livable places for equity-seeking groups.

PURPOSE AND SCOPE OF STUDY

In an increasingly diverse population with housing stock concerns, such as in Ontario, sustainable housing policies play an essential role in providing equitable shelter. Although sustainable housing policies are dependent on politics, supply chain, and demand and supply of houses, the general trend is to move towards sustainable construction.

The general purpose of this research is to understand the potential impacts of sustainable construction from the perspectives of academic and industry experts. In southern Ontario, changes to building construction policies are governed by three objectives. (1) Achieving a carbon-free atmosphere, (2) Reducing energy consumption, and (3) Increasing the affordability of housing.

METHODOLOGY QUESTIONS, AND ANALYSIS

Ten experts were interviewed from the following backgrounds:

- **Energy and Policy** – 4 Experts (4 Engineers)
- **Social and Policy** – 2 Experts (1 Social Worker and 1 Engineer)
 - A sustainability social and policy expert is an individual who possesses specialized knowledge and expertise in the fields of sustainability, social sciences, and public policy.
- **Architecture** – 2 Experts
- **Construction and Trade** – 2 Experts

THE IMPACT OF SUSTAINABILITY POLICIES

Q1. Which types of sustainability policies will be most impactful in the housing sector? Why?

The interviewees all expressed the importance of net-zero goals but recommended different approaches for meeting these goals.

- Experts with **energy and policy** backgrounds stated their preference for “step” or “tiered” energy codes and objectives. A step code comprises voluntary targets that reduce carbon emissions and energy consumption; the steps function as goals to be achieved.
- Experts with **social and policy** backgrounds believed the most effective way to achieve carbon-zero goals is through new construction. The new sustainable construction industry will be

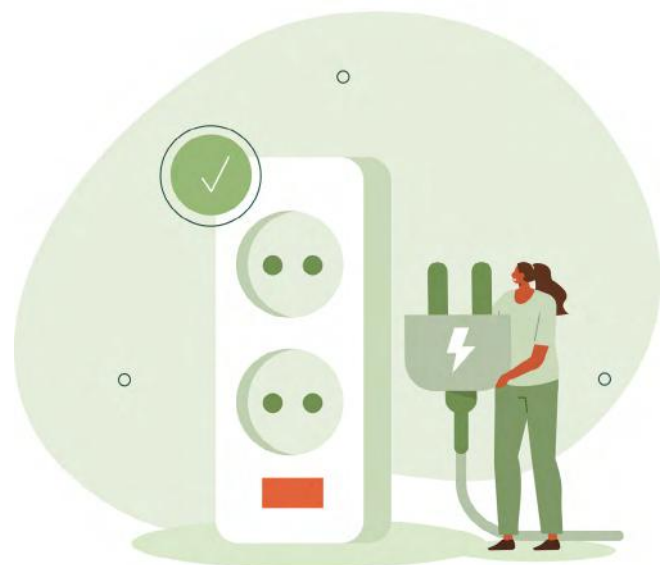
heavily dependent on advanced materials and innovative construction practices.

- According to **architecture** experts, the movement towards net zero demands corporate investment in green technologies. Increasing education about green technologies in school curriculums can help ensure a smooth and effective transition towards green construction.

Q2: Is there a specific policy that you think may have a bigger impact than others?

The interviewees each focused on broad concepts, rather than single policies.

- Experts with **energy and policy** backgrounds suggest that stepwise sustainability systems (like the BC Energy Step Code) can have a significant impact, but they require industry groups to enact these changes. Policy and government incentives can also support carbon reduction (such as subsidies for heat pumps and electrification).
- Experts with **social and policy** backgrounds suggest that electrifying HVAC systems is the most effective way to reduce the building sector’s carbon footprint.
- Experts with **architecture** backgrounds believed step codes would help propel sustainable practices forward.
- Experts with **construction** backgrounds emphasized the need for structured and standardized sustainability policies that work together to avoid conflicting guidelines. These policies will support the electrification of technology, with the largest impact coming from electrified HVAC systems.



What Does the Future Hold for Engineering in Ontario?

Award Winning! This report received an *Association Centre of Excellence Award* from the *Canadian Society of Association Executives*.

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“There are clearly systemic barriers limiting women’s participation in the field.”

“International Engineering Graduates are passionate and enthusiastic, but barriers to employment may limit their ability to contribute.”

“I work in a contract teaching role, and that’s why I have my P.Eng....but if not for that, I probably wouldn’t have it.”



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Q3: What impact will sustainability policies have on equity-seeking groups?

The experts agreed that the largest impact of sustainable construction will be increased employment opportunities. Previous policies and standards (such as LEED) have already increased the sustainable infrastructure workforce, and as the sustainable infrastructure movement grows, there will be even more opportunities.

- According to experts in **energy and policy**, sustainable policies will create job opportunities, particularly in energy modeling. However, implementing these policies may increase housing and energy prices, potentially widening economic gaps due to the high capital cost of initial investment in green technology.
- The **social and policy** experts believe that green policies in the building sector can increase employment opportunities in technical and administrative jobs, and provide individuals with the opportunity to change their career paths. From a health perspective, improved indoor air quality can also support improved health outcomes.
- The **architecture** experts identified the need for incentives to encourage implementing green policies in the building industry (such as tax breaks or other financial benefits). The tax breaks and subsidies allow sustainable retrofits and new construction strategies to be deployed easily at a cheaper cost.

They also emphasized the importance of collaboration between the private and public sectors. Through the collaboration of the public and private sectors, there is a trend of building more sustainable and affordable houses which, the experts noted, has historically been beneficial to equity-seeking groups who often belonged to low-income sectors.

OPPORTUNITIES CREATED BY SUSTAINABILITY POLICIES

Q4: What new employment opportunities will sustainability policies create in Ontario?

The experts identified two major opportunities for employment. The primary opportunities are direct jobs within the construction sector (such as designers, tradespeople, engineers, and architects), and the secondary opportunities are in construction-adjacent jobs (such as shop owners, supply chain and manufacturing workers, and training positions).



- **Energy and policy** experts expect opportunities in the skilled trades to increase most due to an ongoing decline in the number of workers qualified to fill these roles. Additionally, there will be jobs in finance related to the clean energy movement.
- Although skilled workers are believed to have the greatest opportunity, **social and policy** experts warn that slow certification and licensing processes often disproportionately impact equity-seeking groups.
- **Architecture** experts predict that sustainable technology implementation will increase employment opportunities in construction-related jobs, including skilled trades and design.
- **Construction** experts agreed that the sustainability movement can support skill development and employment opportunities. They added that to make the most of the growth in opportunity, education standards need to change. They said more incentives are needed for certification.

The experts agreed unanimously that the biggest increase in job opportunities will be in the skilled trade market. However, there is a steady decline in the number of skilled tradespeople to fill these jobs. This will result in a slower sustainable construction rate, lower housing supply, and increased housing prices. **Energy and policy experts** suggested exploring immigration channels to fill the need for skilled trades workers and proposed integrating immigration services in the construction industry to speed up construction.

Q5: What skills and/or certifications do you think employees need to learn to find employment in the sustainable housing sector?

Experts identified the importance of skilled trades and design skills, as well as financial skills related to funding building construction.

For this research, ‘skilled trades’ refers to skills that require certification and a license in the chosen specialization with hands-on experience (i.e., jobs in carpentry, electrical, plumbing, HVAC, and many more).

Design skills relate to the architecture, construction, engineering, and project management jobs within the building sector. Important skills in this sector are carbon accounting, passive and active design, and energy management.

- According to **energy and policy** experts skilled trade certification is the fastest way to find employment as the need for skilled trade workers will only increase.
- **Social and policy** experts identified skilled trades as the most valuable way of entering the sustainable housing sector. The social and housing policy experts believed that the union licensing process, gender inequality, and benefits acted as barriers to entry in this field.
- The **architecture** experts believed that key skills to learn are quantifying embodied carbon and making rational decisions to make a sustainable building. These skills are important when working towards sustainability in skilled trades and design jobs such as architecture, engineering, and project management. This is because there is a direct relationship with the embodied carbon when deciding what materials to use in construction.
- **Construction and trade** experts see all sectors of construction as promising fields due to the high demand for work. The current skilled trade forces are retiring and the industry is in need of skilled trade workers with sustainability backgrounds.

OPPORTUNITIES CREATED BY SUSTAINABILITY POLICIES

Q6: In your opinion, what are the barriers to equity-seeking communities participating in the green movement in the building sector?

This question elicited multiple unique responses. The barriers identified depended on the type of participation. For instance, if equity-seeking groups are asked to participate as homeowners, the issue might be related to finances, language barriers, or trust. However, if equity-seeking groups are asked to participate as employees, the issue might be a lack of skills or access to training.

Equity-seeking groups face financial barriers and may lack awareness of government-funded programs to support and participate in the green economy.

Architectural experts agreed that trust is also a key issue for equity-seeking groups, as they lack confidence and fear potential exploitation. One of the architecture experts was noted to get fewer homeowners to participate in federal energy audits when the information was provided in English compared to their first language. This is just one example of a lack of trust. Additionally, **construction and skilled trades** experts believed a major barrier to participation stems from a lack of clear guidance provided by the government; there are many programs that support participation in the green building economy, but the lack of outreach results in a lack of awareness.

FINAL THOUGHTS

Work Opportunities: There will be more opportunities for individuals to participate in the sustainability movement by finding work in this sector. The primary jobs are in the skilled trades and design. In addition to the job market, there is an opportunity to obtain new knowledge through pursuing education.

Barriers to Participation: The social and policy experts believed the biggest gap preventing the involvement of equity-seeking groups in the green movement is the lack of awareness of government-funded programs. The energy and policy experts believed that the biggest issue with the green technology movement is the financial burden faced by equity-seeking groups.

Written by:

Yash Vyas, MASc, BASc
PhD Candidate, Building Science
Faculty of Engineering and Architectural Science
Toronto Metropolitan University

Dr. Medhat Shehata, P.Eng.
Professor of Civil Engineering
Associate Dean, Teaching and Outreach
Faculty of Engineering and Architectural Science
Toronto Metropolitan University

Dr. Lee Weissling
Senior Research Officer
Ontario Society of Professional Engineers

Nika Zolfaghari, MASc, BEng
Manager of Equity and Community Inclusion
Faculty of Engineering and Architectural Science
Toronto Metropolitan University



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The Engineering Conference is about to start, and attendees are checking in for a full day of learning and networking.



Student representatives from the Engineering Student Societies' Council of Ontario flip through *The Voice* magazine.



OSPE CEO, Sandro Perruzza kicks off the conference with his welcoming remarks at EngCon 2023.



Toronto Mayor Olivia Chow gives her opening remarks at EngCon 2023.



The first speaker session of the day with panellists (left to right) Stephanie Smith, P.Eng., Dr. Jeffrey Griffin, Wes Johnsen, MBA CFA, Tracy Leung, P.Eng., and moderator, Paul Accchione, P.Eng.



Tradeshow attendees speaking with one of our Engineering Trade Show booth partners.



“AI-Fueled Innovation: The Next Frontier” with Dr. Alexander Wong, P.Eng. (left) and Sanjeev Gill (right).



The bustling Engineering Trade Show floor at EngCon 2023.



Jennifer Gauglietta, P.Eng., of PEO participating in the Q&A portion of the lunchtime keynote presentation.



From left to right, David Garzon, Vanessa Raquel Raponi, P.Eng., Nour Hachem-Fawaz, Kelly Grieves, P.Eng., and Anna Desjardine leading an EDIA breakout session at EngCon 2023.



Representatives from the Toronto Transit Commission (TTC) at their Engineering Trade Show booth during EngCon 2023.

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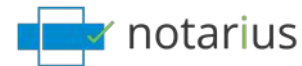
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- Pathipan Sivarasa, P.Eng.

Engineering Medal – Research and Development

- Dr. Amir Fam, P.Eng.
- Dr. Marianna Kontopoulou, P.Eng.

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- Dr. Alexander Wong, P.Eng.

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Project or Achievement of the Year

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 - Vanessa Raponi, P.Eng.
 - Alexander Dow, P.Eng.

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- Daniel J. Young, P.Eng.



Friends and Family of the awardees enjoying a cocktail reception before the award ceremony begins.



Entrepreneurship medal award winner. Dr. Alexander Wong, P.Eng. (right) and Aaron Pereira (left)



(left to right) Stephanie Holko, P.Eng. (OSPE Chair) and Dr. John McPhee, P.Eng. after McPhee accepted the Professional Engineers Gold Medal award.



Karen Webb, P.Eng. making her acceptance speech after receiving the Citizenship Award at the 2023 OPEA Gala.



Lifetime Achievement Award winner Daniel J. Young, P.Eng. celebrating the honour with friends and family.



Stephanie Holko, P.Eng. with OPEA awardees. (Back row L-R) Dr. Aleksander Czekanski, P.Eng., Pathipan Sivarasa, P.Eng., Dr. Amir Fam, P.Eng., Alexander Dow, P.Eng., Dave Crocker, P.Eng. (Front row L-R) Daniel J. Young, P.Eng., Dr. Marianna Kontopoulou, P.Eng., Karen Webb, P.Eng., Vanessa Raponi, P.Eng., Dr. John McPhee, P.Eng.



Vanessa Raponi, P.Eng. and Alexander Dow, P.Eng. (to the left) after receiving the Project or Achievement of the Year award at the OPEA Gala 2023.

Scan the QR code to see highlights from the big night!



THANK YOU TO OUR OPEA PARTNERS

DISTINGUISHED LIFETIME ACHIEVEMENT OF THE YEAR PARTNER



ACHIEVEMENT OF THE YEAR PARTNER



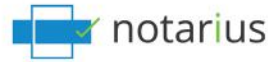
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Celebrate
Engineering
Excellence

2024 OPEA Nominations Now Open

Presented annually since 1947, the Ontario Professional Engineers Awards (OPEA) recognize Ontario engineers who have made outstanding contributions to their profession and their community.

Whose achievements would you like to see recognized at next year's OPEA Gala?

The deadline is Wednesday, February 28, 2024

Find award categories
and nomination process
details here:

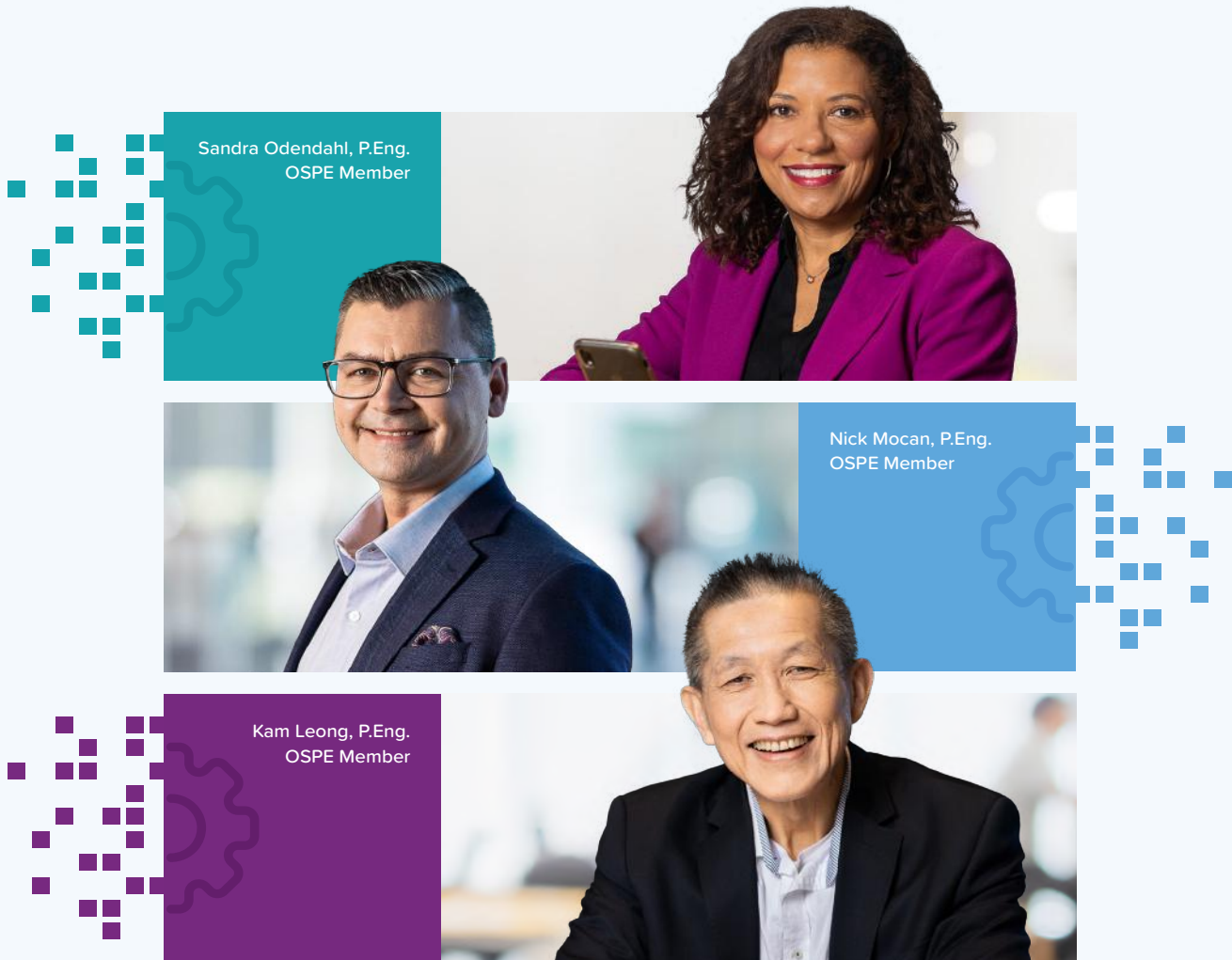


opeaawards.ca

Please allow sufficient time for nominators and referees to review the platform and submit all documents.

For questions, please contact: awards@ospe.on.ca

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#WeAreEngineering
Learn more at ospe.on.ca/weareengineering



OSPE's Upcoming Events



National Engineering Month | **MARCH 2024**



Annual General Meeting | **MAY 07**



OSPE Classic Golf Tournament | **MAY 23**



The Engineering Conference | **OCTOBER 29**



OPEA Awards | **NOVEMBER 15**



The engineers who are elected to OSPE's Board of Directors are committed to ensuring that your profession is headed in the right direction – a direction where your work is valued, and your voice heard.

The Election package will be emailed to members when voting opens on **Monday, March 25, 2024**. Voting will be open until **Monday, April 15, 2024**.

The All-Candidates Virtual Town Hall, where members will have the opportunity to hear from their candidates will take place on **Wednesday, March 27, 2024**, at 6:30 p.m. The event will be recorded, and the video will be uploaded to the OSPE website.

The results of the Board of Directors election will be announced at OSPE's Virtual Annual General Meeting on **Tuesday, May 7, 2024**.

Important Dates

January 2 - 26, 2024
Nomination period

March 25, 2024
Voting opens

March 27, 2024
All-Candidates Virtual Town Hall

April 15, 2024
Voting closes

May 7, 2024
Election results announced at the OSPE Virtual Annual General Meeting

We're looking for passionate and dedicated people like you to join our Board of Directors.

Apply to be in the running for 2024!

Positions Available

This year, members will be electing to fill four open positions. The positions will be elected for a three-year term.

Eligibility

Only Professional, Associate and Honorary Members of the Society in good standing may be nominated. Only Professional, Associate and Honorary Members of the Society may nominate a candidate.

What Potential Candidates and Nominators Need to Know

OSPE is a volunteer-led organization. Every year OSPE is looking for members who want to make a significant contribution to the direction and governance of the association with their volunteer leadership.

If this is something you have thought about, we encourage you to put forward an application for consideration by the *OSPE Nominations Committee*.

See the 2024 OSPE Board Director Nomination and Election Package



For any questions, please contact Marisa Violante at mviolante@ospe.on.ca

CERTIFICATE PROGRAMS

Emerging Leaders Certificate Program



Dates:
Tuesdays
(9:00 AM - 12:00 PM)
April 9 - June 25, 2024

Price:
\$1,950 - \$2,200

ONLINE

Emerging Leaders are the lifeblood of organizations expecting to drive growth and sustainability in their chosen markets. Having the right competencies, character and confidence to lead others is a critical business challenge for the next decade.

The Engineering Academy's Emerging Leaders Certificate program is designed specifically for an engineering audience, leveraging Rzutlt advisors and instructors who combine leadership expertise with a deep understanding of your world.

Pre-start Health and Safety Review – Understanding O.Reg. 851 Section 7



Dates:
March 5, 2024
(8:30 AM - 4:30 PM)

Price:
\$280 - \$379

ONLINE

Designed for Health and Safety representatives, supervisors, management, maintenance staff, engineers, and anyone interested in Pre-start Health and Safety Review (PHSR). This course provides learners with the skills for understanding the requirements of Ontario Regulation 851 Section 7, PHSR exemptions, and the PHSR report. Course materials will be based on the Ontario Legislation, Ministry of Labor, Training and Skills Development Guidelines and PEO Guideline for Engineers Completing Pre-start Health and Safety Review.



Project Management Essentials for Engineers



Dates:
Thursdays and Fridays
(8:30 AM - 12:30 PM)
February 8 - February 16, 2024

Price:
\$695

ONLINE

At one time or another, most people have been faced with the job of planning and executing a project. It might have been a simple thing like organizing an office lunch or something quite complex like developing a software application. Even though these two projects seem worlds apart in importance, objectives, and resource requirements, they have a great deal in common in terms of the planning and overseeing that will make them successes. This course is designed to show you the tools and techniques used by project managers to better organize your work to make your projects more successful.

JOURNEY TO P.ENG.

PE302: Competency-Based Assessment (CBA) Workshops for P.Eng. Experience Requirement

Dates:

December 19, 2023 & January 26, 2024
January 26 & Feb 28, 2024
February 28 & April 3, 2024

Price:

\$350 – \$375

ONLINE

How can you best navigate the P.Eng. competency-based assessment (CBA) system? Professional Engineer (P.Eng.) applicants are required to obtain a minimum of 48 months of acceptable, verifiable professional engineering experience, submitted through a CBA model. CBA is a tool, introduced by PEO in 2023, also used by other provincial regulators (BC, SK, MB, ON, NB, PEI, NL) to assess readiness for licensure that examines 34 engineering competencies across 7 categories: technical, communication, project management, professional accountability, and more.

Our workshop pair gives you the skills and confidence to successfully write your CBA's 34 engineering competencies. Each session covers different competencies while having common elements so learners can start with either one. After making progress on your CBA, join the next workshop, to reflect and ask questions then practice more competencies.

PE403/1223 – Preparatory Course for the National Professional Practice Exam (NPPE)

Dates:

February 26 - March 25, 2024
April 23 - May 21, 2024
July 30 - August 27, 2024

Price:

\$350 - \$425

ONLINE

Research has shown that preparatory courses can improve examination success rates. Taught by experienced instructors, OSPE's most popular course explains the professional practice and legal concepts and issues for the engineering profession to help you prepare for the examination and increase your chances of success. OSPE's NPPE Preparatory course is designed to help applicants for P.Eng. licensure prepare effectively for the National Professional Practice Exam (NPPE).

ospe.on.ca/oea/journey-to-p-eng



MEMBER PROFILE



Hamza Alami, M.Eng., PMP

An International Engineering Graduate's Journey with OSPE

OSPE member Hamza Alami, a civil engineering graduate from Fez, Morocco, came to Canada alone. Not knowing anyone, unfamiliar with the industry, and speaking English as his third language.

After completing a civil engineering degree from the Private University of Fez, he spent the next five years specializing in concrete and corrosive soils in Morocco.

Meanwhile, he was applying for the Federal Skilled Worker Program in Canada. Once he was accepted, he moved to Canada, and started from scratch.

At first, he asked settlement agencies for guidance. Their advice, find like-minded people.

Hamza described Morocco as a very inclusive place because of the mix of Arabic, African, European, Islamic, and Judaic cultures. This inclusivity shaped his value system.

Hamza believed, "Everyone should have access to get into the engineering job market, people with disabilities,

Indigenous peoples, all genders, and also international engineers."

In his search for organizations that shared his values and passion for engineering, he found OSPE. He enrolled in one of OSPE's International Engineering Graduate (IEG) programs, *Engineering Employment Readiness for IEGs*.

There he learned about in-demand skills and engineering trends in the Canadian job market. "This [course] was critical to help me list the skills I already hold and the skills I should develop," said Hamza. He also received training on how to tailor his resume and cover letters to different jobs. "This was critical to make my applications professional, tidy, and attractive to employers."

Equipped with the ability to communicate about his experience and the skills employers are looking for, Hamza was ready to act on a key piece of advice he got from OSPE CEO Sandro Perruzza.

Network as much as you can. OSPE hosts and promotes many networking events for engineers throughout the year that put Hamza in the same rooms as the like-minded people he was searching for.

His job was to reach out, not an easy task for someone who's new to the country, and whose most fluent languages are Arabic and French. But that's what he did, over and over again. First at the Concrete Expo which landed him his first big job in Ontario as a concrete technician for Xradar. He persisted. He kept coming out to events, meeting managers, being asked to apply and putting himself out there.

Hamza enjoyed networking events in Morocco and went often. But what he found at OSPE was that he could participate fully in Canadian engineering events too. Hamza said he likes these events for three reasons, "for [his] personal development, to learn from others' experiences and also to share [his] international experience."

Like with any skill, all it takes is practice and persistence. “Maybe the first time it won’t work, or the second time, or third time,” said Hamza, “but the 10th time it might work. This happened to me. I applied to over 50 jobs, and I just got eight interviews...Stay positive and motivated. The mindset is critical.”

In his continued outreach, Hamza met with managers from the Corrosion Service Company Ltd. An industry leader in North America that Hamza was determined to work with. Despite being passed over for the first job he interviewed for (by someone with twice the experience), he applied to another job with the company and landed a project management position. In less than a year Hamza was gainfully employed in his specialty at a leading corrosion company.

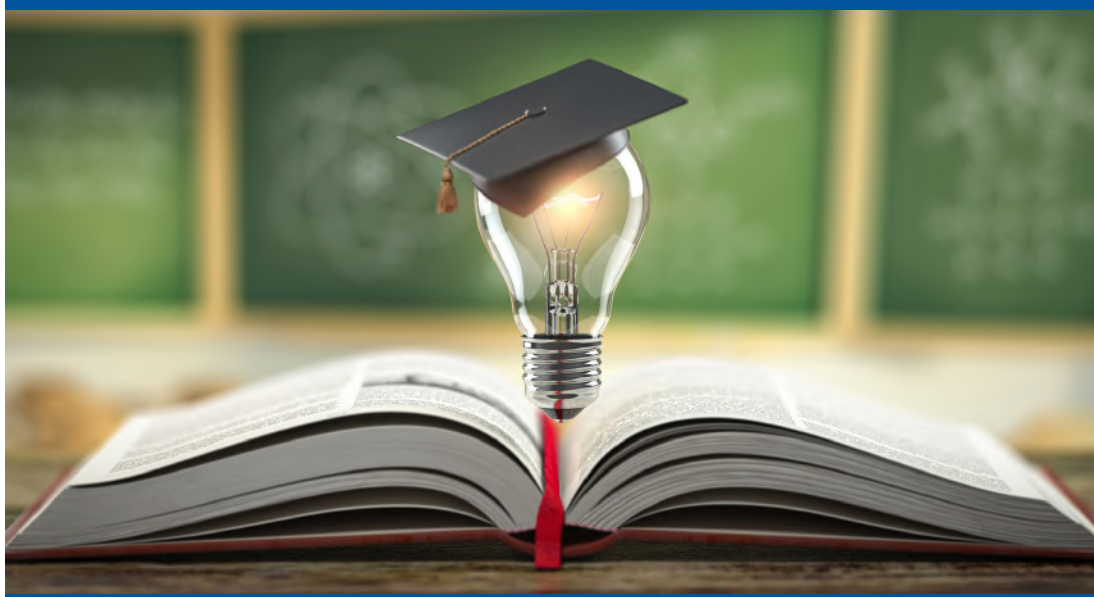
He said that OSPE boosted him and gave him the confidence to pursue work in his field, which is not always the route taken by new immigrants.

Now, he’s working as an internationally trained engineer associate for the Ontario Ministry of Transportation and looking to become a more active advocate for IEGs through OSPE’s Equity, Diversity, Inclusion and Accessibility Task Force.

His advice to newcomers in his position is this, “join like-minded organizations...join a bridging program...and keep networking...There are a lot of opportunities. This is a huge country that needs engineers, whether they are domestic or international.”



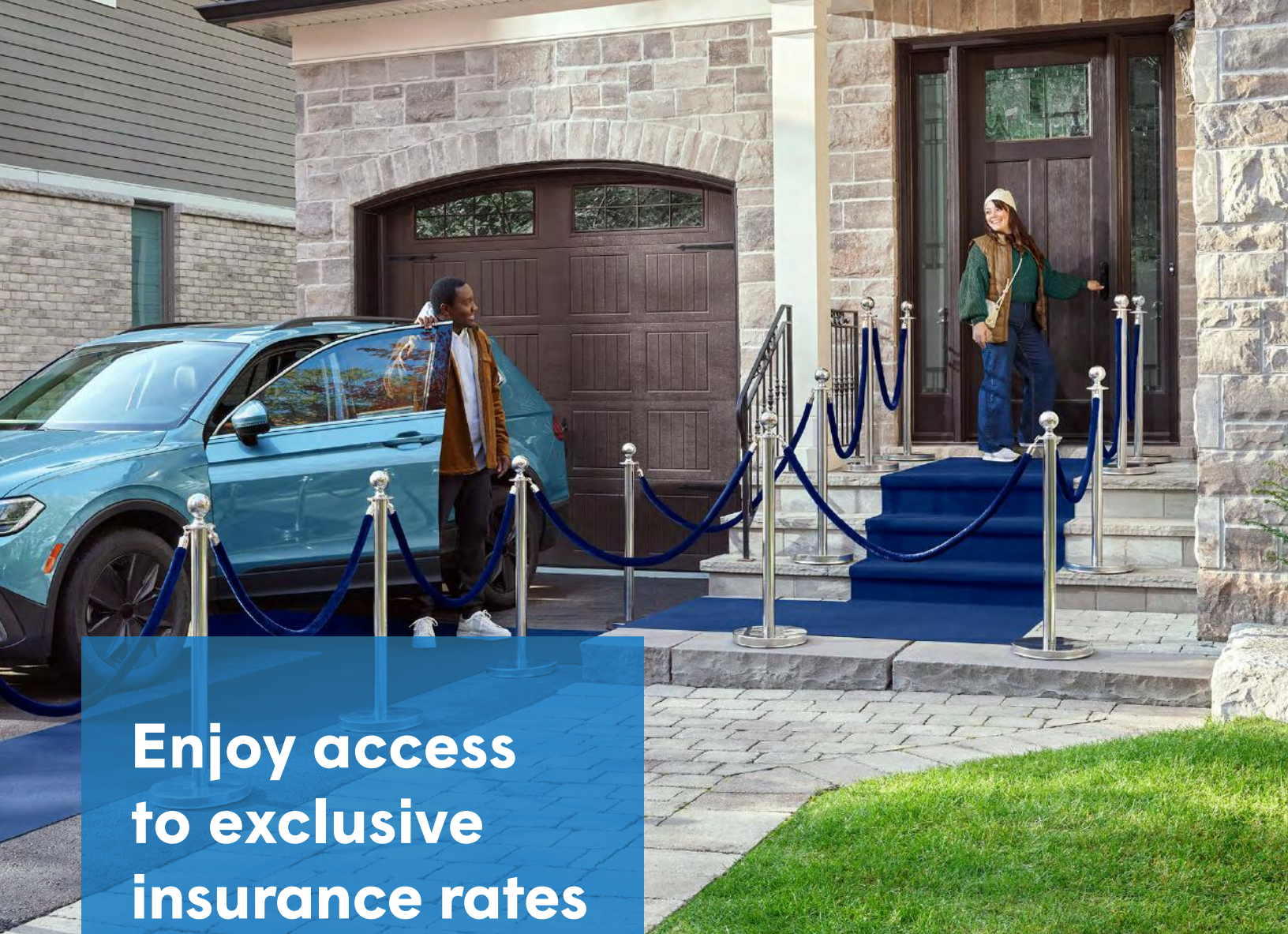
The Foundation for Education provides \$159,000 annually in scholarships to the 16 accredited engineering schools in Ontario



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¹ Internal statistics of The Personal: Approximate number of policyholders who renewed their policies when their policy came up for renewal from January 1, 2022, to July 31, 2022. The rate does not include mid-year term cancellations and terminations.