

CCRE/WISE

Technology Innovation & Policy Forum
University of Waterloo, Nov 24, 2016

Financing, Regulatory & Policy Alignment

Colin Andersen

colin.andersen22@gmail.com

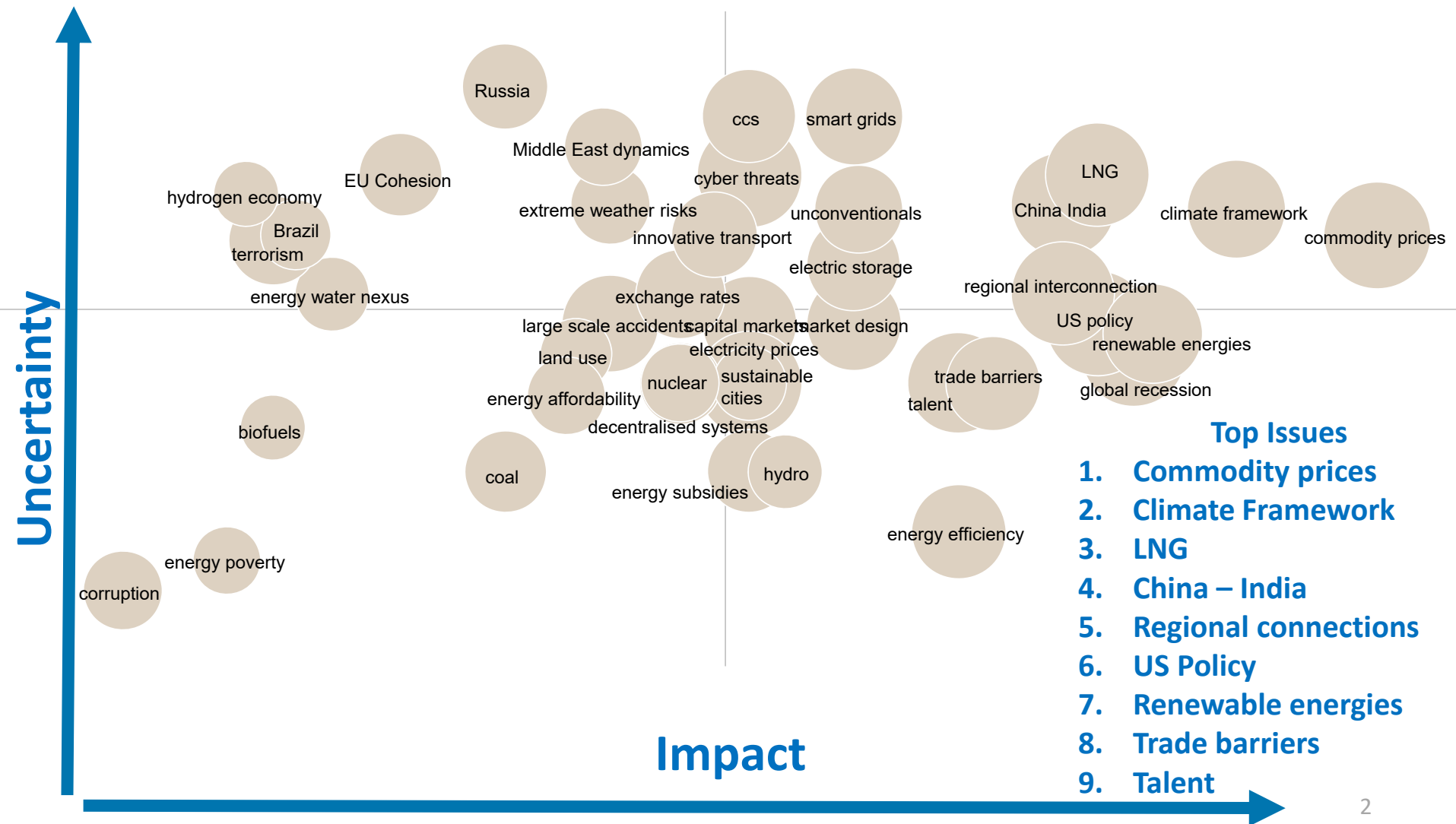
Chair, Energy Council of Canada

Senior Executive Fellow, WISE

Executive Advisor, Canadian Green Bank



World Energy Issues Monitor Canada - 2016



- Top Issues**
1. Commodity prices
 2. Climate Framework
 3. LNG
 4. China – India
 5. Regional connections
 6. US Policy
 7. Renewable energies
 8. Trade barriers
 9. Talent

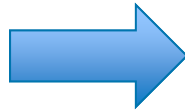
Energy Past



Energy Future

Electricity's 1st 100 years

- Utility scale grids
- Passive consumers
- Generic electrons
- Single fuel projects
- Geographic monopolies
- Central planning
- 2B + in energy poverty



The next 10

- Distributed peer to peer energy
- Engaged “prosumers”
- Hybrid services (eg. efficiency, telecom, alarms)
- Clusters (eg. Renewables/gas/storage)
- Roaming customers
- Local engagement (eg. Indigenous peoples, communities, businesses)
- Low-carbon energy access

“Energy is the golden thread that connects economic growth, social equity, and environmental sustainability” UN Secretary-General Ban Ki-moon

Emerging Trends & Lessons Learned

Trends

- Decarbonization & carbon pricing
- Market evolution
- Integration of renewables
- Rate reform
- Tariffs, subsidies, tax credits
- Utility transformation
- Engaged consumers
- Indigenous partners
- Green Finance (eg. bonds, infrastructure Banks)

Lessons Learned

- Prudent phase-in
- Wait for price decreases
- Community partnership key
- Keep elements of competition-project selection & dispatch
- Incent power where & when needed
- Impacts on existing: system & local
- Willing hosts
- Fair is in the eye of the beholder

Future Readying Energy: Where and What is Needed?

Where is Innovation Needed?	Examples
Policy	Decarbonization - renewable supply; climate change (cap and trade, taxes); revenue recycling (revenue neutral, infrastructure) Energy Poverty – “bird number two”
Financing	Green bonds; capacity contracts; tariffs, subsidies, tax credits; Indigenous and community partners; insurability, green infrastructure banks
Markets	Market hybrids – competition in energy/capacity/dispatch; certainty via PPAs
Regulatory	Rate reform (fixed/volumetric); transformed utilities; social license
Contracting	power where & when needed (eg. renewable/storage/gas combos); term lengths; community adders/partners
Technology	Pico projects; microgrids; prosumers; integration; scaleable/standardized plug & play installations
Utilities/Providers	Microgrid enablers not “death spirallers”
Politics	Interjurisdictional/intersectoral collaboration(!)

Affordable Energy for Humanity

“Energy is the golden thread that connects economic growth, social equity, and environmental sustainability”

UN Secretary-General Ban Ki-moon

“Emerging technological, social and business innovations mean that it is now possible for more than 2 billion people to gain access to energy that will radically transform their well-being...”

WGSJ OpenAccess Energy Summit

Serving this emerging market will provide unprecedented business and economic opportunities – and require breakthrough strategies

The problem is not small

- 1.5B have a light and a washing machine
- 4B have only the lightbulb
- 1.5B have neither

Opportunity NOT TO BE LOST – address energy poverty as we decarbonize

“We hope you will want to join us.” WGSJ OpenAccess Energy Summit

<https://www.dropbox.com/sh/6yosfa91d3q9olr/AAfdKsKguap2Pny8afluceGa?dl=0>

“We need to address energy poverty in ways that are:

- Clean
- Affordable
- Scaleable
- Sustainable”

Affordable Energy for Humanity, Global Change Initiative

AE4H.org <http://www.theglobeandmail.com/report-on-business/rob-commentary/indigenous-communities-must-be-part-of-the-global-green-energy-revolution/article29762478>