



**Alberta
Innovates
Bio
Solutions**

Keeping Alberta Growing: Alberta Innovates Bio Solutions

Dr. Stan Blade, Chief Executive Officer
THECIS Breakfast

Funded by the Government of Alberta



**Inspiring smart solutions in
agriculture, food and
forestry for Albertans and
the world.**

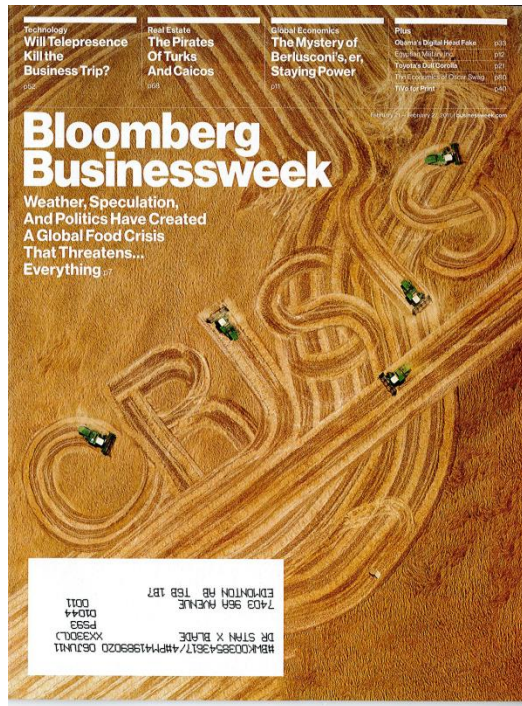
Population

“We are at a unique moment in history as diverse factors converge to affect the demand, production and distribution of food over the next 20 to 40 years.”

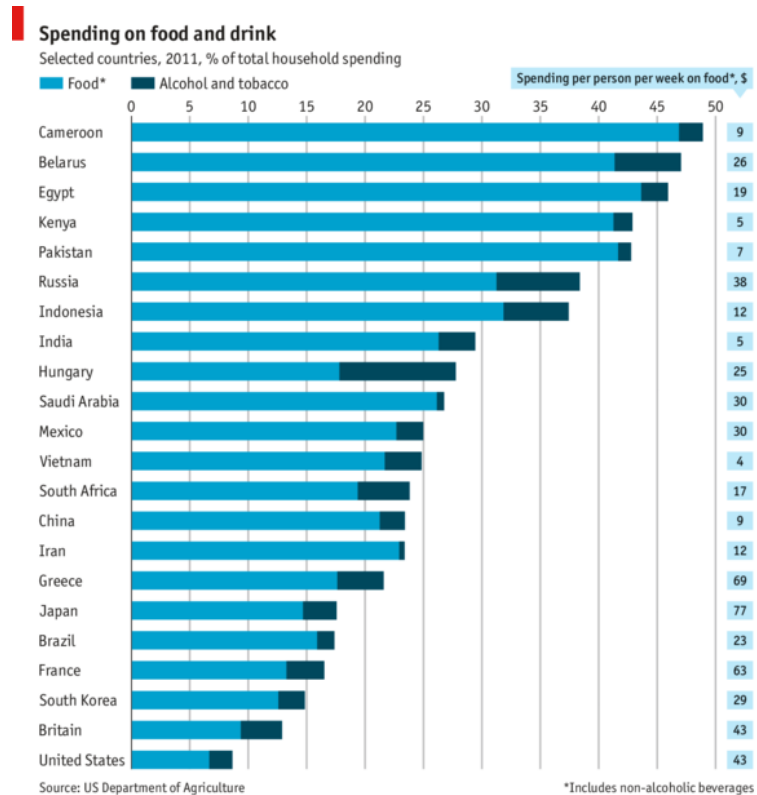
**Sir John Beddington
Chief Scientific Advisor to HM Government
“The Future of Food and Farming”
January 24, 2011**



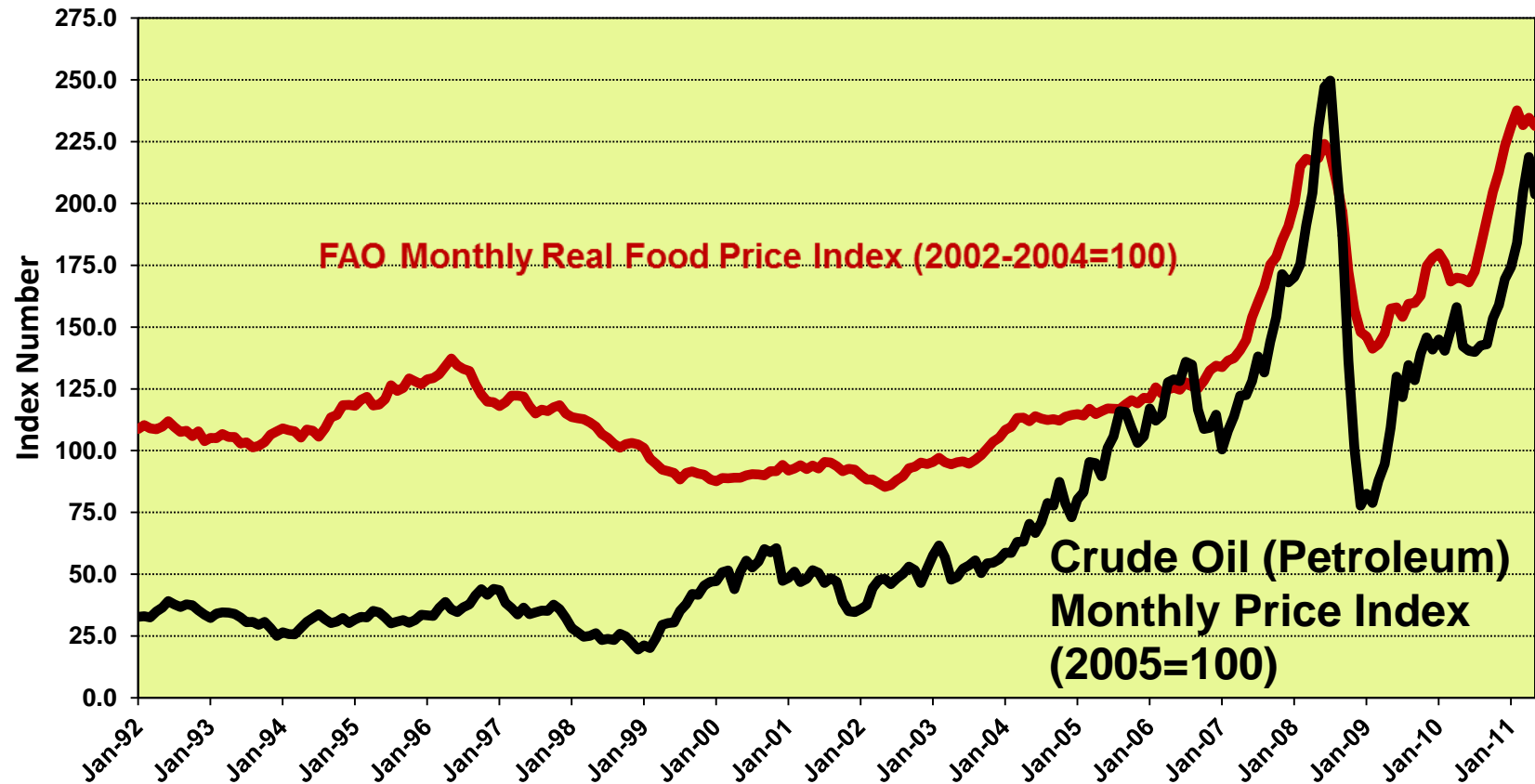
Commodity prices



“Food prices are soaring to record levels, threatening many developing countries with mass hunger and political instability”Feb 24, 2011 N.Y. Times



Energy



Industry change



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Glencore Acquires
Viterra

GLENCORE ACQUIRES VITERRA

Glencore completes acquisition of Viterra and announces key management appointments

Glencore International plc ("Glencore") and Viterra Inc. ("Viterra") announced today that Glencore has completed the acquisition of Viterra. The acquisition brings Glencore immediate critical mass in the key grain markets of North America through Viterra's substantial Canadian operations. Viterra also materially expands Glencore's existing operations in Australia. The acquisition reinforces Glencore's position as one of the world's leading commodity suppliers.

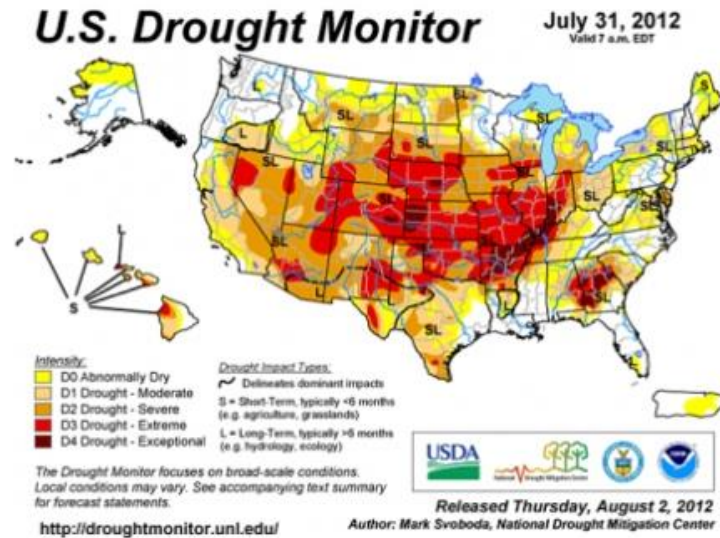
Fran Malecha, formerly Chief Operating Officer of Viterra, has been appointed Director, Agricultural Products, North America, with responsibility for all North American operations. He will be based in Regina, Saskatchewan which becomes headquarters for Glencore's North American Agricultural Products business. David Mattiske has been appointed Country Manager, Agricultural Products, Australia and New Zealand, with responsibility for all agricultural operations in Australia and New Zealand.

GLENCORE

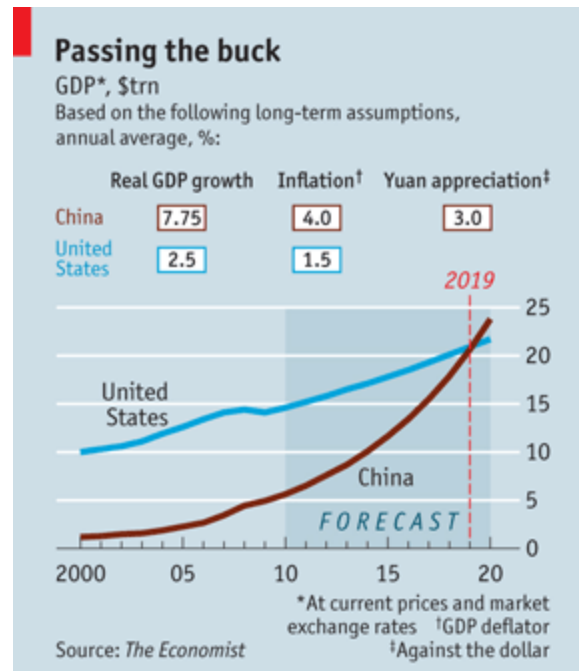
NEWS AND FILINGS

- [January 2, Viterra Provides Corporate Update](#)
- [December 17, Glencore completes acquisition of Viterra](#)
- [December 7, Glencore receives final regulatory approval for acquisition of Viterra](#)
- [November 9, Letter Agreement](#)
- [November 9, Viterra Provides Further](#)

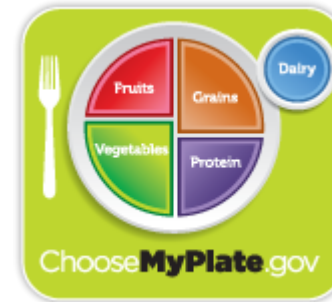
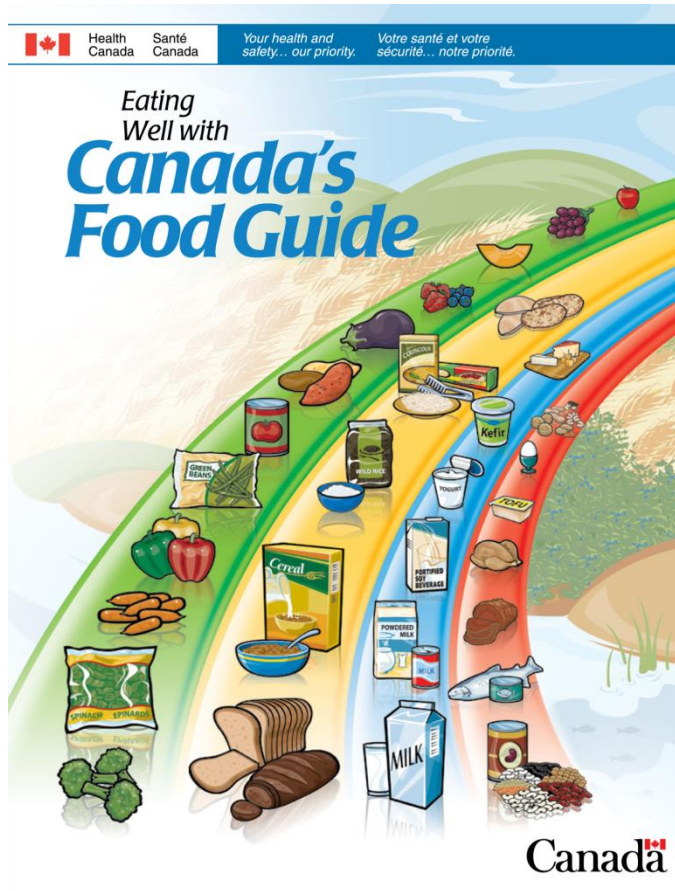
Climate



Global economy



Health



Partnerships



New science



Develop better seeds - Monsanto will double yield in its three core crops of corn, soybeans and cotton by 2030, compared to a base year of 2000.

Conserve resources - Monsanto will develop seeds that will reduce by one-third the amount of key resources required to grow crops by the year 2030.

Help improve farmers' lives - The company will help improve the lives of farmers, including an additional five million people in resource-poor farm families by 2020.

Monsanto press release
June 4, 2008

Development

“Melinda and I believe that helping the poorest small-holder farmers grow more crops and get them to market is the world's single most powerful lever for reducing hunger and poverty.”

Bill Gates
Bill and Melinda Gates Foundation
2009 World Food Prize address
October 15, 2009



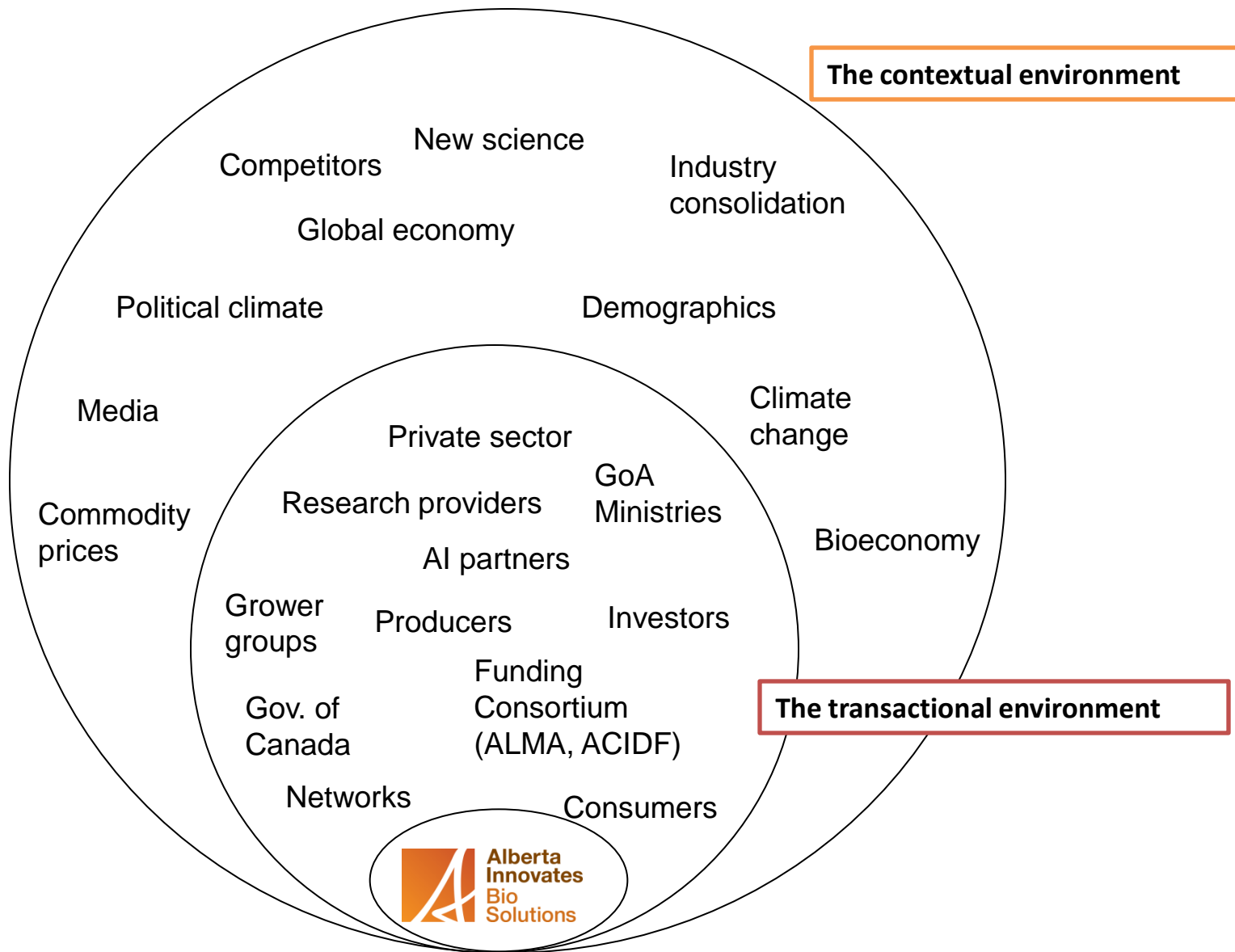


Alberta Innovates

- Focus on areas where Alberta has a competitive advantage.
- A provincially-funded cohesive, accessible research and innovation system.
- World-class research to support Government of Alberta priorities.
- Coordinates and supports investments required to solve major industry challenges.



AI-Bio's Strategic Environment



Alberta Industry drivers

- A need to be profitable
- Next generation economy opportunities
- Sustainable practices
- Greenhouse gas emissions
- Ecosystem adaptation to climate change
- Rural development
- Enhanced agricultural and forestry productivity
- Demographics/industry structure
- The need for innovation



State of the Industry

- In 2011, agriculture in Alberta created \$10.2 billion of value for farmers
- Food and beverage manufacturing reached \$12 billion in 2010
- In 2010, Alberta's revenue from forest manufactured goods was \$2.4 billion



Alberta Industry Vision – Forestry

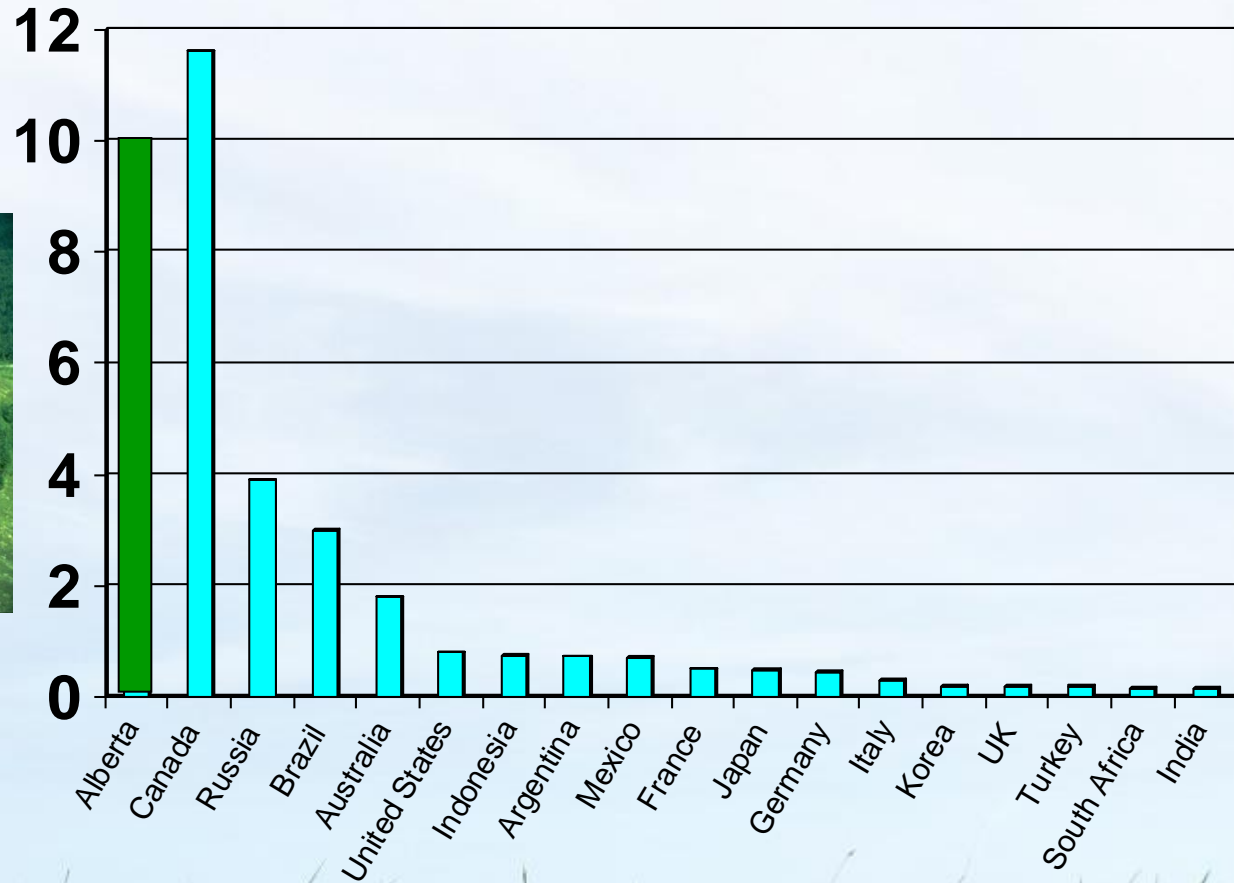
"What we need is change on a macro level, with a new forestry industry business model for a new future defined by growing and competing land uses and a need for innovation in a changing marketplace marked by growing environmental awareness."

Forest Industry Sustainability Committee (FISC) report,
Recommendations for Enhancing Alberta's Business Model.



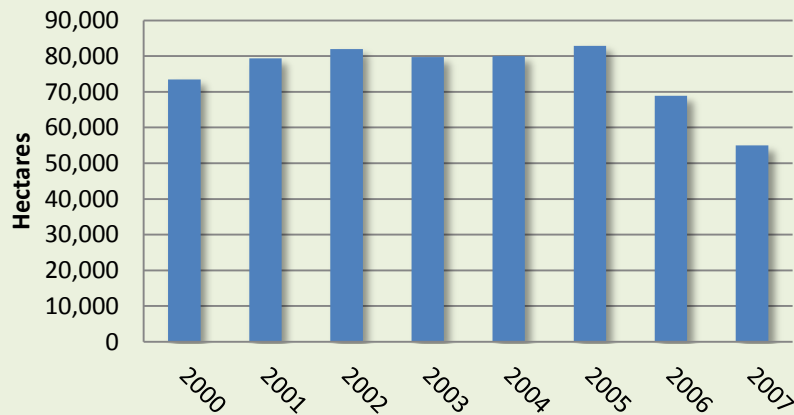
Biological Capital – Alberta

(forest area per person - hectares)



Harvesting Alberta's Forests

Forest Area Harvested in Alberta



Softwood:

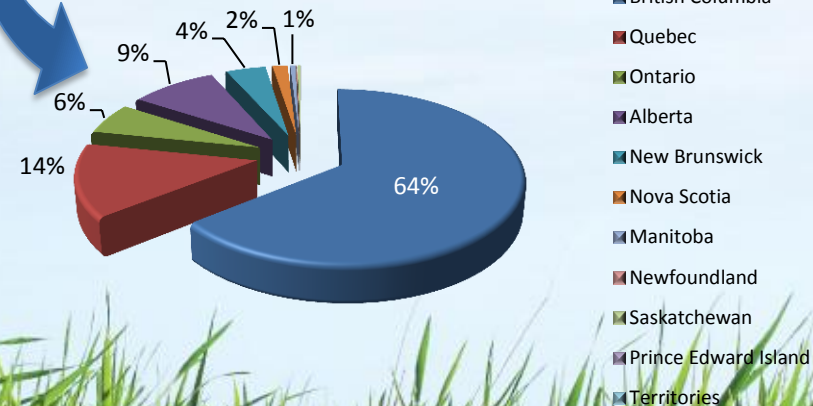
- Spruce.....35.4%
- Pine.....23.7%
- Fir.....1.6%

Hardwood:

- Aspen/Poplar.....35.2%
- Birch.....1.4%

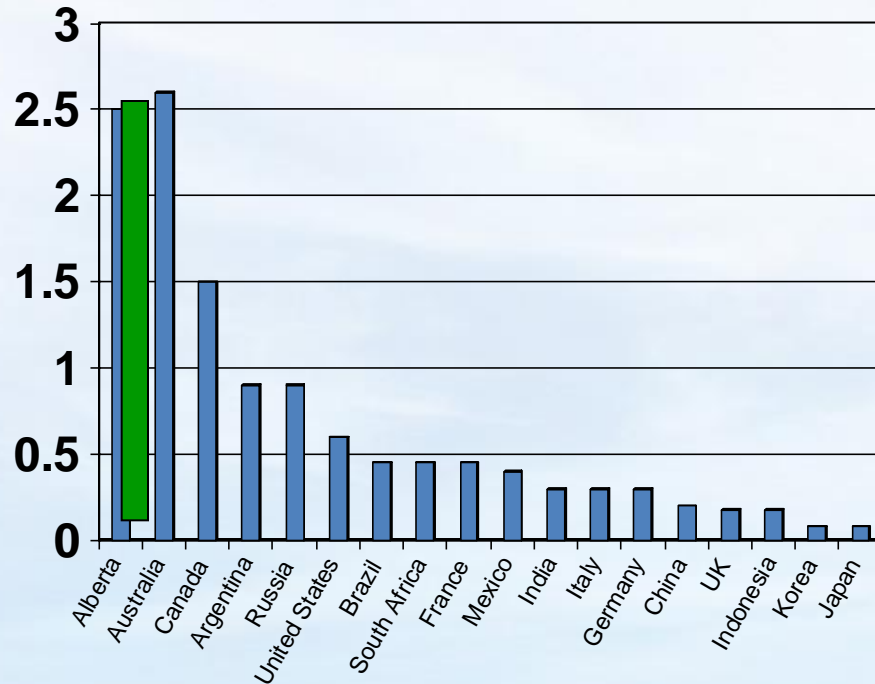
97.3%

Canadian Forest Product Exports, 2008



Biological Capital – Alberta

(arable land per person - hectares)



8.5 million hectares of arable land +

11+ million hectares – pasture and forage

We have mature, established industries....

**Alberta Farm
Gate Value
(2011)**

Product	Value (\$mil)
Beef	3,167
Canola	2,609
Wheat	1,595
Hogs	417
Dairy	504
Poultry	296
Pulses	266
Barley	236
Potatoes	152
Greenhouse	153



Processing - \$12.2B

Growing Prosperity

Alberta Innovates Bio Solutions: Business Plan Priorities

Sustainable Production

- Market Driven Traits and Products
- Agriculture and Forest Sustainability

Advancing the Bioeconomy

- New Conversion Processes
- New Products

Food Innovation

- Products and Processes for Improved Wellbeing
- Food Safety

Ecosystem Services

- Science-based Solutions for Immediate Industry Challenges
- Integrated Business Models

Prion and Protein Misfolding Diseases

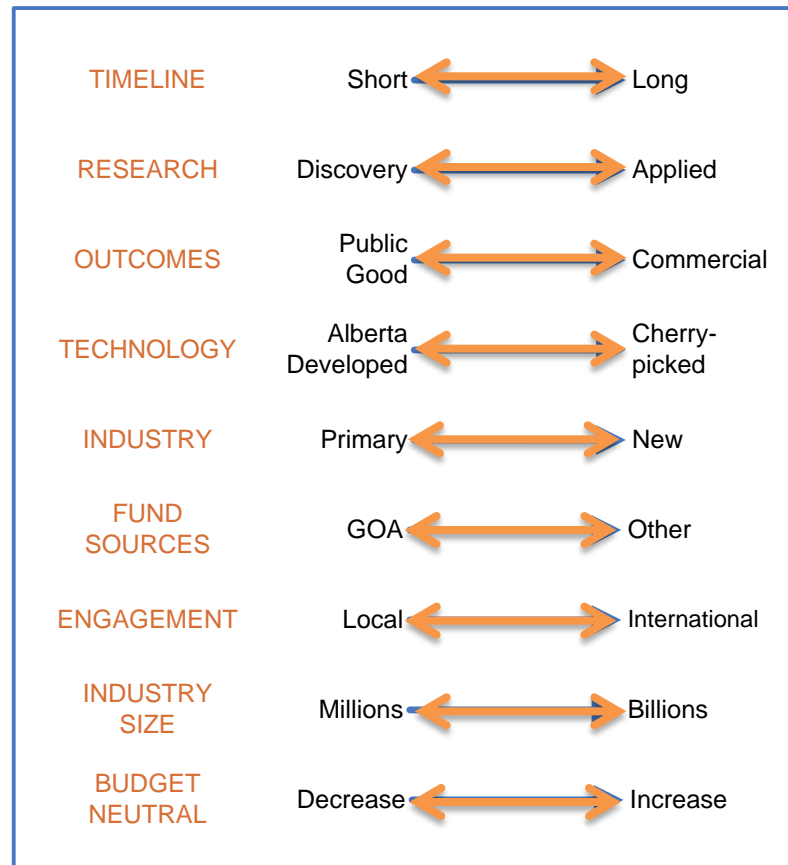
- Advancing Science and its Application
- Connections between Prion and Other Protein Misfolding Diseases

Alberta Innovates Bio Solutions

We lead and coordinate science and innovation that enhances the growth and diversification of Alberta's forest and agricultural sectors.



Portfolio allocation



Core functions

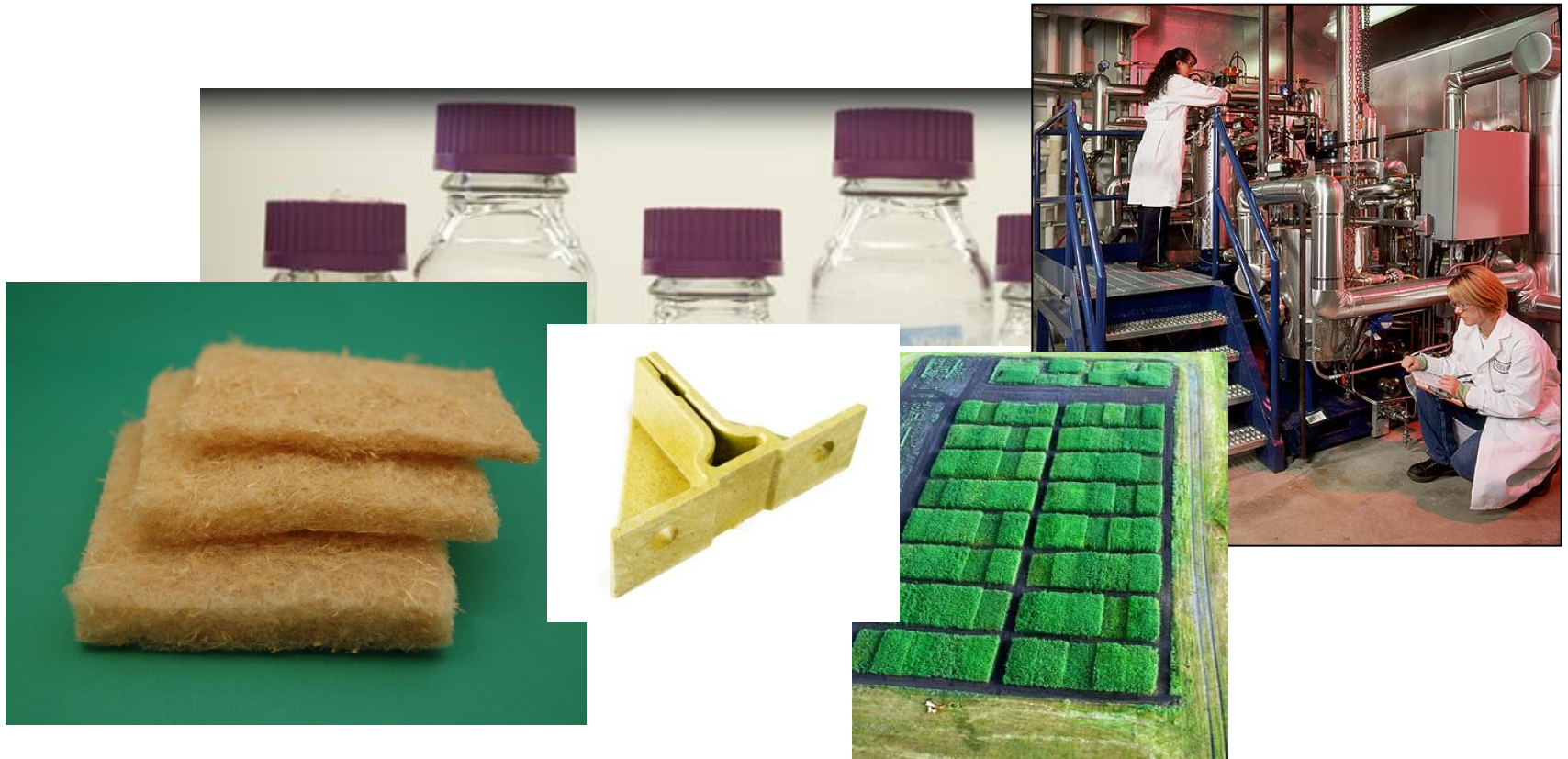
- Lead
- Provide foresight
- Invest
- Broker
- Network and partner
- Evaluate
- Facilitate



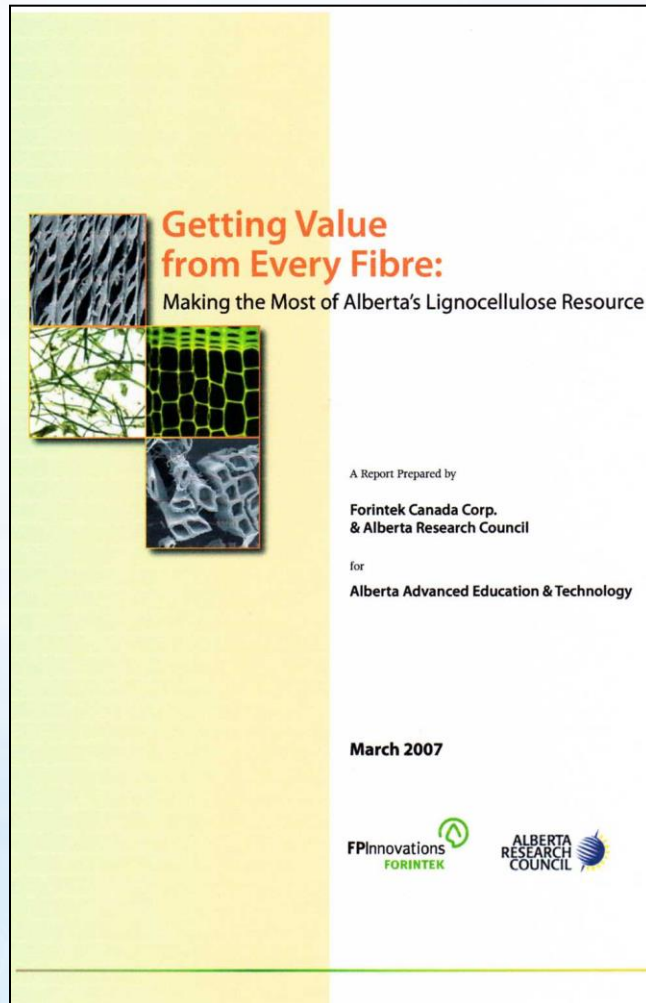
“The term bioeconomy refers to all economic activity derived from: a) the scientific and research activity focused on understanding mechanisms and processes at the genetic and molecular levels, and b) the application of this knowledge to any industrial process.”

Enriquez and Rodriguez, 1997

Advancing the Bio-economy



Focus actions around four key strategies:



1. **Clusters**-Building biorefineries and integrated lignocellulose industrial clusters
2. **Build on existing strength** - Transforming and sustaining the current lignocellulose-based industries
3. **Communities** - Sustaining and enhancing forest and agriculture based communities
4. **New companies** - Growing biocomposite, biomaterial and bioproduct companies

Developing the Alberta bioeconomy

- Feedstock availability
- Building the bioeconomy is a private and public sector priority
- Unique facilities
- Conversion technology initiatives
- Bioproduct development opportunities
- Companies are investing
- Communities are engaged



Bioconversions Network

The Biorefining Conversions Network (BCN), a research network based out of the University of Alberta, is focused on aligning local and global research communities in the area of biorefining conversion technologies.



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Biorefining Conversions Network



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News



Bioeconomy Alberta's Website Launched

April 18, 2011



BCN will be at the 2011 World Congress on

BCN Events

No upcoming events are currently scheduled.

[» More events](#)

Alberta Biomaterial Development Centre - ABDC

- **ABDC is a newly formed provincial initiative with the mandate to establish Alberta as an innovation and commercialization leader in the growing field of agriculture and forestry based biomaterials.**

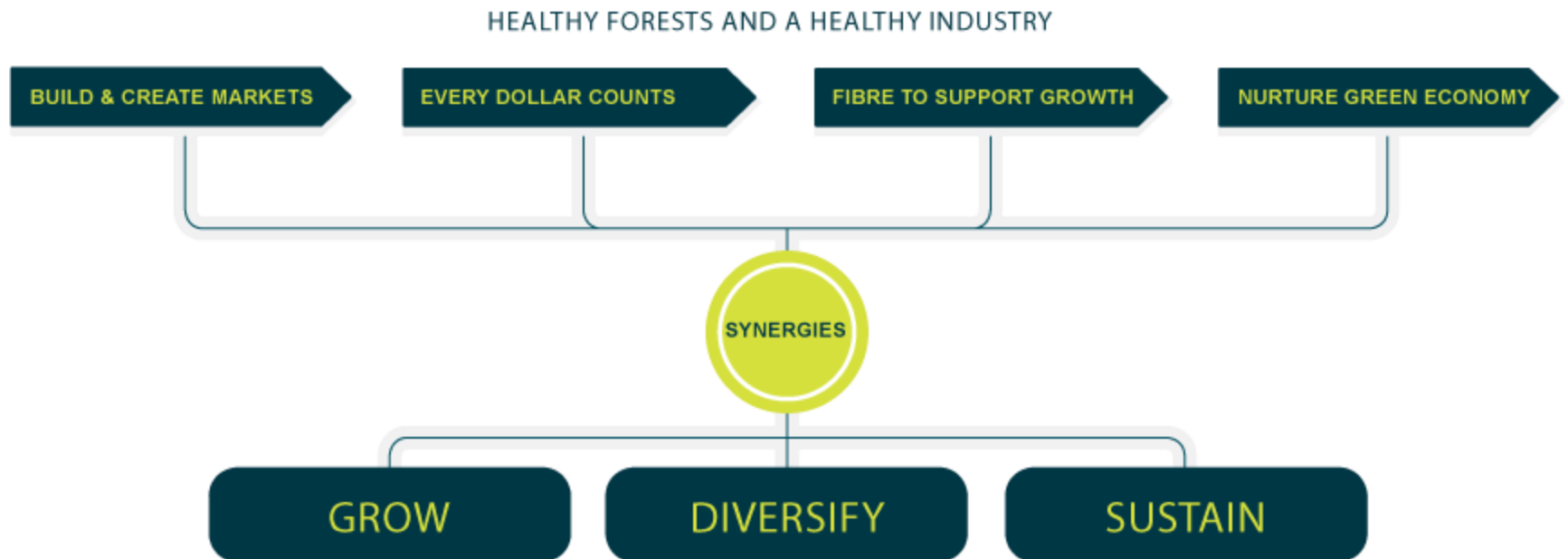


BioE-a 10-year strategy

- Current state assessment
- Industry round table
- Development of an inventory database
- Interviews with 100 CEOs
- Thought Leaders Forum



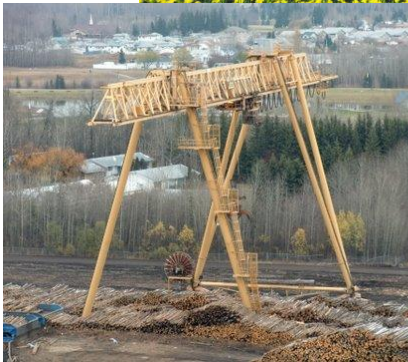
Alberta Forest Products Roadmap



“Sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Our Common Future, 1977

Sustainable Agriculture, Food & Forest Production



“Over the past decade sales of packaged foods have jumped 92%-to a value of \$2.2 trillion.

Euromonitor, 2012

“We are examining our entire portfolio to make sure our products are healthier and tastier than those of our direct competitors.”

Janet Voute
Global Head of Public Affairs
Nestlé

Food Innovation



“Ecosystem Services are the benefits people derive from ecosystems. Besides provisioning services or goods like food, wood and other raw materials, plants, animals, fungi and micro-organisms provide essential regulating services such as pollination of crops, prevention of soil erosion and water purification, and a vast array of cultural services, like recreation and a sense of place...”

The Millennium Ecosystem Assessment

Ecosystem Services



Climate Change Strategy

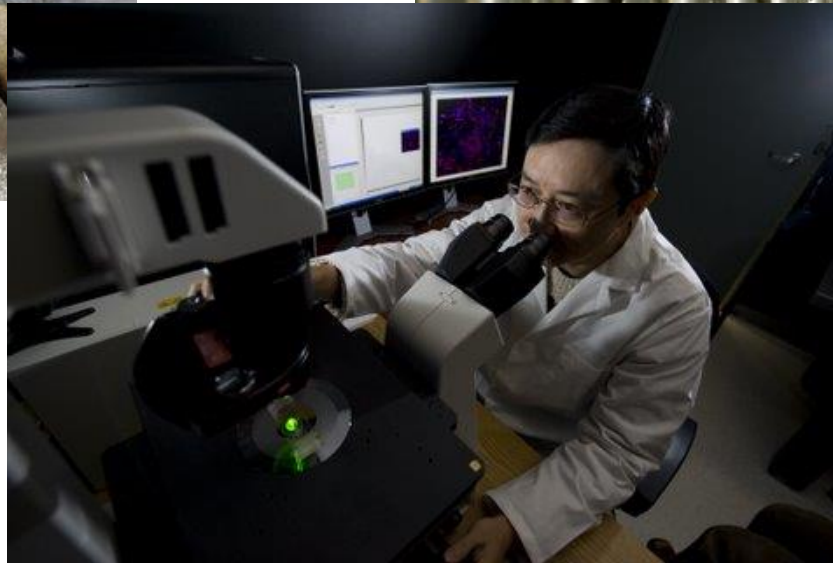
- The Climate Change Strategy established the following targets for Alberta:
 - By 2010 -- Meet intensity target from 2002 plan – 20 megatonne reduction
 - By 2020 -- Stabilize greenhouse gas emissions - 50 megatonne reduction
 - By 2050 -- emissions reduced 50 per cent below business as usual level. This equals 200 megatonnes, or 14 percent below 2005 levels.
- The initiation of the **Climate Change and Emissions Management Corporation** has resulted in \$120+ million (supported by \$15/tonne GHG) available to invest in clean technologies.



"the abnormal protein is capable of recruiting the normal one into the abnormal form.... [O]nce the abnormal form of the prion protein is in the body, it then grabs on to the normal form and co-opts it and turns it into a rogue, or an abnormal form... . It becomes a chain reaction and more and more of the abnormal form accumulates ... and eventually kills the host."

Stanley Prusiner,
Nobel Laureate

Prion & Prion-like Disease Management



Alberta Innovates Bio Solutions: Business Plan Priorities



Sustainable Production	<ul style="list-style-type: none">• Market Driven Traits and Products• Agriculture and Forest Sustainability
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Ecosystem Services	<ul style="list-style-type: none">• Science-based Solutions for Immediate Industry Challenges• Integrated Business Models
Prion and Protein Misfolding Diseases	<ul style="list-style-type: none">• Advancing Science and its Application• Connections between Prion and Other Protein Misfolding Diseases

Stanford Blade, Ph.D.

Chief Executive Officer

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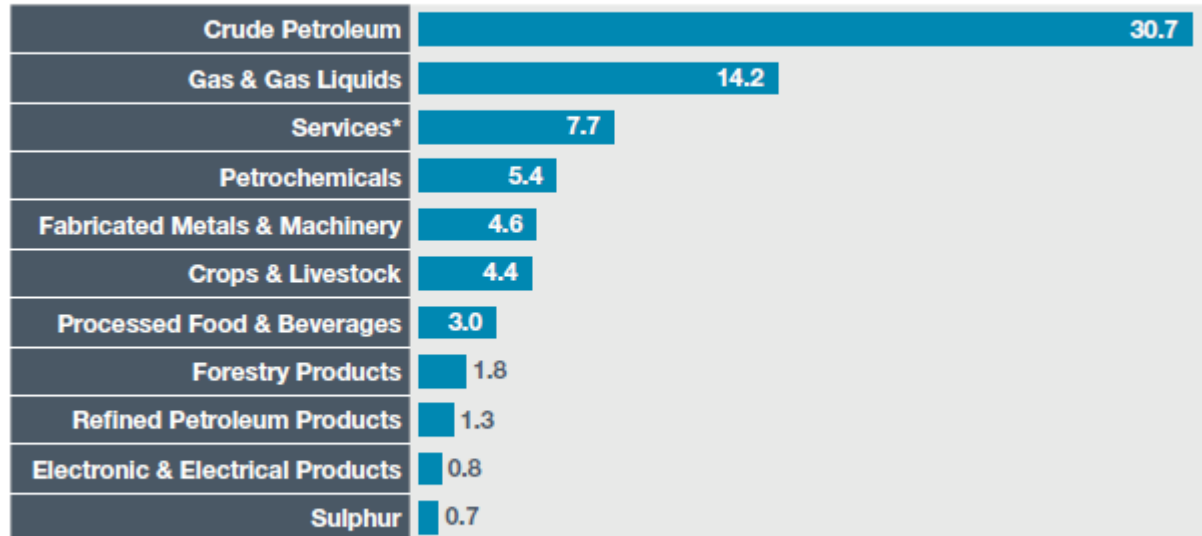
Twitter: BioSolutionsCEO



Alberta Exports

Alberta's Major Exports 2009 (\$ Billions)

Total Exports of Goods and Services: \$76.8 Billion*



* Export of services amount is an estimate.

Sources: Statistics Canada and Alberta Finance and Enterprise