

93rd APEGS Annual Meeting and Professional Development Conference 2023
Keynotes and Professional Development Track Sessions
May 5, 2023

8:45 AM to 9:45 AM – Breakfast and Keynote (in person and live stream) – Trentino Ballroom



Ken From, P.Eng., FEC, FGC (Hon.)

“Humanity, we have a problem.”: Canada’s Energy Future and the Role of Engineers and Geoscientists

Discussions regarding energy and the environment have become increasingly heated and divisive. Climate change has emerged as one of the greatest global environmental and social/economic challenges of all time. Canada wants to be in a leadership role and has committed to net zero by 2050. While this is a challenge, let’s change the narrative to look at it as the biggest opportunity Canada has seen in a long time. Our country has everything the world needs so let’s embrace that and become the best on earth in providing the energy, food and resource systems of the future.

This presentation will explore some of the serious unintended consequences of the current narrative and will outline the need for a new path for economic prosperity and environmental sustainability. As engineers and geoscientists, we need to continue to innovate and develop at scale solutions to produce and use energy with better overall efficiency. We need to understand the train has left the station and as technical professionals, not only must we be on the train – we need to be the conductor. The diverse backgrounds of engineers and geoscientists are of tremendous value as their experience and skill sets are needed to develop the “green” economy. As an example, the incumbents in the oil and gas sector today have significant capabilities, such as fluid flow in porous media, that must be leveraged to meet the immense challenges – as the time is short. As mentors, we need to encourage young professionals to be active in the energy sector as the world needs the best and brightest to solve the issues. It has been said many times: today is the best time to be in the energy business as innovation and pace of change are more important now than ever before.

Ken recently retired as President and CEO of SaskEnergy. Most of his career has been in the private and public energy sectors. After a brief stint in private consulting, he moved to SaskPower/SaskEnergy, then to Prairie Hunter Energy Corporation, the Technical Safety Authority of Saskatchewan as CEO, the Petroleum Technology Research Centre as CEO, and finally back to SaskEnergy in 2017. Ken has a B.Sc. in Mechanical Engineering from the University of Saskatchewan. Passionate about the profession and recognizing that engineers need to take a leadership role in public policy and economic advancement, Ken represented APEGS as the president in 2003-2004 and at the national level as a Director for Engineers Canada. More recently, Ken served on the boards of the Canadian Gas Association and the Canadian Energy Pipeline Association and represented Canada internationally through the International Energy Agency.

10:00 AM – 11:00 AM

Track 1: Practicing the Professions (in person and live stream) – Trentino Ballroom



Dr. Esam Hussein, P.Eng., Professor and former Dean of the Faculty of Engineering and Applied Science, University of Regina

An Overview of Small and Micro Modular Reactors

Nuclear reactors are re-entering the clean-energy mix as a flexible carbon-free, reliable, baseload power source. Advanced reactors are designed to be inherently and passively safe and cost effective. Small and micro modular reactors (SMRs & MMRs) are emerging as an attractive choice for small and medium energy jurisdictions, such as Saskatchewan. The modularity of these reactors aims at enabling factory production and on-site assembly, reducing overall construction time and cost. In Canada, eleven SMR/MMR vendors currently have pre-licensing engagements with the Canadian Nuclear Safety Commission, and one (Global First Power) is seeking approval to prepare the site for an MMR at the Chalk River Laboratories in Ontario. This presentation will examine the main design and safety features of these reactors and the associated regulator aspects. Emphasis will be put on the GE-Hitachi Nuclear Energy's BWRX-300 boiling water reactor, selected for potential deployment by SaskPower in the mid-2030s, and the Westinghouse Electric Company's eVinci solid core and heat pipes MMR, advanced by the

Saskatchewan Research Council. The role Saskatchewan can play in the fuel cycle of these reactors, from fuel production to spent fuel management and in the supply chain, will be discussed.

Esam is a nuclear engineer and professor emeritus at the University of Regina and the University of New Brunswick. He has written a critical review of emerging small modular nuclear power reactors for *Physics Open*, Volume 5, 2020, available open access at <https://doi.org/10.1016/j.physo.2020.100038>.

Track 2: Leadership and Engagement (in person only) – Campania A



Tracy McArthur, P.Eng., Co-op Coordinator, College of Engineering, University of Saskatchewan

Ten Steps for Success in Your Next Job Search: How to Stand out as an Ideal Candidate

Searching for a new job can be a daunting task, but it doesn't have to be. In this session we will go through the ten steps involved in a successful job search and provide you with some tips on how to make yourself stand out from other candidates. Topics include finding purpose and direction in your job search, tips to create effective job search documents, leveraging your network and more.

Tracy graduated with a B.E. in 2005 and a M.Sc. in 2011. She began her career as a Water Resources Engineer, where she worked for seven years before going back to the USask College of Engineering as a sessional lecturer. While sessional lecturing she became a certified life coach to help professionals navigate the challenges of their life and career. She enjoyed teaching so much that she took a full-time position with the College of Engineering. She is now the Co-op Coordinator for the Engineering Co-op Internship Program and is working towards her Certificate in Career Development and Academic Advising.

Track 3: APEGS/Ethics (in person only) – Campania B



Jocelyn Pelletier-Huntley, P.Eng., Principal & Founder, Prairie Catalyst Consulting
Findings from the APEGS' EDI Baseline Assessment

Regulators and organizations across Canada are seeking to meaningfully advance equity, diversity, and inclusion while implementing the Truth and Reconciliation Commission's Calls to Action. In 2022, Prairie Catalyst Consulting completed baseline equity, diversity, and inclusion (EDI) assessment research which documented the current EDI activities within APEGS, the challenges faced by APEGS members as they practice the professions and identified opportunities and recommendations for advancing EDI within the association and membership. This presentation will share findings from the EDI baseline assessment which gathered the experiences from 1,308 APEGS' members in a member survey and through a series of five focus groups which engaged allies and individuals from equity-deserving groups — those who identified as women, Indigenous people, members of the LGBTQ2S+ community, persons with disabilities, visible minorities.

Jocelyn is an Equity, Diversity and Inclusion (EDI) researcher and professional mechanical engineer with nearly 20 years of experience leading change. Jocelyn has been recognized by Engineers Canada as an EDI Champion and by Vanier Canada for her leadership capacity. Through her business, Prairie Catalyst, Jocelyn is driven to create awareness and remove roadblocks so that all individuals and organizations can realize the benefits of inclusion and achieve their full potential. She helps her clients lead change through uncovering problems, establishing common understanding, and implementing practical solutions. Jocelyn supports leaders to make changes with a consultative and collaborative approach that engages key stakeholders.

11:15 AM – 12:15 PM

Track 1: Practicing the Professions (in person and live stream) – Trentino Ballroom



Gavin Jensen, P.Geo., FGC, Saskatchewan Geological Survey and Zach Maurer, Arizona Lithium

Lithium Exploration in Southern Saskatchewan: The Brief History, Present and Exciting Future

The Saskatchewan Geological Survey began sampling brines in 2011, driven by the demand for lithium and other trace elements that could potentially be derived from basinal brines. Numerous wells were sampled from oil-producing regions of Saskatchewan where production was from Paleozoic-aged formations. The sampling results show that lithium concentrations differ and include spatial variations within individual formations.

Arizona Lithium's Prairie Project is in southeast Saskatchewan where the company holds approximately 360,000 acres of brine mineral exploration permits. In 2021, the company drilled the first lithium brine well in Canada. The company is currently exploring the Duperow Formation to better understand lithium concentration distribution and brine productivity potential. In parallel to this, the company has been a pioneer in advancing new forms of lithium extraction technology. The company currently operates a lithium extraction pilot plant in Emerald Park, Saskatchewan.

Gavin obtained a B.Sc. in Land Reclamation and Remediation, and a B.Sc and M.Sc. in Geology all from the University of Alberta. He joined the Saskatchewan Geological Survey as a Research Petroleum Hydrogeologist in 2007. Since 2011 Gavin's focus area has been in determining the concentration and spatial distribution of lithium in brines. His research has helped guide and foster the growth and interest of this emerging industry within Saskatchewan which lead to the province's first subsurface mineral public offering for lithium in December 2019. Gavin's current research is aimed towards a collaboration with the University of Regina that is investigating regarding the presence and distribution of Rare Earth Elements (REE) in brines.

Zach grew up farming in southeast Saskatchewan near the Prairie Project's core project area. He entered the energy sector in 2009 and worked his way from a roughneck into consulting roles. During his consulting career, he managed environmental and hydrogeologic projects in Canada and the United States. In 2019, he incorporated Prairie Lithium and has since lead multiple rounds of private equity funding. Most recently, Zach worked on a transaction with Arizona Lithium for Prairie Lithium to be acquired to help grow the company and project. He holds a B.Sc. in Geology from the University of Regina. He also holds a Diploma in Exploration Information Technology from the South Alberta Institute of Technology (SAIT).

Track 2: Leadership and Engagement (in person only) – Campania A



Mary-Lynn Charlton, President, and Karen Brownlee, Director of Content, Martin Charlton Communications

Communicating with Clarity

APEGS members are often challenged to help those outside the professions make sense of engineering and geoscience issues and projects. It's more important than ever to clearly describe what engineers and geoscientists contribute to society and why your work matters. Communicating your value to senior leadership, key stakeholders and the general public is critical for the success of your career and projects, and can even help shape government policy. This workshop covers communication skills and tactics that help you tell your stories so people better understand you, your work and your goals. We'll share tools to be more compelling and persuasive when communicating to engage target audiences, build trust and gain more respect for the professions.

Whether it's public speaking, boardroom presentations, social media, written briefs, marketing documents, media interviews or chatting with neighbours, this workshop will help you tell your story, grow your reputation and communicate with clarity.

Mary-Lynn has worked in public relations and communications since founding Charlton Communications in 1989. On March 1, 2010, Charlton Communications merged with Paul Martin Communications – two companies that have served Saskatchewan for over 65 years – to create Martin Charlton Communications. Her background in journalism gives her a firm belief in the importance of storytelling. Her goal is ensuring clients' stories are told in a convincing and compelling way to all audiences that need to hear it. Mary-Lynn has been doing APEGS' The Professional Edge magazine since 1990 and is a huge advocate for telling the stories of engineers and geoscientists.

Karen developed her insight into storytelling during her 15 years working as a reporter, producer, content editor, web editor, anchor and talk show panelist in Saskatchewan. These roles in print, radio, and digital media gave her a deep understanding of communications. During the last five years, she has collaborated with organizations wanting to clearly articulate their value to defined audiences. Her skill as a researcher and interviewer puts others at ease. She is relied on to collect the relevant details to be distilled into an easy-to-understand message delivered in words, images and sounds.

Track 3: APEGS/Ethics (in person only) – Campania B



Chris Roney, P.Eng., President, Roney Engineering Ltd.

The Ethics of Infrastructure Failure

On June 23rd, 2012, a highly corroded connection failed at a mall in Elliot Lake, leading to a catastrophic collapse that tragically killed 2 people. The public inquiry that followed found that although it was rust that ultimately defeated the structure, the real story behind the collapse was one of human, not material, failure. Commissioner Belanger wrote that: *“Some engineers forgot the moral and ethical foundation of their vocation and profession – to hold paramount the safety, health, and welfare of the public.”* This is just one case of several that Mr. Roney, through his vast personal experience, will explore to highlight the vital importance of the ethical foundation of our profession and the dire consequences that follow when engineers allow themselves to be swayed from that foundation. Chris will explore the human aspects behind the engineering failures and derelictions, and the lessons to be learned from them.

Chris is an internationally registered, practicing structural engineer with over 32 years of experience. He served on the Council for Professional Engineers Ontario (PEO) and on the board of Engineers Canada, ascending to president. Chris led PEO’s response to the tragic collapse of the Algo Mall in Elliot Lake and testified on behalf of the profession at the public inquiry. He led a national engineering taskforce on lessons from the Charbonneau Commission about collusion and corruption in Quebec’s construction sector and the Mount Polley tailings dam failure in BC. He has served for the past 25 years on the Complaints Committee for PEO and is a fellow of the Canadian Academy of Engineering, a Companion of the Professional Engineers Order of Honour and recipient of the Governor General’s Sovereign’s Medal.

1:15 PM – 2:15 PM – Lunch and Keynote (in person and live stream) – Trentino Ballroom



John Lorinc, journalist, editor and author of *Dream States: Smart Cities, Technology, and the Pursuit of Urban Utopias*

How smart cities fit into the history of urban infrastructure

The history of urban focused technology tracks the evolution of cities, and indeed enables modern societies to live in dense and populous metropolitan regions. For centuries, these technologies -- everything from viaducts and concrete to S-bend pipes, elevators, municipal water treatment plans and advances in civil engineering -- have served as the foundation upon which urban life, in all its forms, plays out. In the past 15 years, with the advent of smart city technology, high speed broadband, IoT devices and big data, urban technology has come to include extremely powerful digital tools that hold tremendous promise but demand increased scrutiny and democratic engagement if they are to become the city-building tools of this century.

John is a Toronto journalist and editor. He writes for a range of media outlets, including The Globe and Mail and Spacing, about cities and climate change, with a focus on planning, clean building technology and local politics. John is the author of four books and a co-editor of six anthologies published by Coach House Books. *Dream States*, his latest book, won the 2022 Balsillie Prize for Public Policy, awarded by the Writers Trust of Canada.

2:30 PM – 3:30 PM

Track 1: Practicing the Professions (in person and live stream) – Trentino Ballroom



Dr. Muhammad Imran, P.Eng., Vice-President, Rare Earth Elements Division, Saskatchewan Research Council
Opportunities and Challenges: Building the Rare Earth Element Supply Chain

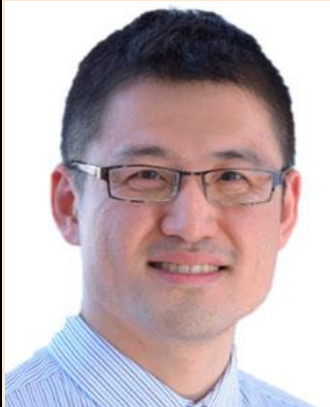
The rare earth element (REE) market is experiencing impressive and unprecedented growth. There are many reasons for this growth, including a move toward electric vehicle adoption, net zero goals at both domestic and international levels and a secure supply of REEs that is no longer dependent on foreign sources. For the REE industry, the secure supply of REEs and the resiliency of their supply chains are essential to meeting increased demand.

As a first-of-its-kind in North America, SRC's Rare Earth Processing Facility will lay the foundation for a REE supply chain in Saskatchewan and form an industry model for future REE resource expansion in the province.

In this presentation, learn about some of the challenges and opportunities in establishing an REE supply chain and how SRC's Facility and REE hub will help address some of the challenges, providing rare earth producers with a potential route to market and completing the important mid-stream piece of the supply chain.

Muhammad has over 20 years of joint experience in operations, and Research and Development, in various industrial sectors including cement manufacturing, oil and gas, and rare earth. He holds a PhD degree in Chemical Engineering and is member of SRC's executive team. He previously served as Director of Operations, in the Mining and Energy Division at SRC (Saskatchewan Research Council). He has led many projects, including innovative proofs of concept; development and optimization of medium and heavy oil Enhanced Oil Recovery processes; lab-scale equipment design; and physical and fluid flow modelling. He is leading a vertically integrated Rare Earth Processing Facility project at SRC, first of its kind in North America. Muhammad is recognized in executing successful strategic business programs and high-performance team building.

Track 2: Leadership and Engagement (in person only) – Campania A



Tate Cao, P.Eng., Assistant Professor, La Borde Chair in Engineering Entrepreneurship, Ron and Jane Graham School of Professional Development, College of Engineering, University of Saskatchewan

Innovation Processes and Developing Innovation Capacity

The world today needs engineering ingenuity to develop better infrastructure, to reduce our carbon footprint, to identify alternative energy, to reimagine our cities and the way we work, and more. Our world needs nothing less than innovation for a sustainable future. Industry and university alike invest heavily in new technology development, yet a gap exists between the idea and impact of new technologies. In this talk, we will dive into the nonlinear innovation process, which is full of twists and turns. We will first distinguish different types of innovations and explore the challenges and opportunities for technology-driven innovation. Following that, we will explore a proven innovation framework that focuses on scaling up the impact of the ideas with some real-life case studies. At last, we will explore the role of university and industry collaboration in generating innovation through either entrepreneurship or corporate intrapreneurship.

Tate teaches courses on engineering technology management, product design, and entrepreneurship. His research interests include 3D printing in tissue engineering and healthcare, smart farming technologies, and entrepreneurial practices. He has founded and directed the SIGMA Educational Skill Accelerator program, and serves on several boards, including the Asian American Innovation Alliance, Co. Learn, Pan Canadian Smart Farm Network, as well as Tech Innovation and Engineering Entrepreneurship group at CEEA. Prior to joining USask, he practiced intellectual property law and built and managed technology startup companies. Tate received his bachelor's degree in biomedical engineering from Beijing Institute of Technology and his Master's in Biomedical Engineering and MBA from the University of Saskatchewan. He is one of the six USask Sustainability Faculty Fellow at University of Saskatchewan and the college lead for the Smart Farming Initiative at the College of Engineering.

Track 3: APEGS/Ethics (in person only) – Campania B

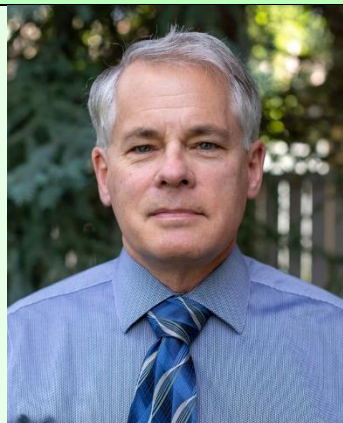
Chris Roney, P.Eng., President, Roney Engineering Ltd.

The Ethics of Infrastructure Failure

See above for abstract and bio.

3:45 PM – 4:45 PM

Track 1: Practicing the Professions (in person and live stream) – Trentino Ballroom



Brad J. Hayes, PhD, P.Geo., FGC, President of Petrel Robertson Consulting

21st Century Energy Transition: The Global Challenge of our Time

Affordable, abundant, and reliable energy is fundamental to human well-being and prosperity. For the past 200 years, human lives have improved immensely as more and more people have gained access to energy, primarily in the form of fossil fuels – coal, petroleum, and natural gas. As the energy transition continues into the 21st century, many challenges are arising as we strive to achieve both energy security and to minimize associated environmental issues.

Effective actions to meet our energy goals require well-informed energy policy – meaning that both the public and policy-makers must learn a great deal more about energy – and about setting reasonable goals and priorities informed by scientific and engineering realities. A variety of polarized viewpoints makes the learning process very challenging and impedes our progress, as demonstrated by a number of energy policy failures affecting billions of people today.

Making the 21st Century Energy Transition work well for humanity is the global challenge of our time.

Brad is the President of Petrel Robertson Consulting, providing professional advice to clients working in oil and gas, helium and lithium exploration, water resource management, carbon sequestration and geothermal energy. Brad holds a PhD in geology from the University of Alberta and has 40 years of diverse experience applying subsurface geoscience in resource industries. He is the Outreach Director for the Canadian Society for Evolving Energy, a Past-President of the Canadian Society of Petroleum Geologists, a member of the Energy Resources Technical Advisory Committee for Geoscience BC and a Fellow of the Balsillie School for International Affairs. Brad is an Adjunct Professor in the University of Alberta Department of Earth and Atmospheric Sciences. Leading a team supported by U of A and CSEE, he developed a Massive Open Online Course (MOOC) “21st Century Energy Transition – How do We Make it Work?” as a product of extensive research on modern energy issues.

Track 2: Leadership and Engagement (in person only) – Campania A



Kelly Lendsay, BSPE, MBA, CAFM, ICD.D, President & CEO, Indigenous Works

Initiating Your Organization's Reconciliation Action Plan

Never has it been so important for companies to establish a Reconciliation Action Plan. In 2015 the Truth and Reconciliation Commission released their reports along with 93 Calls to Action. There are many definitions of what reconciliation means for companies, and employers will want to become acquainted with the specific challenges and opportunities of Call to Action #92 and how it can be addressed. Companies continue to ask what they can be doing in the spirit of reconciliation and how they can develop a plan. Each reconciliation plan is and should be unique to each organization.

Kelly has been with Indigenous Works since it was first established in 1998. Today Indigenous Works gets many calls from companies that want to start their reconciliation journey. The process of setting a reconciliation action plan is an important feature of the authenticity of the plan. Co-design needs to be a vital part of the process. Indigenous Works has been working with APEGS for the past year to learn what APEGS and its members mean by reconciliation and what a plan could look like for

the organization. Join Kelly as he talks about his work with APEGS and the opportunities that companies are discovering through the development of reconciliation action plans.

Kelly, a social entrepreneur, is internationally recognized as one of Canada's foremost innovators and organizational development experts in Indigenous engagement strategies and partnerships. His dynamic communications style has earned him the reputation as an engaging thought leader and effective bridge-builder fostering trusted partnerships for workforce and economic development across Canada, USA, Australia and abroad. He was honored by the University of Saskatchewan as one of their "100 Alumni of Influence" in the last century whose accomplishments have been recognized for influencing the growth and development of the university, the province, and the world. A proud Canadian Metis/Cree Indigenous leader, he moves seamlessly between both worlds fostering innovation, economic inclusion prosperity for all.

Track 3: APEGS/Ethics (in person only) – Campania B



John Fahlman, P.Eng., P.Geo. and Delee Silvius, P.Eng., MBA, PMP, LEED Green Associate, Assistant Director of Registration, APEGS

Recommendations on the Regulation of Firms

The Corporate Registrant Task Group has undertaken a review of the current corporate registration environment in Canada to determine if APEGS should change how it licenses and regulates entities that practice engineering and geoscience in Saskatchewan. On March 2, 2023 the council approved the task group's recommendations that APEGS develop a new program requiring entities to have policies and procedures about practice areas, ethics, professional development, and quality management. APEGS expects to implement the program in three years. This session provides information about the task group's approach to firm regulation and is an opportunity for members to ask questions as well as offer suggestions about program development.

John is the Vice President of Infrastructure Services with the Water Security Agency. He is a long-term holder of Permission to Consult with responsibility for the Certificate of Authorization for WSA with over 30 years of public service. John is a current member of the Corporate Registrant Task Group.

Delee is the staff support of the Corporate Registrant Task Group. She has been with APEGS for over five years and has a diverse background and experience in both the public and private sectors.