

Global Trends in the bioeconomy: Where's Canada?

(and a little bit about capital raise, and policy)

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To begin - Canada is well endowed

Best country to do business in the G20 - Forbes and Bloomberg

Strongest growth record among G7 from 2006 - /'15 - OECD

Most highly educated workforce among OECD members – OECD

Lowest business R&D costs among G7 – KPMG

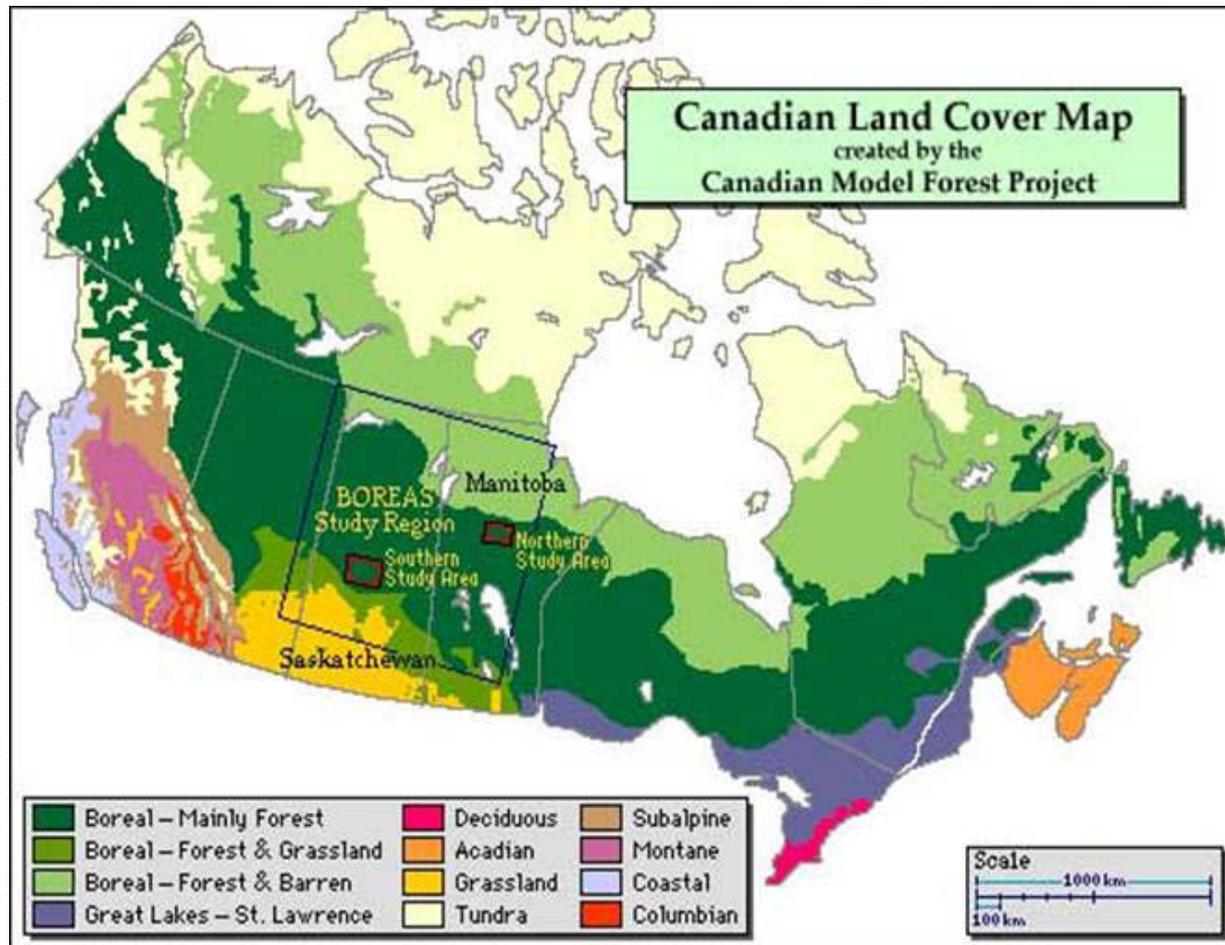
“Most sound” banking system in the world – World Economic Forum

A fun place to live, work and play – Best quality of life in G7 – OECD

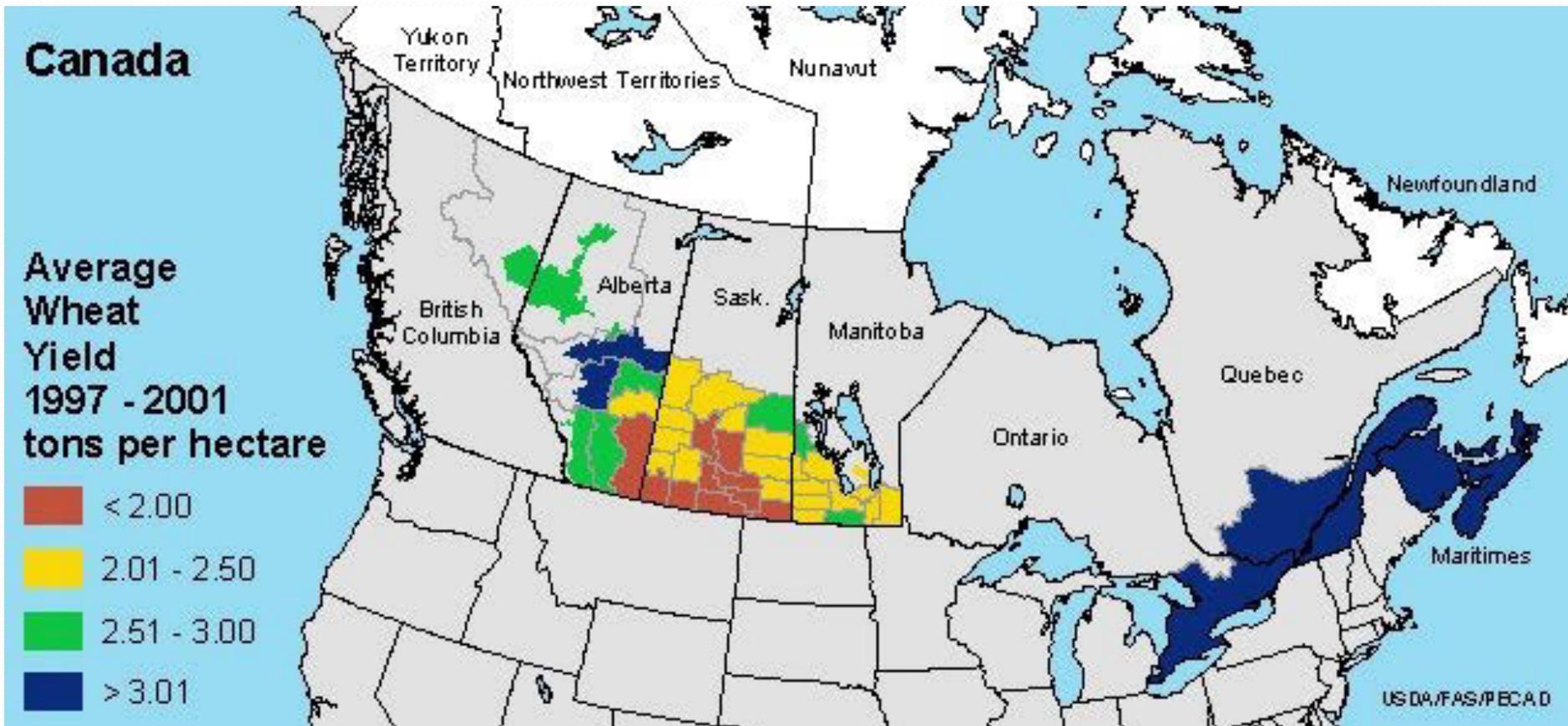
And the bio resource ?

Canada is well endowed

9% of world's forest (348 million hectares)



Canada is well endowed
160 million acres of Crop & Pasture land
(70% in Saskatchewan/Alberta)



The talk in Europe:

World Bio Markets, Amsterdam/March 2018;
Global Bioeconomy Summit, Berlin/April 2018

- 50 countries now have **National Bioeconomy Strategies**
(Does industry need a national strategy to get on with it?)
- Sugar to chemicals is the future (\$\$ Multi billion dollar market)
- Many more would-be Customers in the room:
 - ✓ Lego - goal – be 100% bio-based by 2030 (75 billion elements sold/yr)
 - ✓ Michelin - seeking bio-based alternatives to carbon black in tires
 - ✓ The Airlines - SkyNRG plea for biofuels
 - ✓ Ikea
 - ✓ BASF – **driver is customer demand / raw material diversity / SD**
 - ✓ Toy companies
 - ✓ Packaging companies

The talk in Europe: (Amsterdam / Berlin)

- The bioeconomy compliments the United Nations' **Sustainable Development Goals** (SDGs) agreed upon in 2015. In particular:
 - ✓ Goal 3 - **Good Health** and Well Being
 - ✓ Goal 7 - Affordable and **Clean Energy**
 - ✓ Goal 8 - Decent Work and **Economic Growth**
 - ✓ Goal 9 - Industry, **Innovation** and Infrastructure
 - ✓ Goal 11 - **Sustainable** Cities and Communities
 - ✓ Goal 12 - **Responsible** Consumption and Production
 - ✓ Goal 13 - **Climate** Action
- These SD Goals will drive future global economic development
- The bioeconomy is a strategic partner with the **Circular economy and Sustainability**
- Bioeconomy has potential to help meet the Paris Agreement on climate change
- Need to get Bioeconomy/Circular Economy higher on agenda at COP

The talk in Europe: (Amsterdam / Berlin)

- Two dozen Universities in Europe now have **Masters Courses** in the bioeconomy / circular economy / sustainable chemistry / green growth (UBC undergraduate program in Bioeconomy in 2019)
- In Europe it is never too early to talk to VCs. Will often say “no” many times before we say “yes”
There are currently no US VCs investing in Industrial Biotech (lost so much on Kior etc. they left the space – could come back)
- EU VCs are more patient (8 – 10 years) than in US
(Not a one round game – more like 2 - 3 rounds)
- We expect a **\$US100 – 150/tonne carbon tax by 2030**
(Sweden is heading in this direction)

So you have technology, and are “ready” to take **commercial** advantage of this opp...

Debt financing is the biggest challenge faced by new technologies seeking to build first, or even second-of-kind, commercial facilities

To raise capital, what are your responsibilities as the borrower?

You must convince a lender/investor that **all risks can be managed**:

- technology risk (will it work)
- construction and operating risk (on time/on budget/on performance - EPC wrap)
- feedstock risk (guaranteed volumes at fixed price/time)
- off-take risk (purchase agreement(s) with a customer(s); hedging strategy)
- scale-up risk (independent engineering assessment)
- management team risk (degree of business acumen, management continuity)

Lender will assess risks, then price the debt (e.g., what interest rate does the lender need to charge if the facility only operates 75% of the time?)

The greater the perceived investment risk, the higher the cost of debt

(This all goes away if you can build your plant with 100% equity – good luck)

Will the large Strategics invest?

Yes, large strategic investors (chemicals / fossils) have:

- considerable financial and human resources
- more patient money than venture funds

But:

Where commercialization of new technology is concerned, strategics are not interested in a one-off:

- How big an IRR haircut will I need to take on that first plant?
- Will this offer a simple payback of 5 – 6 years?
- Is this project gov't driven, and if so, how stable is that policy?

- In the long run, will your technology make a material difference to our core business?

And Government's role?

Recognize that **Certainty is the mother of investment**

Assuming bio-economy commercialization is a policy goal (jobs, economic diversification, GHG emissions reduction), governments need

to employ economic instruments that:

- offer **long term policy stability** – “**Certainty**”
- are **flexible, not exclusive** (recognize that successful commercialization often demands co-production of multiple products – i.e., fuels and chemicals)
- properly **share and allocate commercialization risks**
- **drive innovation and substitution (a material carbon tax)**

Scaling Up 2018: www.scalingupconference.ca
Competing in the Global Bioeconomy Market
Nov 5 – 7, 2018 – Ottawa, Canada

- Christopher Ragan, Chair, Canada's Ecofiscal Commission
- Rob van der Meij, Capricorn Sustainable Chemistry Fund
- Misha Valk, SkyNRG
- Jordan Solomon, CEO, ECOSTRAT
- Don Roberts, CEO, Nawitka Capital Advisors
- James Stephens, CEO, Blue Marble Biomaterials
- Marc LePage, President and CEO, Genome Canada
- Marie-Helene Labrie, Senior VP, Enerkem
- Ziyad Rahme, Vice President Investments, SDTC
- Elizabeth May, Leader, Green Party of Canada, and MP, Saanich – Gulf Islands
- Don McCabe, Director, Biological Carbon Canada
- Catherine Abreu, Executive Director, Climate Action Network Canada
- Joseph Galimberti, President, Canadian Steel Producers Association

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