



Government of Canada

Trade Commissioner Service

Gouvernement du Canada

Service des délégués commerciaux

Canada

# CANADA'S CLEAN POWER SECTOR LEADING THE SHIFT TO A SMARTER AND CLEANER GRID



Canada, a leader in electricity generation, is producing some of the cleanest and most affordable power worldwide.

In 2016, Canada ranked fifth in the world in renewable power production and second in hydro production. Canada leads the G7, generating 2/3<sup>rd</sup>s of its electricity from renewable sources. Canada ranks second in the G7, generating 81% of its electricity from non-GHG emitting sources.

Canadian clean energy firms have a global reputation for excellence. Supported by a robust innovation ecosystem, ground-breaking Canadian technologies and solutions are addressing clean energy challenges around the world.

## AREAS OF STRENGTH IN THE CLEAN POWER SECTOR



CLEAN GENERATION



ENERGY STORAGE



REMOTE MICRO GRIDS



TRAINING AND EDUCATION



ADVANCED METERING INFRASTRUCTURE



SMART GRID TECHNOLOGIES



ENERGY EFFICIENCY



CONSULTING, ENGINEERING AND PROJECT DEVELOPMENT

## CANADA BREAKS RECORD AGAIN ON 2019 CLEANTECH 100 LIST

The 2019 Global Cleantech 100 list features 13 Canadian companies; a record for Canada, equaling last year's 13 companies. Nearly half of these companies are in the clean electricity space (indicated in green):

> **Avalon Battery**  
[www.avalonbattery.com](http://www.avalonbattery.com)

> **Axine Water Technologies**  
[www.axinewater.com](http://www.axinewater.com)

> **Carbon Cure Technologies**  
[www.carboncure.com](http://www.carboncure.com)

> **CoolEdge Lighting**  
[www.cooledgelighting.com](http://www.cooledgelighting.com)

> **Ecobee**  
[www.ecobee.com](http://www.ecobee.com)

> **Enbala Power Networks**  
[www.enbala.com](http://www.enbala.com)

> **GaN Systems**  
[www.gansystems.com](http://www.gansystems.com)

> **Inventys**  
[www.inventysinc.com](http://www.inventysinc.com)

> **MTI Metamaterial Technologies**  
[www.metamaterial.com](http://www.metamaterial.com)

> **MineSense Technologies**  
[www.minesense.com](http://www.minesense.com)

> **Opus One Solutions**  
[www.opusonesolutions.com](http://www.opusonesolutions.com)

> **Semios**  
[www.semios.com](http://www.semios.com)

> **Terramera**  
[www.terramera.com](http://www.terramera.com)



ENERGY SECTOR

The global energy challenge is massive: how to meet the persistent growth in global energy demand while reducing greenhouse gas (GHG) emissions. Canadian companies are ready to provide innovative solutions for challenges ranging from increasing adoption of renewable energy and distributed energy resources, the proliferation of behind-the-meter technologies, aging infrastructure, and a move towards digitalization and greater customer engagement in the shift away from carbon.

A robust domestic market has led to the growth of strong clean energy companies. Canadian companies have an export mindset and clean electricity companies are increasingly exporting to foreign markets. 87% of Canadian clean technology firms export and have solutions deployed in United States, Latin America, Asia and Europe.

## CANADIAN COMPANIES ARE LEADING THE WAY

INNOVATIVE CANADIAN COMPANIES INCLUDE:

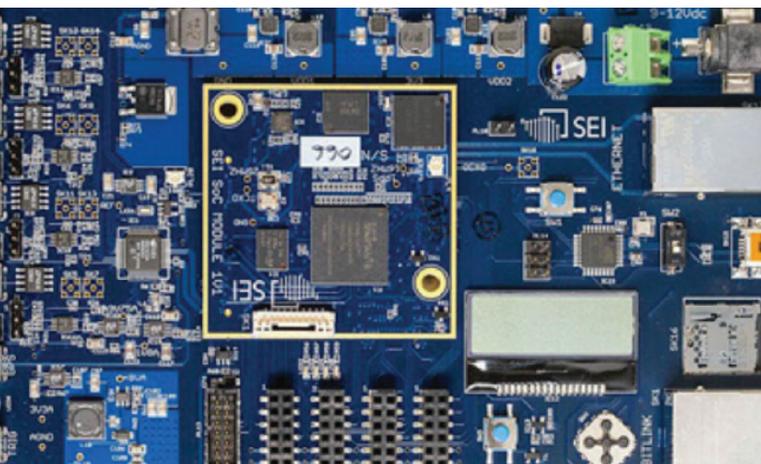


OFF-GRID LIGHTING

### CLEAR BLUE TECHNOLOGIES

**Clear Blue Technologies** combines solar and wind energy with advanced communications and cloud software to power highly reliable off-grid lighting, security, mobile, and Internet of Things systems. Their Illumience Smart Off-Grid software enables the systems to be monitored, maintained and proactively serviced over the Internet, delivering unmatched reliability, long lasting system performance, and significantly lower maintenance cost. Clear Blue has customers in 29 countries, 19 US states and 7 Canadian provinces.

> [www.clearbluetechologies.com](http://www.clearbluetechologies.com)



SMART GRID SENSOR CHIPSET

### SMART ENERGY INSTRUMENTS

**Smart Energy Instruments** develops time-synchronized measurement technologies to address today's global energy challenges. SEI's Smart Grid Sensor Chipset is the first universal measurement and communications core platform for next generation smart grid devices. It provides real-time, synchronized measurements that are vital for operating smart electricity grids. SEI provides electric utilities and system operators an unprecedented ability to monitor, understand, control and plan electric power grids.

> [www.se-instruments.com](http://www.se-instruments.com)

## CANADA IS A WORLD LEADER IN COLLABORATIVE R & D

There are tremendous opportunities to create partnerships between industry, government, universities, research institutes and testing facilities. Canadian firms are ready to expand their presence by providing the best solutions to the challenging energy problems of the world. Through innovative international programs such as Mission Innovation, our technologies, already hard at work, are helping countries reduce GHG emissions and meet their Paris agreement targets.

### INNOVATIVE CANADIAN PROJECTS INCLUDE:

#### HYDROSTOR UNDER WATER STORAGE PROJECT

**Hydrostor's Underwater Storage System**, deployed in lake Ontario is the World's first utility scale underwater compressed air energy storage system. Off-peak electricity is converted to compressed air in marine accumulators 55m below the surface. Heat generated during compression is captured and stored in their proprietary thermal store. On demand, the compressed air spins a generator, supplying the grid with electricity.

This solution increases transmission and distribution line utilization rates and stores excess energy instead of curtailing wind or solar.



UNDERWATER STORAGE

#### RAGLAN MINE ARCTIC MICROGRID PROJECT

Tugliq's Renewable Electricity Smart-Grid sets a new landmark in harvesting wind energy at an industrial scale in Canada's Arctic. Along with Tugliq this project involves Canadian clean energy companies Hydrogenics and ElectroVaya and engineering firm Hatch. This microgrid couples an Arctic-grade wind turbine with leading-edge Canadian storage technologies configured in a three-tiered architecture.

The system has achieved 97.6% availability displacing 5.6 million liters of diesel and 15,540 kT tons of greenhouse gases - a Canadian flagship success.



MICROGRID

### MISSION INNOVATION - CANADA PLEDGED TO DOUBLE CLEAN ENERGY FUNDING

Clean energy technologies will play a crucial role in Canada's transformation to a low-carbon economy. Investing in the research, development and demonstration of new clean energy technologies accelerates their path to commercialization. By joining Mission Innovation (MI) in 2015 the Government of Canada pledged to

double federal investment in clean energy research and development, encourage private sector investment in early-stage clean energy companies, and increase domestic and international collaboration to advance MI goals.

## COMPETITIVE SOLUTIONS FROM CANADA

### GENERATION

- > Boralex
- > Hydrogenics
- > Idénergie
- > Morgan Solar
- > Tugliq

### ENERGY STORAGE

- > Avalon Battery Co
- > eCAMION
- > Eguana Technologies
- > NRSstor Inc.
- > Peak Power

### SMART GRID TECHNOLOGIES

- > dTechs
- > Opus One Solutions
- > PowerHub
- > Subnet
- > Survalent

### ENERGY EFFICIENCY AND CONSERVATION

- > Behold Control
- > CircuitMeter
- > Ecotagious
- > Envio Systems Inc.
- > Parity AI

## REASONS TO DO BUSINESS WITH CANADA

### Sustainable Development Technology

**Canada (SDTC)** is a foundation created by the Government of Canada to support companies as they develop and demonstrate new technologies to address climate change, clean air, clean water and clean soil. SDTC fosters collaboration between the private sector, academia, and other like-mandated organizations to help companies with the potential to become world leaders in their efforts to bring economically viable technologies to market. SDTC is the second largest funder of energy research, development and demonstration in the federal government, allocating between \$80 to \$100 million annually, to 30 to 40 companies. Some notable clean energy companies supported by SDTC include:



**Clean power generation:** ARDA Power, Atlantis Operations, Ballard Power, Borealis Geopower, Wind Smart Inc.



**Energy storage:** Etalim Inc., e-Zn Inc., Heliene Inc., QD Solar Inc., Corvus Energy Ltd., Sigma Energy Storage



**Smart grid technologies:** GaN Systems, Tantalus Systems Corp., Terrestrial Energy, Xantrex Technology Inc.



**Energy efficiency & management technologies:** CoolEdge Lighting Ltd., Effenco, Nanoleaf, Mariner Partners, Shift Energy

> [sdtc.ca](http://sdtc.ca)

### COMPETITIVE BUSINESS ENVIRONMENT:

Canada ranks **#2** for doing business among G-20 countries according to Forbes. Canada is the **easiest place to start a business** in the G-7. According to the world bank, it takes only 2 procedures and 1.5 days to start a business in Canada

### HIGHLY SKILLED AND DIVERSE WORKFORCE:

Canada offers business the **most educated** talent pool among OECD countries

### HIGH QUALITY OF LIFE:

Canada ranks number 1 in G-7 for **Democracy, Economic Freedom and Social Progress**

### STRATEGIC LOCATION:

Canada is the **convenient crossroads** between the North American marketplace and the booming economies of Asia, and enjoys a **privileged relationship** with the European Union through the Canada-EU Trade Agreement (CETA)

### STRONG GOVERNMENT SUPPORT:

Canada has a **clean development agenda** and is strongly supporting the development of clean energy technologies

### INNOVATION ECONOMY:

Canada is home to more than **200 energy companies**. Read about other innovative Canadian companies in the **Energy Innovation Snapshot**, a platform showcasing Canadian clean energy solutions



ENERGY  
INNOVATION  
SNAPSHOT

For more information about Canadian innovative energy companies and projects please visit > [energyinnovationsnapshot.ca](http://energyinnovationsnapshot.ca)

## CONNECT WITH US

The Canadian Trade Commissioner Service is a key resource for anyone interested in doing business with Canada. Our global network of trade offices and dedicated officers are available to connect you with Canadian companies and research organizations. For more information, we encourage you to contact a Canadian Trade Commissioner in your market.

[www.tradecommissioner.gc.ca](http://www.tradecommissioner.gc.ca)