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. It is an updated version of the analysis published by the ECCP in October 2017.

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.

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].

With a GDP of USD 1,653 billion in 2017[3], ranking 10th worldwide[4], and a GDP per capita of USD 46,705 (€ 40,210) for 2017[5], Canada is one of the world's largest economies whilst its population is 37.07 million. Its annual GDP rate is expected to be 3.0% 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 2015[6]. The

[1] World Bank, Canada overview: http://www.worldbank.org/en/country/canada/overview, consulted on 08/08/2018
[2] Prime Minister Justin Trudeau, https://pm.gc.ca/, consulted on 08/08/2018
[3] World Bank Data, Canada, https://data.worldbank.org/country/Canada, consulted on 08/08/2018
[4] World Bank data: http://data.worldbank.org/data-catalog/GDP-ranking-table
[5] OECD Data, Canada, https://data.oecd.org/canada.htm, consulted on 08/08/2018
[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

economic forecast has improved in 2017, with an export-led uplift, stimulated by the restoration of oil pipeline capacity and strong US growth.[7]

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 predictable environment abroad, notably for business investment for which it is one of the most stable in the world. The World Bank rates Canada's political stability with an average value of 1.03 points from 1996 to 2015, and 1.24 in 2014[8] (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 terms of political stability. The Global Competitiveness report 2017-2018 also classified Canada as the 14th country in the world based on a wide range of criteria such as performance, independence or stability of the country's institutions and regulations. Canada's particular strengths are health and primary education, labour market efficiency and financial market development.[9]

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.[10] 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 countries (the first bilateral agreement dates back to 1959)[11]. 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. Both parties are currently discussing a Strategic Partnership Agreement (SPA) to replace the 1976 Framework Agreement, to reinforce cooperation in strategic areas such as "international peace and security; human rights; environment; research; innovation; energy security; and education".[12]

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 (see further information in section 2.2.1). [13]

[7] OECD, Canada – Economic forecast summary (May 2018), https://www.oecd.org/eco/outlook/canada-economic-forecast-summary.htm, consulted on 08/08/2018

[8] The Global Economy, Canada: Political stability, 2015. Based on data from the World Bank. http://www.theglobaleconomy.com/Canada/wb_political_stability/., consulted on 08/08/2018

[9] World Economic Forum, Global competitiveness report 2017-2018, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf, pp.94-95

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

[11] Mission of Canada to the EU: http://www.canadainternational.gc.ca/eu-ue/index.aspx?lang=eng

[12] Delegation of the European Union to Canda, EU-Canada political relations, https://eeas.europa.eu/archives/delegations/canada/eu_canada/political_relations/index_en.htm, consulted on 08/08/2018

[13] Delegation of the European Union to Canada, Trade relations, https://eeas.europa.eu/archives/delegations/canada/eu_canada/trade_relation/index_en.htm, consulted on 08/08/2018

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

2.2.1 Trade and investment

Canada is a strong supporter of free trade and is the 12th most important trading partner of the European Union, accounting for 1.7% of the EU's total trade. In return, the EU is Canada's second biggest trade partner, accounting for 9.5% of its external trade, (after the USA), both in terms of imports and exports, ahead of China with imports dominated by Germany and the United Kingdom in 2016.[14]

The value of bilateral trade in goods between the EU and Canada was €64.3 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 €30.1 billion in 2015. Examples of traded services between Canada and the EU are transportation, travel, insurance and communication[15]. The EU-Canada bilateral trade relationship (balance) is generally slightly in favour of the EU:

[14] Delegation of the European Union to Canda, EU-Canada political relations, https://eeas.europa.eu/archives/delegations/canada/eu_canada/political_relations/index_en.htm, consulted on 08/08/2018

[15] European Commission, Trade, Canada, http://ec.europa.eu/trade/policy/countries-and-regions/countries/canada/, consulted on 08/08/2018

Figure 1 Trade balance EU-Canada; DG Trade, Canada

In terms of Foreign Direct Investments, European investors held investments worth €264,4 billion in Canada while Canadian direct investment stocks in the EU amounted to almost €250.1 billion in 2016.

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 the EU Member States – 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"[16].

[16] European Commission, Trade, Canada, http://ec.europa.eu/trade/policy/countries-and-regions/countries/canada/, consulted on 08/08/2018

2.2.2 Science, Technology & Innovation

In 2016, Canada's ratio of R&D spending as a percentage of the GDP was 1.604 (down from 1.830 in 2010 and 1.710 in 2013). Canada's Gross Domestic Expenditures on Research and Development (GERD), in terms of share of GDP has constantly decreased since 2000.[17] Among all OECD countries, Canada ranked 11th in 2016. In total, Canada's GERD amounted to USD 24.7 billion in 2016[18]. Though the previous government's approach to the 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 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"[19]. It is also worth noting that Kirsty Duncan, Minister of Science, launched an independent review of federal funding for fundamental science in June 2016

Canada is doing relatively well in terms of innovation, being ranked the world's 23rd economy in terms of innovation in the Global Competitiveness report[20] (mostly based on perception). It is particularly well ranked by the Global Innovation Index 2018[21], at 18th – just behind the Luxembourg, France and China, but ahead of Norway or Australia 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 infrastructures[22]. In June 2016, the European Commission and the Canadian government signed an Administrative Arrangement which aims to facilitate cooperation

[17] OECD, Gross Domestic Spending on R&D, Share of GDP https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm, consulted on 08/08/2018

[18] OECD, Gross Domestic Spending on R&D, Million USD https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm, consulted on 08/08/2018

[19] Government of Canada: https://www.canada.ca/en/innovation-science-economic-development/programs/science-technology-partnerships/investment-fund.html , consulted on 08/08/2018

[20] World Economic Forum, Global competitiveness report 2017-2018, http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf, pp.94-95, consulted on 08/08/2018

[21] Global Innovation Index 2018, https://www.globalinnovationindex.org/gii-2018-report, consulted on 08/08/2018

[22] European Commission, International cooperation, policy dialogue, https://ec.europa.eu/research/iscp/index.cfm?pg=canada#policydialogue, consulted on 08/08/2018

between Canadian governmental departments and agencies and Horizon 2020 projects consortia[23]. It is acknowledged that Canadian Science-Based Departments and Agencies and Granting Agencies (SBDA-GA) are 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 in Horizon 2020 as the overall participation of Canadian partners in Horizon 2020 projects has decreased since FP7 (a common issue with other third countries such as the USA, Japan, etc.). 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[24].

2.3 Sectoral strengths

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" [25]. 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-sciences[26].

- Based on the choice of the sectors supported by the supercluster policy (cf. section 3.3), Canada's main sectoral strengths are:advanced manufacturing;
- agro-food;
- Clean technologies clean resources;
- Digital industries;
- Health and biosciences.

These 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 are therefore giving priority to these highly innovative sectors in the next five years.

[23] 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 , consulted on 08/08/2018
[24] EU & Canada priorities for Science & Technology cooperation, October 2016 : http://ec.europa.eu/research/iscp/pdf/policy/roadmaps_ca-2016.pdf

As these superclusters 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, agro-food, clean technology, clean resources, digital industries, health/bio-sciences, as well as infrastructure and transportation. Indeed, the Superclusters chosen by the Government following a competitive process target the following areas: digital technologies, protein industries, advanced manufacturing, artificial intelligence, and ocean-related resource management.

2.3.1. Advanced manufacturing

The advanced manufacturing sector in Canada is one of the strong sectors the Government is developing through its Supercluster programme[27]. Employing more than 1.8 million people in Canada and contributing to 11% of the national GDP in 2015, advanced manufacturing indeed stands in a solid position in the Canadian Economy.[28]

Industry Canada, a government agency, 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 competitiveness[29].

Main sector strengths in Canada and reasons for global attractiveness[30]

- Robust automotive, aerospace and defence manufacturing base to build from
- Accounting for nearly half of all business expenditure on Research and Development
- Strong Corporation: Canadian Manufacturers and Exporters[31]
- Strong engineering clusters (e.g. NGM Canada, the cluster that now leads the Supercluster on Advanced Manufacturing in the Waterloo region)[32]

Global opportunities in the sector

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

Key figures of the sector

- Employment contribution (jobs, direct and indirect): 1,8 million of people
- Direct economic impact: $183 billion, total impact $475 billion representing 28% of Canada's total economy
- GDP contribution (% of Canadian GDP): 11 %

[27] Government of Canada's new supercluster, https://www.ic.gc.ca/eic/site/093.nsf/eng/00008.html, consulted on 08/08/2018
[28] Industrie2030, Manufacturing, Growth, innovation and prosperity for Canada, http://www.industrie2030.ca/download.php?id=67, consulted on 08/08/2018
[29] State of Advanced Manufacturing, A Canadian perspective, available at: https://www.cme-mec.ca/_uploads/documents/13195128081789.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] Canadian Manufacturers and exporters association, www.cme-mec.ca/, consulted on 08/08/2018
[32] NGM Canada, http://www.ngmcanada.com/, consulted on 08/08/2018

- Compound Annual Growth Rate (CAGR) for the 2010-2015 period: 3,7 % [33]

2.3.2. Agro-food

Based on the Advisory Council on Economic Growth report of February 2017[34], the government intends to build on the great potential of the agro-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 favorable.

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 2025[35] . In addition, one Canadian supercluster is now dedicated to agro-food: Protein Industries Supercluster.[36]

Main sector strengths in Canada and reasons for global attractiveness[37]

- 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 Guelph[38] and the recently created Protein Industries Supercluster)

Global opportunities in the sector

- 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 of the sector

- Employment contribution (jobs, direct and indirect): 2,3 million of people representing 12.5% of Canadian employment[39]

[33] Industrie2030, Manufacturing, Growth, innovation and prosperity for Canada, http://www.industrie2030.ca/download.php?id=67, consulted on 08/08/2018
[34] Advisory council of economic growth, Unleashing the growth potential of Key sectors, http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf, consulted on 08/08/2018
[35] Building a strong middle class, Budget 2017, available at: http://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf
[36] Government of Canada, Protein Industries Supercluster, https://www.ic.gc.ca/eic/site/093.nsf/eng/00012.html, consulted on 08/08/2018
[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] https://news.uoguelph.ca/2017/02/university-guelph-poised-help-canada-become-agri-food-leader-report/
[39] Government of Canada, Agriculture and agri-food in Canada, an overview of the Canadian agriculture and agri-food system 2017, http://www.agr.gc.ca/eng/about-us/publications/economic-publications/an-overview-of-the-canadian-agriculture-and-agri-food-system-2017/?id=1510326669269, consulted on 08/08/2018

- GDP contribution (% of Canadian GDP): 6.7 % (Can$ 62.6 billion) [40]
- 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.[41]

2.3.3. Clean technology and clean resources

In the presentation of its innovation agenda as part of the 2017 budget proposal, the government presents "the global campaign against climate change as an economic opportunity for Canada"[42]. 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"[43] 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 technologies[44]. 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 markets[45].

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 forestry, fisheries, mining, energy and agriculture, the public consultation on clean technology conducted in 2016[46] further reinforced the Government's intention to invest in clean technologies and resources.

In addition, clean resources were also targeted by the supercluster call, resulting in the emergence of the Ocean supercluster, dedicated to harnessing emerging technologies to strengthen Canada's ocean

[40] Government of Canada, Agriculture and agri-food in Canada, an overview of the Canadian agriculture and agri-food system 2017, http://www.agr.gc.ca/eng/about-us/publications/economic-publications/an-overview-of-the-canadian-agriculture-and-agri-food-system-2017/?id=1510326669269, consulted on 08/08/2018

[41] Advisory council of economic growth, Unleashing the growth potential of Key sectors, http://www.budget.gc.ca/aceg-ccce/pdf/key-sectors-secteurs-cles-eng.pdf, consulted on 08/08/2018

[42] Government of Canada, Building a strong middle class, Budget 2017, available at: https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf consulted on 08/08/2018

[43] Government of Canada, Building a strong middle class, Budget 2017, available at: https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf consulted on 08/08/2018

[44] "Accelerating Clean Innovation In Canada", Smart Prosperity Institute, April 2017. Available at: http://institute.smartprosperity.ca/sites/default/files/acceleratingcleaninnovationincanada.pdf

[45] 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

[46] LetsTalkCleanResources.ca, Online Engagement: Final Report, December 2016, available at: http://www.nrcan.gc.ca/19593

industries, including marine renewable energies, as well as oil and gas.[47] An additional Can$ 15 million of funds were allocated early 2018 to the Canadian Trade Commissioner Service to "help exporters expand into new markets, promote Canadian clean-technology capabilities, and enhance the country's position on the world stage in this increasingly competitive and rapidly expanding industry."[48]

Main sector strengths in Canada and reasons for global attractiveness

- Top-4 globally for hydro-electricity production, LNG (liquefied natural gas), and oil reserves
- 430 public companies with combined assets over Can$ 495 billion

Global opportunities in the sector

- Global energy consumption will grow by 30% between now and 2040
- Clean technologies are essential to meet climate change challenge
- Proximity to USA — North American energy security and integration

Key figures of the sector (Energy and renewables)[49]

- Employment contribution (jobs, direct and indirect): 0.3 million of people
- GDP contribution (% of Canadian GDP): 3.1 % (representing Can$ 59.3 billion) in 2016[50]
- The sector has doubled between 2004 and 2015 and is expected to triple by 2020. [51]

2.3.4. 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 595,000 ICT professionals in 2016. The Government of Canada declares that there are 39,000 companies working in the digital technologies sector, defined as "a combination of manufacturing and service industries that use creativity, talent, and digital skills to capture, transmit and display data and information electronically". Altogether, they contribute to 4.4% of the Canadian GDP[52], representing Can$ 73 billion.[53] However, by the added value provided in all the other industries (transport, health, agriculture, etc.), Canada's digital economy sector is an even more important contributor to the Canadian economy[54].

[47] Canada's Ocean Supercluster, https://oceansupercluster.ca/, consulted on 08/08/2018
[48] Government of Canada, The Canadian Trade Commissionner Service, http://tradecommissioner.gc.ca/canadexport/0002802.aspx?lang=eng, consulted on 08/08/2018
[49] 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
[50] Statistics Canada, Environmental and Clean Technology Products Economic Account, 2007 to 2016, https://www150.statcan.gc.ca/n1/daily-quotidien/171213/dq171213g-eng.htm, consulted on 08/08/2018
[51] Government of Canada, The Canadian Trade Commissioner Service, http://tradecommissioner.gc.ca/canadexport/0002802.aspx?lang=eng, consulted on 08/08/2018
[52] Government of Canada, Innovation, Science and Economic Development Canada, 2016 Canadian ICT sector profile, https://www.ic.gc.ca/eic/site/ict-tic.nsf/vwapj/ICT_Sector_Profile_2016_EN.pdf/$file/ICT_Sector_Profile_2016_EN.pdf, consulted on 08/08/2018
[53] Government of Canada, Digital Technologies, https://www.ic.gc.ca/eic/site/ict-tic.nsf/eng/home, consulted on 08/08/2018
[54] 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, consulted on 08/08/2018

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*"[55]. As a result, a supercluster on Artificial Intelligence was funded as part of the supercluster programme. [56]

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, CAN$6.6 trillion in economic opportunities coming from the digital industry are expected each year in the G20[57]. 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.

2.3.5. 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 cluster[58]). 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 etc[59].

Main sector strengths in Canada and reasons for global attractiveness[60]

- Domestic demand via national healthcare system

[55] Government of Canada, Building a strong middle class, Budget 2017, available at: https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf consulted on 08/08/2018
[56] Scale AI, AI powered supply chains, https://aisupplychain.ca/, consulted on 08/08/2018
[57] Government of Canada, Building a strong middle class, Budget 2017, available at: https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf consulted on 08/08/2018
[58] To Health Brochure, http://www.tohealth.ca/wp-content/uploads/TOH004_Brochure_6_Panel_0216.pdf , consulted on 08/08/2018
[59] European Commission, Roadmap for EU-Canada S&T cooperation : http://ec.europa.eu/research/iscp/pdf/policy/roadmaps_ca-2016.pdf#view=fit&pagemode=none, consulted on 08/08/2018
[60] Government of Canada, Building a strong middle class, Budget 2017, available at: https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf consulted on 08/08/2018

- 10 largest pharma companies have R&D presence in Canada
- World-class regenerative medicine and stem cell therapy development
- An important cluster: Toronto region's Human Health & Sciences (HHS) cluster

Global opportunities in the sector

- 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): 30,000 of people for the pharmaceutical sector only.[61]
- GDP contribution (% of Canadian GDP): 0.45 % 'Can$ 7.8 billion, in 2016 for the health and bioscience industry, and the broader health ecosystem accounted for 11%.

[61] Government of Canada, Pharmaceutical Industry Profile, https://www.ic.gc.ca/eic/site/lsg-pdsv.nsf/eng/h_hn01703.html, consulted on 08/08/2018

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"**[62].

The Canadian Institute for Competitiveness and Prosperity has developed a project that provides a **web platform**[63] **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 Institute for Strategy and Competitiveness 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 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.[64] 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.

[62] "Accelerating Innovation Through Superclusters". 2017 budget, Government of Canada: http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342, consulted on 08/08/2018
[63] Canadian Institute for Competitiveness and Prosperity web platform: http://www.competeprosper.ca/clusters/data/by-cluster, consulted on 08/08/2018
[64] 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

Other mapping tools have been developed by Canadian business and cluster practitioners, as well as academics, that help identify clusters around the country.[65]

3.2 Cluster mapping

In June 2016, the Canadian government declared its intention to develop a nationwide Canadian Cluster Mapping portal, in collaboration with provinces, territories, research institutions and other stakeholders.[66] The platform "Canadian Cluster Map"[67] was created in 2018, as a participatory tool were clusters are encouraged to sign up. More than displaying existing clusters are such, the tool aims at bringing forward industries of the same sector in an area. The website explains: "Individual industries are grouped into clusters based on an overall measure of relatedness. The overall measure of relatedness is based on four types of linkages including input-output measures, use of similar labour occupations, and co-location patterns of employment and co-location of establishments."[68] Hence, the platform, by registering industries using standardised classifications aims to define the clusters and qualify them, using the Canadian typology of "local" and "traded" clusters.

3.3 Superclusters

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"[69]. A key aspect of this plan is the Can$ 950 million 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 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**"[70].

Organised in two stages[71], 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

[65] Such as http://localideas.org/2014/06/22/cluster-atlas-of-canada/, consulted on 08/08/2018
[66] 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
[67] Canadian Cluster Map, http://www.clustermap.ca, consulted on 08/08/2018
[68] Canadian Cluster Map, Methodology, http://www.clustermap.ca/app/scr/is/ccmp/web#!/en/methodology, consulted on 08/08/2018
[69] 2017 budget, Government of Canada: http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342
[70] MacLeans, Q&A: Navdeep Bains on selling 'superclusters', http://www.macleans.ca/politics/ottawa/q-a-navdeep-bains-on-selling-superclusters/ , consulted on 09/08/2018
[71] 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.

- co-invest, dollar for dollar, to match the federal contribution requested and approved under the program[72].

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

Superclusters winners were announced in February 2018. Five super clusters emerged from the competition.

Cluster name	Technology Focus	Main characteristics
Digital Technology Supercluster British Columbia https://www.digitalsupercluster.ca/	Virtual, mixed and augmented reality; data collection and analytics; quantum computing	Digital Technology Supercluster will use bigger, better datasets and cutting-edge applications of augmented reality, cloud computing and machine learning to improve service delivery in the natural resources, precision health and manufacturing sectors. Number of participants: 270+ Expected economic impact: GDP Impact over 10 years: Can$ 5 billion Job creation over 10 years: 13,500
Protein Industries Supercluster Prairies Province https://www.proteinindustriescanada.ca/	Agri-food enabling technologies, including genomics, processing, and information technology (IT)	Protein Industries Supercluster will use plant genomics and novel processing technology to increase the value of key Canadian crops, such as canola, wheat and pulses that are coveted in high-growth foreign markets, such as China and India, as well as to satisfy growing markets in North America and Europe for plant-based meat alternatives and new food products. Number of participants: 100+ Expected economic impact: GDP Impact over 10 years: Can$ 4.5 billion Job creation over 10 years: 4,500
Advanced Manufacturing Supercluster Ontario http://www.ngmcanada.com/	Internet of Things, machine learning, cybersecurity, additive manufacturing (3D printing)	Advanced Manufacturing Supercluster will build up next-generation manufacturing capabilities, incorporating technologies like advanced robotics and 3D printing. Number of participants: 130+ Expected economic impact: GDP Impact over 10 years: Can$ 13.5 billion Job creation over 10 years: 13,500
AI-Powered Supply Chains Supercluster (SCALE.AI) Québec	Artificial intelligence and supply chain technology	AI-Powered Supply Chains Supercluster (SCALE.AI) will bring the retail, manufacturing, transportation,

[72] "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 , consulted on 08/09/2018

https://aisupplychain.ca/		infrastructure, and information and communications technology sectors together to build intelligent supply chains through artificial intelligence and robotics. Expected economic impact: GDP Impact over 10 years: Can$ 16.5 billion Job creation over 10 years: 16,000
Ocean Supercluster Atlantic Canada http://oceansupercluster.ca/	Digital sensors and monitoring, autonomous marine vehicles, energy generation, automation, marine biotechnology and marine engineering technologies	The Ocean Supercluster will harness emerging technologies to strengthen Canada's ocean industries—industries like marine renewable energy, fisheries, aquaculture, oil and gas, defence, shipbuilding, and transportation. Expected economic impact: GDP Impact over 10 years: Can$ 14 billion Job creation over 10 years: 3,000

3.4 Provincial and local clusters

The following section will provide an overview of the key cluster organisations in the two main Canadian Provinces in terms of GDP output (2016)[73]:

1. Ontario – Can$ 794,835 million
2. Québec – Can$ 394,819 million

3.4.1 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 Agenda[74]:

- 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

[73] Statistics Canada: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610022201, consulted on 08/08/2018
[74] Ontario Network of Entrepreneurs and Centres of Excellence : http://www.oce-ontario.org/

also help to commercialise innovation originating in the province's publicly funded colleges, universities and research hospitals[75].

The Ontario province is home to the following clusters:

- **The Toronto Waterloo Corridor[76]:** 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 Toronto, the University of Waterloo.
- **The Ontario Aerospace Council[77]:** 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) cluster**[78]: 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 Ontario[79]: 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.

3.4.2 Québec

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

- **"Créneaux d'excellence" and "Pôles d'excellence"**

The Québec Province has developed a mapping tool[80] for these "créneaux d'excellence" dedicated to both national and international activity and also with an innovation and excellence focus in 17 sectors. 35 clusters are mapped and the website provides access to detailed information and a contact point.

[75] Ontario Centres of Excellence, http://www.oce-ontario.org/about-us, consulted on 08/08/2018
[76] Toronto – Waterloo region, https://thecorridor.ca/ , consulted on 08/08/2018
[77] Ontario Aerospace Council, http://theoac.ca/ , consulted on 08/08/2018
[78] To Health Brochure, http://www.tohealth.ca/wp-content/uploads/TOH004_Brochure_6_Panel_0216.pdf , consulted on 08/08/2018
[79] Clusters in Ontario, Creating an ecosystem for prosperity, Institute for Competitiveness and Prosperity, June 2016: https://www.competeprosper.ca/uploads/WP26_clusters_FINAL.pdf , consulted on 08/08/2018
[80] Québec cluster mapping tool: https://www.economie.gouv.qc.ca/objectifs/informer/creneaux-et-poles-dexcellence/, consulted on 08/08/2018

The pole d'excellence aim at gathering the companies to help them reach a national market. There are three of them in Québec, IT, optics and photonics, land transportation.[81]

- **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 nine clusters have been activated". A visibility tool[82] for the clusters of the Montréal Metropolitan area is also available on their website, and an overview is available in the figure below:

Montreal Metropolitan Clusters – an overview

[81] Economie, Science et innovation, Québec Pôles d'excellence, https://www.economie.gouv.qc.ca/objectifs/informer/creneaux-et-poles-dexcellence/page/poles-dexcellence-23772/?no_cache=1&tx_igaffichagepages_pi1%5Bmode%5D=single&tx_igaffichagepages_pi1%5BbackPid%5D=243&tx_igaffichagepages_pi1%5BcurrentCat%5D=&cHash=c4d6c8a51c74cdc64274ce81b6fe26f5 , consulted on 08/08/2018

[82] Montréal Metropolitan area cluster: http://grappesmontreal.ca/metropolitan-clusters/montreals-metropolitan-clusters/?L=1 , consulted on 08/082018

Figure 2: Document submitted by the Montréal Metropolitan Clusters to the Minister of Finances as part of the consultation procedure of the Finance Minister regarding the Innovation programme, December 2016[83]

- **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 are[84]:

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)
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. InnovÉÉ (Innovation in electric energy)
9. Advanced materials research and innovation Hub (PRIMA Québec)

[83] Letter to the Finance Minister, by "Grappes Montréal", 13 December 2016: http://grappesmontreal.ca/fileadmin/user_upload/siteGrappes/documents/MemoireGrappes-BudgetFederal2017.pdf , consulted on 08/08/2018

[84] QuebecInnove, single portal access : http://www.quebecinnove.com/les-intermediaires-en-innovation-technologique/

4. Cluster policies and programmes in Canada

4.1 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 support[85]:

- At federal level - we can make the distinction between two initiatives:
  - The **"superclusters":** following the announcement of the federal government, 5 "superclusters" are set-up and funded publicly. The super cluster policy is explained in depth in the section 4.2.
  - **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 the 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 Quebec[86]. 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 study[87].

[85] 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, consulted on 09/08/2018

[86] 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 , consulted on 09/082018

[87] 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 , (archive content), consulted on 09/082018

- 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 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 programmes[88]. 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"[89].

- 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.

Canadian trade policy is strongly supporting business internationalisation and provides support for businesses interested in exporting. Canada has a Global Markets Action Plan, who organises Canada's trade mission and aims to boosts Canadian exports.[90]

4.2 "Superclusters" - the Government's strategy for 2018-2022

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-sciences[91].

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

[89] CLUSTERS IN ONTARIO, Creating an ecosystem for prosperity, Institute for Competitiveness and Prosperity, June 2016: https://www.competeprosper.ca/uploads/WP26_clusters_FINAL.pdf , consulted on 09/08/2018

[90] Ministry of International Trade, Global Market Action Plan, http://www.international.gc.ca/global-markets-marches-mondiaux/index.aspx?lang=eng , consulted on 09/08/2018

[91] http://www.budget.gc.ca/2017/docs/themes/Innovation_en.pdf , consulted on 09/08/2018

In addition, the government created **Innovation Canada**[92] to be a one-stop shop for entrepreneurs and start-ups; and also invested Can$ 50 million (€ 34.5 million) to launch **Innovative Solutions Canada**[93] – a government procurement programme modelled after the United States' Small Business Innovation Research (SBIR) programme[94].

Supercluster members are expected to work around **five main themes of activity**[95]:

- **Technology leadership.** Collaborative projects that directly enhance the productivity, performance and competitiveness of Member firms, such as:
  - collaborative R&D projects
  - demonstration or prototype development projects with benefits for multiple firms
  - development of production methods and processes involving industry and academic partners
  - private-sector led commercialisation 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/organisation 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 programmes for student
  - development and promotion of specialised certifications in areas of technology leadership; re-training programmes (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 specialised technical services

[92] Innovation Canada, https://www.innovation.ca/fr, consulted on 09/08/2018
[93] Innovative solutions Canada, https://www.ic.gc.ca/eic/site/101.nsf/eng/home, consulted on 09/08/2018
[94] SSTI website, Canadian budget focuses on innovation, new economy skills, superclusters, 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 , consulted on 09/08/2018
[95] Innovation Supercluster Initiative, programme guide, available at: https://www.ic.gc.ca/eic/site/093.nsf/eng/00003.html, consulted on 09/08/2018

- 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 are expected to engage in "relevant international partnerships"[96] which will 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"[97]:

	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.

[96] Innovation Supercluster Initiative, programme guide, available at: https://www.ic.gc.ca/eic/site/093.nsf/eng/00003.html consulted on 09/08/2018

[97] Accelerating Innovation Through Superclusters, http://www.budget.gc.ca/2017/docs/plan/chap-01-en.html#Toc477707342 , consulted on 09/08/2018

	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

5. Conclusions

Canada is a strategic country for the EU and presents interesting perspectives for the European clusters.

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

Beyond trade, EU and Canada also have long-standing agreements on scientific and technological cooperation. This is particularly important, as 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.

Canada's well-developed and highly innovative economic sectors have been identified as priority for EU-Canada cluster collaboration. These sectors are:

- **advanced manufacturing** boosted by the strength of the aerospace and automotive industries, accounting for Can$ 183 billion representing 28% of GDP;
- **agro-food** with renowned high quality production, a market worth Can$ 62.6 billion, representing 6.7% of the GDP;
- **Clean technologies and clean resources**, developed from Canada's large natural resources, notably LNG and oil;
- **Digital industries**, with an increasing focus on artificial intelligence, representing Can$ 73 billion;
- **Health and biosciences** boosted by the Canadian pharmaceutical industry.

Canada's latest cluster policy consist of funding five "superclusters" to become competitive worldwide on the abovementioned sectors. The clusters where chosen in a competitive approach and will receive a Can$ 950 million budget over five years to develop. Such policy has successfully managed to define clear priorities for cluster collaboration in the abovementioned sectors; the superclusters are potential partners easy to identify.

In addition, Canada has already established clusters, worth of interest for international collaboration, deriving from the Federal NRC cluster policy (2001- 2009) and implemented at the provincial and local level, supported by the different authorities. If the clusters are well -structured and mature for international cooperation, one of the difficulties may lay in the readability of the Canadian 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 five superclusters the government has further consolidated the landscape which should simplify exchanges with international partners. 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 fact, EU-Canada cluster collaboration will be further facilitated as clusters will have the possibility to yet more easily identify potential partners.