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*Association of Professional Engineers
& Geoscientists of Saskatchewan*

THE PROFESSIONAL

EDGE

ISSUE 199 • DECEMBER 2022





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Table of Contents

ISSUE 199
DECEMBER 2022

- 06 President's Message
- 14 Membership and Licence Fees
- 15 Continuing Professional Development
- 18 Registration of Firms
- 19 Member Profile
- 20 Library Access / Member Grants
- 21 APEGS Awards Banquet
- 22 Professional Liability Insurance
- 23 News From The Field
- 26 News Beyond Our Borders
- 32 Calendar of Events



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7

Geologist promotes energy storage option for Saskatchewan



Okane Consultants

10

An engineering and geoscience perspective on sustainability



12

Indigenous Inclusion in Engineering





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TOGETHER



President's Message



John Desjarlais, P.Eng.

As 2022 nears its end, I continue to look forward as we make progress in our process to modernize the association and its operations.

I am pleased with how we are moving ahead. Council is now at the stage of feasibility and understanding in our review of human resource management and financial management. APEGS administration is also very much involved in that work. As president, I am excited to be able to steward that development.

For example, when it comes to human resource management, we are looking at the roles and responsibilities of those working for APEGS as well as compensation and progression. One of the pieces we are moving on more quickly is formalizing a process around the management and evaluation of the Executive Director's performance to ensure timely and organized feedback.

We hope to have that wrapped up as we contemplated our plan through November to then make decisions and implement them in the new year. From there, changes will cascade through the organization. This will be a benefit by creating more transparency and accountability with how staff are managed.

Another area council is focusing on around modernization is information technology. We want to better understand some of our risks around that as well as determine the appropriate staffing and resourcing. We are in the process of recruiting an IT professional for APEGS to be able to champion a lot of those changes and steward some of the systems that we have in place already.

You will see in this issue of *The Professional Edge* some examples of the changes that are occurring in the association because of this process undertaken by council. There is greater efficiency in our processes and improvements to how we engage members. There are updates to how we celebrate our awards and their recipients. There are changes in our governance and our annual general meeting.

You will also find in this issue the opportunities APEGS provides members in terms of professional development. One of those opportunities was hearing from Bonnie Dobchuk, P.Eng., about her presentation "Sustainability: An Engineering and Geoscience Perspective" during APEGS Fall PD Days. It is a topic I personally think we wrestle with in terms of its application to engineering and geoscience so I'm pleased to see our professions consider and discuss this area as our understanding of sustainability continues to evolve, especially from a regulatory, public safety and environmental protection perspective. The feature story on Dobchuk's presentation will provide you further insight into how she developed her perspective.

Profiling one of our members in each issue of *The Professional Edge* continues to be important. These member profiles provide examples of the professional contributions engineers and geoscientists make to society through the lens of what we do as a regulator.

In the other feature story in this issue, you will read about an idea being promoted by Brian Brunskill, P.Geo., to solve a problem faced by society using geology that is distinct to Saskatchewan along with technology he has found is being used in other parts of the world. Thinking in that way of solving problems is an important contribution those of us in our professions bring to this province.

As this year comes to a close, I am now almost halfway through my term as APEGS' President, a role I have been very honoured to fill. This opportunity has reinforced for me how proud I am to be a member of these professions and the work being done by each of us in our professional lives. I am looking forward to the next half of this term to continue the progress of council in making APEGS the best it can be as an association.

GEOLOGIST PROMOTES

Energy Storage Option for Saskatchewan

BY MARTIN CHARLTON COMMUNICATIONS



Brian Brunskill, P. Geo.

Brian Brunskill, P. Geo., is intrigued by a technology that relies on geology and the role it could play as Saskatchewan invests in generating carbon-free electricity into the future.

It is called Compressed Air Energy Storage (CAES). He wants more people in Saskatchewan – including engineers and geoscientists – to know about CAES as the world’s capacity for generating electricity using renewable energy, such as wind and solar, grows.

As renewable generation capacity grows, he and others in the world point to a need for complementary utility-scale storage and Brunskill is promoting what he sees could be possible for Saskatchewan in that area. Those hesitant to rely more heavily on renewable energy might be more open to considering it if they understood CAES technology and why Saskatchewan could be a suitable location for it.

Electricity generated by such renewable sources is intermittent with critics suggesting they cannot be relied on to support base-load power. Storing surplus renewable energy when it is abundant and drawing on this stored energy when required is a way to overcome that barrier, Brunskill explains.

Batteries are the solution many discuss, but Brunskill wants more people in the province to consider an additional option. He has spent 12 years exploring and advancing ways Saskatchewan’s geology can contribute to developing low-carbon energy sources. This includes developing the province’s deep geothermal resources,

which the DEEP Earth project in southeast Saskatchewan is now doing as well as other projects to come.

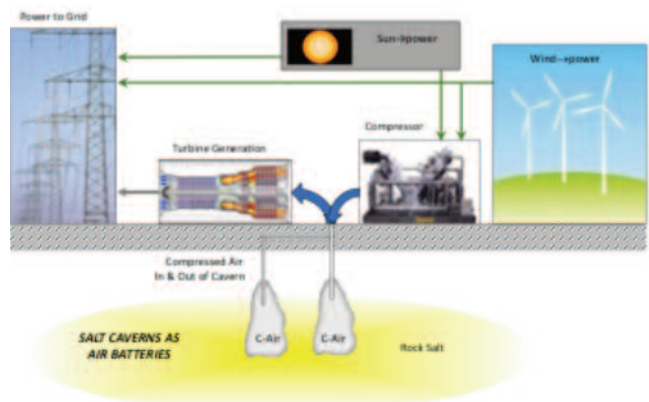
That work led him to review established research and talk to experts focused on CAES. It is a technology that Brunskill sees would align with expertise and experience that already exists in the province’s potash, oil, gas and electricity generation industries, combined with the geology of this province.

He sees Saskatchewan’s geology as able to support three utility-scale, low-carbon generation technologies being considered for development. The first two are being widely discussed in the province – small modular reactors (SMRs) and natural gas with carbon capture and storage (CCS). He explains that SMRs and CCS facilities can provide base-load power generation.

The third technology – CAES – would support renewable energy generation, such as wind and solar, being fully integrated into the electrical grid. CAES technology could potentially convert our abundant but intermittent renewables generation to reliable electricity-on-demand.

“My wish is that we also we start to investigate compressed air storage the same way SMRs and natural gas generation for electricity with carbon capture and storage have been explored,” said Brunskill.

All three technologies are complementary and would increase the reliability and redundancy of our electricity-



Electricity from wind and solar generation can either feed directly to the grid or be used to compress atmospheric air into purpose-built salt caverns. Later in the generation cycle this air is controllably released to generate electricity.

supply mix, while CAES technology could also provide storage services to the other two. He wants more people to be aware of the geological conditions found in this province that lend themselves to this technology as well as the expertise and decades of experience in Saskatchewan using rock-salt caverns to store natural gas and other hydrocarbons. That combination of geology and expertise, he believes, could make Saskatchewan a suitable location for CAES technology.

He believes this technology provides Saskatchewan an opportunity for the province to fully develop its renewable resources while keeping capital investment and jobs in our province, unlocking regional growth opportunities and supporting the tax base of several Saskatchewan rural municipalities.

For the last three years, Brunskill has been promoting CAES technology as a concept to geologists, engineers, students, faculty, researchers, and citizens through opportunities offered by the Johnson Shoyama Centre for the Study of Science and Innovation Policy (CSIP), the Saskatchewan Geological Society, the Saskatchewan Environmental Society, and others. He describes CAES as a mature, cost-effective, safe, and well understood technology. It also produces no toxic waste.

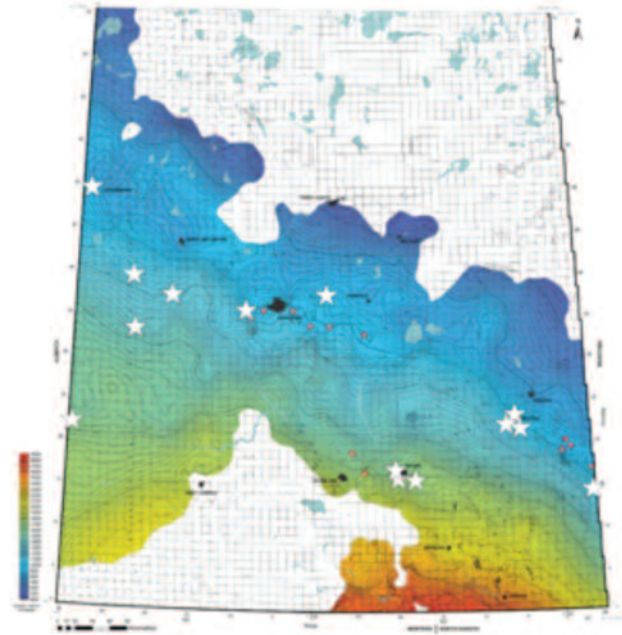
How CAES technology works is it uses electricity generated from renewable sources to compress and store atmospheric air in purpose-built salt caverns. While the sun is shining or the wind is blowing, intermittent wind and solar energy is converted to firm capacity by charging the cavern through this process. Later, a controlled release of the compressed air into a turbine and generator delivers electricity on-demand.

The caverns could potentially be developed in a layer of rock salt. In Saskatchewan that rock salt, which is primarily sodium chloride, is over 200 metres thick in some areas of southern Saskatchewan. The geological makeup and vast extent of the Prairie Salt Formation is well-understood from the drilling of over 170,000 oil and gas wells and from potash mining operations. To form the caverns, the salt must be dissolved, generating large volumes of salt “brine.”

“But in addition to the salt, we also have aquifers in the deep subsurface where we can safely get rid of this brine,” said Brunskill.

“We do that now at many of the potash mining operations. They inject the excess brine into some of these deep aquifers that are already full of salty water, so, there’s no environmental impact.”

Brunskill says that since the 1950s, Saskatchewan has successfully mined and operated caverns over 140,000 m³ (five million ft³) in size within this rock salt to store natural gas, other hydrocarbons and industrial waste. Other parts



This map shows the distribution of and depth to the top of the Prairie Salt Formation and where 58 salt caverns are located. The warmer colours represent greater depth to the top of salt, being approximately 1050 metres deep near Saskatoon and 1650 metres near Regina.

of the world have salt, but not necessarily the deep aquifers with brine already in them, so Saskatchewan has an additional geological advantage there, Brunskill says.

These “highly favourable geological conditions” give this province a significant advantage over other places interested in this technology as advanced global energy markets are considering several energy storage technologies. Many in the world focus on batteries for storage because they can be placed almost anywhere, Brunskill explains. Here in Saskatchewan, we can look at batteries for short-duration storage (hours) plus what is in the earth under us for long-term storage options.

This is why he wants to see engineers and geoscientists discussing this option. He knows his limits and he wants others to begin exploring the feasibility of this idea being implemented here.

“Engineers and geologists are the two disciplines to make this happen,” said Brunskill.

“The geologists and other scientists will be involved in exploring the subsurface for suitable locations and engineers will be involved in developing power-generation infrastructure on the surface.”

CAES is not new technology. Two locations alone have provided industry over 70 years of combined operational experience. It has been used at Huntorf, Germany (290 MW capacity) since 1978 and at McIntosh, Alabama (110 MW capacity) since 1991.

CAES technology is being advanced in several jurisdictions – in Ontario, California and Australia by Hydrostor, in Utah by Magnum Development and in Texas by Apex Clean Energy. Brunskill provides information on these projects that he found available to the public through these companies' websites.



The Hydrostor facility in Goderich, Ont.

The Hydrostor facility in Goderich, Ont. went into service in 2019 with a capacity of 1.75 MW. Magnum Development operates numerous salt caverns for liquid fuel storage. It is planning to develop new caverns in central Utah for an Advanced Clean Energy Storage project that could provide up to 1000 MW of storage capacity. Apex Clean Energy is planning to develop a 324 MW/16,000 MWh CAES facility at the Bethel Energy Centre in Texas. China's first 60 MW (300 MWh) CAES facility came online in May 2022.

Closer to Saskatchewan, a storage developer from Calgary known as RMP Energy Storage has provided information that allows a financial comparison between a wind-supported CAES facility and Combined-Cycle Gas Turbine (CCGT) generation. For reference, Saskatchewan has a new CCGT plant near Swift Current with a capacity of 353 MW. Brunskill says, according to RMP Energy Storage, the Levelized Cost of Electricity (LCOE) for a full time, wind-supported 300 MW CAES facility is cost competitive with new-build, best-in-class CCGT generation while reducing CO₂ emissions by 80 per cent. He points out that advanced CAES facilities use no hydrocarbons and therefore produce zero greenhouse gas emissions.

Brunskill sees this technology as being capable of bridging a gap between reducing coal generation and starting SMR electricity generation while also helping to unlock the economic potential of Saskatchewan's renewable energy generation, one of the best in Canada.

Replacing coal and potentially natural gas power generation by 2035 will require significant investment, but Brunskill believes that developing renewable sources in conjunction with CAES technology has the potential to keep most of this investment in Saskatchewan.

He knows many recognize the great wealth that the geology of Saskatchewan and the resources it provides has generated. For generations, jobs and revenue have been provided by producing oil, gas, potash, coal, uranium, gold and several other minerals. He sees how Saskatchewan's geology could continue to play a significant role.

CAES infrastructure could support significant investments in the wind and solar energy sectors. For example, to emulate base-load generation, each 300 MW CAES facility would require the third-party investment and construction of up to 900 MW of wind generating capacity valued at over \$1.44 billion, a figure he pulls from a market snapshot by the Canada Energy Regulator.

First Nations, farmers, ranchers, co-operatives, municipalities and communities could become power generators harvesting sunshine and wind. Those who build and operate the infrastructure necessary for CAES technology to be developed could be Saskatchewan's highly trained and experienced oilfield and power plant workforce.

Also, he believes this technology could help Saskatchewan become more self-sufficient when it comes to satisfying its energy needs. It would mean being less reliant on importing power from Manitoba or North Dakota, or natural gas from Alberta, which is where more than half of the natural gas Saskatchewan consumes is shipped from.

He wants others to be as intrigued as he is by CAES technology, but he recognizes it takes time for new concepts to be understood and appreciated. That is especially true when the person learning the concept is unfamiliar with what is going on inside the earth. He hopes the information he is bringing forward will help other geoscientists and engineers make informed decisions around the future of energy generation in this province.

AN ENGINEERING AND GEOSCIENCE PERSPECTIVE ON Sustainability

BY MARTIN CHARLTON COMMUNICATIONS



Bonnie Dobchuk, P.Eng.

Bonnie Dobchuk, P.Eng. would like to see engineers and geoscientists at the table when decisions about solving our society's challenges are being made.

"The people that are at the table now are accountants, lawyers, public policy experts and those with a lot of experience in social impact," said Dobchuk.

"Those are the four groups of people that are at the table and they all have fantastic things to say and we need them, but we need two more voices there – engineers and geoscientists."

This is her conclusion after more than 20 years working in the mining industry as a researcher and a consulting engineer who has developed a passion for sustainability and corporate social responsibility. Dobchuk has recently presented her capstone project as part of her post-graduate diploma in Sustainability and Corporate Responsibility at The University of St. Michael's College in the University of Toronto.

She was one of those presenting during APEGS Fall PD Days. Her presentation was "Sustainability: An Engineering and Geoscience Perspective."

Dobchuk was introduced to sustainability in her undergraduate studies in agricultural and bioresource engineering at the University of Saskatchewan. She then went on to earn her Masters of Science in Environmental Engineering. Her research at USASK in mine tailings remediation shaped her career. She moved from research into consulting engineering with O'Kane Consultants, a multi-national engineering consulting company specializing in holistic mine waste management.

Between 2016 and 2021, she served as Director and CEO of O'Kane Consultants, during which she applied her business leadership and saw the business reorganize into a purpose-driven organization.

She explains that sustainability is often viewed through ESG – environment, social and governance – but what is evolving is sustainability being viewed through purpose. She explained what came together for her in her career that inspired her to want to study and promote sustainability through an engineering and geoscience perspective.

"I have a passion around the role for women in everything but specifically STEM," said Dobchuk, who is a mother of three daughters. She is on the board of directors for Women-in-Mining/Women-in-Nuclear Saskatchewan. She also advocates for women by volunteering on the Gender and Trade Advisory Group and the Gender-Based Analysis + Sub-Committee, both for Global Affairs Canada.

"I've also always been very interested in the environment. I am also interested in structuring a business to ultimately meet the purpose that society asks of it. Seeing all of that come into alignment was really exciting."

As a woman in engineering, Dobchuk knew she was a minority in her professional world. At O'Kane, nearly half of its workforce was female and filling technical roles, including in engineering and geoscience. As the person filling the top role and being a woman, she was often asked how she reached that level.

"I never came up with the answer, but it was thinking about it that really started to pique my interest about unconscious bias and the effect of that and how it results in missing rungs in a woman's career ladder or glass ceilings or whatever analogy you want to use.

"I studied that out of my own interest and was really interested in it.

"When I moved into a leadership role, I realized when I looked around me that there are not very many engineering women as CEOs, especially in consulting engineering."

In her research, Dobchuk found when there is a woman in the senior management team, they are almost always in human resources or finance. Occasionally, she would come across a woman who was leading operations, but that was rare.

"I started to get really interested at not only how do we bring women up, but how do we get them at the management team level," said Dobchuk.



O’Kane provides an innovative and integrated geotechnical engineering service to the mining industry internationally.

“There is all this amazing research that shows that the more women are involved at a strategic decision-making level running businesses, the businesses generally do better.”

In her pursuit to better understand who is at the table making decisions that impact society, she recognized an absence of engineers and geoscientists – male and female.

“Whether it’s at the top levels of government or the senior levels of corporations or non-profits, at all the major tables where decisions are being made, engineers and geoscientists aren’t there,” said Dobchuk.

That matters when technical decisions that rely on science are being made. For example, she pointed to an issue that was recently the subject of media coverage in Canada. Canada’s federal government has committed to achieving a net-zero grid by 2035. At the same time, demand for electricity is growing as the infrastructure continues to age. But spending to address this has been conservative. Dobchuk said those at the table making those spending decisions are responding to what they perceive to be the demand for this to be addressed.

“If there had been an engineer at the table, the minute the 2035 goals were discussed, they would pull out a piece of paper and their pencil and they would have started to do some math around grid capacity and long-term planning because that’s just the way engineers think.”

Even in the undergraduate education of engineers and geoscientists, Dobchuk said there is some foundational sustainability theory that is shared around stakeholder engagement and system thinking that involves thinking about the long-term and potential unintended consequences of decisions. She can see how that thinking as well as scenario analysis would better discussions around decision-making tables.

“Engineers and geoscientists learn that as part of their academic rigour. We are generally good at long-term planning and detail when we come into this profession,” said Dobchuk.

“And yet I think we take for granted that way we go about solving problems.”

She doesn’t know if it is because there is an assumption made by engineers and geoscientists that all people think that way or if they are humble about their inclinations and skills.

“We have this fantastic set of skills to bring to the sustainability table — skills that are not natural to or part of the academic study of a lot of other people,” said Dobchuk.

“We can really contribute to sustainability decisions, but instead those decisions are often being made at a high level and then engineers and geoscientists are given the problem that we must react to when we are told ‘Now, go solve this problem.’”

She has some ideas as to why others aren’t inviting engineers and geoscientists to table. She believes engineers and geoscientists focus on solving problems while other professions are better at communicating and marketing what they have to offer in a way that is more accessible to those who don’t have a technical and scientific background.

“I heard from someone in the nuclear industry say that we tend to get too technical, too fast and people shut down when you start to throw too much detail at them,” said Dobchuk.

“I think a lot of it comes down to that we need to learn how to advocate and communicate better. That probably involves hiring the kinds of people that know how to do that for us.”

For example, she looks at renewable energy sources. There is a belief that the only barrier to completely transitioning to renewable energy sources is will – there needs to be political will backed by money. Any technical challenges related to renewable energy sources such as reliability are glossed over in public discourse or the conversation gets pushed into speculating on the political affiliation of the speaker raising the issue.

What engineers bring to that kind of conversation is how to achieve what is desired. For example, an engineer could provide realistic timelines or explain why mining would still be necessary to accomplish the goal.

She sees a role for individual engineers to start to speak up, take board roles, and to put a sustainability statement into their work product.

INDIGENOUS INCLUSION IN ENGINEERING

Pilot Study Results Released

BY MARTIN CHARLTON COMMUNICATIONS



Engineers Canada has released four considerations for how to best to support increased Indigenous inclusion in the profession, improve supports and reduce barriers.

These considerations are based on the findings of a recent survey it did to explore the characteristics and experiences of Indigenous engineers through their lifetimes. The survey asked participants questions about their childhoods (including the upbringing and education) through to their professional years.

Members of APEGS were invited to participate in this survey as the association was one of three engineering regulators in Canada who volunteered for it. (Engineers Geoscientists Manitoba and Engineers and Geoscientists BC were the other two.)

There were 594 APEGS members who responded to the survey. Of those 44 were Indigenous engineers or engineers-in-training. APEGS distributed the survey directly to members resulting in a higher response rate than the other memberships. (The results are based on the responses from all three regulators' members who responded.)

An objective of the survey was to explore professional outcomes of Indigenous engineers and how these compare to non-Indigenous engineers. Systemic differences in pay were looked at and a pay gap was found, even after demographic factors were controlled. The average salary of Indigenous engineers who responded is seven per cent lower than non-Indigenous respondents. The pay gap was even greater for those Indigenous engineers who are not cisgender men.

The survey found a disproportionate number of Indigenous respondents report lower-level job titles. Very few Indigenous engineer respondents report mid-level roles of senior engineer, manager, or team lead. However, representation in top positions (executives, directors and principals) is similar among Indigenous and non-Indigenous respondents.

A challenge Indigenous engineers identified in their professional lives is low Indigenous representation in the workforce, especially for Indigenous women, but the challenges began during their education. The most common challenges they identified during their post-secondary education were financial challenges as well as loneliness/isolation.

Indigenous engineers were asked about supports that would have been helpful during those years. They said monetary support as well as tutoring and academic support. Every Indigenous engineer who responded was enthusiastic about the Indigenous engineering access program they participated in, saying it had a profound and positive impact on their journey.

The survey found almost all (95 per cent) of Indigenous engineers surveyed have obtained a bachelor's degree as their highest educational credential level. The section on education did not provide results comparing the experiences of Indigenous engineers compared to non-Indigenous engineers.

Looking back even earlier in their lives, almost half of Indigenous engineers identify discrimination as the biggest challenge to pursuing math and science in high school (45 per cent). They noted that science, technology, engineering and math (STEM) outreach programs would have made it easier for them to pursue engineering.

A positive role model was instrumental in them becoming engineers – a family member, mentor or teacher. Almost 30 per cent said a teacher recommended they pursue engineering and that was the main reason they did.

The survey was done to identify ways Engineers Canada and regulators, such as APEGS, could better support Indigenous engineers during their education and in their work as engineers. There were four considerations provided based on the findings as well as the qualitative survey responses provided by Indigenous engineers.

Those considerations are:

Research

- Supporting research investigation barriers to licensure, barriers to employment and barriers in education.

Training

- Efforts to facilitate cultural learning, anti-Indigenous racism training and policy changes in the field and in academic spaces.

Networking

- Or more precisely, ensuring that mentorship and networking opportunities for Indigenous engineers are widely available and accessible.

Programming

For example:

- Providing more financial support to Indigenous students,
- Widely communicating about the effectiveness of bridge programs and Indigenous engineering access programs, and
- Developing tutoring programs at the high school and post-secondary levels, among other programming avenues.

The report suggests what that could look like in the three phases of a person becoming an engineer.

Formative years

- Anti-racism training, curriculum and policies for K-12 educators in all school divisions.
- Investing in Indigenous mentorship and training opportunities for high school students.
- Facilitating more STEM outreach and tutoring programs.
- Tailor more services to students from rural areas.
- Investigate the availability of pre-engineering courses at schools run by Indigenous governments.
- Investigate sources of discrimination in public schools.

Post-secondary experiences

- Explore cultural learning and anti-racism training for engineering instructors, faculty, and staff at universities and in the profession. (This work could be done with Engineers Canada's Indigenous Advisory Committee.)
- Provide Indigenous students more financial support, especially when they commute a long distance or relocate.

- Actively share information to increase awareness of bridge programs and Indigenous engineering access programs with potential participants.
- Explore program participation requirements and identify whether Indigenous students face additional barriers.
- Support research investigating factors contributing to feelings of isolation and loneliness and explore opportunities to provide counselling and social support.



Professional experiences

- Assist engineers in receiving more cultural and anti-racism learning as part of continuous professional development programs.
- Leverage resources developed by Indigenous organizations and other professional organizations to support firms with resources to improve Indigenous recruitment and inclusion.
- Provide more mentorship and networking opportunities, especially for Indigenous women engineers to ensure opportunities are equally accessible, regardless of their pre-existing networks.
- Investigate why eligible individuals did not apply for their licence and reasons why qualified individuals cannot find employment as an engineer.
- Investigate experiences of broader training positions and roles such as Indigenous and non-Indigenous engineering students, Members-in-Training / Engineers-in-Training, and engineering technologists.

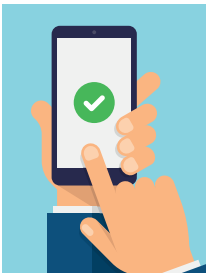
The full report can be found on Engineers Canada's website at engineerscanada.ca/reports/indigenous-inclusion-in-engineering. Big River Analytics designed and undertook the survey, providing Engineers Canada a way to collect data on Indigenous engineering students and professionals in Canada as part of its Operational Imperative 9 sub-strategy on Indigenous access to engineering.

2023 Fees Due on or before Dec. 30, 2022



Fees notices were mailed in mid-November

It is the responsibility of members and the official representative for a Certificate of Authorization to make sure contact information is up to date, including your email address. If you do not receive your fees notice, contact APEGS. Fees are due on or before Dec. 30, 2022 regardless of problems with delivery.



How do I pay my fees?

Log into APEGS Central, your online profile, by clicking “Login” in the top right corner on any page of the APEGS website. If you have never used the system before, click on “Forgot your password” and follow the instructions.

Even if you are mailing a cheque or your company is paying for you, please click on “Pay Now” in APEGS Central to be guided through updating your profile. You can also use your profile to make all other fee payments, enter Continuing Professional Development (CPD) credits, renew Permission to Consult, manage your email/mail subscriptions and volunteer with APEGS.

What happens if I do not renew?

You would no longer have the privilege of practicing engineering or geoscience on projects or properties within Saskatchewan. Use of title in Saskatchewan is also a privilege of membership.

Members who do not retain their membership in APEGS and/or in another Canadian association will lose coverage under the National Secondary Professional Liability Insurance Program. Also, failure to maintain your membership will result in ineligibility for benefits under the group life insurance program offered through Manulife and Engineers Canada if you have subscribed to this insurance.



What if I am not working in Saskatchewan?

Members who are retired or not working (at anything) in Saskatchewan can retain membership and may be eligible for a waiver of the annual licence

fee. More information can be obtained from the documentation accompanying your fees notice or from the APEGS website under Members.

Members under suspension due to non-compliance with CPD

Suspended members (administrative suspension due to non-compliance with CPD) who have not completed their reinstatement requirements will cease as members on Jan. 31, 2023.

What if my membership ceases and I need to reinstate?

Memberships that have ceased due to non-payment are subject to a 15 per cent fee to reinstate in the same calendar year. Members who notify the APEGS office in writing of their intent to resign their membership on or before Jan. 31, 2023 may reinstate their membership and licence during the calendar year without the payment of a reinstatement or application fee. The late payment penalty for the holder of a Certificate of Authorization is 15 per cent of the annual fee.

For reinstatement procedures for subsequent calendar years, see the APEGS website under Apply.

Eligibility for Life Membership

Members who are 65 years of age and retired are eligible to apply for Life Membership. An application came with your fees notice in November.

Continuing Professional Development

The Continuing Professional Development (CPD) Program requires APEGS members to complete ongoing professional development activities to maintain and improve their competence. It encourages members to engage in lifelong learning to protect public health, safety, and welfare. The program provides tools for members to assess their current skills, knowledge, and abilities, determine activities to maintain or enhance them and report completed activities online to APEGS as professional development credits. For more information, navigate to the CPD menu at apegs.ca.



CPD Reporting Deadlines

Members are reminded that they have until Dec. 31, 2022 to earn continuing professional development (CPD) credits for the 2022 reporting year.

While members can update their APEGS online CPD report at any time, the deadline to have all CPD information entered online for 2022 is Jan. 31, 2023.

Attention Licence Waiver Holders!

Members who hold a licence waiver for the entire year require a minimum of 30 credits obtained outside of professional practice including one hour of verifiable ethics training, which can be claimed under Formal Activity as part of the 30 credits.

Online Ethics Modules

APEGS has free one-hour online ethics modules available to assist members in obtaining their ethics credit for the year. The modules are not mandatory and are offered as one option available to members.

Our current ethics module topics are:

Module 1 - Professionalism and Ethics

Module 2 - Conflict of Interest

Module 3 - Investigation and Discipline

Module 4 - The Ethics of Continuing Professional Development

For more information and to access the modules, please visit the CPD menu at apegs.ca.



CPD Tip

The 'Reporting Elsewhere' option

Do you live outside of Saskatchewan? Are you also reporting professional development activity to another Canadian engineering or geoscience regulator?

If yes, you are eligible to report to APEGS using the 'Reporting Elsewhere' option. This is a quick process, but it must be completed on an annual basis. For a guide on how to complete this process, please visit our website and navigate to the CPD/CPD Program Documents webpage and scroll down to the Reporting CPD heading.

Does Your Next Meeting Need an Ethics Topic?



Monthly ethics moments are available to APEGS members for use in meetings. When an ethics moment is included in the minutes of a meeting, along with the start and end times of the ethics moment discussion, this time can count as part of the member's annual ethics requirement. If you would like this month's ethics moment, please email cpd@apegs.ca.

The 2021 CPD Compliance Report

The compliance review for the 2021 CPD reporting cycle has been completed. Members were required to report their information to APEGS online by Jan. 31, 2021.

CATEGORY	TOTAL NUMBER OF MEMBERS
Members who met their 2021 CPD requirements	12,412
Members who reported but did not meet all requirements	263
Members who failed to report to APEGS	175
Overall compliance rate	90%

The following is a summary of the reasons why members did not meet their annual requirements:

NOT COMPLIANT REASON	TOTAL NUMBER OF MEMBERS
Missing Ethics Requirement	127
Missing Credits, Activity Categories and Ethics Requirement	12
Missing Credits Only	33
Missing Activity Categories Only	25
Missing Credits and Activity Categories	39
Missing Credits and Ethics	4
Missing Activity Categories and Ethics	6



On April 1, 2022, 175 members who failed to report to APEGS for the 2021 CPD reporting cycle were placed on Administrative Suspension after being given the opportunity to report.

The 263 members who reported but did not meet their 2021 CPD reporting requirements were assigned a Remediation Plan by the Registrar to bring their files into compliance. On Oct. 1, 2022, 42 of those members failed to bring their file into compliance by the stated deadlines and were also placed on Administrative Suspension.

In total, 217 members were placed on Administrative Suspension for non-compliance with their 2021 CPD reporting requirements. The repercussions for members who are administratively suspended are as follows:

- Not licensed to take professional responsibility for any engineering or geoscience work in Saskatchewan;

- Appear in the APEGS register as being Administratively Suspended;
- Official Representatives for a company's Certificate of Authorization are no longer permitted to hold this position. If they are the only Official Representative for a company, the company's Certificate of Authorization is revoked, and the company is not permitted to offer engineering or geoscience services in Saskatchewan;
- If the Notarius electronic signature tool is used to sign documents, this privilege is revoked and a member must reapply and pay the application fee again if they wish to use this service after they are reinstated; and
- Members-in-Training are not permitted to write the Professional Practice Exam while suspended or apply for professional member licensure.

Members who are administratively suspended must apply to be reinstated. Members must submit the required CPD supporting documentation along with their application for reinstatement. APEGS will review their applications and will only reinstate a member once they have successfully met all criteria. This process may take a few weeks to complete, depending on how quickly a member meets their outstanding requirements and supplies APEGS with all the required documentation. Members who have not completed their reinstatement requirements will cease as members on Jan. 31, 2023.

Continuing Professional Development

The 2021 Assurance Review Report

In May 2021, the CPD Compliance Committee undertook its annual Assurance Review, at the request of Council, to ensure members were complying with the requirements of the CPD Program. This process involved examining the detailed CPD records for each member selected for review.

Here is a summary of those findings:

Year for Review 2021

Documents members were required to submit to APEGS

2021 CPD Plan - 2021:

CPD Activity Tracker or similar document that lists all professional development activities undertaken for 2021 and their corresponding credit values; Verification documents for all activities listed as Formal Activity; and Verification documentation for completing the 2021 ethics training.

Compliance Rate - Request for Documents:

85 per cent of the members selected for the Assurance Review complied with the request to submit their documentation to APEGS.

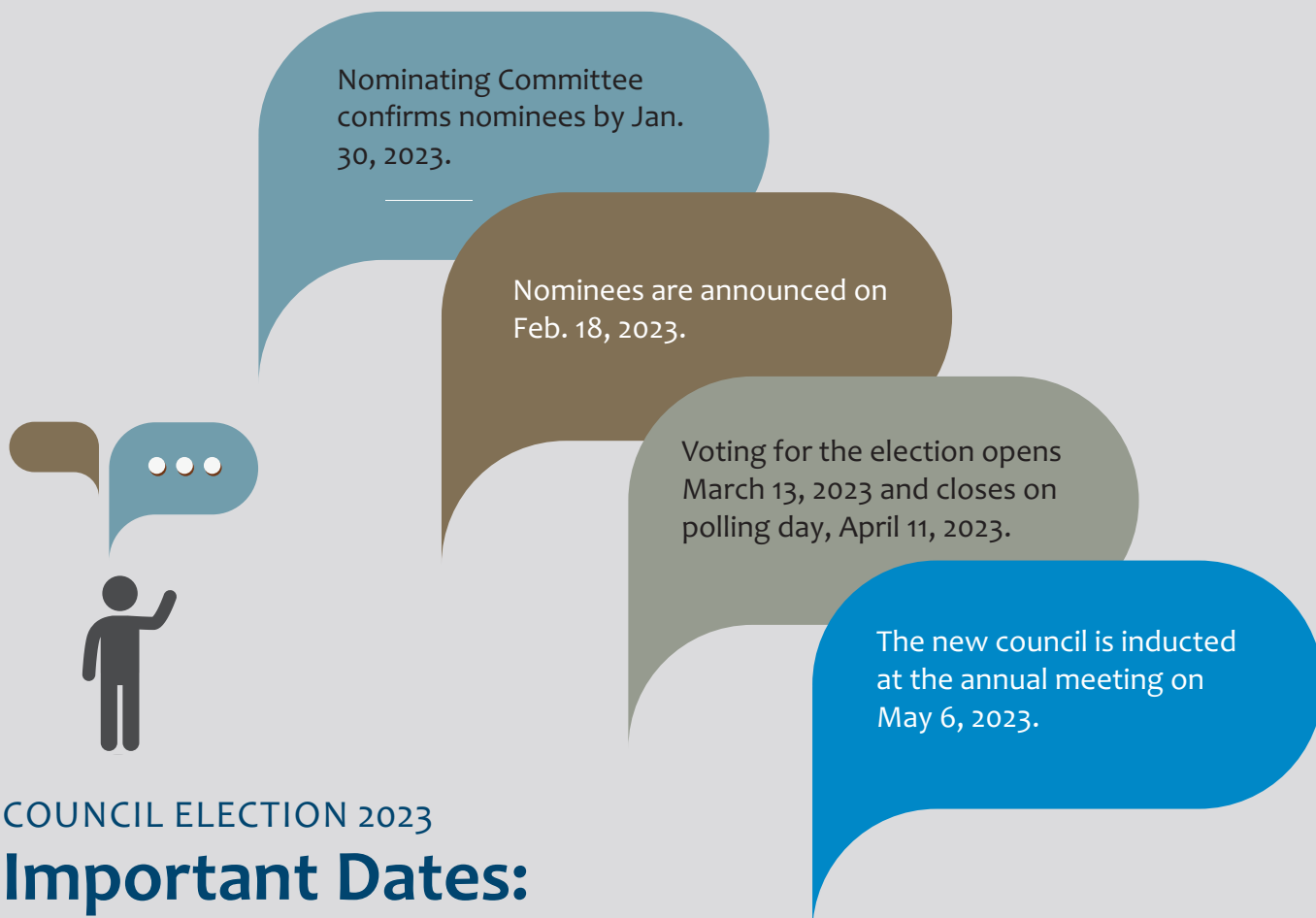
Protocol:

Submissions were evaluated against a protocol containing 55 requirements. These requirements were based on those defined in: Regulatory Bylaws, Section 23.2 and Appendix 5; and Continuing Professional Development (CPD) Program document.

Summary of 2021 CPD Assurance Review Results

Common Findings:

Members did not define scope of practice, include it on their CPD Dashboard, or scope defined was not appropriate. Members reported eligible CPD credits, but in the wrong category. Members changed their online reports to APEGS after receiving notice of their Assurance Review selection. Members did not indicate banked credits used/saved in tracking tool.



COUNCIL ELECTION 2023 Important Dates:



Registration of Firms

APEGS is currently reviewing possible changes to the way it regulates firms that engage in the practice of professional engineering or professional geoscience (Certificate of Authorization) and individuals who provide the public with consulting services in engineering and geoscience (Permission to Consult).

What is the current status?

APEGS drafted recommendations to improve regulation of firms further to surveying and consulting with members, interviewing engineering and geoscience regulators in other provinces, and reviewing key industry trends. The draft recommendations were approved in principle at the September 2022 council meeting. Further research needs to be conducted to finalize the recommendations. With enhanced regulation of firms, it is important for APEGS to make sure the appropriate measures are in place before finalizing the recommendations and before any implementation can begin.

What direction is APEGS going with the draft recommendations?

Be as inclusive as possible and be consistent about who is required to register.

Use best practices in implementing a model similar to the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and Engineers and Geoscientists BC (EGBC), which eliminates the need for Permission to Consult, as all members registered with APEGS should have a scope of practice.

Align with APEGA, EGBC, and other provinces for easy reporting and consistency.

Why this change?

Regulation of firms helps the regulator fulfil its mandate to protect the public. Businesses and individual professionals must promote the importance of what it means to seal and sign work and why the public needs to engage a professional engineer or professional geoscientist. Regulation of firms is intended to address potential conflict by making employers corporately responsible for the engineering or geoscience work that they carry out. Therefore, it is important for firms to be able to demonstrate compliance with a set of responsibilities to be registered and to emphasize the importance of ethical practice.

When can we expect this to be implemented?

It is important to take the time needed to develop an appropriate model and make sure proper supports are in place prior to implementing the program. We are still in the early stages of development. As more information is known, a timeline will be provided.

Who do I contact with questions?

APEGS is happy to answer questions. Submit questions using the “Contact Us” page on the APEGS website. Make sure the title “Regulation of Firms” is in the subject line.

Member Profile



Reinhard Schuetz, P. Eng.

I was born in southern Austria and attended my first seven years of school there. After my parents immigrated to Canada in the mid-1950s, I lived with my grandparents until joining my parents in Canada in 1960. My junior and high school education then continued in Edmonton until 1965.

Having always enjoyed scientific subjects during my formative schooling, and being given the opportunity for higher learning, selecting an engineering discipline to continue my education was a simple choice. After graduating from the University of Alberta with my B.Sc. in Mechanical Engineering in 1969, I joined the Association of Professional Engineers and Geoscientists of Alberta (APEGA) and APEGS, attaining a P.Eng. designation. I have enjoyed Life Membership since 2018.

The initial 12 years of my professional career involved engineering consulting for Montreal Engineering, Acres Consulting and Associated Engineering, followed by 15 years as a Partner in Scion Engineering.

Having received Canadian/USA patents for a unique above-ground, heated, dual-containment storage tank design, I was instrumental in establishing TankSafe Inc. and serving as President from 1996-2009. In 1998, I received additional Canadian/USA patents for the design of a Condenser Unit capable of up to about 90 per cent benzene, toluene, ethylbenzene and xylenes (BTEX) decontamination emitted from dehydration facilities. Both designs incorporated safeguards against contaminated liquid spillage and toxic venting.

My tenure as a professional engineer involved numerous technical, corporate and marketing functions, as well as interfacing with a variety of clients, vendors, contractors and government agencies pertaining to pipeline and related facility projects in Western Canada. A highlight in my career was receiving a Prairie Region Entrepreneur of the Year nomination in 1999, and subsequently having TankSafe recognized as a Top 30 entrepreneurial companies in Alberta.

From 2003 until 2009, I also served as Director/Outreach Committee Chairman for the Alberta Biodiesel Association and was instrumental in the development of marketing materials (such as a logo, website, magazine format and more) as well as trade show set-ups and seminar presentations.

In 2009 I moved to Kelowna (for a short hiatus) and joined the Accelerate Okanagan Mentorship Program for a year. Then, I returned to Calgary in 2012 and worked for Stantec Consulting Ltd. until retirement from engineering in 2016.

However, since 2010 my passion, which resulted in Canadian/USA patents, was the development of an industrial pollution control device (the UV-DOX Reactor) capable of simultaneously destroying airborne organisms and toxic chemicals.

After forming UV-DOX EnviroTek in 2016 (as sole owner), I was also involved in establishing Ti-DOX EnviroTek in 2019 to pursue development of a similar device, the Ti-DOX HydroxylizAire, for polluted indoor air decontamination of residential and commercial buildings. Each device achieved significant destruction of airborne pollutants typically associated with causing Sick Building Syndrome and/or Multiple Chemical Sensitivity issues.

Being a professional engineer had a positive impact during my whole career. It taught me to review problems, solutions, and opportunities by incorporating critical facets of “looking, listening and evaluating” in decision-making. Remember to believe in yourself and pursue your dreams!

University Library Access



APEGS members have access to the resources at the university libraries in Saskatchewan for professional practice and professional development purposes. Here's how to obtain a library card for on-site only access:



Go to the Library Services desk at either the Murray Library or the Science Library and present your APEGS membership card.



Go to the Borrowing desk at the Dr. John Archer Library & Archives and present your APEGS membership card and one piece of ID.

Member Grants



Through the University of Saskatchewan and the University of Regina, APEGS offers six merit-based grants of \$7,500 each to encourage existing APEGS members to further their education in engineering or geosciences or attain an MBA.

Eligibility requirements

Members returning to post-graduation studies at either university in the field of engineering or geoscience or for an MBA program are eligible to apply. Applicants are evaluated in the following areas:

- Accomplishments in the practice of professional engineering or professional geoscience which indicates exceptional potential.
- Demonstration of leadership, volunteerism and community involvement.
- Service to the professions in public education, understanding the role of professionals in society and/or active participation in engineering/geoscience associations, societies and institutes.
- Reasons for pursuing the post-graduate degree, goals, personal statement, how their studies will contribute to the professions.

How to Apply

Applications may be sent to APEGS any time throughout the year. Applications received by Dec. 31 of each year are considered and awarded early the following year. Go to www.apegs.ca and select Member Grants under the Members menu for the application form and more information.

APEGS AWARDS BANQUET moves to March



APEGS is moving the awards banquet from the first Saturday in May during the annual meeting and conference weekend to Thursday, March 2, 2023 to become part of Engineering and Geoscience Week.

The format of the event will be the same as usual:

Thursday, March 2, 2023 / Delta Downtown Saskatoon

Reception 6:00 p.m. / Fellowships: 7:00 p.m. / Banquet 7:30 p.m.
Awards: 8:30 p.m. / \$50 per person

The APEGS awards highlight Saskatchewan engineers and geoscientists for their contributions to the public and the professions. They showcase and recognize professional excellence and exemplary competence and conduct. This helps to foster professional excellence among members and raise awareness of the role of APEGS in protecting the public.

There are six geoscience and engineering awards, as well as an award for a non-engineer/geoscientist (or team) that recognizes projects or achievements in the professions:

- Brian Eckel Distinguished Service Award
- Outstanding Achievement Award
- McCannel Award
- Exceptional Engineering/Geoscience Project Award
- Environmental Excellence Award
- Promising Member Award
- Friend of the Professions Award

Check the events page in January to register.

Know anyone to nominate for an award?



Engineers and geoscientists are in the best position to observe others in their professions for their professional excellence and exemplary competence and conduct and nominate them for an award. If you know someone who has done something outstanding this year or throughout their career, APEGS wants to hear about it! APEGS interviews award recipients and nominators to produce videos as part of the awards banquet.

All professional members and engineering or geoscience licensees of APEGS who are in good standing are eligible for nomination. For more information on nomination and selection criteria, and award details, visit

<https://www.apegs.ca/members/honours-awards>.

Understanding Your Secondary Professional Liability Insurance

Members in good standing at participating regulators automatically have Secondary Professional Liability Insurance.

This unique program protects both you and the public in numerous scenarios involving whistleblowing, retirement, intellectual property, data loss, mentorship, and more. To learn more about the program, coverage amounts, and other benefits available to you, please visit the Engineers Canada website.



News From The Field



CBC

Summit highlights rare earth elements

The StarPhoenix - Saskatchewan's rare earth elements were in the spotlight at a recent summit held in Saskatoon.

The summit was hosted by the Saskatchewan Research Council and Vital Metals Inc. Both are behind new, multimillion-dollar rare earths processing facilities in Saskatoon, which are the first of their kind to be built in North America.

Representatives travelled from as far away as India and Australia to attend while speakers representing Germany and Norway took part in the events.

"There's a lot of excitement because there's a lot of potential and there's a lot of need, so there's demand. The supply side is the question," said Saskatchewan Mining Association president Pam Schwann.

While Saskatchewan was celebrated at the summit for what has been already achieved, there was also serious discussion about what needs to be done to ensure the province grows this opportunity.

For example, Saskatchewan's coal-fired electricity could make attracting environmentally-conscious investors and customers a challenge, said David Connelly, Vital's vice-president of strategy

and corporate affairs. There is limited time for the province to address this challenge as car manufacturers look to make their supply chains carbon neutral.

Indigenous engagement and reconciliation were discussed during the summit. Canada's minable deposits of rare earths are largely situated on Indigenous lands, Connelly said.

This is the case for a subsidiary of Vital, Cheetah Resources, which owns a rare earth mine in the Northwest Territories. A First Nation has been contracted to handle mining operations. Connelly said Vital is engaging Indigenous groups in Saskatchewan, having committed to a percentage of the processing workforce in the province being Indigenous.

"The end-use buyers (of rare earths) want to be assured that they're ethically sourced, that there's a high level of corporate-social licence to operate and that there's a significant environmental, social and governance component," said Connelly.

"That means they expect that the people from whose lands the resources come, or where they are processed, get a chance to participate in the economic opportunities that stem from that. It's just ... it's 2022."

Attracting Indigenous people to these jobs makes sense to John Desjarlais, P.Eng., the president of APEGS as well as the general manager of Great Plains Contracting, and he says it should to those involved in this industry as well.

That segment of the province's population is the youngest and fastest-growing in Saskatchewan, which Desjarlais said means industry and education must attract them or pay a price.

"Engaging that workforce, it's not a social responsibility, we're kind of past that now; it's an economic imperative," said Desjarlais.

"We have to develop that talent to support our growth needs. It's going to constrain growth; it's going to constrain opportunity if we don't."

Saskatchewan could lead Canada: report

CBC Saskatchewan – A report released by Clean Energy Canada and non-profit Trillium Network for Advanced Manufacturing that looks at Canada's potential in the electric vehicle sector says Saskatchewan could play a pivotal role in our country being a competitor in the electric vehicle battery supply chain.

The report says that sector could add up to 250,000 jobs by 2030 and \$48 billion to the economy each year.

Clean Energy Canada is an energy and economic think-tank based at British Columbia's Simon Fraser University. Evan Pivnick is the clean energy program manager there.

Innovative resource practices are already being used here, said Pivnick.

As an example, he points to Saskatchewan's Prairie Lithium, which pulls lithium from brine, using technology to separate it. Lithium is a key component of electric vehicle batteries.

Prairie Lithium completed its first well in southeast Saskatchewan in late 2021, which it believes could be the first well drilled for lithium brine in Canada.

Pivnick said Saskatchewan could share technology and knowledge with other Canadian jurisdictions “about how we can seize some of the opportunities as that critical mineral powerhouse that we are, but to do so in a way that we make high environmental standards a hallmark of what the Canadian battery industry is known for.”

Pivnick said the report breaks down three areas where Canada can capitalize: assembling electric vehicles; battery cell manufacturing; and gathering materials, whether by recycling batteries or mining the elements domestically.

Pivnick said Ottawa needs to develop a battery strategy to guide development of the battery supply chain across the country, and look at growing the workforce and market to take advantage of it.

If the federal government doesn’t take the right steps soon, the report projects it will only meet one-quarter of its potential.

Processing rare earth elements is a complex process, said Pam Schwann, president of the Saskatchewan Mining Association Schwann.

Saskatchewan has two labs that process rare earth elements into magnets used in electric vehicle car batteries, among other technologies. Those labs are very important to Canada’s future battery supply chain.

Schwann said one lab from Vital Metals, a Saskatoon-based company, is the only rare earth element producer in Canada, meaning Saskatchewan could play a crucial role in the country’s purifying of the minerals.

“Without that processing step and without those processing facilities, Canada misses out on a key component of the value chain,” Schwann said.

“That I see as an area that could be carved out for Saskatchewan really developing that global centre of expertise, where countries ship their rarest element concentrates to Saskatchewan ... to be processed.”

Canada’s first metal ingots, a product of rare earth elements, were produced in late August by the Saskatchewan Research Council’s Rare Earth Processing Facility. That announcement came two months after the province announced another \$20 million in funding to expand the facility’s abilities to smelt ingots.

U of S engineering grad developing running shoes

CBC - Gillian Pinder, a University of Saskatchewan engineering grad, is spending her days developing running shoes for her own company as well as Adidas.

Becoming a mechanical engineer was a good fit for her as



CBC

was being mentored by Sean Maw, P.Eng., in the sports engineering research field. Now, Pinder splits her time between Adidas headquarters in Portland, Ore., where she was a lead engineer on one of Adidas latest shoes, the Adizero Prime X Strung, and back at home on the farm in Saskatchewan.

She is also a founder of a company, BareWear, which develops indoor footwear for people who use orthotics. BareWare started as a design project in school with two of Pinder’s classmates. They created a footwear more suitable for those in yoga or gymnastics than wearing an orthotic in a closed toe shoe, such as a running shoe.

After graduating, Pinder went further with the concept and came up with the Barewear Binder. Buyers will receive the first batch of the design before the end of the year.

“It was a really cool learning experience and ultimately did really help me get the job [at Adidas],” said Pinder.

That is not all Pinder initiated. She recalls few women being in her engineering program. The lack of women in the clubs and extra-curricular activities also stood out to her.

So, she created GearUp, which helps female engineering students gain technical skills and build a network of female classmates and professionals.

Energy core of U of R engineering

Global News – Starting in fall 2023, engineering students at the University of Regina can choose to focus on petroleum engineering, sustainable energy engineering or energy transportation and storage beginning in their fourth year of studies.

“As students, we see ourselves as being responsible for the preservation of our planet by creating sustainable, clean energy while continuing to understand the importance of the oil and gas industry,” said Bailey Armstrong, president of the Regina Engineering Students’ Society.

“It’s exciting that the faculty is taking the lead in adapting to the evolving energy sector by creating a diverse and unique program that will certainly be intriguing to students who want to be at the forefront of that change.”

These three programs are the first of their kind developed as the faculty puts a focus on researching renewable energy.

“The energy landscape in not only this province, but nationally and even globally, is rapidly changing and as a faculty we need to be proactive in our programming to ensure our students have the skills and training they need to be successful in this increasingly demanding field,” said Dr. Phillip Choi, P.Eng., dean of the faculty of engineering and applied science.

“No university in Canada offers an energy-related curriculum as comprehensive as the proposed Energy Systems Engineering program.”

As the energy sector changes, new research is needed to prepare the next generation of engineers, the faculty says.

“Our country has a lot of challenges moving forward with respect to energy supplies, food supplies, clean water, all sorts of issues,” said David deMontigny, P.Eng., associate academic dean of the faculty of engineering and science.

“We need young people to be interested in engineering. And on the energy front, clearly, that is an area that is going to require a lot of attention moving forward.”

The Petroleum Systems Engineering (PSE) program is being phased out and admission has been suspended. Students currently in PSE can continue in the program through to graduation.

Donation supports U of R students

CTV Regina – New labs and equipment at the University of Regina are being used by engineering students as of this semester.

An anonymous \$1-million donation was gifted to the U of R’s Faculty of Engineering, which has allowed the university to purchase equipment to create three new labs, including one for electronics and instrumentation.

Engineering student Chance Smith is excited about the new 3D printers. Students can now construct what before only existed on paper, which is valuable experience. Students can learn to design prototypes using the equipment.

APEGS member named head of Nutrien

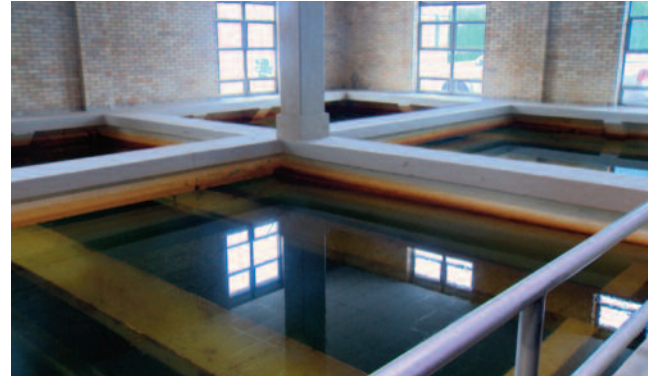
Canadian Press - Ken Seitz, P.Eng., has been named president and CEO of Saskatoon-based fertilizer giant Nutrien Ltd. following a months-long global talent search.

Seitz has been serving as interim CEO since January. He previously led its potash operation and has more than 25 years of experience in agriculture and mining.

Nutrien says it has achieved record results under Seitz’s leadership at a time when there are major changes in the agricultural markets and never-before-seen global food

security challenges. This underscores his leadership, said Russ Girling, chairman of Nutrien’s board of directors.

Seitz, who grew up on a dairy farm in Saskatchewan, says he’s “honoured and humbled” and that Nutrien is well positioned to help meet the global goals of food security and climate action.



GlobalNews

Saskatoon plans for new water treatment plant

The StarPhoenix – The City of Saskatoon is planning to develop a second water treatment plant ahead of the city’s population doubling.

A report tells city council’s environment, utilities and corporate services committee that a second plant is the best option to meet demand. A second plant would bring the city’s total treatment capacity to 450 million litres per day, which is necessary for an expected population of 500,000, according to the interim director of Saskatoon Water, Pamela Hamoline, P.Eng.

“We will continue to utilize and upgrade our current Water Treatment Plant and infrastructure for years to come, but we need to begin planning the development of a second plant to increase treatment capacity,” Hamoline said.

The existing plant currently has a treatment capacity of 250 million litres per day. It is unrealistic to expect the 116-year-old plan to keep up with future demand, Hamoline explained, even with water conservation efforts, maintenance and upgrades.

An update on Saskatoon’s long-term water treatment plan was commissioned by the city from AECOM in 2019. That update presented four alternatives, including retrofitting the existing plant to bump treatment capacity up to 450 million litres per day, building a second, smaller plant alongside upgrades at the current plant, or building a new replacement plant and decommissioning the current one.

The report suggests the city invest in some upgrades to the existing water plant and develop a second plant to meet the desired output. It proposes the city “explore available funding opportunities” with federal and provincial programs over the next two years and work with the provincial Water Security Agency on construction permits.

News Beyond Our Borders



canadianbusinesscollege.com

Tech companies ask government to intervene in regulatory dispute

Canadian Press – Canadian tech companies are asking Alberta’s new premier to intervene after the Association of Professional Engineers and Geoscientists of Alberta (APEGA) took legal action over job titles such as “software engineer.”

“APEGA is actively targeting companies in Alberta with legal action to restrict us from using globally competitive job titles and descriptions,” the letter produced by the Council of Canadian Innovators (CCI), a national tech advocacy organization, reads. It says APEGA “has taken the aggressive position that software engineers must be regulated, and subject to onerous, restrictive, and unnecessary certification requirements.”

More than 30 people signed it, including executives from Helcim, Aimso and Neo Financial. They see “software engineer” as a standard job title for anyone building technical programs and that restricting their use of it hampers their ability to compete for global tech talent.

CCI president Benjamin Bergen argues this is a case of a regulator which has “overstepped” on an issue that hasn’t seen this level of action anywhere else in the world.

APEGA said in a news release that the term engineer comes with a licensed and ethical set of responsibilities and accountabilities and pointed to other regulated professions, such as the health and legal professions.

APEGA’s website says it has “the legal right and requirement” to restrict the practice and use of titles linked to engineering and geoscience to licensed individuals and companies. It says those who are unlicensed cannot use the word engineer combined with any name, title, description, letter, symbol or abbreviation that implies they are licensed with APEGA in job titles, on resumes or on social media. APEGA maintains this is because “the public may believe that you have the right to practise engineering or geoscience” and “this can endanger public safety.”

Jay Nagendran, APEGA registrar and chief executive officer, also explained that software engineering is a nationally and internationally recognized discipline of engineering. An open letter signed by every engineering regulator in Canada in July said use of “software engineer,” “computer engineer” and other information technology titles with the engineer suffix is prohibited everywhere in Canada unless the person using it is licensed by one of their regulatory groups. Engineers Canada also points out on its website that there is legal precedent on the matter.

Alberta’s minister of labour and immigration office responded on behalf of the premier to encourages CCI and APEGA to find a “mutually agreeable solution.” His office promised to work with both groups to resolve the issue because it is “concerned by any regulations that impede our competitiveness.”



mini-ielts.com

World’s most iconic geological heritage sites chosen

Global Times - A list of the world’s first 100 geological heritage sites was announced with one location in Canada making the list.

The list was announced by International Union of Geological Sciences (IUGS). A team of nearly three dozen experts in the field of geological relics from 21 countries was formed to review and select the 100 sites. They evaluated 181 sites that 56 countries applied to have considered.

The sites on the list include seven in China that cover the fields of petrology, structural geology, stratigraphic paleontology, geography, geomorphology and more. The announcement of the list was made in that country.

The Canadian site is the Burgess Shale, which is located in Yoho National Park, near the town of Field, B.C. It is a record of one of the earliest marine ecosystems, providing a look at life as it was over 500 million years ago.

The IUGS is one of the world's largest scientific organizations with 121 national members representing over a million geoscientists. The announcement of this list coincides with its 60th anniversary.

Quebec engineers reach labour deal with government

Montreal Gazette – A labour deal between the Quebec government and its engineers has been reached, in part, because of a new class of engineer with a higher salary, the union says.

The Association professionnelle des ingénieurs du gouvernement du Québec (APIGQ) announced its members had voted 90.37 per cent in favour of the deal, which allows two joint committees to form. The union says these measures will help the government retain experienced engineers.

The vote saw 1,610 union members take part. The APIGQ represents 1,800 engineers, 1,200 of which are employed by the Ministry of Transport. A strike of those engineers had impacted civil engineering and construction sites under the government's jurisdiction. The rest work for the Ministry of the Environment or others.



CBC

Mechanical engineer converts older cars to electric

CBC - Natal Antonini, a mechanical engineer and the founder of Upcycle Green Technology Auto Shop, is transforming older cars into electric vehicles.

The business is in Stratford, P.E.I., near the University of Prince Edward Island's sustainable engineering program. Two recent grads were recently hired.

Antonini explained half of the production of carbon dioxide is during the manufacture of the car. Converting an existing car reduces that production.

"You are saving twice," said Antonini. "You are saving during the use of the car and during the production of the car."

Two of the shop's prototypes are now road legal. The next step is the testing phase. Antonini's plan is to become a niche shop supplying trucks to businesses and other organizations primarily concerned with reliability and cost of fuel. He expects the production line should produce two electric vehicles per week.



NorthernOntarioNews

High-tech hard hat being developed

CTV - A hard hat for miners that incorporates an augmented reality (AR) system to improve safety is the focus of a research project underway in Greater Sudbury.

The AR system, known as the Microsoft HoloLens AR System, allows miners to operate machinery remotely reducing the risk of injury.

NSS (Northern Survey Supply) Canada specializes in engineering measurement systems and mine surveying solutions. It is working with Cambrian College on the project.

The system is already placed on hard hats used in construction. But hard hats worn by miners have a lamp, a larger brim and other differences. Patrick Galipeau-Belair, a mechanical engineer with Cambrian College's research and development (R&D) team, said a distinct design is needed to mount the system on them. Matteo Neville, a second-year student of mechatronics engineering technology at Cambrian College, is designing a bracket so it can be mounted.

The first prototype is expected before the end of the year.

B.C. volcano scan to help drillers

Canada's National Observer – Geologists want to scan a B.C. volcano to help geothermal drillers improve their success rate.

Their success rate depends on sinking wells where underground water is at its hottest. Half the time they drill to supply geothermal plants, drillers need to hit a spot like that in order to be considered successful.

Steve Grasby, a geologist with Natural Resources Canada, and his colleagues are focused on Mount Cayley, about 24 kilometres west of Whistler, B.C. They want to build a 3D map of Cayley's innards – without using traditional tools such as seismic lines.

Part of the map will be drawn through basic geology. The team will analyze which rock types are present, looking at their permeability and porosity to locate and diagram fault systems that may hold hot water. They will also examine how electromagnetic energy moves through the volcano. This will allow them to develop a 3D image of what is underground to provide drillers a more exact position to find the best heat.

“Our goal is to reduce that exploration risk,” Grasby said.

Plan to ship green hydrogen questioned

CBC – The announcement of a plan between Canada and Germany to ship green liquefied hydrogen is being questioned by some engineers.

The plan is to send hydrogen from Newfoundland and Labrador to Germany to help that country wean itself off fossil fuels largely imported from Russia. At the G7 leaders’ summit in the Bavarian Alps in June, Prime Minister Justin Trudeau spoke to other world leaders about how Canada could offer alternatives to nations dependent on Russian oil and gas. Trudeau suggested to reporters at the conclusion of the summit that infrastructure used to carry liquefied natural gas could be adapted to carry hydrogen.

Germany was expected to be the first big customer of a first-of-its-kind project in Canada. A zero-emission energy plant where wind power will be used to produce hydrogen and ammonia for export is planned for Stephenville on Newfoundland’s west shore. The company behind it, World Energy GH₂, said the first phase would see up to 164 onshore wind turbines built to power a hydrogen production facility. Construction is set to begin in 2023.

But some say what this plant will sell will carry a big price tag and won’t help Germany in the near term.

Paul Martin, a Toronto-based chemical engineer who is the co-founder of the Hydrogen Science Coalition, said the business case for liquefied hydrogen isn’t clear.

The process uses energy to break down water into its component parts, hydrogen and oxygen, which Martin said takes a lot of time, money and effort.

“We’re turning electricity, which is really valuable ... and we’re turning it into heat ... and that’s a step backwards in thermodynamics terms,” said Martin.

“When you take a step backwards in sort of dynamic terms, you’re taking a step backwards in value as well. It’s worth less than the electricity is to start with.”

He also points out it would be difficult to transport across the ocean because it will need to be cooled into a liquid state first, loaded on a ship, and then reheated when it arrives to be turned back into a gas. Each step takes additional energy.

“By the time you get to the other end, you’ve paid for 10 units of electricity and in Germany you get one to two units of electricity back again,” said Martin.

The technology needs to improve and more investment needs to be made before the cost is even relatively comparable with its natural gas-derived alternative, said Amit Kumar, the industrial research chair of the Natural Sciences and Engineering Research Council.

“The key is you need a lot of associated infrastructure to be built before we can do a large-scale export of hydrogen into other countries,” said Kumar, who is also a faculty of engineering professor at the University of Alberta who was consulted on the drafting of Alberta’s hydrogen strategy.

Martin said there are a few places “where there’s this magical special set of circumstances” to produce green hydrogen on a mass scale. They just aren’t in Canada.

Places like Chile and Western Australia and maybe the west coast of Africa where there is a desert with few people and an ocean to the west. They can collect solar power during the day and power wind turbines at night when the land cools and the wind comes off the ocean. In a place like that, there is an incentive to produce and export hydrogen because few people there need electricity.



Methane leak between Russia and Germany

New Civil Engineering/Associated Press - Damage to pipelines used to transport natural gas from Russian to Germany that began to leak after explosions were detected could likely be repaired, at least one engineer says.

Other engineers are focused on the environmental impact of the leak with one calling it “catastrophic.”

Explosions detected in September caused huge leaks of methane from the Nord Stream natural gas pipelines. A submersible drone was used to film 80m beneath the surface of the sea and found that many parts are buried in the seabed. Up to 50 metres of pipe is missing.

Nord Stream AG, who operates the pipeline, has said the chances of a leak were a one-in-100,000-year event. Many leaders from the EU and NATO suspect sabotage. German

authorities said the damage is irreparable, but chair of the Offshore Engineering Society, Philip Cooper, disagrees.

“It’s definitely repairable in some form. The original Nord Stream used hyperbaric welding systems to create it and it is exactly the same equipment you would use to repair it,” said Cooper.

“Any big lifeline always comes with a repair plan. You can do all this stuff diver-less now.”

Both layers of the pipes are said to have been ruptured causing anywhere between 15 million cubic metres to 500 million cubic metres of methane to leak into the Baltic Sea. Methane is a major contributor to climate change because it is 82.5 times more potent than carbon dioxide at absorbing the sun’s heat and warming the Earth.

Andrew Baxter, a chemical engineer who has worked in the offshore oil and gas industry, and is now at the environmental group ED, said the amount methane that has leaked is probably not at the high end being estimates. But it is at least double the worst known terrestrial release of methane in U.S. history which was the Aliso Canyon disaster in 2015.

“That’s one thing that is consistent with these estimates,” he said, “It’s catastrophic for the climate.”

Paul Balcombe, a member of the engineering faculty at the department of chemical engineering at Imperial College London, agrees with Baxter that the extent of the gas leak is still coming into focus, but he is concerned.

“It would have a very large environmental and climate impact indeed, even if it released a fraction of this,” said Balcombe.

Methane seen bubbling at the ocean’s surface indicates “a strong upward flow,” according to Balcombe. Cooper said no one would go near the rupture until it is completely safe. He said once it is safe, the very minimum that should occur should be preservation measures. He said sea water entering the ruptures will cause corrosion to start, however, colder conditions over the winter will slow the corrosion.

Nord Stream 1 pipeline stretches 1,200 kilometres under the Baltic Sea from the Russian coast near St. Petersburg to northeastern Germany. It has not transported any gas since August when Russia said it needed maintenance. Nord Stream 2 runs parallel to the existing Nord Stream pipeline, but in February when Russia invaded the Ukraine and German chancellor Olaf Scholz ordered the withdrawal of a key document needed for certification of the pipeline, halting it.

Risk of COVID lower on planes

CBC – A Montreal-based aeronautical engineer says because of the way air flows in the pressurized cabin of an

airplane, there is a lower risk of catching an airborne illness such as COVID-19 while flying than there is in other environments.

“The risk in the cab of an aircraft is probably the lowest of all indoor environments that you could actually be in,” said Nigel Waterhouse, president of Can-Am Aerospace.

Waterhouse explained this after a Calgary doctor filed a human rights complaint about the removal of mask mandates on airplanes as of Oct. 1. Waterhouse said many think of an airplane as a balloon that’s inflated and then sealed, but what is actually happening is air is constantly flowing in and out. He says in a larger airplane, the air in the cabin is replaced about once every two to three minutes.

Airflow is at its highest point once pressure in the cabin reaches about 8,000 feet (2,440 metres).

“But as soon as the doors are closed and the engines are started, the ventilation system is running to meet the minimum fresh air requirements,” said Waterhouse, who is also designated by Transport Canada to approve aircraft design.

He identifies more of a risk during boarding and deplaning and suggests that is when passengers would want to wear a mask.



DiscoverHumboldt

Economic impact studied

CTV – International engineering firm GHD Group is predicting that droughts, floods and storms could cause more than \$88 billion of damage to Canada’s economy by 2050.

Flooding is expected to cost the economy over \$40 billion, storms over \$34 billion and droughts another \$14 billion.

“We experience climate change through the lens of water,” said Don Holland, an engineer and the Canada water market leader for GHD Group.

“Municipalities have declared climate change emergencies and goals, but the biggest challenge is translating that into the projects we construct and the infrastructure that we construct in communities.”

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Calendar of Events

Below are some featured events. Please see the Events calendar online for a full list of events:
<https://events.apegs.ca/>

LEED Green Associate Training

On demand or live webinars on:
Jan. 21, 2023 / Feb. 11, 2023
Feb. 28, 2023 / March 18, 2023
<https://leadinggreen.com/online-leed-green-associate/>

ACEC-SK Leadership Certification Program

Online / Jan. 24, 2023
<https://www.apegs.ca/event/acec-sk-leadership-certification-program-course-seven>

46th C.J. Mackenzie Gala of Engineering Excellence

Saskatoon, SK / Jan. 31, 2023

Awards Banquet

Saskatoon, SK / March 2, 2023
<https://www.apegs.ca/event/awards-banquet>

Spring PD Days

March 2023
Registration opening the beginning of February 2023.

Annual Meeting and Professional Development Conference

Regina, SK / May 5 & 6, 2023

Practical Geocommunication course

On demand. Log into APEGS Central to register using instructions for members only.

4 Seasons of Reconciliation

On demand
<https://www.apegs.ca/cpd/pd-opportunities/4-seasons-of-reconciliation>

Other PD resources

<https://www.apegs.ca/cpd/pd-opportunities/other-pd-resources>



Did you know?

APEGS introduced *The Edge Monthly*, a digital newsletter for members, in August 2022.


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