DECEMBER 2025

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From Earth to Architecture: Unlocking the Sustainable Future of Brick

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From Earth to Architecture: Unlocking the Sustainable Future of Brick

OSPE'S 25TH ANNIVERSARY

OSPE EVENTS

GOVERNANCE

PROFESSIONAL DEVELOPMENT

MEMBER PROFILE

Happy Holidays!

*Please note the OSPE offices will be closed from **December 25th through January 2nd**. Staff will not be available during this time, but you can continue to access all member services as usual or browse upcoming events.*

Wishing you the happiest of holiday seasons.

The OSPE Team

THE VOICE
OF ONTARIO'S ENGINEERS

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Dear members,

Happy Holidays!

At OSPE, we are catching our breath after one of our busiest autumns ever...

Land Drainage Conference (EngCon) ✓
Engineering Conference ✓
Ontario Professional Engineers Awards (OPEA) Gala ✓

And those events were just October/November.

Reflecting on these events, speaking to OSPE members and others throughout the engineering community, there are a few things stand out that I wish to share.

First, is that we are truly in a transformative time to be an engineer, and while this brings challenges, I am optimistic that we can convert these challenges into opportunities by collectively leveraging our community. OSPE is here to help do that, where it can.

At **EngCon**, we heard about the complexities of the current trade environment that we are all navigating. This chaos is disrupting how we work, and who we work with, but also creates opportunities to find new partners and new ways of doing things. Engineers are trained to find order in chaos, and we have an important role to play in helping society navigate this current chaos.

The other prominent theme from EngCon is the influence of artificial intelligence on the work of engineers. All industries are grappling with this to varying degrees, but I do believe there is more urgency for engineers. We each have a core responsibility to ensure that we leverage new technology to benefit society, but we also need to balance this with consideration of potentially negative consequences. I don't doubt there is a place for these tools, but we all need to understand them better, and OSPE can help to communicate externally and internally on this critical issue.

Another reflection from this fall is the amazing depth and breadth of our engineering sector in Ontario. From the people I met at EngCon, to our amazing awardees at this year's **Ontario Professional Engineering Awards**, I have met people working on everything from bones to bots, engineers working on large scale projects, and those working on nanotechnology that could change the world. It is both inspiring and impressive. It left me wondering what aspect of our human environment our engineering community does not touch in some way.

As a final thought on this last message from me to you in 2025, I want to leave you with a couple of items, one personal and one professional.

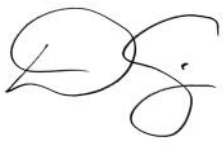
Personally, I wish you a meaningful holiday season as we close the year. We all need a chance to recharge our batteries once in a while. No matter what holidays you celebrate, this time of year provides opportunities to connect with those important to you and to reflect on the year behind and ahead.

Professionally, I want to reaffirm OSPE's commitment to support, elevate and celebrate our engineering community. For its contributions, and for its potential. For its leadership and consistency, keeping our communities safe and our economy humming.

Thank you for what you do for OSPE, and our community.

Happy Holidays.

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



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[1] Statistics Canada, "Survey of Household Spending in Canada," 2022.
[2] ctvnews.ca, "How much money does it take to raise a child in Canada?" July 2022.
[3] clhia.ca, "A guide to disability insurance," 2021.
[4] Canadian Cancer Society, "Cancer Statistics at a Glance," 2023.

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News from the Front

This quarter, OSPE advanced its key advocacy priorities and secured several meaningful policy wins for Ontario's engineering community. Governments released new guidance and announced major investments that align with OSPE's long-standing positions, including support for improved indoor air quality, clean energy, infrastructure, and innovation. OSPE also elevated the role of engineers through public engagement with decision-makers and media commentary, reinforcing the value of evidence-based approaches to infrastructure planning and climate solutions.

September 26 - Media Comments Published in Global News Article

Global News published an article titled, No contract awarded to study Hwy. 401 tunnel plan, one year after it was announced. The article by **Isaac Callan** and **Colin D'Mello** uses quotes from OSPE CEO **Sandro Perruzza** on the Ontario government's feasibility study for Highway 401.

OSPE emphasized the importance of thorough studies and the role of engineers in ambitious infrastructure projects.

October 27 - Indoor Air Quality Working Group Speaks to the Toronto Board of Health

OSPE's Indoor Air Quality (IAQ) subject matter expert, **Joey Fox, P.Eng.** spoke at the **Toronto Board of Health** regarding improving the health of Toronto schools. To build healthier classrooms in Toronto, OSPE recommends that classrooms follow ASHRAE standards, comply with **Health Canada** guidance, and monitor air pollutant levels to ensure safe indoor air.

November 12 - Meeting with NRCAN Policy Team

OSPE's Energy Task Force met with a **Natural Resources Canada** senior policy advisor to discuss sector coupling of electricity and thermal energy systems. OSPE advocated for sector coupling to be considered and included as a near-term opportunity for emissions reductions.

Policy Wins

September 19 - Government of Canada's Guidance for Indoor Air Quality Professionals

Health Canada published Guidance for Indoor Air Quality Professionals. Highlights of the document include the recognition that COVID-19 is airborne and recommendations for CO2 concentrations below 800 ppm. This is a policy win for OSPE and its Indoor Air Quality (IAQ) Working Group, which has been providing evidence-based guidance on improving air quality and reducing the transmission of viruses.

October 23 - $3 billion Investment in Small Modular Reactors

Prime Minister Mark Carney and **Premier Doug Ford** announced a combined $3 Billion investment to build **Small Modular Reactors (SMRs)** at the **Darlington Nuclear Generating Station**. This is a major policy win for Ontario's engineering community.

OSPE has long advocated for SMRs as a clean energy solution. This investment will strengthen Ontario's nuclear, mechanical, civil, electrical, and systems engineering sectors, bolster manufacturing, and expand the province's ability to export nuclear technology.

November 4 - Policy Wins in the 2025 Federal Budget

The Government of Canada tabled the **2025 Federal Budget**. It contained several policy wins for OSPE, such as significant investments in infrastructure, innovation, and clean growth technology. The federal government committed over $115 billion in infrastructure investments over five years, as well as tax incentives for research, clean energy, and advanced manufacturing.

For the engineering community, this means new opportunities in grid modernization, low-carbon systems, national defence, and emerging technologies like artificial intelligence and quantum computing.

Letters and Submissions

September 19 - Submission to ERO 025-0923 – Future of the Natural Gas Expansion Program (NGEP)

OSPE submitted to the Environmental Registry of Ontario's Consultation on the Future of Community Natural Gas Expansion. OSPE urged the ministry to

broaden the scope of the consultation to include district thermal energy systems. Thermal networks are fuel-agnostic and can complement or replace gas expansion where it is technically and economically viable, particularly in rural, northern, and Indigenous communities seeking affordable, reliable, resilient thermal services.

You can view the full submission here.

October 30 - OSPE Recommendations in Response to Canada's 30-Day AI Strategy Engagement

OSPE made a submission on Canada's national Artificial Intelligence (AI) strategy. The submission highlights the need for clear accountability, risk-based oversight, Indigenous data sovereignty, and a public–private AI delivery council to drive implementation.

You can view the full submission here.

October 30 - OSPE Submission on Guidance for Protected Species and Habitats Under the Species Conservation Act (SCA)

OSPE made a submission on the proposed guidance for implementing the **Species Conservation Act, 2025**. This submission urges the Ontario government to pair streamlined approvals with strong, science-based environmental protection.

The submission emphasizes predictable, risk-based approaches, clear roles for engineers and other stakeholders, standardized geographic information systems and field methods, and meaningful Indigenous partnership and data sovereignty.

You can view the full submission here.

October 30 - City of Toronto Budget Comments

OSPE submitted recommendations for the **City of Toronto's 2026 Budget**. OSPE recommended that the city embed engineering expertise in key infrastructure priorities by adopting **Qualifications-Based Selection (QBS)** for procurement to improve project quality, investing in improved indoor air quality for vulnerable residents through ventilation and filtration upgrades, expanding district energy systems to reduce emissions, and continuing to fund transportation infrastructure, including protected bike lanes.

You can view the full submission here.

December 6: Remembering, Reflecting, and Recommitting to Change

by OSPE's Equity, Diversity, Inclusion & Accessibility Task Force

Every year on December 6, the engineering community pauses to remember the 14 young women murdered at **l'École Polytechnique** in 1989. Of the 14, 12 were engineering students, targeted simply because they were women who chose to study engineering.

For more than three decades, we have repeated the same words: we remember, we honour, we will not forget. But remembrance alone does not change the systems that allowed this tragedy to happen. And after so many years, we must ask ourselves with honesty: Have we changed the structures, the cultures, and the expectations that shape engineering in Canada?

The conditions, although different today, have not disappeared. Gender-based violence continues in many forms: discrimination, harassment, silencing, pay inequities, stalled careers, and environments that signal to women, implicitly or explicitly, that they do not fully belong. These realities are much more common for women who also navigate racism, homophobia, transphobia, ableism, or newcomer barriers. This is why gender equality remains pivotal to engineering; not as a symbolic value, but as a fundamental requirement for a strong, ethical, and future-ready profession.

The Importance of Diversity in Engineering

Engineering shapes our infrastructure, technologies, policies, and communities. When women and other underrepresented groups are missing from the table, the consequences ripple through the systems we build. We risk designs that fail to reflect lived experience, technologies that overlook key users, and policies that unintentionally exclude or harm. Diversity is not an accessory to good engineering; it is part of its foundation.

OSPE's Gender Equality Initiatives

At OSPE, we work every day to bridge the gap between ideals and action. This year, we strengthened that commitment through the launch of Engineering Change: A White Ribbon Sexual Harassment Intervention and Prevention Program, a 26-month initiative designed to foster safer, more respectful, and more inclusive workplaces across the engineering sector.

Engineering Change builds on OSPE's long-standing efforts to advance gender equity across our advocacy, research, and professional development. From examining how hybrid work environments impact women and caregivers to pushing for fair licensing pathways and equitable access to engineering roles, our work consistently centres safety, dignity, and inclusion.

Across climate, infrastructure, and innovation initiatives, we also continue to emphasize the importance of diverse leadership in shaping resilient communities. And through our networks, events, and storytelling, we elevate the voices of women engineers whose expertise and leadership strengthen the profession every day.

In Conclusion

This work is ongoing, and it is not finished. True change demands persistence, self-reflection, and a willingness to confront uncomfortable truths. It also requires a collective effort from employers, educators, regulators, policymakers, colleagues, and communities. The responsibility cannot rest only with those who are most affected.

As we mark December 6, we honour the young women whose futures were taken far too soon. We honour the generations of women who continue to push forward in the face of exclusion. And we recommit to building an engineering profession where remembrance is not the primary goal, but rather the focus is on the environments we create, the decisions we make, and the people we empower.

We remember.
We honour.
We act.

Image: (10029237/Pexels.com)

Pivotal Moment: Forging Ontario's Engineering Future

OSPE's 2025 Benchmarking Report

Building on the knowledge from our last benchmarking report, OSPE engaged the engineering community to learn more about how engineers feel about their roles, their future and their opportunities. In some cases, there has been progress and in others the status quo. Either way, knowing where we stand is the best way to move forward. Learn more by checking out our latest report.

Gain insights on:

- **Systemic Barriers:** Why international engineering graduates and women continue to face disproportionate challenges to success.
- **Brain Drain:** The real cost of expensive education and stagnant wages.
- **Evolving Relevance:** What engineers say they need to thrive and why it's more than just a P.Eng. licence.
- **Regulatory Lag:** How regulations are falling behind a rapidly evolving industry.

Download Report

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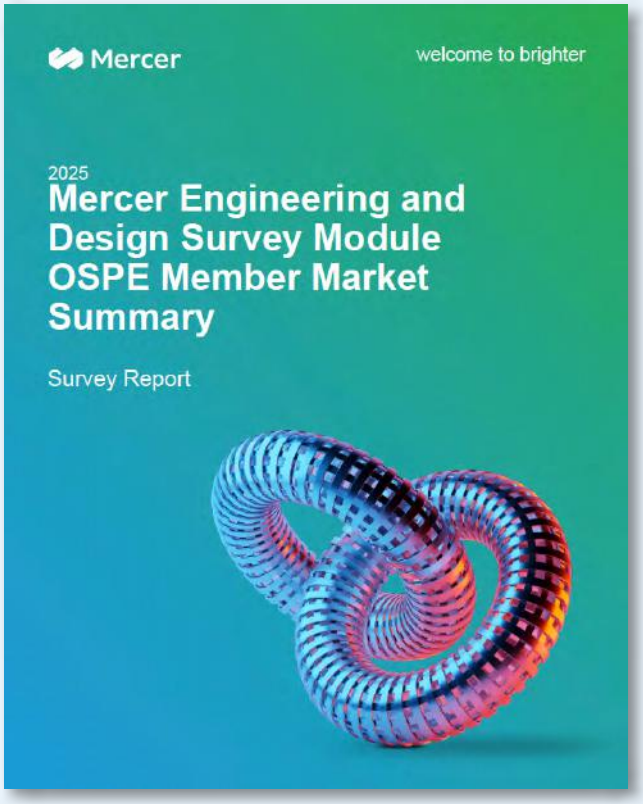

Now Available for Members

2025 Mercer Engineering and Design Survey Module OSPE Member Market Summary

The **Ontario Society of Professional Engineers (OSPE)**, in collaboration with Mercer, is proud to present the **2025 OSPE Member Market Summary Report**.

Whether you are an executive benchmarking compensation, an entrepreneur planning your workforce strategy, a new graduate entering the field, or an experienced professional evaluating your career path, this report provides valuable insight into current hiring trends and compensation levels across all engineering disciplines.

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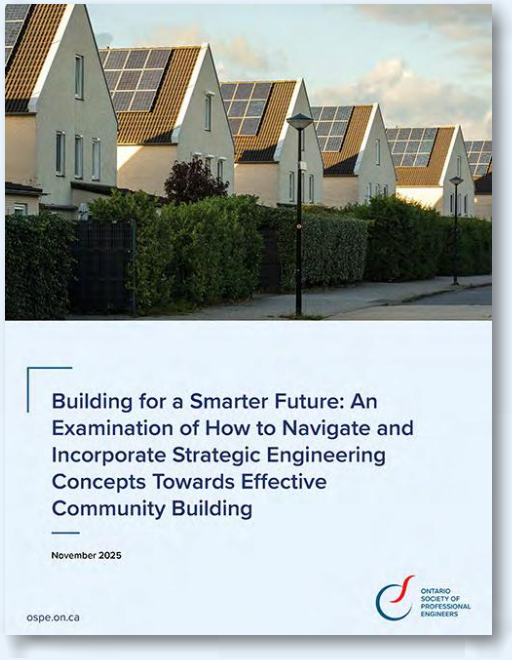
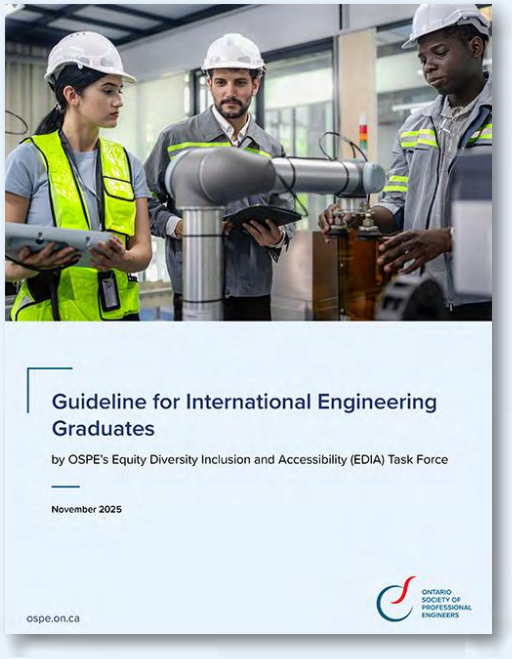


Engineering Smart Communities

The ongoing housing crisis in Ontario has become a critical challenge, exacerbated by rapid population growth, rising housing costs, and increasing environmental concerns. As the demand for affordable and sustainable housing continues to outpace supply, the need for effective, forward-thinking policies that address these issues is more urgent than ever. Ontario's engineering community, with its deep knowledge of infrastructure, sustainability, and innovation, is uniquely positioned to contribute to the creation of policies that can help overcome these challenges. In response, a set of policy recommendations has been put forth by engineers in Ontario to guide the province toward a future where housing is not only more affordable but also environmentally sustainable, resilient, and accessible to all.

Download Report



Guideline for International Engineering Graduates

The engineering profession in Ontario and across Canada has long benefited from the expertise and diverse perspectives of International Engineering Graduates (IEGs). As global mobility increases and qualified individuals seek new opportunities in Canada, the need to ensure that all engineers, regardless of where they obtained their credentials, are empowered to fully contribute becomes ever more urgent. This guideline is designed to help IEGs navigate the professional landscape, overcome barriers, and ultimately succeed in engineering roles that match their skills and aspirations.

Download Report

Let Us Know What You'd Like to See in the 2026 Ontario Budget

To help inform OSPE's Provincial Pre-Budget Submission, we'd like to hear what our engineering community considers to be their main priorities for next year's provincial budget.

Please send your comments to **advocacy@ospe.on.ca** by January 29.

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From Earth to Architecture: Unlocking the Sustainable Future of Brick

by Carly Connor, P.Eng., CAHP and Emily Pepper, P.Eng., CAHP

Circularity in construction starts with brick. In Ontario, millions of tonnes of reusable bricks are discarded in demolition and reconstruction projects, meaning that vast amounts of embodied energy and resources are lost to landfills, while reclaimed brick remains an underutilized sustainable construction material.

The embodied carbon footprint of brick is high at the point of manufacture, but its potential lifespan, when well maintained, can exceed 600 years since it is more durable than many modern construction materials. When you spread the environmental impact over this span, the annualized carbon cost becomes significantly lower. From a lifecycle perspective, brick is one of the few materials whose carbon debt can be amortized across multiple generations.

In the heritage industry, heritage engineers have been leading brick reuse projects. Bringing the reclaimed brick conversation to the forefront of policy could reduce waste and promote the salvaging of a durable and historically significant material.

Brick can be a natural entry point for professionals new to circularity. It bridges the gap between sustainability concepts and construction reality, showing us that carbon can be quantified, touched, and transferred across generations of buildings.

Like a LEGO block, brick can be stacked, dismantled, cleaned, and reused. Reclaimed brick calls engineers in heritage restoration to join a broader mission: creating systems that help engineers, contractors, and owners reuse materials at scale.

Heritage Engineers in Ontario

19th- and 20th-century structures across Ontario contain a paradox. Buildings can be deemed “at end of life,” yet their bricks are not. Even after a century, the fired brick units remain sound; durable, modular, and full of potential.

This mirrors the LEGO analogy. Anyone who has built with LEGO understands you can assemble a house, take it apart, and rebuild it into something entirely new. The LEGO pieces themselves never lose value, they only await new patterns of assembly. Masonry is no different. Each fired brick unit is a reusable block, a piece of embodied carbon that deserves a second life.

Heritage projects prove this is possible. Salvaging and reusing brick is not a theoretical exercise; it is a living practice. But at this time, it can be niche: driven by heritage authenticity rather than sustainability. Bringing brick reuse out of the specialized conservation toolkit and into mainstream construction is a challenge for heritage engineers.

Canada has no mature brick reuse market, despite the millions of tonnes of brick waste likely sent to landfill over the past few decades. Most small-batch reconstructions still use new bricks, even when reusable stock is available. Systems to verify, catalog, and resupply salvaged brick don’t yet exist at scale. Compare this to the United Kingdom, where materials are stored properly, tested regularly, and integrated into projects.

Barriers For Reclaimed Brick

A barrier to scaling brick reuse is trust. Improper storage or harsh deconstruction techniques can compromise the material integrity of brick. Enhancing cross-collaboration and communication between restoration and design teams about the treatment of the brick would create trust for engineers in the safety of the salvaged material.

Reusable brick is precluded from reuse because of current standards. There’s currently no widely accepted system in Canada to evaluate and certify the reuse potential of salvaged brick at scale. Engineers and architects could be hesitant to incorporate reclaimed materials into structural or envelope assemblies because they fall outside of current standards. Current standards, which are mostly built for new bricks and uniform masonry systems, have extreme requirements and parameters requiring updating to reflect the reuse potential of reclaimed brick.

Another significant barrier limiting brick reuse is cementitious mortar. Unlike lime mortar, which can be more easily separated, cementitious mortar has a stronger bond and adheres more strongly to the brick substrate, making manual brick cleaning expensive and labour-intensive. The cementitious mortar locks reusable units into a doomed assembly. The cost can confine reuse to heritage projects with strict requirements.

A Call to Action for Engineers

Heritage engineers, in collaboration with other conservation professionals, are confronting the barriers to the widespread adoption of brick reuse.

The Brique Recyc machine in Quebec is an innovation that uses mechanical and thermal processes to strip mortar quickly and efficiently from salvaged units. What once required painstaking hand-chiseling can now be done at scale and at a lower cost. Brique Recyc has created a contractor solution: a tool to make brick reuse commercially viable, transforming what had been a

heritage craft into a scalable industry practice. For the first time, brick reuse could compete on cost as well as sustainability.

Green Salvaged Materials (GSM) has a complementary role to Brique Recyc by building trust in salvaged materials, creating protocols for documentation, and ensuring compliance with codes and standards. If Brique Recyc solved the contractor's problem, GSM can solve the architect and engineer's problem.

Together, these solutions form two halves of the same system. One lowers the physical barrier to reuse. The other builds the professional and regulatory framework to make reuse credible, measurable, and repeatable.

Scaling this vision requires collaboration. Another group tackling the issue of brick reuse is the Masonry Re-Use Working Group—affectionately called Brick Squad. This group brings together masons, engineers, architects, contractors, and policy thinkers to tackle brick reuse systematically.

Brick Squad is a laboratory of ideas. They map barriers, identify opportunities, test grading and cleaning protocols, and build consensus around standards. More importantly, they practice a problem-solving methodology that is as valuable as the solutions themselves.

When diverse professionals align around a single material challenge, they can create practical, actionable roadmaps. Brick Squad proved that reuse is not just a heritage activity; it is an engineering discipline with measurable benefits and repeatable processes.

This convergence marks the transition from restoration practice to circular engineering. Brick is no longer just a heritage material; it is proof of a new construction economy.

The success of that working group sparked a bigger realization. Why stop at brick? If this methodology could unlock reuse pathways for masonry, it could do the same for cut stone, wood, steel, glass, and beyond.
Out of this momentum, the Re-Use Collective has been built, a platform where owners, contractors, and

engineers collaborate to embed circularity across the entire material landscape.

Final Thoughts

Brick embodies the theme of earth in every sense. It is born of soil, fired by craft, and built to endure. But its greatest lesson is how it teaches us circularity. Like LEGO blocks, bricks can be assembled, dismantled, and reassembled. Brick transfers value, carbon, and trust across generations of buildings.

Breakthroughs in heritage practice are here. The Brique Recyc machine made large-scale reuse affordable. GSM created the systems of trust to bring salvaged materials into mainstream engineering. The Brick Squad showed us how to solve challenges together, and the Re-Use Collective extends that methodology across all materials.

As engineers, we have a responsibility not just to design for performance, but to design for reuse. Brick gives us a tangible entry point with carbon that we can hold in our hands. By embracing it, we build a foundation for circularity that extends beyond masonry to shape a sustainable built environment.

Carly Connor, P.Eng., CAHP – Founder & CEO, Green Salvaged Materials

Emily Pepper, P.Eng., CAHP, Engineering Smart Communities Working Group Chair

Images: (2547604679/Shutterstock.com)
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Mining for Climate Solutions: Pathways for Carbon Sequestration and Enhanced Rock Weathering (ERW) Deployment

Rafael M. Santos, P.Eng.

Mining is often portrayed as part of the climate problem, yet its vast waste streams could become one of our most powerful carbon sinks.[1] If managed strategically.

Every year, more than a trillion kilograms of mine residue, or tailings, are generated globally. A considerable portion of these tailings contain silicates, minerals made of silicon and oxygen, that can bind carbon dioxide into stable carbonates that lock away carbon dioxide (CO_2) in a solid, long-term, and environmentally safe form.

This article argues that mining holds untapped potential to transform waste streams into climate solutions. In it, we explore three practical pathways—ambient tailings weathering, **Enhanced Rock Weathering (ERW)**, and process intensification—while emphasizing the innovations needed for scalable deployment. In addition to climate benefits, these strategies align with circular economy principles, valorizing waste and creating coproducts for construction and agriculture. Success requires operational foresight, policy alignment, and market incentives.

Tailings: From Liability to Climate Asset

While many tailings pose environmental hazards,

[1] A carbon sink is any natural or artificial system that absorbs more carbon dioxide from the atmosphere than it releases, helping to reduce greenhouse gases.

silicate-rich residues from specific mining operations theoretically offer significant carbonation potential.

Despite uncertainties and potential overconfidence, field evidence and modeling suggest that this opportunity warrants strategic exploitation. Global tailings exceed 10^{12} kg annually, and even partial carbonation could offset substantial emissions. Silicate-rich residues from nickel, diamond, copper, and iron mining contain alkaline and alkaline earth elements that can react with CO2 to form stable carbonates (Khalidy & Santos, 2021).

Field evidence from Canada and Australia reveals measurable CO_2 uptake under ambient conditions, resulting in the formation of minerals such as hydromagnesite and nesquehonite. These reactions are slow but permanent, and operational tweaks such as maintaining partial water saturation and disturbing surface crusts can accelerate them.

Monitoring, Reporting and Verification (MRV) frameworks using isotopic tracing ($\delta^{13}C$, $F^{14}C$) and mineralogical analysis can verify removal without imposing prohibitive costs. Model studies predict that optimized water management and aeration could considerably increase carbonation rates (Norouzpour et al., 2025). Strategies include stacking tailings in lifts (compact horizontal layers)[2] to increase airflow, periodically disturbing the crust to prevent passivation[3], and leveraging freeze-thaw cycles in cold climates to expose fresh surfaces. Beyond climate benefits, carbonation can also reduce hazards in legacy asbestos tailings, although these opportunities are limited and require strict safety protocols.

Remaining Challenges

Carbonation kinetics vary with mineralogy. Serpentine and feldspar weather slowly compared with wollastonite or olivine. Climate and hydrology influence CO_2 ingress, and surface crusts can block diffusion. Addressing these issues requires site-specific planning and adaptive management. Integrating carbonation with mine closure plans and permitting frameworks can reduce liabilities and create revenue streams through carbon credits.[4]

Ultimately, tailings represent a practical pathway for carbon removal. With enhancements and credible MRV, they can evolve from environmental burdens into engineered carbon sinks, supporting both climate goals

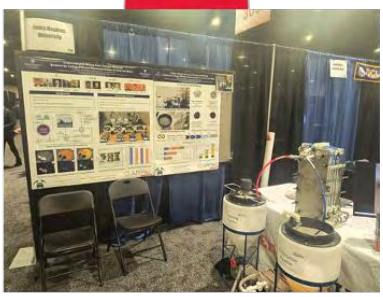
[2] In tailings management, a “lift” refers to a compact horizontal layer of material placed during stacking. While traditionally used for stability and drainage control, in the context of carbonation strategies, lifts can be arranged to maximize airflow and exposure to rainwater carrying carbonic acid, thereby accelerating mineral weathering.
[3] In mine tailings carbonation, “passivation” refers to the formation of a surface layer (often carbonate or silica-rich) that inhibits further CO_2 diffusion and mineral reaction. Periodic disturbance of this crust exposes fresh surfaces and sustains carbonation rates.
[4] A carbon credit is a tradable certificate representing one metric ton of greenhouse gas (GHG) emissions avoided or removed from the atmosphere. These credits are sold to companies or individuals to offset their own emissions.

1

Eco-friendly Mine Tailings Carbon Sequestration Through Hydrodynamic Cavitation

Partners: Exterra Carbon Solutions and Laval University

2



Carbon-Negative Mining from Gangue Minerals Enabled by Energy-Efficient Electrosynthesis of Acid and Base

Partners: Johns Hopkins University, EDAC Labs and Alaska Energy Metals

3

Refining And Benchmarking The Monitoring, Reporting And Verification (MRV) Methodologies For Enhanced Rock Weathering (ERW) In The Southwestern Ontario Context

Partners: UNDO Carbon, Canadian Wollastonite, Washington State University, Yale University

and social licenses.

From Mines to Fields: Why ERW Matters for Climate and Agriculture

ERW applies crushed silicate minerals to croplands, accelerating natural weathering and drawing down atmospheric CO_2 while improving soil health (Haque et al., 2023; Santos et al., 2023a). For mining, ERW is not just an agricultural practice—it is a strategic outlet for silicate residues, reducing stockpiles and creating revenue streams.

Ontario field trials with wollastonite have shown dual benefits: carbon sequestration and improved crop productivity. Globally, croplands could remove gigatonnes of CO_2 under favourable conditions and with sustainable supply chains. Practical deployment requires matching mineral type and particle size to soil conditions, leveraging existing liming equipment, and adopting MRV standards that balance rigour with feasibility. Emerging protocols from Puro.earth and Verra offer pathways for crediting removal.

Partnerships between mines and farmers can reduce transport emissions and unlock regional deployment, creating a win-win for food security and climate mitigation. Recent studies highlight co-benefits beyond carbon removal. Silicate amendments can supply nutrients such as calcium, magnesium, and silicon, which strengthen plant tissues. They can also partially replace conventional liming agents, reducing emissions associated with agricultural lime (Haque et al., 2023).

However, ERW faces uncertainties: weathering rates vary with soil pH and temperature, and the fate of bicarbonate versus carbonate remains debated[5] (Santos et al., 2023a). MRV remains a critical bottleneck. Should verification rely on soil water chemistry, solid-phase analysis, or modeling? (Santos et al., 2023a) argues for tiered approaches: simple protocols for conservative claims and advanced methods for higher credits. Without a credible MRV, ERW risks losing trust in carbon markets. However, complexity must not stall adoption; guideline-based practices could enable early deployment, whereas science refines verification.

ERW reduces stockpiles while generating carbon credits, and promises improved soil health and resilience. Aligning these interests through policy and market incentives can accelerate ERW from niche trials to mainstream practices.

Scaling Up: Innovation Meets Reality

To accelerate deployment and achieve gigaton-scale targets, process intensification offers a route where natural kinetics fall short. Using modular reactors and integrated flowsheets, these advanced methods aim to accelerate carbon capture dramatically—turning years into days—and unlock additional value streams (Khalid & Santos, 2025; Miah et al., 2025; Norouzpour et al., 2025; Santos et al., 2023b).

Mechanical activation, thermal pretreatment via waste heat, and chemical activation embedded in hydrometallurgical circuits[6] can transform tailings into carbonates while recovering critical metals. Recent investigations emphasize hybrid strategies:

[5] In ERW carbon accounting, the “bicarbonate assumption” presumes an idealized scenario wherein alkalinity remains dissolved and reaches the ocean, enabling long-term CO_2 storage. The “carbonate assumption” assumes precipitation of solid carbonates along the path to or in the ocean, which is more conservative and carries lower risk of overestimation. The actual pathways, transport rates, and fate remain subjects of ongoing investigation globally.
[6] Hydrometallurgical circuits are integrated systems of unit operations that use water/solvent-based solutions to extract and purify metals from ores, concentrates, or recycled materials.

mechanothermal and thermochemical activation can reduce energy barriers and improve dissolution rates. Microwave-assisted heating and pH-swing leaching show promise for lowering costs and enabling scalable deployment. These innovations show promise, but careful energy and reagent accounting are essential to ensure net-negative outcomes. Industrial symbiosis, such as sharing waste heat and alkaline residues, for example, in coupling mine carbonation with cement plant residues or steel slag streams, reduces costs and the carbon footprint through resource sharing.

These approaches can be integrated into existing mine infrastructure co-located with CO_2 sources to minimize transport emissions. However, scaling requires more than technology. It demands lifecycle discipline, i.e., low-carbon energy, minimized transport, and transparent accounting, to ensure net-negative outcomes. To this end, the MRV must evolve to capture complex flowsheets without imposing excessive burdens. Policy frameworks should reward conservative claims while enabling innovation, whereas carbon credit programs, procurement standards for carbonate products, and offtake agreements for coproducts can create market pull. Early pilots should target sites with favourable energy and water conditions, supported by clear permitting and stakeholder engagement. Containerized units for milling, leaching, and carbonation can reduce capital risk and accelerate learning.

In summary, collaboration among operators, equipment suppliers, and researchers is essential to move from concept to commercial reality.

Call-to-action

The mining sector must stop treating tailings as liabilities and start seeing them as climate assets by integrating carbonation into closure plans, piloting ERW partnerships, investing in modular intensification units, and aligning these actions with policy frameworks and carbon markets to accelerate adoption. Policymakers and industry leaders need to move quickly from pilots to full-scale deployment. Adaptable deployment systems, farmer partnerships, and transparent MRV can turn today's waste into future climate solutions.

Success will require bold commitments. Mining must treat tailings as climate assets by embedding carbonation in closure plans, scaling ERW partnerships, and piloting intensification technologies where they deliver net-negative outcomes. These pathways are not mutually exclusive; they form a portfolio that can deliver durable removals while creating economic and social co-benefits.

Mining for climate solutions is no longer a theoretical exercise. This is a practical imperative. The question is not whether we can afford to act but whether we can afford to wait.

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Circular Economy of Soil: The Case of Safe Reuse of Excess Soil for Pit and Quarry Rehabilitation in Ontario

S. Madeh Piryonesi, PhD, P.Eng.

The construction industry in Ontario is a massive engine of development, but it generates an equally massive amount of material often overlooked as a valuable resource: excess soil. To put this in perspective, in 2019, more than 25 million cubic meters of soil was excavated and moved during construction projects. Historically, this soil was often treated as a waste product, sometimes deposited without careful environmental consideration. However, in a push towards a more sustainable and resource-efficient future, Ontario is embracing the concept of a circular economy, which emphasizes maximizing the reuse of materials and minimizing their depreciation. Soil, being vital for food production, water filtration, and carbon transformation, is far more than just a construction material; its reuse is critical.

Serious efforts have been made to reuse soil in Ontario projects. The newly developed and implemented ***On-Site and Excess Soil Management regulation (O. Reg. 406/19)***, fully implemented in 2025, represents a significant shift. It mandates a more planned approach to soil management and places the primary responsibility for finding reuse opportunities on site owners. With disposal costs rising and known reuse sites becoming scarce, the industry needs a robust and safe framework for beneficial reuse.

This is where the often-overlooked pits and quarries of Ontario come into play. We have many pits and quarries, especially in the Greater Toronto and Hamilton Area, with over 5,000 active and approximately 8,000 inactive sites.

These sites represent a significant and viable for receiving and reusing excess soil, but there were

challenges that needed to be addressed first. Namely, the rules for soil quality are set by the **Ontario Ministry of Environment, Conservation and Parks (MECP)**, while the operation of pits and quarries is regulated by the **Ministry of Natural Resources and Forestry (MNRF)**, and more research was needed to confirm that MECP's soil and water standards work safely in pit and quarry environments.

To address these technical challenges and regulatory complexities, a dedicated project was undertaken by the **Ontario Society of Professional Engineers (OSPE)** with the support of the MECP and a steering committee composed of experts from different sectors, including members of the public. The goal was to develop a science-based, safe framework for using MECP's soil quality standards in the unique geo-environmental setting of pit and quarry rehabilitation.

Understanding the Geo-Environmental Challenge

While the MECP has established nine standard tables for assessing excess soil quality, these standards were primarily designed for typical construction and brownfield sites, not the complex conditions found in pits and quarries. The fundamental challenge lies in the difference between the traditional **Conceptual Site Model (CSM)** used for excess soil and the realities of a pit or quarry environment.

The standard MECP model for excess soil and brownfields considers various contaminant pathways (from soil to groundwater, and inhalation of soil vapours in indoor and outdoor air) to determine safe contaminant limits. The model assumes that the soil is placed *above* the water table[1] and is not in constant contact with groundwater.

However, in pit and quarry rehabilitation, a significant and unique challenge arises: the direct placement of soil below the water table or in constant contact with it. This is particularly relevant given that about 19% of Ontario's pits and quarries are situated below the water table. When large volumes of soil are submerged, the movement and distribution of chemicals within the groundwater are altered, introducing a new pathway that was not fully accounted for in the original generic standards.

Our team of engineers and researchers at OSPE identified this crucial difference and defined a new exposure pathway: **Saturated Soil to Groundwater (SS-GW)**. This pathway accounts for the movement of contaminants from the saturated soil layer through groundwater to human receptors (via drinking water), to indoor air (via vapour movement), and to aquatic receptors in nearby surface water.

Other critical factors in pits and quarries that can challenge the generic MECP assumptions include:

Aquifer Recharge Rate: The rate at which water replenishes the aquifer[2], which affects the dilution factor in leachate analysis[3], can vary significantly across Ontario and may differ from the rate used in generic standard calculations.

Hydraulic Conductivity: The rate at which water moves through the aquifer, assumed to be meters per second (m/s) in MECP standards, may be much higher in gravel pits or areas with fractured rock, creating preferential pathways for contaminant migration.

pH Levels: While soil pH is generally within the safe range for the generic standards, there is greater uncertainty regarding groundwater pH, which can significantly affect the mobility and toxicity of metals.

A Layer-Cake Framework for Safe Reuse

Recognizing these challenges, the project team proposed a safe, structured approach to excess soil reuse in pits and quarries, based on a "layer-cake" method. This method suggests using different sets of MECP soil quality standards for different layers of backfill, chosen based on the site-specific conditions and the depth of placement.

The standards are selected by a **Qualified Person (QP)** after considering key factors such as the final use of the site, whether the groundwater is potable, proximity to surface water, depth to bedrock, and the environmental sensitivity of the location.

[1] A water table is the upper surface of the zone underground where soil and rock are completely saturated with water, essentially marking the top of the groundwater.
[2] An aquifer is an underground layer of porous, water-saturated rock, sand, or gravel that can hold and transmit groundwater, acting as a natural underground reservoir that supplies water to wells, springs, and rivers.
[3] Leachate analysis is the scientific testing of liquid that has percolated through soil, waste, or other materials, like landfill garbage, to identify and measure dissolved or suspended contaminants (heavy metals, organics, etc.)

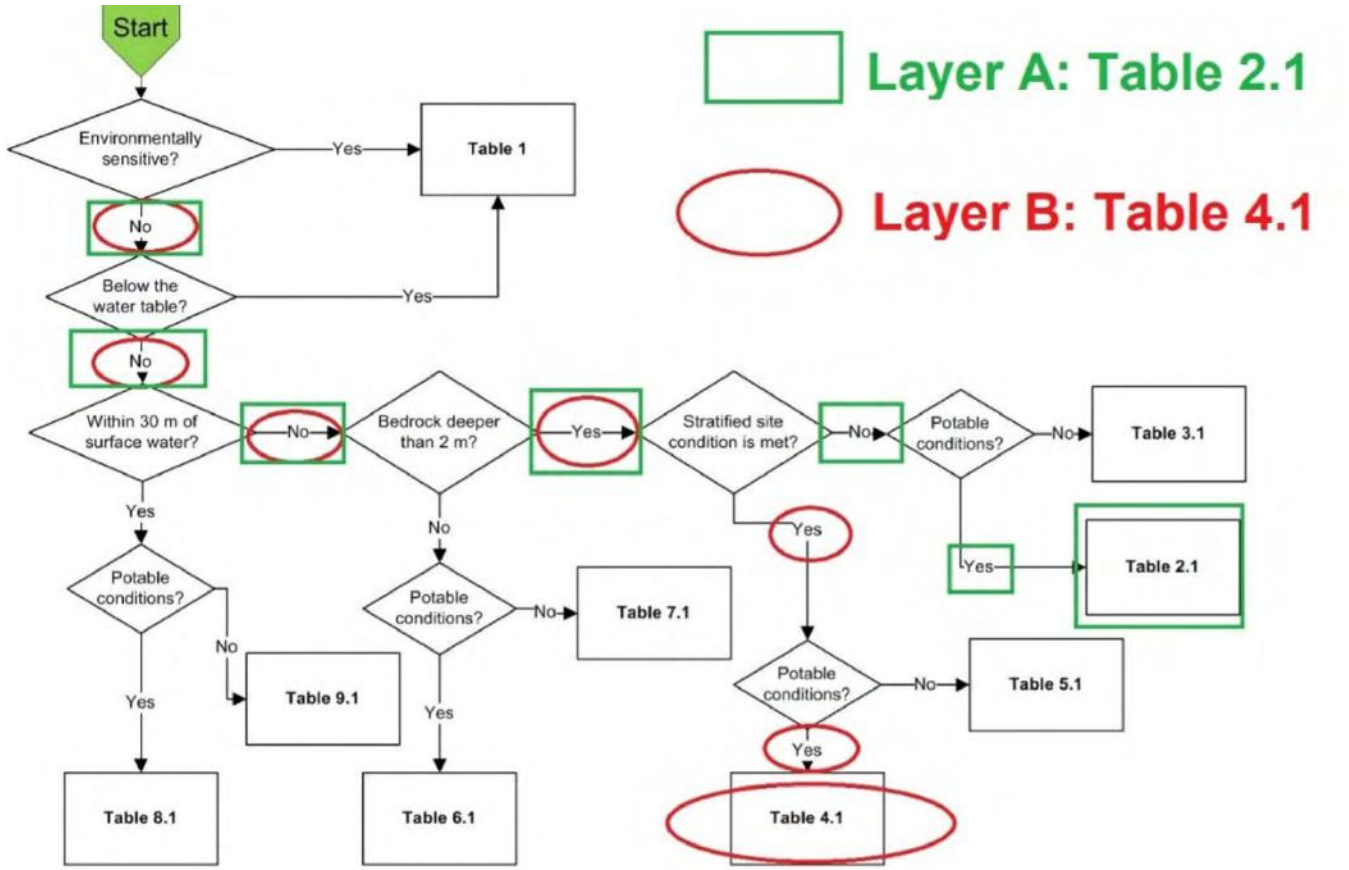

Figure 1: Example of using the flowchart.

Selecting the Right Standard

The framework prescribes MECP **Table 1** standards (which represent background condition standards) as the default reference standard. It is advocated for use in environmentally sensitive areas or for any soil placed below the water table, as it is the safest option due to the direct contact with groundwater (the SS-GW pathway).

For soil placed above the water table (i.e., at least 2 m above the predicted water table), other tables may be appropriate, assuming the soil will not be in constant contact with groundwater:

- Table 2.1 is appropriate for sites with potable groundwater conditions.
- Table 3.1 is suitable for sites with non-potable groundwater settings.
- Other tables (4.1, 5.1, 6.1, 7.1, 8.1, 9.1) may be applicable if specific stratified site conditions or proximity to surface water conditions are met.

The core of this framework is captured in a practical, easy-to-follow flowchart for QPs to determine the appropriate MECP standards for soil placement (for details, see the references). This flowchart serves as a critical tool, ensuring that decisions about soil quality are made systematically and conservatively, considering the unique hydrogeological features of the pit or quarry.

For example, for a pit located in Southern Ontario that is above the water table and in a potable water region, the layer-cake approach could involve using Table 2.1 for the top layer (Layer A, e.g., the top 1.5 m) and Table 4.1 for the deeper layer (Layer B, below 1.5 m). This approach balances the need for environmental protection with the goal of maximizing the beneficial reuse of excess soil.

Conclusion and the Path Forward

The successful rehabilitation of Ontario's numerous pits and quarries presents a major opportunity to realize a true circular economy of soil. By transforming excess soil from a costly waste problem into a valuable resource for site restoration, the construction industry can significantly reduce its environmental footprint, lower disposal costs, and contribute to the ecological recovery of aggregate sites.

This framework, developed by the Ontario Society of

Professional Engineers with the support and cooperation of the Ontario MECP and a cross-sector steering committee, provides the clear, technically sound guidance needed for this shift. By integrating the new SS-GW pathway into the conceptual model and accounting for the unique hydrogeological characteristics of pits and quarries, the approach ensures that beneficial reuse is done safely and sustainably.

The developed flowchart is a practical instrument for Qualified Persons, translating complex science and regulatory requirements into a step-by-step decision process. This project moves the industry beyond the perception of excess soil as waste and establishes a robust pathway for its reuse, demonstrating Ontario's leadership in sustainable resource management.

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Engineering for Environmental Equity: Flood Susceptibility and Inclusive Planning

by Naomi Williams, P.Eng.

Many marginalized communities are disproportionately exposed to flooding, as described in the Climate Institute's Flood Vulnerability and Climate Change publication. This article builds on previous OSPE communications to explore environmental equity as it relates to flood susceptibility. It considers why flood vulnerability is an equity issue, shares a case study of a mid-sized Ontario city, highlights available data and tools, and presents recommendations for engineers.

Reviewing Key Terms

For those less familiar with the topic of environmental equity, a quick explainer: **environmental equity** refers to the fair distribution of environmental burdens across communities, regardless of their diversity or social position. A related term, **environmental justice**, is the movement seeking to ensure fair and meaningful inclusion of affected peoples, and equal sharing of benefits and costs when making decisions about the environment. **Environmental racism** is when environmental decision-making, policies, and practices (intentionally or unintentionally) overly disadvantage some people due to their race. OSPE's previous advocacy post and Voice article explore these themes further.

Flood Vulnerability as an Equity Issue

Applying an environmental equity lens to flood vulnerability leads to questions such as, do disadvantaged communities experience disproportionate exposure to environmental hazards? Where are those communities are located? How do the risks manifest?

And what can be done to reduce those risks? In the case of flooding susceptibility, we can find answers such as:

- Research has demonstrated that certain vulnerable groups, including lone-parent households, Indigenous peoples, older adults, and economically insecure residents, are at a higher risk of flooding in Canada.

  An example of how these risks manifest is the 2021 catastrophic flooding affecting Indigenous communities in British Columbia (B.C.). Communities such as the Shackan Indian Band in the Interior of B.C. had been forcibly relocated onto the floodplains under the **Indian Act of 1876**, making them particularly vulnerable to such disasters.

- Improved flood risk transparency is insufficient, and transformative adaptation is needed to address these risks. While flood risk transparency includes practices such as mapping, disclosure, and pricing of flood risks to help communities avoid or mitigate damages, transformative adaptation includes removing inequities and unintended consequences for equity-deserving groups.

Case Study: Windsor, Ontario

Researchers from the **University of Waterloo** and **Public Safety Canada** undertook a case study of Windsor, Ontario to measure socioeconomic vulnerability to flood risk. The research relied on publicly available data, such as national maps and datasets of flood hazards (including both fluvial and pluvial flood risks), residential properties, and census information. The socioeconomic vulnerability of populations was calculated using census data for socioeconomic, racial/ethnic, and demographic variables, and the maps of residential flood exposure and socioeconomic vulnerability were combined to reveal correlations.

The research looked at both neighbourhood instability (lack of home ownership, high shelter costs relative to income, unemployment, etc.) as well as economic insecurity (lacking high school education, requiring social assistance, suffering from a physical disability, etc.). These indices were linked to demographic census data to determine whether historically marginalized or disadvantaged populations live in neighbourhoods with high levels of deprivation, in addition to hazard exposure.

Important equity findings resulted from the study. The research revealed that Black households in Windsor are disproportionately exposed to surface water (pluvial) flood risk compared other population subgroups considered in the study. Indigenous peoples, other visible minorities, and lone-parent households were also found to be highly exposed to pluvial flooding. Further, pluvial flood risk was found to be more significant in areas with higher neighbourhood instability and economic insecurity. The same correlations were not present for flooding risks from rivers (fluvial flood risk).

These study findings show the potential environmental injustice associated with flood risk in Windsor, and numerous policy implications for flood risk management result from this, such as:

- Better risk assessments can focus government policies on people and communities that would benefit most from flood risk reduction
- Flood risk communication and education campaigns should be targeted to reach the most vulnerable
- Beyond infrastructure and planning, flood risk can also be reduced through social programs that target the determinants of socioeconomic vulnerability, such as low income, unemployment, and high shelter costs

A Useful Tool

Engineering professionals seeking to better understand environmental equity considerations affecting their work may look to available tools and datasets to deepen their knowledge. An example of this is HealthyPlan.City, an online mapping tool that combines built environment datasets with demographic census data to present a picture of environmental equity across 129 Canadian cities (see figure 1). The tool explores the disproportionate impact of environmental benefits and harms on several vulnerable populations, such as low-income individuals, children, older adults, visible minority individuals, individuals living alone, and newly-arrived immigrants. There are 13 environmental data layers included in the map, such as air pollution, greenspace provision, average summer temperature, and flood susceptibility.

As an example: An engineer working on a stormwater planning project in Burlington, Ontario could explore equity in the city by navigating through the application, selecting “Burlington” as the city, “flood susceptibility” as the built environment indicator, and choosing from the range of vulnerable population groups. Looking at the data for newly-arrived immigrants, for example, reveals that 57% of newly-arrived immigrants in Burlington live in areas where additional resources targeting flood susceptibility could improve equity in the city. The equity priority map shows colour-coded areas where the percentage of vulnerable population is higher than the

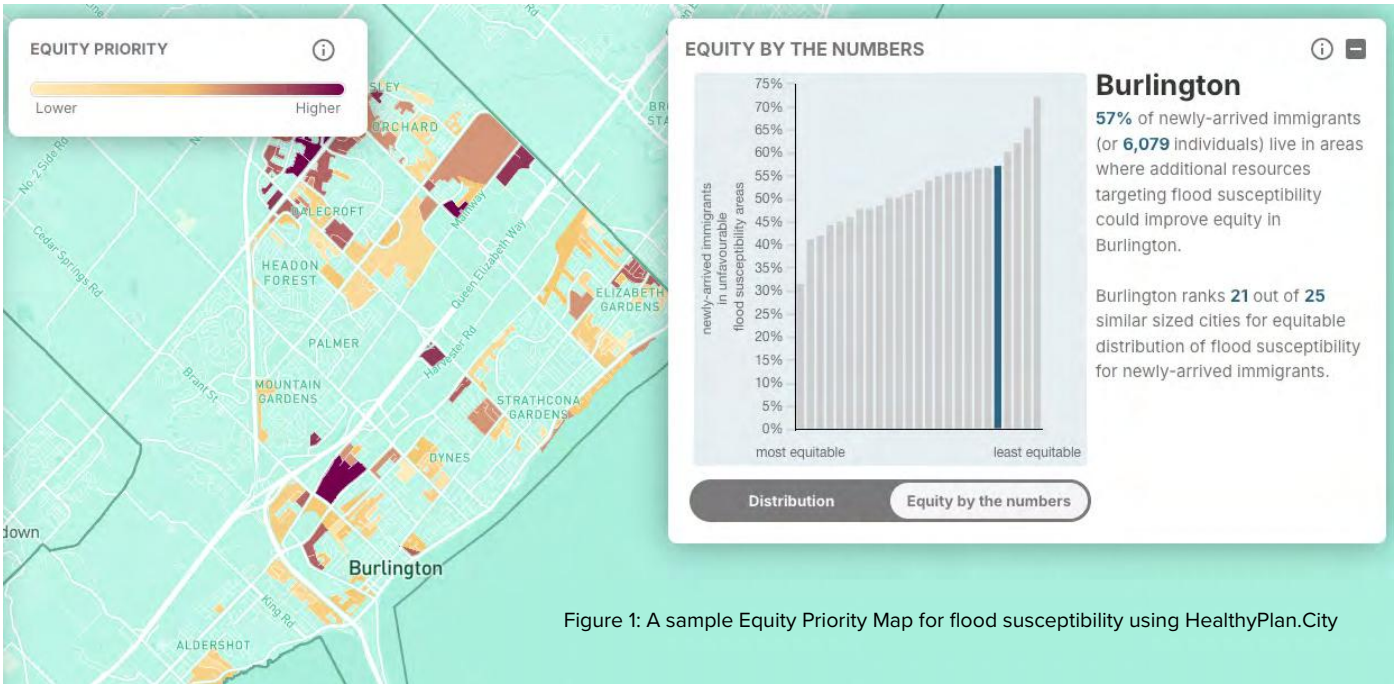

Figure 1: A sample Equity Priority Map for flood susceptibility using HealthyPlan.City

city median, and the level of beneficial built environment is lower than the city median. One can further view the data on a neighbourhood, scale, and learn which of the city's six wards are most equitable for that indicator.

Three Ways Engineers Can Respond

Flood risk assessment is an engineering issue, and engineers can play an important role to help ensure that resources targeting flood susceptibility also work to further improve equity. Further, engineers following the standard **Public Infrastructure Engineering Vulnerability Committee (PIEVC)** protocol can expand their work to consider how environmental equity themes may be applicable. Here are a few ways that engineers can take meaningful action:

1. **Expand the scope of data review and analysis:**
   - Use an equity lens to consider how vulnerable populations may be disproportionately susceptible to environmental hazards and explore publicly available data to gain important insights.
   - Expand flood risk assessments to include measures of socioeconomic vulnerability.
2. **Engage affected groups through meaningful consultation:**
   - Seek to ensure fair inclusion of affected peoples, such as by initiating a **Sustainable Neighbourhood Action Plan (SNAP)** offered through many conservation authorities.
   - Undertake collaborative floodplain mapping alongside a broad range of stakeholders, like in the example of floodplain mapping of Deshkan Ziibi in southern Ontario, co-developed by First Nations, conservation authorities, and community organizations.
3. **Explore project potential for multisolving:**
   - Collaborate with local groups to deliver multiple objectives with projects, increasing value and leveraging innovative funding.
   - Coordinate public and private realm actions, fostering delivery partnerships and innovation while realizing multiple co-benefits.

Conclusion

Flooding is not just an environmental hazard; it is a matter of equity. As the Windsor case study and broader research show, marginalized communities often face disproportionate exposure to flood risks. Engineers have a unique opportunity and responsibility to address these inequities through inclusive data analysis, meaningful community engagement, and multisolving approaches that deliver both technical and social value. By integrating environmental equity considerations into flood risk assessments and infrastructure planning, engineering professionals can help build safer, more resilient communities for all.

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The 6th Extinction: The Engineering Response

by OSPE's Climate Crisis Task Force

There have been six extinction events in natural history. The first five were caused by natural forces. The sixth extinction, which we are currently in, is caused by human activity.

Humankind's current evolution and presence on Earth dates back 11,700 years. After the Industrial Revolution, in the mid 18th to 19th centuries, our relationship with the earth changed. Our exploitation of resources grew exponentially and as humankind's population has grown, our use of land has become unsustainable.

Currently, 40% of all land has been converted for food production. Agriculture is responsible for 90% of global deforestation and 70% of the planet's freshwater use. These activities devastate local species by significantly altering their habitats. How our food is produced is one of the biggest threats to species' populations and our ecosystems.

These devastating effects are amplified as severe droughts, frequent and intense storms, and challenges with food production brought on by climate change stress species and create conditions that make natural habitats inhospitable.

The species extinction rate is estimated to be between 1,000 and 10,000 times higher than natural extinction rates. Extinctions are a normal part of the evolutionary process, but the current rate of species population decline, and extinction threatens the ecological functions that support human life on Earth.

The work of engineers has contributed to the conditions that led to these changes in climate and biodiversity loss. However, now is the time for our discipline to drive the habitat restoration efforts and ecological change needed to protect surviving species, for current and future generations.

Case Study: Civil Engineers and Salmon

Human development has altered watersheds through sediment buildup, temperature changes, and barriers like dams. These changes have resulted in a widespread decline in the salmon population in the Pacific Northwest.

In British Columbia and the Yukon, more than 70% of salmon species are below their long-term average. Declining salmon populations negatively impact aquatic and terrestrial ecosystems, Indigenous communities, and regional fisheries.

Civil and environmental engineers helped by integrating ecological priorities into infrastructure design and construction. Projects included watershed restoration planning, culvert replacements, and stream restoration to improve salmon passage.

After the implementation of these engineering solutions, reports on salmon populations have started to show signs of hope, Coho salmon from the Fraser River and Chinook from Vancouver Island and Mainland Inlets are now above their long-term average. Integrating these approaches also improved conditions for other species that rely on the region's connected waterways.

Salmon population recovery efforts give engineers the chance to support environmental and cultural resilience with engineering solutions.

Case Study: Chemical Engineers and Coral Reefs

Healthy coral reefs support high levels of biodiversity. Approximately 25% of all marine species are found in and around coral reefs. These reefs also protect coastlines by mitigating the impacts of storm surges, reducing flooding and erosion.

Ocean warming and land pollution has devastated coral reefs, and they are projected to decline by 99% at 2°C.

Chemical engineers and marine biologists from the **University of California San Diego** collaborated to create a protective gel for reefs that can increase coral larvae settlement by up to 20 times compared to untreated surfaces. The gel releases chemical cues to coral that a reef is safe for larvae to attach. With coral settlement, damaged reefs can once again become self-sustaining and reproduce.

Encouraging coral larvae to settle on reefs is a breakthrough in reef restoration efforts, exemplifying the transformative impacts of engineering solutions to protect marine biodiversity and benefit ecosystems.

Final Thoughts on the Sixth Extinction

As profit-fueled exploitation and excessive development continue, engineers should lead, implement, and get involved in mission-driven efforts to preserve and restore habitats and biodiversity.

This extinction would not exist if it were not for us as a species. Humankind is the only species on the planet that creates excessive infrastructure for more than just the basic needs of accommodation and sustenance.

If we do not drastically course correct, we will continue to lose life-sustaining biodiversity at an alarming rate. These losses will result in a planet less able to support current and future generations.

If the sixth extinction and other negative consequences of the climate crisis are of concern to you, consider joining the Climate Crisis Task Force. Email advocacy@ospe.on.ca to learn more.

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Closing the Resource Loop: Engineers Can Lead the Change

by Toronto and Area Road Building Association (TARBA)

Ontario is growing—fast. Our population continues to climb, and with it comes an urgent need to expand transportation networks, deliver more housing, and keep aging infrastructure in a state of good repair. Yet the math is getting harder.

Since 2020, inflation has pushed municipal construction costs up 25–30%, tightening capital budgets as the infrastructure gap widens. At the same time, our supply of close-to-market primary aggregates continues to dwindle, pushing materials ever farther from job sites and driving up both emissions and costs.

But there is another, often overlooked, source of construction material sitting right in front of us.

Every year, as we rebuild roads, repair bridges, and replace aging infrastructure, Ontario removes tens of millions of tonnes of asphalt and concrete—materials with enormous residual value. If not recycled, they head to landfills already projected to reach capacity in just over eight years. These discarded materials represent both a waste management crisis and an extraordinary missed opportunity.

The solution is not hypothetical. It's already here, quality proven, sustainable, and cost-effective: **Recycled Crushed Aggregates (RCA)**.

Engineers know the basics: asphalt and concrete are 100% recyclable. RCA is either reclaimed concrete and/or asphalt — crushed, screened, tested, and verified for use in new construction.

We also know the science: RCA performs as well as, and in many cases better than, primary aggregate for road bases and backfill, among other applications. It has already met performance standards once in its life;

now, with rigorous processing and quality control, it can do it again. When produced to OPSS 1010 specifications, RCA meets all durability, gradation, and performance criteria needed for municipal and provincial infrastructure.

So the real question is not whether RCA works. The question is: Why aren't we using more of it?

Ontario's Ministry of Transportation (MTO) has been using recycled aggregates for decades—and using them at scale. MTO uses 10–12 million tonnes of recycled content every year. In 2017, a 9-kilometre highway 400 expansion used 300,000 tonnes of RCA, saving taxpayers $1.2 million and delivering excellent pavement performance eight years later.

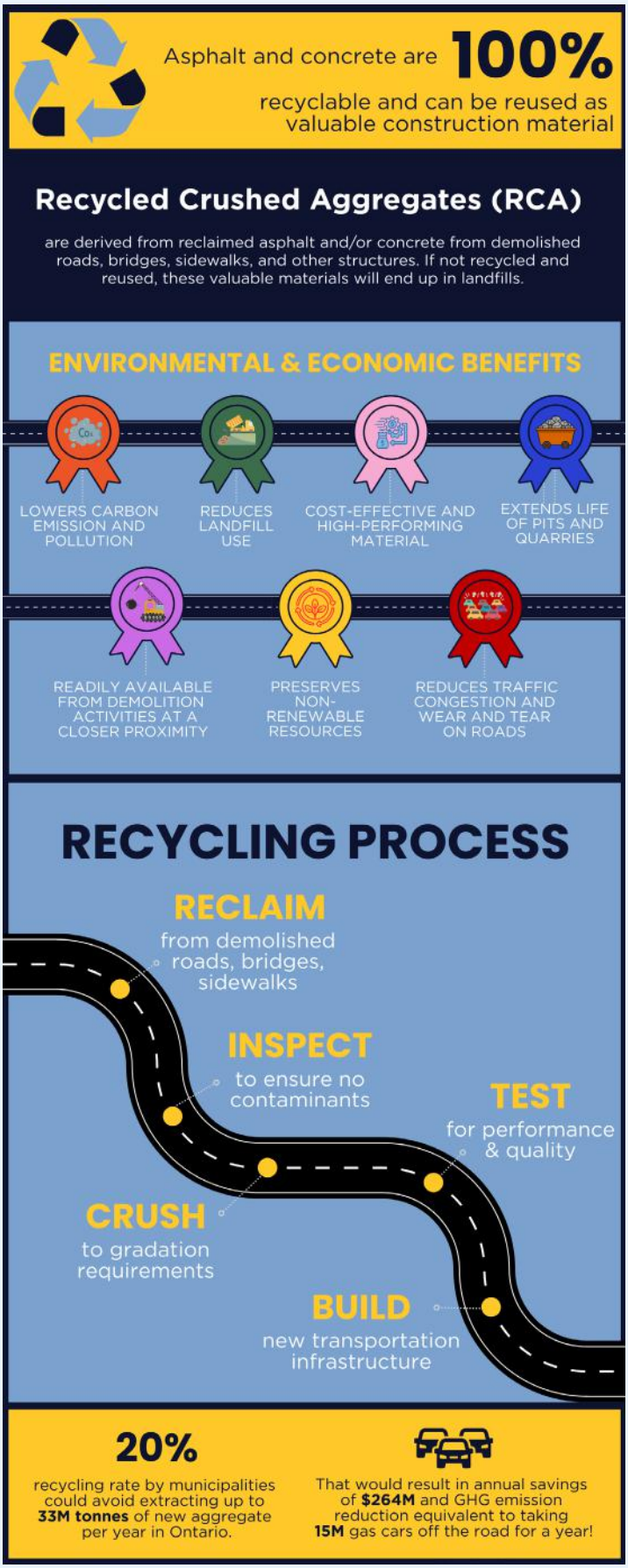
York Region used more than 250,000 tonnes of RCA on Yonge Street as part of the VivaNext transit corridor. Toronto Pearson Airport recycled 253,000 tonnes of Terminal 1 into its apron subbase.

Even small municipalities are proving its value: East Gwillimbury's 2021 Queensville subdivision used 88% recycled materials, saving $152,000 on a single project.

These results are not one-offs. They are repeatable, scalable, and backed by extensive research.

Transportation accounts for up to 60% of aggregate cost, meaning distance matters. EXP research found that RCA sources are often less than 10km to urban job sites, while primary aggregate pits average more than 60km. The result: lower project costs, fewer trucks on the road, and drastically reduced carbon emissions. In fact, if municipalities across Ontario adopted even a modest 20% recycling rate, the province could avoid extracting 33 million tonnes of primary aggregate annually—saving at least $264 million per year and avoiding emissions equivalent to taking 15 million gas cars off the road for a full year.

This is the kind of impact engineers dream of—evidence-based, measurable, and transformative. But municipal policy hasn't caught up. Despite OPSS 1010 allowing up to 100% recycled concrete and up to 30% RAP in road base, many municipalities still issue tenders requiring "primary aggregate only." Others maintain local standards that diverge from OPSS without data-driven justification, adding cost, fragmenting the market, and limiting innovation.



And yet the answer is straightforward: standardize, enforce quality, and collaborate.

Quality concerns can and should be addressed directly—through rigorous testing, stronger quality assurance, clear contractor performance management, and enforcement within the OPSS framework. The industry is ready to support municipalities with depot tours, pilot projects, shared data, and transparent quality control plans like TARBA's publicly available guidance at RCAontario.ca.

Ontario's engineers are central to both the low-carbon shift and closing the infrastructure deficit. We can accelerate change—or we can allow barriers to persist.

The case for action is simple:

- Specify RCA as allowed material in road, bridge, sewer, and subdivision tenders.
- Adopt OPSS 1010 consistently across municipalities.
- Require justification when recycled materials aren't used—not when they are.
- Build municipal capacity through industry partnerships, pilot projects, and shared testing protocols.

RCA is not the future—it's the present. Proven. Low-carbon. Cost-effective. High-performing.
The only thing missing is widespread adoption.

For a sector facing escalating costs, shrinking aggregate supply, climate commitments, and tight budgets, the question for engineers is no longer *"Why use RCA?"* It's: "Why aren't we using it everywhere we can?".

Now is the moment for Ontario's engineering community to lead—again.

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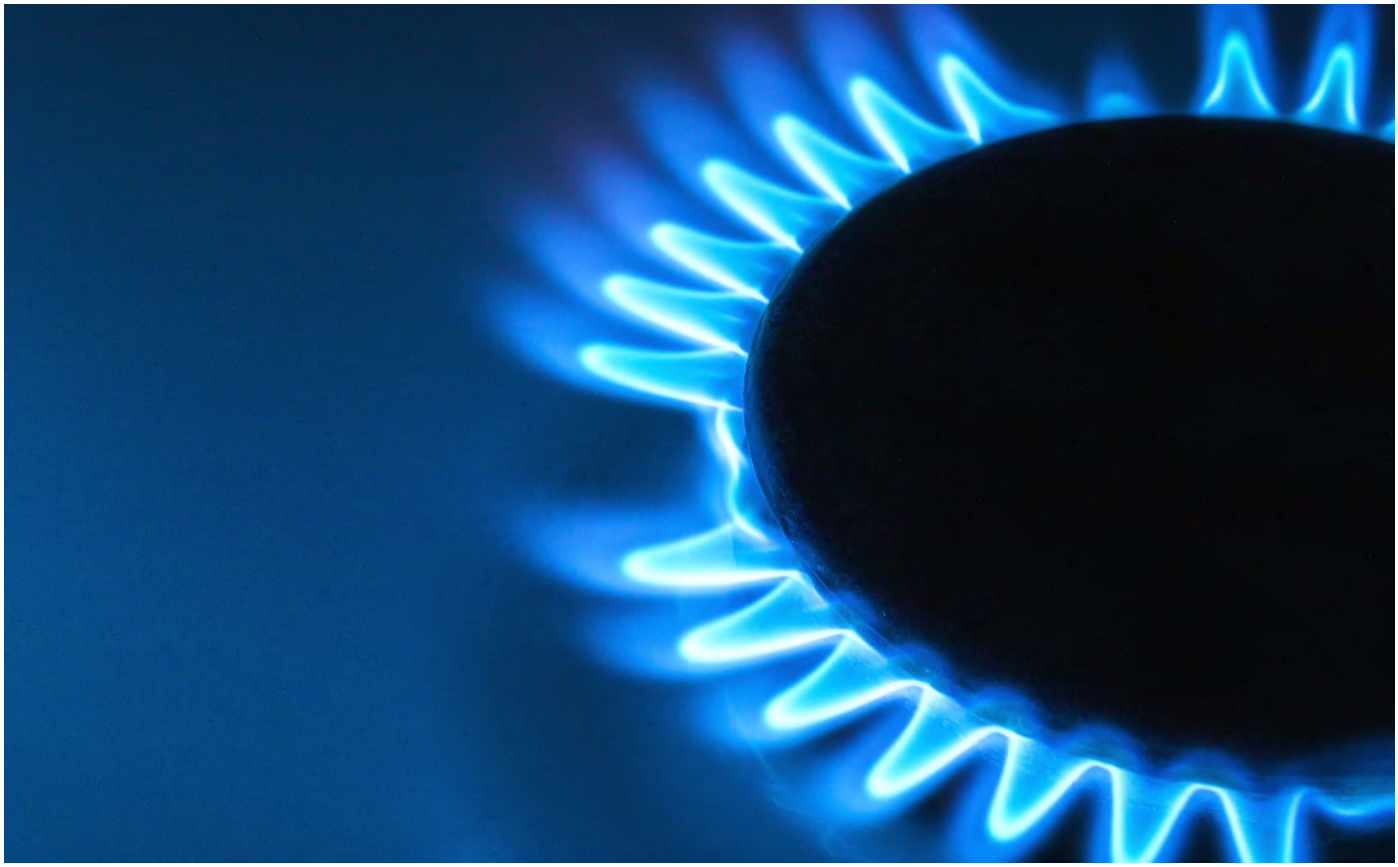
Hydrogen Blending with Natural Gas and the Impact on Existing Pipeline Infrastructure

by Mark Egbedeyi-Emmanuel. P.Eng., RGDP, C.Dir, CEM



As the world transitions towards a cleaner energy future, a sense of urgency has emerged among advocacy groups to make natural gas, a fossil fuel, greener.

Hydrogen fuel cells, which create electricity through an electrochemical reaction with oxygen, are classified as a non-toxic and non-poisonous fuel source. This technology has been adopted to reduce **Greenhouse Gas (GHG)** emissions, aiding in achieving global emission targets within the next two decades. Utilities providers have made changes to accomplish climate goals across various sectors such as residential, commercial, industrial, agriculture, transportation, and other areas where natural gas is used.

This topic holds significance for the **Ontario Society of Professional Engineers' (OSPE's) Energy Task Force**, especially considering the impact of blending hydrogen with natural gas on existing pipeline assets. This impact is crucial for developing long-term asset management plans and accurate budget forecasting for pipeline replacement and associated components. OSPE's can provide valuable knowledge based on industry experience to engineers, utilities, advocacy groups, government employees, regulators (TSSA, OEB), and political officials.

Despite the promise of hydrogen's clean, efficient, and zero-carbon properties, the use of existing gas pipelines for hydrogen-natural gas transportation raises concerns. Impurities such as HC4, high-pressure H2, H2S, and CO2, along with free water in pipelines, lead to high levels of corrosion and hydrogen embrittlement. The interaction of

corrosion and hydrogen embrittlement remains unclear and necessitates further experimental clarification. Failure mechanisms are particularly sensitive to three factors: H2S/CO2 partial pressure ratio, hydrogen blending ratio, and material strength, which collectively increase pipeline materials' susceptibility to corrosion and hydrogen embrittlement.

There is no scientific data indicating the impact of hydrogen blending on reducing the life span of existing pipelines, which typically have a useful life of 40-50 years. Without adequate data, proper asset management plans and macro budget forecasting become impracticable. Hydrogen, being highly corrosive, poses a risk to plastic, steel, and aluminum piping in the natural gas industry. While the concept of hydrogen blending is supported, the lack of reliable scientific data makes it challenging to fully understand its impact on current assets.

Hydrogen Embrittlement

Hydrogen embrittlement (HE), also known as hydrogen-assisted cracking or hydrogen-induced cracking (HIC), refers to the reduction in metal ductility due to absorbed hydrogen. Hydrogen atoms easily permeate solid metals, lowering the stress required for cracks to initiate and propagate, resulting in embrittlement.

Pilot Project

It is worth noting that a pilot project from Enbridge Gas Inc. in Markham, where hydrogen is blended with natural gas to supply gas to its customers, will ultimately provide very useful and accurate scientific data to the utility industry in Canada and around the world on the impact hydrogen blend into natural gas will have on existing assets.

This will allow for informed and adequate asset management planning and ensure budgeting is more accurate and reliable. No data has been provided by Enbridge since the project was initiated in 2019. Enbridge Gas is currently providing a blend of hydrogen and natural gas to 3,600 customers in Markham, Ontario as part of a pilot program to validate the reduction of carbon in our natural gas system.

Looking Ahead

A lot of inference has been made to the expected outcome of a study or pilot project to gather good data to demonstrate the rate of corrosiveness of the pipe, leading to hydrogen embrittlement of current assets that are expected to last for between 40 to 50 years based on manufacturers and industry specifications. There is no known impact on the percentage of hydrogen to natural gas blending on the outcome of embrittlement of the pipeline and its associated components. Organizations around the world have done a ratio of 100% hydrogen to 100% natural gas, some like Enbridge Gas Inc. have blended 2% hydrogen to 100% natural gas, while others have done various ratios of blending of both products. Industry experts have determined that whatever ratio of blending you use, it does not change the outcome of the level of corrosiveness on the pipelines.

It is worth noting that there are hydrogen pipelines in North America serving oil refinery operations, so data on 100% hydrogen used in oil refineries is also available. However, blending hydrogen into natural gas pipelines, which is the purpose of this paper, has limited research data, though there are ongoing studies. The impact on natural gas pipeline materials and elastomeric materials is fully unknown at this time.

Research has revealed that some areas in Europe blend up to 20 percent hydrogen, while Enbridge Gas is beginning with up to two percent by volume as a pilot project.

There has also been a lot of work done in Germany, where they have had systems in operations for several years.

Encouragement for Government Support on Hydrogen-Natural Gas Projects:

OSPE's Stand on Pilot Projects and Research Initiatives

Support for Pilot Projects

OSPE strongly encourages both the Federal and Provincial governments in Canada to support pilot projects similar to the endeavor embarked on by Enbridge Gas Inc. in Markham. This project aims to blend hydrogen with natural gas to supply gas to customers, and it is crucial for collecting invaluable scientific data to inform the utility industry about the impact of hydrogen blending on existing assets. Such data is essential for developing reliable asset management plans and ensuring accurate budgeting for the replacement of these assets after their useful life span of 40 to 50 years.

Research on Suitable Materials

Both levels of government can also support and encourage manufacturers to start researching and developing the types of steel, stainless steel, and plastic

pipes most suitable for transporting hydrogen-natural gas blended gas. This initiative will contribute to a zero-energy environment by mitigating the risks associated with hydrogen embrittlement and corrosion in current pipeline materials.

OSPE's Perspective on Hydrogen Utilization

In summary, government support for these pilot projects and research initiatives is vital for the advancement and sustainability of hydrogen-natural gas blending. By fostering innovation and encouraging scientific exploration, Canada can lead the way in creating efficient, reliable, and environmentally friendly energy solutions.

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Measuring the Value and Return on Investment (ROI) of CWB Certification

by Mark Fernandes, CET

In the June 2025 issue of The Voice Magazine, we compared a **Canadian Welding Board (CWB)**-certified organization to one that is not certified and identified many benefits of certification, including increased quality, reduced waste, and immediate short and long-term cost savings. Cultivating success by measuring the Value and **Return on Investment (ROI)** of CWB Certification programs is critical for currently certified organizations, as well as those considering a CWB Certification. However, most leaders frame CWB Certification as a compliance issue, treating it more as an abstract value rather than as a driver of performance.

While the initial costs associated with certification, including assessment, training, and documentation, may seem considerable, the long-term advantages often outweigh these expenses. This article offers a comprehensive overview of how organizations can analyze the costs involved, measure the Value and ROI, and accurately assess the impact, effectiveness, and long-term benefits of CWB Certification.

Understanding the CWB Certification Cost Factors

Several factors contribute to the cost of CWB Certification. Obtaining CWB Certification requires a notable investment of time, resources, and finances, as well as a commitment throughout the organization. The total cost of CWB Certification includes both external costs (certification fees) and internal implementation costs incurred by organizations for training and labour hours to meet the CWB Certification requirements. The following elements influence the total CWB Certification cost:

- The size of the business (number of welders).
- The number of plants where the organization

operates.

- The effectiveness of current processes and procedures.
- The number of welding procedures and welders.
- Qualifications of the welding supervisors and welding engineers.

CWB Certification is a multi-tiered process, with each stage incurring its own unique set of costs. The typical expenses associated with implementation, certification, and renewal are as follows:

Internal Implementation Costs

A notable portion of organizations' expenses for CWB Certification is attributed to the internal labour hours spent on welding procedures, welder qualifications, and establishing a **Quality Management System (QMS)**. Organizations will also need to consider the training and qualification costs for welders, welding supervisors and welding engineers (for Div 1 and 2). Additionally, labour hours will be spent in the following areas to prepare the organization for certification and continue to maintain compliance with the applicable **Canadian Standards Association (CSA)** standards. Considering these cost areas will help an organization to plan accordingly and allocate resources effectively. The following are the key areas where labour hours will be spent:

- Performing gap analyses as per the applicable CSA Standards for which CWB Certification is required.
- Maintaining welding records and reports.
- Ensuring welding equipment and auxiliary equipment are maintained in good repair and are adequate to produce the required welds.
- Maintaining weld quality and workmanship at the levels specified by the design or product standard.
- Addressing any non-conformities that arise.
- Implementing any necessary operational changes where required.

Internal labour and expenses for implementation will depend on the scope of certification.

External Costs (Certification fees)

The organization will cover the initial application fees to CWB, which administers the CSA structural standards and oversees the organization's audit and registration process. Achieving CWB Certification is just the beginning; maintaining it requires periodic surveillance audits. This involves a two-stage initial application fee, as well as annual renewal fees to maintain certification.

Additionally, there will be travel expenses for CWB **Customer Service Representatives (CSRs)**.

Calculating Total Costs

To achieve CWB certification, organizations need to make informed decisions and budget accordingly, considering the total cost incurred (internal cost + external cost). Understanding the different types of costs involved in CWB Certification will help organizations more accurately assess whether it aligns with their goals and budget constraints.

Calculating the ROI of CWB Certification

ROI is a measure used to determine the profitability of an investment. When an investment produces a positive ROI, it means it has generated more revenue than it costs to pursue. Conversely, a negative ROI indicates that the investment has not generated enough revenue to cover its costs. If the ROI is zero, it means that the revenue from the investment matches the expenses.

To calculate ROI, subtract the estimated costs from the estimated revenue to determine the total profit expected from the initial investment. Then, divide this number by the estimated costs using the following formula:

ROI = (Estimated Revenue - Estimated Costs) / Estimated Costs

There are two primary ways to calculate the organization's ROI. The first, straightforward way to determine the ROI is if CWB Certification is obtained to win a bid or a tender. It's easy to calculate the cost of investment versus the contract value received from having the CWB Certification. However, calculating the ROI can be less straightforward if it is decided to achieve CWB Certification for other reasons (i.e. continuously performing welding to CSA structural standards, improving delivery or producing high-quality welds).

The cost of CWB Certification is just one part of an organization's total operating expenses. If organizations understand financial valuation basics, they can assign a monetary value to the CWB Certification and assess the potential benefits before pursuing CWB Certification.

Let's analyze the example below to calculate the ROI that includes initial and maintenance certification costs for organizations that want to pursue CWB certification for other reasons.

External Cost: Annual initial certification and maintenance cost = **CAN $5,000**
Internal Cost: Labour hours and training cost = **CAN $20,000**

Total Cost: External + Internal = **CAN $25,000**

Annual Revenue

Let's assume with the CWB certification, the organization's **billing rate is $80 per hour** and the organization's **operation expense is $65 per hour**. Therefore, the organization's net **ROI is $15 per hour** (80 - 65 = 15)

Annual revenue generated from CWB certification: 15 dollars per hour × 1880 Hours = **$28,200**

ROI = Total Revenue - Total Costs ÷ Costs × 100
ROI = (28,200 - 25,000) ÷ 25,000 × 100 = 12.8%

In this example, we see and ROI of 12.8%. This indicates that for every $100 invested in CWB certification, the organization generates a return of $13 in revenue.

Total hours in a year = (number of hours worked per week × 52) - (number of days of paid time off + number of paid holidays) × number of hours worked per day. Based on average of 40 hour work week, 15 paid days off and 10 paid holidays. The total hours an employee works in a year is 1,880 (8 hours per day × 5 days a week × 52 days = 2080 - (15 + 10) = 25 paid holidays = 25 × 8 = 22 = 2080 - 200 = 1,880)

Using data from the example shown above, the CWB Certification five-year life cycle cost analysis is detailed in the table below (all values in Canadian dollars):

CWB Certification 5-Year Life Cycle Cost Analysis						
	Initial Certification	Certification Maintenance				
		1st year	2nd year	3rd year	4th year	5th year
External cost	3,000	2,000	2,000	2,000	2,000	2,000
Internal cost	20,000	12,000	10,000	8,000	8,000	8,000
Total cost	23,000	14,000	12,000	10,000	10,000	10,000
Annual Revenue	28,200	28,200	28,200	28,200	28,200	28,200
Return on Investment (ROI)	23%	101%	135%	182%	182%	182%

In this analysis, we observe that the ROI for initial certification is 23%. Over the next five years, this ROI increases significantly, ranging from 101% to 182%. This improvement is attributed to reductions in internal costs resulting from one-time expenses for the training and qualification of welding supervisors and welding engineers. Additionally, there are fewer internal labour hours required due to the implementation of quality management systems and welding procedures.

Value of Investment for CWB Certification

The cost of CWB Certification should not be viewed as an optional extra or as something that can be afforded only if there are funds available after covering all other business costs. Many organizations fail to realize that CWB Certification is a way for them to demonstrate and prove their quality and best practices to potential customers, as well as mitigate project risk.

The value of the investment for CWB Certification can be significant and should be considered as an intangible benefit that contributes greatly to an organization's performance. While the tangible benefits include compliance with standards and improved job prospects, the intangible benefits are just as important.

The intangible benefits noted below may not be easily measured in terms of direct financial return, and quantifying this ROI might be complex. Dismissing their significance would be a strategic misstep as they contribute significantly to the overall health, productivity, and long-term success of the organization.

Improved Brand Reputation

Organizations that are certified by the CWB are considered trustworthy partners and benefit from a positive brand reputation. This reflects their commitment to quality, safety, and stringent welding standards. The CWB is a respected institution in Canada and internationally, and certification from a recognized certification body strengthens an organization's standing within the industry.

Long-Term Organizational Stability

Organizations with CWB Certification are more likely to establish long-lasting relationships with clients due to their reliable reputation. Certification provides a competitive edge in the market, not just because of technical abilities, but also because of the commitment to ongoing excellence.

Increased Employee Confidence and Morale

Welders employed by a CWB-certified organization tend to feel more confident in their skills, as they know they meet a globally recognized standard. This results in better job satisfaction and personal pride in their work. Other employees within the organization feel more secure in their teams' capabilities, knowing they have qualified personnel capable of performing tasks to a high standard.

Enhanced Customer Trust (An Incalculable Return)

The CWB Certification is considered a quality seal that customers recognize as a guarantee of reliability and consistency. This strengthens customer confidence and enhances trust in the organization. CWB's independent

validation acts as an external, impartial third-party assessment of an organization's welding processes. The acceptance of supervisory and engineering personnel further strengthens trust in the reliability and consistency of the organization's work.

Conclusion

Assessing the Value and ROI of the CWB Certification program helps organizations determine if CWB Certification aligns with their goals and budgets. It also ensures that leadership can make informed decisions and provide the necessary resources to achieve CWB certification.

CWB Certification can pay for itself and provide an ROI through various tangible and intangible benefits. Although the upfront costs and effort to achieve CWB Certification can be notable, comparing this initial investment against the long-term and potential intangible benefits of enhanced customer trust, improved brand reputation, increased employee confidence and morale, long-term organizational stability, and competitive advantage makes the ROI impressive and provides a compelling case for pursuing CWB certification.

Organizations must ask themselves whether CWB Certification is worth it and whether they can afford to operate without the high-quality, stringent welding standards and credibility that CWB Certification provides. For organizations committed to long-term success, investing in the CWB Certification program is a strategic decision that yields multiple benefits at all levels, making it an essential component of a sustainable business strategy.

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Mark Fernandes can be contacted for any questions or comments on this article: Mark.Fernandes@cwbgroup.org | 780-809-2638 | 587-708-7092

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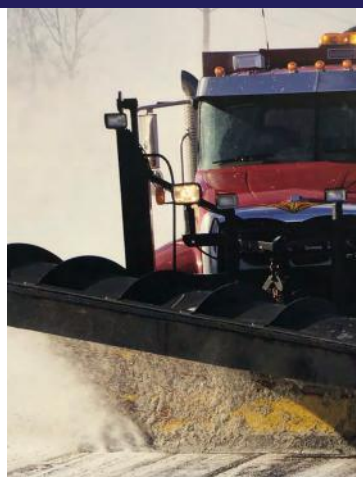

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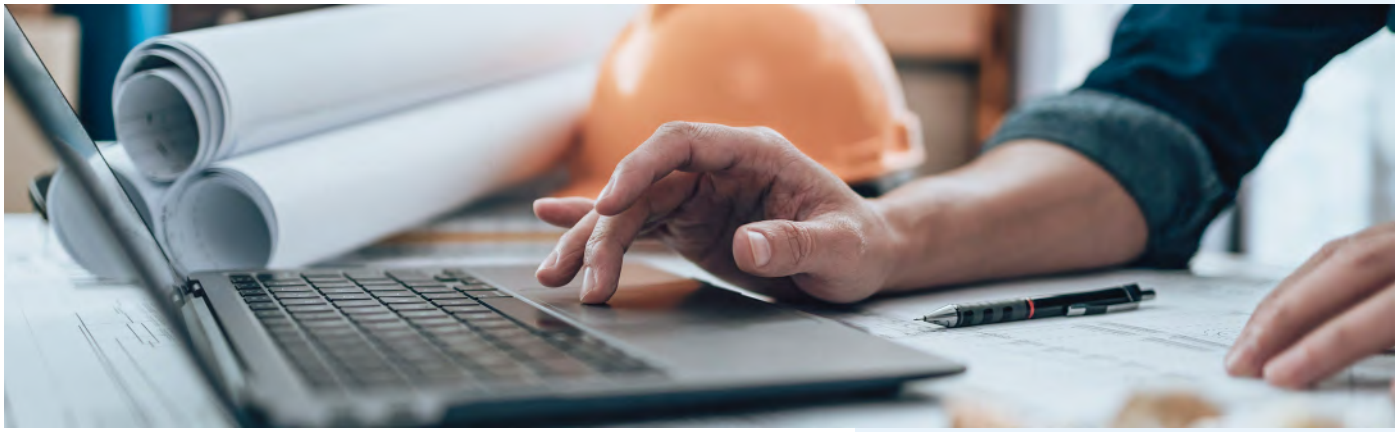
Advancing Engineering Excellence: Continuous Learning through Engagement with CSA Group

CSA Group



Engineering is a profession built on progress – progress in technology, safety, sustainability, and in the expertise of the professionals who design, build, and maintain the systems that shape our world. To keep pace with new technologies, evolving standards, and shifting societal needs, engineers must commit to **Continuing Professional Development (CPD)**, which is also required by professional associations, licensing, and regulating bodies.

As the year draws to a close, many engineers are reviewing their CPD activities to ensure they have met their annual goals. For those still looking for meaningful ways to earn CPD credits - while also contributing to the advancement of their profession, CSA Group offers a variety of valuable opportunities.

A Century of Standards, Safety, and Innovation

For more than 100 years, **CSA Group**'s Standards organization has been at the heart of engineering advancement in Canada. From the first **Canadian Electrical Code** to the standards that guide modern renewable energy systems and smart infrastructure, CSA Group has provided engineers with the guidance and tools needed to design and maintain systems that are safe, efficient, and trusted.

Engineers looking to fulfill their CPD requirements have the opportunity to do so through activities with CSA Group. Engaging with CSA Group in certain activities can count toward their professional development requirements.

How Engagement With CSA Group Can Help You Earn CPD Credits

Interactions and participation in activities with CSA Group represent an opportunity to strengthen professional knowledge and may qualify for earning CPD credits. Here are some examples:

- **Participating in standards development**
  CSA Group's standards development process depends on the collaboration of experts from diverse backgrounds – engineers, academics, industry representatives, regulators, and

consumers – who come together to set requirements that safeguard people, infrastructure, and the environment.

By volunteering on a **technical committee**, engineers can actively shape the standards that guide their industry. This work involves reviewing drafts, contributing technical expertise, and helping to build consensus around key issues. Participation in standards development may be recognized as a significant CPD activity, since it demonstrates leadership, collaboration, and deep engagement with evolving professional practices on the national and international levels.

- **Participating in CSA Group training**
  CSA Group's training programs are designed to help professionals understand and apply standards effectively in their work. These programs cover a wide range of topics – from electrical and mechanical safety to sustainability, infrastructure resilience, and occupational health. CSA Group's training programs can provide engineers with practical, applicable insights that can be immediately integrated into their projects, with the potential to earn CPD credits. For example, completing the **CSA Z462:24 Workplace Electrical Safety Online Training** can help enhance both technical proficiency and compliance awareness – two pillars of professional excellence.

- **Participating in the Research Advisory Committee**
  For engineers interested in influencing the future of their field, joining the **CSA Group Research Advisory Committee** is a unique opportunity. Members of this committee help identify research priorities that can help in future standards development. This type of participation not only contributes to the public good but also demonstrates leadership in advancing the engineering profession. It is often recognized as a high-value CPD activity – one that reflects both intellectual engagement and civic responsibility.

- **Reading standards, research, and public policy reports**
  Reading and applying CSA Group standards in day-to-day work is both a professional necessity and a recognized form of CPD. By reviewing relevant standards, engineers can directly expand their technical competence and understanding of current best practices. Documenting reviews and reflections on these standards can help accumulate CPD hours while implementing knowledge in projects, ensuring they remain compliant and innovative.

  Beyond standards, CSA Group research and public policy reports provide valuable insights into emerging trends and policy developments that influence engineering decision-making. Reading and engaging with these publications helps engineers stay informed about the broader context of their work and supports evidence-based practice. Recording this as self-directed learning is a straightforward way that can help earn CPD credits while expanding strategic awareness.

- **Participating in the Annual Member Conference**
  Each year, CSA Group hosts its **Annual Conference and Committee Week**, a conference for CSA Group volunteer members, bringing together technical experts, standards professionals, researchers, and industry leaders from across Canada and around the world. The conference features presentations on emerging technologies, sustainability initiatives, and new developments in standards and research. Attending the conference provides engineers with exposure to thought leadership, practical insights, and peer-to-peer networking – all of which may qualify as CPD activities.

Embedding Professional Growth Into Everyday Practice

Earning CPD credits does not require stepping away from day-to-day responsibilities. Many of the activities engineers already engage in – reviewing standards, attending training, contributing to technical committees, or reading new research – are powerful learning opportunities supporting both personal growth and the broader advancement of engineering practice in Canada. Engaging with recognized organizations, such as CSA Group, can help convert their activities into professional development credits.

Visit CSA Group's Professional Development Credits web page to explore opportunities to engage and earn CPD credits before the year ends. Continuous learning isn't just a requirement – it is the foundation of engineering excellence.

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The Role of Phosphorus in Cyanobacteria Blooms—and Emerging Treatment Solutions

Clearflow Group Inc. (Canada)

Phosphorus is one of the most influential nutrients driving the growth of cyanobacteria, often called blue-green algae. While naturally present in soils and aquatic systems, unnatural phosphorus loads from agricultural fertilizers, disturbed soils, and stormwater runoff create conditions where cyanobacteria proliferate rapidly. These blooms can release toxins harmful to drinking water supplies, aquatic life, and animal health, while also depleting oxygen in lakes and rivers through eutrophication.

In land drainage and water management systems, phosphorus mobilizes easily. When fine sediments are carried by runoff into ditches, ponds, and rivers, phosphorus attached to soil particles is released into the water column. Because phosphorus is typically the limiting nutrient in freshwater environments, even small increases can trigger significant ecological impacts.

The challenge for engineers and regulators is twofold: to limit phosphorus migration at its source, and to remove suspended solids already present in stormwater before they discharge downstream. Both strategies are needed to prevent the costly cycle of nutrient loading, algal bloom formation, and subsequent water quality decline.

Controlling Soil Migration with Clearflow Ultrabind

Clearflow's Ultrabind is designed to stabilize exposed soils and prevent the migration of fine particles that carry bound phosphorus. Unlike traditional soil tackifiers, Ultrabind works by chemically binding soil particles into a cohesive matrix. This reduces erosion on construction sites, roadworks, and along drainage channels, limiting the amount of sediment—and thus phosphorus—that enters receiving waters.

The value of Ultrabind lies in proactive prevention. By reducing soil movement at the source, engineers can substantially reduce the nutrient loading risk before runoff occurs. This is particularly important in areas with sensitive downstream ecosystems or where regulatory phosphorus thresholds are tightening.
Agricultural applications further highlight the importance of soil stabilization. Much of the phosphorus that drives cyanobacterial blooms is carried on eroded soil particles; stabilizing those particles at the field edge prevents them from ever reaching waterways. Ultrabind applies this principle in agricultural margins and disturbed soils, binding fine sediments and preserving valuable topsoil. In doing so, it both conserves agricultural productivity and reduces nutrient loading downstream. By combining Ultrabind with gel flocculants in runoff treatment systems, engineers can design an integrated solution—reducing soil loss in the field and capturing what might escapes during large runoff events.

Clearflow Gel Flocculants for Treating Suspended Solids

Even with soil stabilization in place, stormwater systems can still carry fine suspended particles — these contribute not only to turbidity and contaminant transport, but are a major vector for phosphorus that fuels harmful cyanobacterial blooms. Traditional chemical dosing approaches often require pumps, tanks, power, and trained operators, making them impractical for remote or variable-flow situations.

Clearflow Gel Flocculants offer a passive, reliable alternative. Installed in solid block or reactor formats, the gel slowly dissolves as water flows past, releasing a calibrated dosage of flocculant. This causes fine, colloidal particles to bind into larger aggregates, which either settle naturally or are caught in downstream filtration or sedimentation systems.

Independent validation from the Town of Innisfil, Ontario (via an Advanced Sedimentation Technologies pilot), demonstrates strong performance: an average of 90% phosphorus reduction was achieved across three Stormwater Management Facilities (SWMFs). In the same pilot project, Total Suspended Solids (TSS) were also significantly reduced — in some high-flow/extreme events, removal reached ~74% for fine sediments leaving the ponds.

The benefits for stormwater and land-drainage engineering are compelling:

- Substantial nutrient load reduction: With both P and TSS removed, risk of algal blooms and downstream ecological harm is dramatically lowered.
- Operational simplicity: No external power source, no complex dosing systems; Clearflow Gel Flocculants are self-dosing and largely maintenance-free.
- Adaptability: Works in conjunction with forebays, filter bags, channels, or as upgrades to existing SWMFs.
- Environmental compatibility: Tested formulations meet regulatory water quality standards with minimal aquatic toxicity.

By combining the proactive soil stabilization offered by Ultrabind with the passive treatment capacity of Clearflow Gel Flocculants, engineers obtain a dual-layer strategy: reduce phosphorus release at the source, and treat what enters the runoff. This approach not only helps meet tightening regulatory limits but also protects aquatic ecosystems and drinking water supplies from the cascading impacts of eutrophication and harmful algal blooms.

Clearflow Group Inc. (Canada)
Corporate Office: Sherwood Park, Alberta, Canada
Phone: +1 (780) 410-1403
Email: sales@clearflowgroup.com
Website: www.clearflowgroup.com

Reduce Your Risk of Frivolous Claims

Corestone Law

In today's dynamic business environment, engineering firms face the constant threat of legal claims, even in the absence of any wrongdoing. These claims can be, not only financially burdensome, but also detrimental to reputation and business operations. However, by implementing preventative measures and understanding potential areas of vulnerability, you can safeguard your firm against frivolous allegations and navigate legal challenges with confidence.

Activities that can lead to a civil claim:

Professional Services

- Incomplete documentation
- Advice for repair, refurbishing, or renovation
- Disputes related to the scope of service, end outcome, or deliverables
- Errors in your report or ambiguous reports
- An oversight while drafting or reviewing drawings
- Professional reviews of procedures
- Faulty design resulting in damage, bodily harm, or the requirement for reconstruction
- Issues developed after construction: mold, water entry, inherent vice, insufficient fire protection

General Operations

- Supervision
- Libel and slander of a competitor
- Loss of client documents
- An oversight during an onsite inspection, assessment, or investigation
- A breach of contractual obligations

- Vicarious liability (being held liable for a sub consultant's work)
- Training provided to others
- Project delays

Breach of Regulations

- Breach of privacy
- Designs that do not meet code
- A complaint made to Professional Engineers Ontario (PEO)
- Accusation of a criminal act

Field Work

- Injury to a third party
- Failure of prototypes or products
- Project management – at risk (budget, overseeing trades, etc.)
- Damage to client equipment or facility
- Liability as a tenant

Preventative measures to minimize legal risks:

Establish Clear Contractual Agreements: Ensure that all projects are governed by comprehensive written contracts that clearly define the scope of services, responsibilities, and expectations of both parties. Beware of indemnification clauses that may expose you to additional liability.

Prioritize Staffing: Your team is the cornerstone of your business. Conduct thorough background checks and hire personnel who are qualified, ethical, and reputable. Regularly review the work of junior staff and provide ongoing training and mentorship.

Stay Informed about Industry Trends and Regulations: Keep abreast of changes in legislation and industry standards that may affect your business operations. Maintain active memberships in professional organizations like the Ontario Society of Professional Engineers (OSPE) to access valuable resources and networking opportunities.

Documentation is Key: Maintain meticulous records throughout all stages of your projects, including correspondence, meeting minutes, and emails. A well-documented file can serve as invaluable evidence in the event of a legal dispute.

Invest in Insurance: Ensure that your firm has adequate insurance coverage to protect against potential claims. Consult with an experienced insurance broker to assess your coverage needs and mitigate financial risks.

Specialize Wisely: Acknowledge your areas of expertise and limitations when accepting new projects. Avoid taking on work that falls outside your realm of experience and consider partnering with specialized sub-consultants when necessary.

Choose Clients Carefully: Establish partnerships with clients who are known for their ethical conduct and financial stability. Maintain open lines of communication to address any concerns or issues promptly.

Manage Expectations: Clearly define the scope of your services and manage client expectations throughout the project lifecycle. Encourage honest and transparent communication to prevent misunderstandings.

In the event of a claim:

If faced with a formal legal claim or regulatory complaint, follow these guidelines to protect your interests and ensure the best possible outcome:

- Refrain from admitting liability or altering records.
- Report the claim to your insurer promptly and seek guidance from legal counsel.
- Utilize resources such as OSPE and your insurance broker for support and guidance throughout the claims process.

By taking proactive measures to mitigate legal risks and navigate potential challenges effectively, your engineering firm can operate with confidence and resilience in today's complex business landscape.

Corestone Law
Corporate Office: Toronto, Ontario, Canada
Phone: (416) 591-2222
Email: info@corestone.ca
Website: www.corestone.ca

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. **In this issue, we're celebrating the inaugural moments of OSPE's flagship events.**

2015

OSPE Hosts its First Ontario Professional Engineers Awards

In 2015, OSPE co-hosted the 68th annual Ontario Professional Engineers Awards (OPEA) Gala. Held at the International Centre in Toronto, the gala celebrated Ontario's most exceptional engineers, with a special focus on those driving environmental sustainability across the province.

The evening featured keynote speaker, the Honourable Glen Murray, then Minister of the Environment and Climate Change, whose insights underscored the importance of engineering leadership in building a sustainable future.

2021

OSPE Hosts its Inaugural Engineering Conference

OSPE proudly hosted The Future of Engineering virtual conference, the largest event of its kind in Canada. Over two days, more than 2,000 attendees from government, industry, and academia came together for technical presentations, panel discussions, and networking with over 60 leading employers.

The conference explored critical themes shaping the profession, from artificial intelligence and sustainability to workforce development and equity, diversity, and inclusion. A keynote address by Canadian icon and Dragon's Den star Arlene Dickinson highlighted the spirit of innovation and resilience that defines Ontario's engineering community.

Explore OSPE's Career Services Portal

EngWork By OSPE

No matter your background, industry or stage of your career, OSPE has the resources you need in your job search.

Engineering Employment Events

At OSPE's Engineering Employment Events, network face-to-face with top engineering employers looking for talent like yours.

You can cut through the noise of online applications and meet directly with companies looking to hire engineers across a variety of sectors.

Learn more

Career Centre

The OSPE Career Centre is the premier resource for both engineers looking to find a job and advance their careers and for employers looking to fill engineering roles.

Through OSPE's Career Centre, you can learn about networking opportunities, get professional advice, or simply check out the job board for the latest opportunities.

Learn more

Career Coaching

OSPE has partnered with CareerCycles to offer members one-on-one professional career coaching.

Learn more

Engineers4Hire

Engineers4Hire secures valuable engineering and STEM talent for the business community

With over 40 years of talent search and retention experience, along with their strategic collaboration with OSPE, Engineers4Hire provides a one-of-a-kind solution for businesses in need of talent and candidates seeking rich work opportunities.

Learn more

New! OSPE's EngTalks Events

EngTalks By OSPE

OSPE is excited to introduce our new **EngTalks** event series. These sector specific special events will be a combination of thought leadership and learning, providing the engineering community with opportunities to connect and share on the topics that are shaping the industry.

AI & the Future of Engineering

March 25, 2026 | Waterloo

Artificial intelligence takes on many forms and needs to be understood, managed and appreciated to be used effectively. This one-day learning event will explore the opportunities and risks associated with this emerging technology, a must for those throughout the engineering community from design, implementation, management and development.

Engineering the Transition – Building Ontario's Net-Zero Future

May 2026 | Ottawa

A Net-Zero future is an aspirational target, requiring commitments across many sectors. This one-day learning event brings together representatives from the engineering, engineering, infrastructure and construction sectors, focusing on what needs to be done today and tomorrow to move toward a Net-Zero future.

Positioning Engineers as Leaders of Innovation & Design Thinking

September 2026 | Toronto

The role of the engineer is more multi-faceted than ever. Engineers have the responsibility to do more than just problem solve, they innovate, using new technologies and technique that drive our economy and ensure the smart growth of our communities.

Land Drainage Conference 2026

October 2026 | Guelph

The Ontario Land Drainage Conference is an annual event bringing together Ontario's leading drainage engineers, municipal professionals and industry experts for two days of networking and collaboration.

OSPE's Upcoming Events

MAR

Engineering Employment Event

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

GTA, ON

MAR 25

All Candidates Virtual Town Hall Meeting

Meet your 2026 Board of Directors candidates and make an informed choice in this year's election. Access is limited to current OSPE members.

Virtual

MAY 06

Annual General Meeting

Members and guests who attended the meeting got a chance to celebrate OSPE's advocacy wins of 2025, recognize incoming and outgoing Board Directors, and conduct official OSPE business.

Virtual

JUN 4

OSPE Classic Golf Tournament

Relax, mix and mingle with Ontario's engineering community and industry stakeholders over golf and dinner. A portion of all proceeds go to the Ontario Professional Engineers Foundation for Education, which helps engineering students design the world of tomorrow!

Angus Glen Golf Club, Markham, ON

Land Drainage Conference 2025

On October 16 - 17, 2025, the **Ontario Society of Professional Engineers (OSPE)** hosted its first **Land Drainage Conference** in Guelph, ON. The conference explored the topics developed throughout the year by OSPE's Land Drainage Committee. Attendees enjoyed lively discussions, engaging presentations, and relevant case studies.

Land Drainage Committee Chair Jeremy Taylor, P. Eng, giving the welcoming remarks at the Land Drainage Conference 2025 in Guelph, ON.

A conference attendee asks a question during a presentation's Q&A.

Conference attendees participate in a group discussion portion of Pierre Lebel's session "Leadership and Communication".

Paul Marsh, P. Eng., giving his presentation "Case Study: Wignell Drain: To Pump or Not to Pump?"

James Bryant, P.Eng., (right) networks with a conference attendee during a break.

A conference attendee asks a question during a presentation's Q&A.

Conference attendees gather for a scheduled meal break.

Conference attendees listen closely to Tony Peralta's, P. Eng., session "Case Study: Full Circle: From Wetland to Farmland and Back Again Through the Drainage Act."

The Delta Hotel in Guelph conference room filled with delegates attending The Land Drainage Conference 2025.

Thank you to our partners!

ADS Our reason is water.™ armtec AIL Atlantic Industries Limited CLEARFLOW Group Inc. EKHO INFRASTRUCTURE SOLUTIONS

HUBB CAP MACCAFERRI TERRALYNX AERIAL INSIGHTS. CLEAR RESULTS. WOLSELEY

EngCon 2025

On November 3 - 4, 2025, the **Ontario Society of Professional Engineers (OSPE)** hosted the 8th **Engineering Conference** in The Blue Mountains, ON. This conference was marked by two days of engaging sessions, a vibrant trade show floor, and a community of engineers, excited to gather and discuss today's most pressing engineering challenges.

OSPE CEO Sandro Perruzza giving the welcoming remarks at The Engineering Conference 2025 in The Blue Mountains, ON.

EngCon 2025 attendees enjoying time to connect with peers over breakfast.

From left to right: Aaron Pereira, Sumeet Bhatia, and Dr. Peter Carr, P.Eng., on the panel "Preparing Engineers and Organizations for AI Integration," at EngCon 2025.

EngCon 2025 attendees socializing with their peers during a networking break.

Crozier representatives speaking with EngCon 2025 attendees during the conference trade show.

From left to right: LCdr Marie-Sonya Sowa, Dr. Emily Moore, P.Eng., and Inga Hipsz, P.Eng. on the panel, "Beyond the Paycheque: Why Purpose, Culture, and Growth Matter Most," at EngCon 2025.

OSPE CEO Sandro Perruzza (middle left), with OSPE staff and volunteers at EngCon 2025.

EngCon 2025 attendees listening to a plenary session on day 2 of the conference.

EngCon 2025 attendees speaking with representatives from the University of Guelph during the conference trade show.

Travis Gibson, P.Eng., an EngCon speaker from Crozier, asking a question during the Q&A portion of a plenary session on day 2 of the conference.

A breakout session on day 1 of the conference.

Thank you to our partners!

Join us at #NEM2026

- 1300+ Registrants
- 4 Weeks
- 100+ Speakers & Experts
- 50+ Partners
- 40+ Events

Join thousands of the brightest engineering minds in March for **National Engineering Month (NEM Ontario)** events.

Dive into a month of premium engineering content featuring panel discussions, skill-building workshops, and networking opportunities. These events, led by the engineering community, are designed to inspire and help you maximize your engineering career.

Discover new perspective and gain valuable tools to shape your future in engineering. Don't miss out on this incredible opportunity to learn, thrive, and grow together.

Learn more: nemontario.ca

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

national ENGINEERING MONTH
Engineers Open Doors.

OPEA 2025

On November 14, members of Ontario's engineering community came together in Vaughan, ON to celebrate engineering excellence at the **Ontario Professional Engineers Awards Gala**. Between the awardees, family, friends, and colleagues, about 300 people attended the prestigious event.

To view winner videos please click **here**.

OSPE Chair, David Carnegie, P.Eng., addressing the attendees of the 2025 Ontario Professional Engineers Awards (OPEA) Gala in Vaughan, ON.

Award Recipients

Professional Engineers Gold Medal
Dr. Jing Jiang, P.Eng.

Citizenship Award
Mark Salsberg, P.Eng.

Engineering Achievement of the Year
Camp Engies | Cassondra Fonseca, P.Eng.

Engineering Medal – Engineering Excellence in Industry
Michael Branch, P.Eng.

Engineering Medal – Management
Dr. Emily Moore, P.Eng.

Engineering Medal – Entrepreneurship
Dr. Parsin Haji Reza, P.Eng.
Nancy Hill, P.Eng.

Engineering Medal – Research and Development
Dr. Farrokh Janabi-Sharifi, P.Eng.
Dr. Joshua A. Marshall, P.Eng.
Dr. Heidi-Lynn Ploeg, P.Eng.

Distinguished Lifetime Achievement Award
Michael Monette, P.Eng.

OPEA Award Recipients Emily Moore, P.Eng. (left), Michael Branch, P.Eng. (second from the right) and their guests at the 2025 OPEA Gala Cocktail Reception.

2025 OPEA Gala attendees mingling before the start of the awards ceremony.

Attendees at the 2025 OPEA Gala.

Chair of the OSPE Awards Committee, Kadra Branker, P.Eng. (left) and Project of the Year Award winner, Cassondra Fonseca, P.Eng. (right).

All the 2025 Ontario Professional Engineers Award Recipients and OSPE Chair, Dave Carnegie, P.Eng. at the 2025 Ontario Professional Engineers Awards Gala in Vaughan, ON.

Back row, left to right: Alexander Dow, P.Eng., Dr. Shaun Ghafari, P.Eng., Michael Pathak, P.Eng., Bobby Umar, P.Eng., and Sandro Perruzza. Front row, left to right: David Carnegie, P.Eng., Dr. Jing Jiang, P.Eng., Dr. Chao Zhang, P.Eng., and Kadra Branker, P.Eng. at the 2025 OPEA Gala.

Dr. Parsin Haji Reza,P.Eng., recipient of The Engineering Medal - Entrepreneurship giving a thank you speech at the 2025 OPEA Gala.

Thank you to our partners!

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Cost Engineering - Effective Estimating and Cost Control of Engineering and Construction Projects
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NEW WEBINAR
Understanding AI Data and Statistical Calculations
February 20, 2026 // 12:00PM

Register Now

NEW COURSE
Mechatronics
Mar 23-24, 2026 // 14 CPD Hours

Register Now

Structural Engineering for Non-Structural Engineers
Apr 13-16, 2026 // 28 CPD Hours

Register Now

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- General Skills

*Discount is applied to the advertised course fee and may not be used in conjunction with any other discount. It may not be combined with other coupons, promotions, or group discounts. If the group discount value is greater than the discount code value, you may receive the group discount instead. This discount does not apply to Partner Courses, Onsite Training, or the Technical Exam Preparation Program. Promo code cannot be used for courses previously booked or any courses booked after the end of the promotion.

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

Nominations deadline is 11:59 p.m. ET on February 25, 2026. 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

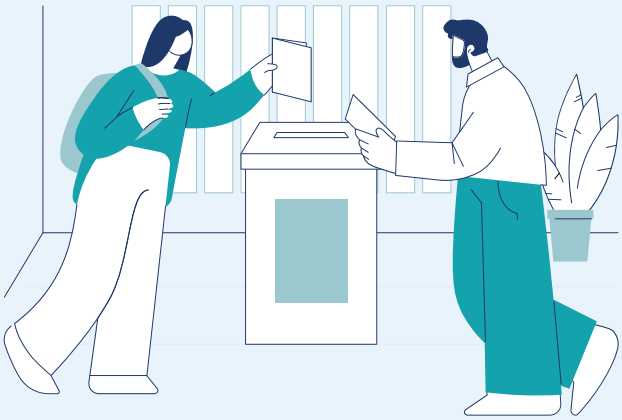
The award recognizes outstanding young Ontario engineers in industry, who have made exceptional achievements in their chosen fields and are active in communities both personally and professionally.

*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.

2026 OSPE Board Elections



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

The Election package will be emailed to members when voting opens on Monday, **March 23, 2026**. Voting will be open until **Monday, April 13, 2026**.

The All-Candidates Virtual Town Hall, where members will have the opportunity to hear from their candidates will take place on **Wednesday, March 25, 2026**, at **6:30 p.m**. The event will be recorded, and the video will be uploaded to the OSPE website.

The results of the Board of Directors election will be announced at OSPE's Virtual Annual General Meeting on **Wednesday, May 6, 2025**.

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

Positions Available

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

Eligibility

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

What Potential Candidates and Nominators Need to Know

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

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

Learn more

ospe.on.ca/the-profession/governance/board-elections

Important Dates

Friday, January 2, 2026
Nominations open

Friday, January 23, 2026
Nominations close at 4:30pm

Monday, March 23, 2026
Ballots and candidate information sent to members – Voting Opens

Wednesday, March 25, 2026
All andidates Virtual Town Hall

Monday, April 13, 2026
Voting closes

Wednesday, May 6, 2026
OSPE Virtual Annual General Meeting

For more information please contact **Valeria Mueller** at vmueller@ospe.on.ca.

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS | ENGINEERING ACADEMY

To register please visit go.ospe.on.ca/AM2025

Build Equitable Energy Strategies for a Low-Carbon, Resilient Future

Municipalities across Canada are feeling the pressure: climate change, rising energy costs, and the need to deliver services fairly for every resident. OSPE's new course, Building Equitable Energy Strategies in Municipalities, gives leaders and staff the tools to respond.

This hands-on learning experience shows how to evaluate Greenhouse Gas (GHG) emissions, build resilience, and design energy strategies that emphasize Equity, Diversity, Inclusion, and Accessibility (EDIA).

Participants will learn how to:

- Assess local energy use and its climate impacts
- Strengthen the business case for future climate and energy investments
- Apply EDIA principles so climate actions benefit vulnerable and socio-economically disadvantaged groups

Through case studies, discussions, and hands-on exercises, participants will develop a business case highlighting the social, environmental, and economic benefits of equitable energy initiatives. By course end, municipal leaders and staff will be equipped to champion inclusive, low-carbon, and resilient community planning.

Cost and Registration

Municipality Rate: $125 + HST per person
Non-municipality Rate: $165 + HST per person

Upcoming Course Dates:

January 20-21, 2026 (9 am - 12:30 pm ET)
March 3-4, 2026 (9 am - 12:30 pm ET)

Funded by:

Canada | FCM Federation of Canadian Municipalities / Fédération canadienne des municipalités | Green Municipal Fund / Fonds municipal vert

Certificate Programs

Project Management Essentials for Engineers

Date: April 14 - April 22, 2026

Price: Member $695 | Non-Member $860

CPD HOURS: 16

ONLINE

Managing projects effectively is a crucial skill for engineers, whether they are leading simple tasks or complex projects. The Project Management Essentials for Engineers workshop is a hands-on, virtual course designed specifically for engineering professionals. This course walks participants through key project management principles and techniques, helping them plan, execute, and oversee successful projects of all sizes.

Lean Six Sigma White Belt Certificate Program

Date: April 13 - April 13, 2026

Price: Member $80 | Non-Member $119

CPD HOURS: 8

ONLINE

Designed for individuals seeking to understand the core concepts of process improvement and operational efficiency, this introductory program covers the essentials of Lean and Six Sigma, illustrating how these powerful methodologies work together to enhance processes and eliminate waste.

AM360° Overview

Date: On-Demand

Price: Member $350 | Non-Member $500

CPD HOURS: 11

ONLINE

A collaboration effort between the University of Windsor Faculty of Engineering and CAMufacturing Solutions Inc., AM 360° Overview provides a foundational understanding of additive manufacturing (AM), also known as 3D printing. It covers the principles, processes, and materials used in AM, highlighting its applications across industries such as aerospace, healthcare, and automotive.

Writing that Sells: Technical Proposals & Pitches Certificate Course

Date: On-Demand

Price: Member $225 | Non-Member $350

CPD HOURS: 10

ONLINE

This program provides you with tools to deliver impressive proposals and develop stronger relationships with clients and win over potential clients. Developed specifically for an engineering/technical audience, it's not your typical self-paced course. Its blended approach allows you learn independently and provides opportunities to interact with the course's subject matter expert and instructor through discussion boards and assignments.

Journey to P.Eng.

CBA Workshops: Crafting Your CBA Stories

Date: January 14, 2026 (8:30 am – 12:30 pm)

Price: Member $350 | Non-Member $475

ONLINE

Learn to identify your engineering experience and turn it into compelling stories aligned with PEO's 34 competencies. This session covers breaking down your experience into structured "Situation–Action–Outcome" stories, techniques for mapping them to all competencies, and practical writing strategies, templates, and exercises to build your confidence and skills.

CBA Workshops: Polishing Your CBA Submission

Date: February 24, 2026 (8:30 am – 12:30 pm)

Price: Member $350 | Non-Member $475

ONLINE

Take your drafted stories and refine them to create a portfolio that meets PEO's experience requirements. Learn how to strengthen your stories, align your experience with remaining competencies, and organize a clear, professional CBA submission.

Prep Course for the National Professional Practice Exam

Date: February 18, 2026 - March 18, 2026

Price: Member $350 | Non-Member $450

ONLINE

Our Prep Course for the National Professional Practice Exam provides the essential tools, knowledge, and guidance to help you excel in the National Professional Practice Exam. These sessions ensure you're fully prepared to meet the licensure requirements.

40 Hour Technical Prep Course: Winter 2026

Dates: January 24, 2026 - April 30, 2026

Price: Member $1095 | Non-Member $1195

ONLINE

Get the targeted support you need to pass your Technical Exams with our Technical Exam Prep Course: Winter 2026. This expert-led, time-efficient course helps you review core concepts and practice real exam scenarios, all on your schedule.

Thought Leadership Thursdays

A Hydrogen Energy Transition – with a focus on the Motion Picture Production Industry

Date: January 08, 2026

Price: Member $0 | Non-Member $59

CPD HOUR: 1

ONLINE

Change Energy conducts both qualitative and quantitative assessments of markets for emerging fuels. This presentation will focus on the comparative attributes of launching hydrogen as an alternative fuel in various markets with a focus on the assessment of, and a solution for, the motion picture production industry.

Reconciliation in Engineering – Indigenous Voices Make Better Projects

Date: January 22, 2026

Price: Member $0 | Non-Member $59

CPD HOUR: 1

ONLINE

Truth and Reconciliation Commission (TRC) Calls to Action and UNDRIP highlight the importance of including Indigenous voices being heard and Indigenous Peoples being decision-makers. Consultation and engagement with Indigenous communities, organizations, and peoples is not only required for many projects, but results in better projects when done well.

Essential Tools for Becoming a Transformative Leader

Date: February 26, 2026

Price: Member $0 | Non-Member $59

CPD HOUR: 1

ONLINE

Today's engineering leaders are expected to do more than deliver technical results—they're asked to shape direction, build stronger teams, and drive innovation. This session is designed for engineers who want to move beyond simply "getting things done" and become leaders who spark real, positive change.

Check the OSPE Events Calendar to see what new topics we'll be covering in the coming months.

EngLearn By OSPE | The Engineering Academy

ONTARIO SOCIETY OF PROFESSIONAL ENGINEERS

go.ospe.on.ca/ELRP

OSPE's Engineering Licensure Readiness Program

Fully Virtual

CBA & NPPE Preparation for International Engineering Graduates (IEGs)

The Ontario Society of Professional Engineers (OSPE) is pleased to introduce our newest bridging program, the Engineering Licensure Readiness Program, designed to support IEGs with CBA preparation, NPPE preparation and employment supports.

Component 1: CBA Preparation

Present your international experience confidently

- 3 live virtual workshops
- 2 one-on-one coaching sessions
- Supplemental tools to support writing success

Component 2: NPPE Preparation

Ace the National Professional Practice Exam

- Access to public NPPE course
- 4 group support sessions
- On-demand videos to support learning and more

Component 3: Employment Supports

Advance your engineering career

- 3 one-on-one job search and career coaching sessions
- Access to OSPE employment events
- 1.5 year OSPE membership

Program Eligibility

- Canadian Language Benchmark 7+ | Non-Canadian B.Eng.
- Permanent Resident, Citizen, Nominee, Asylum Claimant, or approved work permit
- 4+ years of verifiable work experience
- Completed/near completion of technical exams and/or eligible for NPPE

Program Dates

- Cohort 2 Schedule: October 2025 – January 2026
- Cohort 3 Schedule: December 2025 – March 2026
- Cohort 4 Schedule: February – June 2026

For more information and program details, visit our program website go.ospe.on.ca/ELRP

OSPE - 5000 Yonge St, Suite 701, Toronto, ON
1.866.763.1654 | info@ospe.on.ca

Ontario

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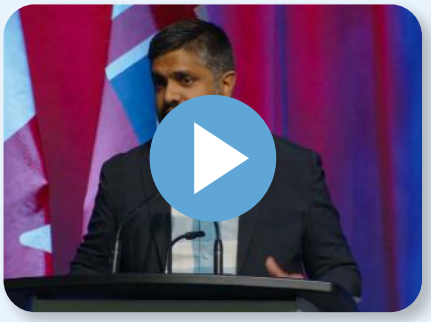
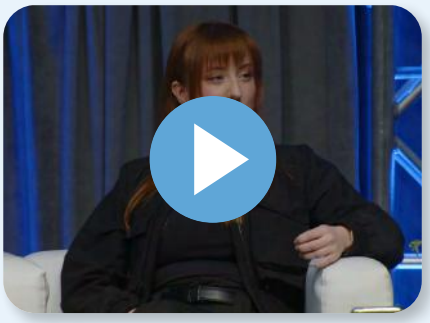


Preparing Engineers and Organizations for AI Integration

Economic Forecast for Engineering in 2025-2026

Beyond the Paycheque: Why Purpose, Culture, and Growth Matter Most



Advancing Engineering Competencies for Climate Action: What's Next for the Profession?

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

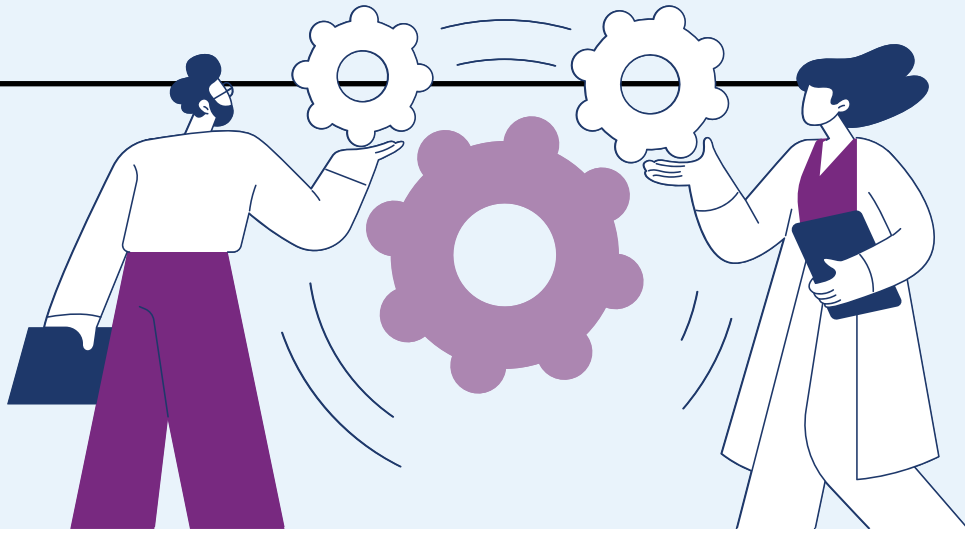
Artificial Intelligence and Machine Learning in the Water Sector

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

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

Standards Solutions in Action: Advancing Engineering for a Changing World

MEMBER PROFILE



Kadra Branker, P.Eng.

Make Things Better Than When You Found Them

For **Kadra Branker, P.Eng.**, one piece of advice has become a cornerstone of her approach to engineering and volunteerism: *"Make things better than when you found them."* The words came from a former manager, and she carries them into every role she takes on, whether in electricity systems and sustainability initiatives, or committee involvement.

Her motivation to improve the world around her began early. Growing up in Trinidad and Tobago, she spent much of her life outdoors and saw firsthand the effects of climate change and pollution on coral reefs. She recalls swimming among a healthy coral reef with bright colours and lots of fish. She grew to see those same environments become bleached and covered in algae overgrowth.

"Those experiences made me want to do something… to help protect some of those systems, not just for myself, but for other people's enjoyment as well," said Kadra.

This desire led her to Canada at 18 to study at **Queen's University**. She completed her degree in mechanical and materials engineering with a minor in economics, followed by a collaborative master's in applied sustainability.

In an interview with OSPE, Kadra shared that "Engineering appealed to [her] because it offered the chance to be a problem solver… being able to help come up with solutions that can benefit the environment as well as society, and deal with complex constraints."

Today at the **Independent Electricity System Operator**, Kadra works with colleagues on how planning the grid must evolve as the climate changes. She collaborates with teams to build the capability to account for changing trends in temperatures and extreme events so the system remains reliable and resilient.

Kadra's Involvement with OSPE

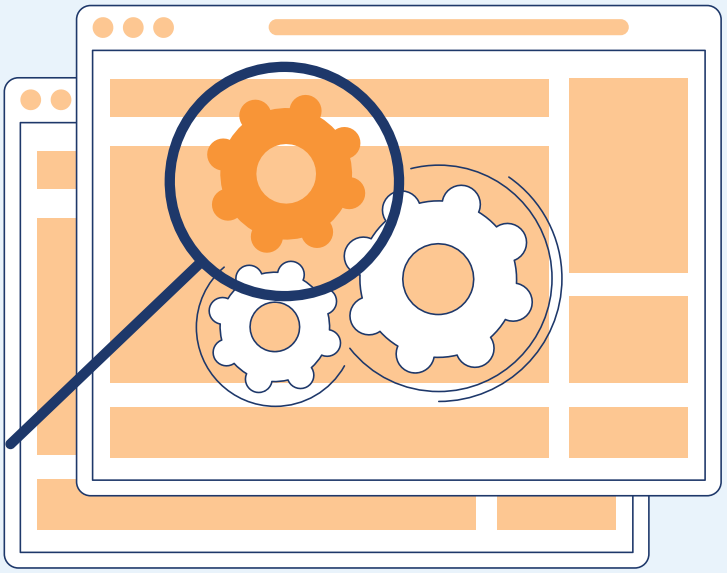
Kadra first encountered OSPE in university. She said, "OSPE was a great place for [her] to… learn about how to become a P.Eng. [and] find mentors to provide guidance." Volunteering became a way for her to give back and even build on those initial enriching experiences. Her current roles with OSPE include **Chair of the Awards Committee** and member of the **Climate Crisis Task Force**.

Joining the Climate Crisis Task Force allowed her to turn her passion into collective action: "It was a great opportunity to take my interest and work with other like-minded people, but then also leverage a platform… to support more change. Recently, I've been able to bring an Ontario perspective to National climate adaptation projects," said Kadra.

At the heart of her work is a commitment to incremental, meaningful improvement. She acknowledges the complexity of the challenges she works on, stating that: "As you learn more, you realize how complex and how big a challenge these things are,". But even within that complexity, she remains dedicated to contributing positively. For her, leaving things better than you found them is not always about achieving sweeping change. It is about thoughtful, steady contributions. Moving projects, people, and systems in a more positive direction, one step at a time.

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

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



Article Length: 800-1500 words

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

Subjet Matter: Something Newsworthy

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

Audience: Engineering +

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

We invite all members to submit their interest in having work published by sending a brief message to **marketing@ospe.on.ca**. Please be sure to include your name, a brief bio, and an overview of the work you wish to submit. There is no need to submit the finished work as part of your declaration of interest.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