

JUNE 2024

THE VOICE

OF ONTARIO'S ENGINEERS

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How Do Salaries of
Engineering Graduates
Compare with Graduates
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¹ Statistics Canada, "Survey of Household Spending in Canada," 2022.

² ctnnews.ca, "How much money does it take to raise a child in Canada?" July 2022.

³ clhia.ca, "A guide to disability insurance," 2021.

⁴ Canadian Cancer Society, "Cancer Statistics at a Glance," 2023.

* For complete details, see [manulife.ca/newmember](https://www.manulife.ca/newmember).

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THE VOICE

OF ONTARIO'S ENGINEERS

PUBLISHER

Sandro Perruzza

EDITORS

Bajjul Shukla

Matt Wiesenfeld

Rachael Masih

CONTRIBUTORS

Benjamin King

Safayat Moahamad, LL.B., CIPP/C, CIPM, FIP

Lee Weissling, Ph.D.

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,

This is my first chance to engage you since becoming Chair of OSPE last month at the AGM.

This is an exciting time to be a leader at OSPE as my fellow board members and I are beginning to think about the next Strategic Plan for the association. The last time we did this was in the middle of the pandemic and needless to say, a lot has changed since then.

At that time, there was an urgency to get through the next week, month, and year, but now, we can take a longer view of the challenges our engineering industry and engineering community are facing, and work with you to address them.

Chief among them is why so few engineering graduates are sticking with the engineering profession as we currently define it. Like so many challenges, the causes are varied, but issues like this have the full attention of the Board.

I personally find retention within the profession a very interesting dilemma because of my own experience. Unlike many of you, I did not follow the traditional pathway into the profession through an undergraduate engineering program. I had to play catch up so to speak, by challenging technical exams and completing additional formal education.

In that regard, I know how many of our members, who have not taken the traditional path to working as an engineer here in Ontario may feel. Never have we more needed engineers with a diverse set of experience and perspectives. Paradoxically we are seeing some of the obstacles for future “outside the norm” engineers beginning to ease while others have formed or persisted. Promoting a dynamic and leading profession is and will remain a priority for our organization.

OSPE remains committed to growing our membership and supporting our members through all stages of their professional journeys. Recent changes to our bylaws ensure that all members of our engineering community find a home at OSPE

and are able to cost effectively access all of our learning and career development resources. OSPE is consistently updating and adding to our suite of membership benefits. In the last few months we launched our EngLearn platform, a YouTube style interface to provide OSPE Members access to all of our learning content. This month we are launching EngTravel, providing all members access to dedicated agency services for business and personal travel (and starting every member off with a \$250 bonus to try out the service).

My fellow board members and I continue to look forward to engaging with as many of you as possible. We look forward to meeting you through the strategic planning process and our many upcoming events. We also continue to cheer you on as you serve society at large through the work of our task forces, through your daily engineering practice, and your volunteer contributions to organizations in your communities.

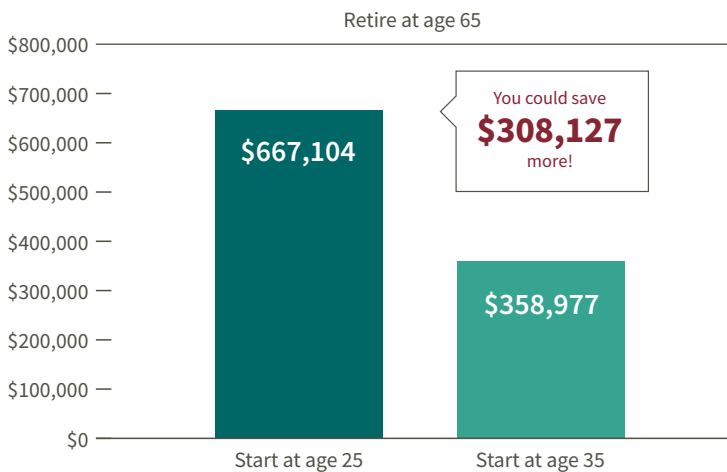
Sincerely,



Dave Carnegie, P.Eng., MBA
OSPE Chair
Ontario Society of Professional Engineers

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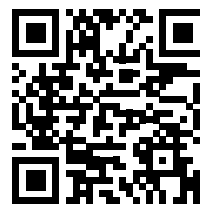
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NEWS FROM THE FRONT

Since the last update, OSPE staff and volunteers took to Parliament Hill in Ottawa for OSPE’s first Federal Lobby Day and MP Reception, an opportunity to engage national decision makers on the issues important to our engineering community in Ontario.

The advocacy team has also engaged provincial officials, promoted improved indoor air quality, recommended tools for infection prevention and control, and spread awareness about the critical work being done by OSPE’s task forces.

April 29th and 30th 2024 - OSPE’s First MP Reception and Federal Lobby Day

The Ontario Society of Professional Engineers (OSPE) celebrated a significant milestone by hosting its first Federal Lobby Day and Members of Parliament Reception in Ottawa. This strategic two-day event aimed to position engineers at the forefront of federal policymaking, addressing key issues relevant to the engineering profession and the broader well-being of Ontario and Canada.

On April 29, the reception welcomed over 30 influential guests from Parliament Hill, including MPs **Ted Falk**, **Omar Alghabra**, **Francesco Sorbara**, **Dave Epp**, and **Robert Oliphant**, along with representatives from pivotal federal entities such as the **Prime Minister’s Office**, the **Ministry of Employment, Workforce Development and Official Languages**, and the **Ministry of Transport**. This event served as a vital platform for OSPE members to engage directly with key policymakers, fostering a direct line of communication that went beyond mere social interaction.

The momentum continued into April 30, with a series of focused meetings that allowed for deeper discussions on specific engineering issues. These interactions were crucial for voicing the engineering community’s concerns and suggestions, ensuring that MPs understood the precise needs and proposals from the field. The agenda was comprehensive, covering topics such as **Qualifications-Based Selection (QBS)**, enhancing diversity within the engineering sector, cybersecurity measures, developing sustainable infrastructure solutions to tackle the housing crisis, and addressing the urgent issues of energy and climate change. These focused dialogues were crucial for shaping a more informed understanding among policymakers about the critical contributions engineers can make to society.



(From left to right) OSPE CEO, Sandro Perruzza, Emily Pepper, P.Eng., MP Karen Vecchio, and Paola Cetares at OSPE’s MP Lobby Day in Ottawa, April 30, 2024



(From left to right) Michael Wiggin, P.Eng., MP Marilyn Gladu, Stephen Pepper, P.Eng., and Baijul Shukla at OSPE’s MP Lobby Day in Ottawa.

May 14th, 2024 - Ontario Legislative Internship Programme (OLIP) Reception

OSPE attended the OLIP reception at Queens Park and met with many Members of Provincial Parliament (MPPs) and interns who attended the event. OSPE discussed the initiatives and policy work that the various Task Forces are currently conducting to foster innovation, sustainability, and economic growth. The OSPE team also discussed key issues affecting the engineering profession and broader society.



Paola Centares, Bojana Nakic and OLIP interns at the Ontario Legislative Internship Programme Reception

LETTERS AND SUBMISSIONS

May 2, 2024 - Letter to the Ontario Ministry of Education

This letter was sent to the Ontario Ministry of Education to advocate for **the need to regulate indoor air quality in Ontario schools**. The issue of safe indoor air for child well-being at school is not currently regulated or monitored by the Ministry. Our letter calls for the need to **impose regulations on ventilation and filtration** as well as **required testing and monitoring** to ensure compliance.

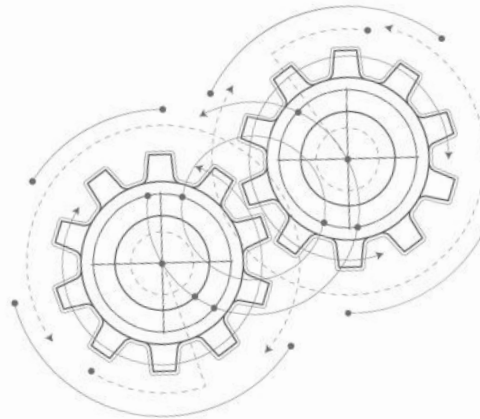
May 6, 2024 - Letter to the College of Physicians and Surgeons of Ontario (CPSO)

This letter responded to the CPSO’s draft **Infection Prevention and Control for Clinical Office Practice Policy**. OSPE’s submission recommends the policy be updated to **differentiate between medical masks and respirators**. Additionally, we suggest the policy should recommend **adherence to ventilation guidelines** CSA Standard Z317.2-2019 and ASHRAE 241-2023 Control of Infectious Aerosols, coupled with **transparent indoor air quality monitoring practices**.

May 17th, 2024 – Canadian Sustainability Standards Board (CSSB) consultation survey on adoption of Canadian Sustainability Disclosure Standards (CSDS) 1 and 2 based on the International Financial Reporting Standards (IFRS) S1 and S2

OSPE staff completed the CSSB survey based on the letter previously written to the Ontario Securities Commission, adjusted to fit the Canadian context. OSPE

is advocating for the need to ensure Qualified Persons (QPs), such as licenced engineers, are responsible for the technical aspects of reporting required by the International Sustainability Standards Board (ISSB) sustainability disclosure standards. In this survey, we urge the CSSB to consider the necessity of the involvement of licenced engineers in the technical aspects of reporting required by the ISSB Standards.



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Want to see your work published in an upcoming issue of the Voice?



We do too, which is why we are sharing some information on what we are looking for and how you can best share your research and perspective with the engineering community.

Article Length: 800-1500 words

Anything longer probably is best published as a white paper (although an executive summary could be in the magazine to promote it).

Subject Matter: Something Newsworthy

Submissions should emanate from research and or technical work that is engaging and interesting to an engineering audience. Common aspects to look at are the economic, social, and or regulatory impacts of particular areas of practice.

Audience: Engineering +

Our magazine is distributed directly to all our members and another 30,000+ members of the engineering community. That is a broad audience, and we encourage submissions to be written in a way such that all can access the content. Subject matter expertise is demonstrated as much by an ability to educate, as it is to demonstrate depth of knowledge.

We invite all members to submit their interest in having work published by sending a brief message to marketing@ospe.on.ca. Please be sure to include your name, brief bio, and an overview of the work you wish to submit.

There is no need to submit the finished work as part of your declaration of interest.

Research & Innovation Task Force

John Wang, P. Eng., CISSP, CISA, CRISC

OSPE is pleased to announce the appointment of John Wang, P. Eng. to the position of Chair of the Cybersecurity Working Group.

John Wang, P.Eng, CISSP, CISA, CRISC has been an information security consultant for over 15 years providing guidance to senior executives in government and industry on security governance, policy development, organizational structure, risk management, and security incident response. For the past 6 years, he also teaches what he practices at George Brown College.



SECONDARY VS. PRIMARY PROFESSIONAL LIABILITY

Did you know? Your OSPE membership automatically includes Secondary Professional Liability Insurance (Secondary PLI) coverage.

What is Secondary Professional Liability Insurance (PLI) and how does it differ from a Primary Professional Liability Insurance policy?

Secondary Professional Liability insurance protects individuals against liability or allegations of liability for injury or damages that have resulted from a negligent act, error, or omission that has arisen out of your professional capacity as an engineer. The Secondary Liability insurance now extends to provide protection in the event of a disciplinary complaint (limit of \$30,000), for reputational management (limit of \$15,000), loss of physical documents (limit of \$5,000), as well as broader coverage for retired business owners. In addition, OSPE's Secondary PLI now includes Whistle-blower coverage up to a limit of \$25,000,

If you would like to secure a quote or receive more information with respect to a primary professional liability insurance policy, please contact BMS Canada at 1-844-294-2717 or ospe.insurance@bmsgroup.com or visit their website ospe.bmsgroup.com.

The following are claims scenarios where the Secondary Professional Liability policy could respond:

Employed Engineer:

An employee of an engineering firm receives notification that a lawsuit had been filed against both himself and the engineering firm that he works for as a result of an error on a drawing that he reviewed and stamped. The engineering firm reports this to their Primary Professional Liability Insurance provider and files a claim. As the case moves forward, it becomes apparent that the Primary Professional Liability Insurance limit is inadequate to pay for 100% of the damages. The individual engineer then files a claim under the Secondary Professionally Liability Insurance policy, which affords him an additional limit of \$125,000 to cover his individual legal fees and damages owed for his involvement in the claim.

Dissolved Engineering Firm:

An engineer provided an assessment on the structural integrity of a barn. Several years later, the claimant builds a second barn to the same specifications, relying on the original report provided by the engineer. When the second barn subsided, a claim was initiated against the engineer who has already retired; further, the engineering firm he had previously worked for is now dissolved. Fortunately, the dissolved engineering firm maintained run-off (inactive) primary professional liability coverage. In this case, the claim was defended by the primary run-off insurance provider, but the claimant was extremely aggressive, and a six-figure lawyer's bill was incurred. Had the run-off policy not been in place once the Primary Professional Liability policy was cancelled, the retired engineer would have incurred these costs. The Secondary Liability would respond (with a per claim limit of \$125,000) to cover any additional legal costs incurred over and above the defence costs limit included in the run-off coverage.

An Excess Layer or Secondary policy is exactly that: The Secondary Professional Liability Insurance policy is intended to supplement existing Primary Professional Liability Insurance—which members may hold through their employer or on their own.

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The Privacy Paradox of AI: How Engineers Can Bridge the Gap

Safayat Moahamad, LL.B., CIPP/C, CIPM, FIP



The rise of emerging technologies, often powered by Artificial Intelligence (AI), has triggered a global “arms” race as countries across the world increase investment in this critical sector.

As a result, major players in the technology industry are focused on steering national policies in a direction that allows for increased data extraction to train AI systems and models (Waldman, 2021). At the same time, AI researchers, like Yoshua Bengio and Geoffrey Hinton, are contemplating if humanity is on the course of ethical AI development, and whether it is more data access, or data privacy, that leads to better AI systems.

While responsibly developed AI promises great advancements, there have been cases where AI powered systems have been released that have revealed negative consequences, such as wrongful civil and criminal allegations. This has led to a rise in safeguards against harmful AI development, for example:

- Professional and advocacy groups are exploring the use of risk assessments, red-teaming, data

protection technologies, and independent third-party audits, among other methods to encourage responsible tech development.

- Governments have also begun to take policy positions on the regulation of this rapidly growing market, including Canada, where the Ministry of Innovation, Science and Economic Development (ISED) has proposed a federal-level legislation for the governance of AI known as the [Artificial Intelligence and Data Act \(AIDA\)](#). Recently, a voluntary [code of conduct for the development of Generative AI](#) was also released by the ISED.

These safeguards are only effective if they can be applied by those developing AI, so it is incumbent for engineers to understand the posture of their organizations in the context of data security and privacy protection. Only then can they act responsibly when developing new AI systems/models or participating in their use. This will remediate short-term detrimental effects on individuals and long-term existential risks to humanity.



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The problem with AI is that it relies on the algorithmic processing of big data. Often, narrow algorithms developed by individual organizations are integrated with larger AI engines – often offered as a service by big tech. This contributes to the feared “Black Box” of AI-generated decisions. From a transparency perspective, this makes it difficult for developers to explain to stakeholders how a decision is reached by AI.

One example has been false positives in plagiarism detection that disproportionately affect non-native English speakers, raising concerns about accuracy and fairness (Mathewson, 2023). In fact, several US universities have decided to stop using AI detection tools provided by anti-plagiarism companies due to concerns that the technologies could wrongly accuse students of cheating - impacting scholarships, career prospects, and student rights.

In a separate investigation into predictive policing software, it was discovered that algorithms designed to make predictions based on historical crime reports can replicate biases inherent in these reports. This has led to

over-policing in communities with a higher population of Black, Latino, and low-income families. Critics argue that predictions based on historical data from law enforcement activities do not necessarily pertain to future instances of crime. They are more about predicting future policing patterns (Hicks, 2021).

For a long time, experts have cautioned that AI has the potential to produce content that could mislead voters and possibly sway elections. In the past, AI-produced images and videos were typically not convincing and costly. However, with the advancement of AI tools, the creation of hyper-realistic fake content has become quick and inexpensive. When these tools are combined with social media algorithms, the resulting content can spread rapidly and widely, potentially intensifying the severity of campaign malpractices. Even seemingly harmless AI applications, like ad targeting, can have unintended consequences, as was the case in the Cambridge Analytica scandal, leading to the election of one of the most controversial US presidential candidates.

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Such past scenarios highlight the need for transparency and trust-building measures in developing AI responsibly. Researchers and professionals have demonstrated over the years that rationales behind automated decisions can be derived through the thoughtfully curated testing of AI products. However, that step of the process must be contemplated from the ideation and design stage of the AI development lifecycle by all professionals, including engineers, putting outcomes and impact on humans at the forefront - as opposed to a “check the box” exercise.



Solutions to Consider

A growing area of understanding among engineers is that implementing privacy and security by design is a crucial element of AI engineering. It emphasizes the need to integrate data privacy, security, and governance considerations throughout the entire development and post-deployment lifecycle (not just when problems start to arise). To support this approach, Threat & Risk Assessments (TRAs) and Privacy Impact Assessments (PIAs) can be adapted to enable the identification and management of risks that AI systems pose to individuals and communities.

Open communication between AI engineers and privacy professionals regarding the technical aspects that should be explored to strike a balance between business objectives, AI system outputs, and impact on individuals can facilitate the responsible development of AI.

It is important to note here that AI-related risk assessments must also encompass potential harm

stemming from algorithmic bias and inaccuracies, capture reasoning behind the use of these algorithms, and document any trade-offs between statistical accuracy and data minimization.

Moreover, simulating real-world adversarial scenarios such as using “red-teaming” plays a crucial role in fostering responsible AI development. It is a pivotal approach to identifying risks, validating assumptions, and enhancing security measures by detecting system issues like unintended harmful content. Diverse red team members can offer valuable insights into potential risks, improving system safety. It serves as a vital testing ground for safety protocols, addressing shortcomings as they arise. Another element of privacy and security by design is mitigation of negative impacts through implementing technical mechanisms for data protection. These can improve the reliability and ethical behaviour of AI systems:

- **Homomorphic Encryption** creates a secure space for data analysis. It allows queries without revealing plain text, enabling analysis of encrypted data. This enhances data security during use, while at rest, and in transit.
- **Differential Privacy**, an anonymization technique that facilitates responsible data analysis for machine learning. It reduces the risk of exposing personal information within training data in a measurable way. It has been debated that there is a trade-off between privacy and accuracy of outputs, however, recent research suggests it can improve generalization in machine learning algorithms.
- **Synthetic Data** enhances privacy by removing all personal identifiers. It ensures the original data cannot be reconstructed from either the algorithm or the synthetic data it generates. Gartner Inc., an engineering consulting firm, forecasts that by 2024, synthetic data will constitute approximately 60% of AI development data.

Going beyond the internal ecosystem of organizations, third-party audits can also promote responsible AI development. However, this may require a range of vital policy interventions. For example, legal safeguards need to secure auditor access to critical information to foster

impartial assessments of AI systems. Accreditation and training overseen by impartial bodies can ensure auditor integrity and audit quality, maintaining professionalism and independence (Raji, et al, 2023). Universally recognized AI standards, such as the NIST AI Risk Management Framework and the proposed EU Artificial Intelligence Act, can set performance expectations and serve as benchmarks for audits.

Key Takeaway: Prepare for a Regulated AI Environment

Canada's approach to AI regulation closely aligns with the EU, emphasizing the pursuit of AI's benefits and trying to mitigate potential risks. Canada's proposed regulatory framework, the [Artificial Intelligence and Data Act \(AIDA\)](#), will apply to private sector organizations engaged in the development of high-impact AI systems.

However, criticisms have been raised regarding the extent of public consultation and the level of detail provided in the AIDA. The lack of well-defined context on "high-impact AI Systems" and expected delays in clarifying specifics through future regulations have stirred additional concerns. To effectively address these challenges, Canada must strike a balance between establishing a comprehensive regulatory framework and retaining flexibility to adapt to the rapidly evolving AI landscape.

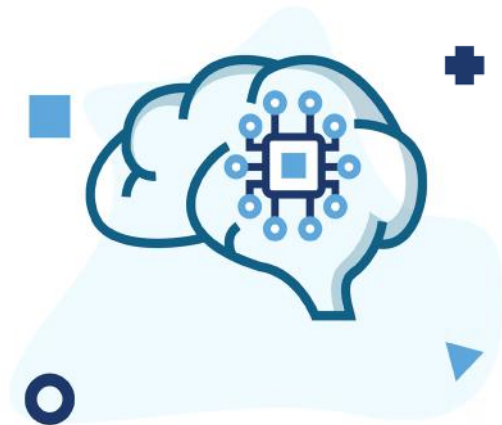
Nevertheless, Canada's commitment in setting guiding principles for generative AI systems underscores its dedication to responsible AI development. The recently released voluntary code of practice, tailored for organizations deploying generative AI systems, serves as a testament to Canada's resolve in ensuring responsible development and deployment of such technologies.

Principles set by the code of practice include:

- **Safety:** Recognizing potential malicious or detrimental uses and instituting measures to prevent them.
- **Fairness and Equity:** Evaluating and curating datasets to mitigate biased results.
- **Transparency:** Offering techniques for identifying AI-generated content and providing lucid

explanations of the system's development process.

- **Human Oversight and Monitoring:** Ensuring supervision throughout deployment and operations, along with mechanisms for detecting and reporting adverse outcomes.
- **Validity and Robustness:** Employing testing methodologies and cybersecurity measures to guarantee system effectiveness and resilience.
- **Accountability:** Enacting multiple layers of defence, policies, procedures, and training to delineate roles, responsibilities, and activities.



Whether developing isolated products to place in market or piecing together many to build networks of smart technologies, engineers in Canada should prepare to be adaptive to a more regulated environment regarding the collection and usage of personal data for AI use and development. As AI continues to evolve and permeate all aspects of life, understanding the importance of data protection by design becomes paramount for the engineering community. AI demands responsible development and post-deployment practices, but the systems also benefit from such safeguards. Engineers should be excited about ethical AI development, because it will ensure better functioning systems while addressing the harmful outcomes AI can produce, from hallucinations to discrimination – and beyond.

Written by:

Safayat Moahamad, LL.B., CIPP/C, CIPM, FIP

Safayat is a Canadian Information Privacy Professional. He was called to the Bar of England & Wales as a member of the Honourable Society of Lincoln's Inn following the completion of LL.B. program at the University of London.

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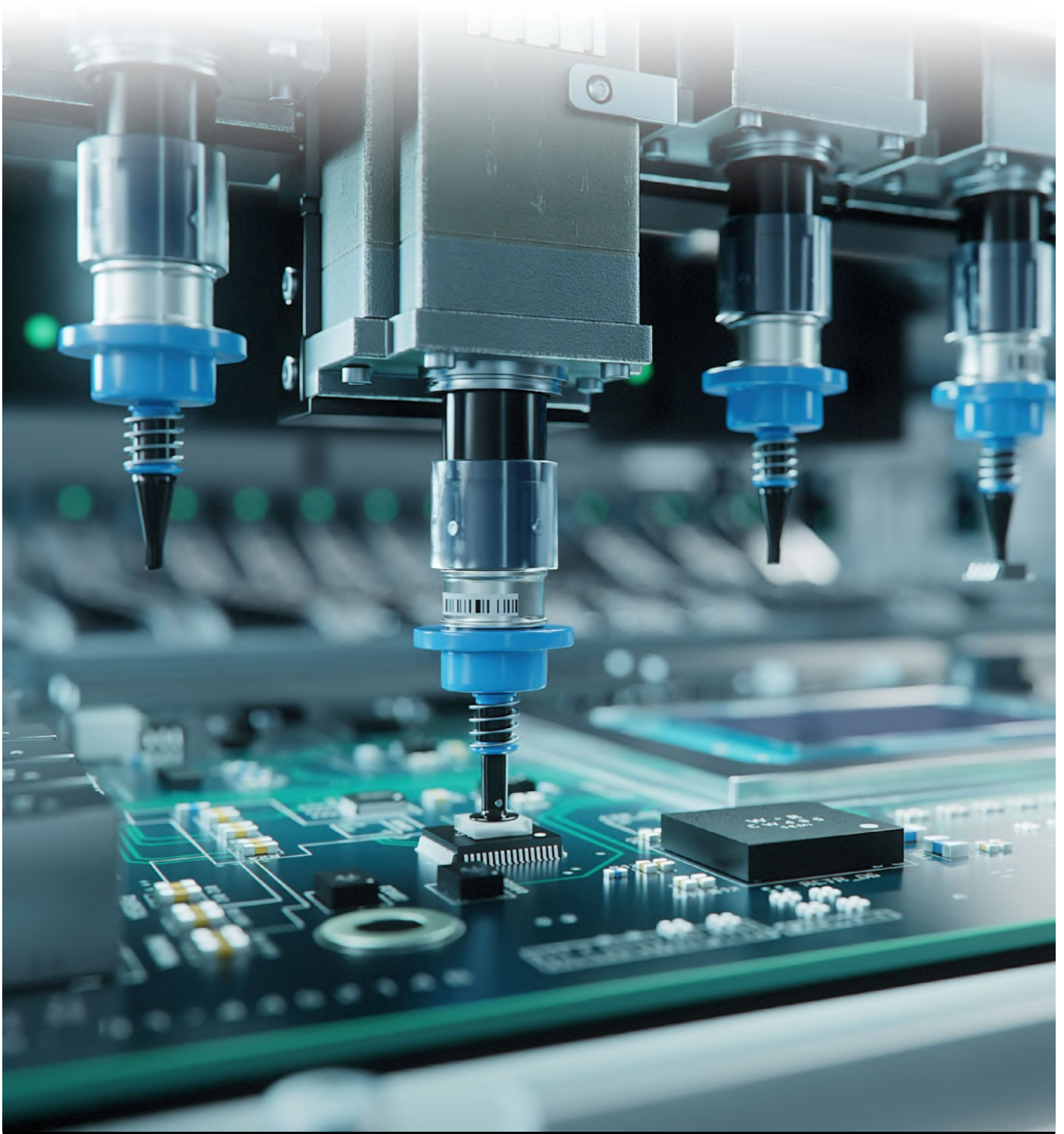
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Organic Semiconducting Nanomaterials in Sustainable Electronics Manufacturing

Benjamin King



Reducing e-waste while continuing to produce enough electronic components to meet the demand of an expanding Internet of Things (IoT), requires a substantial shift in how engineers approach manufacturing and material management.

One strategy showing a lot of promise is the use of organic nanomaterials as they can reduce the burden of pollution from manufacturing, and e-waste, by using less energy-intensive techniques such as inkjet or screen printing, blade coating, and synthesizing novel biodegradable and biocompatible solvents and active materials.

Rapid development in electronics for healthcare, communication technology, and consumer electronics have accelerated e-waste accumulation in Canada and across the world, with over 10.8 million tonnes of e-waste sent to landfills and incinerators in 2018 alone, according to Statistics Canada.¹

To combat this challenge, the Ontario government introduced new regulations in 2020 that require producers to manage the life cycle of commercial

electronics and develop a circular economy.² But the sheer number of sensors and electronics forecast for the IoT poses a critical environmental challenge that will demand a transition towards a green and circular economy and advances in sustainable electronics manufacturing. Sustainable solvents and nanomaterials based on non-toxic, earth-abundant elements are necessary to help deliver these consumer electronics.

This article discusses emerging techniques for improving sustainable electronics manufacturing, how material scientists and engineers are leveraging the properties of organic nanomaterials to replace or supplement silicon-based electronic components, and potential applications of these materials in commercial electronic devices using these manufacturing techniques.

Exploring Sustainable Manufacturing Techniques

Printing electronics is a manufacturing strategy for next-generation consumer electronics including 5G/6G communications tools and sensors in which devices are fabricated using additive manufacturing. This represents a shift from the manufacturing of traditional silicon-



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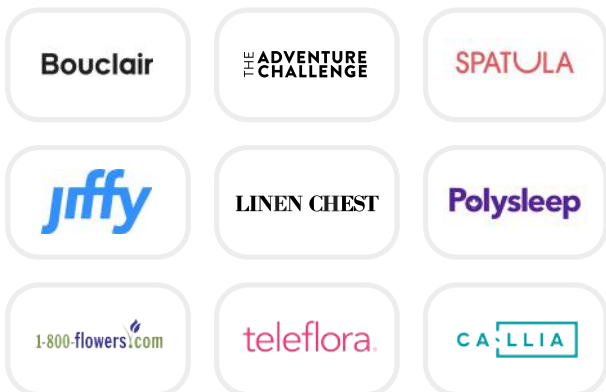
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based electronics that are made using techniques like photolithography.

Traditional silicon production requires temperatures upwards of 1700 degrees Celsius and emits substantial greenhouse gas emissions when processing silicon dioxide.³ Commercial manufacturing of nanomaterial-based Organic LED (OLED) displays, and organic solar cells rely heavily on thermal evaporation under ultra-high vacuum.⁴

In contrast, nanomaterial-based layers in printed electronics can be fabricated by solution-processing and are patterned onto substrates from a dispersion.⁵ Recent progress has been made in fabricating large-area printed electronics by inkjet printing, screen printing and gravure printing at modest temperatures and atmospheric pressure, resulting in high-throughput manufacturing of electronics with substantially less energy input and material use than lithography and thermal evaporation.⁶

In addition to developing additive manufacturing techniques, solvent selection is an important consideration for sustainable printed electronics. Guides exist to screen solvents for material synthesis and manufacturing processes, for those unfamiliar, they are assessed based on their physical properties, environmental and health impacts and other metrics with “green” solvents often being derived from biological feedstocks.^{7,8}

While there are many sustainable solvents available, existing organic nanomaterials are often poorly soluble in water and water-miscible solvents, and are therefore typically processed in high-boiling point or halogenated solvents, which can be toxic and are not sustainable.⁹ Therefore high-performance active materials, which are soluble in ecologically friendly solvents, must be developed to enable more widespread adoption of sustainable, additively manufactured electronics and a transition towards a green economy.

Leveraging the Properties of Electronically Active Organic Nanomaterials and Biodegradable Plastics

The development of new electronic materials and substrates are key pieces of future sustainable

electronics manufacturing. Important considerations when developing novel sustainable materials for electronics are their performance and their end-of-life considerations, such as their degradability or ability to be recovered and recycled.¹⁰ Popular candidate materials for biodegradable substrates in electronic devices include plant-based polysaccharides including cellulose and animal-derived polymers such as chitosan which are abundant, have the ability to be chemically modified, and can be processed in water-miscible solvents.

In one recent example, specialty cellulose nano paper was developed as a mechanically strong and biocompatible substrate for microwave resonators, which have applications as communication devices and gas sensors.¹¹ The conductive ink used in the device was the only non-ecological component and it was able to be fully recovered from these devices. Green synthesis of semiconductors has also been explored to eliminate the need for halide-containing reagents which can be processed in ecologically friendly solvents. Some advances have also been made in the development of new eco-friendly solvents including solvents made from renewable feedstocks.

Terpenes, which are biosynthetic building blocks have been explored as a component of non-toxic and biologically derived inks for organic solar cells, with power conversion efficiencies of devices processed from these solvents as high as 15.7% being reported, approaching state-of-the-art silicon cells at 26% power conversion efficiency.¹²

The pursuit of new solvents, substrates and semiconductors are all ongoing research themes in the field of sustainable electronics, and the development of these materials will require a multidisciplinary approach with collaboration between chemists and engineers.

Written by:

Benjamin King, PhD

Benjamin King has completed his PhD at uOttawa and is currently a Research Associate in Green-Large Area Electronics at the University of Glasgow.

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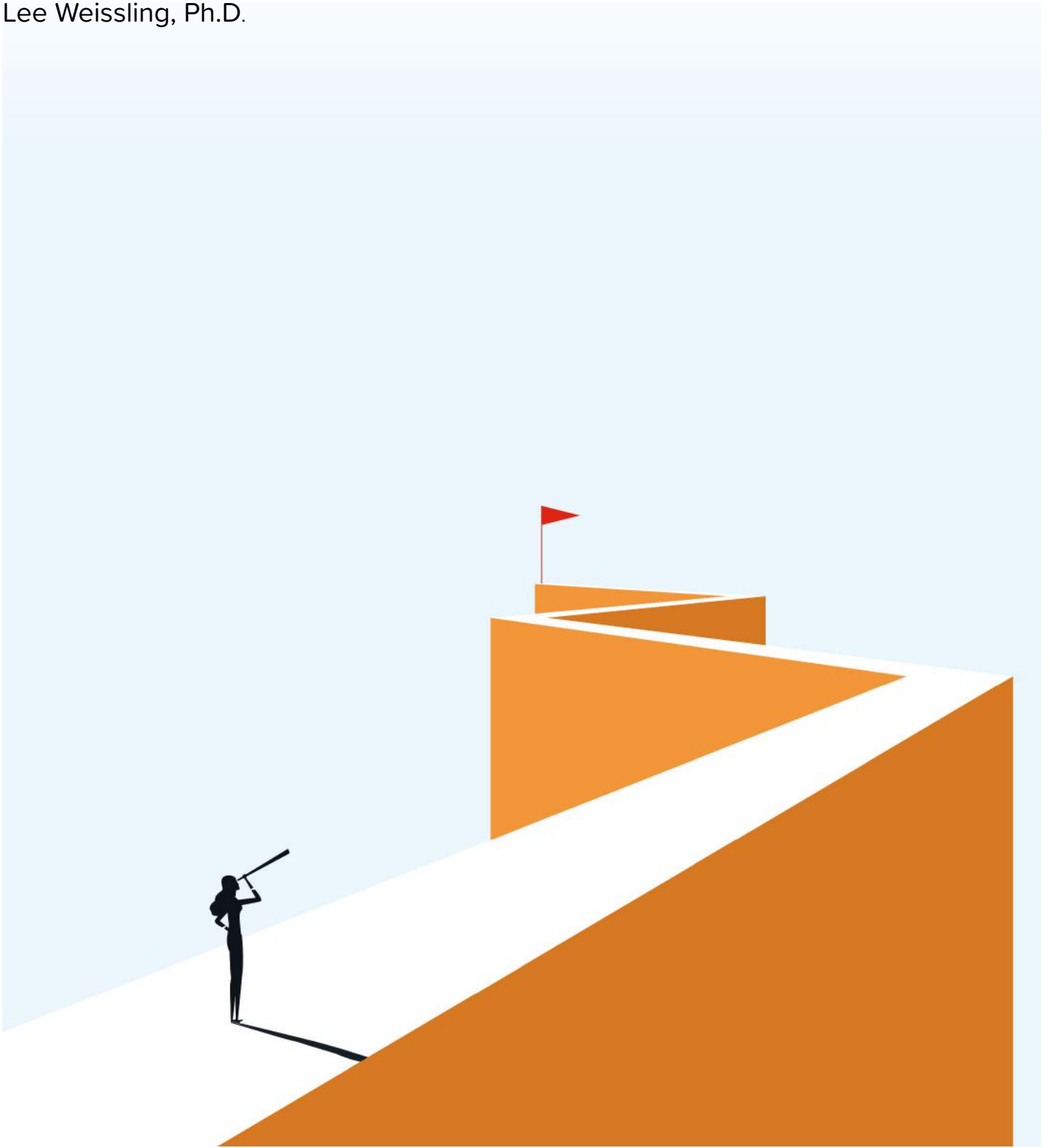
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How Do Salaries of Engineering Graduates Compare with Graduates from Other Disciplines?

Lee Weissling, Ph.D.



HOW DO SALARIES OF ENGINEERING GRADUATES COMPARE WITH GRADUATES FROM OTHER DISCIPLINES?

OSPE is often asked how engineering salaries compare with those of other professions. One indicator of this is to look at 2021 Census data about salaries of respective graduates from selected other professions - Math/Computer/Information Science (Math+), Business, Education, and Law. We particularly want to look at income of graduates in these fields who actually work in the profession associated with their degree. Conversely, it is also pertinent to look at the respective graduates who are underemployed, defined as jobs that do not necessarily require a university degree, to gain an understanding of how engineering degree holders working in these types of jobs compared to other underemployed degree holders. As well, location of where one obtained their degree offers insights on both those working in their field of study and who are underemployed.

This article builds upon other census observations conveyed in the June, September, and December 2023 Voice magazines. 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 licenced engineers or non-licenced 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.

Key observations can be made from reviewing the charts in Figure 1 that convey weighted annual salaries of the respective disciplines analyzed in this article. The professions looked at show salaries of individuals having a degree in that discipline, including engineering. Age ranges are shown, and variables are broken down by location of degree and comparisons between those working in their field and those underemployed.

Key Observations:

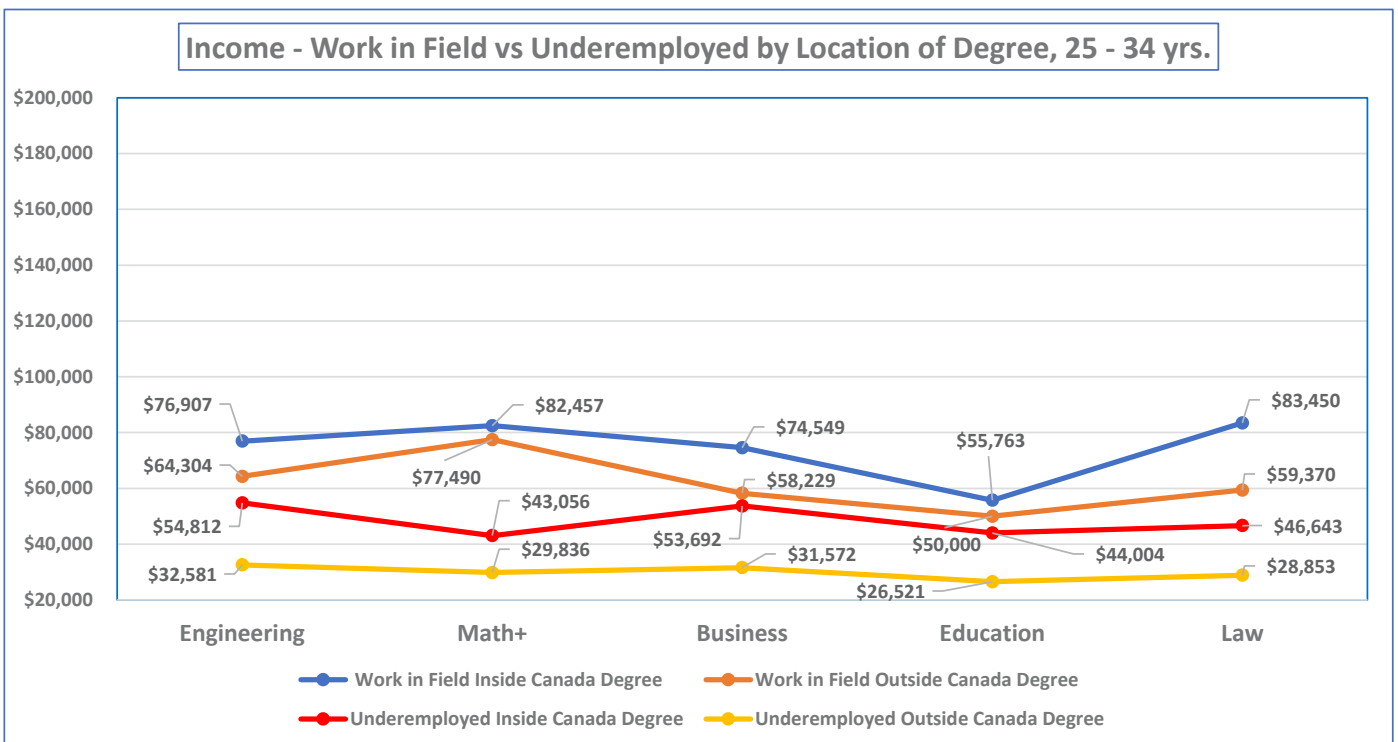
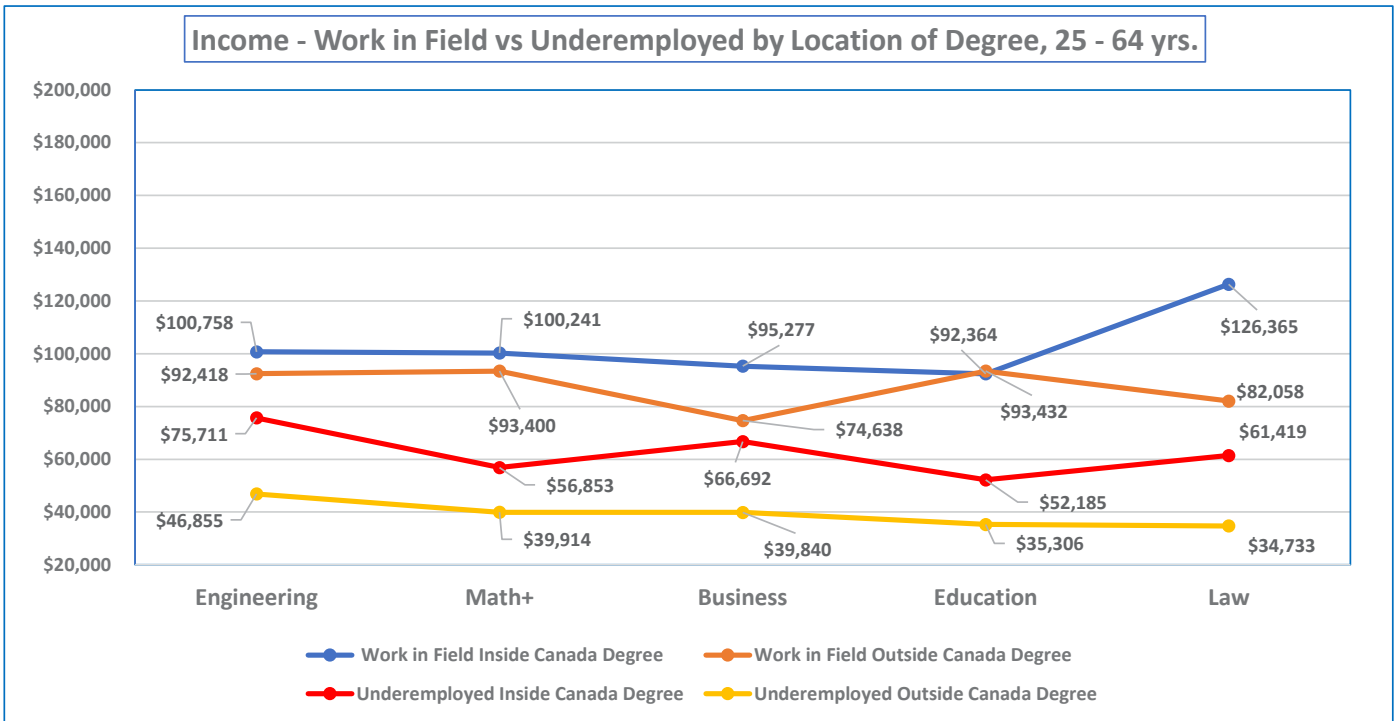
Working in field of study

- Over the duration of their career (25 to 64 years old), engineering graduates make comparable (and high) incomes compared to those with Math+, Business, and Education degrees. For Engineering graduates in older age ranges (over 45), however, they have higher incomes than those other professions and for those 55 – 64, considerably higher incomes. This applies in general to both those with degrees from inside and outside Canada although Internationally Educated Graduates (IEGs) earn less than Canadian degree holders, except for Education graduates.
- Law graduates with degrees from inside Canada unsurprisingly earn significantly more than those with other degrees and those with degrees from outside Canada.
- The location of degree makes no difference for Education degree holders; this is no doubt because most are covered by collective agreements.
- IEGs with Math+ degrees make close to the same amount of money as Math+ degree holders from inside Canada.
- As workers get older, the disparity of incomes between inside and outside Canada degrees holders grows wider in Engineering, Business, and Law.

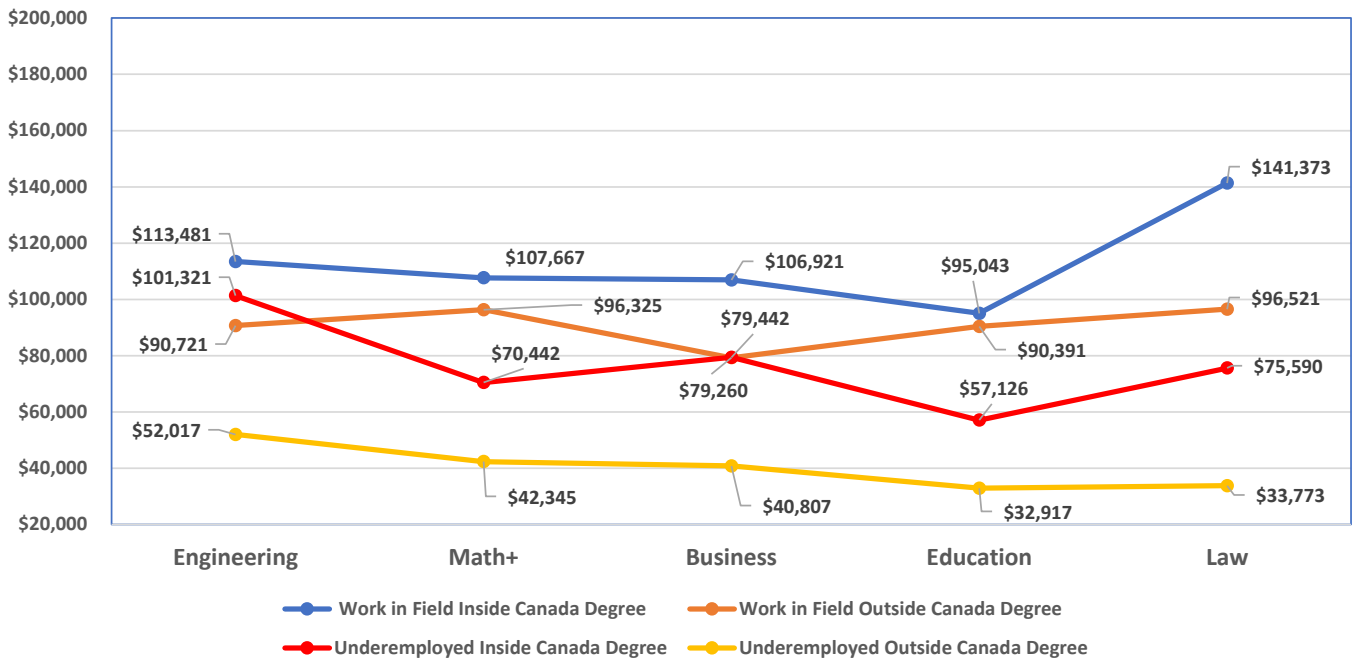
Underemployed

- Even though many Canadian educated Engineering graduates are, by definition, underemployed, they earn a higher income than all other Canadian educated underemployed graduates from the other disciplines covered in this article; this includes those with degrees in Law.
- By a wide margin, underemployed IEGs earn less than all other cohorts described in this analysis.
- Underemployed IEGs with Engineering degrees in general earn a bit more income than all other types of degree holders who are underemployed, including those with law degrees.
- In general, underemployed IEG Law degree holders earn the least or near least of all other degree holders.
- Income disparity in older age ranges is similar for those working in Engineering, Business, and Law; interestingly, those in the 45 and older age ranges working in Engineering as IEGs make the same or marginally more than underemployed inside Canada degree holders.

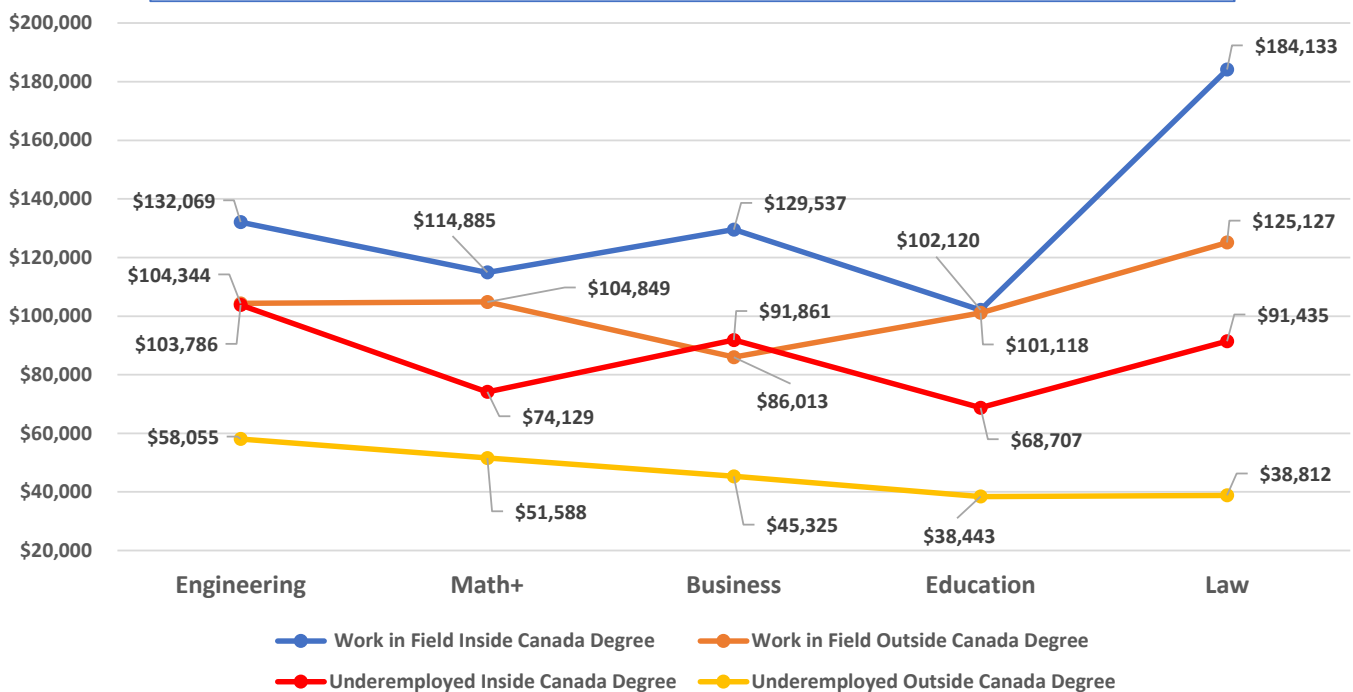
Figure 1: Annual Salaries of Degree Holders Working in their Field or Underemployed by Age Ranges and Location of Degree

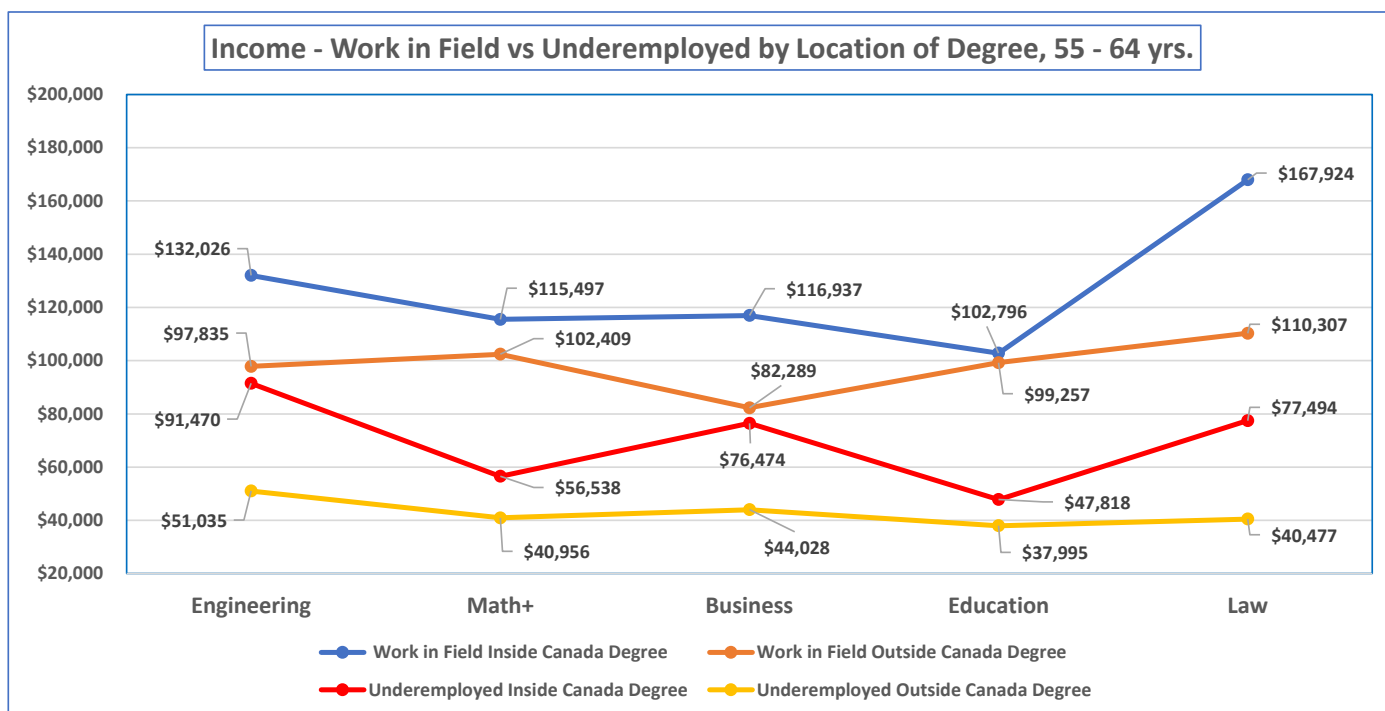


Income - Work in Field vs Underemployed by Location of Degree, 35 - 44 yrs.



Income - Work in Field vs Underemployed by Location of Degree, 45 - 54 yrs.





Source: 2021 Canada Census

HOW DO INCOMES OF ENGINEERING GRADUATES COMPARE WITH OTHER PROFESSIONS BY LOCATION OF DEGREE AND GENDER – WORKING IN THEIR FIELD?

There is ample evidence that IEGs earn less than Canadian degree holders in all disciplines covered in this article. Evidence has also been presented in prior Voice articles that women with engineering degrees earn less than their men counterparts, albeit the gaps for those working in engineering are narrowing. How do women with degrees in other disciplines fare, then, compared to engineering degree holders? This section covers income by gender and location of degree. These are graphically displayed in Figure 2.

Key Observations:

- Over the duration of their career (25 – 64 years old), income gaps between men and women are narrowest in Education (collective agreements), Math+, and, which is a positive sign, Engineering. Law by far has the widest gaps in income, although in specific age ranges which are described below, the gaps are much narrower.
- When broken down in separate age ranges, the weighted income of IEG men is in general lower than Canadian educated women.
- IEG women earn the least in all professions and all age ranges.
- Law graduates unsurprisingly make the most money, although IEGs of both genders do not necessarily make more than IEGs in other professions.
- Income of Canadian educated men and women Law graduates in the oldest age range of 55 – 64 are virtually on par.
- For separate age ranges over 35 years old, wage gaps are progressively wider in Engineering, Business, and Law between Canadian and non-Canadian degree holders.
- For ages older than 35, wage gaps between Canadian educated men and women become wider for Math+ and especially Business.
- Canadian educated men and women over 55 years old in Engineering have the highest income of any profession, except, of course, those in Law.



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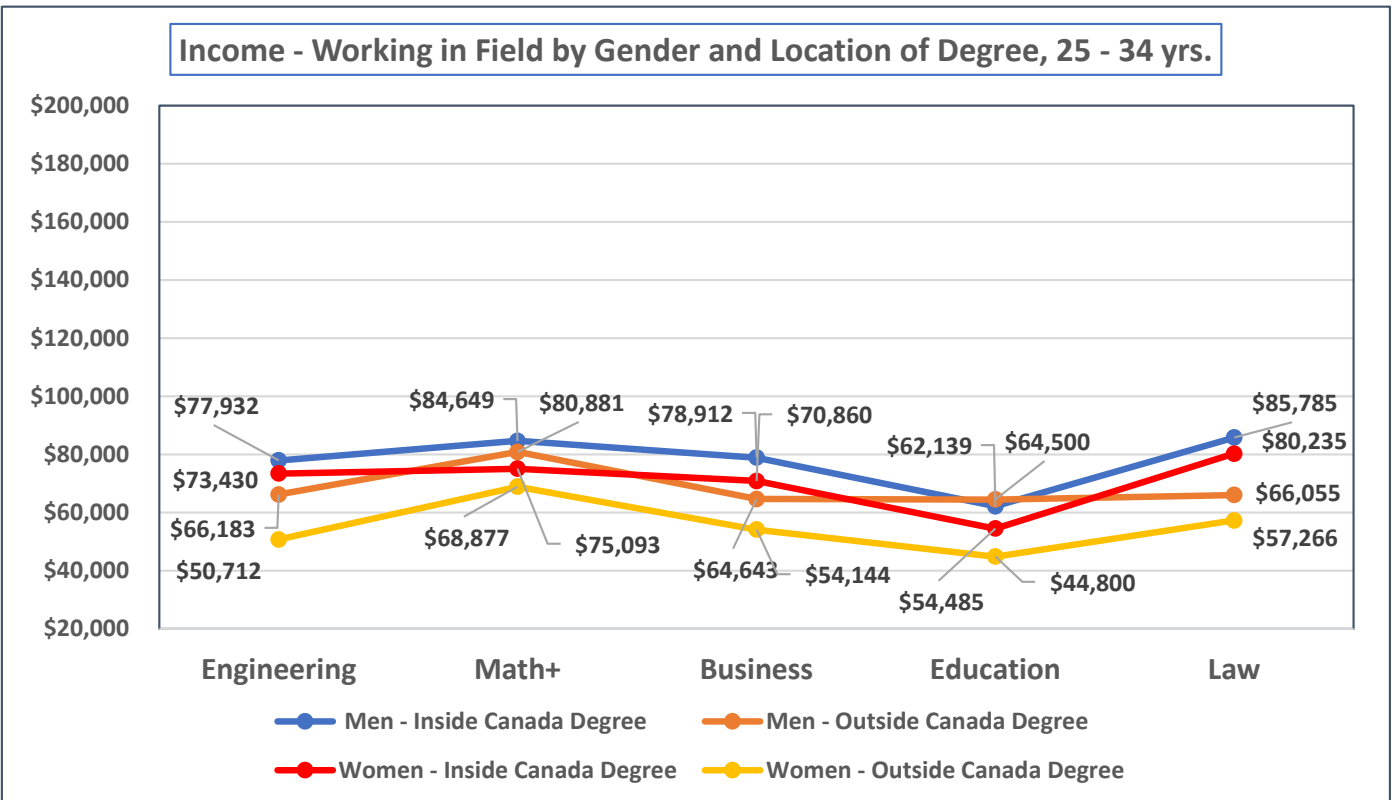
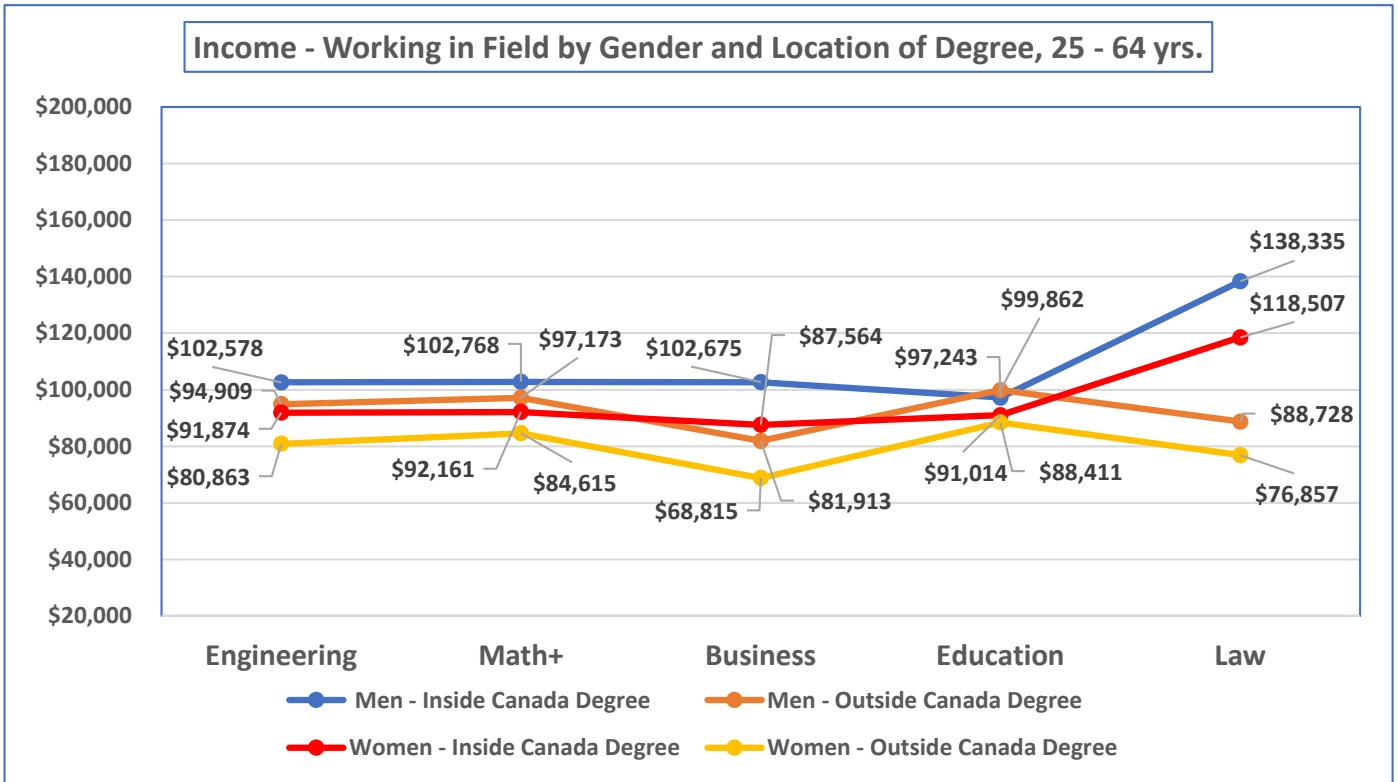
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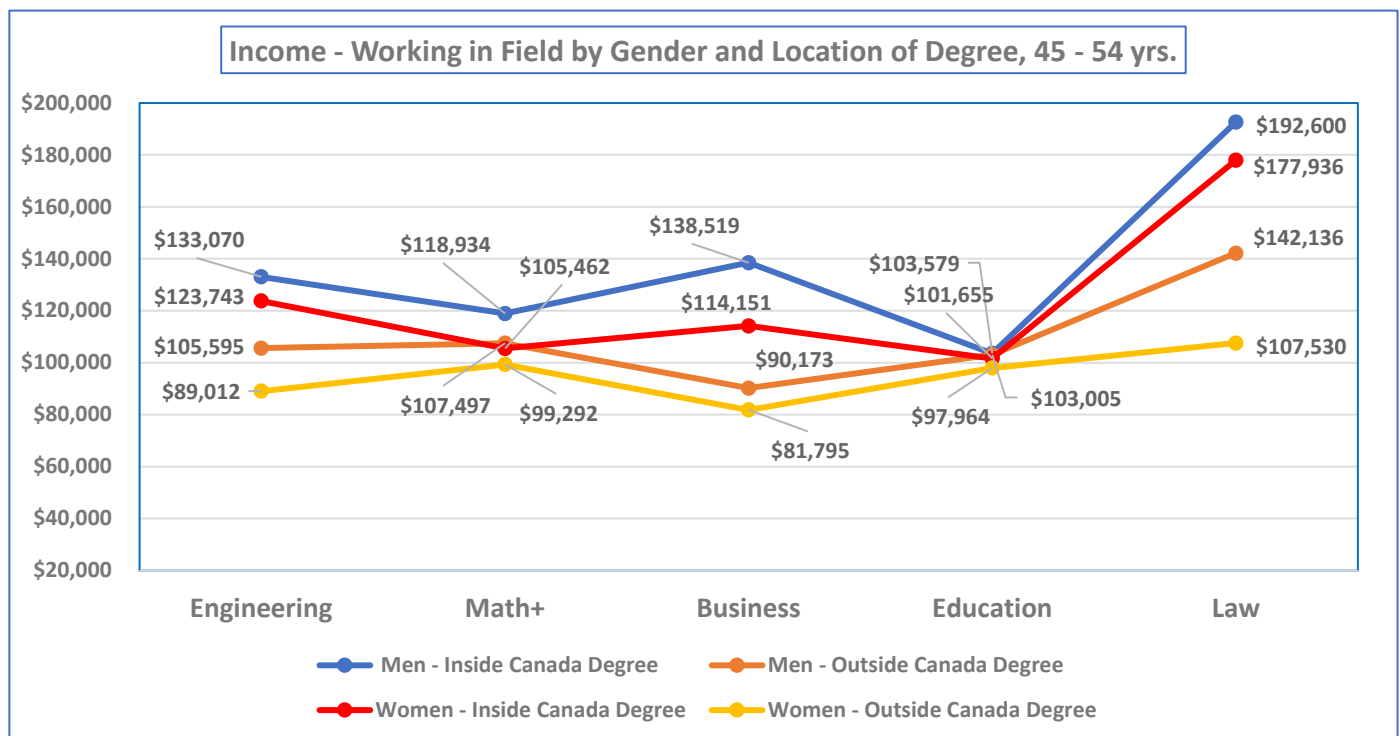
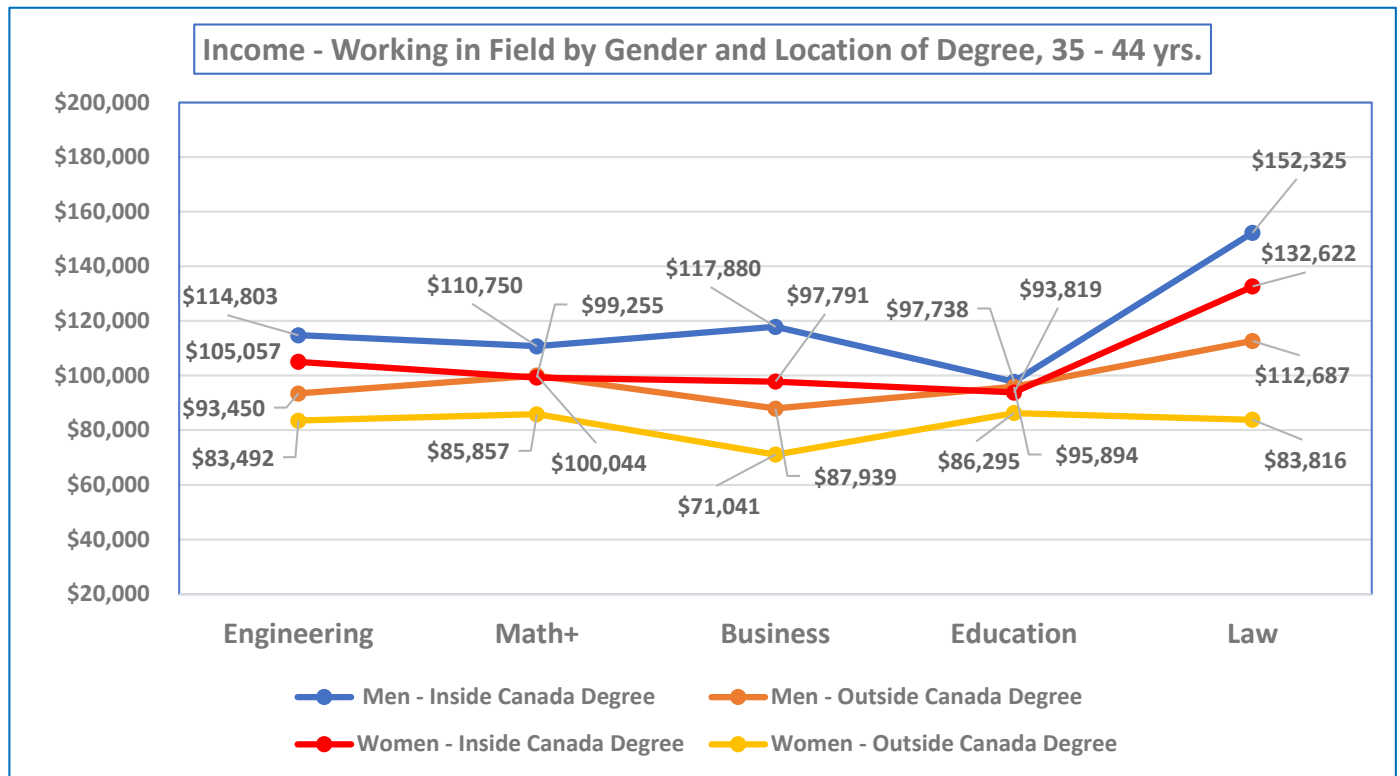
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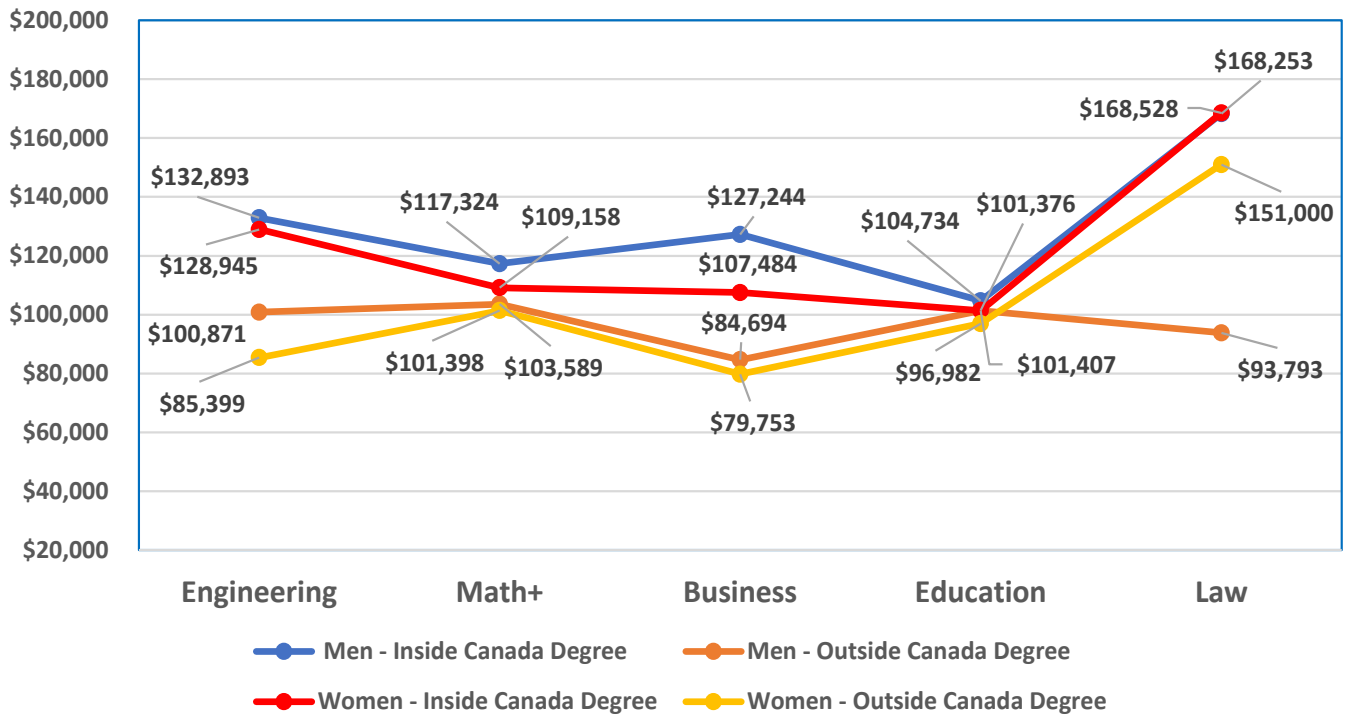
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Figure 2: Annual Salaries of Degree Holders Working in their Field by Age Ranges, Location of Degree, and Gender





Income - Working in Field by Gender and Location of Degree, 55 - 64 yrs.



Source: 2021 Canada Census

Conclusion

As demonstrated in the June, September, and December 2023 Voice articles about the 2021 Census, in terms of income and type of job, Canadian educated graduates, especially men, are doing quite well in their careers if working in their field of study. For engineering graduates, this is especially true when working in their field as well as other professions. Even if underemployed, Canadian educated engineering graduates do well, assuming earning over \$100,000 a year is deemed doing well.

It appears that income parity between men and women is becoming more a reality in some professions and in older age groups. This, of course, primarily applies to those Canadian educated. Parity is evident in IEGs as well in older age ranges although income for both IEG men and women remains lower than Canadian educated, except in jobs covered by collective agreements (Education).

What is abundantly clear is that women IEGs are struggling as they obviously face barriers in earning power, even if working in their field and especially if underemployed. Except for a few professions like Math+ and Education, IEG men also earn less than Canadian educated counterparts.

Going forward, OSPE will continue to advocate for pay parity between genders and higher pay for IEGs. OSPE will continue to encourage more young people, and especially those from underrepresented groups, to pursue engineering as a career. OSPE will continue to advocate to the provincial and federal governments to provide more funding and bridging programs to help IEGs integrate into the Canadian economy and obtain gainful employment. OSPE will continue to provide career services including regular Engineering Employment Events (E3s). Most importantly, OSPE will continue to raise the profile of all engineers and provide meaningful services and benefits for its members.

Look on OSPE's website in the near future for a report that combines and adds to all Voice articles about the 2021 Canadian Census.

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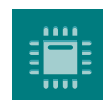
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An Overview of Risk, Operational Readiness and Monte Carlo Simulations

An honest look at why so many projects fail, and the tools required to minimize financial and overall project risk.

Carmine Ciriello, P.Eng., M.Eng., LSS MBB
Analyze and Improve Inc.

Engineering Practices and Technology



Connecting ISO Certifications with Important Environmental, Social, and Governance Goals

There are many tools for engineers to use to increase their positive environmental, social, and political impact. This session will explore the use of ISO 9001, ISO 14001, and ISO 45001 in positioning engineers to maximize their contributions within their organization and their community.

Ivana Strgacic, P.Eng.
Canadian Wood Council

Engineering Practices and Technology



Cybersecurity and Global Privacy Trends and Their Impact on Canada

Learn about what leading organizations from across the world are doing to reinforce their cybersecurity and privacy programs. Explore ideas on how the generation and preservation of trust can be demonstrated to the public.

Carlos Chalico NIST CSF LI, CISSP, CDPSE
EY

Cybersecurity and Data Management

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Empowering Green Futures: Innovative Approaches in Decarbonizing Buildings

This presentation will explore cutting-edge strategies for decarbonizing buildings, with a focus on practical applications, technological advancements, and sustainable practices. It will cover the role of engineers in driving the green revolution, showcase successful case studies, and discuss challenges and opportunities in this evolving field.

Mike Hassaballa, MA.Sc., P.Eng., CEM
HH Angus and Associates Ltd. Consulting Engineers

Sustainability and Innovation



Generative AI and its Implications on Software Engineering

This session will provide a deeper understanding of the technologies that are shaping the future of software engineering. Learn how to acquire the skills needed to thrive over the next decade with a focus on Generative AI.

Gary Tamber, P.Eng. CISM
ADP

Cybersecurity and Data Management



How AI is Making Smart Buildings Greener

Real estate is undergoing a massive transformation, moving from a static to a dynamic and programmable asset. The move to programmability is being driven by sustainability and the need to ensure both new and retrofit projects meet present and future business needs. The design and construction industries require a set of new tools to keep up with the advancements in technology and industry standards.

William MacGowan, P.Eng., CEM
Cisco Systems Inc

Sustainability and Innovation



How to Craft a Killer Generative AI Product

This session will examine lessons learned from navigating this rapidly growing and evolving field. From AI roadmap definitions to probabilistic user journeys, a step-by-step process of how to create a killer generative AI product will be explored.

Jingfei Chen
ServiceNow

Cybersecurity and Data Management



Lessons for Planning a Climate-Resilient Electricity Sector

The path to net-zero means an increased reliance on our electricity system. The Ontario Provincial Climate Change Impact Assessment highlighted that the Ontario electricity system has a medium-risk profile under current conditions, and that risk is rising. This panel will discuss the lessons from new and updated climate adaptation strategies and action plans from the perspective of different electricity sector entities and experts.

Kadra Branker, P.Eng.
Independent Electricity System Operator (IESO)

Sustainability and Innovation



Managing Climate Change Impacts on Water Resources

Learn about procedures, methods, and technologies available to maintain the delivery of safe drinking water and reduce the impact of contaminants generated due to climate change.

Saad Jasim, P.Eng.
SJ Environmental Consultants (Windsor) Inc.

Engineering Practices and Technology

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Redefining “Safety” in the 21st Century

Engineers have always had a responsibility to ensure the safety of our communities. In our modern connected digital world, that now means new and different things. This session will begin an ongoing dialogue expanding the definition of the term ‘safety’.

Beatrice Sze, P.Eng., Juris Doctorate
Sze Law

Cybersecurity and Data Management



The Challenges of Increasing Electric Vehicle Adoption and Multi-Residential Housing

Most EV owners charge at home, however, more than 1/3 of Canadians live in multi-residential buildings. This creates a challenge and an opportunity as Canada encourages personal vehicle travel to go electric. The presentation will address ways to overcome those obstacles, and the multiple options available in the market, with an engineering approach to demand management.

Luis-Alberto Quiroz, P.Eng.
Intellimeter

Sustainability and Innovation



The Use of Encapsulated Mass Timber as an Opportunity within the National Building Code

This session will discuss the fire-related national building and fire code changes for a new construction type called Encapsulated Mass Timber Construction (EMTC) to be used for wood buildings and provide an overview of ongoing changes and future changes to the current EMTC provisions.

Noah Fetterly
Canadian Wood Council

Sustainability and Innovation

Member Engagement Events across Ontario

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6:30 pm – 8:30 pm (Non-Members)

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October 28

5:30 pm – 6:30 pm (Members)

6:30 pm – 8:30 pm (Non-Members)

[Learn more](#)

Member Price: \$25

Non-Member Price: \$40

Keep an eye on our [events page](#) to see when we add a Member Engagement Event near you!



OSPE's Upcoming Events

THE 2024 ENGINEERING CONFERENCE

Canada's Largest Engineering Event!



October 29, 2024



Windsor, ON

#ENGCON

Join us for Canada's largest engineering event. In 2024, the Engineering Conference will bring engineers together with industry, government and academic partners to discuss the latest opportunities, challenges and innovations in engineering.

Delegates will:

- Network with colleagues from all sectors
- Join interactive presentations from professional engineers and subject matter experts
- Learn about the innovative engineering work happening in Ontario
- Discuss the important issues facing the profession
- Visit trade show booths with leading industry, government and academic partners



engineeringconference.ca



ONTARIO PROFESSIONAL ENGINEERS AWARDS

Celebrate Engineering Excellence

opeaawards.ca



November 15, 2024



Woodbridge, ON

The Ontario Professional Engineers Awards (OPEA) Gala is the province's most prestigious and anticipated engineering event of the year. Proudly presented by the Ontario Society of Professional Engineers (OSPE), this annual gala brings industry innovators, business leaders and policymakers together to celebrate and be inspired by engineering excellence and achievement.

OSPE Classic Golf Tournament 2024

On May 23, OSPE members and partners gathered at Angus Glen Golf Club for the 2024 OSPE Classic Golf Tournament. In addition to a round of golf on a world-class course, the event featured a silent auction, helicopter ball drop, and mulligan sale that raised \$2,520 for the Ontario Professional Engineers Foundation for Education. OSPE is already eagerly planning the 2025 tournament. Stay tuned to our digital channels for updates on all upcoming events.



**Ontario Professional Engineers
Foundation for Education**



Golfers at the Angus Glen Golf Club driving range before the start of the OSPE Classic Golf Tournament, 2024



Golfers competing in the OSPE Classic Golf Tournament Putting Contest, 2024



(Left to right): Americo Viola, P.Eng. (PEO), PEO CEO, Jennifer Quaglietta, P.Eng., and OSPE CEO Sandro Perruzza at the OSPE Classic Golf Tournament, 2024



A golfer teeing off at the OSPE Classic Golf Tournament, 2024



Sandra Ausma, P.Eng., OSPE Board Director, ready to start a day of golfing at the OSPE Classic Golf Tournament, 2024



Golfers practicing their putting at the OSPE Classic Golf Tournament, 2024



A golfer at the OSPE Classic Golf Tournament, 2024



A helicopter preparing to release golf balls onto the course as part of a 50/50 raffle



Alison Abbott accepting her prize for winning Ladies Longest Drive at the OSPE Classic Golf Tournament, 2024



From left to right: Nick Chung, Adam Harun, Sean Cline, and Henry Stafferton, the winning foursome at the OSPE Classic Golf Tournament

Volunteer Week 2024 (April 14th - 20th)

OSPE is so grateful for the many volunteers on its task forces, committees and Board of Directors. OSPE could not thrive without the work of members who volunteer their time to ensure that Ontario's engineers have a voice.



"The amount of advocacy work done at OSPE for the profession and for the public benefit was an eye opener when I joined. I've enjoyed volunteering as a great way to give back and stay connected to the engineering community while growing as a professional." - **Kadra Branker, P.Eng.**

Image: Kadra Branker, P.Eng. on a panel at EngCon 2023 in Toronto (Note: Kadra is the one sitting furthest to the right, in the pink)

"I am grateful for the community I've found through volunteering at OSPE. I've met some of the most talented, passionate, creative members of the engineering community who have inspired me and helped me to learn more in the last few years of volunteering." - **Tiffany Joseph, P.Eng.**

Image: Left to right, Paola Cetares, Kimberley Paradis, Stephanie Holko, P.Eng., Michelle Liu, P.Eng., Tiffany Joseph, P.Eng., and Jasmine Shaw, at EngCon 2023 in Toronto



"They say those who change the world are those who have the audacity to believe they can. I volunteer with OSPE to nurture that audacity." - **Beatrice Sze, P.Eng.**

Image: Left to right, MP Ben Lobb, Beatrice Sze, P.Eng., Stefanie Black, and Dave Carnegie, P.Eng. at the OSPE MP Lobby Day in Ottawa. (April 2024)

"The greatest part of volunteering with OSPE is sharing ideas with like-minded people of various backgrounds and formulating ideas for global challenges like decarbonization of our energy system." - **Michael Wiggin, P.Eng.**

Image: Left to right, Stephen Pepper, P.Eng., MP Randy Hoback, and Michael Wiggin, P.Eng. at the OSPE MP Lobby Day in Ottawa. (April, 2024)





EngTalks Presents **THOUGHT LEADERSHIP THURSDAYS**

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- Leadership & Management
- Mining
- Sustainability
- The Engineering Profession
- Research & Innovation
- Project Management
- Public Safety



Note: All presenters earn continuing professional development credits for their efforts.



OSPE Annual General Meeting

2024

OSPE's **Annual General Meeting (AGM)** is held in accordance with our Bylaws on an annual basis. This year, it was held virtually on **Tuesday, May 7 at 6:00 PM.**

Members and guests who attended the meeting got a chance to celebrate OSPE's advocacy wins of 2023, recognize incoming and outgoing Board Directors, and conduct official OSPE business.

Here is a summary of the events of the AGM:

Introduction

The AGM opened with remarks from **OSPE Chair, Stephanie Holko, P.Eng.** She offered a land acknowledgment for the evening's proceedings and thanked OSPE's Annual Partners and the 2023-2024 Board Directors. Following these introductory statements, the members voted to approve the Minutes of the 2023 AGM.

Report from the Chair & CEO

OSPE CEO Sandro Perruzza joined OSPE Chair Stephanie Holko, P.Eng. to highlight some of the exciting progress and achievements OSPE has made in 2023. These highlights include:

- **The Voice Magazine, OSPE's signature publication transitioning to digital only**, leading to more timely content, less waste, and more opportunities for members and partners to reach our engineering audience.

- OSPE's **largest Engineering Conference to date**, with over 5200 attendants in Toronto, coming to see 50+ subject matter experts and over 120 engineering employers in attendance
- OSPE's implementation of a **new Association Management System** to serve members better
- Central to this technology upgrade is access to OSPE's video learning library, which we have branded our **EngLearn platform**, where visitors can find recordings from past conferences, our Thought Leadership Thursday series, and so much more. All with the ease of navigation we are accustomed to from YouTube.
- **Exciting advocacy wins** from throughout 2023:
 - » PEO initiating a continuing professional development program for PEO and the government use licence holders
 - » PEO eliminating the Canadian experience component to make it easier for internationally trained engineers to use their skills in the workforce faster
 - » OSPE realized a 37% increase in meetings with government policymakers, and an increase in policy papers and reports published by 60% over 2022 levels
 - » OSPE remains very active on the critical files of energy management, housing development, infrastructure renewal, and public safety.
- **The return of OSPE's Annual Holiday Celebration**, representing the beginning of getting back to

being more physically present for our members. (In 2024 we are hosting a series of member engagement events across the province.)

- The great work of **OSPE's Task Forces**. This past year we were more active than ever, especially on critical issues of indoor air quality, smart construction, and sustainable procurement.

Report from the Nominations Committee

Meggen Janes, P.Eng., Nominations Committee Chair delivered the report.

This year, there were four open Board positions.

The following professional engineers shall become Directors of the Society to hold office for a three-year term:

- **Nicholas Burgwin, P.Eng.**
- **Nick Colucci, P.Eng.**
- **Dr. Marilyn Powers, P.Eng.**
- **Beatrice Sze, P.Eng.**

Report from the Treasurer

OSPE Treasurer, Stephen Pepper, P.Eng. delivered the report on OSPE's financial statements for the fiscal year ended December 31, 2023, including a summary of OSPE's revenue and expenses.

Report from the Audit and Finance Committee

OSPE Treasurer, Stephen Pepper, P.Eng. presented the report and the motion was carried to appoint **BDO Canada, LLP** as auditors of the Society.

The Ontario Not-for-Profit Corporations Act

OSPE Vice Chair Dave Carnegie, P.Eng. joined Stephanie Holko to move forward with the motions regarding the new **ONCA (Ontario Not for Profit Corporations Act) Compliant By-Law #1-2023** and **Special Resolutions**.

Some main points in regards to ONCA:

- Under ONCA it is necessary to formally establish the range of Board Directors with a minimum and maximum number.
- OSPE will be simplifying our categories of membership into 3 classes. **Regular Members, Corporate Members and Affiliate Members (students)**

The following motions were carried:

1. Approval of **Special Resolution #1**, which will amend the Letters Patent and apply for Articles of Amendment in order to be compliant with ONCA legislation.
2. Approval of **By-Law Number 1-2023**, which will replace **Bylaw Number 2** in its entirety in order to be compliant with ONCA legislation.
3. Approval of **Special Resolution #2**, with respect to **Section 11.8 of Bylaw #1-2023**, membership not being transferable between classes.
4. Approval of **Special Resolution #3**, with respect to Notice of Member Meetings in order to be compliant with ONCA legislation.
5. Approval of **Special Resolution #4**, which will fix the number of Directors of the Corporation to 12.

Member Questions

There were two questions on the following topics: Support for students and advocacy on behalf of the profession.

On the first topic, members were reminded of the suite of career related services available to student members to help them navigate from the classroom to the workforce.

In terms of advocating on behalf of the profession, it was shared how OSPE has been active in explaining to all levels of government that there needs to be a focus on increasing the number of engineers employed, in addition to those in skilled trades. OSPE is also active as part of many alliances to make sure that engineers are recognized as necessary for the smart economic growth of the provincial and federal economy.

Closing Remarks

Chair Stephanie Holko took a moment to individually thank each outgoing Board Director for their special contributions to OSPE.

The Directors who completed their 3-year terms this year are **Jerome James, P.Eng., Stephen Pepper, P.Eng., and Peter Marcucci, P.Eng.**

Thank You to Chair Stephanie Holko, P.Eng.

Vice Chair Dave Carnegie, P.Eng. reflected on and thanked Stephanie Holko for her many contributions to OSPE.

Stephanie Holko is now an honorary lifetime member of the Ontario Society of Professional Engineers.

2024-2025 OSPE Executive Committee

The OSPE Board of Directors convened after the AGM. At this meeting it was determined that the Executive Committee of Board will be as follows:

- OSPE Chair, Dave Carnegie, P.Eng.**
- Vice Chair, Nicholas Burgwin, P.Eng.**
- Treasurer, Raymond Mantha, P.Eng.**
- Secretary, Meggen Janes, P.Eng.**
- Past Chair, Stephanie Holko, P.Eng.**




(From left to right) Back row: Meggen Janes, P.Eng. (Secretary), Sandra Ausma, P.Eng., Stephanie Holko, P.Eng. (2023 Chair), Dr. Marilyn Powers, P.Eng. (Past Chair), Caroline Wojtyla, P.Eng.


Front Row: Stephen Pepper, P.Eng. (2023 Treasurer), Jerome James, P.Eng., Dave Carnegie, P.Eng. (2023 Vice Chair), Mark Emmanuel, P.Eng., Peter Marcucci, P.Eng., Raymond Mantha, P.Eng., FEC

Not Pictured: Jane Ravenshaw, P.Eng.

More information regarding the AGM as well as the video recording are available at [here](#).



**Ontario Professional Engineers
Foundation for Education**



www.EngineersFoundation.ca

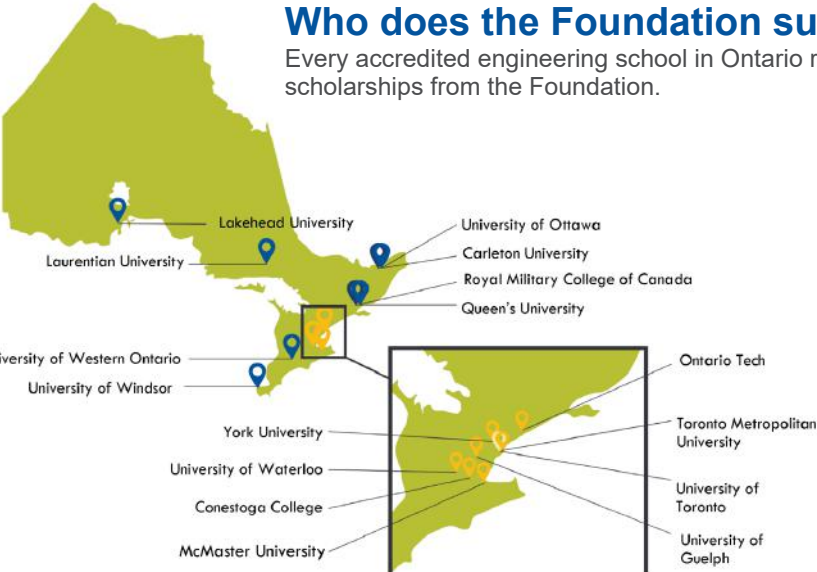
By the numbers

Since 1959
More than \$4 million in scholarships to over 4,000 students

Today
Annually, the Foundation provides \$159,000 to 106 students

Who does the Foundation support?


Every accredited engineering school in Ontario receives scholarships from the Foundation.



Ways to support the Foundation

- ◆ Make a donation through our website
- ◆ Ask your employer to make a donation
- ◆ Run a social media fundraiser

- ◆ Tell your friends and colleagues about us
- ◆ Ask family and friends to make a donation in lieu of a gift
- ◆ Remember the Foundation in your will



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OSPE'S ANNUAL REPORT

2023

Engineers **Lead**
Engineers **Grow**
Engineers **Care**
Engineers **Prosper**

For access to OSPE's full 2023
Annual Report please visit
go.ospe.on.ca/annual-report-2023
or scan the QR code.



The Results Are In: OPEA 2024 Awardees



PROFESSIONAL
ENGINEERS
AWARDS

OSPE is thrilled to announce the winners of the 2024 Ontario Professional Engineers Awards. From seasoned engineers celebrating lifetimes of achievement to young engineers making their first impactful strides in the engineering community, OSPE is proud to honour the following list of awardees.



Professional Engineers Gold Medal

Dr. Zheng Hong (George) Zhu, P.Eng.
York University



Citizenship Award

Annette Bergeron, P.Eng., MBA, FEC, FCAE
Bergeron Consulting



Citizenship Award

Omar Alghabra PC, MP, P.Eng., MBA
Parliament of Canada



Engineering Medal – Engineering Excellence in Industry

Michael Kropp, P.Eng.
PEER Group Inc.



Engineering Medal – Management

Inga J. Hipsz, M.A.SC., P.Eng.
CSA Group



Engineering Medal – Management
David Poirier, P.Eng., P.Log., CBSF
The Poirier Group



Engineering Medal – Entrepreneurship
Dr. Giovanni Grasselli, P.Eng.
University of Toronto



Engineering Medal – Young Engineer
Serena Mandla, P.Eng., MAsc.
Noa Therapeutics



Engineering Medal – Research and Development
Gregory Kopp, P.Eng.
Western University



Engineering Medal – Research and Development
Boxin Zhao, Ph.D., P.Eng.
University of Waterloo



Distinguished Lifetime Achievement Award
Paul Acchione, P.Eng.

This group represents the very best of the Ontario engineering community and we are thrilled to bring Ontario's engineers together on November 15 at Paramount EventSpace in Woodbridge, ON to celebrate their accomplishments.

For more information on each awardee and to purchase tickets please visit opeaawards.ca.



PROFESSIONAL
ENGINEERS
AWARDS

ONTARIO PROFESSIONAL ENGINEERS AWARDS

Celebrate Engineering Excellence

RECOGNIZE A GREAT ENGINEER IN YOUR COMMUNITY!

Since 1947, the **Ontario Professional Engineers Awards (OPEA)** have recognized professional engineers in Ontario who have made outstanding contributions to their profession and their community. The Ontario Society of Professional Engineers is proud to honour the very best of the Ontario engineering community at an annual awards gala in November. This annual gala brings industry innovators, business leaders and policy makers together to celebrate and be inspired by engineering excellence and achievement.

Recognize an engineer in the areas of:

- Innovation
- Community Service
- Entrepreneurship
- Research
- Leadership
- And more!



What is OSPE?

The **Ontario Society of Professional Engineers (OSPE)** is the voice of the engineering profession in Ontario. We represent the entire engineering community, including professional engineers, engineering graduates, and students who work or will work in several of the most strategic sectors of Ontario's economy.

Who is eligible to be nominated?

All P.Eng. licence holders of Professional Engineers Ontario (PEO) in good standing, who have demonstrated achievements significantly above the standards of the profession, with the exception of members serving on PEO Council, the Board of Directors of the Ontario Society of Professional Engineers (OSPE) and the OSPE Awards Committee (OAC), are eligible to receive an Ontario Professional Engineers Award (OPEA). A licence holder from one of the excluded groups above may be nominated for an award after 12 months have elapsed from their participation in the group.

Who can Nominate?

Nominations may be made by any P.Eng. licence holder of Professional Engineers Ontario (PEO). The nominee must not be aware of the nomination and self-nomination is not allowed. All nominations must be submitted using the Awards Force platform.

Deadline for Nominations

Wednesday, February 25, 2025



Learn more: opeaawards.ca

Award Types

The Gold Medal

This is the OPEA highest honour, recognizing conscientious commitment to public service, as well as technical excellence, and outstanding professional leadership.

Citizenship Award

This award recognizes a professional engineer's contributions to public service. Those who earn this award have given freely of their time, professional experience, and engineering expertise to the benefit of humanity.

The Engineering Medal - Entrepreneurship

The award recognizes professional engineers for applying new technologies or innovative approaches that have enabled new companies to get started, and/or assisted established companies to grow in new directions. The engineer should have demonstrated the initiative, energy, and spirit it takes to seek out new ideas and to take a leading role in fostering and promoting them.

The Engineering Medal - Management

The award recognizes professional engineers who are managing and directing engineering projects or enterprises where innovative management practice has contributed excellence in engineering achievement.

The Engineering Medal - Engineering Excellence in Industry

This award recognizes excellence in the practice of engineering in industry, where the innovative application of engineering knowledge and principles has solved a unique problem, led to advanced products, or produced above-average results based on work-related contributions and achievements from the last four (4) years.

The Engineering Medal - Research and Development

The award recognizes professional engineers using new knowledge in developing useful, novel applications, or advancing engineering knowledge or applied science, or discovering or extending any of the engineering or natural sciences.

The Engineering Medal - Young Engineer

The award recognizes outstanding young Ontario engineers in industry, who have made exceptional achievements in their chosen fields and are active in communities both personally and professionally.

** NOTE: The Nominee must be 35 years of age or younger by the submission deadline date.*

Engineering Achievement of the Year

The award recognizes a professional engineer, or group of professional engineers, who have given freely of their time, professional experience, and engineering expertise - to improve the engineering profession in Ontario.

CERTIFICATE PROGRAMS

Emerging Leaders Certificate Program

40
CPD HOURS

Dates:
Weekly (9:00 am - 12:00 pm)
Sept 11 – Nov 27, 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 Rzultz advisors and instructors who combine leadership expertise with a deep understanding of your world.

Critical Communication Skills for Engineers

12
CPD HOURS

Dates:
Sept 12 – Nov 21, 2024

Price:
\$800 - \$965

ONLINE

The ability to communicate information, precisely, and unambiguously is an essential skill required by engineers.

Well-trained writers:

- Save Time
- Save Money
- Build Better Client Relationships
- Deliver Higher Quality Product
- Dramatically Reduce Senior Consultant Stress

Digital Transformation *Delivered in Partnership with WatSPEED*

40
CPD HOURS

Dates:
Oct 18 – Dec 15, 2024

Price:
\$2,195

ONLINE

As disruptive innovations and new technologies continue to shape our world, being prepared to adapt is more important than ever. To keep up, your organization must have a strategy that enables your business to respond to our changing landscape and embrace emerging technology. From mastering new technologies to ensuring your teams can successfully adapt to technological change, avoid future roadblocks by strengthening your knowledge of digital transformation today.

This eight-week online course, developed in partnership with the Ontario Engineering Academy and Ontario Society of Professional Engineers (OSPE), addresses the impact that technology is having on our workforce and helps you discover new technologies and develop a plan for their integration into your workplace. It covers current digital transformation models, and examples of new technologies and their applications, and offers unique case studies from a wide range of organizations that have undergone their successful digital transformation.

Project Management Essentials for Engineers

16
CPD HOURS

Dates:
2 per week (8:30 am- 12:30 pm)
Dec 2 – Dec 10, 2024

Price:
\$860

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 successful. 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.

Check the OSPE Events Calendar for more information:
go.ospe.on.ca/learn

JOURNEY TO P.ENG.

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

Dates:
 Jun 20 (8:30 am – 12:30 pm)
 Jul 30 (1:00 pm – 5:00 pm)

 Jul 30 (1:00 pm – 5:00 pm)
 Sept 12 (1:00 pm – 5:00 pm)

Price:
 \$475
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. We've developed two alternating 4-hour workshops (Dates: June 20, 8:30 AM-12:30 PM & July 30, 1:00 PM – 5:00 PM), each offered every few weeks (dates listed below). 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.

PE403/0724 – Preparatory Course for the National Professional Practice Exam (NPPE)

Dates:
 Tuesdays (5:30 pm – 8:30 pm)
 Jul 30 - Aug 27, 2024

Price:
 \$450
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).



Thought Leadership Thursdays

1
CPD HOUR

Informing Structural Building Material Selection Through Case Study Analysis

Dates:
 Jun 20 (12:00 pm - 1:00 pm)

Price:
 \$0 - \$59
ONLINE

Attendees will be guided through the impact of building materials and systems on the structure and façade of mid-rise and high-rise building design scenarios, evaluated using environmental metrics, project cost, and construction timelines.

Attendees will gain an understanding of the impact of utilizing a concrete, steel or wood based design through three case studies to highlight differences in construction schedule, cost and environmental impact.

Decibels and Dwellings Noise Control Evolution in the NBC

Dates:
 Jun 27 (12:00 pm - 1:00 pm)

Price:
 \$0 - \$59
ONLINE

The webinar will examine the historical evolution of the provisions of the Model National Building Code of Canada with regard to acoustics, noise, and vibration issues. This includes a version-by-version overview of the requirements articulated in successive versions of the Code. Further discussion will be provided regarding the progression of court decisions that have been made and how this may influence the evolution of future Codes. Attendees will be provided with information about the past, present, and future constraints that have been, and potentially will, be incorporated in the model NBCC.

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- Health and Safety
- Journey to P.Eng.
- Project Management
- And more!

NEW!

MEMBER PROFILE



Joey Fox, P.Eng.

Advocating for Better Indoor Air Quality (IAQ) in Ontario

If OSPE member Joey Fox knows about anything, it's heating, ventilation, and air conditioning. Fox has over 10 years of experience in Building Automation Systems (BAS) and currently works with the Toronto District School Board, as a BAS Energy Coordinator, designing and commissioning ventilation systems for buildings and primarily, for schools.

It may surprise some people to hear that the ventilation systems in buildings are designed primarily for comfort, meaning that the building maintains the right temperature and doesn't smell bad. Current standards do not have adequate measures for promoting good health on top of comfort.

When the COVID-19 pandemic hit, Fox already knew that the ventilation systems were in a state of neglect. The current system fails to ensure good air quality in indoor spaces.

While some provisions are made for Indoor Air Quality (IAQ) in the Ontario Building Code, experts agree these are insufficient to provide good air quality, and crucially, do not require reporting or verification. Indoor air quality

is an issue that affects every person and regulating it is vital to public health and safety, especially as people spend more time indoors.

"There's this faulty assumption amongst the general public that ventilation is generally OK and done properly. Just like we're not worried about the structure of buildings and we're not worried about how clean the water we drink is, so people assume that the air was OK, but I knew it wasn't," said Fox.

In fact, most people weren't critically thinking about the quality of indoor air until the height of the COVID-19 pandemic.

"It all goes back to the fact that COVID is an airborne disease and essentially you could see respiratory viruses as indoor air pollutants," said Fox. "The whole pandemic was essentially an indoor air quality problem." Fox added, "there was big denial about the airborne nature of COVID by public health throughout the pandemic, and I was hoping that they would eventually come around and give proper guidance and tackle the issue of poor ventilation and poor indoor air quality across society."

It was during the second omicron wave in late 2021 that Fox realized this was not happening and approached OSPE's CEO Sandro Perruzza to see what engineers could do to help mitigate the risks of infection for people spending time indoors, which is most people.

"We did not have any systems in place to ensure people are provided with clean air. It was a glaring hole that needed to be addressed [by Ontario's engineers]," said Fox.

Sandro's initial thoughts after speaking to Joey on the topic was that Joey was spot on.

"I supported him 100%," said Sandro Perruzza. "The science and engineering made sense. I was also

frustrated that no one was following the science, so when Joey approached us, it was fully aligned with what OSPE is all about ... giving engineers a voice!”

Sandro decided that the next course of action would be for OSPE to create an Indoor Air Quality Advisory Group. Joey was excited about the support from OSPE, and that they would be taking steps to help people live healthier lives and breathe cleaner air.

But if Fox was being honest, he was hoping that this idea would take off with someone else at the helm. Someone with years of experience leading task forces and speaking at political engagements.

Of course, Sandro asked Joey Fox to be the Chair and lead the group.

The group is made up of HVAC engineers, respiratory specialists and healthcare workers whose mandate was, and is, to respond to the need for evidence-based guidance around indoor air quality and transmission of COVID-19 and other infectious aerosols.

He hesitantly agreed, never having done anything like what would be asked of him. At his core Joey knew HVAC and health, not delegating tasks, and getting ideas in front of policymakers.

[Where it Went and Where it's Going](#)

When the group was created in June 2022 there were many internal meetings, and lots of heavy lifting that needed to be done to get roles organized and goals defined.

[Initially, the group published three reports](#) on airborne COVID-19 transmission and protective measures. The reports were authored by a panel of multi-disciplinary experts and provided valuable guidance for individuals, business owners, government leaders, and others to limit the spread of COVID-19 and promote health and well-being through indoor air quality.

“The guidance documents that we created really help serve as a basis for many people to advocate for clean air, which was one of the main goals behind it,” said Fox.

Another vital role of the task force is to speak to public officials, which fell to the advocacy team and Fox as the Chair of the group. In 2022, Fox and company met with the Minister of Infrastructure and the Ministry of Municipal Affairs and Housing, and they’ve gone on to speak with many policymakers in different areas of government. “OSPE’s been extremely supportive and helpful all along

the way,” said Fox. “They have been extremely effective at getting the relevant parties involved and getting legislation through.”

The first big policy win for the IAQ Advisory Group came the following year. It was the creation of **Bill 86, Advisory Committee to Protect Ontario’s People and Economy from Airborne Pandemics Act, 2023**. This Private Members’ Bill was introduced by MPP Kristyn Wong-Tam and proposed the creation of an advisory committee to protect Ontario’s people and economy from airborne diseases.

Later that year MPP Chandra Pasma announced **The Improving Air Quality for Our Children Act, 2023** which 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. The Act also sets out a maximum carbon dioxide threshold of 600 parts per million above outdoor carbon dioxide levels.

Several of the group’s recommendations were also incorporated into **ASHRAE Standard 241 Control of Infectious Aerosols** which established minimum requirements aimed at reducing the risk of disease transmission through exposure to infectious aerosols.

The group is now looking forward to the tabling of another bill later this year.

Though initially tentative to lead the group, Joey Fox has been able to accomplish amazing things alongside his colleagues. Not only has he grown personally as a leader, but the group has been vital to the development and tabling of nearly three bills, published three critical reports, and had recommendations adopted into ASHRAE 241.

Fox is proud of what the advisory group has been able to accomplish, but the work isn’t over yet.

“What we need to advocate for is a Clean Indoor Air Act in Ontario and adopting ASHRAE 241 into the building code,” said Fox.

To join Joey Fox in advocating for a Clean Indoor Air Act, visit ospe.upolicy.ca/campaign/CleanAirAct and send a pre-drafted letter to your MPP. Not only will it keep people safer during rampant infectious diseases, as in COVID-19, but good indoor air quality is a pillar for all-around good health and well-being.



Guide the Next Generation of Professional Engineers

▶ **Become a Mentor with OSPE**

**Are you looking to give back to the engineering community?
Consider joining OSPE's mentorship program.**

Help aspiring engineers navigate the engineering space in areas like:

- Getting their license
- Developing their careers
- Building leadership skills
- And more!

We're looking for OSPE members of all career stages and disciplines.

If you're interested in learning more, email ihersi@ospe.on.ca



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