Summary of Presentation to

New Brunswick Select Committee on Climate Change

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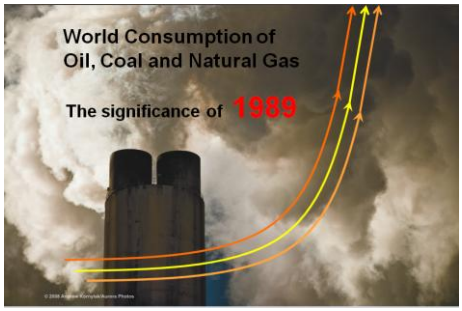
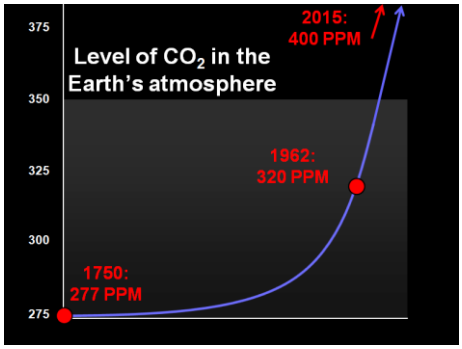
Some stark realities about climate change (IE what keeps me awake at night):

- **50% of all the coal, oil and natural gas ever consumed by humanity has been consumed since 1989** *(Source: Personal communication, David Hughes, Post Carbon Institute, http://www.postcarbon.org/our-people/david-hughes)*



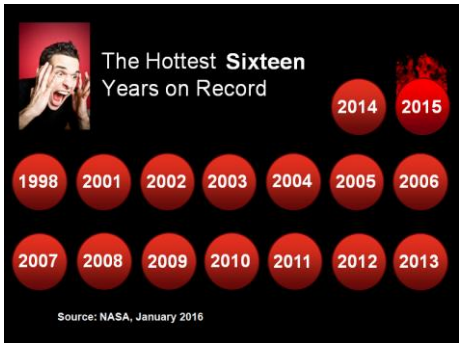
- Globally, we now generate **more than 1000 tonnes of emissions every second** of every day *(Source: Carbon Dioxide Information Analysis Center, http://cdiac.ornl.gov/ftp/ndp030/global.1751_2013.ems)*



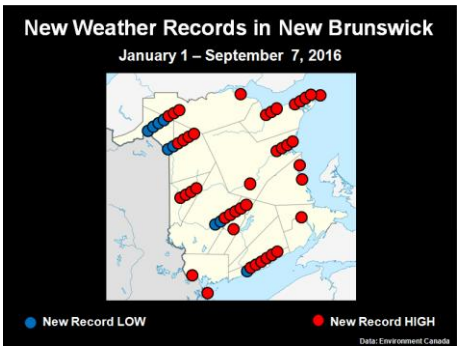
- The level of CO2 in the atmosphere has grown exponentially **from 277 PPM in 1750 to 404 PPM today;** two-thirds of that increase has happened in my lifetime *(source: Carbon Dioxide Information Analysis Center, http://cdiac.ornl.gov/trends/co2/modern_co2.html)*

- the 16 hottest years on record **include each of the past 15 years** *(Source: NASA, http://data.giss.nasa.gov/gistemp/tabledata/GLB.Ts+dSST.txt)*

- **Every single month of 2016** has been the hottest on record *(Source: NASA, http://data.giss.nasa.gov/gistemp/tabledata/GLB.Ts+dSST.txt)*



- So far in 2016, New Brunswick has had **42 record high temperatures versus just nine new record lows** *(Source: Environment Canada)*



- If we are to limit global warming to 2°C, all future global emissions must not exceed 565 bilion tonnes – but if all known reserves of fossil fuels are burned, we will generate 2,795 billion tonnes, or about five times our 'global carbon quota' (IE just because we have fossil fuel reserves does not mean we can safely burn them) *(Source: Bill McKibbon, http://www.rollingstone.com/politics/news/global-warmings-terrifying-new-math-20120719; the World Bank, the International Energy Agency and Bank of England Governor Mark Carney offer similar conclusions)*

- The bottom line: what we today consider as 'normal' consumption is actually the greatest consumption in history, and is causing unprecedented environmental disruption

- Einstein said *"We can't solve problems by using the same kind of thinking we used when we created them."* My own interpretation of that is, *"We need to rethink everything we hold to be true."*

Mitigation strategies – overall

- Not everyone is guided by a *moral compass*, but everyone is guided by a *money compass*

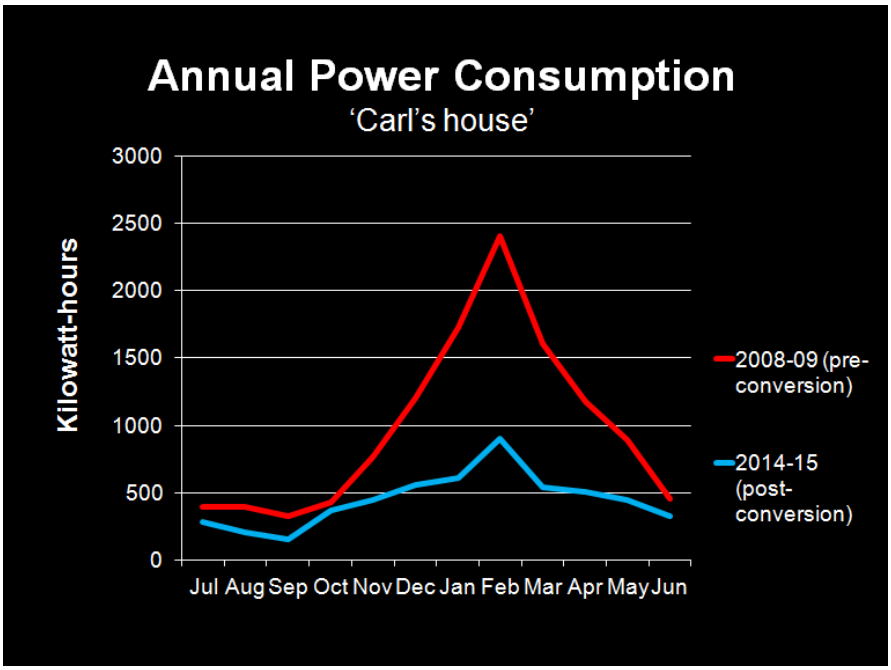
- A price on carbon is required to appeal to that money compass; it must be revenue-neutral, with proceeds directed toward programs for energy efficiency and the disadvantaged

- Concurrently, any incentives or subsidies for the fossil fuel industry should be eliminated

Mitigation strategies – Electricity:

1. Consider a program to promote conversion to wood and wood pellets

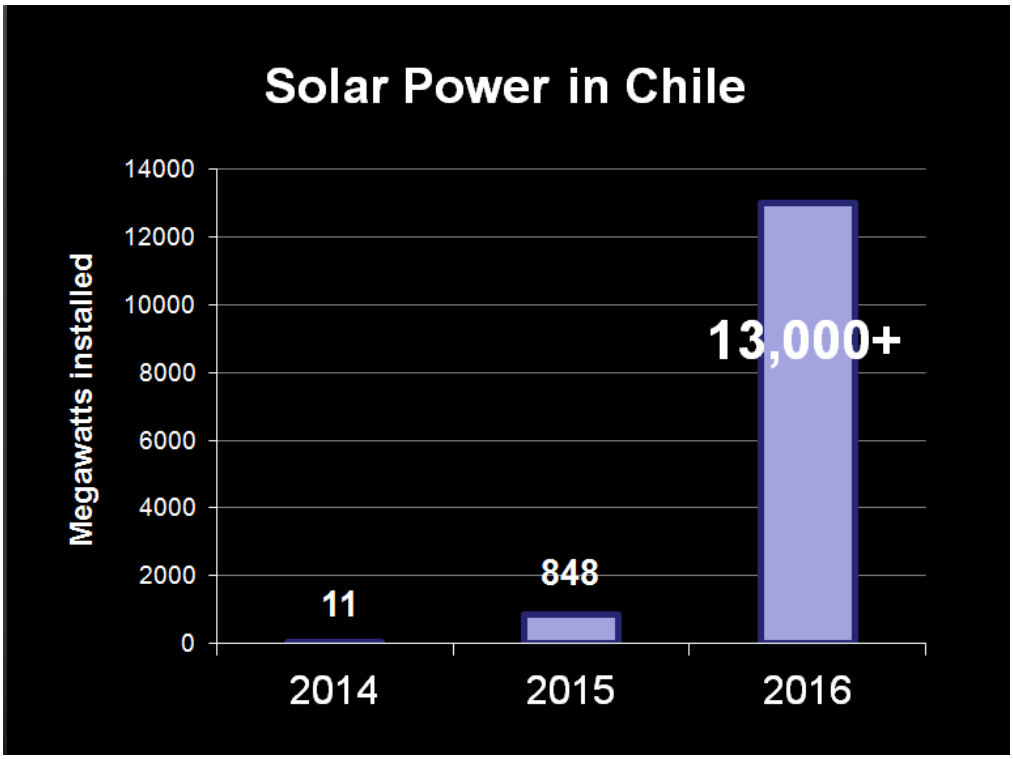
- Would reduce the need for purchased fuel and power, which cost NB Power **$826 million** in 2015 *(Source: NB Power Annual Report)*
- Would help reduce winter peak power, which is expensive and often produced by fossil fuel plants
- Personal experience: conversion to wood has greatly reduced our home's winter peak



- Considerations: requires careful, sustainable forest management; must be for clean-burning, low emission EPA-rated appliances only, ideally combining heat and hot water; must apply to all buildings, including residential, institutional, commercial and industrial
- *Perhaps the irony of NB's current situation is well illustrated by the Port of Belledune, which handles two products: coal is imported, increasing our emissions, and wood briquets are exported to European customers, reducing their emissions*

2. Get ready to embrace solar

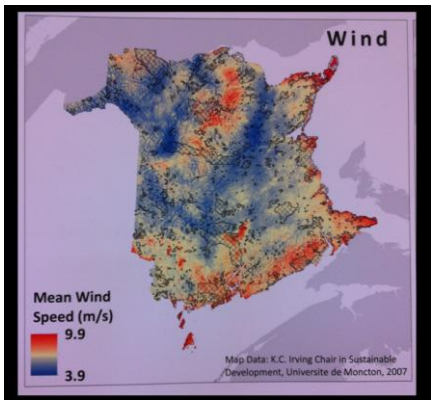
- Chile's amazing growth proves how fast solar can be adopted (since 2014, Chile has installed enough new solar to power NB **four times over**) *(Source: http://cleantechnica.com/2016/01/19/2015-solar-installation-figures-continue-rolling-algeria-chile)*



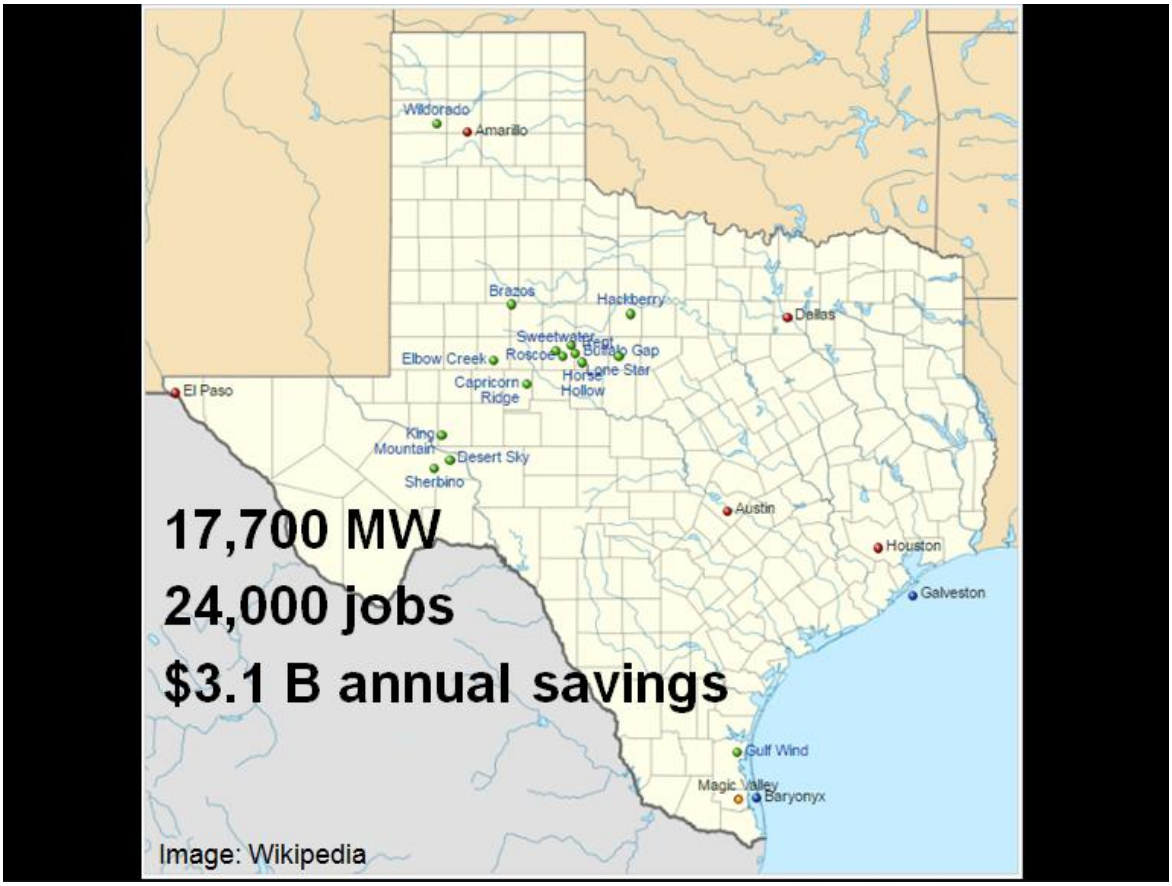
- Chile's most recent project (August 2016) will provide power for **2.9 cents/KWH** *(Source: https://thinkprogress.org/solar-delivers-cheapest-electricity-ever-anywhere-by-any-technology-c2ef759ac33f#.fulr5b42v)*
- Consider options for financing residential solar through property taxes
- Develop a trained workforce through universities and the NBCC

3. Invest in more wind

- NB used to be Maritime leader but has fallen behind NS
- Wind maps show we have lots of potential (further proof: turbines are installed in QC and NS within sight of NB)



- Costs have dropped greatly: a new project in Morocco is providing power for **three cents/KWH** *(Source: https://data.bloomberglp.com/bnef/sites/4/2016/04/BNEF-Summit-Keynote-2016.pdf)*
- Texas has invested heavily in wind and is realizing **jobs, savings and other benefits** *(Source: https://www.climaterealityproject.org/blog/six-reasons-texas-wind-energy-leader)*



- Renewables have no fuel costs; they're like buying a truck that never needs gas

4. Promote Community Economic Development Corporations (CEDCs) as a way to finance community-based power

- CEDC-like models have been used to finance wind farms in NS and PEI
- NBers invest $600 million annually in retirement savings – but only a small fraction stays in NB

5. Pursue a share of the federal government's Low-carbon Economy Fund

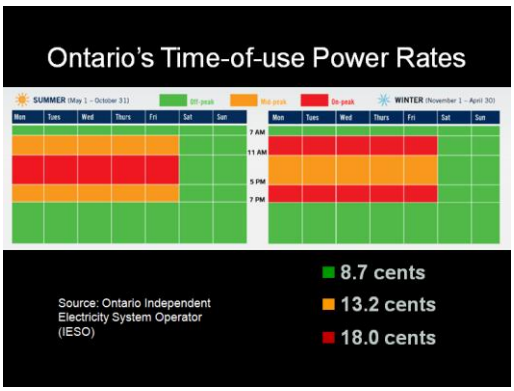
- Support research in tidal power (the second best site for tidal power in the Bay of Fundy is in NB) *(Source: http://www.marinerenewables.ca/wp-content/uploads/2012/11/Canada-Ocean-Energy-Atlas-Phase-1-Potential-Tidal-Current-Energy-Resources-Analysis-Background.pdf)*
- Support research in wave energy, such as the Danish WaveStar system *(Video: https://www.youtube.com/watch?v=zy1hXBI7SNo)*
- Investigate and exploit NB's considerable potential in micro hydro

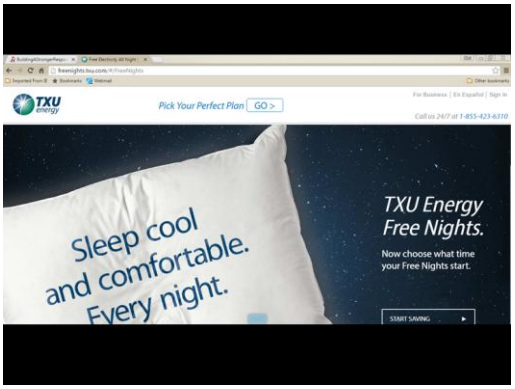
6. Support entrepreneurs and business incubators

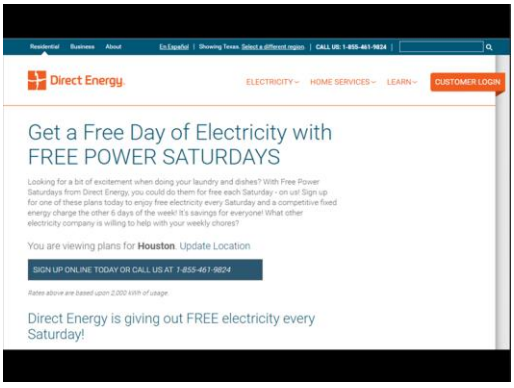
- NB has an abundance of 'backyard geniuses' who need help converting ideas into products and intellectual property

7. Help reduce time-of-day peaks and valleys through time-of-day pricing

- Better aligns power prices with true cost of generating & delivering power
- Common in many jurisdictions, including Ontario
- Many utilities in Texas offer **free power overnight and/or on weekends**
- Smart Meters can enable time-of-day pricing in NB







8. Make efficiency standards mandatory for all new construction

- Every new building is an opportunity to lock in efficiency – or inefficiency – for decades
- New technologies and designs make net zero or near net zero possible
- Adopt National Energy Code for Buildings, R2000 or another standard
- 'Solar-readiness' should be part of the standard
- Develop programs to support the upgrading of existing buildings
- Bring back an independent Efficiency New Brunswick

Mitigation strategies – Transportation

- Promote carpooling, modelled on Saint John's ShareYourRide.ca site or a successful program from another jurisdiction
- Consider reducing highway speed limits to 95 or 100 KM/H to improve fuel economy by 5-10% (my personal experience in slowing down from 110 to 95 KM/H resulted in 13% fuel savings)
- Implement strongly tiered registration fees to promote efficient vehicles and disincent inefficient vehicles; every new vehicle on our roads is an opportunity to lock in efficiency – or inefficiency – for at least a decade
- Consider incenting electric vehicles; a recent MIT study concludes 90% of trips made by drivers are within the range of current electric cars

Building broader awareness

- Integrate climate change (the problem and the solutions) into all grades and subjects of education
- Lead by example in government: vehicles, buildings, methods of doing business

- Develop ongoing information campaigns for general public
- Use power bills as a means to educate consumers on consumption and how to save energy; highlight kilowatt-hours and emissions

One final point: *it is hard to imagine how a project such as the Energy East Pipeline could in any way, at any time, be compatible with a goal of reducing greenhouse gas emissions.*

To Summarize

	Sustainability	Self-sufficiency	Jobs
Wood heat	✓	✓	✓
Solar Power	✓	✓	✓
Wind Power	✓	✓	✓
Tidal Power	✓	✓	✓
Wave Power	✓	✓	✓
Entrepreneurship	✓	✓	✓
Power rate signals	✓	✓	
Building efficiency stds.	✓	✓	✓
Carpooling	✓	✓	
Speed limits	✓	✓	
Tiered registration fees	✓	✓	
Education	✓	✓	
Pipeline	✗	✗	Short-term