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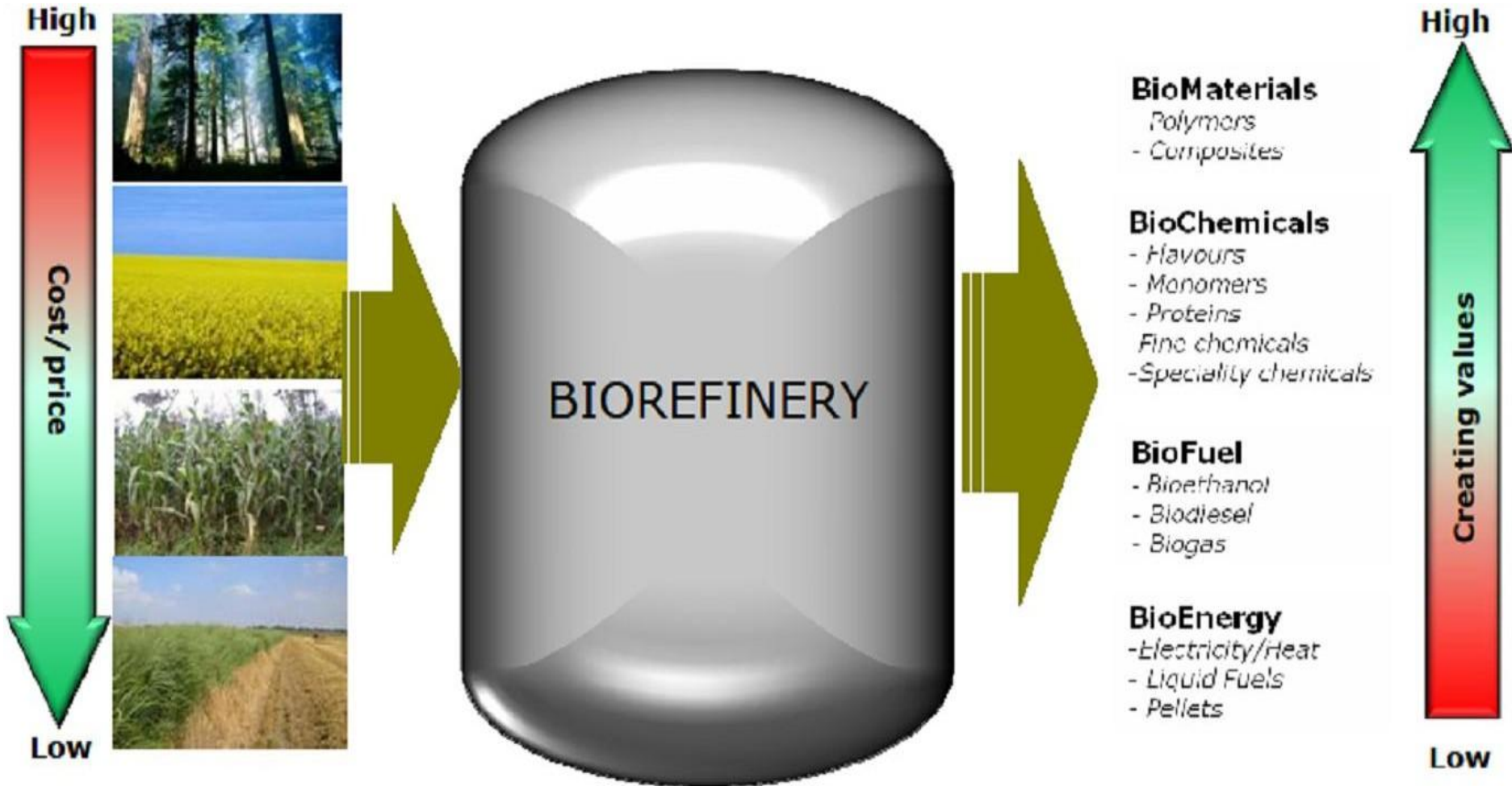
Moving Towards a Cohesive Bioproducts Strategy for the Sector

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Canada 

A broad stream of industrial bioproducts can build on our commitment to biofuels, offer Canada new economic opportunities and...



... will promote environmentally sustainable forms of manufacturing

There are a number of drivers spurring development of bioproducts worldwide

- Increasing demand and rising costs of energy and petroleum
- GHG emissions and the importance of environmental sustainability
- New markets and economic opportunities for farmers and rural and remote communities
- Increasing demands for environmentally sustainable products from both business and consumers
- Technological advances are creating new options to develop various products using biomass as an input
- A number of countries are seeking alternatives to oil to achieve energy security

Many governments, such as the US and EU, have already made strong commitments and significant investments in bioproducts

A strong bioproducts industry can provide new opportunities for the agricultural sector and rural communities



However diverse views exist on the benefits & opportunities associated with bioproducts

Concerns

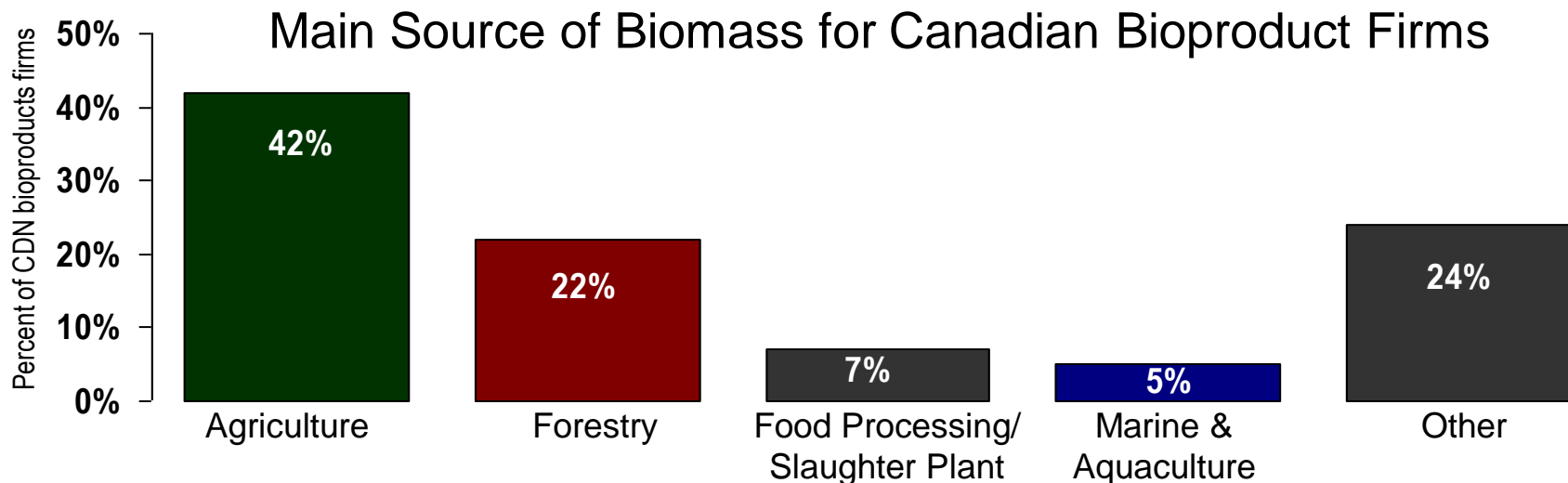
- Food vs. Fuel – diverting food to industrial uses seen as raising prices
- Feed costs – higher grain prices affect the livestock industry
- Environmental – some question environmental benefits of bioproducts (particularly biofuels)
- There remain concerns around genetically engineered crops for industrial uses:
 - public apprehension
 - potential trade issues if non-approved GE crops co-mingle with food exports

Support

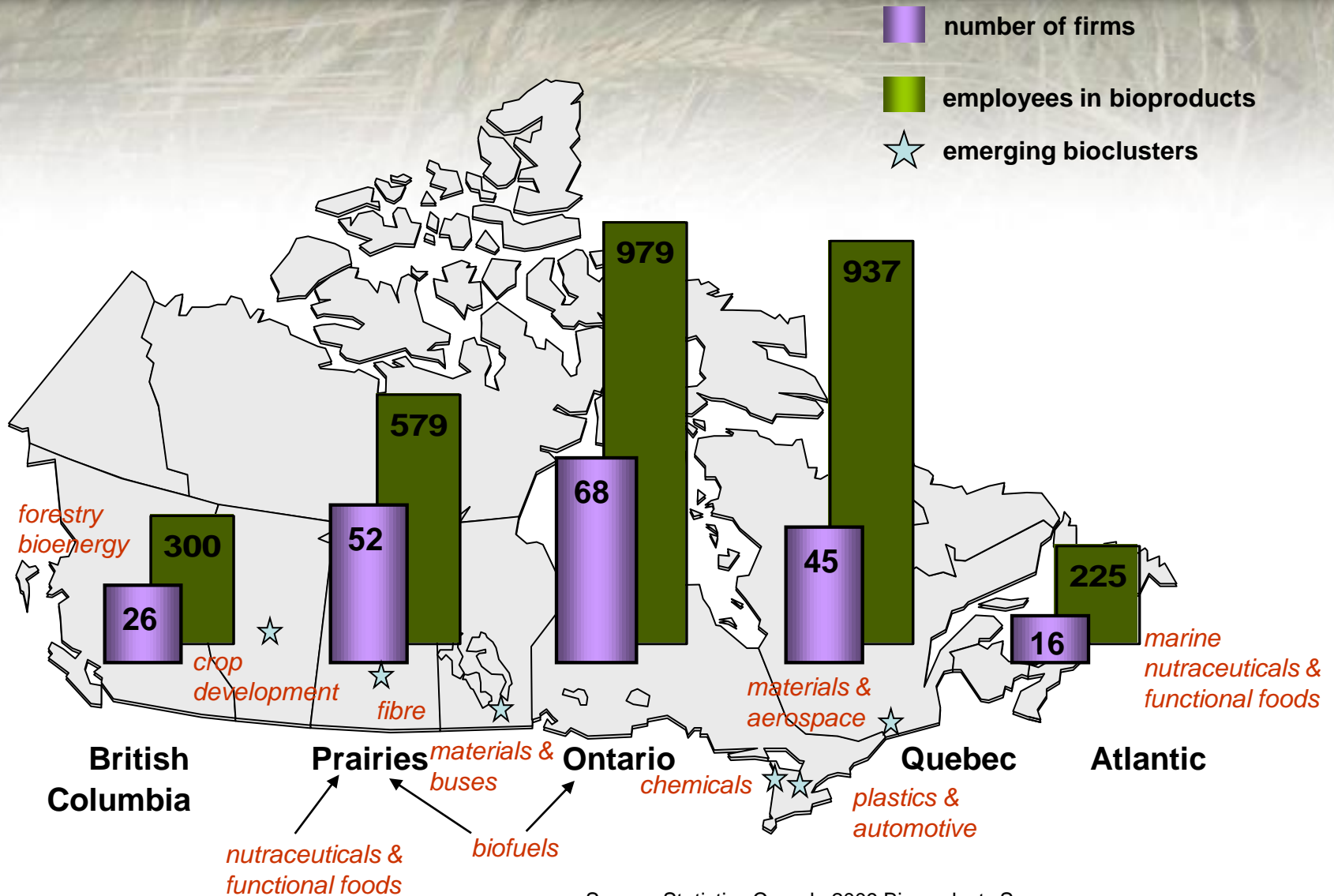
- The CRFA: biofuels have environmental benefits through GHG reductions, plus a \$2 billion economic benefit and will create over 1,000 new ongoing jobs
- A recent FAO study: for developing countries, energy crops provide important complementary opportunities including reducing dependence on rising fuel costs and diversifying markets for agricultural goods
- The WWF: source of clean energy that can gradually replace fossil fuels, and provide environmental benefits, rural development and employment benefits
- The CCC: producing feedstocks for biodiesel helps to stabilize acreage and potentially improve the net return from growing canola
- The Canadian chemical industry is beginning to invest in development of bio-based substitutes for petroleum feedstocks

The market for bioproducts holds great potential for both Canada and the agricultural sector

- Canadian bioproducts firms generated bioproduct sales of \$1.3 billion in 2009-10, including \$433 million in exports and employed over 3 thousand people (Statistics Canada)
- The market is large and growing
 - In 2010, the bio-based chemicals market was estimated to be worth \$US 61-93 Billion (3-4% of global chemical sales) and is projected to be worth US\$483-614 Billion in 2025 (USDA)
 - Global demand for bioplastics could grow by more than 30% per annum (Wall Street Journal)
 - Worldwide, the production of biofuels has grown by 6 times over the past decade and is projected to increase by about 50% in the next decade according to internal AAFC calculations
 - The potential Canadian natural fibres market was estimated to be worth as much as \$2 billion by Industry Canada in 2005



Bioproduct firms are active throughout Canada



Source: Statistics Canada 2009 Bioproducts Survey

New bioproduct value chains should provide real economic, social and environmental benefits

Strategy is required to target efforts that will help achieve a series of overarching objectives:

To support the development of a vibrant, innovative and profitable bioproducts sector

- Canada currently possesses a nascent bioproducts sector. Supporting its development into a successful and established industry would provide wide-ranging economic benefits.

To stimulate new opportunities for farmers and rural communities

- Both farms and rural communities should economically benefit from greater demand for biomass and the establishment of new rural-based businesses linked to the bioproducts sector.

To foster sustainable resource use and environmental benefits

- The bioproducts industry has potential to provide environmental benefits by developing more sustainable crop production systems, better managing our natural resources and our waste, using biomass feedstock to replace petroleum feedstocks, diversifying energy sources.

Each step of the value chain, including at the farm gate, will have to evaluate sustainability

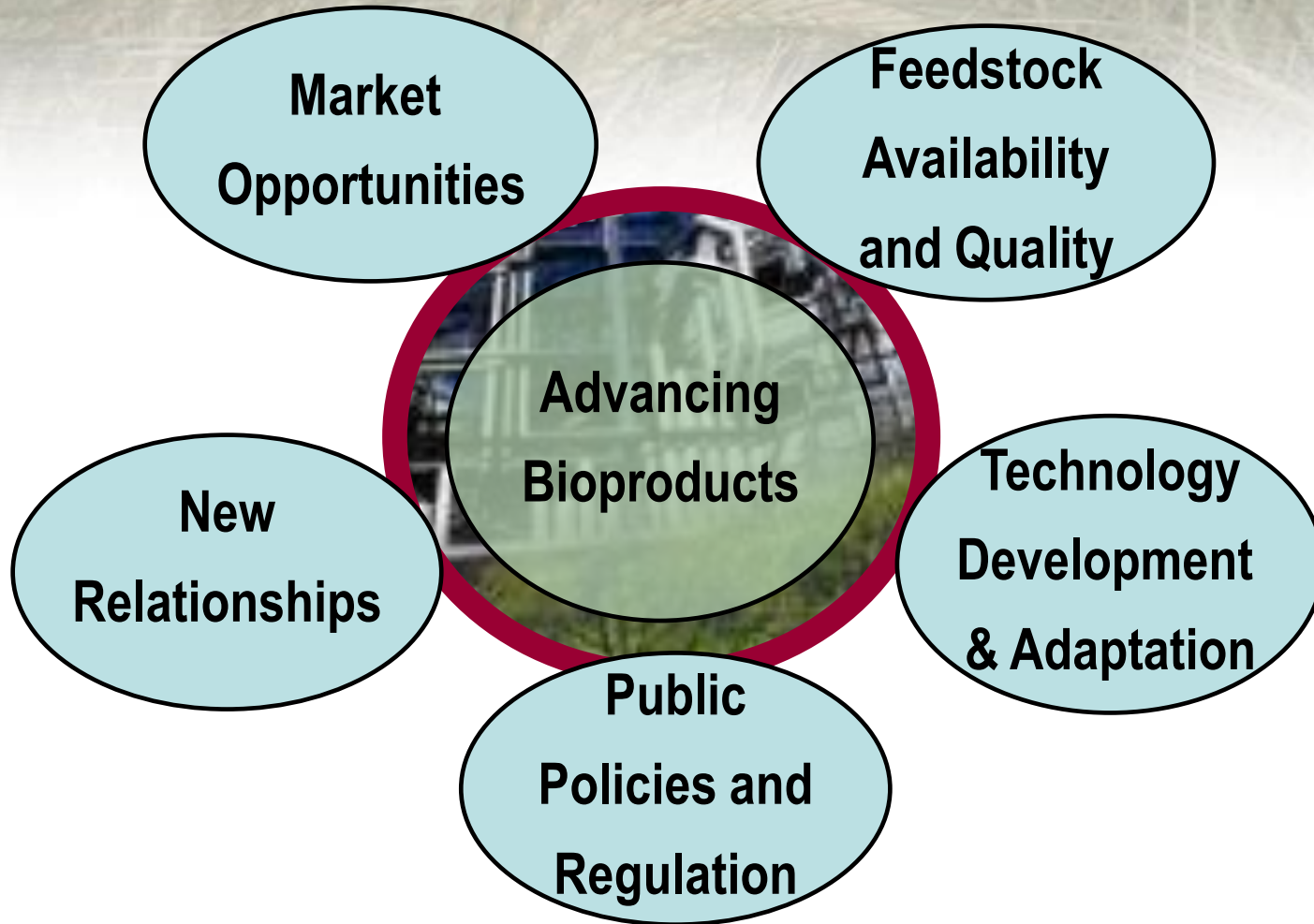
- Success in the market place will provide a measure of economic sustainability.
- Environmental sustainability is much more difficult to measure and assess as is social sustainability.
- How should the strategy approach these issues to ensure traction?

Early thinking on some guiding principles...

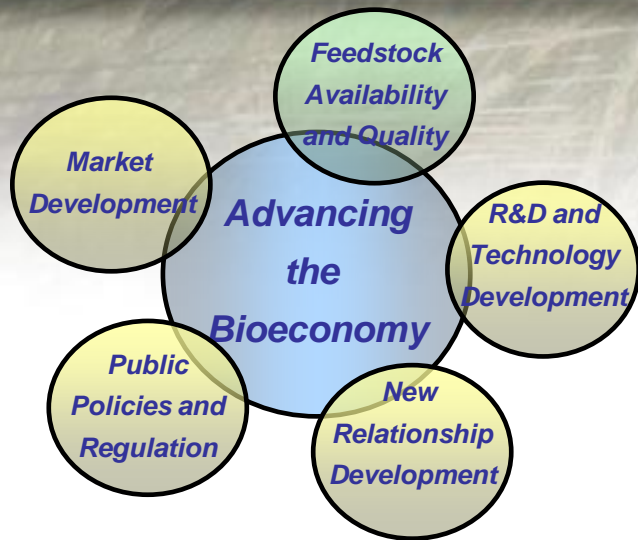
- **Government as an Enabler:** Government has an enabling role to play in creating the economic, policy and regulatory environment for innovation.
- **Industry Led:** Government policies and programs will be developed in alignment with industry needs and priorities, and will support market-driven decision making.
- **Flexible:** Canada is a vast country with significant regional diversity - national programs must reflect regional/provincial priorities. Similarly, national institutions must find flexibility to address gaps and overlaps in mandates and jurisdictions with new bio-based industrial development.
- **Feedstock Agnostic:** Many bioprocessing technologies can use multiple feedstocks, depending on seasonal prices, local supplies and end-product requirements. Government initiatives should endeavour to promote efficiency in the use of feedstocks to optimize local industry opportunities and should not favour specific feedstocks
- **Product Neutral:** Advances in biorefining technologies have potential to create many new products. Policies and programs that are inclusive of multiple output products will better ensure successful commercialization of biomass processing and adoption of profitable business models.
- **Environmentally Beneficial:** Biomass processing has potential to improve the environmental performance of agriculture and other sectors through reductions in fossil fuel use, carbon emissions and waste management issues. Government will support bio-based industrial development that contributes to long-term environmental benefits along the product lifecycle.

...to ensure a consistent application of the strategy

Proposed Bioproducts Strategy: Five Key Themes



Five key themes could underpin policy development for the Bioproducts Strategy

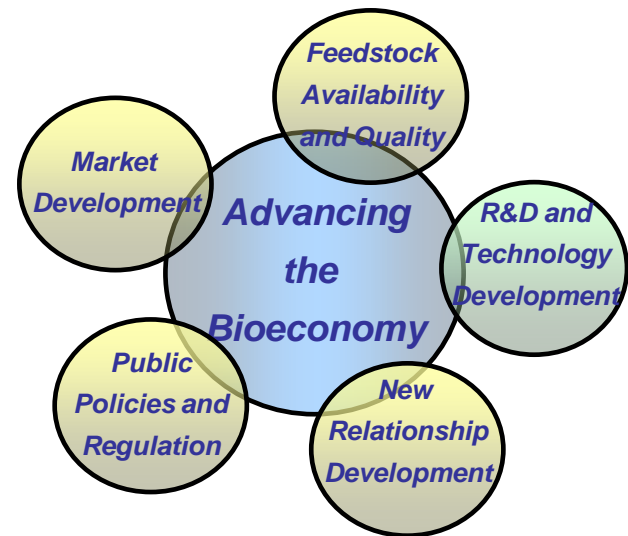


Feedstock Availability and Quality

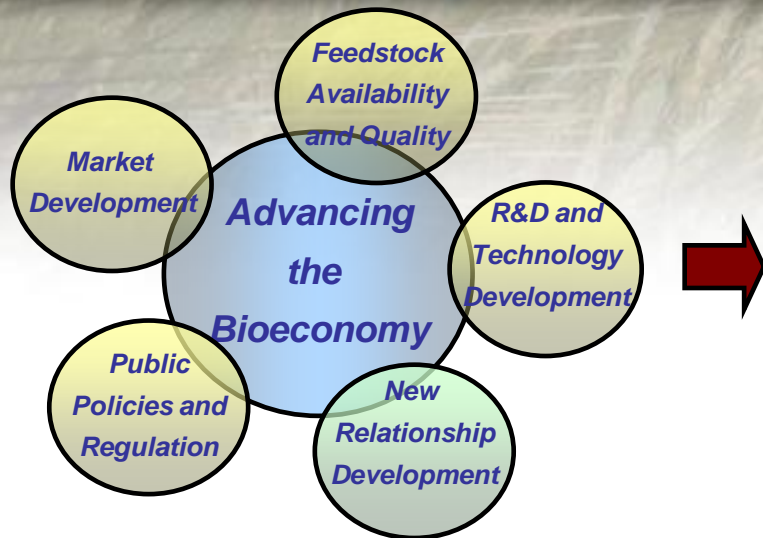
- Canada requires a good understanding of biomass availability and quality
- Logistical challenges - cultivation, harvest, storage, & transport of biomass
- Competitive disadvantage – lack of support for new crop development

R&D and Technological Development

- Multidisciplinary efforts required to address issues yet not fully integrated in Canada and much of the expertise exists in other countries
- GMO's may have great potential but face large barriers
- Integrated bio-refineries appear to offer much promise but many technological and financial challenges remain



Five key themes could underpin policy development for the Bioproducts Strategy

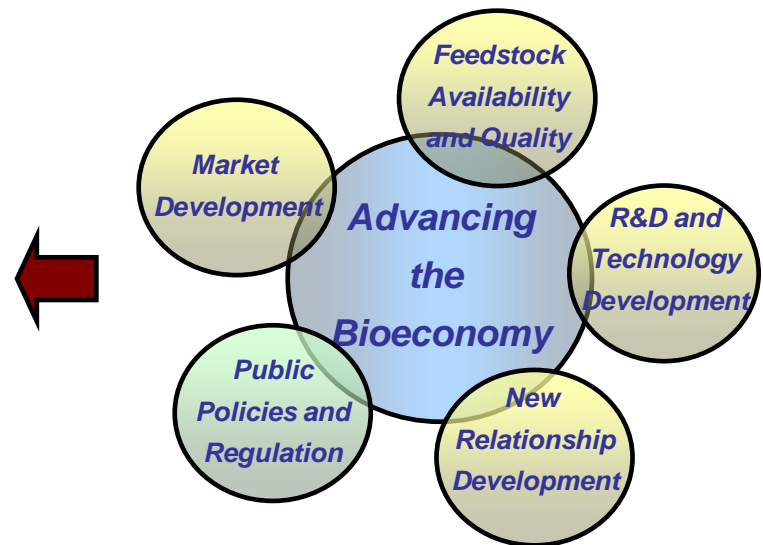


New Relationship Development

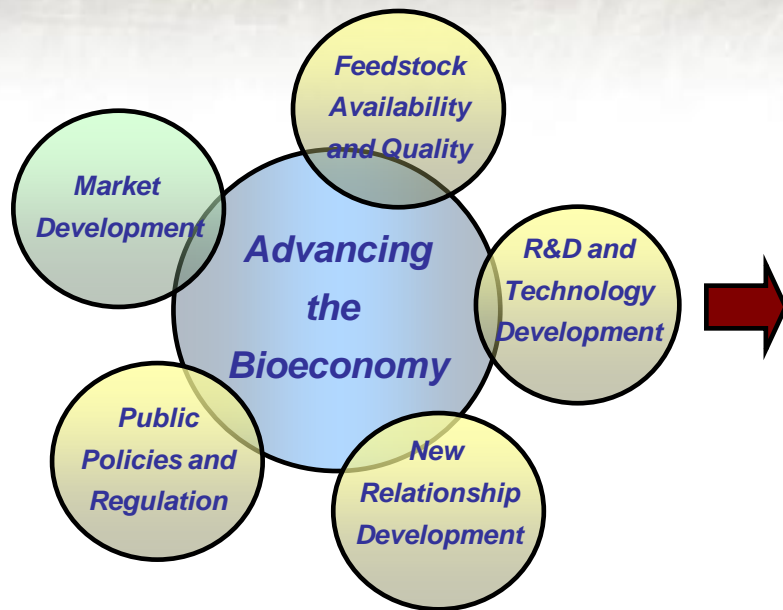
- New supply chains with non-traditional partners
- No national association or voice to represent bioproducts
- As an emerging industry, opportunities and challenges are not well understood or communicated
- Horizontal issue that crosses departmental mandates; new working models are needed

Public Policies and Regulatory Environment

- Canada's support for bio-based industrial development is unclear; we risk falling behind developments of trading partners and competitors
- The multi-jurisdictional nature of bioproducts presents new challenges for governments as issues cross over mandates of departments and levels of government
- The regulatory system is not keeping pace with technological advances; new frameworks and standards are needed
- Regulatory barriers may be inconsistent with government research priorities



Five key themes could underpin policy development for the Bioproducts Strategy



Market Development

- Biomass can be used as an input to produce an endless array of products but they are having difficulty breaking into a market dominated by petroleum infrastructure
- Production costs remain quite high due to technological challenges and lack of maturity in the industry to optimize processes
- Securing capital, particularly at the commercialization stage, is a challenge
- Seen as a high-risk investment; market information for bioproducts is difficult to obtain thus scaring off potential investors

Strategy Development Process

- **Phase I** – identification, verification and prioritization of issues, barriers, and opportunities
- **Phase II** - development of a roadmap that will lay out what needs to be accomplished technologically, economically, and policy-wise over the next 10 years to foster sector growth
 - A shared government/industry vision for moving forward
- **Phase III** - development of options and recommendations for actions that would help to set the roadmap into motion

When thinking about Strategy Implementation...

- There may be some priorities that we can address now with little or no new resources.
- Implementation of parts of the strategy can be accomplished through GF2.
- Consider the potential for new roles between industry and government.



Comments and Questions

- To provide comments online, please visit www.agr.gc.ca/GrowingForward2 or send an email to GrowingForward2@agr.gc.ca

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