



# 2022 CIGRE CANADA CONFERENCE & EXPO

October 31-November 3, 2022 Westin Calgary Alberta, Canada [cigreconference.ca](https://cigreconference.ca)

*The Great Energy Transition*



Host Utility:



Premiere Sponsor:





# TRANSFORMING OUR ENERGY FUTURE

**DELIVERING INSPIRED, SUSTAINABLE SOLUTIONS FOR A BETTER WORLD.**

The global energy landscape is changing at a rapid pace and ATCO is committed to keeping up. We are leading the transition to a lower-emitting future, driven by the knowledge that everyone needs secure, reliable and affordable energy to thrive. It is our privilege to energize homes, communities and industries with customer-focused, sustainable energy now and into the future.

**Visit: [Electric.ATCO.com](https://Electric.ATCO.com)**



Photograph taken by Brian Berenguer, Environmental Advisor



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**HITACHI**  
Inspire the Next

## Manage tree growth before they cause power outages with Vegetation Manager

Utilities understand the importance of vegetation management to grid reliability and long-term resilience—but it's an expensive, complex, and tedious process. Without the right data, you can't plan; without planning, you can't prioritize; without prioritizing, critical issues go unresolved, and a hazard tree takes down part of your grid. Be proactive with prevention.



 **Hitachi Energy**



## WELCOME MESSAGE FROM THE GENERAL CHAIR

On behalf of the members of the CIGRE Canada committee and ATCO, I invite you to join us in Calgary for the 17th Annual CIGRE Canada Conference, October 31 to November 3, 2022.

We respectfully acknowledge this event is taking place in the Treaty 7 region of Southern Alberta, on the traditional territories of the Blackfoot Confederacy (Siksika, Kainai, Piikani), the Tsuut'ina, the Îyâxe Nakoda Nations and the Métis Nation (Region 3), in the beautiful foothills of the Canadian Rockies.

Over the four days of this conference, business leaders, manufacturers, engineers, regulators and academics will collaborate and discuss the latest trends and developments within the evolving electricity sector.



This year's theme, "The Great Energy Transition," is top of mind for me—and undoubtedly for us all. It continues last year's conversations about decentralization and decarbonization while establishing the path towards transforming the global energy sector from fossil-based to zero carbon by 2050. Navigating this transformation requires us to create sustainable supply, improve infrastructure, shape demand, and innovate our collective approach through new partnerships.

At its core, this transition represents an enormous opportunity for us to propel, support and embrace the shift to clean energy. I believe advancing towards a lower-emitting future is our responsibility now. What we do today will profoundly benefit people and communities across the globe tomorrow.

The CIGRE Canada Conference continues to be one of the most enriching forums to meet and exchange knowledge, experience and ideas within our evolving industry. I look forward to learning and sharing perspectives on how we can collectively support the Great Energy Transition that will take us to our energy future together.

Yours truly,

Melanie Bayley  
President, ATCO Electric

## COMMITTEES

### General Chair

**Melanie Bayley**  
ATCO, Canada

### Organizing Committee

**Loraleigh Kovacik**  
ATCO, Canada

**Corinne Mah**  
ATCO, Canada

**Erin Newell-Lupien**  
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**Steven Desrochers**  
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ATCO, Canada

**Pete Bothwell**  
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**Shan Jiang**  
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**Jeanie Chin**  
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**Bogdan Kasztenny**, Schweitzer Engineering Laboratories, Canada

**Claude Rajotte**, Hydro-Québec, Canada

**David Jacobson**, Manitoba Hydro, Canada

**Farnoosh Rahmatian**, Nugrid Power, Canada

**Francisc Zavoda**, Hydro-Québec (IREQ), Canada

**Fred Ritter**, Alberta Electric System Operator (retired), Canada

**Hany Soloumah**, Siemens Canada, Canada

**Janos Toth**, Enginomix Consulting, Canada

**Jean-Francois Allan**, Hydro-Québec (IREQ), Canada

**Jerry Wen**, BC Hydro, Canada

**Nicolas Pouliot**, Hydro-Québec (IREQ), Canada

**Patrick Picher**, Hydro-Québec (IREQ), Canada

**Pierre Van Dyke**, Hydro-Québec (IREQ), Canada

**Steven Pai**, BC Hydro, Canada

**Sudhakar Cherukupalli**, BC Hydro, Canada

**Tarlochan Sidhu**, University of Western Ontario, Canada

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**Ramy Azar**, Member, Canada

**Mike Bartel**, Past Chairman, Canada

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**Greg E. Farthing**, Co-Vice Chair, Canada

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**Bruno Jesus**, Member, Canada

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**Philippe Landry**, Member, Canada

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**Susana van der Veen**, Operations Coordinator, Canada

**Philip Zinck**, Chairman, Canada

## SCHEDULE-AT-A-GLANCE

Exhibitor Trade Show Opening Hours		Monday	Tuesday	Wednesday
Exhibits Area		18:00 - 20:00	09:00 - 20:00	09:00 - 16:30
Monday, October 31, 2022				
08:00-17:30 Registration — Central Foyer				
CIGRE Workshops — Bow Valley				
08:30 – 09:30	<b>Workshop 1</b> <b>ATCO’s ADMS Journey &amp; Challenges</b> Hieu Tran, ATCO; Ken Pratt, Power Systems Consultants	<div><b>Technical visits to ATCO Newell Converter Station</b> Departures and arrivals at the main entrance of the Westin Calgary Hotel</div> 		
09:45 – 10:45	<b>Workshop 2</b> <b>A Panel Discussion on the Energy Transition and Reconciliation with Indigenous Communities</b> Panelists: Ian Scholten, Indigenous Clean Energy; Jorge Aviles, ATCO; Moderator: Ryan Makela, ATCO			
11:00 – 12:00	<b>Workshop 3</b> <b>Transition to Climate Neutral, Safe and Sustainable Power Grids – Benefits for Grid Operators and Society</b> Dr. Dirk Helbig, Siemens Energy; Eduardo Gomez Hennig, Siemens Energy			
12:00 - 13:30 — Lunch		Departure: 08:30 Return: 16:00		
13:30 – 14:30	<b>Workshop 4</b> <b>The Evolving Energy Transition: Technology, Consumers, and Business Models</b> Joe Slater, ATCO	<div><b>Technical visits to ENMAX Shepard Energy Centre</b> Departures and arrivals at the main entrance of the Westin Calgary Hotel</div> 		
14:45 – 15:45	<b>Workshop 5</b> <b>Transmission Line Clearance Enhancement Using the AMPJACK® Lift System</b> Nathan Stahl, Ampjack Industries Ltd.			
18:00- 20:00 Welcome Reception — Exhibits Area				

Time		Tuesday, November 1, 2022					
06:30	19:00	Registration — Central Foyer					
06:45	08:00	Breakfast — Britannia/Belaire					
07:00	16:00	Speaker ready at registration desk — Central Foyer					
08:00	08:10	Word of Welcome — Britannia/Belaire Phil Zinck, Chair CIGRE Canada; Arne Wohlschlegel, Managing Director, Siemens Energy Canada					
08:10	08:30	Keynote: Embrace the Shift: Transforming our Energy Future — Britannia/Belair Melanie Bayley, President, ATCO Electric					
08:30	10:00	Business Panel: The Evolution, Opportunities & Challenges of the Great Energy Transition — Britannia/Belaire Pete Bothwell, Vice President, Customer Experience & Initiatives ATCO Electric; Francis Bradley, President & CEO, Electricity Canada; Tony DiFranco, VP Sales, Hitachi Energy; Eduardo Gomez, North America Director Sales & Innovation – Grid Technologies, Siemens Energy Canada; Ameen Hamdon, President & CEO, SUBNET Solutions; Moderator: Shah Nawaz, Business Unit Head, Digital Grid, Smart Infrastructure, Siemens Canada					
10:00	10:30	Networking Break — Exhibits Area					
10:30	12:00	Session 1 — Britannia/Belaire		Session 2 — Eau Claire North		Session 3 — Bow Valley	
		475	C6 Active Distribution Systems & DER	489	B4 DC Systems & Power Electronics	479	B2 Overhead Lines
		484		482			
		492		499			
		506		503			
12:00	13:15	Women in Energy Luncheon: Transition and Evolution — Britannia/Belaire Marie-France Samaroden, VP Grid Reliability Operations, AESO; Rebecca Ostash, VP Business Development, TransGrid Solutions; w, VP Finance Grid Technologies, Siemens Energy; Claudia Cosoreanu, Product Management Executive - Grid Automation, GE Renewable Energy; Kirsten Trunzo, Vice President, Controller, ATCO; Moderator: Aimee Intac-Leung, P.Eng., PMP, Converter Stations Protection & Controls Maintenance Engineering Head, Manitoba Hydro					
13:15	14:30	Session 4 — Britannia/Belaire		Session 5 — Eau Claire North		Session 6 — Bow Valley	
		476	C1 Power System Development & Economics	509	A2 Power Transformers & Reactors	514	A3 Transmission & Distribution Equipment
		481		530		536	
		494		540		523	A1 Rotating Electrical Machines
14:30	15:00	Networking Break — Exhibits Area					
15:00	16:15	Session 7 — Britannia/Belaire		Session 8 — Eau Claire North		Session 9 — Bow Valley	
		478	C2 Power System Operation & Control	483	B5 Protection & Automation	491	B3 Substations & Electrical Installations
		502		498		515	
		517		516		547	
16:15	16:45	Networking Break — Exhibits Area					
16:45	17:45	Session 10 — Britannia/Belaire		Session 11 — Eau Claire North		Session 12 — Bow Valley	
		535	B2 Overhead Lines	524	C4 Power System Technical Performance	527	B5 Protection & Automation
		541		529		537	
		545		539		542	
17:45	19:00	Cocktail Reception — Exhibits Area					
19:00	22:00	Conference Banquet and presentation of the finalists — Britannia/Belaire Best Student Papers - Best NGN Papers					



Time		Wednesday, November 2, 2022					
06:30	13:00	Registration — Central Foyer					
06:45	08:00	Breakfast — Britannia/Belaire					
07:00	13:00	Speaker ready at registration desk — Central Foyer					
08:00	08:15	Keynote: Energizing the Future: A Vision for Net-Zero in Alberta — Britannia/Belaire Gary Hart, President & CEO, Altalink					
08:15	09:15	CEO Panel: Balancing Reliability & Affordability in the Transition to Net-Zero — Britannia/Belaire Melanie Bayley, President, ATCO; Mark Poweska, President & CEO, ENMAX; Cory Strang, President & CEO, Northwest Territories Power Corporation; Gary Hart, President & CEO, Altalink; Arne Wohlschlegel, Managing Director, Siemens Energy Canada Moderator: Francis Bradley, President & CEO, Electricity Canada					
09:15	09:45	Networking Break — Exhibits Area					
9:45	10:45	Session 13 — Britannia/Belaire		Session 14 — Eau Claire North		Session 15 — Bow Valley	
		504	C6 Active Distribution Systems & DER	518	B5 Protection & Automation	538	C2 Power System Operation & Control
		511		522		477	C4 Power System Technical Performance
		519					
10:45	11:15	Networking Break — Exhibits Area					
11:15	12:15	Session 16 — Britannia/Belaire		Session 17 — Eau Claire North		Session 18 — Bow Valley	
		510	B4 DC Systems & Power Electronics	485	A2 Power Transformers & Reactors	487	D2 Information Systems & Telecommunication
		513		488			
				505			
12:15	13:45	NGN Networking Luncheon — Britannia/Belaire Kurtis Martin-Sturmy, Chair Next Generation Network Canada					
13:45	14:45	Session 19 — Britannia/Belaire			Session 20 — Eau Claire North		
		501	B4 DC Systems & Power Electronics	534	C6 Active Distribution Systems & DER		
		521					
		533					
14:45	16:30	Next Generation Network (NGN) Reception — Exhibits Area					
16:30	17:00	Award Presentation of the Best Papers and Closing Session — Britannia/Belaire Award of the Best Student Paper – Award of the Best NGN Paper – Prize draws					

Time		Thursday, November 3, 2022					
08:00	12:00	Tutorial 1 — Bow Valley		Tutorial 2 — Eau Claire		Tutorial 3 — Bonavista	
		<b>Siemens Energy</b> Part 1 - Carepole - Innovation for pole top transformers Part 2 - Energizing society with the world's 1st rapid response multi-voltage transformer lease		<b>Siemens Canada</b> Digital Twins and the Energy System – Interactive Tutorial Session		<b>Hitachi Energy</b> EconIQ™ High-Voltage Technology and Innovation - Our Promise Towards a Sustainable Energy Future for All	

## WORKSHOP 1

08:30 – 09:30 Monday, October 31, 2022

Bow Valley

### ATCO's Advanced Distribution Management Systems (ADMS): Journey & Challenges

There are a variety of trends and changes underway that will materially impact electricity's distribution system in the foreseeable future. Worldwide behaviors surrounding electricity consumption and production are rapidly changing. ATCO Electric is committed to innovating existing infrastructure to futureproof the grid while providing new offerings and services that customers and retailers expect within this new emerging electricity marketplace.

As a core component of ATCO's broader Grid Modernization investment, ATCO's Advanced Distribution Management System (ADMS) program will enable ease of access for connecting new renewable energy resources to the existing grid, enabling customers to participate in microgrid, EV charging, and active demand side management technologies.

This workshop will take you through ATCO's journey from the inception (request for proposal phase) to our current project activities and future visions. Topics of discussion include:

- Pre-ADMS program – Request for Proposal experience
- Current project activities:
  - Risks and risk management approach
  - ATCO approaches
  - Data requirements and technical challenges
- Benefits and lessons learned
- ADMS 2.0

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#### PRESENTERS:

**Hieu Tran**, ATCO; **Ken Pratt**, Power Systems Consultants

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## WORKSHOP 2

09:45 – 10:45 Monday, October 31, 2022

Bow Valley

### Reconciliation in the Energy Transition

This panel-based workshop will introduce how to practice Reconciliation through the principles of cross-cultural communication and negotiation. Specific examples that will be shared demonstrate Reconciliation in action within the utility sector. The topics that will be discussed include:

- Reconciliation in action
- Cultural Intelligence
- Indigenous inclusion in Canada's clean energy future
- Cross-cultural communication and negotiation
- Meaningful collaboration
- The importance of Traditional Knowledge

The workshop's presenters will introduce the audience to important concepts about meaningful engagement and collaboration, as well as examples of how these concepts are applied in practical ways. Towards the end of the workshop, the audience will have an opportunity to participate through an open Q&A portion.

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PRESENTERS: **Ian Scholten**, Indigenous Clean Energy; **Jorge Aviles**, ATCO

MODERATOR: **Ryan Makela**, ATCO



## WORKSHOP 3

11:00 – 12:00 Monday, October 31, 2022

Bow Valley

### Transition to Climate Neutral, Safe and Sustainable Power Grids – Benefits for Grid Operators and Society

Global warming and the related climate change impacts on health, safety and environment are significantly caused by man-made CO<sub>2</sub> emissions. After decades of scientific research and discussions, there is global consensus to decrease and limit harmful CO<sub>2</sub> emissions to lessen the negative effects of global warming. But how can our world become CO<sub>2</sub> neutral?

In this workshop, the global sustainability targets of governments and electrical grid operators are described. For power grids, a new product generation is presented, which is completely free of GHG, in accordance with highest standards concerning a healthy and safe working environment. The product development is guided by a holistic approach for the whole lifecycle including sourcing, production, operation, and end-of-life, and covering all aspects of health, safety, and environment. The benefits for grid operators and society are represented by achieving GHG-free power grids, a safe and healthy working environment, high public acceptance, and access to investment opportunities which are connected to highest environmental, social and governance standards (ESG investments).

We will present and share thoughts on:

- 1) UN sustainability goals and actions of grid operators worldwide
- 2) A target system for sustainable grid technologies
- 3) Greenhouse gas free switching and insulation grid technologies and products
- 4) Realization of a GHG-free grid: specification, evaluation and implementation roadmap

#### PRESENTERS:

**Dr. Dirk Helbig**, Siemens Energy

**Eduardo Gomez Hennig**, Siemens Energy

2022 CIGRE CANADA TECHNICAL TOUR

# NEWELL CONVERTER STATION

Located in Brooks, Alberta, the ATCO Newell 500KV HVDC Converter Station sits at the south end of the Eastern Alberta Transmission Line (EATL). Newell has a 1,000MW capacity and converts power from AC to DC, providing reliable transmission for the Alberta grid. Tour participants will get to view the station, particularly the valve hall, DC & AC yards and associated equipment, converter transformers, and 2 STATCOMs.

**October 31, 2022**

**8:30 a.m. – 4:00 p.m.**





2022 CIGRE CANADA TECHNICAL TOUR

# ENMAX SHEPARD ENERGY CENTRE

Participants will get a guided walking tour of Alberta's largest natural gas-fuelled power generating facility. Located on a 60-acre site east of Calgary, the Enmax Shepard Energy Centre uses combined-cycle technology, two natural gas-fuelled turbines and one steam turbine provide more than 860 megawatts (MW) of electricity to the provincial grid - enough to meet almost half of Calgary's current needs.

**October 31, 2022**

**1:30 p.m. – 4:30 p.m.**



## WORKSHOP 4

13:30 – 14:30 Monday, October 31, 2022

Bow Valley

### The Evolving Energy Transition: Technology, Consumers, and Commercialization

The Energy Transition as a concept is exciting, daunting, inspiring, challenging, stimulating and so much more. As the global community continues to engage in and embrace the Energy Transition, it is becoming increasingly clear that there is no one-size fits all solution that can be applied across countries, companies, and consumers. Finding a way through the Energy Transition will require reimagining the art of the possible and developing a Swiss army knife-like solution that has the right tools to get all jobs done. These tools require continued innovation in how, when and where energy is produced, stored, consumed, and commercialized. Further, end users are becoming more engaged with energy they consume. That is, interest in energy is no longer limited to expecting the lights to turn on or the

heater to kick-in but extends to the full life cycle impact of the energy being used. Sustainability has a seat in the board room; stakeholders of all stripes are calling for decarbonization and emissions accountability extends beyond a facility's fence line.

This workshop will look back on progress made on carbon-free energy and look forward to what needs to come next from a generation and storage perspective. In addition to exploring game-changing technologies, this workshop will be used to discuss how the consumer is a driving force in the Energy Transition and integral to enabling innovative and economic solutions

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PRESENTER: **Joe Slater**, ATCO

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## WORKSHOP 5

14:45 – 15:45 Monday, October 31, 2022

Bow Valley

### Transmission Line Clearance Enhancement Using the AMPJACK® Lift System

The AMPJACK® tower lifting system has been developed as a tool that can be used on its own or in conjunction with other transmission line upgrade solutions to increase capacity. This is accomplished using state of the art engineering and construction methods, addressing challenges encountered when increasing tower heights for line uprating. This workshop will provide an overview of the AMPJACK® Lift System, explore operational benefits of utilizing this construction method as a “tool in the toolbox” for utilities. Several cases of the implementation of this technology will be presented, showcasing the feasibility and versatility of the construction method.

PRESENTER:

**Nathan Stahl**

Ampjack Industries Ltd.





















# TECHNICAL SESSIONS

## Tuesday, November 1, 2022

	Session 1 Session Chair: Alexandre Nassif	Session 2 Session Chair: Alberto Oscar	Session 3 Session Chair: Usama Ahmed
10:30 – 12:00	<b>CIGRE-475 C6</b> A Reliability-Driven Battery Energy Storage System Sizing Method for Distribution Radial Supplies Alexandre Nassif, LUMA Energy, United States	<b>CIGRE-489 B4</b> Application of Static Synchronous Compensator (STATCOM) on the Yukon Integrated System (VIS) Ben Korbutiak, ATCO, Canada	<b>CIGRE-479 B2</b> Root Cause Analysis of Damaged ACSR Conductors During Construction of a 500 kV Transmission Line Chenyang (Chen) Wang, Manitoba Hydro, Canada
	<b>CIGRE-484 C6</b> Virtualization of the Experiential Learning Platform for Operation and Maintenance of Smart Microgrid Applications in Remote and Rural Communities in Canada Dr. Moein Manbachi, British Columbia Institute of Technology, Canada		<b>CIGRE-482 B2</b> Case Study -- Live Work Maintenance on Legacy Double Circuit 144kV H Frame Structures Vic Barr, ATCO Electric, Canada
	<b>CIGRE-492 C6</b> Quantification of Hosting Capacity Enhancement Value and Gain by Utilizing Smart Inverter Functionalities Huda Chuangpishit, Quanta Technology, Canada	<b>CIGRE-497 B4</b> Improved Performance of Large-Scale Solar PV Power Transmission using an Energy Storage-MMC HVDC Link Nuwan Herath, University of Manitoba, Canada	<b>CIGRE-499 B2</b> Transmission Structures Advanced Analytics and Machine Learning Algorithms Ibrahim Hathout, Hathout PGS Inc, Canada
	<b>CIGRE-506 C6</b> Community Microgrids – Operational and Maintenance Considerations Governed by Technology Selection and Control Systems Farid Katiraei, Quanta Technology, Canada		<b>CIGRE-503 B2</b> Design of Tap Connections on Overhead Transmission Lines Ming Lu, BC Hydro, Canada
	Session 4 Session Chair: Humud Said	Session 5 Session Chair: Karl Jakob	Session 6 Session Chair: Chen Wang
13:15 – 14:30	<b>CIGRE-476 C1</b> A Reliability and Customer Criticality Based Prioritization Method for Reliability Improvement of Distribution Lines Alexandre Nassif, LUMA Energy, United States	<b>CIGRE-509 A2</b> Feasibility Study on the use of Magnesium Silicate for Reclaiming Synthetic Ester Insulating Liquid Jayasree Thota, Research Chair on the Aging of Power Network, Canada	<b>CIGRE-514 A3</b> Induced Voltage Study on a Traction System and Mitigation methods Hesamaldin Maleki, EPE, Canada
	<b>CIGRE-481 C1</b> Virtualization of the Experiential Learning Platform for Critical Energy Infrastructure using Digital Twin Technology and Cloud-based Applications Dr. Moein Manbachi, British Columbia Institute of Technology, Canada	<b>CIGRE-530 A2</b> OLTC Contact Monitoring using Vibro-Acoustic Signals and Time Series Forecasting Fataneh Dabaghi-Zarandi, University of Quebec at Chicoutimi, Canada	<b>CIGRE-536 A3</b> Micro Substation with Power Voltage Transformers for EV charging Tiago Santos Guimaraes, Siemens Energy, Germany
	<b>CIGRE-494 C1</b> Accelerating Infrastructure Planning Using a Grid-wide Approach Ted Zalucki, Engineered Intelligence Inc., Canada	<b>CIGRE-540 A2</b> Installation and Energization of the World's First EHV Rapid Response Multi-Voltage Transformer Lease Eduardo Gomez Hennig, Siemens Energy, Canada	<b>CIGRE-523 A1</b> Improving Generator Rewind Quality and Reliability Through End-Winding Impact Testing and Analysis Aaron Doyle, Iris Power/Qualitrol, Canada

### CIGRE STUDY COMMITTEE THEMES:

- |  |                                      |   |   |
|--|--------------------------------------|---|---|
| <b>A1</b> Rotating Electrical Machines | <b>B2</b> Overhead Lines             | <b>C1</b> System Development and Economics    | <b>C6</b> Distribution Systems and Dispersed Generation |
| <b>A2</b> Transformers                 | <b>B3</b> Substations                | <b>C2</b> System Operation and Control        | <b>D1</b> Materials and Emerging Test Techniques        |
| <b>A3</b> High Voltage Equipment       | <b>B4</b> HVDC and Power Electronics | <b>C3</b> System Environmental Performance    | <b>D2</b> Information System and Telecommunications     |
| <b>B1</b> Insulated Cables             | <b>B5</b> Protection and Automation  | <b>C5</b> Electricity Markets and Regulations |   |

15:00 – 16:15	<b>Session 7</b> Session Chair: Moein Manbachi	<b>Session 8</b> Session Chair: Bogdan Kasztenny	<b>Session 9</b> Session Chair: Aslam Khan
	<b>CIGRE-478 C2</b>  <b>Optimal Tuning of the Automatic Voltage Regulator- a General Approach</b> Nick Wooster, BBA Engineering Ltd, Canada	<b>CIGRE-483 B5</b>  <b>Virtual Testing Lab for Digital Substation</b> Ashutosh Singh, Siemens Canada Limited, Canada	<b>CIGRE-491 B3</b>  <b>Developments in Online Monitoring of Substation Apparatus and the Digital Substation</b> Nathan Jacob, Camlin Energy, United States
	<b>CIGRE-502 C2</b>  <b>Power System Security Assessment Considering the Automatic Definition of Topological Corrective Actions</b> Fernando De Marco, DlgSILENT GmbH, Germany	<b>CIGRE-498 B5</b>  <b>Analysis of Directional Protection on Distribution Feeders for DER Interconnection and its Performance During Multi-Fault Events</b> Marco Ciofani, AltaLink, Canada	<b>CIGRE-515 B3</b>  <b>Contribution of Electrical Industry to Clean Environment &amp; Elimination of Green House Gases</b> M. Sharif Ahmed, Siemens Canada Limited, Canada
	<b>CIGRE-517 C2</b>  <b>Automated Data Labeling for Machine Learning Based Short-Term Voltage Stability Classification</b> Kalana Dharmapala, University of Manitoba, Canada	<b>CIGRE-516 B5</b>  <b>Effective Grounding of Utility-Scale Microgrids: Design Approaches and Considerations</b> Dr. Omid Alizadeh, Quanta Technology, Canada	<b>CIGRE-547 B3</b>  <b>Using Automated Infrared Transformer Monitoring to Reduce Maintenance Costs</b> Richard Harada, Systems With Intelligence, Canada
16:45 – 17:45	<b>Session 10</b> Session Chair: Ryan Maltais	<b>Session 11</b> Session Chair: David Jacobson	<b>Session 12</b> Session Chair: Farnoosh Rahmatian
	<b>CIGRE-535 B2</b>  <b>Continuous Linear Puller: a Highly Efficient Reconducting Process</b> Alberto Oscar, Tesmec SpA, Italy	<b>CIGRE-524 C4</b>  <b>Modelling Auto-transformers for TRV studies- Lessons learned</b> Mohammad Akbari, Tetra Tech Canada, Canada	<b>CIGRE-527 B5</b>  <b>COMTRADE-Based Relay Testing: Special Test Cases and Field Data Analysis</b> Hadi Khani, Quanta Technology, Canada
	<b>CIGRE-541 B2</b>  <b>Mechanical Design and Testing of a High Strength Composite Insulated Cross Arm</b> Usama Ahmed, SHEMAR Power Canada, Canada	<b>CIGRE-529 C4</b>  <b>Scaling Operational Peak Powerflow Cases to Create Historical Powerflow Cases</b> James Schwartz, AltaLink Management Ltd., Canada	<b>CIGRE-537 B5</b>  <b>Short Circuit Analysis of Power Systems with Inverter Interfaced Resources</b> Erandika Kalubowilage, University of Manitoba, Canada
	<b>CIGRE-545 B2</b>  <b>Transmission Line Rerating to Upgrade the Power Grid</b> Todd Shipway, Ampjack Industries Ltd., Canada	<b>CIGRE-539 C4</b>  <b>Compliance Monitoring Using Synchrophasor Technology in Indian Power System</b> Chandan Kumar, Chief Manager, India	<b>CIGRE-542 B5</b>  <b>Line Distance Protection Near Unconventional Energy Sources</b> Bogdan Kasztenny, Schweitzer Engineering Laboratories, Inc., Canada

**CIGRE STUDY COMMITTEE THEMES:**
**Group A – Equipment**

- A1** Rotating Electrical Machines
- A2** Power Transformers & Reactors
- A3** Transmission & Distribution Equipment

**Group B – Technologies**

- B1** Insulated Cables
- B2** Overhead Lines
- B3** Substations & Electrical Installations
- B4** DC Systems & Power Electronics
- B5** Protection & Automation

**Group C – Systems**

- C1** Power System Development & Economics
- C2** Power System Operation & Control
- C3** Power System Environmental Performance
- C4** Power System Technical Performance
- C5** Electricity Markets & Regulation
- C6** Active Distribution Systems & Distributed Energy Resources

**Group D – New Materials and IT**

- D1** Materials and Emerging Test Techniques
- D2** Information System & Telecommunication



## Wednesday, November 2, 2022

09:45 – 10:45	<b>Session 13</b> Session Chair: Kurtis Martin-Sturmey	<b>Session 14</b> Session Chair: Bogdan Kasztenny	<b>Session 15</b> Session Chair: Mohammad Akhbari
	<b>CIGRE-504 C6</b> 📄 <b>Island Interconnected Microgrids for Resilience</b> Alexandre Nassif, LUMA Energy, United States	<b>CIGRE-518 B5</b> 📄 <b>Data Transformation from Simulation Environments to Field Applications and Vice Versa</b> Hadi Khani, Quanta Technology, Canada	<b>CIGRE-538 C2</b> 📄 <b>Improvement in Performance of Primary Frequency Response of Generating Units in Indian Power System</b> Chandan Kumar, Chief Manager, India
	<b>CIGRE-511 C6</b> 📄 <b>Impact of IEEE 1547 Reactive Power Support Functions on Voltage Regulation of a Synthetic Residential Distribution Network</b> Mahmoud A. Allam Alsanbawy, CanmetENERGY, Natural Resources Canada, Canada	<b>CIGRE-522 B5</b> 📄 <b>Integrating Distributed Energy Resources into ENMAX's Secondary Network System</b> Pallavi Sehgal-Sidhu, P. Eng., Canada	<b>CIGRE-477 C4</b> 📄 <b>Potential Issues and Mitigation to RoCoF with High Penetration of IBRs</b> Alexandre Nassif, LUMA Energy, United States
11:15 – 12:15	<b>Session 16</b> Session Chair: Colin Madsen	<b>Session 17</b> Session Chair: Moein Manbachi	<b>Session 18</b> Session Chair: Stephen VanderZande
	<b>CIGRE-510 B4</b> 📄 <b>Parallel Operation of Grid-Forming Inverters with Synchronous Machines</b> Theja Thilekha Muthukumarana Hewa Thondilege, Student, Canada	<b>CIGRE-485 A2</b> 📄 <b>Dynamic Thermal Modeling and Overload Testing for Optimization of Transformer Loadability in the Context of Energy Transition</b> Patrick Picher, Hydro-Québec, Canada	<b>CIGRE-487 D2</b> 📄 <b>Interactive Parallel-Coordinates – A Bridge between Probabilistic and Deterministic</b> Ming Hu, AESO, Canada
	<b>CIGRE-513 B4</b> 📄 <b>Damping of Sub-Synchronous Resonance by Placing Thyristor Controlled Series Compensators (TCSC) at Optimal Locations</b> Dilini Rathnayaka Weerakoon, University of Manitoba, Canada	<b>CIGRE-488 A2</b> 📄 <b>Safer and more reliable transformers using natural ester liquids</b> Roberto Ignacio, Cargill, United States	
13:45 – 14:45	<b>Session 19</b> Session Chair: Chun Fang	<b>Session 20</b> Session Chair: Alexandre Nassif	
	<b>CIGRE-501 B4</b> 📄 <b>Operational Use of Grounding Switches Within a HVDC Converter Station</b> Lyle Neumann, BBA, Canada	<b>CIGRE-534 C6</b> 📄 <b>How Microgrid will Support Canada's Energy Transformation</b> Abhik Bera, Schneider Electric, Canada	
	<b>CIGRE-521 B4</b> 📄 <b>Unanticipated Costs of Increasingly Networked Digital HVDC &amp; FACTS Infrastructure</b> Colin Madsen, ATCO Electric, Canada	<b>CIGRE-546 C6</b> 📄 <b>Forecasting Grid Capacity Impacts of Electric Vehicles</b> Kurtis Martin-Sturmey, METSCO Energy Solutions, Canada	
	<b>CIGRE-533 B4</b> 📄 <b>Hybrid LCC-VSC Bipolar HVDC System for DC Power Tapping Studies</b> Manish Persand, University of Alberta, Canada		



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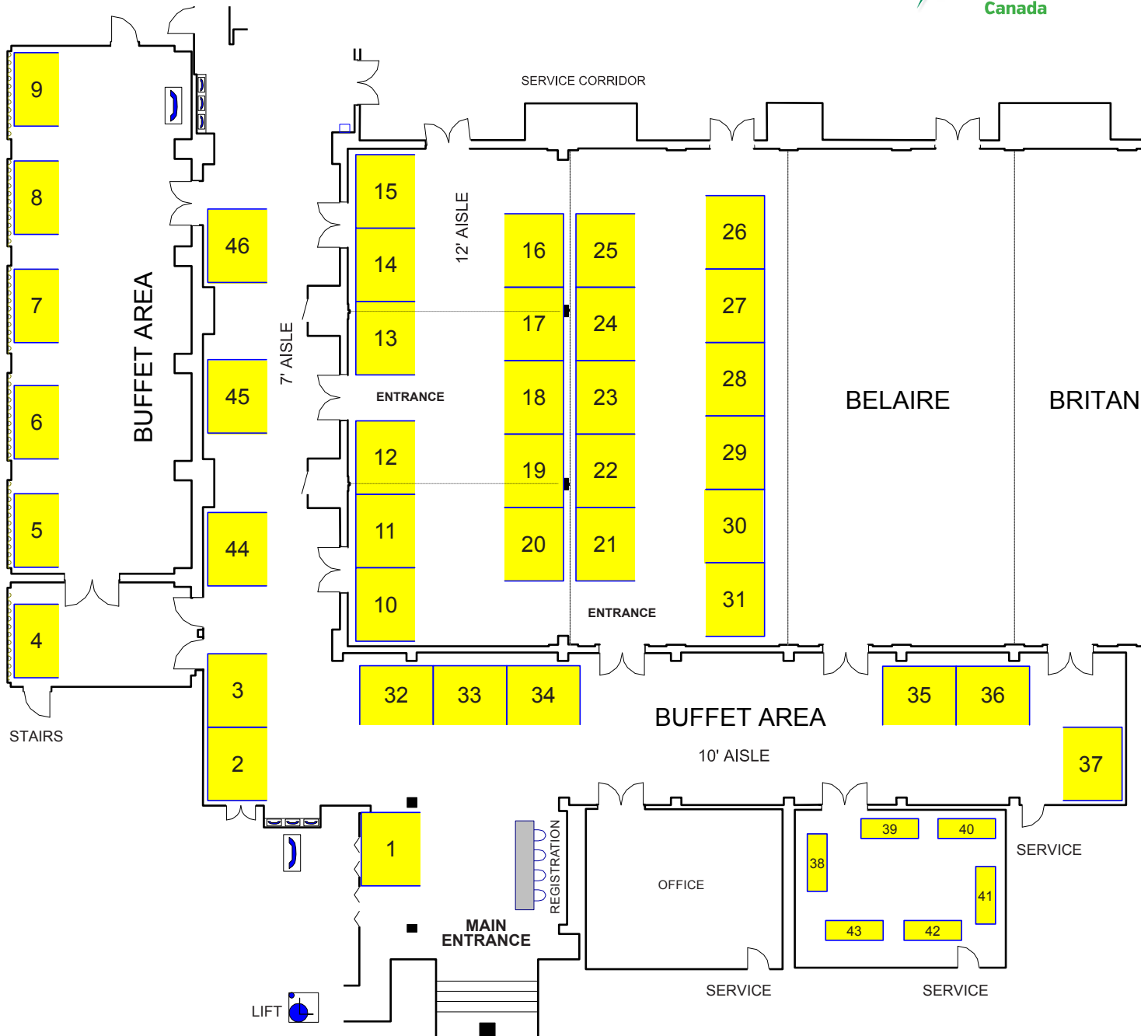


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## KEYNOTE

**08:10 – 08:30** Tuesday, November 1, 2022  
Britannia/Belair

### Embrace the Shift: Transforming our Energy Future

Speaker: Melanie Bayley, President, ATCO Electric

“The Great Energy Transition” is already underway. We have leapt off the starting line, beginning to transform how we live and how we work, doing our best to keep pace with a rapidly changing world. It’s an exciting transition and it represents an enormous opportunity for us to propel, support and embrace the shift to clean energy. As we advance, however, we must recognize that a lower-emitting future is only possible if no one gets left behind. How should we balance social responsibility with innovation to support a lower-emitting future? How can the old ways work in concert with the new as we forge ahead? And most importantly: how can we champion this transition while ensuring we fulfill our responsibility to get it right?



## BUSINESS PANEL

**08:30 – 10:00** Tuesday, November 1, 2022  
Britannia/Belair

### The Evolution, Opportunities & Challenges of the Great Energy Transition

Energy efficiency, decarbonization, and renewables are central pillars needed in the energy transition, but additional strategic oversight and technology investment are needed to achieve net-zero emissions. In today’s business panel, we join several leaders to discuss industry trends, key technologies, and the importance of Canada-wide collaboration to support smart grids, interties and new ways of managing power in the journey towards net-zero.

#### MODERATOR:

**Shah Nawaz**, Business Unit Head, Digital Grid, Smart Infrastructure, Siemens Canada

#### SPEAKERS:

**Pete Bothwell**, Vice President, Customer Experience & Initiatives, ATCO Electric; **Francis Bradley**, President & CEO, Electricity Canada; **Tony DiFranco**, VP Sales, Hitachi Energy; **Eduardo Gomez**, North America Director Sales & Innovation – Grid Technologies, Siemens Energy Canada; **Ameen Hamdon**, President & CEO, SUBNET Solutions



Shah Nawaz



Pete Bothwell



Francis Bradley



Tony DiFranco



Eduardo Gomez



Ameen Hamdon



## WOMEN IN ENERGY LUNCHEON

12:00 – 13:15 Tuesday, November 1, 2022  
Britannia/Belaire

### Transition and Evolution

The 2022 CIGRE Canada conference theme is ***The Great Energy Transition***. Following this theme, CIGRE Canada's Women in Energy panel session will focus on ***Transition and Evolution***. "The past few years have involved dramatic transition and evolution – in the way we live, work, and create community. Change is never easy, especially when the change seems out of your control. In this panel, we are going to explore hidden opportunities that are present in our evolving world."



Aimee Intac-Leung



Marie-France Samaroden



Rebecca Ostash



Paula Dickey



Claudia Cosoreanu



Kirsten Trunzo

#### MODERATOR:

**Aimee Intac-Leung**, P.Eng., PMP  
Converter Stations Protection &  
Controls Maintenance Engineering  
Head, Manitoba Hydro

#### SPEAKERS:

**Marie-France Samaroden**  
VP Grid Reliability Operations, AESO

**Rebecca Ostash**  
VP Business Development,  
TransGrid Solutions

**Paula Dickey**  
VP Finance Grid Technologies,  
Siemens Energy

**Claudia Cosoreanu**  
Product Management Executive - Grid  
Automation, GE Renewable Energy

**Kirsten Trunzo**  
Vice President, Controller, ATCO

## KEYNOTE

**08:00 – 08:15** Wednesday, November 2, 2022  
Britannia/Belaire

### Energizing the Future: A Vision for Net-Zero in Alberta

Speaker: **Gary Hart, President & CEO, Altalink**

There is no doubt that clean electricity play a critical role in enabling the net-zero transition on a global level, and the world needs more energy. “The Great Energy Transition” represents an opportunity for the entire sector to come together in support of the transformation. Underpinned by the need to achieve physical greenhouse gas reductions while ensuring a reliable, affordable, and accessible supply, we’ve developed a principled, practical approach for Alberta. While each region will need to define a slightly different path, the need for a plan forward has never been greater. Will we make adjustments as we go? – Yes, but let’s not let that stop us from getting started.



## CEO PANEL

**08:15 – 09:15** Wednesday, November 2, 2022  
Britannia/Belair

### Balancing Reliability & Affordability in the Transition to Net-Zero

The electricity industry, utilities and government have a challenging road ahead to meet the public need and customer expectations for reliable and affordable energy in the transition to net-zero. Our industry is undergoing tremendous change and we each have a role to play in building capacity and enhancing the reliability of the system while maintaining energy accessibility and equity across Canada’s diverse regions. Join us as several CEOs from the country’s electricity industry discuss the path forward to simultaneously position electricity for the future, achieve environmental targets, and deliver safe, clean and affordable clean energy options.



Francis Bradley



Melanie Bayley



Mark Poweska



Cory Strang

#### MODERATOR:

**Francis Bradley**, President & CEO, Electricity Canada

**SPEAKERS:** **Melanie Bayley**, President, ATCO;

**Mark Poweska**, President & CEO, ENMAX; **Cory Strang**, President & CEO, Northwest Territories Power Corporation;

**Gary Hart**, President & CEO, Altalink; **Arne Wohlschlegel**, Managing Director, Siemens Energy Canada



Arne Wohlschlegel



Gary Hart

## NGN NETWORKING LUNCHEON

12:15 – 13:45 Wednesday, November 2, 2022  
Britannia/Belaire

Come network with the Next Generation of Canada's Power System Industry at this hour and a half Luncheon. There will be a brief introduction of CIGRE's Next Generation Network (NGN), followed by entertaining networking activities.



SPEAKER:

**Kurtis Martin-Sturmy**, Chair Next Generation Network Canada



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## SOCIAL EVENTS

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### Welcome Reception

Monday, October 31, 2022 | 18:00 – 20:00

Exhibits Area, Westin Calgary, Casual dress code

Get the conference off to a great start by networking with your colleagues over a glass of wine and collecting your registration materials.



### Cocktail Reception

Exhibits Area, November 1, 2022 | 17:45 – 19:00

Exhibits Area, Westin Calgary, Business casual dress code

Enjoy a beverage while networking with the exhibitors and your colleagues before the banquet.

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### Banquet

Tuesday, November 1, 2022 | 19:00 – 22:00

Britannia/Belaire, Westin Calgary, Business casual dress code

The conference banquet is an evening of fine dining and stimulating conversation, providing an opportunity to salute the work accomplished during the conference. Network with participants and enjoy the entertainment.

The finalists for the Best Student Paper Award and the Best NGN Paper Award will be presented during the banquet.

This recognition consists of a personalized certificate for each finalist.



### CIGRE Canada NGN Social Networking & Cocktails

Wednesday, November 2, 2022 | 14:45 – 16:30

Exhibits Area, Westin Calgary

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### Award Presentation, Prize Draw & Closing Remarks

Wednesday, November 2, 2022 | 16:30 – 17:00

Britannia/Belaire, Westin Calgary, Casual dress code

In recognition of their outstanding contributions for the 2022 CIGRE Canada Conference, a Best Student Paper Award and a Best NGN Paper Award will be presented to the author(s) of a student and an NGN paper, based on the quality of the full paper and the presentation.

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#### 2022 CIGRE CANADA CONFERENCE BEST STUDENT PAPER AWARD

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#### 2022 CIGRE CANADA CONFERENCE BEST NGN PAPER AWARD

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