Canada

Resource Wealth as Leverage for Growth

	Yes	No
1 Is this a specific bioeconomy strategy?		✘

2 If No, what are the key points? How are they being addressed within the bioeconomy?

So far, Canada has not developed a federal bioeconomy strategy or vision. In 2006 it adopted a strategy for renewable energies, in which timber plays a key role as a raw material (e.g. Bio-Pathways Project, 2009). The agricultural strategy "Growing Forward 2" (2013–2018) defines Canada's agricultural policy and provides for total investments of CAD 3 billion for innovation, competitiveness and marketing. The Canadian government has high hopes of the use of biotech applications in agriculture and forestry. Accordingly, the commercial cultivation of genetically modified crops was accepted at a comparatively early stage.

Inspired by the preparatory efforts of a US Bioeconomy Blueprint, the national biotechnology association, BioteCanada, produced the strategic document "Blueprint beyond Moose and Mountains" in 2009. This Blueprint represents a competitive strategy motivated by the fact that the Canadian biotech/bioeconomy industry might fall behind internationally, compared to the USA, France and even Brazil. Although the strategy was discussed at a roundtable with relevant political stakeholders, it was not adopted as a federal policy (Public Policy Forum. 2009. The future of the bio-based economy

in Canada. Roundtable outcomes report). However, there are several dedicated political bioeconomy actions taken on provincial levels. For example, in 2011 the government of British Columbia appointed a Bioeconomy Council under the responsibility of the Ministry for Labor, Tourism and Innovation. The province is concentrating primarily on utilizing its huge forest and agricultural resources to provide bioenergy but is also recognizing the need of promotin life sciences and cleantech industries. Alberta, another example, is one of the strongest agricultural provinces in Canada and is also banking on the bioeconomy. Apart from agriculture, the strategy also fosters the production of biobased chemicals and materials as well as bioenergy.

3 Who is the author of the strategy?

The Ministry of Agriculture is responsible for developing the "Growing Forward" agricultural strategy, which is implemented in the individual provinces on a co-funding basis. Natural Resources Canada is responsible for policy making in the bioenergy and forestry sectors.

4 What measures are used to promote the strategy?

The political strategies are supported by traditional research and technology funding measures as well as commercialization projects. It is expected that private sector stakeholders will co-fund these investments. The "Growing Forward" agricultural strategy provides for co-funding programs in the areas of agricultural research (particularly cluster projects) and the commercialization of innovations. However, these programmes are not specifically focused on ecological or bioeconomic applications. The Forest Innovation Program (FIP) of Natural Resources Canada supports research, development and technology transfer in Canada's forestry sector, with biobased materials being explicitly mentioned. The ministry also manages the Canadian Biomass Innovation Network (CBIN), consisting of researchers, politicians, industry experts, researchers and NGOs. The CBIN awards innovation projects in the areas of sustainable resources management, biomass conversion technologies, biorefineries and how to measure sustainability. The funds come from the outgoing "ecoENERGY Technology Initiative" (ecoETI) or the BEST (Bio-Based Energy Systems and Technologies) program. The "NextGen Biofuels Fund" promotes the building of demonstration plants for producing second-generation biofuels. Some Canadian provinces also plan to establish a joint biohybrid cluster with the focus on sustainable chemistry, similar to the industrial clusters being developped in Lampton County and Sarnia, where industrial-scale production plants for biobased chemicals are being built by an international industrial consortium. To push the demand side, a national "green" procurement policy specifies that ecological criteria must be considered in the procurement process.

5 Is there a time limit on the initiatives?

R&D programmes are limited to terms of 5–7 years.

6 Are there any identifiable key funding areas within the bioeconomic value chain?

Federal R&D efforts are concentrated on the optimized use of the country's natural resources. Bioenergy is a priority (see, e.g., the evaluation report on "Sustainable Bioenergy Strategic Priority" from Natural Resources Canada, 2012). Research into biobased materials (e.g. wood-based) is recently taking a more important role.

7 What are the implicit effects/side-effects of the strategy?

At present, the federal government is restricting itself to the coordination of strategic goals, without defining its own comprehensive bioeconomy strategy. As an example of a provincial strategy, British Colombia is aiming to establish a long-term «bioeconomic vision», which incorporates various other goals such as climate protection, opening of new markets, creating jobs and fostering energy production.

8 Are any quantitative targets specified?

No

Tab. 2: Important Measures for Promoting the Bioeconomy in Canada

Key Points	Policy Measures	Concrete Implementation	Budget in CAD	Timetable	Sources
a) Promoting innovation	Basic research and applied research	Funding programmes in the areas of agricultural research (particularly cluster projects) and the commercialization of innovations.		2013–2018	Growing Forward 2 (website)
		Forest Innovation Program (FIP): research, development and technology transfer in Canada's forestry sector, with biobased materials being explicitly mentioned.	92 m	2013–2016	Natural Resources Canada (website)
		Canadian Biomass Innovation Network (CBIN)			CBIN (website)
		EcoENERGY Innovation Initiative und Clean Energy Fund: innovation projects in the areas of sustainable resources, biomass conversion technologies, biorefineries and measuring sustainability and its performance.		2009–2013	Natural Resources Canada (website)
	Pilot and demonstration plants	NextGen Biofuels Fund: demonstration plants for second generation biofuels.	500 m	2007–2017	Sustainable Development Technology Canada SDTC (website)
b) Commercialization	Marketing	Funding programmes relating to the commercialization of agri-tech innovations		2013–2018	Growing Forward 2 (website)
	Support for biomass producers	Grants for and tax relief on biofuel production			Growing Forward 2 (website)
c) Demand-side instruments:	Public procurement	"Green" procurement policy		from 2006	http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/index-eng.html