



Making the Transition to a Cleaner Future: Contributions from Ontario SMEs

DIANA CARTWRIGHT, TRADE COMMISSIONER, ONTARIO
CLEANTECH

Trade Commissioner Service

Core Services

1. Prepare for International Markets
2. Assess Market Potential
3. Find Qualified Contacts
4. Resolve Problems

160 Offices around the world

*These services are provided at no cost
to our qualified clients*

Climate Change impacts



Impacts in Ottawa

Future climate in Canada's Capital Region



Shorter
winters



Hotter
summers



Earlier
springs



Wetter fall, winter
and spring



Later
falls



More extreme
events



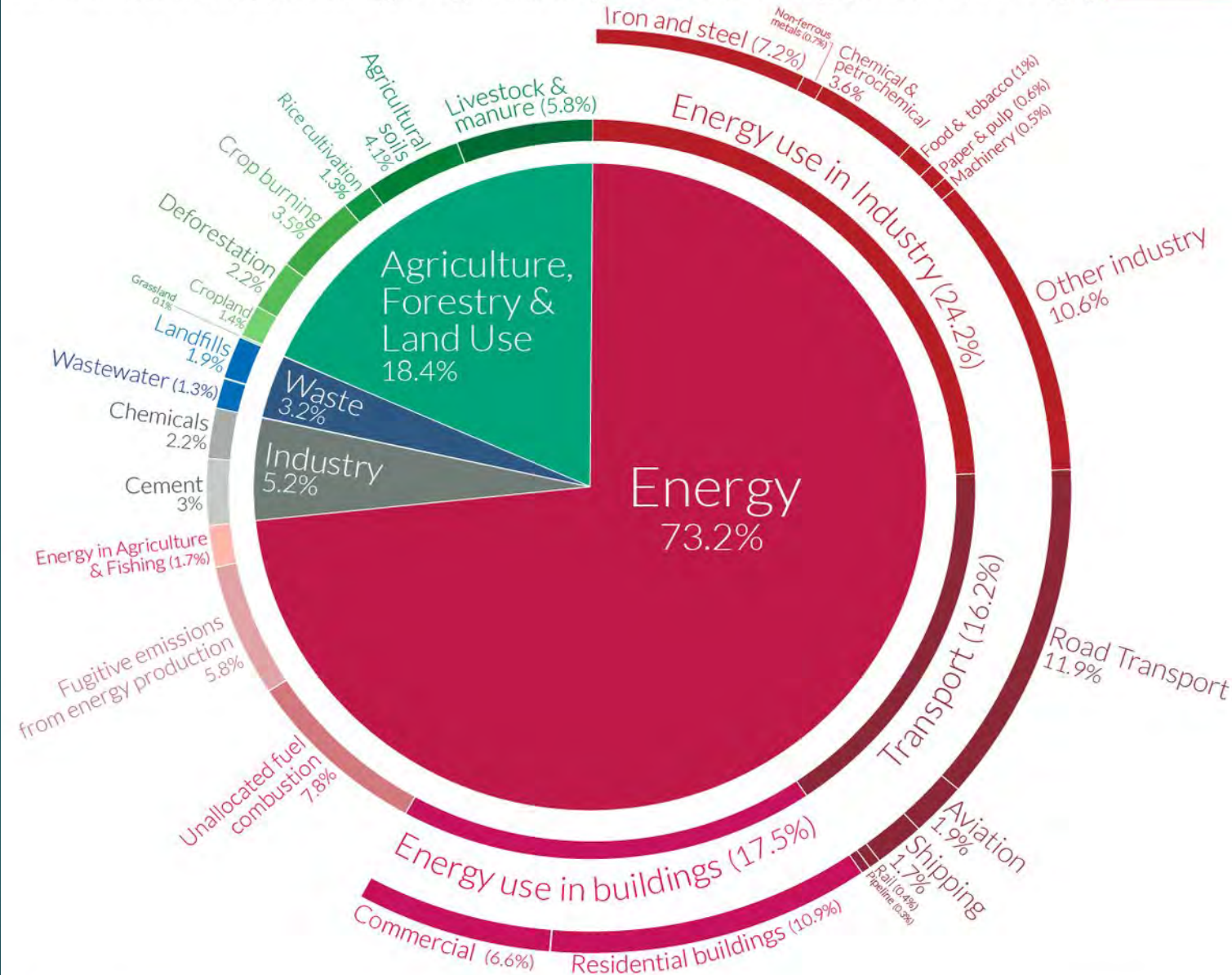
Net Zero by 2050

- ▶ “a target of completely negating the amount of greenhouse gases produced by human activity, to be achieved by reducing emissions and implementing methods of absorbing carbon dioxide from the atmosphere”
- ▶ Requires a huge transition in every aspect
 - ▶ Technological
 - ▶ Societal
 - ▶ Economic
 - ▶ Political
 - ▶ Spiritual
- ▶ **Justice:** Global North with 20% of population responsible for over 70% of global emissions

Global greenhouse gas emissions by sector

Our World
in Data

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq.



OurWorldinData.org – Research and data to make progress against the world's largest problems.

Source: Climate Watch, the World Resources Institute (2020).

Licensed under CC-BY by the author Hannah Ritchie (2020).

Renewable Energy

- ▶ Electrify the economy with cleaner power sources
- ▶ More Renewables
- ▶ U.S. \$100 trillion is needed for net zero over the next three decades (globally)
- ▶ Canada: (CanREA)
 - ▶ Decarbonize and DOUBLE our electricity
 - ▶ 2/3 of new electricity needs to be wind / solar
 - ▶ next 29 years: 3,800 MW of wind energy
 - ▶ 1,600 MW of solar energy annually – increasing capacity 10-fold
 - ▶ In 2019, 5 projects were added for 597 MW new capacity

Canada's current installed wind and solar energy capacity

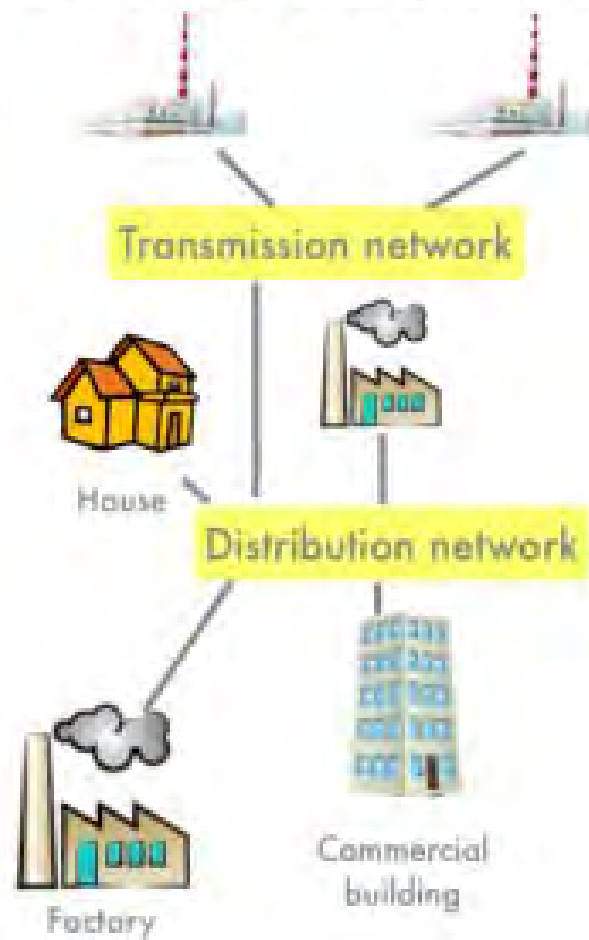
December 31, 2021

(Note: this year-end update does not include data for rooftop or behind-the-meter solar that was installed in 2021, which we intend to include in our upcoming, mid-year update).

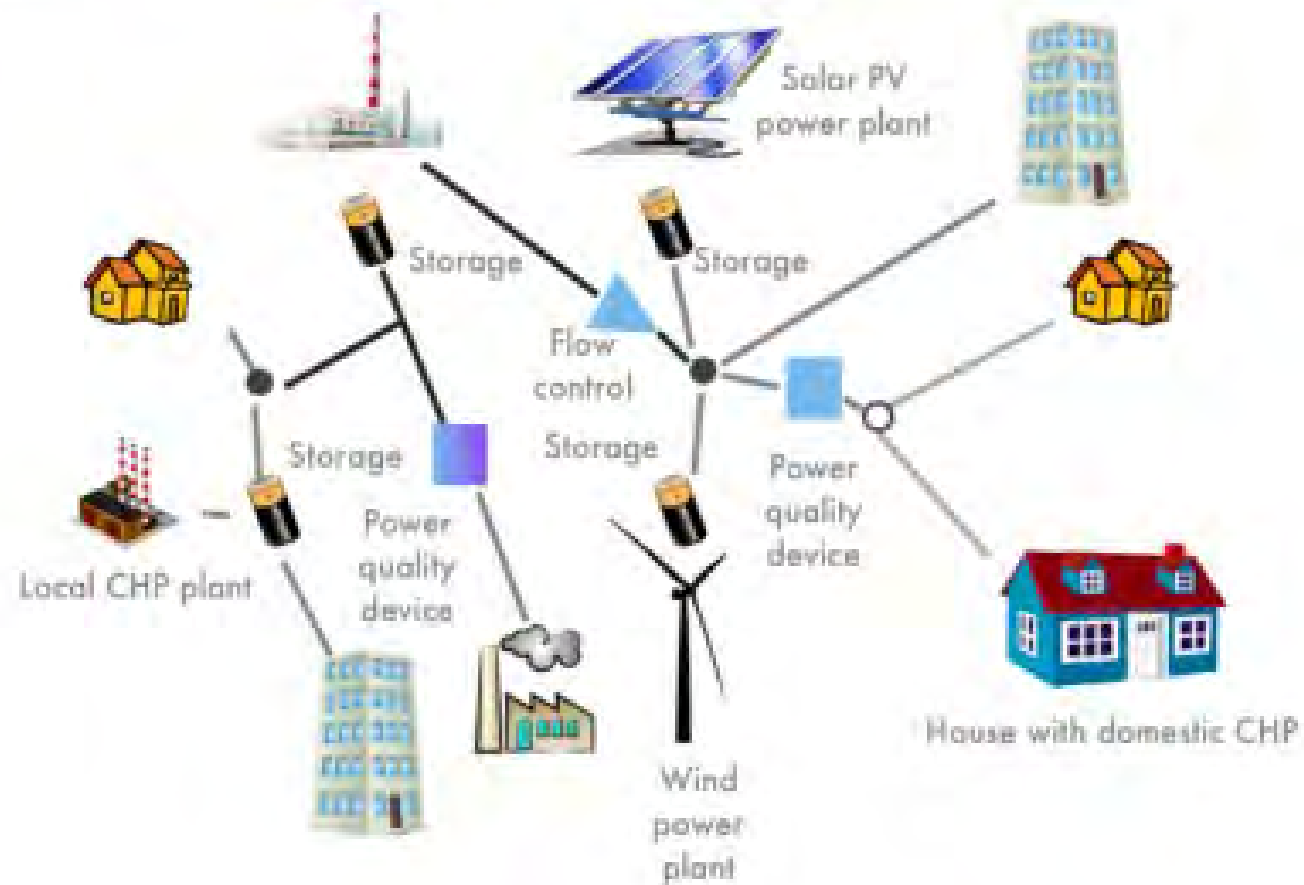


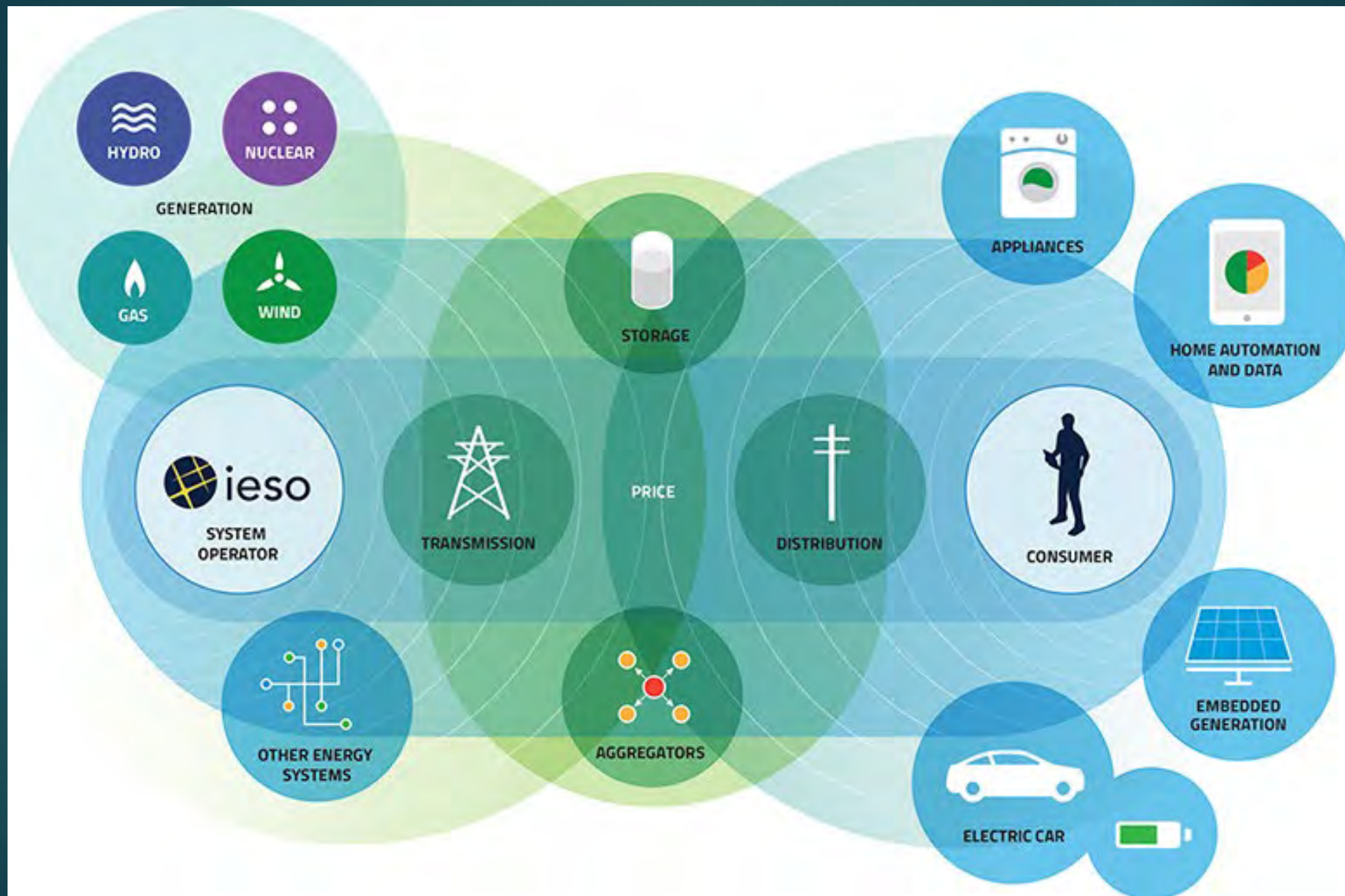
The Transition: the Smart Grid

Yesterday Centralized Power

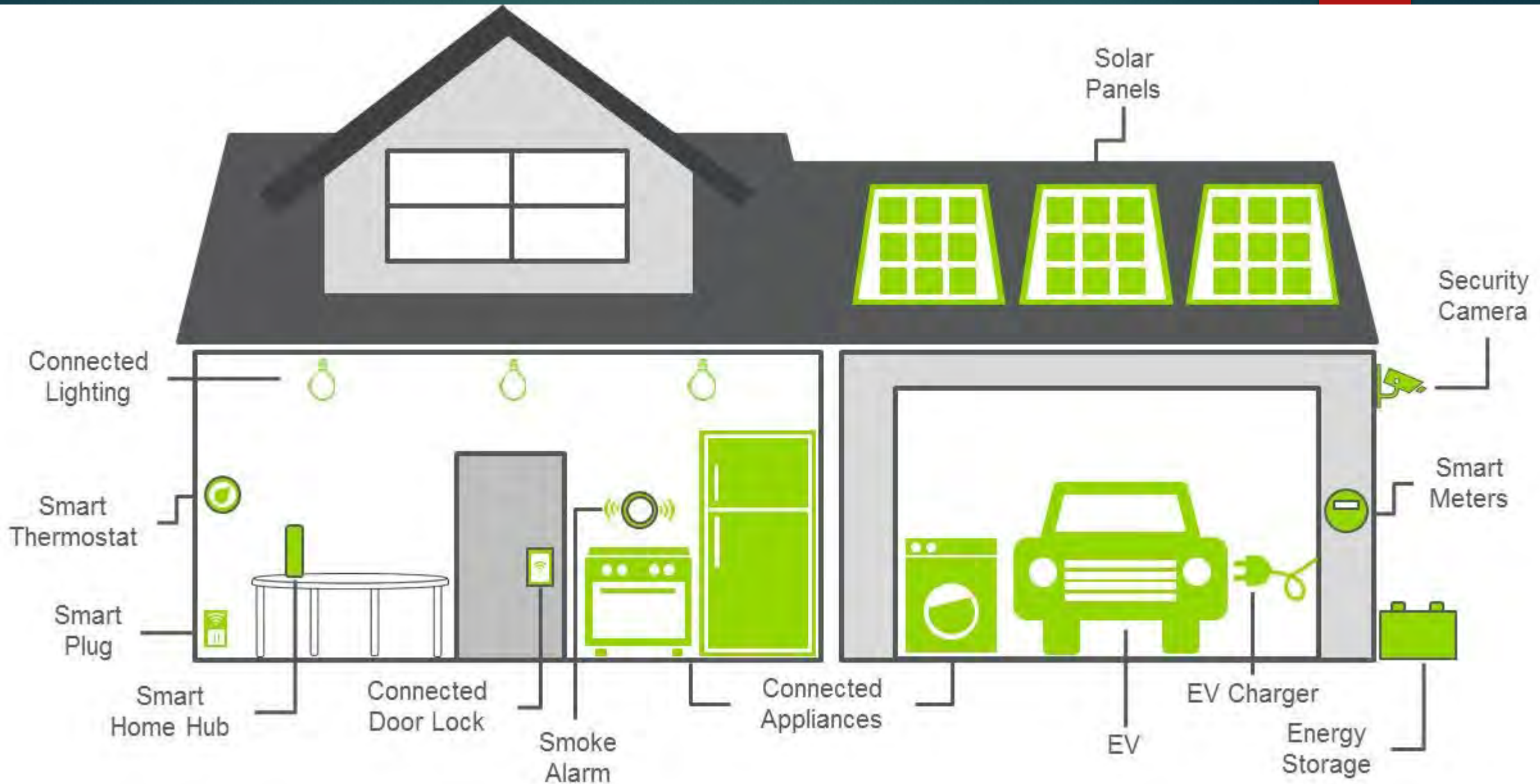


Tomorrow Clean, local power





Home



Ontario Companies: Renewables - Wind



Borealis Wind – addresses problem of icing on turbines



Biome Renewables: passive fluid-dynamic hardware device that produces 10% more power

Solar PV Solutions



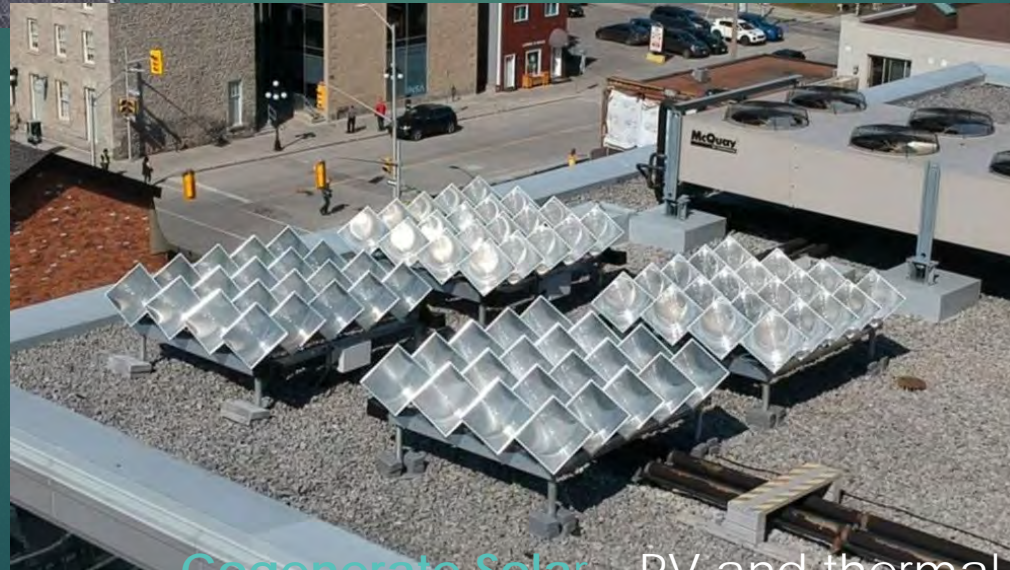
Canadian Solar
Heliene
Silfab



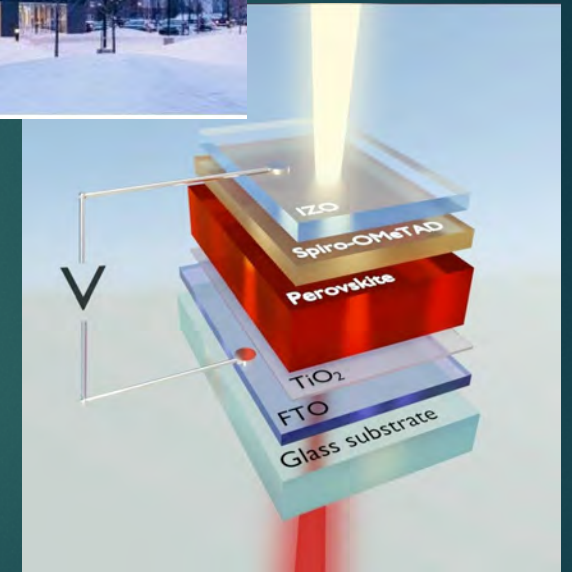
Mitrex -
Solar
cladding



PV Technical - Solar shingles



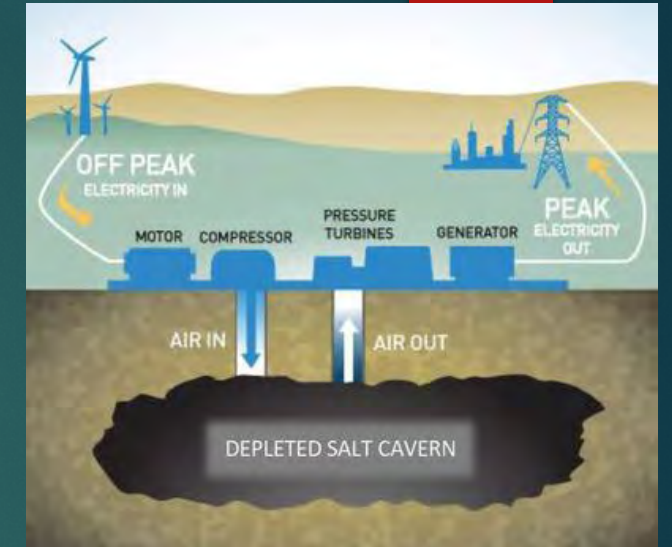
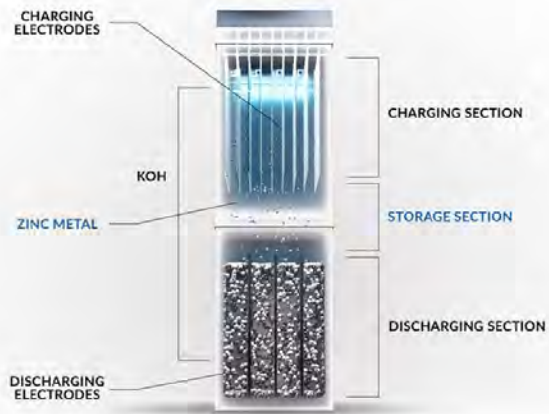
Cogenerate Solar - PV and thermal energy



QD Solar
Quantum dots
Perovskite solar cells

Energy Storage

Hydrostor – advanced compressed air energy storage

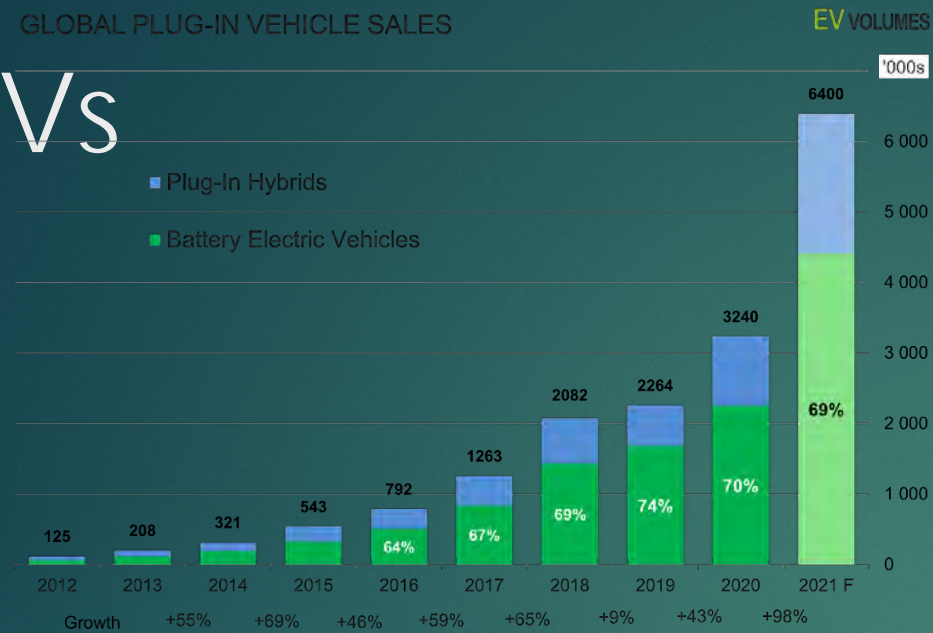


E-zinc- zinc powered battery



GLOBAL PLUG-IN VEHICLE SALES

EVs



BluWave~ai

50

Technology **Fast 50**
2021 CANADA
COMPANIES-TO-WATCH WINNER
Deloitte.

ISGF
India Smart Grid Forum



Start Up
Energy Tr
#SET100 2021
TOP 100 energ

PEAK POWER

 **PEAK DRIVE**
POWER THE FUTURE



Carbon Capture

Hyperion Global Energy -



Design Rendering



MVP Prototype

Carbon Engineering's Direct Air Capture system directly removes CO₂ from the atmosphere, purifies it, and produces a pipeline-ready compressed CO₂ gas using only energy and water.

Global Solutions



[Solar Panda](#)

Conclusion

There's one issue that will define the contours of this century more dramatically than any other, and that is the urgent threat of a changing climate." *Barack Obama*

Climate change isn't an 'issue' to add to the list of things to worry about, next to health care and taxes. It is a civilizational wake-up call. A powerful message — spoken in the language of fires, floods, droughts, and extinctions — telling us that we need an entirely new economic model and a new way of sharing this planet. Telling us we need to evolve. *Naomi Klein*