JUNE 2025

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Engineering Water Resilience: Building Infrastructure for a Changing Climate

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Engineering Water Resilience: Building Infrastructure for a Changing Climate

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THE VOICE
OF ONTARIO'S ENGINEERS

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Dear OSPE Members

If you have been following our advocacy efforts lately, I am sure that you have noticed that we have had a busier than usual first half of the year. We had two important elections whilst also navigating the economic instability from actions south of the border, all of which has thrust OSPE into the spotlight on a number of key issues.

In response to the ***Keep It Canadian*** sentiment, OSPE is actively supporting the mobility of engineering talent within Canada, to make it easier for our highly trained engineers to contribute to the most important projects, wherever they may be.

Just as important are our recent advocacy activities regarding the very controversial **Bill 5**. OSPE is committed to the development of our economy, but in ways that do not create environmental or societal challenges that can be avoided. Engineers are critical not just in the execution of Ontario's economic vision, but in ensuring that it is done in a manner that enhances society at large.

As you may have seen, OSPE CEO, **Sandro Perruzza** provided testimony at **Queen's Park**, demonstrating the respect and value of OSPE to decision makers, such that we were granted the opportunity to represent the expertise and concerns of the engineering community.

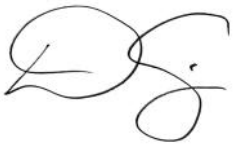
As we look ahead to the summer, I expect a shift in focus. As Queen's Park rises, we will be able to focus on some other issues of importance, such as spearheading modernization of the **Professional Engineers Act** to ensure it provides the framework that we need for engineers to thrive and contribute to all sectors of our economy.

That is just one of many priorities set out in OSPE's **2025 – 2030 Strategic Plan**, launched at the Annual General Meeting last month. I urge all of you to take a look and follow along as we share updates and results in the future.

This is your association, and we always want members to engage with OSPE's priorities and activities.

Have a great summer,

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



Discover what's in store at our 2025 EngCon this November— see page 53!

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News from the Front

Between March and June, OSPE actively engaged in legislative advocacy, with CEO **Sandro Perruzza** presenting to provincial committees on Bills 2 and 5 to call for modernized engineering licensure, improved labour mobility, and stable regulatory frameworks.

The Society also participated in infrastructure-focused events, submitted formal recommendations on nuclear innovation and economic policy, and welcomed new government leadership with a renewed push for evidence-based policy.

OSPE's advocacy efforts contributed to several key policy wins, including support for clean energy, credential recognition, streamlined permitting, and a historic $750 million investment in STEM education.

March 4 - OSPE Engages with Key Ministers at 2025 Ontario Post-Election Breakfast

OSPE attended the **2025 Ontario Post-Election Breakfast** hosted at the **Albany Club** in Toronto. The event featured a panel discussion with senior campaign advisors and elected officials, including the **Ministers of Infrastructure, Energy, and Colleges and Universities**. This provided a valuable opportunity to gain insights into the election outcomes and discuss the implications for Ontario's policy direction. OSPE participated in the networking session and engaged with key stakeholders on priorities related to infrastructure, clean energy, and workforce development in the engineering sector.

March 6 - Advancing Women in Engineering: OSPE's Role in the ElevateHER Project

OSPE proudly participated in the **Advisory Council of the ElevateHER Project**, a systemic change initiative funded by **Women and Gender Equality Canada (WAGE)**. The project addresses critical barriers that hinder women, particularly those from marginalized communities, from advancing in their careers. Through this collaboration, OSPE is actively shaping policies and best practices that support women in engineering by identifying systemic challenges, promoting equity-focused workplace policies, and supporting the development of structured mentorship and sponsorship models.

May 26 - Standing Committee of Interior Public Hearings regarding Bill 5

OSPE CEO, **Sandro Perruzza** made remarks before the **Standing Committee on Finance and Economic Affairs** regarding **Bill 5**. He underscored the critical need for evidence-based policymaking and called for clear, stable regulatory frameworks that enable long-term planning, environmental stewardship, and public safety.

May 27 - Standing Committee on Finance and Economic Affairs Regarding Bill 2

OSPE CEO **Sandro Perruzza** presented before the **Standing Committee on Finance and Economic Affairs** regarding **Bill 2**. He emphasized the urgent need to modernize Ontario's engineering licensure system to support labour mobility and highlighted the importance of reinstating eligibility for previously qualified applicants.

June 5 - Protecting Ontario by Building Faster: Infrastructure Ontario's Market Update – Hon. Kinga Surma, Minister of Infrastructure

OSPE attended the **Ontario Market Update** hosted by the **Empire Club of Canada**, featuring the **Honourable Kinga Surma, Minister of Infrastructure**. The event offered valuable insights into the province's **Protecting Ontario by Building Faster Plan** and the government's infrastructure priorities. It also provided an excellent opportunity to engage with leaders in government relations and hear directly from A**ngela Clayton, President of Infrastructure Ontario**. OSPE extends its thanks to the organizers for facilitating such an informative and engaging session.

To view all of OSPE's advocacy activities, including meetings with key stakeholders and policymakers, visit OSPE's Advocacy Timeline.

Policy Wins

April 4 – Small Modular Reactor License Granted

OSPE has consistently emphasized to both provincial and federal leaders the importance of investing in nuclear innovation, including the development and deployment of **Small Modular Reactors (SMRs)**. The granting of a license to build an SMR at an Ontario nuclear generating station is a major milestone that demonstrates confidence in engineering-led clean energy solutions.

April 15 – Throne Speech Highlights Engineering Priorities

The 2025 **Speech from the Throne** marked another advocacy success, as it directly addressed many of OSPE's long-standing priorities. The government's commitment to removing credential and trade barriers, expanding investments in energy, infrastructure, and workforce development, and supporting clean technology and internationally educated professionals reinforces the vital contribution of engineers to Ontario's economy and society.

April 17 – Protect Ontario by Unleashing Our Economy Act, 2025

The new legislation delivers several key wins aligned with OSPE's recommendations, including streamlined permitting, faster project delivery, and protections for local ownership and strategic resources. It advances clean energy and critical mineral development while upholding environmental standards and strengthening regulatory safeguards.

April 22 – Historic $750 Million Investment in STEM Education

The Ontario government announced a historic $750 million investment to expand **Science, Technology, Engineering, and Mathematics (STEM)** education. This investment will create up to 20,500 new STEM seats annually at Ontario colleges and universities, helping build a skilled, resilient workforce capable of anchoring industries like advanced manufacturing, clean energy, infrastructure, and life sciences.

May 15 – Ontario Budget Alignments with OSPE Recommendations

The **Ontario 2025 Budget** delivers key policy wins aligned with OSPE's advocacy priorities.

OSPE CEO Sandro Perruzza speaks before the the Standing Committee on Finance and Economic Affairs regarding Bill 5.

Public hearing on Bill 2 before the Standing Committee on Finance and Economic Affairs where OSPE CEO Sandro Perruzza presented key recommendations.

Paola Cetares, Public Affairs Director for OSPE (right) & Minister of Energy and Mines, Hon. Stephen Lecce (left) at the 2025 Ontario Post-Election Breakfast.

Major investments in infrastructure and housing, including a $200B 10-year plan and over $2B for water systems, support OSPE's call for sustainable, long-term growth.

Energy and environmental measures, such as funding for small modular reactors, hydrogen, and critical minerals, advance OSPE's priorities for resilience and innovation. Workforce development investments and expanded support for digital technologies also reflect OSPE's vision for a future-ready engineering profession.

Read more about these policy wins in the Society Notes Blog.

Letters and Submissions

March 14 – Advancing Canadian Nuclear Innovation: OSPE's ERO Submission on the MONARK Reactor Initiative

OSPE submitted feedback through the **Environmental Registry of Ontario (ERO)** in support of the **Government of Canada's** investment in modernizing **CANDU** technology through the **MONARK** reactor initiative.

Read the full submission here.

March 19 – OSPE Congratulates the New Prime Minister of Canada and the Newly Appointed Ontario Ministers

With the appointment of **Prime Minister Mark Carney** and Ontario's new cabinet, OSPE is actively engaging with key decision-makers to advocate for evidence-based policies in clean energy, infrastructure, environment, procurement, and innovation.

May 13 - Bill 2: Protect Ontario Through Free Trade Within Canada Act, 2025

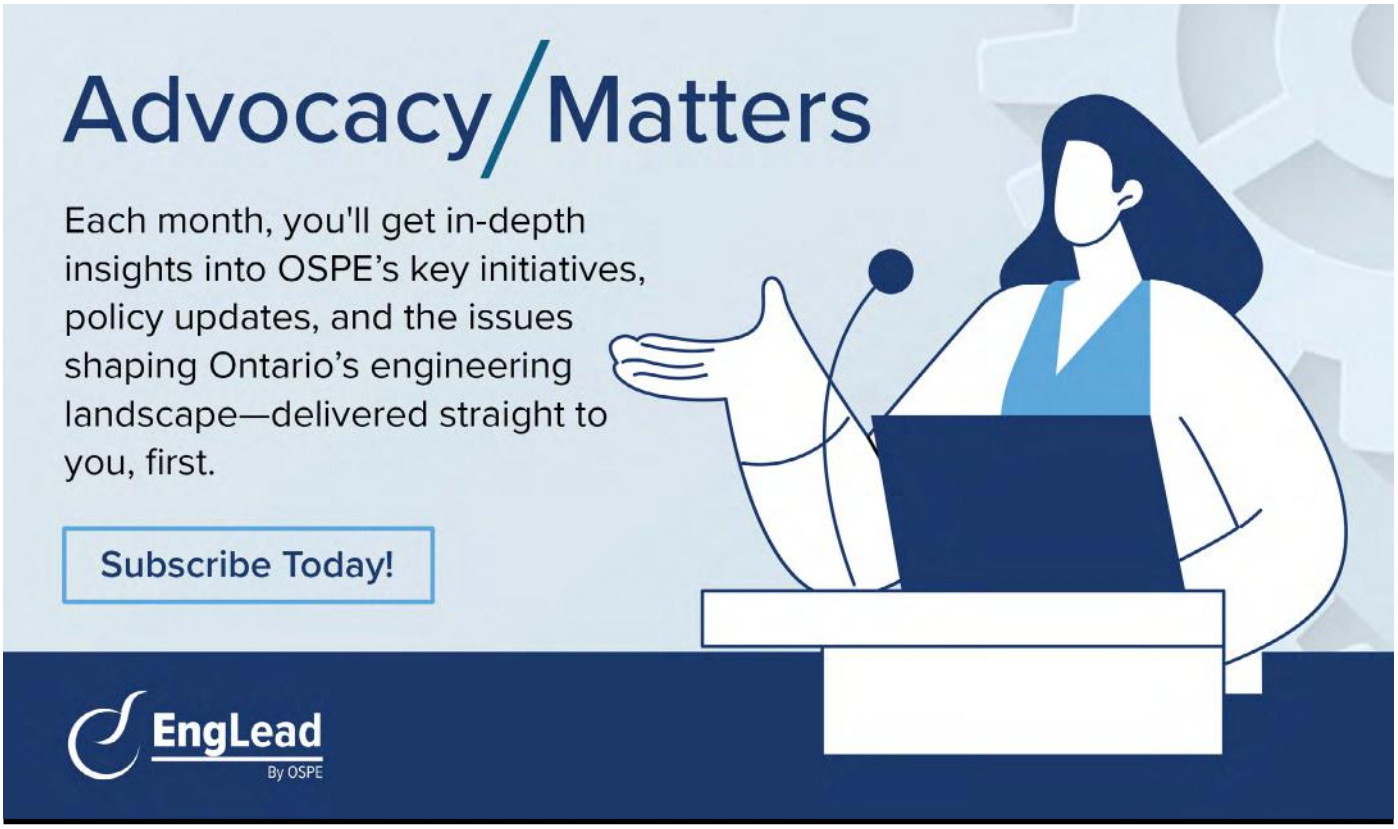
OSPE submitted recommendations related to Bill 2, focusing on labour mobility and the urgent need to modernize Ontario's engineering licensure system.

Read the full submission here.

May 13 - Bill 5: Protect Ontario by Unleashing Our Economy Act, 2025

OSPE submitted a statement to the **Standing Committee on Finance and Economic Affairs** in response to Bill 5, emphasizing the need for clear, stable frameworks that support long-term planning, environmental stewardship, and public safety.

Read the full submission here.



Special Topics in Indoor Air Quality Reports

Many take for granted that the quality of the air circulated through our homes, workplaces, and schools is held to a high standard. Sadly, it is not, as highlighted during the recent COVID-19 pandemic.

The global, catastrophic event changed our perspective on many things. For the engineering community, chief among them was more than just how it could have been prevented, but also what current measures are in place to protect our most vulnerable communities.

People on average spend 80–90 percent of their lives indoors. With that in mind, OSPE has continued the work of our ***Indoor Air Quality (IAQ) Working Group***, developing recommendations to bring light to, and ultimately increase, the quality of the air we breathe.

The result of that work is a series of research and recommendations for institutions and households alike.

These documents are intended to be introductory guides, to provide readers with a robust foundational knowledge on IAQ. These documents outline methods to improve IAQ and explore various factors affecting indoor air. The goal is to support efforts to improve the spaces where we live, work, and play.

To access our growing library of research and policy documents, click here or on the linked reports below:

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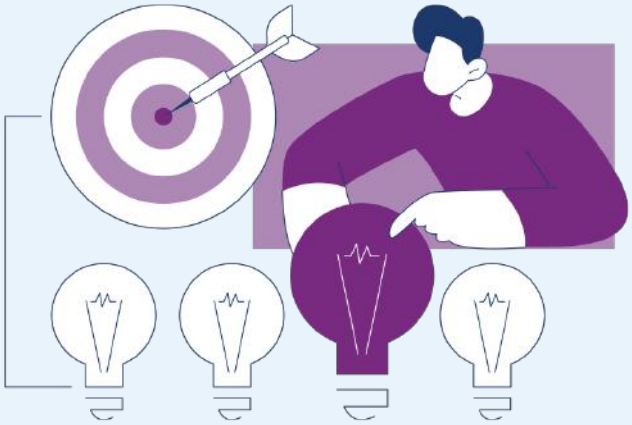
Fee Guidelines for the Engineering Profession

This document provides comprehensive guidance on determining fair, transparent, and sustainable engineering service fees in Ontario. Developed for use by engineers, clients, government agencies, and industry stakeholders, the fee guidelines aim to support consistent, ethical, and value-driven pricing practices across the engineering profession.

The guidelines outline the purpose, scope, and ethical considerations that underpin professional fee structures, while establishing core principles for determining fees. Various pricing models are explored; including fixed fees, hourly rates, and percentage-based methods, with practical insights into when and how to apply each.

Read more ↗

Qualifications-Based Selection (QBS)

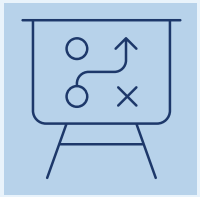


How do you use Qualifications-Based Selection (QBS)?

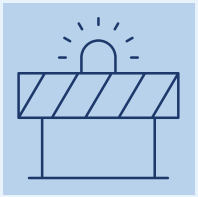
If you work in procurement, you have a tremendous opportunity to influence the future of engineering... through **QBS.** In brief, QBS attempts to improve the quality of engineering outcomes by elevating the capabilities and qualities of bidding firms over costing. With that focus, better outcomes follow.

The Benefits of QBS:

Focuses on Quality, Not Just Cost



Reduces Long-Term Costs

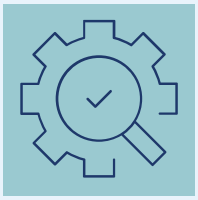


Minimizes Risk and Improves Safety

Encourages Innovation and Problem-Solving

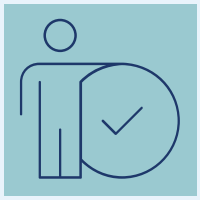
Ensures Compliance with Regulations

QBS in Practice:



1. Identify the Most Qualified Firms

The client evaluates engineering firms based on factors such as experience, past projects, and team expertise.



2. Select the Best One

The most qualified firm is chosen before discussing price to ensure the right expertise is in place.

3. Negotiate a Fair Price

The client and engineer then agree on a scope of work and a fair fee for that scope.

Learn more by visiting go.ospe.on.ca/QBS

CSA GROUP™

Helping Municipalities Build Flood-Resilient Communities

Municipalities looking to build flood-resilient communities and reduce costs related to property and infrastructure damage can benefit from **the Municipal How-to Guide for CSA Community Water Standards**. This step-by-step resource helps urban planners, managers, and municipal officials by providing descriptions of CSA water-related standards. The guide also includes examples of wording that municipalities can adopt for their bylaws and policy documents. **Download the guide.**

A Framework for Conducting Coastal Flood Hazard and Risk Assessments

The National Standard of Canada, CSA W224:24, provides guidance for conducting coastal flood hazard and risk assessments to help inform community planning, design, and retrofitting measures and protect lives, property, and the environment. These assessments are intended to inform the design of new buildings and infrastructure, and retrofitting measures for existing buildings and infrastructure. **Read more about CSA W224:24.**

Helping Manage Growing Stormwater Systems Service Demands Across Canada

With increased urbanization and more extreme weather, service demands on stormwater systems across the countryare growing. The National Standard of Canada, CSA W211:21, a new standard CSA W211:21 introduces a holisticapproach to managing critical water infrastructure. Any municipality can use this National Standard of Canada to helpimprove the climate change resiliency of their communities by implementing proactive and preventative strategiesbeyond just physical infrastructure. **Get view access to CSA W211:21.**

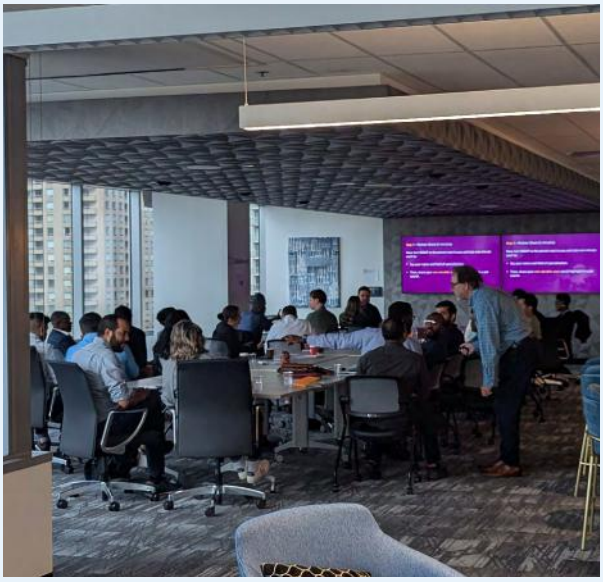
New Standards Can Help Protect Communities from Flooding

Did you know that over 1.5 million homes across Canada are located in areas of high flood risk? Over the last decade, flooding has become the costliest extreme weather disaster affecting Canadians. CSA Group has facilitated several research studies, guidance documents, and standards to help improve the resiliency of property and infrastructure to flooding. **Learn more about Standards for flood mitigation and resiliency in communities.**

P.Eng. Licensing and Career Summit Recap

On May 7, the **Ontario Society of Professional Engineers (OSPE)** held it's first **P.Eng. Licensing and Career Summit**. 27 eager professionals joined us at OSPE's North York office for a dynamic half-day event designed to demystify Ontario's P.Eng. licensing process and offer practical career advice for engineers.

The audience consisted primarily of internationally educated engineers, many of whom were mid-career professionals. The atmosphere was incredibly supportive, filled with thoughtful questions and shared encouragement.

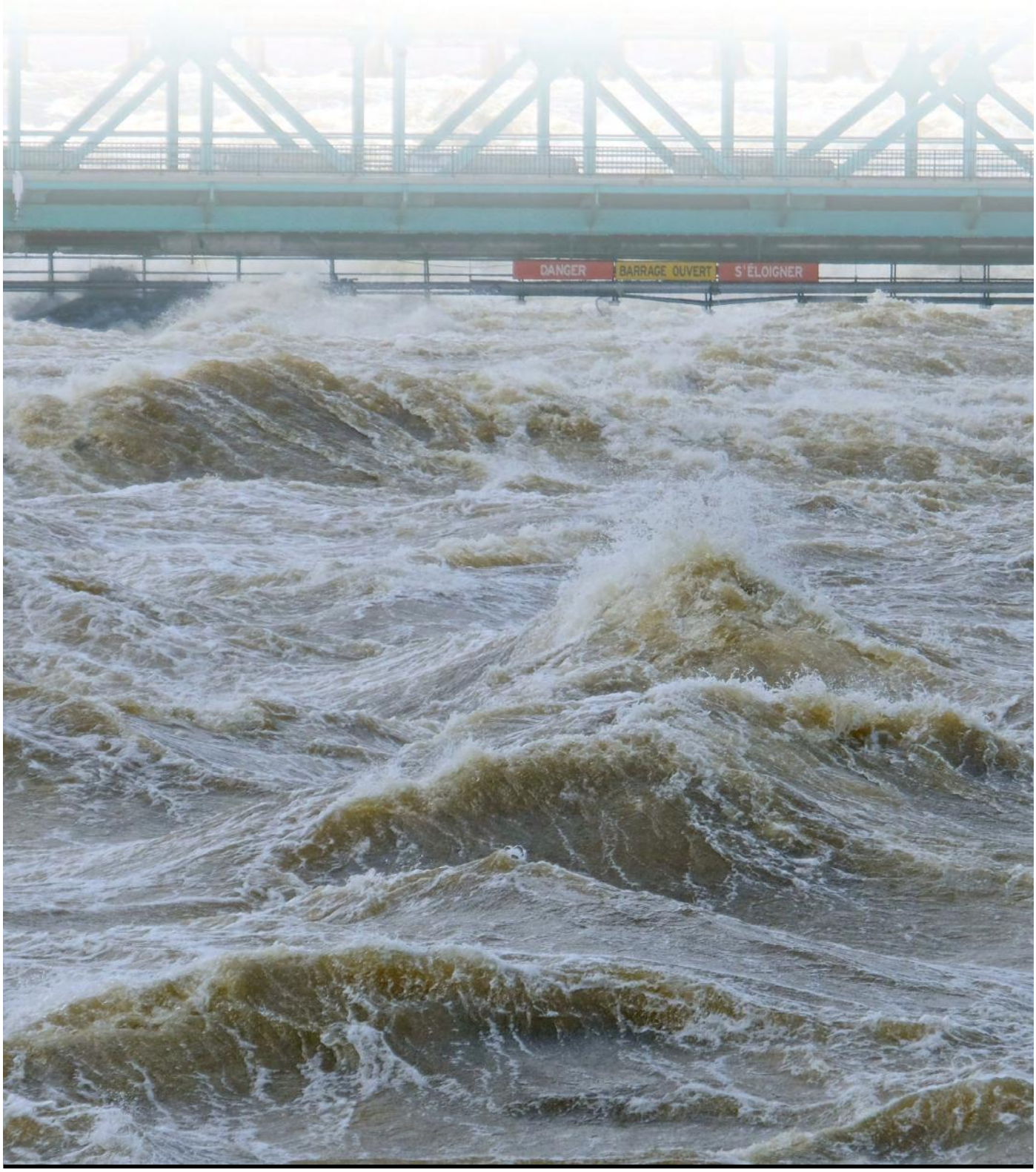


Participants heard directly from **Sami Lamrad, P.Eng.**, a representative from **Professional Engineers Ontario (PEO)**, who provided a detailed overview of licensing steps, eligibility, and milestones. Afterwards, **Dr. Matthew Minnick** offered strategic insights into preparation and study resources for the **National Professional Practice Exam (NPPE)**, and late career development expert **Mark Franklin, P.Eng.**, explained how to approach the **Competency-Based Assessment (CBA)** effectively.

To close, **Pierre Lebel** of **Engineers4Hire** delivered actionable tips on resume writing and job searching, which were especially valuable for international engineering graduates looking to advance their careers in Canada.

Join the OSPE Community and Become a Member Today!

Engineering Water Resilience: Building Infrastructure for a Changing Climate



In a world increasingly shaped by extreme weather events, engineers are at the forefront of an urgent mission: designing water infrastructure that can withstand the unpredictable forces of climate change. The stakes are higher than ever. Rising sea levels are threatening coastal cities, extreme rainfall is overwhelming outdated drainage systems, and prolonged droughts are straining reservoirs and agricultural water supplies.

Around the globe, once-in-a-century storms are now occurring with alarming frequency, exposing the vulnerabilities of traditional infrastructure that was built for a more stable climate.

According to the United Nations' 2023 Climate Report, more than 2 billion people currently live in areas facing high water stress, a number projected to rise sharply without immediate intervention. Meanwhile, the World Bank Group warns that climate-related water scarcity could cost some regions up to 6% of their **Gross Domestic Product (GDP)** by 2050 if no action is taken.

Against this backdrop, the need for resilient, adaptive water systems has never been greater. Engineers today are not just building for efficiency; they are designing for survival, sustainability, and long-term societal well-being. They are rethinking the way we manage rivers, protect coastlines, design cities, and secure access to clean drinking water, recognizing that resilience must be embedded at every level, from local communities to global infrastructure networks.

Far beyond simply "hardening" existing systems, engineering resilience demands a holistic approach: one that integrates technology, nature, social equity, and forward-looking risk management to ensure that water -the essence of life- remains accessible, safe, and reliable in an increasingly uncertain future.

The Rising Challenge

According to the World Meteorological Organization, the number of water-related disasters has increased by 134% over the past two decades. Floods, droughts, coastal erosion, and devastating storms are no longer distant or abstract risks; they are today's pressing reality, reshaping landscapes, displacing populations, and threatening economies.

Communities across the globe are struggling to adapt, often relying on aging water infrastructure designed for a different climate era. In New Orleans, levees built to withstand 20th-century storms are now tested by the growing intensity of hurricanes fueled by warmer oceans. In Jakarta, sinking land and rising seas are forcing plans for an entirely new capital city to protect its citizens from chronic flooding. Even traditionally stable regions like Western Europe are experiencing unprecedented flood events, such as the catastrophic floods in Germany and Belgium in 2021 that caused billions in damages and tragic loss of life.

The reality is sobering. Much of the world's critical water infrastructure was engineered based on historical weather patterns that no longer apply. As a result, engineers are now tasked with the enormous challenge of upgrading, retrofitting, and reimagining these systems.

Levee Flood Wall, New Orleans, LA. (Image: Shutterstock 2118925766)

Rethinking Water Infrastructure

Traditional engineering practices often relied heavily on historical weather data to inform design standards. Engineers would calculate stormwater systems, dams, and flood defenses based on the assumption that future weather would mirror the past. However, as climate extremes intensify and become less predictable, this foundational principle, known as **stationarity**, is no longer valid. Today, the engineering community must adopt what researchers have called a "stationarity is dead" mindset, recognizing that historical patterns are no longer reliable predictors of future risks.

This shift demands a radical rethinking of design principles. **Water resilience** now requires infrastructure that is not just robust but able to evolve in response to a much wider range of environmental conditions than ever before.

Engineers around the world are pioneering innovative solutions that embody this new mindset:

- **Flexible Stormwater Systems:** Traditional stormwater networks are being replaced or

supplemented with systems that can expand during extreme rainfall and contract during dry periods. In Copenhagen, Denmark, a city increasingly vulnerable to sudden cloudbursts, engineers have integrated "blue-green infrastructure," transforming parks and public spaces into dual-purpose flood zones that safely store excess water during storms. This approach not only manages flood risk but also enhances urban livability.

- Floating Infrastructure: In the Netherlands, a country where much of the land lies below sea level, engineers have embraced the challenge of water by designing floating neighborhoods, schools, and offices. These structures rise and fall with changing water levels, offering a glimpse into a future where climate-proof living becomes mainstream.
- **Managed Retreat:** In some highly vulnerable coastal areas, engineering innovation is paired with tough policy decisions. Rather than continuously battling against rising seas, communities and engineers are collaboratively developing **phased withdrawal strategies**, relocating infrastructure and populations inland over time. This managed retreat approach balances human needs with ecological sustainability, ensuring that resources are directed toward building resilience rather than fighting inevitable change.

These examples demonstrate that engineering for water resilience is no longer about building higher walls or bigger pumps. It's about designing with nature, embracing flexibility, and planning for uncertainty, principles that will define the next generation of water infrastructure.

Living shoreline restoration project, Tampa Bay, FL. Oyster reef balls, marsh grass and bagged fossilized shell. (Image: Shutterstock 2287295785)

Nature-Based Solutions

In the face of escalating climate risks, engineers are increasingly turning to nature as a critical ally in designing resilient water systems. While traditional "grey infrastructure" -dams, levees, seawalls- will always play an important role, it is now clear that **Nature-Based Solutions (NBS)** can provide powerful, complementary tools for water resilience.

Nature-based solutions use natural processes and ecosystems to mitigate water risks while delivering a host of co-benefits such as biodiversity enhancement, carbon sequestration, and improved quality of life. According to the World Bank Group, integrating NBS into infrastructure projects can reduce flood damages by up to 50%, often at a lower cost than conventional engineering approaches.

Leading examples include:

- **Restoring Wetlands:** Wetlands act as natural sponges, absorbing excess rainfall and reducing flood risks downstream. In Louisiana, large-scale wetland restoration projects are underway to protect communities from storm surges and rebuild vital coastal ecosystems devastated by decades of erosion and sea level rise.
- **Urban Green Infrastructure:** Cities are incorporating rain gardens, green roofs, and permeable pavements to naturally manage stormwater runoff, reduce urban heat, and improve air quality. Philadelphia's Green City, Clean Waters initiative has become a model for integrating nature into dense urban environments, showing that green solutions can be scalable even in major metropolitan areas.
- **Living Shorelines:** Instead of traditional hard seawalls, engineers are now designing **living shorelines**, using native plants, sand, and oyster reefs to buffer coastlines against erosion and storms. These structures not only provide natural protection but also create critical habitats for fish and wildlife, supporting broader ecosystem resilience.
- **Reforestation and Watershed Management:** Protecting and restoring upstream forests helps stabilize soil, regulate water flow, and ensure a cleaner, more reliable water supply downstream. Programs like New York City's Watershed Protection Program have demonstrated that investing in natural infrastructure can be more cost-effective than building new filtration plants.

Implementing nature-based solutions often requires cross-sector collaboration among engineers, ecologists, urban planners, policymakers, and local communities. These projects demand a shift in thinking; from controlling water to working with it, embracing uncertainty, and valuing the multifunctional benefits that natural systems provide.

Ultimately, nature-based solutions are not just about mitigating risk; they are about building a future where communities are healthier, landscapes are more vibrant, and our relationship with water is both resilient and regenerative.

Tools for Resilient Design

Designing water infrastructure for a changing climate demands more than traditional engineering expertise; it requires new tools, new data, and new ways of thinking. Fortunately, advances in technology are empowering engineers to anticipate risks, simulate future conditions, and optimize designs like never before.

Some of the most transformative tools now reshaping water resilience planning are:

- **Predictive Modeling and Artificial Intelligence:** Using machine learning and complex algorithms, engineers can now forecast flood risks, droughts, and storm impacts with increasing precision. Predictive models integrate real-time weather data, land use patterns, and hydrological variables to simulate multiple future scenarios. This enables proactive decision-making rather than reactive crisis management. Cities like Miami, vulnerable to both hurricanes and sea level rise, are already using predictive flood modeling to guide critical infrastructure investments.
- **Geographic Information Systems and Remote Sensing:** Geographic Information Systems (GIS) and satellite imagery have become indispensable for mapping floodplains, monitoring coastal erosion, and assessing infrastructure vulnerabilities. Engineers can now track land subsidence, changes in vegetation cover, and river course shifts over time, providing a dynamic understanding of evolving risks.
- **Digital Twins:** A cutting-edge innovation, digital twins are virtual replicas of physical infrastructure systems, from entire water networks to individual treatment plants. Singapore's national water agency, **PUB**, has developed a digital twin of its water system, allowing engineers to run

simulations, test scenarios, and optimize responses before taking action in the real world. Digital twins can model how a storm would impact water pressure, detect potential system failures, and even support maintenance planning, greatly enhancing resilience and operational efficiency.

- **Early Warning Systems and Real-Time Monitoring:** Sensors installed in rivers, reservoirs, coastal areas, and urban drainage systems provide real-time data on water levels, flow rates, and contamination risks. Early warning systems built on these data streams can alert communities to imminent flooding, allowing precious time for evacuation and response. For example, Bangladesh's flood early warning system has saved thousands of lives by providing 72-hour advance alerts to vulnerable communities.
- **Resilience Rating Tools:** New frameworks, such as the **Envision**® sustainable infrastructure rating system and the **World Bank Group's Climate Resilience Rating System**, provide engineers with structured methodologies for assessing the climate resilience of water projects. These tools help ensure that resilience is systematically incorporated into project design, evaluation, and funding decisions.

These innovations are revolutionizing the way engineers approach water infrastructure, shifting from static, one-size-fits-all designs to dynamic, data-driven, and adaptive solutions. But technology alone is not enough. True resilience requires a mindset shift: embracing uncertainty as a design parameter, planning for multiple plausible futures, and building systems that can evolve alongside our rapidly changing world.

The future of water infrastructure will be shaped by those who are willing to blend engineering excellence, ecological wisdom, and visionary leadership.

As the climate crisis deepens, engineers are called to be innovators, leaders, and stewards, turning challenges into opportunities for resilience, adaptation, and hope.

Reviewed By: Shivani Nathoo, P.Eng., Planner for Independent Electricity System Operator (IESO)

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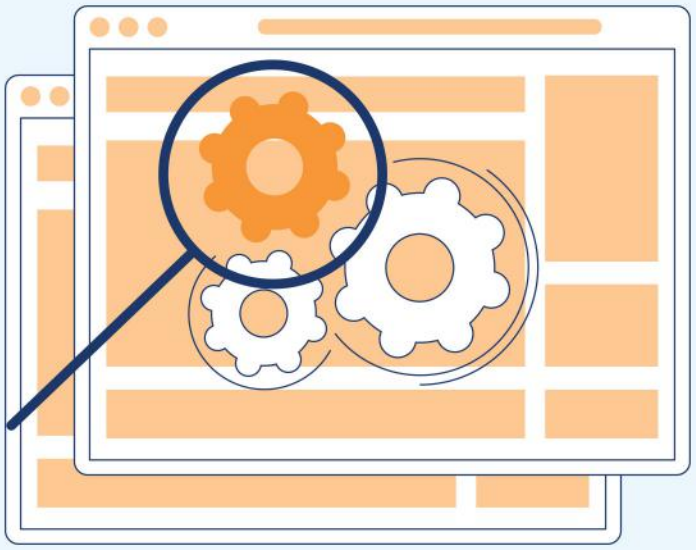

Article Length: 800-1500 words

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.

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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.

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From Trash to Treasure: Maximizing Renewable Fuel with Codigestion

David Ellis, P.Eng. and Peter Quosai, MASc

Introduction to Anaerobic Codigestion

The only currently established, potentially carbon-negative fuel in the world is energy produced from waste. As we seek to reduce our carbon footprint, codigesting food waste at sewage treatment plants presents an excellent opportunity to maximize existing resources and create a more sustainable future.

Codigestion of food waste is a process that blends waste materials from different sources–for example, food waste and sewage waste–together inside an anaerobic digester to produce biogas and **Renewable Natural Gas (RNG)**.

That biodegradable waste material can come from a variety of sources, including:

- **Agricultural Waste** from farm operations
- **Industrial Food Waste** from your local apple pie factory or other food processors
- **Retail Food Waste**, such as bruised grocery store fruit
- **Source Separated Organics (SSO)** from your city's curbside green bin program
- **Organic Fraction of Municipal Solid Waste (OFMSW)**, which is produced by extracting food and other biodegradable waste out of household domestic garbage

Without engineered anaerobic digestion facilities, much of this food and organic waste would wind up in manure pits or landfills and break down. This would still result in the production of biogas containing methane, except, that methane would be emitted into the environment, rather than captured and repurposed as energy.

When WRRFs accept organic waste for codigestion, the resulting biogas has a significantly lower **Carbon Intensity (CI)** score. This lower CI score considers the improved carbon footprint of the biogas and considers the landfill methane emissions that are avoided by diverting the waste to an engineered digester system.

Codigestion of food waste at **Water Resource Recovery Facilities (WRRFs)** is a promising solution to not only help WRRFs save on energy costs but to generate more energy, all while keeping our water clean and maximizing the use of existing assets.

Capturing Methane

The release of methane into nature should be avoided since it is a greenhouse gas more than 80x more potent than carbon dioxide over a 20-year timespan.

Historic **U.S. Environmental Protection Agency (US EPA)** estimates from the early 2000s indicated that landfill capture managed to get 60 to 90% of the methane produced. However, more recent research has shown that most landfill collection systems capture less than half of the methane they produce.

Conversely, producing methane in an engineered environment, like at a WRRF, allows for nearly complete methane capture. Once the biogas is produced, it can be burned in a cogeneration engine to produce heat and electricity to power the WRRF. Alternatively, the biogas can be purified to produce biomethane, which is then compressed to produce RNG. RNG has the same composition as traditional pipeline natural gas but has a much smaller carbon footprint.

RNG can be added to the current natural gas grid for use anywhere it is needed. One of the great things about the Ontario natural gas grid is its storage ability. We have enough natural gas storage in Ontario to power the entire province for months, even during peak winter demands if needed.

As long as people continue to prepare and consume food, food waste will be produced. This waste can then be transformed into biogas and RNG, making them clean and sustainable renewable fuels.

The Business Case for Codigestion

There are three key benefits for a municipal sewage treatment plant considering codigesting sewage solids with food waste:

1. Revenue Generation
2. Waste Management
3. Increased Energy Production

Revenue Generation

Codigestion provides new revenue streams for existing anaerobic digestion facilities. Facilities can generate revenue from :

1. The feedstock, in the form of a tip fee
2. From the produced biogas itself
3. From carbon offsets from avoided emissions

Tip fees are charged on a dollar-per-tonne of waste basis to cover the cost of receiving and processing the waste. Just as landfills charge tipping fees, sewage treatment plants can do the same.

The lower CI value of the biogas produced incentivizes facilities to refine it into renewable natural gas, which can be injected into the natural gas grid or used as a clean transportation fuel. RNG fetches a premium price compared to natural gas, as the gas molecules can be sold in addition to the green attributes tied to avoided emissions from the digestion process.

A farm-based biogas system producing renewable natural gas in BC. (Image: https://www.ontario.ca/page/producing-biomethane-and-renewable-natural-gas-farm-and-food-based-biogas-systems)

By capturing methane that otherwise would have been released into the atmosphere (i.e., organic waste breaking down in a landfill), codigestion supports the generation of carbon offsets and provides another source of revenue for digester owners through either voluntary or regulated carbon markets.

Waste Management

Food waste is a significant issue in many cities. According to the City of Toronto, in Ontario, landfills are expected to be at capacity in less than 10 years. It can take years (sometimes more than 10) to get all the permits and approval to build a new landfill, so timing is critical.

Food waste decomposing in landfills releases methane to the atmosphere, toxic leachate to wastewater treatment systems, and traps nutrients like phosphorus and nitrogen away from natural systems. Even when finished, landfills are generating methane they cannot capture as well as an anaerobic digester.

By codigesting food waste with sewage solids, municipalities can divert food waste from landfills, reduce landfill usage and the associated greenhouse gas (GHG) emissions, and can even extend the lifespan of landfills. Currently, Canada is only using 14% of the readily available biodegradable waste-also known as 'feedstock' for RNG[1] which leaves enormous potential to divert waste and create renewable fuel.

Increased Energy Production

Many sewage treatment plants are currently producing biogas because they already have an anaerobic digester. The anaerobic digesters at these WRRFs are often designed for a future population, resulting in a facility that is oversized for today's needs.

Codigesting food waste can help increase the biogas production and maximize the utility of these existing assets with fewer energy costs. Food waste is also rich in different nutrients and high in fuel value, which can help the digester perform more efficiently than if it were processing sewage waste alone. The increased energy production can offset the high energy demands of WRRF operations and help municipalities achieve sustainability targets.

Assessing Adoption

To successfully introduce anaerobic codigestion for biogas and RNG production, these systems need to be both biologically and economically sustainable. When assessing an opportunity, stakeholders need to take a close look at the details. Questions to consider include:

- What biochemical benefits does the feedstock offer?
- What's the fuel value of the feedstock available in the local area?
- How far does the feedstock need to be trucked?
- How much will the feedstock change seasonally?
- How will accepting new feedstock affect plant operations?
- Is there a risk that a feedstock may compromise the digester biology?
- Does the feedstock put us at higher risk for operational challenges such as foam, plastics, or grit?

When considering adopting codigestion, take on the mindset of someone farming as opposed to someone building a machine. Successful biogas production requires a long-term view of nutrition and balancing biology. If you focus on growing good biomass and feeding good feedstock, you can't help but get great biogas out of the system and excellent RNG.

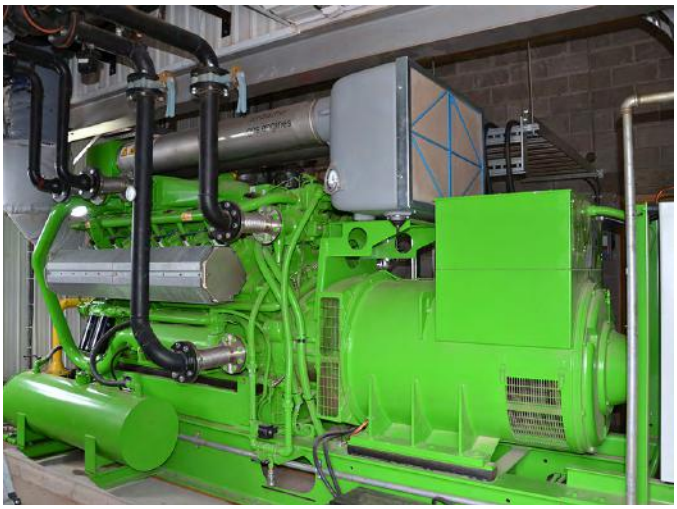
Evaluating Feedstocks for Codigestion

When evaluating potential feedstocks, anaerobic digestion experts start with a quick qualitative screen. We ask questions like:

- Is the material from a source that we would expect to be biodegradable?
- Did it start as a food or an agricultural material?
- What goes on inside the farm or factory where this waste is made?

Once it passes that first qualitative screen, the big number to look at is the fuel value. How much fuel is in this material? The fuel value is how much methane will be produced from a wet tonne of feedstock as it comes in the door. If you know how much gas you can produce, you can estimate whether it would generate enough revenue or savings to justify investing in a digester. The fuel value used for these calculations could be found in a five-minute exercise, looking at reference data to get a first estimate. Then, simple testing can begin to refine those estimates. Later, testing can extend all the way out to a six-week batch laboratory test, validating the initial estimates.

[1] https://bettergas.ca/images/uploads/standard_site/2024_RenewableGas_Infographic.pdf



Biogas systems produce electricity by burning biogas in a co-generation system. (Image: https://www.ontario.ca/page/anaerobic-digestion-basics)

The next step looks at how much of what comes in will break down in a digester. There are a lot of organic materials that are not biodegradable. For example, wood chips, sawdust, and wood waste are natural and biodegrade in the forest. However, wood does not biodegrade in an anaerobic digester.

Also, consider the nutrition in the potential waste. Degradable food is not enough to make a great feedstock. While a digester can break down butter and ice cream, it would not be very healthy if that were all it was fed. Feedstocks with more nutrients can be valuable to your digester, depending on the situation.

Evaluating Feedstocks for Contamination

Like sewage, digester feedstocks are waste materials that can contain all sorts of trash or other material that the plant will need to manage. If it's waste from a food factory, contamination can be rubber gloves, hair nets, and things that are in the food factory as part of the normal operation that occasionally end up on the floor. If it is vegetable or grease trap waste, there could be sand and gravel or metal nuts, bolts, and washers. Again, whatever got washed into the factory wastewater system can get to a digester. All this non-feedstock material is called contamination and finding uncontaminated feedstocks is important for municipal digesters to consider when accepting new waste.

The third type of contamination is chemical contamination. In a food factory, food safety trumps pretty much everything. Just as we might use bleach at home, there are other chemicals that are used in food factories to make sure that their tools and knives, and baking dishes are all clean and safe. But, everything they use to kill the bacteria in the food factory has the potential to kill the bacteria in a digester too. That's where being aware of what goes on inside a food factory is important to understand the risk of contamination.

Conclusion

Using a biodigester to anaerobically codigest food waste at a sewage water resource recovery facility presents a promising solution for managing food waste and sewage solids, offering significant environmental and economic benefits. By diverting waste from landfills and increasing biogas production, municipalities can reduce greenhouse gas emissions, generate renewable energy, and create new revenue streams. To ensure the success of a codigestion project, it is crucial to carefully evaluate potential feedstocks. This evaluation involves assessing the biochemical benefits, fuel value, and seasonal availability of the feedstock, as well as understanding the impact on plant operations and the risk of contamination. By adopting a thorough screening process, stakeholders can maximize the utility of their existing assets and contribute to a cleaner, greener future.

As long as humans eat food and produce food waste, it needs to be managed in an economically and environmentally sound way. With quickly filling landfills, there is great potential for codigestion to become a larger part of organic waste management, reduce the amount of methane being released to the atmosphere, and tap into one of the only potentially carbon-negative fuels we have.

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Climate Change Impacts on Electricity Demands

Jongho Keum and Dr. Paulin Coulibaly, P.Eng.

As Canada continues to rely heavily on hydropower to meet its electricity needs (Global Energy Observatory, 2019), understanding how climate change influences electricity demand is essential for a resilient and adaptive electricity system. This article is a part of a broader initiative exploring how climate data can be integrated into electricity system design and planning, with a specific focus on how climate-induced shifts in demand patterns intersect with electricity infrastructure.

Electricity demand is a key parameter for the reliable operation and planning of power systems. Climate change is reshaping demand dynamics by altering temperature patterns, such as average conditions, frequency of extremes, and seasonal shifts, and influencing human behaviour across sectors. A growing body of literature indicates consistent trends of higher cooling demand during hotter summer months and reduced heating requirements in milder winter months (Amonkar et al., 2023; Auffhammer and Aroonruengsawat, 2011; Bonkaney et al., 2023; Emodi et al., 2018; Pilli-Sihvola et al., 2010; Zachariadis and Hadjinicolaou, 2014). However, these trends are not uniform because their magnitude and direction vary considerably depending on latitude and regional climate. This article reviews how climate change has influenced electricity demand by examining seasonal demand shifts, regional variations, and demand parameters as reported in the literature.

Seasonal Demand Shifts

Temperature increases are reshaping seasonal electricity demand, with higher cooling loads in summer and decreasing heating demand in winter. Auffhammer et al. (2017) demonstrated that United States (U.S.) electricity use responds nonlinearly to temperatures above 25-30°C, mainly due to air conditioning. De Cian and Sue Wing (2019) confirmed this trend globally, showing steep increases in cooling energy consumption. Studies from diverse regions (Bonkaney et al., 2023; Garrido-Perez et al., 2021) also emphasize that peak demand is more frequently associated with extreme heat days, challenging power system capacity, and highlighting the need for demand-side strategies and infrastructure enhancement. Taseska et al. (2012) and Zachariadis and Hadjinicolaou (2014) forecasted rising summer cooling demand in Europe, while Dirks et al. (2015) noted a shift toward summer-dominant peaks in the United States.

In contrast, winter demand projections are more variable. Romitti and Sue Wing (2022) categorized demand-temperature responses as V-shaped, increasing, or unresponsive, depending on regional climate zones. These categories represent how the electricity demand responds specifically in winter months as well as summer months. V-shaped responses, commonly observed in North America and Europe, indicate that demand increases at both high and low temperatures. In contrast,

tropical regions, where winter heating is typically unnecessary, do not show an increase in demand during colder periods. When considering annual demand, Northern and Central Europe may benefit from reduced heating needs, while southern regions such as Spain are likely to experience increased annual demand due to growing summer cooling requirements (Pilli-Sihvola et al., 2010).

Regional and Latitudinal Variations

Climate change affects electricity demand across regions too, largely due to latitude, baseline climate, and infrastructure. Lower-latitude countries are likely to experience steep increases in cooling demand, while higher-latitude areas may see trade-off effects from milder winters and hotter summers. Hu et al. (2024) also classified demand responses of European countries into three temperature-demand curves: linear decline curves in Northern European countries, linear curves with a horizontal segment for cold and intermediate climate countries, and V-shaped curves with a comfort zone for intermediate or warm countries where both heating and cooling demands are affected. In Japan, Hiruta et al. (2022) found a clear latitudinal divide: northern regions, such as Hokkaido, will benefit from reduced heating needs, while southern regions will face surging cooling demand. Due to climate change, transition zones between these areas are shifting northward, underscoring the importance of adaptive planning. Similarly, McFarland et al. (2015) noted a decline in heating degree days across the Northern United States, while increases of cooling degree days were reported in the south.

In tropical nations, where baseline temperatures are already high, even small increases in heat can result in significant demand spikes. For example, rising temperatures in Niger will significantly burden the grid due to increased air conditioning use, exacerbated by limited adaptive capacity (Bonkaney et al., 2023). De Cian and Sue Wing (2019) projected steep demand rises in regions facing more frequent extreme heat. In temperate zones, outcomes are mixed and depend on local climate conditions and socio-economic resilience.

Demand Parameters

Climate change influences several parameters critical to electricity system planning, including annual demand, peak load characteristics, spatial distribution of demands, and sectoral responses. These demand parameters are essential for determining generation and storage capacity, designing transmission infrastructure, and scheduling maintenance and construction activities.

Annual electricity demand is projected to increase in many regions due to rising temperatures and socioeconomic development, especially in areas with growing air conditioning needs. Auffhammer and Aroonruengsawat (2011) estimated substantial increases in residential electricity use due to higher cooling degree days, suggesting the need for long-term adjustments in generation and storage capacity. Similarly, Bonkaney et al. (2023) found that electricity demand in West Africa is likely to rise under future climate change scenarios, driven by climate-sensitive sectors and limited infrastructure.

The size and timing of peak demand are also expected to shift under climate change. Peak loads may become more pronounced and occur at different times of day or year as temperature extremes intensify. Amonkar et al. (2023) emphasized that temperature extremes significantly amplify electricity demand, increasing the likelihood of coincident peak loads and challenging system reliability. Cooling and heating degree days are indicators of energy requirements as the annual sum of the degrees that average daily temperatures is above or below 18°C. They become popular indicators in assessing temperature-related demand changes and have been used to model future peak demand patterns (Emodi et al., 2018; Gaudard et al., 2013; Golombek et al., 2012; McFarland et al., 2015; Pilli-Sihvola et al., 2010; Reyna and Chester, 2017; Taseska et al., 2012; Trotter et al., 2016; Véliz et al., 2017; Zachariadis and Hadjinicolaou, 2014).

Climate change affects electricity use across sectors differently, shaped by each sector's temperature sensitivity, adaptability, and operational flexibility. The residential sector is widely recognized as the most sensitive to weather variations, primarily due to its direct dependence on space heating and cooling. Auffhammer and Aroonruengsawat (2011) found that residential electricity demand in California shows a nonlinear response to temperature changes. Commercial buildings, such as offices and retail spaces, also experience increased electricity demand primarily for cooling (Emodi et al., 2018). Electricity demand by the commercial sector is known to be relatively inelastic (Shaik, 2024). Hu et al. (2024) suggested that thermal insulation for buildings and passive cooling measures can mitigate the peak demands of residential and commercial areas. On the other hand, the industrial sector's electricity demand is generally less sensitive to temperature fluctuations compared to residential and commercial sectors, but climate change can still indirectly affect industrial electricity use through impacts on water availability and infrastructure reliability. Industries reliant on water for cooling processes may face increased electricity consumption due to the need for alternative cooling methods in response to water scarcity (Craig et al., 2018).

Ontario's Electricity Demand

In Ontario, the **Independent Electricity System Operator (IESO)** is responsible for the stable and reliable operation of the power system and electricity market. According to the recent **Annual Planning Outlook (APO)** (IESO, 2025), Ontario's electricity demand is influenced by both growth-inducing and demand-tempering factors. On the growth side, demand is expected to rise significantly due to the expansion of industrial electric vehicle production, an increasing number of data centres driven by artificial intelligence services, ongoing decarbonization and electrification initiatives, and continued population growth and household formation. Conversely, demand growth may be moderated by energy savings from **Energy Demand-Side Management (eDSM)** programs, slower growth of the agricultural greenhouse sector, and rising living costs and economic uncertainty.

As a result of these offsetting factors, grid-level electricity demand in Ontario remained relatively flat over the past decade. However, a substantial increase is projected: net summer seasonal peak demand is forecasted to grow by 48%, and net winter seasonal peak demand by 57% by 2050. It is important to note that these projections are based on a normal weather scenario, which assumes average climatic conditions. This approach may introduce potential limitations, as it does not account for increasing weather variability due to a changing climate. Weather-sensitive demand, such as heating and cooling, is strongly influenced by actual weather conditions, which are expected to include more frequent heat waves and cold snaps. Therefore, the application of various climate scenarios is recommended to better capture uncertainty and inform more resilient electricity system planning.

Conclusion

Understanding how climate change alters electricity demand profiles, through higher cooling loads, shifting seasonal peaks, and sector-specific sensitivities, enables establishing climate change adaptive electricity design and planning. Demand forecasting models can be improved by integrating climate-adjusted variables such as cooling and heating degree days, extreme temperature thresholds, and regional climate projections. This enables more accurate estimation of peak loads and time, intra- and inter-annual variability, and shifts in demand, which are essential for optimizing the location and timing of infrastructure investments. Long-term planning should embed climate-resilient scenarios into capacity expansion models, evaluate storage and grid flexibility needs under new peak patterns, and even inform policy planning for enhanced efficiency.

Climate change alters electricity demand in complex ways, through shifts in temperature patterns, extremes, and seasonal balances, that vary across regions and sectors. The literature consistently presents increased summer cooling needs, shifting peak demand profiles, and variable heating reductions, all of which challenge the assumptions regarding electricity system design and planning.

Ontario's electricity demand is projected to rise substantially, primarily driven by industrial electrification, data centre growth, and population increase. Given the uncertainties introduced due to climate change, a scenario-based planning approach is recommended.

Fig. 1. Typical pattern of temperature response

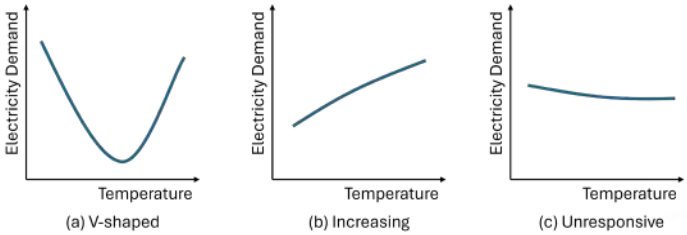
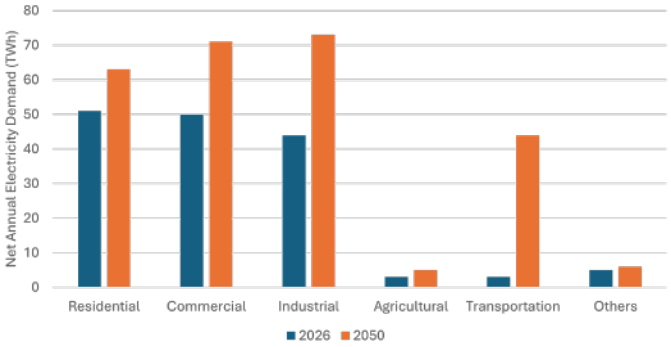


Fig. 2. Projected electricity demand by sector in Ontario (2026 vs. 2050). Source: IESO (2025)



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Engineering Accountability and Environmental Justice: Lessons from Grassy Narrows

Image: CBC News (www.cbc.ca)

Water is fundamental to life, yet not all communities have equal access to clean, safe water. In Canada, a country celebrated for its abundant natural resources, the case of the **Grassy Narrows First Nation** reveals deep environmental injustices that persist across generations. For engineers, particularly those working within environmental and civil disciplines, this tragedy underscores the critical need to embed equity, ethics, and accountability in every aspect of our work.

A History of Contamination

In the 1960s and early 1970s, the **Reed Mill** in **Dryden, Ontario**, discharged an estimated 9,000 kilograms of mercury directly into the **English-Wabigoon River** system, a watershed that sustains the **Grassy Narrows and Wabaseemoong First Nations**. This toxic pollution infiltrated the fish populations, which were not only a primary food source for the surrounding communities, but also the backbone of local culture, economy, and identity. For these communities, fishing was much more than sustenance; it was a way of life, supporting both nutrition and livelihoods through guiding and tourism.

The mercury contamination triggered a cascade of devastating consequences. Residents began to exhibit serious symptoms of mercury poisoning, including neurological disorders, sensory impairment, and developmental delays in children. Over time, chronic exposure has led to lasting health consequences, with studies continuing to confirm high mercury levels in residents' bodies decades after the initial dumping.

The crisis also shattered the economic fabric of the communities. Commercial fishing and guiding industries collapsed, plunging families into poverty and deepening the cycles of marginalization and trauma. Despite clear scientific evidence and persistent advocacy by community leaders, environmental groups, and human rights organizations, remediation and compensation have lagged far behind.

To this day, Grassy Narrows residents contend with the reality of mercury-laden waters. Promised cleanup projects have been slow to materialize, and government and corporate responses have often fallen short of community demands. The Grassy Narrows tragedy has become a powerful symbol of environmental racism in Canada; a stark reminder of how Indigenous communities disproportionately bear the consequences of industrial pollution and systemic neglect.

The Engineering Lens: Prevention and Remediation

From an engineering standpoint, the Grassy Narrows crisis raises fundamental questions about the governance of industrial waste, the robustness of risk assessment protocols, and the sufficiency of environmental regulations in safeguarding vulnerable ecosystems and communities. The tragedy exposes how gaps in environmental oversight can lead to catastrophic, long-lasting harm, particularly when economic interests are prioritized over public health and ecological integrity.

Mercury contamination, especially in aquatic environments, is notoriously persistent. Once released, mercury can convert into methylmercury, a highly toxic compound that bioaccumulates in fish and magnifies up the food chain. This not only affects aquatic life but also threatens the health of human populations that depend on fish as a staple food source. The health impacts -ranging from neurological damage and developmental delays to cardiovascular issues- are well documented and, in many cases, irreversible.

For engineers specializing in wastewater management, environmental monitoring, and remediation, this crisis underscores a professional and ethical duty of care. The role of an engineer is not merely to implement technical fixes but to **anticipate, prevent, and mitigate environmental risks**, especially in contexts where human health and cultural livelihoods are at stake. This demands a proactive rather than reactive approach, rigorous application of the precautionary principle, and sustained monitoring even after project completion.

In response to the Grassy Narrows contamination, engineering efforts in recent years have focused on designing and deploying **innovative remediation strategies**. These include:

- **Sediment Capping:** Placing clean materials over contaminated sediment to isolate mercury and prevent it from entering the water column.
- **In-Situ Stabilization:** Introducing chemical agents to bind mercury within sediment, reducing its mobility and bioavailability.
- **Advanced Filtration Systems:** Developing high-efficiency filtration technologies to capture mercury particles in both industrial effluent and affected water bodies.
- **Water Treatment Innovations:** Applying cutting-edge techniques such as nanomaterials and phytoremediation to support water quality restoration.

However, the technical complexity of mercury remediation, combined with decades of institutional inertia and underinvestment, has made progress painstakingly slow. Mercury's chemical properties, the scale of the contamination, and its deep integration into sediment layers mean that **no solution can fully erase the ecological and social scars** left by this disaster. Remediation, while essential, cannot substitute for prevention.

Moreover, engineers must grapple with the reality that technological solutions alone are insufficient. **Collaborating closely with affected communities, respecting Traditional Ecological Knowledge (TEK), and advocating for stronger regulatory frameworks** are equally critical dimensions of responsible engineering practice. The Grassy Narrows case is a sobering reminder that engineering is not isolated from social justice; it is deeply entwined with it.

This crisis serves as a significant call for the engineering profession to adopt **holistic, equity-centered approaches**, ensuring that the tragedies of the past are neither forgotten nor repeated.

Responding to Environmental Injustice Through Inclusive Practice

Engineering is never separate from its social and environmental context. The mercury contamination in Grassy Narrows is not only a devastating public health and environmental disaster, but also a clear example of environmental injustice, where an Indigenous community has endured long-term harm and been excluded from decisions that directly impacted their lives and lands.

For decades, the concerns of Grassy Narrows residents were dismissed or ignored, even as the effects of mercury poisoning continued to take a toll across generations. This tragedy underscores how technical decisions—when made without inclusive and respectful engagement—can deepen existing inequities and perpetuate systemic harm.

Applying **Equity, Diversity, Inclusion, and Accessibility (EDIA)** principles to engineering means moving beyond technical solutions. It requires us to confront the legacy of exclusion in our profession, and to affirm the right of Indigenous communities to guide decisions that affect their wellbeing. It means listening deeply to community knowledge holders, respecting traditional ecological knowledge, and co-creating solutions that are rooted in community priorities.

Here are some examples of what engineers can do now:

1. **Strengthen Environmental Due Diligence:** Push for rigorous environmental assessments that center Indigenous perspectives from the outset of any project.
2. **Prioritize Community Engagement:** Embed meaningful consultation and co-design practices in all stages of project development.
3. **Advocate for Policy Change:** Support regulatory reforms that ensure stronger safeguards against environmental harm, especially in vulnerable communities.
4. **Champion Environmental Equity:** Work with professional associations, like OSPE, to promote environmental equity as a standard in engineering ethics and practice.

Conclusion

Grassy Narrows is a sobering reminder that engineering decisions have profound human consequences. As engineers, we hold both the technical expertise and ethical responsibility to ensure that no community is left behind.

Reviewed By: Shivani Nathoo, P. Eng., Chair of OSPE's Equity, Diversity, Inclusion, and Accessibility Task Force

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(Bio)Engineering to Build a Sustainable Biorefinery

Dr. Eugene Fletcher

In August 2024, I spent a month at the **Federal University of Viçosa**, a university in Brazil about 200 kilometers from Rio de Janeiro. I was there working with collaborators focused on renewable energy and bioprocessing.

Spending days in the research lab, I never thought a simple walk to a gas station would inspire new ways to produce transportation fuel. One afternoon, while walking through town, I stopped at a gas station and noticed something interesting: cars were filling up with 100% ethanol or “Etanol” as it shows on the display board.

I knew Brazil’s bioethanol industry was significant, but seeing it firsthand brought home the realization that renewable transportation fuel isn’t a futuristic concept or an academic narrative; it is already an everyday reality in areas where infrastructure and policy have aligned to make it happen.

Biorefineries: A Cleaner Alternative to Oil

In Ontario, gasoline is, in some cases, blended with up to 10% ethanol in a move to reduce transportation greenhouse gas emissions. Indeed, there have been proposals to increase the ethanol content in blended fuel. To meet this market demand, **Alco Energy Canada**, a company based in Aylmer, Ontario, is leading commercial ethanol production from corn.

Biorefining corn to produce ethanol closely mirrors traditional petroleum refining. Both processes take raw feedstock (fossil crude oil in petroleum refining and biomass, corn, in biorefining) and convert it into a range of useful products. Petroleum refineries produce fuels, waxes, oils, and asphalts, among other products while biorefineries produce biofuels, biomaterials, and biochemicals, among other products.

Oil refining, however, comes with significant greenhouse gas emissions and the persistent release of environmental pollutants like benzene and toluene. The biorefinery concept, first articulated in the early 2000s, proposes an alternative: using renewable feedstock obtained from agriculture to produce the same range of petroleum-derived products without the environmental costs.

However, converting biomass such as corn into biofuels raises concerns about land use and food security. Using crops like corn and sugarcane for energy can drive up food prices and threaten global food security. Additionally, land use change, including deforestation to make way for biofuel crops—can undermine the environmental benefits by releasing stored carbon and reducing biodiversity.

When I returned to Ottawa from Brazil, I began thinking more seriously about alternative feedstocks for a modern biorefinery. **What if instead of competing with food production, we could use waste materials?** This is not a new idea since a lot of work has gone into developing agricultural and forestry waste into bioethanol. This innovation is still being developed, but what if we turned our attention to another type of waste, which we struggle to manage today — plastics?

Introducing a Non-Conventional Feedstock

Plastic waste is a global challenge. If you look around you right now, you will find a plastic item that might end up in the natural environment at some point. Most of our plastics do not get recycled, and significant volumes of plastic still end up in landfills or the environment. The good news is - nature has its own recyclers in the form of bacteria that digest plastics in the landfill. While this seems promising, this natural process is very slow and will take a significant number of years to naturally degrade most of the plastic waste in the environment. However, we can take inspiration from nature to develop a bio-based process to efficiently break down plastics into their chemical building blocks and convert these building blocks into new chemicals in a process called upcycling. This is very similar to how Alco Energy Canada breaks down corn into its basic building blocks of sugar and ferments these sugars into ethanol.

In my research laboratory at **Carleton University**, we are developing a consolidated bioprocess to break down plastics into their basic building blocks and genetically modifying brewers' yeast – yes, the same yeast used to brew your favourite IPA – to ferment these building block chemicals into ethanol, just like how brewers ferment barley sugars into beer. It's still early days, but I am excited about the prospects.

Some groups have been able to convert plastic breakdown products into vanillin, the primary flavor compound in vanilla, and other biochemicals. We do not expect consumers to bake pastries with plastic-derived vanilla, but this product can be used as a fragrant compound in cosmetics, lotions, soaps, and perfumes. This is an excellent proof of concept that plastic can be upcycled to valuable chemicals, making me confident that a future biorefinery can be built on a plastic waste feedstock to produce biofuels, flavour compounds, and biochemicals for making bioplastics just like how an oil refinery will convert petroleum into fuels, pharmaceuticals, and plastics.

A Future Fueled by Innovation

Transitioning to a biorefinery-based economy will require technical innovation, supportive policies, and significant investment in new infrastructure. It will also require a shift in how we think about waste, not as a disposal problem, but as a valuable resource.

Scaling up the process of converting plastic waste in a biorefinery into new products won't happen overnight. It will need careful engineering, life cycle assessments, pilot projects, and, most importantly, collaboration across disciplines. But with a renewed interest in increasing the production of biofuels, protecting the environment from petroleum-refining-derived gas emissions, and dealing with plastic pollution, this presents several opportunities. By combining engineering ingenuity with biological creativity, Ontario can lead in designing local biorefineries that turn today's waste into tomorrow's wealth.

The next time you hold a plastic bottle or toss away a food wrapper, imagine it not as trash, but as the feedstock for a cleaner, more sustainable future.

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Dr. Eugene Fletcher, Assistant Professor at Carleton University

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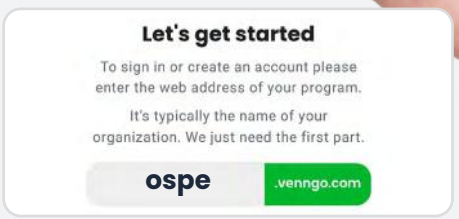

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Water Treatment: Think Globally, Act Locally

James W. Hotchkies, M.Eng., P.Eng.

Water is a fundamental element of everything we are, and what we do. As we are taught early in school, water covers 70% of the Earth and humans are composed of around 60% water.

Throughout history, civilizations have developed and blossomed over access to a plentiful supply of safe, affordable water. Conversely, communities have declined in its absence.

Cultivating water is the lifeblood of agriculture, it enables transportation, it underpins industry, and it is essential to the very fabric of our society. However, in a fraction of the time we have walked the earth, we have tested the limits of this essential resource to sustain our modern lives and civilizations.

An Overtaxed Water Treatment System

Today's traditional end-of-pipe wastewater treatment facilities often struggle to manage the combined discharges from residential areas, food and beverage production, chemical and industrial processes, surface runoff, and even some biomedical waste.

Even with at-source pretreatment, residual contaminants in these non-sanitary sources increase the complication of treatment. Over the several decades since many

of these centralized treatment facilities were built, unexpected growth and unplanned light industrial contributions to the wastewater stream have easily overtaxed the capacity of these operations.

For Example:

> *Without pretreatment, even a modestly sized craft brewery can overload the wastewater treatment plant in a small community. A 20-barrel-per-day craft brewery (around 2,300 liters of beer per day) can discharge as much as 14,000 litres per day of spent process wastewater. Without in-house processes to side-stream poorly biodegradable solids, such as spent grains, this wastewater may have a biological load ten times stronger than sewage. This results in the brewery creating an impact equivalent to as many as 300 single-family homes.*

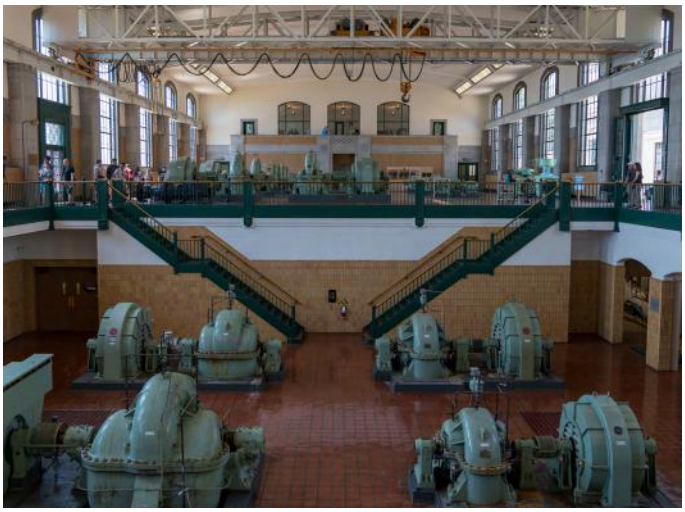
Even after wastewater has been treated, downstream water intake and treatment facilities may still struggle with lingering levels of potentially hazardous or bioaccumulative chemicals that were released back into the environment and not removed through natural processes. These might include persistent levels of heavy metals, pharmaceutical products, the “forever” **Per and Polyfluoroalkyl Substances (PFAS)**, and **Perfluorooctanesulfonic acid (PFOS)**, micro-plastics, and more.

At-Source Treatment: A Key to Future Sustainability

To manage the growing complexity of wastewater contaminants and support a sustainable society, it’s essential to re-evaluate our primary water and wastewater infrastructure models, both in urban and non-urban areas. This requires increased focus on at-source removal or enhanced mitigation of potentially harmful discharges. Without question, the most effective place to treat wastewater is at the source of generation, where one knows exactly what is in the stream and how to remove or reduce the contaminants of concern.

This is also where, for a successful circular economy, we optimize the recovery of valuable resources and maximize the potential for water reuse. Whether recovering metals from a processing operation, animal feed from a brewery, or even the water itself following effective treatment, at-source treatment is a key milestone along the way to sustainability.

As demonstrated around the world, a combination of traditional centralized infrastructure models complemented by decentralized options, offer the most affordable, scalable, resilient and sustainable approach for our developing society. Not only can these decentralized and distributed systems be constructed and commissioned in a matter of months, rather than years, but they also offer a very cost-effective option to accelerate revenue generation in growth-designated corridors.



Interior of pump building in Toronto R. C. Harris Water Treatment Plant. (Image: Shutterstock 1102609049)

With today’s wide range of advanced, affordable, and reliable technologies, nearly all sanitary, commercial, and industrial wastewater can, and should, be treated to a high standard. This enables greater water reuse, maximizes resource recovery, and reduces both the volume and environmental impact of any remaining discharge.

By embracing these at-source treatment solutions, whether as discrete decentralized systems or as a network of distributed operations managed by a utility, we can lessen the load on an overtaxed centralized infrastructure, minimize our environmental footprint, and maximize resource recovery as we grapple with population growth and demographic changes while maintaining a sustainable environment.

James W. Hotchkies, M.Eng., P.Eng.,CEO of Enereau Systems Group Inc.

A Comparison Between CWB-Certified & Non-Certified Organizations

Mark Fernandes

In today's competitive business world, companies face constant pressure from their rivals to improve their products, services, and business processes to gain competitive advantages.

One effective strategy for companies to maintain competitiveness while ensuring compliance with Canadian rules and regulations governing the construction of buildings, bridges, other specific products, and their structural components is to obtain **Canadian Welding Bureau (CWB) Certification**. This applies to welding, fabricating, or erection organizations in Canada, the United States, or internationally that are working with or providing applicable structural welded products for use within Canada.

Understanding CWB Certification

For engineers working in fields like structural, mechanical, or civil engineering, understanding CWB certification is not just a technical advantage, but a key part of responsible engineering practice. While engineers themselves may not require certification, their work often intersects with welding in the design, fabrication, and inspection of critical structures and components.

In Canada, like many other countries, some specific regulations and guidelines govern the construction of buildings and their structural components. These regulations may be mandatory as per national, provincial, or municipal laws, as well as contractually obligated.

CWB certification is a voluntary process that is relevant for organizations of varying sizes and industry sectors, with or without a plant or shop. This certification is generally mandated for structures and ancillary components fabricated to meet Canadian municipal, provincial, and federal building codes, bridges, occupational health and safety codes, specifications, and regulations.

CWB-Certified vs. Non-Certified Organization

Trust and Credibility

CWB-certified organizations distinguish themselves from their non-certified counterparts by demonstrating an unwavering commitment to building customer confidence in an ever-evolving business environment. These organizations implement the correct welding procedures while upholding high-quality structural welding standards. CWB certification gives clients and stakeholders the assurance that the organization adheres to Canadian-recognized welding-related standards. In a business world where trust and credibility are critical, this validation becomes an important business tool.

Operational Excellence

CWB certification is a crucial tool for organizations to attain and uphold operational excellence. It fosters a culture of efficiency and transparency by providing a roadmap for continuous improvements. CWB-certified organizations can streamline procedures and processes, pinpoint inefficiencies, and take necessary measures to enhance productivity and decrease welding defects by using qualified and competent personnel and procedures. By doing so, the company maintains a strong foundation that can withstand and adapt to the challenges of the ever-changing market and customer needs.

Risk Management

CWB-certified organizations are required to follow applicable CSA welding standards that ensure both the personnel and the companies involved in the design and construction of structures follow standard practices. This helps to reduce public safety concerns and liability.

Business Growth

CWB certification can provide a competitive edge and open new markets and business opportunities, as numerous industries and regulatory bodies stipulate CWB certification.

CWB-certified organizations find it easier to navigate complex regulations, as their welding processes align with or exceed international standards and expectations. Being a CWB-certified organization demonstrates a commitment to quality and safety, which can be a valuable marketing point for potential customers, as the requirements of CWB certification meet and/or exceed the requirements of many national and international codes. CWB certification can also assist organizations in accessing new international markets.

Commitment to Quality Management Systems

The ability of organizations to provide consistent quality and sustainability for their products while ensuring operational safety depends on the effectiveness of their quality management programs and processes. Quality management programs are an inherent aspect of a CWB-certified organization, setting them apart from others that do not have this designation. CWB-certified companies have qualified welders, approved welding procedures, and qualified supervisory and welding engineering personnel. CWB independently verifies all elements of the welding operation with regular frequency.

Conclusion

Obtaining the CWB certification is a crucial business decision that organizations should make based on the benefits they stand to gain. It's important to note that the certification is more than just a certificate or validation letter. It's a symbol of quality and competence that demonstrates the ability of both individuals and companies to weld metal structures. The certification augments the safety of welds and is a necessity for all organizations looking to enhance their operations, gain customer trust, and expand their business.

CWB-certified organizations can enjoy numerous benefits, such as increased quality, reduced waste, and immediate cost savings. Furthermore, clients can have a heightened confidence in their products, knowing tht they are of high quality and meet Canadian welding standards.

Mark Fernandes, EPC Manager, Government Relations and Public Safety for the Canadian Welding Bureau.

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

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Shaping OSPE: Honourary Member Profiles

Dr. Marilyn Powers, P.Eng., ICD.D.

As OSPE celebrates 25 years of representing Ontario's engineers, we are celebrating some of the members who have made an impact on OSPE, and for OSPE and the engineering profession over our history.

One of those members is Dr. Marilyn Powers, P.Eng., ICD.D., an OSPE member currently sitting on the Board of Directors. Marilyn has played an active role in shaping OSPE's direction and objectives, while contributing to community events and thought leading discussions around the future of engineering.

Marilyn has become a recognizable face of the Ontario Society of Professional Engineers, serving as OSPE Chair in 2022-23. Like so many board members and influential volunteers, the beginning of her journey with OSPE was unassuming.

"I joined OSPE because it was an inviting and inclusive organization for those of us who don't identify as a traditional engineer. My engineering degrees have created the technical knowledge I need to have a great career, but in many roles, I was often the only engineer on the team. OSPE was the place I could meet more people like me," said Dr. Marilyn Powers, P.Eng., Dean of Engineering and Technology at Conestoga College.

Marilyn's journey with OSPE began at a networking dinner, where she happened to meet a board member who introduced her to OSPE's mission.

Having earned her engineering license in Quebec, Marilyn was unaware that an organization like OSPE even existed in Ontario—one that actively advocates for all engineers.

On joining OSPE, Marilyn said, "I probably did what most people do, join and then wait to see what would be of interest. The real value came when I got involved in the events and started meeting people."

Marilyn has countless fond memories from events such as the annual conference, National Engineering Month (NEM) activities, and P.Eng. Day at Queen's Park.

Her involvement and belief in the organization only deepened over time. For Marilyn, OSPE has been a source of both professional and personal fulfillment. eventually leading her to a leadership role on the OSPE board.

"I've been on the board of OSPE for the past 4 years, serving as Chair in 2022-23. We accomplished a lot as a board by improving governance and ensuring we had a strategic focus. I think that is visible in the new strategic plan [Strategic Plan 2025 – 2030] that has a vision of creating a profession with a reputation and respect we can all get behind."

OSPE has evolved and continues to evolve to serve the profession, far beyond just driving individual member value.

Looking ahead, Marilyn is excited about OSPE's future and the broader impact we can have on the engineering community and its culture.

"I think OSPE has reached a maturity to truly influence engineers, employers, government, and society at large. I see a profession that makes young people say, 'I want to make the world a better place, so I'm going to become an engineer.'"

To create this change, Marilyn said, "The culture needs to shift in engineering companies and society as a whole. We can't afford to drive people from the profession, we need to draw more people to the benefits of working better, differently and inclusively."

At OSPE, we are committed to being the driving force behind this transformation in engineering. OSPE envisions a merit-based profession, free of biases, where Ontario's engineers can reach their full potential without barriers to entry and progress. Through educational programs, thought leadership, collaboration with other engineering groups, and advocacy for a Qualifications-Based Selection procurement model, we'll be working to shift attitudes and change the culture of the engineering profession.

Paul Acchione, P.Eng., FCAE

For Paul Acchione, P.Eng., FCAE, supporting the Ontario Society of Professional Engineers (OSPE) was a natural decision. With decades of experience in the energy sector, Paul recognized early on the critical need for engineers to have a seat at the policy table, especially regarding decisions that directly impact infrastructure, innovation, and Ontarians' everyday lives.

"I wanted to support an organization that could advocate for engineers with governments. OSPE was the best organization to do that here in Ontario," said Paul Acchione, member of OSPE's Energy Task Force.

Paul's contributions to OSPE have had a profound impact, particularly in energy policy. In 2008, as the province rolled out new energy strategies, Paul grew concerned that the policies being introduced didn't align with the unique design of Ontario's electricity system. He feared that these misalignments would lead to rising electricity costs and declining system reliability. These outcomes would negatively affect engineers in the energy sector and energy-intensive industries across the province.

That year, Paul joined OSPE's Energy Task Force (ETF) and quickly became a driving force behind the organization's advocacy work. Over the years, he progressed to Chair of the task force, then served three years on the OSPE Board of Directors, one of which was as OSPE President and Chair. Today, he continues to contribute as a subject matter expert with the Energy Task Force. Under Paul's leadership, OSPE's Energy Task Force became a key voice in the province's energy policy discourse. Over 17 years, the Task Force has produced numerous government policy reports and delivered over 100 energy-related seminars in partnership with PEO Chapters across Ontario, engaging engineers, students, and the general public alike.

Their work gained attention. OSPE was invited to speak on The Agenda with Steve Paikin and featured in prominent media outlets. A turning point came when the Energy Task Force began reporting the growing quantities of surplus clean electricity being discarded or sold below market value. Their policy proposals gained traction and were instrumental in the introduction of Ontario's Ultra-Low Overnight (ULO) electricity rate plan, a new option tailored for electric vehicle owners to take advantage of excess clean power.

The Task Force also played a key role in convincing Ontario's Independent Electricity System Operator (IESO) and the Ministry of Energy to amend dispatch rules for renewable energy producers. These changes eliminated frequent multi-day nuclear plant shutdowns, reducing both carbon emissions and natural gas backup costs.

Today, OSPE and the Energy Task Force continue their advocacy, working with the Boltzmann Institute to promote thermal networks and energy storage in city planning. These systems could significantly reduce the

infrastructure needed to meet Ontario's net-zero goals by 2050.

"My involvement in OSPE's Energy Task Force enabled me to meet a number of Energy Ministers and understand the complex process behind making and deploying energy policy," said Paul Acchione.

Beyond the work of the task force, one of the most personally meaningful periods of Paul's OSPE involvement was his time as President and Board Chair. He valued the friendships built with fellow engineers, the opportunity to influence industry leaders and policymakers, and the role he played in hiring OSPE's current CEO, Sandro Perruzza.

In recognition of his exceptional service, Paul was awarded the Distinguished Lifetime Achievement Award at the Ontario Professional Engineers Awards in 2024. Surrounded by family and friends, the evening celebrated a career—and a legacy—defined by leadership, advocacy, and impact.

"If I am fortunate to live for another 10 years, I hope to continue contributing to OSPE's advocacy efforts to press governments for good energy policies. Engineers must be at the table to guide the complex transition to a net-zero economy, affordably and effectively," said Pauk Acchione.

Michael Monette, P.Eng.

As OSPE celebrates 25 years of advocacy, leadership, and impact, we reflect on the contributions of members who have shaped our organization and the engineering landscape in Ontario. One such member is Michael Monette, P.Eng., a visionary leader whose nearly two decades of volunteer service have left a lasting mark on the profession.

Michael Monette has been a dedicated member of OSPE since its inception in 2000, and he is this year's esteemed winner of the Ontario Professional Engineers Lifetime Achievement Award.

His unwavering commitment to OSPE's mission has made him a member known for his passion and impact on the community. Michael's first foray into OSPE leadership was when he ran for the Board of Directors in 2005—he was elected, and his journey began. Over the next 12 years, Michael played a vital role in shaping OSPE's identity, impact, and strategic direction. He served as Chair in 2008, 2009, and again in 2016, Vice Chair in 2007 and 2015, and Past Chair in 2009, 2010, and 2017.

Throughout his time with OSPE, Michael served on numerous leadership committees including the Executive Committee, Board Development Committee, and Strategic Planning Committee. He helped establish key frameworks that continue to guide OSPE's operations and long-term vision to this day.

His contributions to OSPE's advocacy work are especially notable. As Chair of the Advocacy Priorities Committee and a core member of the Climate Change Committee, Energy Strategy Committee, and Energy Task Force, Michael helped define OSPE's voice on critical issues such as infrastructure, innovation, energy efficiency, and climate change mitigation. His ability to unify engineers across sectors and disciplines has been instrumental in advancing policy conversations and influencing provincial direction on sustainable development.

Michael's vision extended far beyond committee rooms. Early in his OSPE leadership, while working in strategic planning for a printing company, he simultaneously took on an ambitious $3.1 billion initiative aimed at positioning Ontario as a global leader in green energy and zero-carbon power production. His vision included the development of 2,500 MW of industrial wind power, local steel tower manufacturing, biomass processing across southern Ontario, and hydrogen generation for mobility solutions. This ambitious public-private partnership demanded engagement with government, industry, and academia—a feat made possible through the relationships and experience Michael built at OSPE.

"Working on the OSPE Board, and two terms as President and Chair, opened doors to key decision makers that allowed this ambitious project to move to the preliminary funding stage with an initial 80MW wind power project to power the Stelco steel facilities at Nanticoke on Lake Erie," said Michael Monette, P.Eng., past OSPE Chair and President of Rinion Consulting Inc.

Michael has also been a passionate advocate for mentorship and leadership development. He has guided countless engineers in navigating their careers, engaging in public discourse, and stepping into leadership roles within OSPE. His dedication to inclusivity, transparency, and respect for diverse perspectives continues to shape OSPE's culture and community.

As a Professional Engineer since 1982, Michael has embodied the values of service, excellence, and professionalism. His knowledge of the energy sector, his strategic foresight, and his collaborative leadership style have earned him the respect of colleagues, public officials, and industry leaders alike. His legacy is woven into the fabric of OSPE's evolution and its growing influence in shaping public policy and the future of engineering in Ontario.

Karen Chan, P.Eng.

As the Ontario Society of Professional Engineers (OSPE) marks its 25th anniversary, we are proud to reflect on the transformative impact of the individuals who have shaped our organization and the engineering profession in Ontario over the years. Among these leaders is a former Chair and President of OSPE, Karen Chan, P.Eng., whose passion for advocacy, equity, and mentorship continues to leave a legacy.

A Voice for Engineers

Karen was drawn to OSPE because she recognized the need for a stronger voice for the profession. "Engineers shape industries and economies," Karen noted, "yet too often, we're left out of key decisions." That realization became the driving force for her to join OSPE in 2011.

Passionate about OSPE's mission to influence policy and champion the profession, she found a community of like-minded professionals, equally committed to advancing engineering.

Her focus began with policy matters and later extended to mentoring early-career engineers, supporting diversity in STEM, and raising the public profile of the profession.

Her exceptional leadership has been recognized with several prestigious honours, including being named one of the WXN Top 100 Most Powerful Women in Canada, receiving the PEO Order of Honour and the Ontario Women's Directorate (OWD) Leading Women, Leading Girls, Building Communities Award

Leading with Purpose

During Karen's tenure on the OSPE's Board of Directors, and later as Chair and President in 2015 – 2016, Karen was instrumental in driving initiatives that brought real change to the engineering landscape.

One of her most impactful contributions was leading policy advocacy efforts focused on equity in STEM. Her work helped bring government and industry attention to the barriers faced by underrepresented groups in engineering, sparking vital conversations around career progression and systemic change.

She also played a pivotal role in bringing engineers in Ontario to discussions on the gender wage gap. Through data-driven advocacy and strategic engagement with policymakers, she ensured that compensation and mobility issues within the profession were heard and acted on at the highest levels.

These efforts helped elevate the visibility of engineers in public policy, strengthen diversity and inclusion efforts, and create more opportunities for early-career professionals.

Among her proudest achievements was standing in the Ontario Legislature as the motion to create P.Eng. Day was passed. It was a powerful moment, one that symbolized OSPE's influence and the growing recognition of engineers' critical contributions to society.

Another highlight was her involvement in OSPE's Women in Engineering events. These gatherings, rich with mentorship and energy, exemplified the kind of supportive, empowering spaces she envisioned for the profession.

Looking Ahead

As OSPE enters its next chapter, Karen remains steadfast in her belief that the engineering profession must continue to evolve, and OSPE must lead that evolution.

Karen envisions a future with:

- Stronger advocacy for engineers in emerging fields like artificial intelligence and automation
- Sustainability-driven policies to support green infrastructure and innovation
- Expanded mentorship and career support for early-career and international engineering graduates
- Increased public awareness of the essential role engineers play in shaping Ontario's future

We are deeply grateful for the dedication, leadership, and vision Karen Chan has brought to OSPE. Her work has helped build a stronger, more inclusive, and more visible engineering profession in Ontario.

From the Archives: Celebrating 25 Years of OSPE

As OSPE marks 25 years of championing Ontario's engineering community, we're reflecting on the milestones that have shaped both our organization and the profession. From groundbreaking inaugural events that are now OSPE traditions, to the foundations of our advocacy framework, we're celebrating the moments that have defined our journey.

2000

The Ontario Society of Professional Engineers is Founded

In April 2000, the **Ontario Society of Professional Engineers (OSPE)** was founded after a pivotal referendum revealed that 80% of Ontario's engineers wanted a dedicated advocacy body for their profession. Since then, OSPE has grown to represent approximately 10,000 engaged members of the engineering community. For the past 25 years, we have been steadfast in our mission, elevating the profile of engineers by influencing government policy, amplifying key issues and achievements in the media, and providing valuable member services.

As we celebrate this milestone, we remain committed to being the voice of Ontario's engineers and driving meaningful change.

2002

OSPE Elects its First Woman President and Chair

From OSPE's inception, women have been encouraged to contribute their expertise to shape the future of the engineering profession in Ontario.

As we celebrate 25 years, we are honouring OSPE's first woman President and Chair, **Catherine Karakatsanis, P.Eng.**, who served as President from 2002 - 2003.

A devoted advocate for creating a more diverse profession, Karakatsanis worked hard to promote engineering to young people and increase the number of women in the profession during her tenure. Karakatsanis has become an empowering voice and role model, helping these groups become better integrated into the engineering profession. .

2007

OSPE Hosts It's First MPP Reception at Queen's Park

2025 marks 18 years since our first **MPP Lobby Day and Reception**, a longstanding tradition of bringing engineers' voices to **Queen's Park** to shape policies that impact our communities and economy. Our very first Queen's Park Reception was held on Tuesday, October 30, 2007, sponsored by **Frank Klees, MPP**, who spoke on behalf of the **Progressive Conservative Party**. **Michael Prue, MPP** also spoke on behalf of the **New Democratic Party**.

From those early meetings with provincial leaders to our inaugural **MP Lobby Day** on **Parliament Hill** last year, OSPE has steadily built influence at every level of government.

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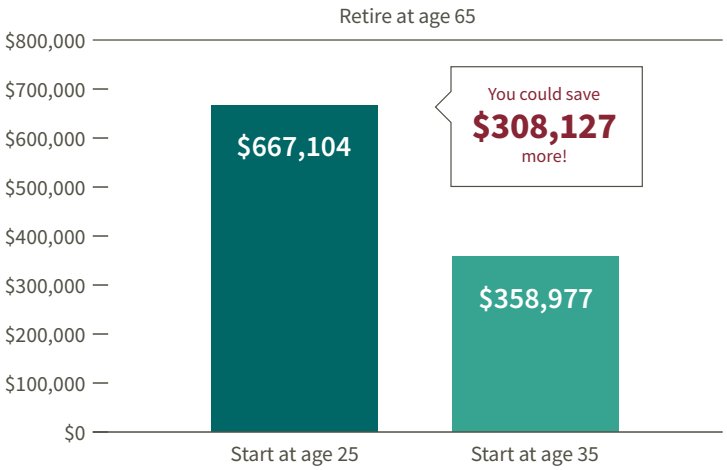

Assumptions: 6% annual gross growth rate and mid-year annual lump sum contributions of $5,000 are assumed. Ontario HST is applied. Investment Management Fee IMF (%) based on the JF Canadian Equity fund.

The above example is for illustrative purposes only. Situations will vary according to specific circumstances.

The earlier you start saving with the **Engineers Canada-sponsored Group Savings and Retirement Program's registered retirement savings plan (RRSP)**, the more you'll save.

Ok, we know that's not exactly rocket (or geo) science – but do you know how much more you can save? It really adds up!

Get the guidance you need

Want some advice? Connect with your personal Canada Life health and wealth consultant online when it's convenient for you at all steps of your financial journey.

The Engineers Canada-sponsored Group Savings and Retirement Program is exclusive to engineers, geoscientists, students, and their families, across Canada.

Start today

canadalife.com/EC-RRSP

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#WeAreEngineering
Passion. Drive. Opportunity.

We bring passion for sustainable building practices, dreaming big and overcoming barriers with the power of mentorship.

Investing in a future where creativity and innovation drive progress that shapes a brighter tomorrow for everyone.

Meet our members and view their stories at
ospe.on.ca/weareengineering

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

OSPE's Upcoming Events

SEP 10
OCT 8

Engineering Employment Event (E3)

Join us at one of OSPE's engineering job fairs. They bring together dozens of major employers and skilled engineering candidates across Ontario to network face-to-face.

GTA | September 10

Mississauga, ON | October 8

OCT
16-17

Land Drainage Conference 2025

Stay up to date on the latest practices, policies, and innovations shaping land drainage engineering in Ontario.

Delta Hotels Guelph Conference Centre, Guelph, ON

NOV
3-4

The 2025 Engineering Conference

Join us for Canada's largest engineering event. In 2025, the Engineering Conference will bring engineers together with industry, government and academic partners to discuss the latest opportunities, challenges and innovations in engineering.

Blue Mountain Resort - Village Conference Centre

NOV
14

Ontario Professional Engineers Awards (OPEA) Gala

OSPE proudly celebrates Ontario's top engineering talent at its annual November awards gala, bringing together innovators, leaders, and policymakers to honour excellence in engineering.

Paramount Event Space, Vaughan, ON

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

SAVE THE DATE

Land Drainage Conference 2025

Oct 16 - Oct 17, 2025

Delta Hotels Guelph Conference Centre

This annual event brings together Ontario's leading drainage engineers, municipal professionals and industry experts for two days of networking and collaboration.

REGISTER TODAY

go.ospe.on.ca/LDC2025

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

Canada's largest engineering event! | #EngCon

The Engineering Conference

Nov 3 - 4

The Blue Mountains, ON

2025

- Economic Forecast for the Engineering Community
- Access to 20+ hours of CPD from leading experts
- Engineering State of the Union
- Unmatched Networking
- Industry Trade Show

Register Now and Save!

Access the **$399 Early Bird Price** until September 5th.

engineeringconference.ca

Day 1 | Nov 3

engineeringconference.ca

Making Sure Your Projects Meet CSA Structural Design and Welding Requirements

Speaker: Mark Fernandes, CET *(CWB)*

Infrastructure & Asset Management

How to Conduct Better Risk Assessments Featuring Live Monte Carlo Simulation Demonstrations

Speaker: Dr. Asim Khan *(Analyze and Improve Inc)*

Technology, Innovation & Risk

Artificial Intelligence and Machine Learning in the Water Sector

Speaker: Chris Gerrits, P.Eng. *(Crozier Consulting Engineers)*

Technology, Innovation & Risk

Fireside Chat - The Opportunities and Challenges of Train Automation

Speakers: Ron Mitchell, P.Eng. *(A to B Road & Rail Engineering)* and Yousef Kimiagar, P.Eng. *(Hatch)*

Transportation & Mobility

Mastering Interdisciplinary Collaboration for Smarter Land Development

Speaker: Travis Gibson, P.Eng. *(Crozier Consulting Engineers)*

Professional Practice & Consulting

Day 1 | Nov 3

engineeringconference.ca

How to Safely Work Alongside Collaborative Robots (COBOTS)

Speaker: Renee Frigault, P.Eng. *(Lucid Engineering Ltd.)*

Technology, Innovation & Risk

Fireside Chat - New Techniques for Rehabilitating Bridges and Structures

Speakers: Daniel Baggio, P.Eng. *(County of Essex)* and Philip Loh, P.Eng. *(Facca Incorporated)*

Infrastructure & Asset Management

Net-Zero: A Glimpse Into a Post-Fossil Fuel World

Speaker: Ruth Cooper, P.Eng. *(EcoDomus Consulting)*

Energy, Climate, and Sustainability

The Evolution of Self-Unloading Vessel Technology

Speaker: Chad Starr, P.Eng. *(EMS-TECH)*

Transportation & Mobility

The Critical Relationship Between Consulting Engineering and Urban Planning for Land Development

Speaker: Trevor Fraser, P.Eng. *(Crozier Consulting Engineers)*

Professional Practice & Consulting

Day 1 | Nov 3

engineeringconference.ca

Liability in Engineering Practice

Speakers: Harp Khukh *(Corestone Law.)* and Zach Lynch, CRM *(BMS)*

Professional Practice & Consulting

The State of Asset Management in Canada: Trends, Challenges, and Success Stories

Speaker: Nigel D'Souza, P.Eng. *(Asset Management Association of Canada)*

Infrastructure & Asset Management

Positive Building - A Carbon-Negative and Nature-Positive Buildings Design Solution

Speaker: Phil Fung, P.Eng. *(SRS Consulting Engineers)*

Energy, Climate, and Sustainability

Building Decarbonization and Its Impact on the Electricity Grid

Speakers: Michael Wiggin, P.Eng. *(Public Services and Procurement Canada)* and Paul N. Acchione, P.Eng. *(MIDAC)*

Energy, Climate, and Sustainability

Effective and Innovative Public Transportation as the Key to Sustainable Cities

Speaker: Mo Yousefpour, MEng, EIT and Mukul Asthana, P.Eng.

Transportation & Mobility

Day 1 | Nov 3

engineeringconference.ca

Navigating Risk in Engineering: Strategies for Mitigation, Resilience & Future Preparedness

Speaker: Kirsten Anderson

Technology, Innovation & Risk

Inclusive Design in Ontario's Transportation Sector

Speaker: Yoland El-hajj, EIT

Transportation & Mobility

Day 2 | Nov 4

Visit trade show booths with leading industry, government and academic partners. The tradeshow is open all day from 8:00 am - 5:00 pm.

Day 2 | Nov 4

engineeringconference.ca

Digital Transformation in Engineering – Trends and Opportunities

Plenary Session 1

Technology, Innovation & Risk

Economic Forecast for Engineering in 2025-2026

Plenary Session 2

Speakers: Daniel Tisch and Amir Abd El Halim

Professional Practice & Consulting

Building Healthy Corporate Culture in Engineering Through Sustainable Recruitment Practices

Plenary Session 3

Speakers: Nick Mocan, P.Eng. *(Crozier Consulting Engineers)*

Professional Practice & Consulting

Integrating Climate Action into Practice by Advancing Engineering Competencies

Plenary Session 4

Speakers: Charlynne Robertson, PMP, Kadra Branker, P.Eng. *(IESO)* and Paul Cobb, B.Eng *(Climate Risk Institute)*

Energy, Climate, and Sustainability

Benchmark Report – A State of the Union for Engineering in Ontario

Plenary Session 5

Speaker: Sandro Perruzza, B.Sc., ICD.D. *(OSPE)*

Professional Practice & Consulting

OSPE Classic Golf Tournament 2025

On June 5, OSPE members and partners gathered at **Angus Glen Golf Club** for the **2025 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 over $5,500 for the **Ontario Professional Engineers Foundation for Education**. OSPE is already eagerly planning next year's tournament. Stay tuned to our digital channels for updates on all upcoming events.

Ontario Professional Engineers
Foundation for Education

OSPE CEO, Sandro Perruzza, announcing the award winners at the 2025 OSPE Classic Golf Tournament in Markham, ON.

An attendee of the 2025 OSPE Classic Golf Tournament hitting balls on the Angus Glen Golf Club Driving Range.

An attendee participating in the putting contest.

Two attendees enjoying wood-fired pizza at the first hole.

An attendee of the 2025 OSPE Classic Golf Tournament celebrating after recovering a lost ball.

Danny and Meg Young playing a round of golf. The couple was also celebrating their 60th wedding anniversary.

A helicopter flying over Angus Glen Golf Club in Markham , ON preparing to drop the golf balls for the 50/50 ball drop.

Two attendees at the 2025 OSPE Classic Golf Tournament on the putting green at Angus Glen Golf Club.

From left to right: Paul Davies, Rishi Singh, Baijul Shukla, Anil Sarwan, and the golf tournament winners, Sunil Harricharan, Neil Rooplal, Arvind Soreng, and Dan Patram.

From left to right: OSPE President and Chair David Carnegie, P.Eng., Candice Johnston, MBA, PMP, and Sandra Ausma, P.Eng., celebrating Candice's 50/50 ball drop win.

OSPE's Annual General Meeting 2025 Recap

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 6 at 6:00 PM.

Members and guests who attended the meeting got a chance to celebrate OSPE's advocacy wins of 2024, recognize the 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, David Carnegie, P.Eng. He offered a land acknowledgment for the evening's proceedings and thanked OSPE's Annual Partners and the 2024-2025 Board of Directors. Following these introductory statements, the members voted to approve the Minutes of the 2024 AGM.

David Carnegie then recognized engineering industry partners in attendance.

Report from the Chair & CEO

OSPE CEO Sandro Perruzza joined OSPE Chair David Carnegie, P.Eng. to highlight some of the exciting progress and achievements OSPE made in 2024. This year is especially meaningful as OSPE celebrates its 25th anniversary and Sandro marks his 10th year as CEO.

Advocacy Highlights:

In 2024, OSPE expanded the scope of its advocacy efforts, demonstrating bold, forward-thinking leadership that reaches beyond provincial borders. Our first-ever Advocacy Day in Ottawa recognized that many of Ontario's challenges and opportunities are mirrored at the national level. The event received a very positive response, and we look forward to returning.

Other advocacy highlights include:

- A growing number of policy wins across multiple engineering sectors.
- Creation of the Engineering Smart Communities Working Group – developing forward-thinking solutions to address Canada's housing crisis.
- Creation of the Artificial Intelligence Working Group – examining how AI is shaping the future of engineering, with a focus on practical, ethical, and innovative integration.

Engineering Academy Highlights:

OSPE launched EngLearn, a new on-demand platform that gives engineers easy access to all of our professional development offerings. Alongside this, we introduced new academic supports and resources designed to help engineers thrive in a rapidly evolving industry by building technical and non-technical skillsets.

Other Key Highlights:

- OSPE launched a new website to improve access to resources, events, and information as part of a broader effort to enhance member experience.
- OSPE developed a new strategic plan to guide the organization into the future.

OSPE Fellowship Program:

As part of our commitment to recognizing excellence in the profession, OSPE proudly introduced the Fellowship of the Society (FOS) Program, which honours individuals who exemplify excellence, equity, and impact in engineering. Fellows are nominated through a collaborative process between OSPE staff and the Awards Committee and receive a pin, certificate, and the post-nominal designation FOS.

This program will also include the awarding of Honorary Fellowships of the Society to acknowledge exceptional contributors to engineering in Ontario who are not eligible to be OSPE members.

OSPE Strategic Plan 2025 – 2030

Nicholas Burgwin, P.Eng., OSPE Vice Chair of the Board Development and Strategic Planning Committee joined OSPE CEO Sandro Perruzza to discuss OSPE's Strategic Plan for the next 5 years.

Over the past year, OSPE has worked hard to build a systemic, future-focused strategy. The plan introduces new Vision and Mission Statements, built around the core values of engineers uniting, leading, caring, and prospering. It aims to:

- Create a culture where engineering talent is valued and free of bias
- Strengthen the presence of engineers in leadership roles across sectors
- Elevate the profession through skills development and new tech adoption
- Redefine engineering in a changing world

At its core, the plan calls for a cultural shift, one that recognizes the problem-solving power of engineers and ensures they are equipped, empowered, and embraced in all areas of society.

You can read the full Strategic Plan now on OSPE's website.

Report from the Nominations Committee

Mark Emmanuel, 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.

- **Sandra Ausma, P.Eng.**
- **John Hazel, P.Eng.**
- **Inga Hipsz, P.Eng.**
- **Raymond Mantha, P.Eng.**

We are pleased to have this group of dedicated engineers on the OSPE Board. Their expertise and leadership will help guide our mission to create a better future for the engineering profession and society at large.

After the Annual General Meeting the Board of Directors elected the following as Officers of the OSPE Board for the 2025-2026 term:

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

These will be the members of the Executive Committee effective immediately.

Report from the Treasurer

OSPE Chair, David Carnegie, P.Eng. delivered the report on OSPE's financial statements for the fiscal year ended December 31, 2024, including a summary of OSPE's revenue and expenses.

Report from the Audit and Finance Committee

OSPE Chair, David Carnegie, P.Eng. presented the report and the motion was carried to appoint BDO Canada, LLP as auditors of the Society.

Member Questions

During the Member Questions portion of the evening OSPE CEO, Sandro Perruzza discussed several key topics brought forward by OSPE members. He underlined how OSPE is uplifting racialized engineers to take leadership positions in the organization, as well as how

OSPE strategically gathers regional perspectives from across the province.

Sandro also presented the key strategies OSPE uses to increase engineering salaries, including government advocacy, the OSPE Fee Guidelines Report, and OSPE's Annual Salary Survey to name a few.

Regarding OSPE's Strategic Plan, Sandro provided insights into how the strategic direction was developed through consultation with the board and a third-party consultation agency. The agency interviewed members of the community and industry stakeholders to identify challenges and opportunities for OSPE to address and explore in the coming years.

Sandro also confirmed OSPE's participation with the Engineers Canada 30 by 30 initiative, and spoke to OSPE's stance on PEO Chapters, noting that while chapters currently belong to PEO, OSPE believes they would benefit from OSPE's programs and leadership.

Closing Remarks

Chair David Carnegie took a moment to thank each outgoing Board Director for their special contributions to OSPE.

The directors who completed their 3-year terms this year are Stephanie Holko, P.Eng., and Jane Ravenshaw, P.Eng.

Thank You to Chair David Carnegie, P.Eng.

Vice Chair Nicholas Burgwin, P.Eng. reflected on, and thanked David Carnegie for his many contributions to OSPE over the past year, including his strategic insight and a genuine care for the engineering community found at OSPE.

To view the full video recording of the AGM please click here.

EngTalks By OSPE

ospe.on.ca

EngTalks Presents

Thought Leadership Thursdays

Call for Speakers!

Are you a subject matter expert in an engineering field?
Want to lead a one-hour webinar on a current engineering topic you care about?

Email us at pd@ospe.on.ca

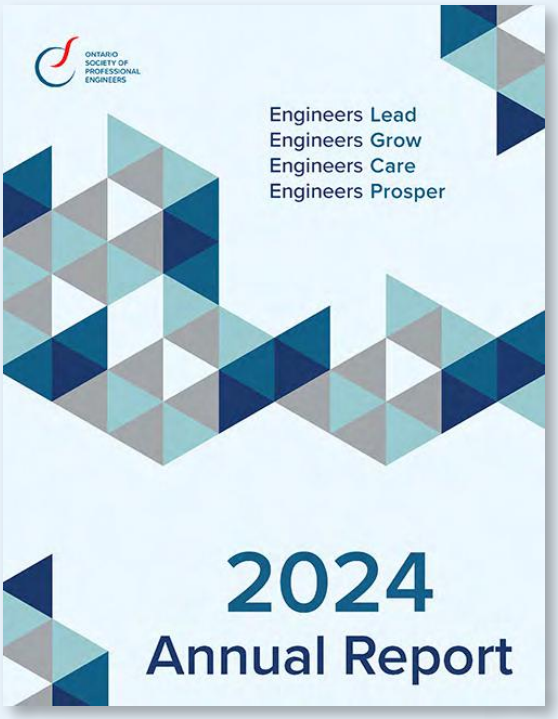
Topics of Interest:

• Artificial Intelligence • CleanTech • Climate change • Construction
• Emerging Technologies • Energy • Leadership & Management • Mining •
Sustainability • The Engineering Profession • Research & Innovation
• Project Management • Public Safety

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

Explore Our Strategic Plan and Discover OSPE's Vision for the Future of Engineering in Ontario

Read more ↗



Read OSPE's 2024 Annual Report to See the Impact and Progress We've Made Over the Past Year

Read more ↗

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The Results Are In: OPEA 2025 Awardees

OSPE is thrilled to announce the winners of the **2025 Ontario Professional Engineers Awards**. This group of engineers showcases the diverse ways that engineering professionals contribute to society. Whether it be shaping large infrastructure projects or giving young girls opportunities to pursue STEM, these engineers have made waves in their industries and in the engineering community. OSPE is proud to honour the following list of awardees.

Professional Engineers Gold Medal

Dr. Jing Jiang, P.Eng., M.Esc.

Citizenship Award

Mark Salsberg, P.Eng., MBA

Engineering Medal – Engineering Excellence in Industry

Michael Branch, P.Eng., MMAI

Engineering Medal – Management

Dr. Emily Moore, P.Eng., FCAE

Engineering Medal – Entrepreneurship

Nancy Hill, P.Eng., LL.B., FCAE, FEC, Corp. Dir.

Engineering Medal – Entrepreneurship

Dr. Parsin Haji Reza, P.Eng.

Engineering Medal – Research and Development

Dr. Farrokh Janabi-Sharifi, P.Eng.

Engineering Medal – Research and Development

Dr. Joshua A. Marshall, P.Eng., M.Sc., SMIEEE

Engineering Medal – Research and Development

Dr. Heidi-Lynn Ploeg, P.Eng.

Engineering Achievement of the Year

Cassondra Fonseca, P.Eng. | Camp Engies

Distinguished Lifetime Achievement Award

Michael Monette, 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 14 at Paramount EventSpace in Woodbridge, ON to celebrate their accomplishments.

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

2026

Ontario Professional Engineers Awards

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

Recognize an engineer in the areas of:

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

Please see back for more information. Learn more: opeaawards.ca

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.

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.

Benefits to the Awardee

- Recognition on social media
- Physical award
- Tickets to gala dinner
- Video vignette
- Marketing of accomplishment to the engineering community

2026 Nominations Open July 1

For more information visit opeaawards.ca.

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

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.

THE ENGINEERING ACADEMY | EngLearn By OSPE

CERTIFICATE PROGRAMS

Leadership Development for Engineers

1-5 CPD HOURS

Date:
On-Demand & Live Sessions Available

Price:
Member Price: Starting at $150
Non-Member Price: Starting at $200

Leadership skills are essential for engineers looking to advance their careers, lead teams, and drive organizational success. The **Leadership Development for Engineers** program offers a range of CPD-accredited courses tailored specifically to engineers, focusing on the unique challenges they face in leadership roles.

With both on-demand and live, instructor-led options, these courses cover key leadership competencies, including strategic decision-making, managing high-performing teams, effective communication, and mentorship. Engineers will gain practical skills through case studies, exercises, and real-world scenarios designed to bridge the gap between technical expertise and leadership effectiveness.

Emerging Leaders Certificate Program for Engineers

40 CPD HOURS

Date:
June 19 – August 28

ONLINE

Price:
Member Price: $1,950
Non-Member Price: $2,200

Developing the next generation of leaders is critical for driving business growth and sustainability. The **Emerging Leaders Certificate Program for Engineers**, offered by **The Engineering Academy**, is designed specifically for engineering professionals. This program equips emerging leaders with the skills, confidence, and tools they need to lead teams and drive strategic initiatives. Led by expert instructors from **Rzultz**, who combine deep leadership expertise with an understanding of engineering challenges, this program offers interactive and engaging sessions. Participants will hone their leadership abilities through case studies, exercises, and real-world engineering scenarios, gaining practical skills they can immediately apply in the workplace.

Health and Safety HS100 - HS400

10-30 CPD HOURS

Date:
On-Demand

ONLINE

Price:
Member Price: $140
Non-Member Price: $170

Creating a safe and healthy work environment is more than a legal obligation—it's a leadership priority. OSPE's **Health and Safety E-Learning Program**, developed with **Minerva Safety Management Education**, offers flexible, self-paced modules tailored for professionals at all levels, from managers to safety specialists. Covering topics like mental health, legislation, hazard control, and risk communication, the program delivers practical, real-world insights that can be applied immediately. It's not just for safetyprofessionals - anyone responsible for people, including engineering managers, HR professionals, and executives, will benefit. By empowering leaders to take an active role in workplace safety, the program supports stronger policies, better audit readiness, and improved overall performance.

Critical Communication Skills – Team and Client Communications

2 CPD HOURS

Date:
June 19 (3:30 pm – 5:30 pm)

ONLINE

Price:
Member Price: $140
Non-Member Price: $170

Effective communication is essential for engineers, especially when working in teams or interacting with clients. The **Team and Client Communications for Engineers Workshop** is a hands-on, virtual course designed to help engineering professionals navigate team dynamics and client relationships with clarity and efficiency.

This workshop will help participants understand how to break ineffective communication cycles and establish strong, clear, and effective communication practices with both internal teams and external clients. Through interactive sessions, participants will learn how to optimize communication to improve project outcomes, avoid misunderstandings, and foster better relationships in the workplace.

Please note this is part of a 3 part series, you can take them individually or all together!

Journey to P.Eng.

PE300: Journey to P.Eng.

Dates:
July 2 (12 pm – 1 pm)
August 6 (12 pm – 1 pm)
September 3 (12 pm – 1 pm)

Price:
FREE

ONLINE

This **free 1-hour webinar** will offer you guidance and support on the licensing process in Ontario. At the end of this presentation, participants will have a foundational understanding of:

- Submission requirements for PEO's application form
- Overview of the stages to licensure
- OSPE's membership services
- Ways in which OSPE's Career Services can benefit you in your skill development and job search techniques
- Professional development programs that may help you in building your career in Ontario

Journey to P.Eng.

Prep Course for the National Professional Practice Exam

Dates:
July 23 – August 20
October 1 – October 29

Price:
Member Price: $350
Non-Member Price: $450

ONLINE

Ready to take the next step in your engineering journey and secure your P.Eng license? Our workshop, **Preparatory Course for the National Professional Practice Exam (NPPE)**, provides the essential tools, knowledge, and guidance to help you excel in the National Professional Practice Exam (NPPE). Designed for both members and non-members, these sessions ensure you're fully prepared to meet the licensure requirements.

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

Dates:
July 29 (Workshop B)
September 12 (Workshop A)
October 20 (Workshop B)

Price:
Member Price: $350
Non-Member 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, each offered every few weeks. 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.

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

THE ENGINEERING ACADEMY | EngTalks By OSPE

1 CPD HOUR

THOUGHT LEADERSHIP THURSDAYS

OSPE's Engineering Academy hosts Thursday webinars with leading experts on a diverse range of technical and non-technical topics.

Leverage Generative AI Text-to-Action Applications for Enterprise Productivity

Date:
June 26 (12 pm - 1 pm)

ONLINE

Price:
Member Price: $0
Non-Member Price: $59

This presentation explores the application of generative AI models in transforming text inputs into actionable tasks to enhance enterprise productivity. By automating workflows and decision-making processes, agentic AI can bridge the gap between natural language inputs and complex operational tasks. You will analyze key use cases within enterprise environments, examining how text-to-action systems can improve efficiency, reduce errors, and optimize resource allocation. The research demonstrates significant gains in productivity across various sectors through AI-driven task automation, offering insights into future developments and challenges in deploying these technologies at scale.

System O)): Beyond Conventional

Date:
July 10 (12 pm - 1 pm)

ONLINE

Price:
Member Price: $0
Non-Member Price: $59

Join Ryan Thomas, from **Make-Way Environmental Technologies**, to explore the **System O)) Septic System**, a revolutionary technology that can drastically reduce system footprint and installation costs by up to 50% – all without compromising treatment efficiency. Discover how this innovative system achieves robust pollutant removal through a passive process, eliminating the need for moving parts or electricity.

What is the Path to Licensing an AI Engineer?

Date:
July 24 (12 pm - 1 pm)

ONLINE

Price:
Member Price: $0
Non-Member Price: $59

The **AI Engineer Project** seeks input from professional engineers and the engineering community about the path to licensure for an AI Engineer. In this session, you will discuss what should be included on the road to licensure, what gaps exist, and suggest next steps that could be taken to close the gaps.

During this session the AI Engineer Project will discuss the importance and urgency of their work and compile their recommended list of standards and ethical guidance to help navigate an AI practitioner towards professional licensure.

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

EngLearn By OSPE

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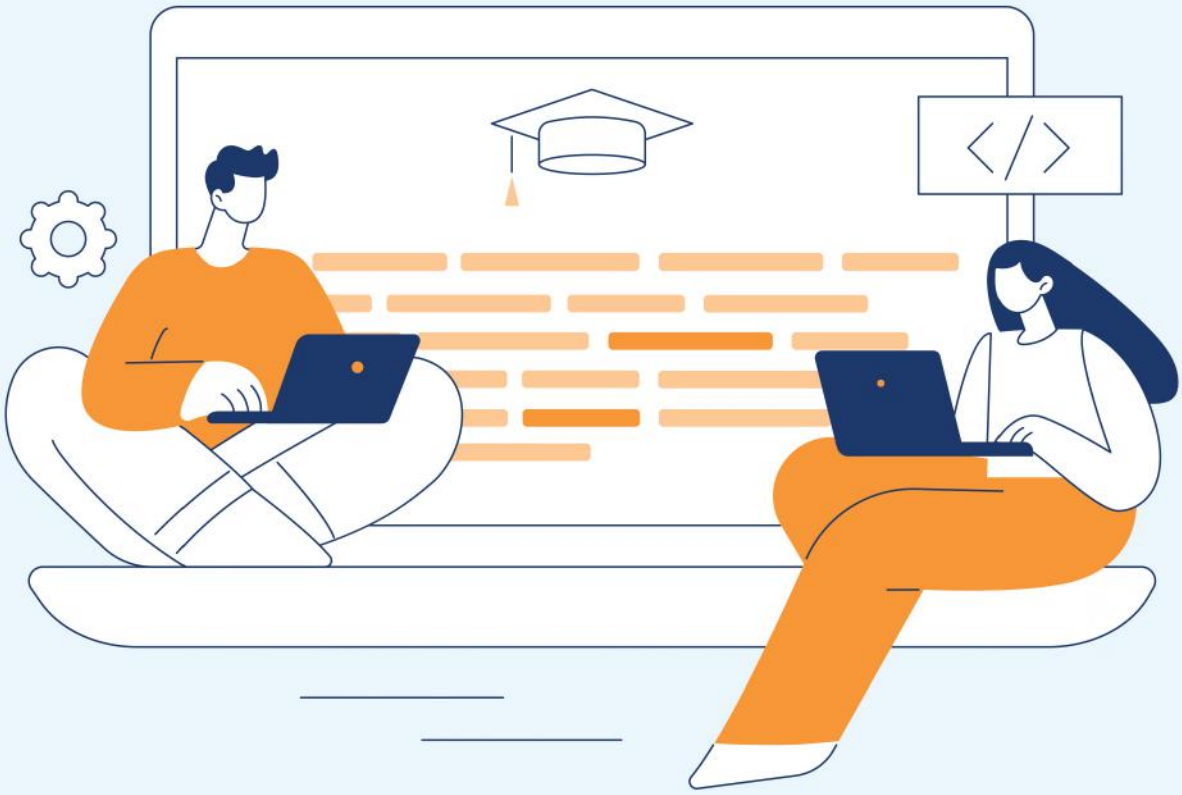
All of OSPE's educational content on one convenient platform.



UNLIMITED ONLINE ACCESS FOR ALL MEMBERS

Find engineering content that interests you and track your **Continued Professional Development** hours all in one place.

- Certificate Programs
- EngTalks
- Thought Leadership Thursdays
- Webinars
- Health and Safety
- Workshops
- Project Management
- And More!

CSA Codes, Standards, and Learning

OSPE is all about making it easy to access valuable resources, and we are excited to announce a new partnership with CSA Group, an internationally recognized provider of codes, standards and education.

Through this partnership members of the engineering community can easily and affordably access:

Codes and Standards

Prior to any project, you need to ensure you know the requirements. The CSA library is a great resource for engineers, to make sure they are up to date.

- Construction & Infrastructure
- Electrical
- Environment & Natural Resources
- Fuels & Transportation
- Health Care and Well-being
- Management Systems
- Mechanical & Industrial Equipment
- Nuclear
- Occupational Health & Safety
- Petroleum and Natural Gas
- Public Safety

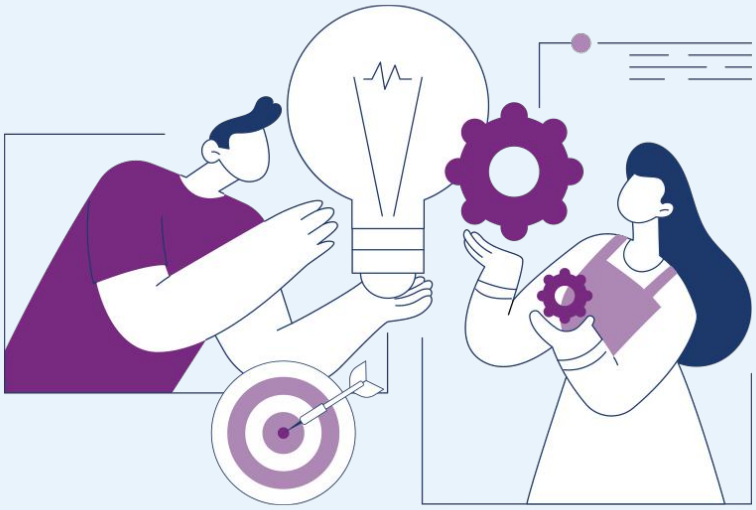
Education

Get ahead and meet professional development requirements by learning about the practical topics governing work in Ontario and across the country.

- Electrical
- Gas
- Petroleum & Natural Gas
- Health and Safety
- Construction & Infrastructure
- Environment and Business Excellence

To access savings contact pd@ospe.on.ca to receive a special member access code. Learn more by visiting ospe.on.ca/academy/standards-and-codes/

OSPE's Community Corner



FIRST Robotics Competition

There is an opportunity for an engineer or engineering student in the Guelph area to become a volunteer mentor/coach for Team 10218 - No Signal from Rockwood, Ontario, in the FIRST Robotics Competition.

The high school team made an impressive debut, ranking 10th out of 30 teams in the qualification rounds and advancing to the playoffs. At the **Ontario District McMaster University Event**, they earned the **Rookie All-Star Award**, recognizing their strong partnership and alignment with FIRST's mission to inspire youth in science and technology. They recently qualified for the **2025 FIRST Ontario Provincial Championship**.

For more information, please reach out to Marie at **mladores@bell.net**.

Grade 8 STEM Camp: 1 - 2 Day Volunteer Opportunity

GE Girls Summer Camp is requesting volunteers for their annual Grade 8 summer camp this August in Mississauga, ON.

GE Girls is a free, hands-on summer camp designed for Grade 8 girls from the Peel region, aimed at sparking interest in science and math through real-world applications.

They will need women in electrical or computer engineering to volunteer on Monday, August 18th, and/or, Thursday, August 21, to help with their 'City of Lights', and BOE-BOT Robot activities.

For those who are interested in learning more, reach out to **mviolante@ospe.on.ca**.

Want to get the word out about your engineering event or opportunity?
Share it with us at **marketing@ospe.on.ca**, and it could be featured in The Voice's Community Corner!

MEMBER PROFILE

David Ellis, P.Eng.

A graduate of the **University of Waterloo's** Systems Design Engineering program, OSPE Member **David Ellis, P.Eng.**, has always followed a unique path within the engineering world. Now the Founder and Principal Engineer of **Azura Associates**, David began his engineering path with the systems design program, which offered him the flexibility to chart a highly specialized course in water and environmental systems. In the final years of undergraduate study, he drew on courses from civil and chemical engineering as well as microbiology from the Faculty of Science—effectively building a custom curriculum focused on water and wastewater treatment.

That focus stemmed from a lifelong fascination with water. From a young age, David was captivated by the natural world, especially the oceans. As a kid, he'd watch The Undersea World of Jacques Cousteau, which ignited an early interest in marine environments and ecological exploration. By the age of 15, he had earned a scuba diving certification.

That early passion for water evolved through Waterloo's renowned co-op program. Work terms in Fort McMurray's oil sands introduced David to industrial water management and tailings pond operations, while placements in environmental laboratories and consulting firms offered firsthand experience with sampling and analysis. Through these roles, he developed a strong interest in biological treatment methods. Observing the gaps between disciplines, where civil and chemical engineers offered complementary strengths but little microbiological depth, David identified an opportunity to bring these perspectives together. This insight ultimately laid the foundation for a master's degree and a career at the intersection of engineering and life sciences.

His early industry experience began with the multinational consulting firm, **CH2M Hill**, (now **Jacobs Engineering Group**), in Waterloo, where David developed expertise in anaerobic digestion, a biological process for treating organic waste in oxygen-free environments. This work led to a pivotal career milestone: co-founding the first Canadian office of **Geomatrix Consultants**. Drawing on the leadership of many great mentors there, David helped shape a practice focused on converting organic waste (like banana peels and food scraps) into methane-rich biogas, a renewable energy source.

This work opened the door to global opportunities, including projects across Canada, the U.S., Europe, South America, and South Africa—all while remaining rooted in Kitchener-Waterloo, where he raised his family.

In 2012, David launched his own engineering practice, **Azura Associates**. His mission being to provide practical, customer-focused specialist engineering solutions for the anaerobic digestion, wastewater, and cleantech sectors. David now leads a team of dedicated, curious professionals united by a commitment to lifelong learning, technical excellence, and meaningful environmental impact.

3 Pillars of Career Success for Professional Engineers: How to Grow from Entry-Level to Executive

By: David Ellis, P.Eng.

There is no better day than today to start investing in yourself. We know that work is changing; hours are getting longer, and jobs are less secure than they once were. As a professional engineer with more than 30 years in the consulting industry, and Principal Engineer at **Azura Associates**, I have found that there are 3 key pillars to career success for early-career engineers:

1. Skills and Experience
2. Public Profile
3. Professional Network

Skills and Experience

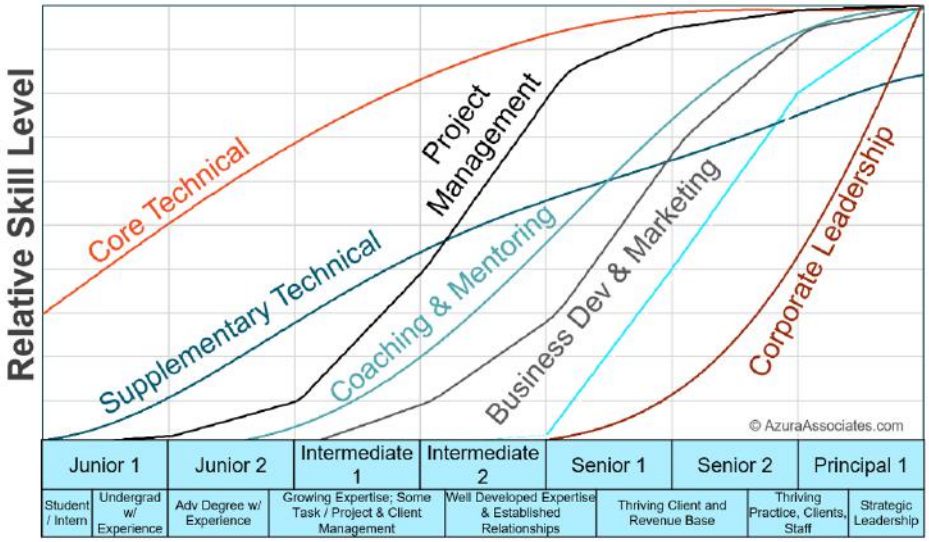
Engineers need both technical knowledge and soft skills. A commitment to lifelong learning will ensure that skills continue to evolve over the course of a career, and this chart is one example of how required skills can change over time.

OSPE Can Help

OSPE supports professional growth for engineers by offering a wide range of Continuing Professional Development (CPD) and educational opportunities. OSPE's wide array of courses, workshops, and webinars help the engineering community build both technical and soft skills. OSPE members get free access to expert-led webinars and educational content through our Thought Leadership Thursday and EngLearn platforms.

Public Profile

An established profile is both public and professional. It is extremely important as it speaks for you to let people know about your skills and experiences. It also includes your digital footprint, so it is critical that you are



(Source: Graph was originally devised by David and other shareholders and senior office managers in a multinational engineering consulting firm in the early 2010s to show a potential framework within which people could begin to craft their own career paths. Some people aspire to stay technically focused, others to business development and relationships, and other to firm management. The vertical axis is not numbered, relative scale only. Horizontal axis generally aligned with PEO's / OSPE A through F levels from the annual salary survey classifications, based on our collective experience up to that point.)

showcasing the best version of yourself, whether that is on LinkedIn, ResearchGate, or another professional website.

OSPE Can Help

OSPE can help elevate your public profile through career advancement opportunities, like free professional headshots at Engineering Employment Events, and expert-led career workshops. These resources are designed to help you present your best self, online and in person.

A Professional Network

This is the opposite of a digital profile - these are genuine person-to-person relationships. These are the people whom you can call for mutual support. Building a trusted network takes decades, and it's important to start early. Volunteering with professional associations, like OSPE, and attending industry conferences and events is a great way to start connecting with others in your industry.

Conclusion

While it is true that the landscape of work is changing, technology is also advancing, making it a great time to be a young professional. There are many free or low-cost options for training, and the internet connects people to professional and volunteer opportunities across the globe. By taking the time to invest in yourself, you can build a great career as a professional engineer. Want to hear more of David's advice for growing your engineering career? Check out his mentorship videos on Azura's YouTube channel, YouTube.com/@AzuraAssociates

OSPE Can Help

OSPE helps the engineering community build strong professional networks through social and networking events, the Engineering Conference, the OSPE mentorship program, and volunteer opportunities. Participating in these activities is a meaningful way to connect with fellow engineers, gain visibility, and make lasting industry relationships.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Nov 24, 2025 | 10:00AM-1:30PM

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