



D. 3.2 – Preparatory Briefing on Canada

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1. Objectives of the report

The aim of this “preparatory briefing” is to provide up to date information on the cluster landscape in Canada in order to support European cluster organisations and their small and medium enterprises (SME) to familiarise themselves with the country and explore its potential for collaboration and market opportunities. More specifically, this briefing paper provides an overview of the country’s economy and sectoral trends/strengths where clusters contribute. In addition, it aims at giving an idea of the existing cluster community, the cluster policies/local support to clusters and the cluster programmes - including their historical development and internationalisation activity when relevant.

The content of this report is provided through desk research and confirmed by relevant local contact points.

A complementary report, “discussion paper”, is also available and provides an overview on the existing EU-Canada cluster cooperation, presents related good practices/success stories and opportunities for future exchange.

This report is part of a series of “preparatory briefings” papers. They are elaborated according to the selection of 10 strategic third countries by the European Commission DG Growth and its Executive Agency EASME.

The briefing papers are intended to provide information to the clusters themselves, as well as their SMEs, the European Strategic Cluster Partnerships for internationalisation (ESCP-4i), as well as policy-makers.

2. Canadian Economy: focus on sectoral trends

2.1 Overview

Canada is well-established democratic country and is often considered as a “model for stability, sustainable prosperity, and economic inclusion”¹. A constitutional monarchy, the country is currently led by Prime Minister Justin Trudeau (since November 4, 2015)².

¹ World Bank, Canada overview: <http://www.worldbank.org/en/country/canada/overview>

² <https://www.weforum.org/agenda/2017/03/worlds-biggest-economies-in-2017/>

With a GDP per capita of \$43,248.5 (€39,817³) for 2015⁴, Canada is one of the world's largest economies (it ranks 10th in terms of GDP in 2015⁵) whilst its population is 36.29 million. Its annual GDP rate is expected to be 2.2% in 2017, an improvement compared to the last three years where Canada was impacted by a historically low oil price that led to a recession in the first quarters of 2015. However, increases in exports and household spending (although under pressure) resulted in a slight growth in the second part of 2015, helped by a weak Canadian dollar.⁶

It is worth noting that Canada is considered one of the most attractive countries to do business with, this being further reinforced by a stable political context. This means that Canada generally benefits from a good image of a stable and predictable environment abroad, notably for business investment for which it is one of the most stable in the world. Indeed, it can be considered as the country with the lowest regional political risk in the world (score of 92 out of 100)⁷. The World Bank rates Canada's political stability with an average value of 1.03 points from 1996 to 2015, and 1.24 in 2014⁸ (on a notation where the minimum of -2.5 means weak; maximum 2.5 as rather strong), which classified it as the first big industrial country in 2015 in terms of political stability. The Global Competitiveness report 2015-2016 also classified Canada as the 13th country in the world based on a wide range of criteria such as performance, independence or stability of the country's institutions and regulations.

Diplomatic relations between the EU and Canada are well developed and Canada is considered one of the European Union's 10 most Strategic Partners worldwide.⁹ The EU and Canada share common values that are deeply rooted in cultural and historical ties. It is worth mentioning that Canada is one of the EU's oldest partner (the first bilateral agreement dates back to 1959)¹⁰. The EU has set up a Delegation in Ottawa and Canada has also a specific diplomatic mission to the EU.

As a consequence of these strong ties, Canada has always been a natural ally for the EU and is a strong supporter of free trade. Though their trade relations were already strong, both Canada and the EU decided to further develop their trade relationship and launched the EU-Canada Trade Agreement (CETA) negotiations in May 2009.

³ Oanda, USD 1: EUR 0.92067 EUR, 28th of March 2017

⁴ World Bank: <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

⁵ World Bank data: <http://data.worldbank.org/data-catalog/GDP-ranking-table>

⁶ National Bank of Canada, Economic Outlook (Winter 2016), 2016 : <https://www.nbc.ca/content/dam/bnc/en/rates-and-analysis/economic-analysis/economic-outlook-winter-22dec2015.pdf>

⁷ <https://www.prsgroup.com/category/risk-index>

⁸ The Global Economy, Canada: Political stability, 2015. Based on data from the World Bank. http://www.theglobaleconomy.com/Canada/wb_political_stability/.

⁹ EEAS, EU Delegations, Delegation to Canada http://eeas.europa.eu/delegations/canada/eu_canada/political_relations/index_en.htm

¹⁰ Mission of Canada to the EU: <http://www.canadainternational.gc.ca/eu-ue/index.aspx?lang=eng>

2.2 Opportunities for Europe – investment, trade and Science, Technology & Innovation cooperation

2.2.1 Trade and investment

Canada is the EU's 10th most important trading partner, accounting for 1.9% of the EU's total external trade in 2016. More specifically, Canada accounted for 2 % of EU exports (11th EU partner), in progress compared with 2015, and 1.7 % of EU imports in 2016¹¹.

On the other hand, the EU is Canada's second most important trading partner (after the U.S.), both in terms of imports and exports, ahead of China with imports dominated by Germany and the United Kingdom in 2016¹². As Canada's second most important trading partner, the EU accounted for about 9.5 % of Canada's total external trade in goods in 2015¹³.

The value of bilateral trade in goods between the EU and Canada was €64.2 billion in 2016. The EU's exports of goods to Canada were dominated by machinery, chemicals and transport equipment. Pearls and precious metals, and mineral products dominate the imports of goods from Canada. In addition, machinery and chemicals also constitute an important part of the EU's imports from Canada. As regards services, the value of bilateral trade between the two partners amounted to €27.2 billion in 2014. Examples of traded services between Canada and the EU are transportation, travel, insurance and communication¹⁴. The EU-Canada bilateral trade relationship (balance) is generally slightly in favour of the EU:

¹¹ European Union, trade with Canada: http://trade.ec.europa.eu/doclib/docs/2006/september/tradoc_113363.pdf

¹² Statistics Canada, Imports, exports and trade balance of goods on a balance-of-payments basis, by country or country grouping, open data, updated 2015: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/gblec02a-eng.htm>

¹³ DG Trade, Canada: <http://ec.europa.eu/trade/policy/countries-and-regions/countries/canada/>

¹⁴ Ibid



Figure 1: DG Trade, Canada: <http://ec.europa.eu/trade/policy/countries-and-regions/countries/canada/>

In terms of Foreign Direct Investments, European investors held investments worth €274.7 bn in Canada while Canadian direct investment stocks in the EU amounted to almost €166 bn in 2014.

Currently guided by a Framework Agreement for Commercial and Economic Cooperation (since 1976), Canadian-EU trade and economic relations should soon be regulated by the freshly negotiated Comprehensive Economic and Trade Agreement (CETA). This new EU-Canada treaty was negotiated by both partners for 7 years and was officially signed by the Council of the EU in October 2016 and the European Parliament in January 2017. On 21 September 2017 CETA entered into force provisionally. However, the treaty still has to be ratified by National parliaments in EU countries – and in some cases regional ones, too, – before it can fully enter into force. The European Commission expects “CETA to increase two-way trade in goods and services, helping to create jobs and grow the economy on both sides of the Atlantic”¹⁵.

¹⁵ DG Trade, Canada: <http://ec.europa.eu/trade/policy/countries-and-regions/countries/canada/>

2.2.2 Science, Technology & Innovation

In 2014, Canada's ratio of R&D spending as a percentage of the GDP was 1.74 (down from 1.79 in 2012 and 2.00 in 2004 but up from 1.71 in 2013). Among G7 countries, Canada ranked fifth in 2014. In total, Gross domestic expenditures on research and development (GERD) amounted to \$33.9 billion in 2015¹⁶. Though the previous government's approach to Canadian science policy over the last ten years has resulted in a substantial decrease of funding for science and research, the Trudeau government has announced a number of measures that aim to support research and innovation. For example, the government has just announced in its 2017 budget its intention to provide up to \$2 billion over the three years for infrastructure projects at post-secondary institutions "to enhance and modernize research and commercialization facilities, as well as industry-relevant training facilities at colleges and polytechnic institutions"¹⁷. It is also worth noting that Kirsty Duncan, Minister of Science launched an independent review of federal funding for fundamental science in June 2016¹⁸.

Canada is doing relatively well in terms of innovation, being ranked the world's 13th economy in terms of innovation in the Global Competitiveness report¹⁹ (mostly based on perception). It is particularly well ranked by the Global Innovation Index 2015²⁰, at 15th – just behind the USA, Singapore, Hong Kong and South Korea apart from EU Member States and some European countries, but ahead of Japan or France for example. This index aims to capture the various dimensions of innovation and country-competitiveness; and Canada is significantly well ranked in terms of institutions, market sophistication and for its infrastructures. It is also ranked second country in the world for its business environment (starting a business, easy administrative procedure for businesses).

The EU and Canada have established an "[Agreement for Scientific and Technological Cooperation between Canada and the European Community](#)" in 1996. Not limited in time, this agreement aims to encourage and facilitate cooperation between the two parties in Science and Technology. The main areas of Science and Technology cooperation between the EU and Canada are: Health, ICT and Food, Agriculture and Fisheries, and Biotechnology. At the last EU-Canada Joint Science and Technology Cooperation Committee, both partners agreed to reinforce existing cooperation and to develop new collaborations in the following additional areas: aeronautics, marine and arctic, researcher mobility, energy research and research infrastructures²¹. In June 2016, the European Commission and the Canadian government signed an Administrative Arrangement which aims to facilitate cooperation between Canadian governmental departments and agencies and Horizon 2020 projects consortia²². It is acknowledged that Canadian Science-Based Departments and Agencies and Granting Agencies

¹⁶ Statistics Canada: <http://www.statcan.gc.ca/daily-quotidien/170623/dq170623c-eng.pdf>

¹⁷ Government of Canada: <http://www.ic.gc.ca/eic/site/051.nsf/eng/home>

¹⁸ <http://www.sciencereview.ca/eic/site/059.nsf/eng/home>

¹⁹ World Economic Forum, Global Competitiveness Report 2015-2016, Canada, <http://reports.weforum.org/global-competitiveness-report-2015-2016/economies/#economy=CAN>

²⁰ Global Innovation Index 2016: <https://www.globalinnovationindex.org/gii-2016-report>

²¹ Roadmap for EU-Canada S&T cooperation: http://ec.europa.eu/research/iscp/pdf/policy/roadmaps_ca-2016.pdf#view=fit&pagemode=none

²² Administrative arrangement between the European Commission and the government of Canada on cooperation with Horizon 2020 project consortia: http://ec.europa.eu/research/iscp/pdf/policy/administrative_arrangement_canada-h2020_062016.pdf

(SBDA-GA) is able to cooperate with Horizon 2020 consortia projects outside the framework of the Grant Agreement (providing the coordinator of the project and the SBDA-GA formalise in writing the modalities of their cooperation). The aim is to allow a greater participation of Canadian entities to Horizon 2020 as the overall participation of Canadian partners to Horizon 2020 projects has decreased since FP7 (a common issue with other third countries such as the USA, Japan, etc.).

2.3 Sectoral strengths

2.3.1. The policy ambition

As part of the emphasis put on investing in Research and Innovation, the government of Prime Minister Trudeau launched an ambitious Innovation and Skills Plan “to make Canada a world-leading centre for innovation”²³. A key aspect of this plan is the \$950 million CAD investment over five years (€655.5 million) to develop “superclusters” with a focus on pre-identified “highly innovative industries” (more details on this large scale initiative are provided in section 4.1).

The purpose of the Government is to boost Canada’s competitiveness in areas of economic strength that have a high potential in terms of their economic prospects and their strengths relative to global opportunities. The areas that were identified in Canada’s innovation and skills plan are: advanced manufacturing, agro-food, clean technology, clean resources, digital industries, and health/bio-sciences²⁴.

2.3.2. Advanced manufacturing

The Advanced manufacturing sector in Canada is one of the strong sectors the Government intends to develop in its 2017 budget proposal²⁵. Employing more than 1.7 million people in Canada and contributing to 10.5% of the national GDP, Advanced manufacturing indeed stands in a solid position in the Canadian Economy.

Industry Canada has in particular highlighted that due to the reinforcement of competition both domestically and internationally, Canadian firms have had to adapt to become more agile, flexible and thus reinforce their competitiveness²⁶.

Main strengths in Canada and reasons for global attractiveness²⁷

- Robust automotive, aerospace and defense manufacturing base to build from

²³ 2017 budget, Government of Canada: <http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342>

²⁴ http://www.budget.gc.ca/2017/docs/themes/Innovation_en.pdf

²⁵ <http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

²⁶ State of Advanced Manufacturing, A Canadian perspective, available at: <https://www.cme-mec.ca/uploads/documents/13195128081789.pdf>

²⁷ Data retrieved from the report Unleashing The Growth Potential Of Key Sectors, available at: <http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf>

- Accounting for nearly half of all business expenditure on Research and Development
- Strong engineering clusters (e.g. Waterloo)

Global opportunities

- “4th industrial revolution” in the making at the global scale
- Cost of labor considered as a declining factor in manufacturing global value chains

Key figures

- Employment contribution (jobs, direct and indirect): 1,7 million of people
- GDP contribution (% of Canadian GDP): 10,5 %
- Compound Annual Growth Rate (CAGR) for the 2010-2015 period: 3,7 %

2.3.3. Agro-food

Based on the Advisory Council on Economic Growth report of February 2017²⁸, the government intends to build on the great potential of the agri-food sector. Indeed, Canada is able to count on large natural endowment of water and arable land, but also on a unique record of accomplishments in science and technology, and what is considered an exceptional base of companies and entrepreneurs. With an increasing international demand for food (in particular in fast-growing Asian economies where the consumption of protein is on the rise), the report considers that the agro-food global market trends are indeed favourable.

For these reasons, the Innovation and Skills Plan of the Canadian government sets a highly ambitious target to grow Canada’s agri-food exports to at least \$75 billion annually by 2025²⁹.

Main strengths in Canada and reasons for global attractiveness³⁰

- Strong reputation for safe, high-quality products
- Resource availability (e.g., water) and productivity (e.g., crop yield)
- Arable land position
- Strong clusters dynamics (e.g., University of Guelph³¹)

Global opportunities

- Exploding emerging market demand for higher-value food (e.g. proteins, functional foods)
- Growing global supply constraints in land, water, energy, and carbon emissions

Key figures

- Employment contribution (jobs, direct and indirect): 2,1 million of people

²⁸ <http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf>

²⁹ Building a strong middle class, Budget 2017, available at: <http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

³⁰ Data retrieved from the report Unleashing The Growth Potential Of Key Sectors, available at: <http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf>

³¹ <https://news.uoguelph.ca/2017/02/university-guelph-poised-help-canada-become-agri-food-leader-report/>

- GDP contribution (% of Canadian GDP): 6,7 %
- Compound Annual Growth Rate (CAGR) for the 2010-2015 period: 2,7 %
- Canada ranks 5th in agriculture exports and 11th in agri-food exports
- Agrofood exports have averaged annual growth of 9.5% between 2011 and 2016.

2.3.4. Clean technology and clean resources

In the presentation of its innovation agenda as part of the 2017 budget proposal, the government presents the *“the global campaign against climate change as an economic opportunity for Canada”*³². Considering Canada’s abundant resources (in water for instance, which allows for a strong hydro-electricity production), its innovation capacity in clean technologies but also the potential of renewable and sustainable sources of energy in the country, it is considered that *“Canada has the opportunity to be a true global leader”*³³ in this field. Currently, Canada performs comparatively well in the early stages of clean innovation (research and innovation). However, it does not perform as well when it comes to commercialisation and market deployment of clean technologies³⁴. To bridge this gap, Canada has invested steadily in clean technology for the past ten years. The Advisory Council on Economic Growth considers that Canada has a strong entrepreneurial ecosystem. It also combines a maturing clean-tech sector with a healthy number of market-ready companies that are able to compete globally and deliver strong export revenues in large overseas markets³⁵.

For these reasons, public investment in clean resources and technologies has been further reinforced in the past two years. In addition to its 2016 budget commitment in which the government decided to invest more than Can\$ \$1 billion over four years to support clean technology, including in the forestry, fisheries, mining, energy and agriculture, the public consultation on clean technology conducted in 2016³⁶ further reinforced the government’s intention to invest in clean technologies and resources, notably via its supercluster call for proposals.

Main strengths in Canada and reasons for global attractiveness

- Top-4 globally for hydro-electricity production, LNG, and oil reserves
- 430 public companies with combined assets over Can\$ 495 billion
- Strong innovation capacity

Global opportunities

- Global energy consumption will grow by 30% between now and 2040
- Clean technologies are essential to meet climate challenge

³² Building a strong middle class, Budget 2017, available at: <http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

³³ Building a strong middle class, Budget 2017, available at: <http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

³⁴ “Accelerating Clean Innovation In Canada”, Smart Prosperity Institute, April 2017. Available at: <http://institute.smartprosperity.ca/sites/default/files/acceleratingcleaninnovationincanada.pdf>

³⁵ Unlocking Innovation to Drive Scale and Growth, Advisory Council On Economic Growth, available at: <http://www.budget.gc.ca/aceg-ccce/pdf/innovation-2-eng.pdf>

³⁶ LetsTalkCleanResources.ca, Online Engagement: Final Report, December 2016, available at: <http://www.nrcan.gc.ca/19593>

- Proximity to USA — North American energy security and integration

Key figures (Energy and renewables)³⁷

- Employment contribution (jobs, direct and indirect): 0,9 million of people
- GDP contribution (% of Canadian GDP): 13,7 %
- Compound Annual Growth Rate (CAGR) for the 2010-2015 period: 2,6 %

2.3.5. Digital industries

Canada's digital economy, which is wider than the strict ICT sector and generally refers to markets based on digital technologies, employed more than 877,470 ICT professionals in 2015. The Information and Communications Technology Council considers that on its own, the Canadian ICT sector is a Can\$ 74 billion per year industry. However, by the added value provided in all the other industries (transport, health, agriculture, etc.), Canada's digital economy sector is a much major contributor to the Canadian economy³⁸.

Artificial intelligence, already considered as a strong Canadian area of expertise (the Canadian Institute for Advanced Research's pioneering technique called "deep learning" was a major achievement), will benefit from a dedicated strategy. The Strategy intends to "*promote collaboration between Canada's main centres of expertise in Montréal, Toronto-Waterloo and Edmonton and position Canada as a world leading destination for companies seeking to invest in artificial intelligence and innovation*"³⁹.

Strong opportunities already exist at the global level, and will be further reinforced by the global shift towards a new digital reality: it is expected that by 2020, there will be 25 billion devices embedded with Internet-based systems, and by 2021 over 4.5 billion people will have access to the Internet. Overall, \$6.6 trillion in economic opportunities coming from the digital industry are expected each year in the G20⁴⁰. By actively promoting Canada's digital future, the government wants to further strengthen Canada's assets in this sector and reinforce its competitiveness to take advantage of the global opportunities.

The intention is to:

- Make Canada an advanced, digital environment, home to more "smart cities" and connected communities;
- Deliver high-speed Internet access;
- Give all Canadians a real opportunity to participate in the digital economy;
- Support an open and transparent Internet.

³⁷ Data retrieved from the report Unleashing The Growth Potential Of Key Sectors, available at: <http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf>

³⁸ ICTC, Digital talent: road to 2020 and beyond. Available at: https://www.ictc-ctic.ca/wp-content/uploads/2016/03/ICTC_DigitalTalent2020_ENGLISH_FINAL_March2016.pdf

³⁹ Building a strong middle class, Budget 2017, available at: <http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

⁴⁰ Building a strong middle class, Budget 2017, available at: <http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

2.3.6. Health/bio-sciences

With 1.8 million people employed and contribution of 6.8% to the Canadian GDP, this sector makes an important contribution to the Canadian economy. Canada has many assets in this sector, including the presence of leading pharmaceutical companies that conduct Research and Innovation activities in the country (example of Astra Zeneca or Pfizer that are involved in the Toronto region's Human Health & Sciences cluster⁴¹). Health and medical research are extremely strong scientific areas, in particular in the fields of cardiology and cardiovascular medicine, but also general medicine, cancer research etc⁴².

Main strengths in Canada and reasons for global attractiveness⁴³

- Domestic demand via national healthcare system
- 10 largest pharma companies have R&D presence in Canada
- World-class regenerative medicine and stem cell therapy development

Global opportunities

- Aging population in most advanced economies
- Productivity imperative to favor innovation and sector growth (e.g. new healthcare delivery models)

Key figures

- Employment contribution (jobs, direct and indirect): 1,8 million of people
- GDP contribution (% of Canadian GDP): 6,8 %
- Compound Annual Growth Rate (CAGR) for the 2010-2015 period: 1,7 %

2.3.7. Main considerations on the sectoral strengths and priority sectors

Based on this strong government innovation policy to support the development of superclusters, **the abovementioned sectors are strategic for the EU regarding Canada.** In addition, the private sector is expected to at least double the public investment of the Canadian government in the superclusters (as detailed in section 4.1). Both public and private investment will therefore give priority to these highly innovative sectors in the next five years.

As these superclusters will primarily focus on the highly innovative sectors selected by the government, there is a strong potential of cooperation with Canada for EU clusters involved in advanced manufacturing, agri-food, clean technology, clean resources, digital industries, health/bio-sciences, as well as infrastructure and transportation.

⁴¹ http://www.tohealth.ca/wp-content/uploads/TOH004_Brochure_6_Panel_0216.pdf

⁴² See notably table 1, in Roadmap for EU-Canada S&T cooperation : http://ec.europa.eu/research/iscp/pdf/policy/roadmaps_ca-2016.pdf#view=fit&pagemode=none

⁴³ Data retrieved from the report Unleashing The Growth Potential Of Key Sectors, available at: <http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf>

Finally, it is worth mentioning that two of the current EU/Canada priorities for Science and Technology cooperation, focus on the priority sectors of the Canadian government: **digital industries/ ICT and Health**⁴⁴.

3. Cluster community in Canada

3.1 The landscape

Canadian clusters appear labelled under various names: “clusters”, “networks of excellence” or “consortium”, “grappes” (in French), etc. This is reflected in the variety of cluster initiatives and cluster support policies at the different levels (Federal, Provincial and Local level). However, in its March 2017 announcement regarding the set-up of “superclusters”, the government has provided a quite specific definition: **clusters are defined as “dense areas of business activity that contain large and small companies, post-secondary institutions and specialized talent and infrastructure”**⁴⁵.

The Canadian Institute for Competitiveness and Prosperity has developed a project that provides a **web platform**⁴⁶ **with open data on Canadian regional clusters** and economies to support Canadian business, economic development and public policy, where searching by region and by cluster is possible. This platform uses Harvard’s ISC approach to map clusters which in turn followed up on the European Cluster Collaboration Platform concept. It provides data on the industrial clusters based on employment and location quotient indicators. It identifies **51 “traded clusters” in Canada, and 16 “local clusters”** on its website, corresponding to different sectors.

- **Traded clusters** are defined as producers of goods and services in a particular region that are then distributed across Canada or to other countries. They are concentrated in specific regions of Canada that afford specific competitive advantages.
- **Local clusters** are located everywhere in Canada and produce goods and services needed by the local population (examples of local clusters include Local Entertainment such as movie theatres or local commercial services such as sandwich shops).

For the purpose of this briefing, we will therefore **focus on the notion of “traded clusters”**. Traded clusters are developed in a broad range of industrial areas, from aerospace and defence, automotive, biopharmaceuticals to tobacco and textile manufacturing. In terms of industrial clusters, a number of

⁴⁴ EU & Canada priorities for Science & Technology cooperation, October 2016 : http://ec.europa.eu/research/iscp/pdf/policy/roadmaps_ca-2016.pdf

⁴⁵ “Accelerating Innovation Through Superclusters”. 2017 budget, Government of Canada: <http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342>

⁴⁶ Canadian Institute for Competitiveness and Prosperity web platform: <http://www.competeprosper.ca/clusters/data/by-cluster>

mature and emerging clusters exist in Canada, according to indicators such as employment and firm numbers, especially in sectors such as aerospace, bio-pharma, and ICT.⁴⁷ Geographic areas where the most important and mature sectorial clusters are located are Montréal and Toronto for aerospace, bio-Pharma and ICT, as well as Vancouver and Québec City for the bio-pharma industry and Ottawa for ICT.

Other mapping tools have been developed by Canadian business and cluster practitioners, as well as academics, that help identify clusters around the country.⁴⁸

The following section will provide an overview of the key cluster organisations in the two main Canadian Provinces in terms of GDP output (2015)⁴⁹:

1. Ontario – Can\$ 763,276 million
2. Québec – Can\$ 380,972 million

3.1.1 Ontario

In June 2009, the Ontario Government introduced the Ontario Network of Excellence (ONE) – “Ontario’s revitalized, client-focused, province-wide innovation network”. The ONE was re-branded to the Ontario Network of Entrepreneurs (ONE) in 2013. In this framework, Ontario Centres of Excellence (OCE) were set up to support strong sector opportunities that align with Ontario’s Innovation Agenda⁵⁰:

- Advanced Manufacturing
- Advanced Health Technologies
- Energy and Environment
- Information, Communications & Digital Media

The “Ontario Centres of Excellence” can be considered as another type of clusters. They work with their members (companies, universities and research hospitals, technology transfer and industry liaison offices) to support early-stage projects that have a strong commercialisation potential but they also help to commercialize innovation originating in the province’s publicly funded colleges, universities and research hospitals⁵¹.

In relation to the seven sectorial strengths put forward by the Federal government in its announcement regarding Federal superclusters, the Ontario province is home to the following clusters:

- **The Toronto Waterloo Corridor⁵²:** with 15,000 companies, including companies such as Google or Cisco, 5,200 start-ups and 16 universities and colleges (such as the University of

⁴⁷ David A. Wolfe, University of Toronto, Aspects of Cluster Development in Canada and Policy Implications. See list on P.14-15 http://sites.utoronto.ca/progris/presentations/pdfdoc/2012/Clusters_Tokyo%20Forum05OC12.pdf

⁴⁸ Such as <http://localideas.org/2014/06/22/cluster-atlas-of-canada/>.

⁴⁹ Statistics Canada: <http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/econ15-eng.htm>

⁵⁰ Ontario Network of Entrepreneurs and Centres of Excellence : <http://www.oce-ontario.org/>

⁵¹ <http://www.oce-ontario.org/about-us>

⁵² <https://thecorridor.ca/>

Toronto, the University of Waterloo), the Toronto Waterloo Corridor is cited as an example by the Government in its 2017 budget announcement on “Superclusters”.

- **The Ontario Aerospace Council⁵³**: the cluster is comprised of universities and colleges but also has over 200 member companies, and claims to represent over 70% of the Ontario aerospace industry employment
- **The Toronto region’s Human Health & Sciences (HHS) cluster⁵⁴**: the cluster gathers both industry (Astra Zeneca, Pfizer) and University partners (the University of Toronto), but also the city of Toronto.

In addition, the Institute for Competitiveness & Prosperity has recently published a paper on how cluster growth could increase the prosperity of the Ontario province and how the local ecosystem could be improved to further foster successful clusters. To do so, the study is based on the **five examples of “strong clusters”** in Ontario⁵⁵: the Automotive cluster in Ontario, the Communications Equipment & Services cluster in Ontario, the Financial Services cluster, the Hospitality & tourism cluster and the marketing, design & publishing cluster.

3.1.2 Québec

The **Québec Province is recognised as a dynamic region in Canada for cluster development.**

- **“Créneaux d’excellence”**

The Québec Province has developed a mapping tool⁵⁶ for these “créneaux d’excellence” dedicated to both national and international activity and also with an innovation and excellence focus in 17 sectors. 49 clusters are mapped and the website provides access to detailed information and a contact point.

- **Montreal Metropolitan clusters**

In the province of Québec, Montreal has decided to rather use the term “Metropolitan clusters” instead of “créneaux d’excellence”. The Montreal metropolitan area is actually probably the most advanced in the field of cluster policy in the Province. These have a strong international focus in the metropolitan area of Montréal, especially targeting North America: AéroMontréal (aerospace), Finance Montréal (finance), CargoM (transport and logistics), Montréal in vivo (life sciences and e-health), techno Montréal (ICT), ecotech Québec (green technologies) and in cinema and audio-visual. Information is available on the website. According to Yves Charrette, Greater Montreal Economic Development Coordinator at the Communauté métropolitaine de Montréal, the Montréal Metropolitan area is probably the most advanced in cluster policy development in Canada, as “to date

⁵³ <http://theoac.ca/>

⁵⁴ http://www.tohealth.ca/wp-content/uploads/TOH004_Brochure_6_Panel_0216.pdf

⁵⁵ CLUSTERS IN ONTARIO, Creating an ecosystem for prosperity, Institute for Competitiveness and Prosperity, June 2016: https://www.competeprospers.ca/uploads/WP26_clusters_FINAL.pdf

⁵⁶ Québec cluster mapping tool: <https://www.economie.gouv.qc.ca/objectifs/informer/creneaux-dexcellence/>

nine clusters have been activated”. A visibility tool⁵⁷ for the clusters of the Montréal Metropolitan area is also available on their website, and an overview is available in the figure below:



Figure 2: Document submitted by the Montréal Metropolitan Clusters to the Minister of Finance as part of the consultation procedure of the Finance Minister regarding the Innovation programme, December 2016⁵⁸

▪ Consortia of research and innovation

In addition to the “créneaux d’excellence”, the province of Québec is supporting nine “consortia de recherche et d’innovation” that can be qualified as clusters. Their mission is to support the development of research and innovation projects to the benefit of their members (companies, research centres, public institutions, Universities). The consortia that are active in the 7 sectors identified in section 2.3 are⁵⁹:

1. The Québec consortium for research and innovation in the development of aluminium (CQRDA)
2. The Québec consortium for research and innovation in ICT (PROMPT)
3. The Québec consortium for research and innovation in Aerospace (CRIAQ)
4. The Québec consortium for research and innovation in medical technologies (MEDTEQ)

⁵⁷ Montréal Metropolitan area cluster visibility tool: <http://grappesmontreal.ca/metropolitan-clusters/montreal-metropolitan-clusters/?L=1>

⁵⁸ Letter to the Finance Minister, by “Grappes Montréal”, 13 December 2016: http://grappesmontreal.ca/fileadmin/user_upload/siteGrappes/documents/MemoireGrappes-BudgetFederal2017.pdf

⁵⁹ QuebecInnove, single portal access : <http://www.quebecinnove.com/les-intermediaires-en-innovation-technologique/>

5. The Québec consortium for research and innovation in the development and processing of metals (CRITM)
6. The Quebec consortium for industrial bioprocess research and innovation (CRIBIQ)
7. The Québec consortium for research and innovation in drug discovery (CQDM)
8. InnovÉE (Innovation in electric energy)
9. Advanced materials research and innovation Hub (PRIMA Québec)

3.2 Cluster mapping

For the moment, there is no single mapping gathering all Canadian clusters but the Government announced in June 2016 its intention to develop a nationwide Canadian Cluster Mapping portal, in collaboration with provinces, territories, research institutions and other stakeholders.⁶⁰ It is worth mentioning that this is part of an initiative led by the USA, Canada and Mexico: in 2016, the Heads of State announced their commitment to establishing a North American Cluster Map, “an activity that helps a large array of stakeholders gain a solid understanding of a region’s economic strengths and opportunities”⁶¹.

4. Cluster policies and programmes in Canada

4.1 Towards “superclusters” - the Government’s strategy for 2018-2022

During the presentation of the 2017 budget on 22 March 2017, Finance Minister Bill Morneau announced the setup of an ambitious Innovation and Skills Plan “to make Canada a world-leading centre for innovation”.⁶² Overall, the government intends to invest about **Can\$ 950 million over five years** (€655.5 million⁶³) **to develop superclusters in six key national industries**; the creation of Innovation Canada to be a one-stop shop for entrepreneurs and start-ups; and also Can\$ 50 million

⁶⁰ Developing a Canadian Cluster Map to Identify and Build on Regional Strengths, 2016 budget, Government of Canada: <http://www.budget.gc.ca/2016/docs/plan/ch2-en.html>

⁶¹ United States key deliverable for the 2016 North American Leader’s Summit: <https://obamawhitehouse.archives.gov/the-press-office/2016/06/29/fact-sheet-united-states-key-deliverables-2016-north-american-leaders>

⁶² 2017 budget, Government of Canada: <http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342>

⁶³ Oanda, CAD 1: EUR 0.69005 EUR, 24th of April 2017

(€34.5 million) to launch Innovative Solutions Canada – a government procurement programme modelled after the United States’ Small Business Innovation Research (SBIR) program⁶⁴.

According to the 2017 budget proposal, superclusters will focus on the following **target sectors**⁶⁵:

1. advanced manufacturing,
2. agri-food,
3. clean technology,
4. digital industries,
5. health/bio-sciences,
6. clean resources,
7. infrastructure and transportation.

The competition to select these “superclusters” was launched in May 2017. The Minister of Innovation, Science and Economic Development, the Honourable Navdeep Singh Bains MP, explained that the government would be “very strategic and thoughtful, and identify maybe **three to five clusters in Canada** that can be **global centres of excellence**”^{66,67}.

Organised in two stages⁶⁸, this competition invited industry-driven consortia to:

- pull together a critical mass of large firms, innovative SMEs, industry-relevant academic and research institutions;
- leverage funding from multiple private sector companies from across highly innovative industries of economic and strategic importance within the cluster; and
- co-invest, dollar for dollar, to match the federal contribution requested and approved under the program⁶⁹.

Successful applicants will have to set up **dedicated supercluster entities**, in the form of a not-for-profit corporation. This not-for-profit entity will formally represent the supercluster and will be referred to as a “Supercluster Entity” or “Entity”. A membership structure will therefore be put in place.

Supercluster members are expected to work around **5 main themes of activity**⁷⁰:

- **Technology leadership.** Collaborative projects that directly enhance the productivity, performance and competitiveness of Member firms, such as:
 - collaborative R&D projects

⁶⁴ SSTI website: http://ssti.org/blog/canadian-budget-focuses-innovation-new-economy-skills-superclusters?utm_source=SSTI+Weekly+Digest&utm_campaign=a11cebb2ee-EMAIL_CAMPAIGN_2017_03_30&utm_medium=email&utm_term=0_ecf5992d4c-a11cebb2ee-220200913

⁶⁵ <http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342>

⁶⁶ <https://www.canada.ca/en/government/ministers/navdeep-singh-bains.html>

⁶⁷ <http://www.macleans.ca/politics/ottawa/q-a-navdeep-bains-on-selling-superclusters/>

⁶⁸ The first stage (letter of intent) ended on 24 July 2017. Successful applicants will be invited to the second phase by the Ministry of Innovation, Science and Economic Development Canada. Full applications will be due in Fall 2017.






⁶⁹ “Funding to develop and grow business-led innovation superclusters in Canada”. Eligibility criteria available at <https://www.canada.ca/en/innovation-science-economic-development/programs/small-business-financing-growth/innovation-superclusters/funding-superclusters.html>

⁷⁰ Innovation Supercluster Initiative, program guide, available at: <https://www.ic.gc.ca/eic/site/093.nsf/eng/00003.html>

- demonstration or prototype development projects with benefits for multiple firms
 - development of production methods and processes involving industry and academic partners
 - private-sector led commercialization projects
- **Partnerships for scale.** Activities serving a target group of cluster firms to enable their growth, including by increasing domestic demand for cluster products and services or by facilitating expansion, such as:
 - linking start-ups with strategic partners (e.g., 'pitch days')
 - offering business mentoring, consulting and coaching
 - supply chain development or integration efforts for cluster SMEs with local anchor firms
 - partnering with a public stakeholder/organization that provides access to capital and financing
 - **Diverse and skilled talent pools.** Activities enhancing regional labour force skills and capabilities or initiatives addressing industry needs for talent, such as:
 - a recruitment campaign to repatriate Canadian talent to the cluster; development of curricula linked to industry's needs and workforce integration programs for student
 - development and promotion of specialized certifications in areas of technology leadership; re-training programs (e.g., digital skills) for existing workforce
 - assessment of industry's current or anticipated workforce needs; or building awareness of industry demand for skilled talent across stakeholder groups (e.g., students, workers, firms, universities and vocational colleges, policymakers)
 - **Access to innovation.** Investing in and providing access to assets, services or resources that benefit a range of cluster firms over a period of time, such as:
 - support for access to specialized technical services
 - installation of and access to dedicated laboratory or cutting-edge equipment
 - acquisition and assertion of jointly held intellectual property
 - **Global advantage.** Activities and initiatives that position the cluster and its strengths as world-leading, enable firms to seize market opportunities, and attract international investments and partnerships, such as:
 - cluster promotion
 - investment attraction to cluster region; studies to identify new global markets for cluster products and services
 - participation in or leadership of trade missions to key geographic markets
 - development of regulatory or policy proposals to enhance domestic technology advantage
 - development and promotion of new international standards that embed Canadian approaches

Canadian supercluster entities will therefore be able to engage in are expected to engage in “relevant international partnerships”⁷¹ which should provide opportunities for cluster-to-cluster cooperation with EU clusters.

Citing models of successful clusters of the Silicon Valley, Berlin, Tel Aviv and the Toronto-Waterloo corridor, the Canadian government set out its vision of “what superclusters would look like”⁷²:

	Risk sharing to develop platform technologies and disruptive technologies that will boost Canada’s competitiveness in areas of economic strength (e.g. advanced manufacturing, agri-food, clean technology, digital economy, health/bio-sciences, clean resources, and infrastructure and transportation).
	Strong connections between businesses, from large anchor firms to start-ups, post-secondary institutions and research institutions that support private sector-led research and development that is linked to commercial outcomes with application in the real economy.
	Create opportunities to grow Canadian companies through globally integrated supply chains.
	Diverse and skilled talent pools enhanced by advisory services and business mentoring for start-ups and small and medium-sized enterprises that lead to opportunities for Canadians to access high-value, well-paying jobs.
	Focus on innovative solutions that will improve the quality of life of Canadians and allow businesses to better perform in a competitive environment.

The government’s budget plan regarding the development of the superclusters is the following:

2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	TOTAL
Can\$ 50 million	Can\$250 million	Can\$250 million	Can\$250 million	Can\$150 million	Can\$950 million

⁷¹ Innovation Supercluster Initiative, program guide, available at: <https://www.ic.gc.ca/eic/site/093.nsf/eng/00003.html>

⁷² <http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342>

At the time of writing this briefing, the results from the first phase had not been published yet (the submission of letters of intent was set on 24 July 2017). The expected timeline for the application process is:

- submission of full applications by Fall 2017
- funding allocations to successful Applicants before March 31, 2018.

By the scale of the planned investment, focusing on a core group of pre-identified highly innovative sectors, the supercluster initiative is a major game-changer for Canada's innovation landscape. This is obviously particularly the case for Canadian clusters as they are asked to reorganise the way they work, how they collaborate with other clusters (from the same areas but also, more importantly, from different sectors) and determine how they can maximise their impact. Such a large scale initiative will reshape the cluster-to-cluster collaboration between Canada and the EU as EU clusters will have to take this new reality into account.

4.2 Canadian cluster policies – the current landscape

As stated before, Canadian clusters are labelled under various names: “clusters”, “grappes” (in French), “networks of excellence” or “consortium”. This variety illustrates the diversity of cluster policies and wider innovation policies in the Provinces.

Canadian clusters are built around three levels of support⁷³:

- At federal level - we can make the distinction between two initiatives:
 - The upcoming support to **“superclusters”**: following the announcement of the federal government, 5 to 6 “superclusters” will be set-up in the abovementioned fields from 2018 onwards.
 - **The “NRC clusters” initiative**: from 2001 to 2009, the National Research Council of Canada (NRC) had been the architect of an initiative for technological clusters of the Canadian government. Eleven clusters were developed around its main laboratories. They fell within the framework of the Strategy for Science and Technology of Canadian federal government. These thematic clusters were set up to complement provincial priorities, often in emerging sectors and in locations outside the big cities. According to Erin Cassidy, NRC cluster initiatives have focused on building science based innovation capacity in areas of local and regional strength to foster economic growth and improve quality of life. The NRC's cluster initiatives include: ocean technologies, e-business, information technologies and life sciences in Atlantic Canada; nanotechnology, nutraceuticals, bio diagnostics and fuel cells in Western Canada; photonics in Ontario; and aerospace, biotechnology, and aluminium transformation in

⁷³ DGCIS, French General Directorate for Industry and Services' Competitiveness, Canadian clusters: mapping, lessons, perspectives and opportunities for French competitiveness clusters, 2010: http://competitivite.gouv.fr/documents/commun/Documentation_poles/Comparaisons_internationales/Rapport%20cluster%20canadiens.pdf Document only available in French.

Quebec⁷⁴. An evaluation of the NRC Technology Cluster Initiatives was undertaken in 2009: overall the results were very positive but the issue of long-term support (compared to 5-year funding plans from the NRC) was raised by the participants in the evaluation study⁷⁵.

- At provincial level where the typology of clusters (or “grappes” in Québec) is very heterogeneous. Each province has developed its own model: from the labelled clusters by provincial governments such as the “créneaux d’excellence” in Québec (a policy named “ACCORD project”⁷⁶) to Provincial industrial concentrations around flagship projects. For example, on December 11th, 2014, the Ontario Legislature passed the Partnerships for Jobs and Growth Act, 2014 to support the development of clusters (proclaimed into force on April 1, 2015) and the government has developed a concept of “Cluster plans” established jointly by the cluster organisation and the government that enable key clusters to benefit from the governmental funding programmes⁷⁷. In January 2016, the Ontario government began to implement the Act by introducing its Cluster Development Seed Fund to fuel cluster growth. Administered by the Ontario Chamber of Commerce, “the fund grants eligible businesses up to Can\$ 100,000\$ to support networking activities and research and feasibility studies. In turn, the provincial government benefits from increased information about clusters to inform policy decisions”⁷⁸.
- At local level where clusters are initiated either by metropolitan organisations, chambers of commerce, industry associations or sectoral consortia, in order to meet the challenges of economic development. They are often extensions or divisions of economic development agencies in the region. The “Montréal Metropolitan Clusters” are part of them, highly supported by local authorities.

The Canadian Innovation, Science and Economic Development Department, and Industry Canada, the Government of Canada’s centre of microeconomic policy expertise, developed a database of Canadian industries on its website, classified by sector, also available with a map.⁷⁹

⁷⁴ Erin Cassidy, National Research Council Canada, Measuring Technology Clusters: the National Research Council’s approach, 2005 : <http://www.ryerson.ca/~c5davis/publications/Cassidy%20-%20Measuring%20NRC%20Clusters%20-%203%20October%2005.pdf>

⁷⁵ Portfolio Evaluation of the NRC Technology Cluster Initiatives : http://www.nrc-cnrc.gc.ca/eng/about/planning_reporting/evaluation/2009_2010/technology_cluster_initiatives.html

⁷⁶ Accord Québec Maritime, <http://www.accordrstm.ca/>

⁷⁷ Arizona State University, Cluster Mapping Initiatives in Ontario, North America Economic Connectivity Conference, September 30th 2015, <https://morrisoinstitute.asu.edu/sites/default/files/content/events/Cluster%20Mapping%20Initiatives%20in%20Ontario%20-%20Poirier.pdf>

⁷⁸ CLUSTERS IN ONTARIO, Creating an ecosystem for prosperity, Institute for Competitiveness and Prosperity, June 2016: https://www.competeprosper.ca/uploads/WP26_clusters_FINAL.pdf

⁷⁹ Database of Canadian Industries: <http://www.ic.gc.ca/eic/site/ccc-rec.nsf/eng/home?OpenDocument#tab1>

Canadian trade policy is strongly supporting business internationalisation and provides support for businesses interested in exporting. Canada has a **Global Markets Action Plan**, to position Canadian business for export success in foreign markets and is leading Canadian trade missions.⁸⁰

5. Conclusions

Currently the 10th biggest economy in the world, Canada is one of the EU's most important trading partner. When fully into place, the Comprehensive Economic and Trade Agreement (CETA) will further reinforce the trade relations between Canada and the EU.

Canada is also extremely active in terms of innovation, it is a technologically advanced country and is ranked second country in the world for its business environment (starting a business, easy administrative procedure for businesses). Being a business-friendly open country is certainly one of Canada's major assets.

Following a decline of public investment in Research and Innovation in the last decade, the new Trudeau government appears to have put a strong emphasis on boosting investment in these domains research and technology⁸¹. The March 2017 announcement regarding the Innovation and Skills plan is a clear sign of support towards innovation in the country. In particular, the Trudeau government's planned investment of **Can\$950 million over five years** (€655.5 million⁸²) to develop "superclusters" in key priority sectors will change the current landscape dramatically and should provide opportunities for collaborations for European clusters. At the moment of writing this briefing the Canadian government had not yet published the call for expression of interest to select these "superclusters". However, some key messages can already be drawn at this stage:

- **A better-structured cluster landscape:** as stated in this report, the current Canadian cluster landscape is heterogeneous, both regarding the notion of clusters (various definitions co-exist), as well as the differences in cluster policies between provinces. By setting-up "three to five" superclusters the government will further consolidate the landscape which should simplify exchanges with international partners. The exact shape that this new set-up will take remains to be seen, though it is already known that specific "entities" will be set-up to manage each supercluster. At this stage, it is not possible to assess how far this new cluster structure should enhance European clusters to do business with their Canadian counterparts. EU clusters will have interest in quickly adapting to the new landscape for their cooperation with Canadian counterparts. In addition, once the nationwide Canadian Cluster Mapping portal will open, EU-Canada cluster collaboration will be further facilitated as clusters will have the possibility to yet more easily identify potential partners.

⁸⁰ Ministry of International Trade: <http://www.international.gc.ca/trade-missions-commerciale/index.aspx?lang=eng>

⁸¹ 2017 budget, Government of Canada: <http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342>

⁸² Oanda, CAD 1: EUR 0.69005 EUR, 24th of April 2017

- **Clearly defined priorities:** the Canadian government has made it clear it intends to invest in “superclusters” in the following key sectors: **advanced manufacturing, agri-food, clean technology, clean resources, digital industries, health/bio-sciences, as well as infrastructure and transportation.** These sectors might therefore be considered a priority for EU-Canada cluster collaborations, given the strategic focus and investment of the Canadian government on these priorities.