

Enter the 2023 Canadian Consulting
Engineering Awards! p. 15

Specifying Sustainable Building
Materials p. 16

Supporting Canada's Energy
Transition p. 20

CANADIAN • CONSULTING January/February
2023
Engineer
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Exceptional Careers

Jeremy Haile, P.Eng., is one of three
winners of our inaugural Lifetime
Achievement Awards. **P. 10**

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ON THE COVER Over one of his firm's longest tenures, Jeremy Haile has combined technical expertise in civil and geotechnical engineering with mentorship of his fellow engineers and contributions to industry associations. See story on p. 10.

PHOTO COURTESY KNIGHT PIÉSOLD CANADA.



Comment

by Peter Saunders

New year, new plans

By now, it may seem a bit late to say "Happy New Year," but how about ... "Welcome to 2023!" We have a lot of new initiatives planned this year, while still continuing to feature the major highlights you've enjoyed about this magazine in the past—such as the annual Canadian Consulting Engineering Awards, for which we recently issued this year's call for entries (see p. 15). We encourage all ACEC-Canada member firms to submit their projects by the deadlines in March and April.

"We encourage all ACEC-Canada member firms to submit their projects to the 2023 Canadian Consulting Engineering Awards."

At this point, you've probably already noticed the first new feature of 2023: our Lifetime Achievement Awards Program. We launched this program in late 2022, soliciting nominations from across the country. Despite it being our first attempt at the concept, it proved very effective right from the start and we heard about many highly deserving individuals currently working at (or retired from) a wide variety of Canadian consulting engineering firms.

In the end, we decided we had to recognize not just one, but three of these remarkable professionals. You'll find their stories starting on p. 10.

(And please keep in mind that if you nominated someone who wasn't honoured this year, don't give up; they can still be considered for next year's awards.)

Meanwhile, have you discovered our Women in Construction campaign? Each March, tying in with International Women's Day, we join our fellow Annex

Business Media construction brands in celebrating this theme through a multi-media effort. Please be sure to join our virtual event on Mar. 8, where several expert panels from across the sector will discuss how best to attract and retain female professionals. This year, for the first time, I will be managing one of these discussions. I look forward to 'seeing' you there!

Now, while that campaign has grown over the past few years and is not in itself new for 2023, this next one is: Women in Engineering. That's right, we are also planning to celebrate female consulting engineers, specifically, both in our May/June issue and with a virtual event on June 21, all timed to tie in with International Women in Engineering Day on June 23. Watch for further event details and registration information in the weeks to come.

Another returning feature for 2023, which achieved strong initial results in 2022, will be our Top 10 Under 40 Awards Program. If you haven't already planned to support this effort, please be sure to start thinking now about which of your colleagues and employees would be most deserving of this honour.

In the months ahead, we also plan to launch an industry-wide survey and business report, as well as some previews of key conferences and trade shows. Details about those ventures will be coming soon.

Again, though, what's most important to us is your input. What else would you like to see from *Canadian Consulting Engineer* in the months and years to come? Webinars? In-person summits, conferences and/or expos? Please feel free to email me with your suggestions; my address appears below. **CCE**

Peter Saunders • psaunders@ccemag.com



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CANADA NEEDS INNOVATIVE SOLUTIONS TO COMPLEX PROBLEMS

In most surveys, engineers consistently receive extremely high ranking on the question of public trust. This trust has been earned over time by our industry and is well deserved, however, it comes with responsibility and obligations. We are responsible for maintaining and building on that existing public trust and we have an obligation to be leaders in aggressively innovating and developing solutions to address today's critical challenges.

The world today is facing many substantial issues testing the foundation of our societies such as climate change, homelessness, housing affordability, food security, water quality, pandemics, equity and inclusion to name a few. Many of these issues are inter-related which adds to their

Our industry is dedicated to improving the social, environmental, and economic quality of life for Canadians and people around the world. We execute projects through labour shortages, challenging work conditions, supply chain issues – and in some cases difficult and remote physical environments. Yet we adapt to meet the needs of our clients and deliver projects on time and often with important cost savings due to the innovations we bring to the design and delivery of the project.

This past October, I was elected Chair by my fellow Directors of the ACEC-Canada Board of Directors. To say I'm honored to take on this role is an understatement and I look forward to serving our industry and its stakeholders over the next 12 months. I have big shoes to fill as I follow many true leaders of our industry.

Over the coming year, I look forward to promoting our industry's role as trusted advisors to society and catalyst for the development of results driven solutions to the challenges within our communities. My goal is to further educate the public, elected officials, and stakeholders on how consulting engineering firms excel at finding innovative solutions to complex problems, play a critical role in addressing climate change, assist in achieving a sustainable green economy, and connect people and communities across the country and the world. I will strive to communicate our industry's unparalleled ability to tackle societies challenges while contributing to building a strong and sustainable economy and connecting people and communities from coast to coast.



Our industry is dedicated to improving the social, environmental, and economic quality of life for Canadians and people around the world.

complexity. Engineers actively tackle complexity every day as they execute their projects by developing innovative solutions to variable needs, requirements, and objectives. We, as engineers, have the obligation to be leaders in the development of approaches to resolve these issues. We have the expertise, management capability, and public trust to play significant roles in the process and the responsibility to act. In some cases, we need to step out of our comfort zone and take the lead to identify unique approaches to the challenges faced by our communities.

I will also have the opportunity to travel across the country during my term to hear about your successes and your challenges. More importantly, I will also learn how ACEC-Canada, as your national advocate, can help you tackle your challenges and positively impact our industry. I encourage you to come chat with me during your provincial association events that I will be taking part in. If we are unable to connect in person, I hope you will reach out to me through ACEC-Canada. In closing, I would like to thank David Murray for his service over his tenure on the Board and specifically as Chair in 2022.



Tim Stanley, P.Eng.
Chair, Board of Directors
ACEC-Canada

2022 YEAR IN REVIEW

The new year brings an opportunity to reflect on everything our ACEC team was able to achieve on behalf of our member firms and the consulting engineering industry in Canada in 2022. Over the past year, our effective engagement with the federal government meant we were able to ensure your voice was heard when it mattered most, while driving important policy changes for our industry.

A STRONG ADVOCACY PUSH AHEAD OF BUDGET 2022

ACEC kicked off the new year by amplifying our recommendations to the federal government ahead of Budget 2022. We focused on how long-term, strategic funding in infrastructure is essential for a thriving economy, particularly after the uncertainty brought on by the pandemic. We highlighted this theme during ACEC's Parliament Hill Day, held virtually.



82% of participating MPs were familiar with the consulting engineering industry

90% of participating MPs expressed their support for ACEC—Canada's goals and advocacy messages

100% of participating MPs expressed a willingness to work with the industry

With our strong advocacy push in the leadup to its release in April, Budget 2022 set out a policy roadmap that was well-aligned with ACEC's core priorities. In addition to reducing the size of the annual deficit, the Budget contained many commitments that will benefit the consulting engineering industry. The document mentioned infrastructure 90 separate times and expanded eligibility for projects funded by the Canada Infrastructure Bank. It dedicated over \$10 billion to construction, retrofits and maintenance, and tax changes to encourage more housing construction. It also had a strong focus on developing supply chains for critical minerals, as well as renewable electricity and grid modernization projects. Overall, these funding commitments have made government officials more enthusiastic about the delivery of major infrastructure projects, and ACEC continues to work with them to ensure our industry's voice is heard.

NEW EVIDENCE STRENGTHENS CASE FOR QBS

2022 was an exciting time for advocates of Qualifications-Based Selection (QBS). After the University of Alberta released a long-awaited study in late 2021 that evaluated and confirmed the benefits of QBS, two more studies were released earlier this past year: one by the Construction and Design Alliance of Ontario, and the other by ACEC-US and the American Public Works Association. They provided solid evidence that the best qualifications – not the lowest price – lead to better financial, environmental, and social outcomes. Together, these studies serve as excellent reinforcement to our ongoing advocacy to advance much-needed procurement reform in Canada.

SHAPING THE NATIONAL INFRASTRUCTURE ASSESSMENT

The National Infrastructure Assessment (NIA) will be a crucial tool in building strong and resilient communities for this generation of Canadians and the next. As a follow up to ACEC's official submission to the government's NIA consultations in 2021, we continue our advocacy in shaping the development, scope, and mandate of this important institution, while pushing for its swift implementation. To make the NIA a success, we believe it should include a thorough review of the current state of Canada's infrastructure, a vision for the next 30 years of infrastructure, and a clear roadmap to evaluate and make progress along the way.

In February 2022, ACEC held a meeting with key government officials, including Assistant Deputy Minister at Infrastructure Canada, Gerard Peets, and Director General for the NIA, Robert Judge, to reinforce our recommendations. They were very receptive and expressed interest in continuing to work with us as they develop the NIA.

The following month, ACEC met with the Institute of Fiscal Studies and Democracy (IFSD), which conducts research about the NIA on behalf of Infrastructure Canada. It was a productive meeting to discuss how best to assess labour market and capacity constraints so that we can encourage infrastructure investment in Canada. It was clear from the discussion that we were well aligned on the scope of the NIA, and we agreed to ongoing engagement with IFSD.

In May, we met with Nathan Bessner, then Policy Advisor to Infrastructure Minister Dominic LeBlanc, where he affirmed that the NIA remains a priority for the government and the Minister himself. He noted its potential to help the government achieve their goals of building more sustainable communities while fostering economic growth.

ACEC will be exploring the potential synergies and possible coordination and cooperation between the proposed NIA and the existing Canadian Infrastructure Report Card (CIRC), of which ACEC is a member. Their priorities are certainly aligned, given that the CIRC assesses the current state of municipal infrastructure – which represents the majority of public infrastructure, and which receives significant investments from federal programs.

PROMOTING AN ENVIRONMENTALLY SUSTAINABLE FUTURE THROUGH THE NIA AND QBS

ACEC has been actively calling for procurement reform and the development of the National Infrastructure Assessment (NIA) as effective tools to boost economic growth and build environmentally sustainable communities simultaneously.

In May, ACEC submitted recommendations to the House of Commons Standing Committee on Natural Resources for their study on how to create an equitable energy transformation. We also met with the Committee Chair, MP John Aldag, to discuss our recommendations, which included a push for QBS as the most efficient and effective procurement process, and for the NIA to be implemented as quickly as possible so that we can fulfill our infrastructure needs as a country. Our discussion made it clear that consulting engineering firms have an important role to play in the transition towards to a low-carbon future.

This past spring, the Senate Standing Committee on Transportation and Communications undertook a study on the effects of climate change on critical infrastructure and how we can adapt to ensure more resilience in the industry.

The government committed to developing this Strategy in Budget 2022, with the aim to create a climate-resilient buildings sector with net-zero emissions by 2050.

This was the perfect opportunity for ACEC to highlight the benefits of the NIA and QBS, so we met with one of the committee members, Senator Jim Quinn (New Brunswick) in June. Senator Quinn was very open to ACEC's perspective on the importance of the NIA to understanding the state of Canada's infrastructure. This led to a positive discussion on the need for procurement reform. ACEC plans to continue working with Senator Quinn to encourage a separate study on infrastructure procurement, which would give more profile to the benefits of QBS and how it will encourage better outcomes and more sustainable infrastructure.

ACEC made the same case for procurement reform during the government's consultations for the Canada Green Buildings Strategy. The government committed to developing this Strategy in Budget 2022, with the aim to create a climate-resilient buildings sector with net-zero emissions by 2050. In addition to emphasizing how the NIA would deliver better information about Canada's infrastructure and support sound decision-making, our recommendations highlighted that QBS was necessary to make the Canada Green Buildings Strategy a success, given that it would help ensure higher quality, more durable, and longer-lasting infrastructure. We have engaged directly with the office of the Natural Resources Minister on this.

ACEC continues to engage with the Office of the Minister of Public Services and Procurement Canada to make this case for procurement reform to make this case for procurement reform. We affirmed that because QBS considers the entire lifecycle of projects, unlike price-based procurement, it is better suited for achieving government's policy objectives such as sustainability, GHG reductions and climate change resilience. This is in addition to the well-documented improvements in project outcomes that include cost and schedule savings achieved by QBS.

CAPACITY BUILDING FOR OUR INFRASTRUCTURE NEEDS

Over the past year, another focal point of our advocacy work has been encouraging the government to invest in capacity building by creating tools and resources that will help industry and their clients deliver the infrastructure Canada needs. The government has done this successfully in the past by with the National Guide to Sustainable Municipal Infrastructure. Known as InfraGuide, it was a collection of tools and best practices to help municipalities build resilient infrastructure. We strongly believe reviving and updating InfraGuide, or creating a similar program, would be an effective way to build capacity in communities across the country to address longstanding and emerging infrastructure needs.

In October, ACEC brought together officials from the National Research Council and Infrastructure Canada to talk about how capacity building at the municipal level can help the government get better value for their investments in infrastructure, while also helping to advance their goals in combatting climate change and mitigating its effects. ACEC underscored the past success of InfraGuide and its potential to address new challenges.

In June, ACEC welcomed the opportunity to submit recommendations as part of Public Safety's consultation on critical infrastructure – specifically, how to make it more resilient in the face of environmental dangers, security threats, and economic risks. This was another opportunity to advocate for strategic infrastructure investments through the NIA, procurement reform through QBS, and capacity building through InfraGuide. We made the case that the NIA would ensure that we have the best data for decision-making, that reforming procurement to implement QBS would improve long-term project outcomes, and that InfraGuide would give municipalities the resources they need to build capacity and respond to emergencies. Together, these tools would allow for the successful planning, building, and maintaining of critical infrastructure over the long-term.

The InfraGuide program is strongly supported by numerous other stakeholders, including the Federation of Canadian Municipalities (FCM). That's why ACEC continues to collaborate with FCM on shared priorities in our respective pre-budget submissions. We agreed to continue our partnership as organizations committed to supporting capacity building for municipalities, improving procurement processes, and building stronger communities.

CALLING FOR MORE FLEXIBLE AND PREDICTABLE INFRASTRUCTURE INVESTMENTS

This past June, the House of Commons Standing Committee on Transport, Infrastructure and Communities released a report entitled, “Targeted Infrastructure Investments to Influence Social, Economic and Environmental Outcomes.” ACEC President and CEO John Gamble gave testimony in 2021 about the value of flexibility, scalability, and predictability in infrastructure funding. He emphasized that programming criteria should be proportional to both the size and nature of the project and should focus on positive outcomes. His advice was heavily featured throughout the report, which made concrete recommendations to advance targeted infrastructure investments in Canada in a way that benefits our communities, the environment, and the economy.

DEFENDING YOUR OPPORTUNITY TO PARTICIPATE IN FEDERAL PROCUREMENT

Earlier this spring, the federal government released a new procurement policy that requires all engineering documents to be in both official languages, regardless of location or demand. Based on a directive from the Official Languages Commissioner, ACEC understands that the purpose of this new policy is to allow firms to participate in federal procurement opportunities in their language of choice. While we support the intent of this new policy, we are concerned about its unintended consequences – notably, precluding hundreds of consulting engineering and architecture firms from participating in federal procurement. We are also concerned that, for the firms that can participate, it will lead to higher project costs, extended delivery delays, and significant increases in both commercial and professional liability.

ACEC responded quickly to this new policy and reached out to the federal government outlining these serious issues. We have since put forth pragmatic recommendations along with our provincial member organizations to ensure our member firms have the opportunity to participate in federal procurement. In turn, Public Services and Procurement Canada has expressed openness to our recommendations, committing to working closely with ACEC and our industry on this matter.

CELEBRATING THE ACHIEVEMENTS OF OUR MEMBERS AND OUR INDUSTRY

In the fall, we hosted ACEC’s national leadership conference where we heard from many private and public sector stakeholders and experts, including the Deputy Chief Economist of CIBC World Markets Benjamin Tal and Rebecca Zofnass, Managing Partner at Environmental Financial Consulting Group (EFCG). The topics of the presentations and panels covered a wide range of policy priorities for the consulting engineering sector – from ESG

and the potential for an integrated environmental and economic vision for Canada, to how to achieve net-zero policy and navigating new and emerging risks.

At the end of the Conference, the Canadian Consulting Engineering (CCE) Awards took place at the Ottawa Art Gallery on November 3rd, an annual event to celebrate our industry’s exciting accomplishments and incredible contributions to Canada. During the event, 20 Awards of Excellence were awarded for projects that strengthen communities, improve safety, and enhance quality of life for people in Canada and around the world. In the days that followed, our #20DaysofExcellence social media campaign shone a light on the award-winning projects from the CCE Awards for twenty straight weekdays, highlighting the positive impact they have on our communities across the country.

LOOKING AHEAD TO 2023

2023 brings us one year closer to a potential federal election. Between now and 2025, the government will likely present three more Budgets – every one of them is an opportunity for us to push hard for a strong, integrated economic and environmental vision for Canada, and for smart policies that benefit our industry.

We are well-positioned ahead of Budget 2023. As we do each year, ACEC participated in the government’s pre-budget consultations and submitted our official recommendations in early October, titled “Building Capacity: Infrastructure Investments to Help Communities, Businesses and Families Thrive.” We also had a meeting with the office of Chrystia Freeland, Deputy Prime Minister and Finance Minister, to discuss how our recommendations would benefit our economy, our communities, and all Canadians. ACEC will be requesting a committee appearance at the Finance Committee so that we can further amplify our industry’s priorities.

It is also crucial that we continue advocating on both sides of the aisle in the House of Commons. To that end, we look forward to hosting our cornerstone government relations event, Parliament Hill Day, in the fall. This is an excellent chance for you to speak with Members of Parliament from all the major parties, brief them on key issues, and make your voices heard.

We also look forward to bringing the industry together to celebrate excellence in the consulting engineering industry when we host the 2023 CCE Awards.

As always, we want to hear from you. If you’d like to share your thoughts and perspectives about how we can best advocate on behalf of your firm and the consulting engineering industry, we encourage you to reach out to your ACEC-Canada Board representative.



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Lifetime Achievement Awards

We proudly present our inaugural three winners.

By Peter Saunders

In late 2022, for the first time, *Canadian Consulting Engineer* launched an initiative to recognize leading professional engineers for their exceptional careers in—and legacies of contributions to—consulting engineering in the fields of construction and infrastructure. The community responded strongly, with a wide variety of nominations for

these accolades. The following are the chosen winners.

Jeremy Haile

Principal engineer (formerly president) of Vancouver-headquartered Knight Piésold Canada, Jeremy Haile expressed an early interest in engineering projects when he was a child—and as it happened, he was in the right place at the right time.

“I was very fortunate to grow up in Northern Rhodesia (now Zambia) and go to school in Southern Rhodesia (now Zimbabwe) at a time when lots of major projects were being built, including the Kariba Dam and the Kafue hydroelectric project,” he recalls. “We lived in one mining town, Bancroft (now Chililabombwe), before moving to another, Broken Hill

PHOTO COURTESY KNIGHT PIÉSOLD CANADA.

(now Kabwe). All of that was part of my youth and I wanted to go into civil engineering.”

Haile graduated from Oxford University with an M.A. in engineering sciences and economics in 1972. He started his career that year as a project engineer with Watermeyer, Legge, Piésold and Uhlmann (WLP), the predecessor to Knight Piésold, working at an office in the U.K. and construction sites in Zambia and Malawi.

After completing an M.Sc. in soil mechanics at Imperial College of the University of London, he was transferred to Knight & Piésold in Vancouver in 1979, where he served as senior engineer and director until 1990. (The Knight Piésold name was adopted by WLP and associated operating companies around the world in the early 1990s.)

Following the retirement of Bruce Knight, founding partner of the Canadian operations, Haile became president of Knight Piésold Canada, a position he held until 2012.

“I’ve only worked for one company,” he says. “When we expanded to Canada, we brought a different perspective from mining in central Africa. Translating our expertise into a Canadian context was a major learning exercise; I’d never dealt with winter conditions before! It was an exciting challenge.”

Growing from a team of about 20 people in the 1980s, the company focused primarily on mining tailings and water management projects until Haile, as president, branched out into British Columbia’s hydropower industry in the early ’90s. The company developed run-of-river hydro-

electric projects for mining clients and independent power producers. Haile also led geographic and service expansion by opening another office in North Bay, Ont., increasing involvement in Eastern Canadian and international projects.

“He has been an incredible mentor.”
- Ken Embree

The company had grown to about 200 people across Canada when Haile stepped down from the helm in 2012.

“It was a big relief to hand it on,” he says, “knowing there was a very capable team in place to continue managing the company.”

Looking back today, Haile’s 50-year career—one of the longest tenures of anyone currently working at Knight

Piésold anywhere in the world—has combined technical expertise in civil and geotechnical engineering, mentorship of his fellow engineers and contributions to industry associations.

“He has been an incredible mentor to me ever since I started at the company 32 years ago,” says its current president, Ken Embree.

“Now I can work when I want to,” says Haile. “I get involved when I’m asked to and I don’t come into the office unless there’s something for me to do. I enjoy staying in touch with everyone. I write proposals, look at management systems, conduct risk reviews for projects around the world, streamline office documents and just help make it all work seamlessly. I like staying involved in complex, challenging projects.”



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Continuing a legacy of excellence

Congratulations to Jeremy Haile, recipient of the *Canadian Consulting Engineer’s* Lifetime Achievement Award.

For over 50 years, Jeremy has dedicated his career to the success of the Knight Piésold team, and we are continuing to build on his legacy of excellence for the next generation of consulting engineers.



Jeremy Haile, P.Eng.
Principal Engineer

Catherine Karakatsanis

Morrison Hershfield (MH) chief operating officer (COO) and board director Catherine Karakatsanis sensed she was destined for a career in engineering from a very early age.

“In a foreshadowing of my profession, when I was in Grade 1, I was put in a special math class where we studied algebra,” she recalls, “and through the years, I always wanted to do something meaningful. I had relatives who were in engineering and I knew the positive impact their profession made to society’s standard of living. I was always encouraged by my family and never made to feel like I shouldn’t pursue work in

a male-dominated field. And I wasn’t let down at all—it’s been really rewarding!”

Karakatsanis studied civil engineering at Western University in London, Ont. One of her particularly influential mentors was Professor Alan G. Davenport, whom she calls “the father of wind engineering.”

“It was inspirational to visit buildings like the World Trade Center and Sears Tower on field trips,” she says. “That experience focused me on buildings and infrastructure.”

Davenport encouraged her to join MH. Karakatsanis was receptive to the suggestion, not least because she had studied firm co-founder Car-



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son Morrison’s book on ethics in her fourth year.

“You had to study that book to get your engineering licence,” she explains. “It reflected the ethical culture of the firm, which was highly professional and a very welcoming place for a woman.”

She joined MH in 1989 as a structural engineer and quickly progressed through technical and project management

of our company over the years,” she says. “I haven’t had one day when I’ve been bored, so it never occurred to me to go anywhere else!”

As a leader, she has strived to make the firm even more welcoming to and inclusive of women and minorities and to provide greater technical support to its younger engineers. She oversees MH’s inclusion and equity committee, com-

“I was always encouraged by my family and never made to feel like I shouldn’t pursue work in a male-dominated field. And I wasn’t let down at all—it’s been really rewarding!”

roles to become a director, senior director, vice-president (VP) and COO. She was the firm’s first female executive and board member.

“I’ve worked in and gained an understanding of every part

munities of practice and climate change practice development initiative.

Along the way, she has worked with Engineers Without Borders (EWB) and led Professional Engineers On-

PHOTO COURTESY MORRISON HERSHFIELD



“I haven’t had one day when I’ve been bored, so it never occurred to me to work anywhere else!”

tario (PEO), the Ontario Society of Professional Engineers (OSPE) and Engineers Canada as president. Most recently, continuing that trend to a global level, she became president-elect of la Fédération Internationale des Ingénieurs-Conseils (FIDIC). She will be the first woman to hold the position in the organization’s history when she takes the office this year.

“FIDIC has been very exciting,” she says. “It represents more than 1.4 million engineers and 40,000 firms in more than 100 countries. With its global reach, it is the ideal vehicle to facilitate collective action to advance the industry and deal with the pressing issues facing our planet.”

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Maurice Brisson

A founding—and still active—member of BBA in Mont-Saint-Hilaire, Que., Maurice Brisson was recently invested as a Member of the Order of Canada in recognition not only of his expertise in designing electrification plans and developing major power transmission lines, but also for his philanthropic contributions to promoting education in electrical engineering. He received the honour—the nation’s highest for civilians—on Nov. 3 at Rideau Hall in Ottawa.

Brisson grew up under entrepreneurial parents who owned a bakery in the Laurentians. As he explains, they passed along their values and principles for achieving business success by respecting and satisfying clients’ needs.

“Engineering was a natural fit for me because I loved applied sciences,” he continues. “I also liked the idea of giving back to society and my community, of being part of something bigger than myself, by advancing knowledge and practice.”

He earned his bachelor’s and master’s degrees in electrical engineering from Polytechnique Montréal, began his career as a high-voltage system researcher at l’Institut de Recherche en Électricité du Québec (IREQ) and then joined Shawinigan Engineering, where he developed close working relationships with colleagues who would go on to co-found BBA in 1980.

During his career, Brisson has been involved in projects around the world (including electrification plans in Ivory Coast, Guinea, Burundi and Honduras), led techno-eco-



nomics and development programs for rural, urban, public and industrial distribution systems and studied markets, load consumption and forecasting, power generation and transmission planning.

“Engineering was a natural fit for me because I loved applied sciences. I also liked giving back to society.”

In recent years, he has completed studies on interconnecting independent power producers, cogeneration projects and medium- and large-capacity wind farms in Québec and Ontario.

“Trailblazing projects in energy efficiency and optimization and in wind and solar farms will help us with decarbonization efforts in the coming years,” he says.

One significant way he has given back to the industry is through education. He has mentored more than 30 junior engineers, many of whom are still working for BBA today. In 2016, l’Association des Firmes de Génie-Conseil – Québec (AFG) named him Mentor of the Year in Consulting Engineering.

In 2009, he created the Maurice Brisson Scholarship through Polytechnique Montréal to promote university education in engineering. In 2015, he made a sig-

nificant donation to the institution to launch the Maurice Brisson Scholarship Fund and ensure its continuity. In recognition for his involvement, a laboratory at l’Institut en Génie de l’Énergie Électrique (IGEE) has been named after him.

Meanwhile, as an educator himself, he has taught courses about protection relays and systems for power grids as part of the university’s master’s program in electrical engineering.

Even now, Brisson is at BBA’s offices five days a week.

“It’s not like work for me!” he says. “It’s always a pleasure to progress with projects, connect with young engineers and continue to learn.” **CCE**

PHOTO COURTESY BBA.

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The Rise of EPDs

The sustainability of materials is only becoming more relevant.
By Mickel Maalouf

Nearly 200 members of the United Nations Framework Convention on Climate Change (UNFCCC) are parties to the Paris Agreements, a treaty adopted in 2015 with the goal of mitigating global temperature rises through reductions in emissions. Canada signed the treaty in its first year and passed the Canadian Net-Zero Emissions Accountability Act into law in 2021, committing to a 40% to 45% reduction in greenhouse gas (GHG) emissions by 2030 and net-zero GHG emissions by 2050.

These bold commitments will have significant ramifications for the building industry, which currently accounts for nearly 40% of global annual GHG emissions. It is time for environmentally friendlier building materials.

Indeed, environmental factors are now dominating the decision-making process. The easiest way for an engineer to determine the environmental impact of a building material is through its Environmental Product Declaration (EPD).

International Organization for Standardization (ISO) 14025:2006, Environmental labels and declarations, defines an EPD as a Type III declaration that “quantifies environmental information on the life cycle of a product,” from raw material extraction and manufacturing through installation, use and maintenance to disposal; while ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework, details the independently verified life cycle assessment (LCA) data upon which Type III declarations must be based, with strict



PHOTO COURTESY HUNTSMAN BUILDING SOLUTIONS.

standards to be followed when conducting an LCA.

EPDs are completed by third-party sustainability consultants and verified by third-party certification organizations. In recent years, they have been increasingly requested by engineers to help reduce their projects’ carbon emissions.

Product-specific vs. industry-wide

There are different types of EPDs to designate groupings of products.

Sector or Industry-average EPDs are developed by industry associations to represent products from multiple vendors within the same sector (e.g. glass-mat gypsum boards, with data averaged from 51 facilities across Canada).

Single-company, product-specific EPDs are more common. Their LCA may

take a cradle-to-grave or cradle-to-gate approach; the former, which accounts for emissions caused by the product’s continued use and eventual disposal, provides a more complete view.

The ability to pinpoint areas for improvement only comes about through product-specific EPDs. A sector EPD, for example, could help an engineer choose spray foam insulation over hydrofluorolefin (HFO) extruded polystyrene (XPS) in their specifications, but it wouldn’t help them source the best closed-cell spray foam insulation.

Defining environmental impact

EPDs detail the impact of a product in six categories:

1. Global warming potential (GWP)

GWP measures greenhouse gases' (GHGs) ability to trap heat in the atmosphere, in comparison to carbon dioxide (CO₂). Methane, for example, has a GWP of 25, as its impact is 25 times greater than that of CO₂. EPDs report the GWP of a product as the culmination of all CO₂ and GHG emissions from its production and use.

2. Ozone depleting potential (ODP)

ODP measures a product's ability to destroy the ozone layer in comparison to chlorofluorocarbons (CFCs).

3. Acidification potential

With the combustion of fossil fuels, this is the potential for the release of sulphur dioxide (SO₂) and nitrogen dioxide (NO₂) to increase the concentration of hydrogen ions in soil

(which can reduce nutrients) or water in the atmosphere (which can cause acid rain).

4. Eutrophication potential

This on the other hand is the potential for a product's nitrogen and phosphorus emissions to enrich nutrients in soil or water, which can cause excessive propagation of algae and reduce oxygenation levels, which can negatively affect plant life and groundwater.

5. Smog formation potential

This is the potential for the product's emissions to be trapped at ground level and exposed to certain climatic conditions and sunlight. This chemical process can form ground-level ozone, which affects respiratory systems.

6. Resource depletion

This is a measure of the depletion of abiotic resources in the Earth's crust, along with the energy required to transport and process these resources during the product's life cycle.

The larger context

Beyond such details, the larger context is important. Assembly comparisons should include other materials required for the building envelope.

Closed-cell spray foam insulation, for example, provides the assembly's thermal insulation, air barrier and vapour barrier. It significantly reduces the embodied carbon of a building envelope by replacing three products, where more traditional assemblies use mineral wool, fibreglass and full-surface membranes.

There is certainly more to environmentally conscious

building design than reducing GWP. Products that help a building save energy result in lower operating carbon emissions over that building's lifetime. A tighter building envelope benefits everyone.

Increasingly relevant

Embodied carbon in building materials is responsible for 10% of total annual GHG emissions worldwide. As environmental policies and laws change to reflect emission-reduction mandates and society moves towards more sustainable materials, EPDs will become increasingly relevant and promote further use of LCAs and energy modelling.

CCE

Mickel Maalouf is a LEED Green Associate and senior representative for sustainable building science with Huntsman Building Solutions.



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EPDs Build a Foundation for Resilience

By **Brian J. Hall**

In late 2022, the federal government responded to the impacts of climate change and extreme weather events with Canada's National Adaptation Strategy: Building Resilient Communities and a Strong Economy. Among its goals, the strategy aims to establish more resilient built infrastructure. For the construction industry, Environmental Product Declarations (EPDs) will play a key role in this endeavour.

CPCI's path to sustainability

In 2007, the Canadian Precast/Prestressed Concrete Institute (CPCI) facilitated a workshop in Ottawa to discuss sustainability. The workshop concluded CPCI should pursue the development of a sector sustainability strategy and aim for maximum buy-in from its members. CPCI struck a sustainability committee to establish a consultation paper as the forerunner of this strategy.

In 2012, CPCI completed its first life-cycle assessment (LCA) of precast concrete for commercial buildings, 'from cradle to grave,' working with consulting engineering firm Morrison Hershfield and the Ottawa-based Athena Sustainable Materials Institute. Next, CPCI developed Product Category Rules (PCRs) in 2014 and released

EPDs in 2015 in three major categories: architectural, structural and underground products.

In 2019, CPCI issued updated EPDs with Athena, certified by Underwriters Laboratories (UL) Solutions. Most recently, again working with Athena and certified by UL Solutions, CPCI issued new precast regional industry average EPDs earlier this year.

In these ways, the institute promotes third-party verified measurements and assessments for the construction industry.

Sustainable resilience

The Canadian Green Building Council (CaGBC), much like the U.S. Green Building Council (USGBC), defines resilience as the "ability to prepare and plan for, absorb, recover from and more successfully adapt to adverse events."

Notably, attributes of resilience share characteristics with precast concrete infrastructure, which:

- Delivers long and effective service life.
- Provides safety and well-being to occupants.
- Effectively resists hurricane- and tornado-force wind, earthquake, fire or blast incidents.
- Minimizes disruption during and reduces recovery time following adverse events.

Any investment in buildings and community infrastructure should enhance resilience by incorporating adaptation measures, mitigating future harm and enabling effective post-disaster response. By applying 'green' building practices and using resilient materials, usually at low to no added cost, such infrastructure can enhance health, spur investment and save energy, water and money over the longer term.

Enhancing buildings and communities

CPCI is now working with government agencies and architectural, engineering and construction (AEC) professionals to transform how buildings and related infrastructure are designed, built and operated to encourage green building practices.

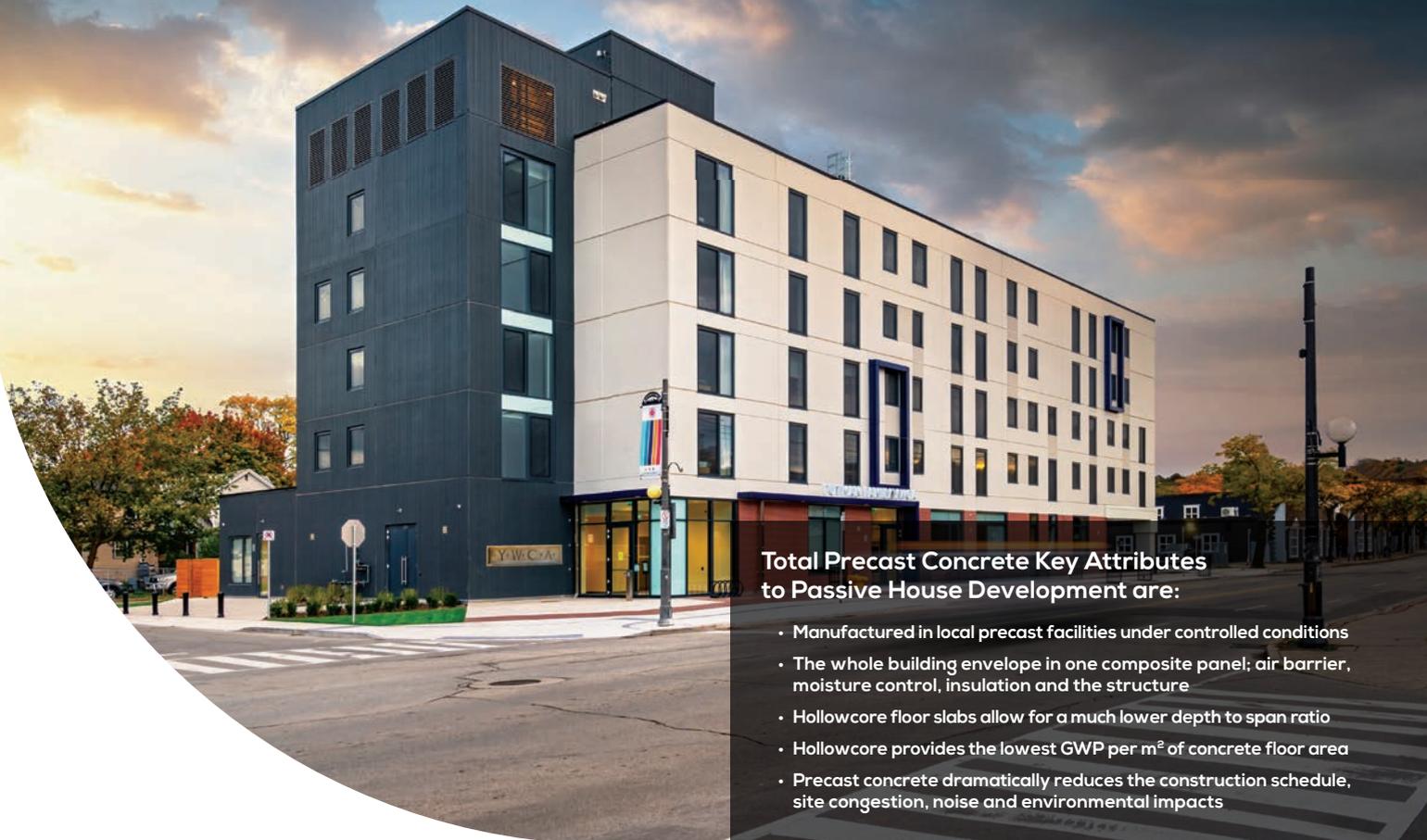
One of the challenges of resilience is to do more with less, which highlights precast concrete's most significant advantages in terms of modularity, prefabrication, aesthetic versatility and speed of construction. Indeed, resilience is a direct extension of the institute's existing mandate. **CCE**

"Morrison Hershfield assessed the life cycle of precast concrete for commercial buildings."

Brian J. Hall is managing director of CPCI and vice-chair of the Royal Architectural Institute of Canada (RAIC) Foundation. For more information, visit www.cpci.ca.

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Making Energy Smarter

SGIN's forum brought experts together to discuss innovations.
By Peter Saunders

In September, the Fredericton-based Smart Grid Innovation Network (SGIN), which works to support Canada's energy transition, hosted the Energy Innovation Forum (EIF) in Toronto.

The first day kicked off with a keynote by Francis Bradley, president and CEO of Electricity Canada, considering the role of electricity in the transition away from fossil fuels. The first panel discussion expanded from that starting point.

"The big pieces of the puzzle will be electrification, renewables and energy efficiency," said Ahmed Hanafy, director for Dunsky Energy + Climate Advisors. "We are also going to need fuel switching."

"For electrification, Canada's grids will need two to three times today's capacity," said Caroline Lee, mitigation research lead for the Canadian Climate Institute. "The pace for bringing renewables online is unprecedented, but not enough to get us to our goals. We need to deploy energy storage and make demand more flexible. It's technologically feasible."

Co-panelist Patrick Lo, senior manager of innovation partnerships for Ontario's Independent Electricity System Operator (IESO), suggested public-private partnerships (P3s) need to be more prominent.

The next panel tackled cost assumptions for renewables, storage and demand management.

"Natural gas prices are going up while on-shore wind prices are coming down," said moderator Bruce Cameron, principal



with Envigour Policy Consulting.

Hence, "we need more long-term energy storage," added Jim Fonger, Canadian VP of asset and advanced technology development for Ameresco.

Peak Power chief operating officer (COO) Matt Sachs described how his company installs very large lithium-ion batteries in buildings, then adds software to control how energy is stored and used.

Hydrogen Business Council (HBC) executive director Robert Stasko suggested fuel cells could be filled indirectly by wind farms.

"Trucking and heavy transport are a big emitter," he said. "To switch to hydrogen, we need fuelling stations along highways."

Phil McKay, senior director of the Canadian Renewable Energy Association (CREA), moderated a panel that explored more ways to optimize clean generation.

"One of the biggest challenges is interoperability between energy system vendors," said Giles Counsell, management consultant and smart energy lead for Siemens Canada. "Standardization could go a long way in scaling up renewables."

Getting back to the issue of storing energy from intermittent sources, another panel discussion showcased E-Zinc's rechargeable electrochemical cells, SunGrid's battery energy storage system (BESS) projects and Malta's thermoelectric facilities, which use tanks of high-temperature molten salt and low-temperature liquids.

Day two started with a showcase of Canadian energy transition projects involving NB Power, Alectra Utilities and the aforementioned IESO, including overviews and lessons learned. Further panels discussed the role of institutions, including universities, and new technologies in accelerating the energy transition and supporting decarbonization.

Following a presentation by Electricity Human Resources Canada (EHRC) VP of programs Mark Chapeskie about filling future jobs, the EIF closed out with one last decarbonization discussion with representatives of the National Research Council of Canada (NRC) and Natural Resources Canada (NRCan), setting the stage for developments yet to come. **CCE**

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