

Welcome

The Centre for Urban Energy is proud to lead a five-year, \$5 million pan-Canadian network of 15 universities and 26 industry and government partners focused on the future of energy storage — an essential technology in the Canadian transition to clean energy.

The NSERC Energy Storage Technology Network (NESTNet) collaboratively explores many different types of energy storage, including flywheels, lithium-ion batteries and compressed air, while determining how best to integrate these technologies into electricity grids. In addition, researchers consider the implications arising from the increasing adoption of energy storage and how consumers will perceive, adopt and interact with these technologies. By partnering with the private sector, NESTNet enables directed progress — without duplication of efforts — towards a strong domestic Canadian energy storage industry that is also competitive in the global marketplace.

As our energy systems transform to integrate storage technologies, cooperation from all sectors is needed. With that in mind, we welcome you to the inaugural *Leading the Charge* Conference. This conference provides a stage for manufacturers, utilities and customers to share their perspectives on the challenges and opportunities of energy storage.

We would like to offer our sincere thanks for joining us today and gratefully acknowledge the support from our partners, without whom this event would not have been possible.

ryerson.ca/nestnet

The Centre for Urban Energy at Ryerson University is an academic-industry partnership that explores and develops sustainable solutions to urban energy challenges such as the advancement of smart grid technologies, energy policy and regulatory issues, storage, electric vehicles, net-zero homes and renewables.

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About the speakers

In order of appearance.

Bala Venkatesh
Professor, Electrical and Computer Engineering; Academic Director, Centre for Urban Energy at Ryerson University

Chris Evans
Interim Provost and Vice President Academic, Ryerson University

Jessie Ma
IESO Distinguished Research Fellow, Centre for Urban Energy at Ryerson University

Geoff Osborne
Associate, NRStor

Carmine Pizzurro
President, eCAMION

Pratap Revuru
Smart Grid Solutions Architect, Schneider Electric

Curtis VanWalleghem
Chief Executive Officer, Hydrostor

Birendra Singh
IESO Distinguished Research Fellow, Centre for Urban Energy at Ryerson University

Ajay Garg
Manager, Reliability Standards and Compliance, Hydro One

Neetika Sathe
Vice President, Corporate Development, PowerStream

Gary Thompson
Lead, Generation Planning and System Studies, Toronto Hydro

Sean Conway
Public Policy Adviser, Gowling WLG

Bruce Campbell
President and Chief Executive Officer, IESO

Brad Cochrane
Director, Energy Management, York University

Brian Hewson
Senior Manager, Strategic Policy, Ontario Energy Board

Michael Lithgow
Manager of Energy and Sustainability, Sunnybrook Hospital

Brett Smith
Manager, Distribution and Grid Modernization, Ontario Ministry of Energy

Bhanu Opathella
IESO Distinguished Research Fellow, Centre for Urban Energy at Ryerson University

Paul Marot
President, Virelec

Mohammad Sedighy
Principal Consultant and Associate, Technologies Business Practice, Hatch

Erik Spek
Chief Engineer, TUV SUD Canada

Notes

NSERC Energy Storage Technology Network

Leading the Charge

Conference Program
Friday, June 24, 2016

#LeadingTheCharge



Agenda

8:30am **Coffee and registration**

9:00 **Welcoming remarks**
Bala Venkatesh
Chris Evans

9:10 **The manufacturers' perspective**

This panel will explore the value proposition offered by energy storage products and discuss the technical and regulatory barriers to implementation. It will also forecast paths to growth and maturity for energy storage, both in Canada and abroad. Questions considered could include:

- What are your energy storage products and how are they game-changers?
- Who are your key client groups, and what is the value proposition that you offer them?
- What are the key opportunities and challenges for energy storage in Ontario, across Canada and elsewhere?
- How do you see unit costs for your technology in five, 10 and 15 years?
- What is your company doing to drive down unit costs?
- What are Canada's strengths when it comes to energy storage?

Featuring:
Geoff Osborne
Carmine Pizzurro
Pratap Revuru
Curtis VanWalleghem
Jessie Ma (Moderator)

10:10 **Break and networking**

10:30 **The utilities' perspective**

Energy storage is being touted as a game changer for Ontario, where the electrical grid is expected to see a much higher level of wind and solar integration in the next decade than exists today. This panel will discuss opportunities and barriers of using storage to address grid challenges, taking into consideration technical, regulatory and economic factors. By exploring drivers and enablers of energy storage, it will also shed light on the path of transformation for LDCs in Ontario. Questions considered could include:

- Most utilities are still using the old proven methods for addressing power system problems. Why aren't they considering energy storage as an option?
- Do you think utilities understand energy storage well enough to make use of it in their operations?
- What has been your experience in using energy storage to date?
- Where is your utility headed in terms of utilizing energy storage for future needs?
- To what extent do current regulation allows utilities to monetize all the benefits — upstream and downstream — of an energy storage application?
- How do you think regulation can promote use of energy storage on the grid?
- What do you think are some of the grid challenges with energy storage at all different levels — transmission, distribution and utilization?

Featuring:
Ajay Garg
Neetika Sathe
Gary Thompson
Birendra Singh (Moderator)

11:30 **Lunch and keynote**

Energy storage in Ontario: Experiences to date and opportunities for expansion
Bruce Campbell
Introduced by Sean Conway

12:45pm **The customers' perspective**

This panel will discuss energy storage from the point of view of both commercial and residential customers. Questions considered could include:

- What are the environmental, social and economic benefits for customers?
- How can energy storage benefit your individual stakeholders?
- How much will energy storage cost? Will it help ratepayers save money on their energy bills?
- How can energy storage benefit large customers such as hospitals in the event of weather-related incidents and blackouts?
- Are there any unintended consequences we should consider?

Featuring:
Brad Cochrane
Brian Hewson
Michael Lithgow
Brett Smith
Sean Conway (Moderator)

1:45 **Break and networking**

2:15 **Safety and implementation**

This panel will exchange ideas about the safety and implementation challenges of energy storage systems from a testing, grid integration and social perspective, as well as discuss how to improve and enhance public awareness. Questions considered could include:

- What kind of safety issues — chemical, mechanical and electrical — do you think that utilities and the general public should be concerned about?
- During the last decade, what sort of safety improvements have you observed in energy storage technologies? Are they satisfactory or do we need further improvements?
- What level of safety improvements do we expect in the coming decade?
- What are the available testing and validation techniques, safety codes, standards and regulations? Are they sufficient?
- What are the challenges of implementation and grid integration of energy storage?
- What kind of grid evolution do we need?
- Can we expect islanded grids in near future?
- Do you think energy storage provides more value to cities like Toronto or to rural communities where renewable resources are plentiful?
- What are the benefits of energy storage to northern isolated community grids?
- Based on your experience with energy storage, how critical do you think societal acceptance is?
- Do you think energy storage also faces a challenge of NIMBYism?

Featuring:
Paul Marot
Mohammad Sedighy
Erik Spek
Bhanu Opathella (Moderator)

3:15 **Closing remarks**
Bala Venkatesh