

European  
Commission



July 2021

# Advanced Technologies for Industry – International reports

Report on Canada: technological capacities and key  
policy measures



This report was prepared by Palina Schauchuk (Technopolis Group) and Alba Balla (IDC).

## EUROPEAN COMMISSION

European Innovation Council and SMEs Executive Agency (EISMEA)

Unit I.02.2 — SMP / COSME Pillar

E-mail: [EISMEA-SMP-COSME-ENQUIRIES@ec.europa.eu](mailto:EISMEA-SMP-COSME-ENQUIRIES@ec.europa.eu)

Directorate General for Internal Market, Industry, Entrepreneurship and SMEs

Unit D.2 — Industrial forum, alliances, clusters

E-mail: [GROW-ATI@ec.europa.eu](mailto:GROW-ATI@ec.europa.eu)

European Commission

B-1049 Brussels

## LEGAL NOTICE

The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of EISMEA or of the Commission. Neither EISMEA, nor the Commission can guarantee the accuracy of the data included in this study. Neither EISMEA, nor the Commission or any person acting on their behalf may be held responsible for the use, which may be made of the information contained therein.

More information on the European Union is available on the Internet (<http://www.europa.eu>).

PDF

ISBN 978-92-9460-789-8

doi: 10.2826/314330

EA-08-21-225-EN-N

Luxembourg : Publications Office of the European Union, 2021

© European Union, 2021





# Table of contents

**Introduction.....4**

**Section 1.....**

**1. Activities and capacities in advanced technologies.....5**

1.1 Patent applications..... 5

1.2 International competitiveness ..... 6

1.3 Investment activities ..... 6

**Section 2.....**

**2. Key actors, policy and governance framework .....8**

2.1 Country overview ..... 8

2.2 Government policies towards technology development and adoption ..... 9

2.3 Government initiatives to foster specific advanced technologies..... 11

**Bibliography.....14**

**About the ‘Advanced Technologies for Industry’ project .....15**



## Section

### Introduction

This report has been prepared in the framework of the Advanced Technologies for Industry (ATI) project, initiated by the European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs and the European Innovation Council and Small and Medium-sized Enterprises Executive Agency.

The objective of the international country reports is to explore the technology and policy landscape of selected non-EU countries. Country performance in advanced technologies is presented based on patent, trade and investment data. The reports provide also a concise and informative review of policies relevant for advanced technology development and deployment.

The starting point of this analysis has been sixteen advanced technologies that are a priority for European industrial policy and that enable process, product and service innovation throughout the economy and hence foster industrial modernisation.

Advanced technologies are defined as recent or future technologies that are expected to substantially alter the business and social environment and include *Advanced Materials, Advanced Manufacturing, Artificial Intelligence, Augmented and Virtual Reality, Big Data, Blockchain, Cloud Technologies, Connectivity, Industrial Biotechnology, the Internet of Things, Micro and Nanoelectronics, Mobility, Nanotechnology, Photonics, Robotics and Security*. The full methodology behind the data calculations is available on the ATI<sup>1</sup>.

The report is structured as the following:

The first section outlines the capacities of Canada in terms of technology generation (patent applications), followed by an analysis of international competitiveness in technology-based products (export shares) and, eventually, entrepreneurial dynamism (venture capital activities and investments in tech firms).

The second section analyses the main Canadian policy strategy in support of advanced technologies and provides an overview of some of the key policy initiatives and policy measures in the field.

---

<sup>1</sup> <https://ati.ec.europa.eu/reports/eu-reports/advanced-technologies-industry-methodological-report>



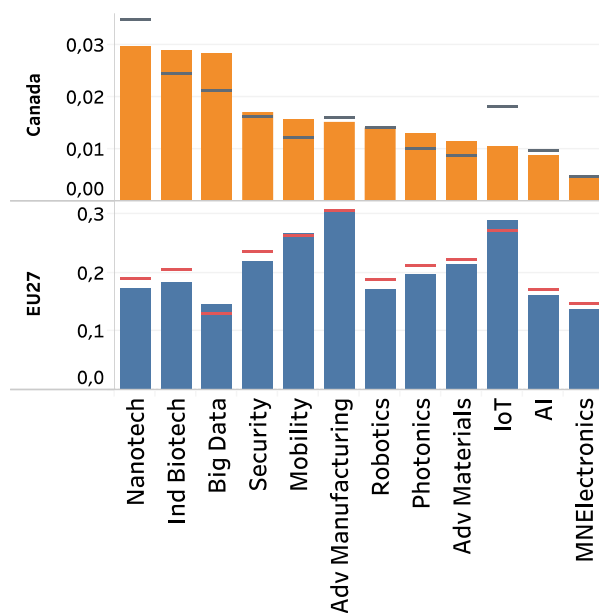
# Section 1

## 1. Activities and capacities in advanced technologies

### 1.1 Patent applications

Technological trends and development have been captured based on patent data<sup>2</sup>. An analysis of Canada's current share of transnational patent applications helps to evaluate its current technological performance across different fields of advanced technologies. Figure 1 gives an overview of the Canada's share of worldwide transnational patent applications related to advanced technologies in comparison with the EU27 Member States both in 2017 and in 2018.

Figure 1: Share in global transnational patent applications in advanced technologies (2017-2018) (bars refer to 2018 value and the grey and red lines indicate the status in 2017)



Colour legend  
 Canada 2018  
 EU27 2018

Source: Fraunhofer ISI, based on EPO PATSTAT

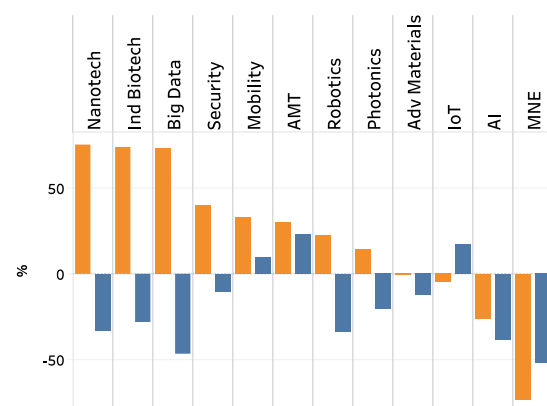
As shown in Figure 1, the EU27 holds a considerably higher share of global patent applications than Canada in all advanced technology fields (please note that the scaling is different on the two diagrams above). In Canada

<sup>2</sup> The patent analysis reflects the owner (applicant) of the technology, since patents have been localised based on the location of their legal owner.

the highest share of patent applications within the total number of transnational patent applications was recorded in the field of Nanotechnology in 2018. Further technologies that played a relatively more important role were Industrial biotechnology, followed by Big Data and Security. Compared to 2017, Canada decreased its share in Nanotechnology, Advanced manufacturing, AI and IoT, but it increased its share in various other technologies such as Industrial Biotechnology and Big Data.

The analysis of the RPA-index<sup>3</sup> as visualised in Figure 2 displays the relative technological specialisation of Canada in all twelve advanced technology fields in comparison with the EU27. In 2018, Canada was the most specialised in Nanotechnology and Industrial Biotechnology followed by Big Data and Security (similarly as in the case of its share of world patent applications). On the contrary, the EU27 displayed weak specialisation in all four of these areas. Negative specialisation is found in Advanced Materials, IoT, Artificial Intelligence and Micro and nanoelectronics. The results of the RPA analysis indicate that Canada has a rather strong specialisation in most of the advanced technologies.

Figure 2: Technological Specialisation RPA-Index of Canada and EU27 (2018)



Colour legend  
 Canada  
 EU27

Source: Fraunhofer ISI, based on EPO PATSTAT

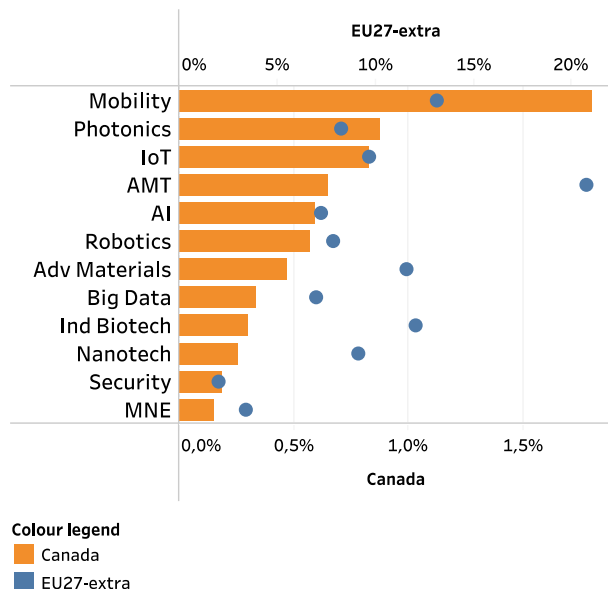
<sup>3</sup> The RPA-Index illustrates the relative specialisation on a scale from -100 to +100, putting the share of a specific field in national applications in relation to the global average share.



### 1.2 International competitiveness

Trade measures are a common indicator of global competitiveness, as they document the attractiveness of a country's products beyond the home market. Total exports provide evidence about a country's role as a producer and trade balance captures its sovereignty in certain areas of production.

Figure 3: Export share in world total (2018)

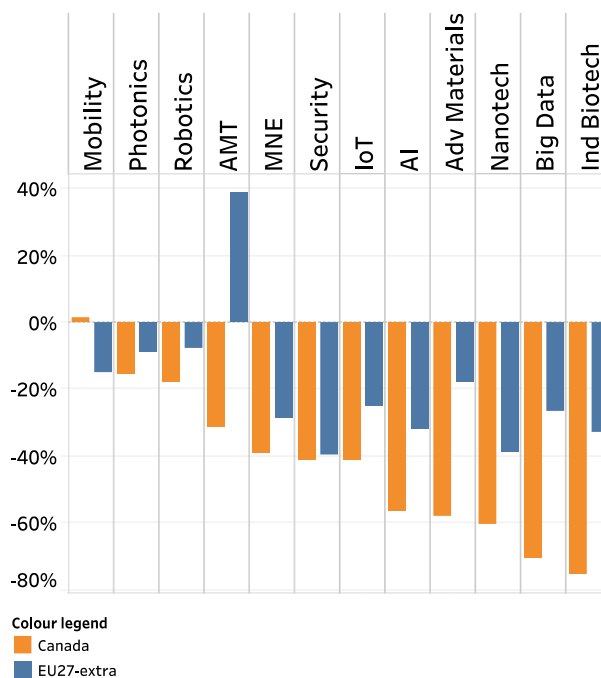


Source : Fraunhofer ISI, based on UN COMTRADE

Figure 3 displays the Canadian share of global exports related to advanced technologies in comparison with the EU27 for 2018. The results clearly demonstrate that the EU27 exports more products that include any of the twelve types of advanced technologies than Canada. Canada displays a large relative trade advantage in Mobility and Photonics, followed by IoT compared to other fields of advanced technologies.

Figure 4 visualises the trade balance<sup>4</sup> in relation to the total trade volume of Canada and the EU27 countries in 2018.

Figure 4: Trade balance in relation to overall trade volume (exp. - imp.) (2018)



Source : Fraunhofer ISI, based on UN COMTRADE

Canada exhibits a strong trade deficit with regard to goods relevant for all twelve advanced technologies. However, the EU27 displays notable relative trade surplus in Advanced Manufacturing technology. Overall, however, this situation does not differ much from that of the EU, since the main exporters of advanced technology related goods are located in East Asia at least since the mid-1990s.

### 1.3 Investment activities

The following figures analyse private and venture capital (VC) investments in advanced technologies in Canada. Figure 5 illustrates the number of investment deals in advanced technologies and the share of investment-backed firms in Canada based on Crunchbase<sup>5</sup> data. The results have to be interpreted with caution since the data from Canadian start-ups and scaleups are limited.

The analysis suggests that the relative number of investment-backed firms in Canada was the highest in Microelectronics, Artificial Intelligence and Advanced Manufacturing, followed by Security and Robotics.

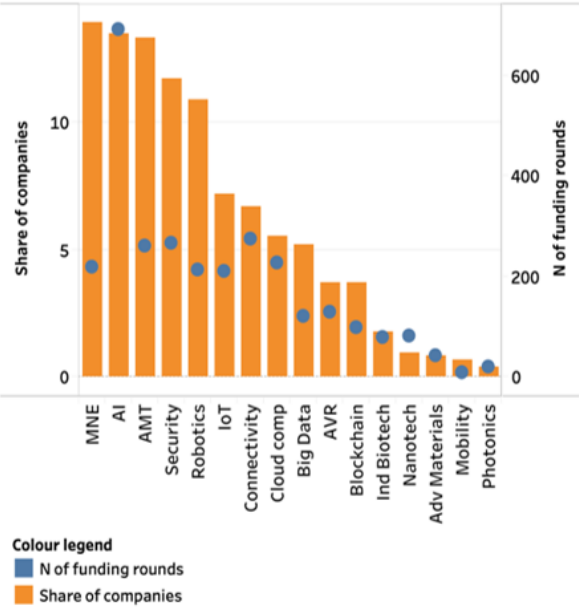
<sup>4</sup> Exports - Imports

<sup>5</sup> Private equity, venture capital investment and related innovative start-up creation have been explored based on a

merged dataset available in Crunchbase and Dealroom. Crunchbase provides information on venture capital backed innovative companies.



Figure 5: The number of funding rounds and share relative to the number of companies in Canada (2020)



Source: Technopolis Group based on Crunchbase



## Section 2

## 2. Key actors, policy and governance framework

### 2.1 Country overview

Table 1: Overview of policy strategies and measures in support of advanced technologies

<b>Policy Strategy</b>		
<b>Title</b>	<b>Year</b>	
Innovation for a Better Canada	2016	
Strategic Innovation Fund	2017	
Canada Innovation and Skills Plan	2018	
<b>Policy Measures</b>		
<b>Title</b>	<b>Year</b>	<b>Funding</b>
Pan-Canadian Artificial Intelligence Strategy	2017	CAN\$125 m (€85 m)
Digital Literacy Exchange Program	2017	CAN\$29.5 m (€20 m)
Innovative Solutions Canada	2017	CAN\$50 m (€34 m)
Digital Research Infrastructure	2018	CAN\$752.5 m (€ 509 m)
Digital Research Infrastructure Strategy	2018	CAN\$572.5 m (EUR 387 m)
National Cyber Security Strategy	2018	CAN\$507.7 m (original plan) (€343 m)
(new) Intellectual Property Strategy	2018	CAN\$85.3 m (€57 m)
Innovation Canada	2018	CAN\$13.5 m (€9 m)
Venture Capital Catalyst Initiative	2018	CAN\$450 m (€305 m)
Global Skills Strategy	2019	CAN\$35.2 m (€24 m)
Innovation Superclusters Initiative	2019	CAN\$950 m (€643 m)
Cyber Security Innovation Network	2021	CAN\$80 m (€54 m)

Source: authors

Canada is working on the creation of a wide innovation programme. However, unlike the Horizon 2020 initiative fostered by the European Union, the Canadian government has chosen not to allocate budget to specific technology

advancement but to create broader frameworks and eventually update them yearly. Most of the current research funding continues to be under two big umbrella projects, which spans broader than simple investments in emerging





technologies, smart materials, etc. The first large project was established in 2016 under the name of 'Innovation for a Better Canada' to generally drive and foster economic growth focusing on the idea that innovation is not always based and brought by technology but it can be achieved also with innovation and modification of products and services. With this programme, Canada is also investing on creating new jobs and new markets, increasing productivity and efficiency<sup>6</sup>. Whereas the second big umbrella project was started in 2018, under the name of 'Canada Innovation and Skills Plan'<sup>7</sup>. The country's investments in R&D are moderate: according to the OECD<sup>8</sup>, gross domestic research spending was 1.5% of GDP in 2019.

In a KPMG report, it was stated that in 2019 Canada was spending more than 2.2% of its nominal gross domestic product in researching and developing digital technologies however, this is far below that OECD average, set at 2.7%<sup>9</sup>. Looking further back in time, in 2018 Canada was well below the EU28 gross domestic spending, totalling a scarce 1.56% against the 2.03% achieved by EU28 countries.

This shows the relatively weak position of Canada in respect of European and other OECD countries. The Canadian government is spending to create dedicated investment on some growth areas across the country, with the so-called 'Innovation Superclusters Initiative'<sup>10</sup> (started in 2017). For instance, Canada has a strong AI research community with the third-largest concentration of AI experts in the world<sup>11</sup> and the city of Montreal presents the largest deep learning cluster – with more than 9 000 students in AI and related programmes<sup>12</sup>.

As already mentioned, often Canada is not investing strictly and directly on technologies but is working on creating more generalised frameworks to sustain diversity and inclusion in the country market labour, a better inclusion of immigrants and retention of talents but also on reducing CO2 emissions. The achievement of these objectives will help Canada to foster innovation and economic growth. Despite the relatively lower spending, in 2018, Canada was one of the most advanced countries with a relatively high share of renewables in their energy

supply with 16.3%, against 10.5% of the OECD countries<sup>13</sup>.

In the frame of COVID-19 pandemic, the 2021 Budget of the Government of Canada prioritises investing in industry and innovation to facilitate Canada's economic recovery. Through the Recovery Plan for Jobs and Resilience<sup>14</sup>, Canada aims to provide growth and expansion to businesses by empowering them to embrace new technologies. This will provide funding to support a variety of innovative fields through new and existing strategies. The Strategic Innovation Fund launched in 2017 provides repayable and non-repayable contributions to encourage research and development, accelerate technology transfer and commercialisation of innovative products and leverage advance industrial research, development and technology demonstration through collaboration between academia, non-profit organisations and the private sector. For 2021 an incremental CAN\$2.2 billion (€1.4 billion) over seven years on a cash basis and CAN\$511.4 million (€325 billion) ongoing will be available to support innovative projects across Canada through the Strategic Innovation Fund<sup>15</sup>.

## 2.2 Government policies towards technology development and adoption

The Ministry of Innovation, Science and Industry is responsible for the economic development and corporate affairs department – before 2015 the Ministry name was 'Innovation, Science, and Economic Development Canada'. This Ministry works in parallel to develop different objectives, from investments in innovation and science, to commercialisation of research and ideas and to support both small and medium enterprises and Canadian citizens with the appropriate digital skill set.

In 2018, Canada through the Ministry of Innovation, Science and Industry started a multi-year programme called 'Canada Innovation and Skills Plan'. With this plan, the Ministry intended to support innovation, science, women equality, SMEs and commercialisation of research and ideas to push Canada forward. The financing scheme is directly allocated with the yearly budget, and in

<sup>6</sup> [https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00051.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00051.html)

<sup>7</sup> <https://www.budget.gc.ca/2017/docs/plan/chap-01-en.html>

<sup>8</sup> <https://data.oecd.org/canada.htm>

<sup>9</sup> <https://assets.kpmg/content/dam/kpmg/ca/pdf/2019/04/canadas-digital-future.pdf>

<sup>10</sup> <https://www.ic.gc.ca/eic/site/093.nsf/eng/home>

<sup>11</sup> <https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/canada> - mention to "Canada's AI Imperative: From Predictions to Prosperity", Deloitte 13.

<sup>12</sup> <https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/canada>

<sup>13</sup> <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/renewable-energy-facts/20069>

<sup>14</sup> <https://www.budget.gc.ca/2021/pdf/budget-2021-en.pdf>

<sup>15</sup> <https://www.ic.gc.ca/eic/site/125.nsf/eng/00007.html#k-1>



this case, it started with Budget 2018 toward 2021 (and potentially onward).

### Canada Innovation and Skill Plan<sup>16</sup>

The Canada Innovation and Skills Plan envisions support to entrepreneurs and companies through specific programmes, such as: Innovation Superclusters Initiative, Strategic Innovation Fund, Innovative Solutions Canada and Venture Capital Catalyst Initiative. These programmes will further add to the Digital Research Infrastructure (DRI) Strategy (2018) and the initiatives to support scientific innovation and world-class research thanks to the establishment of Canada Research Chair and the Canada Foundation for Innovation<sup>17</sup>. For instance, this latter focuses on creating and collecting tools and services for researchers to exploit big data to obtain scientific breakthrough.

Supported by Innovation, Science and Economic Development Canada (ISED) – formerly and legally the Department of Industry – this plan aims to implement the Innovation and Skills Plan around four main themes:

- People, skills and communities – equip Canadians with the right skills to have the chance to be further involved and grow in the new (digital) economy.
- Research, technology and commercialisation – strengthen larger business investments in research and lead the innovation into effective commercialisation.
- Investment and scale – support and grow companies across the country but with a strong focus in developing the start-up and scale-up ecosystem and attract further investments.
- Programme simplification – secure a client-centric programme to guide Canadian innovators to success through the support they need.

and 6 main areas:

- Advanced manufacturing
- Agri-food
- Clean technology
- Digital industries
- Health/biosciences
- Clean resources

In this plan, noteworthy is the Science, Technology, Research and Commercialisation theme that aims to create and enable business-led investments and key collaborations and partnerships to build and deploy leading-edge technologies and as further step to commercialise them. Corollary to the aim, Canada intends to build, maintain and improve its research excellence, pointing at supporting fundamental science, experimentation and exploitation to address global challenges such as globalisation and climate change among many others<sup>18</sup>.

The four main achievements Canada is expecting are:

1. Increase of 30% by 2025 Canadian goods and services export – focusing attention mostly on resources and advanced manufacturing.
2. Increase the contribution of clean technology to the gross domestic product (GDP).
3. By 2025, double from 14 000 to 28 000 companies with a high growth (especially in digital and clean technology and technology for health sectors).
4. Within the Labour Market Transfer Agreements, increase the support for job training, eligibility programmes and services.

### Innovation for a Better Canada<sup>19</sup>

With Innovation for a Better Canada, the Canadian government aims to keep up and thrive during a moment of slow growth but rapid change, not only from an economic perspective but also from a broader societal and political points of view. Hence, in Budget 2016 Canada envisioned a multi-year programme to support:

- **People.** Acquire and retain new skills and experiences to compete in the global and digital economy.
- **Technologies.** To leverage the opportunities derived by emerging technologies to create new sectors and job roles not existing nor foreseen yet – to further harness the potential driven by new technologies.
- **Companies.** To support Canadians and their organisations to grow and compete

<sup>16</sup> <https://www.budget.gc.ca/2017/docs/plan/chap-01-en.html>

<sup>17</sup> [https://www.ic.gc.ca/eic/site/017.nsf/eng/h\\_07608.html#p2](https://www.ic.gc.ca/eic/site/017.nsf/eng/h_07608.html#p2)

<sup>18</sup> [https://www.ic.gc.ca/eic/site/017.nsf/eng/h\\_07608.html#p2](https://www.ic.gc.ca/eic/site/017.nsf/eng/h_07608.html#p2)

<sup>19</sup> [https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00051.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00051.html)



globally both financially and in ecosystem terms.

Canadians perceive their country as a region with solid foundations for growth with a good and well-established education system and a multicultural environment, which are good starting points for setting the basis for competitiveness and leading innovation. Canada is a country extremely open-minded and before setting the foundation of this programme, the government polled and consulted Canadians on which topics they felt were critical to success before building the innovation agenda. After the consultation, the agenda pointed out 6 key areas to be further developed by Canadian government:

1. 'Entrepreneurial and creative society' to foster innovation and entrepreneurship, leveraging diversity and talents.
2. 'Global science excellence' from fundamental to applied science.
3. 'World leading clusters and partnerships', creating inclusive clusters of businesses and technologies spanning from idea generation to value creation.
4. 'Grow companies and accelerate clean growth' to leverage the potential of start-ups and scale-ups and setting solid foundations for bigger organisations to thrive and be competitive worldwide.
5. 'Compete in a digital world' in harnessing the potential of the digital and digitised economy and emerging technologies across sectors and company sizes.
6. 'Ease of doing business' in creating and strengthening an agile marketplace with easier regulations and more common standards.

Financed by Budget 2016, the Innovation for a Better Canada programme committed over CAN\$800 million (€680 million) over four years to strengthen both networks, clusters and technology partnerships across private and public Canadian actors.

### 2.3 Government initiatives to foster specific advanced technologies

Canadian government highly valued people and organisations' opinions and ideas before creating technology-related policies, strategies and frameworks. Canada built its strategies looking both at developing present needs with a thoughtful eye to what is coming. Under these considerations, the Canadian government set its strategies defining a current wave of technologies, such as mobile and cloud, science and big data, advanced manufacturing and fintech and cryptocurrencies and a second and future horizon, based on artificial intelligence (AI) and augmented reality (AR), robotics and enhancing technologies, autonomous vehicles and genomics. Both the first wave and future horizon will be backed by a continuously developing and enlarging ecosystem, based on smart connected cities and societies, industrial and research clusters and social networks<sup>20</sup>. For instance, the Canadian government believes that by 2030, the wide adoption of AI and AI-based technologies could deliver an additional economic output of CAN\$13 tn (€8.3 tn), creating an increment in the country GDP of 1.2% a year<sup>21</sup>.

#### Digital Literacy Exchange Program<sup>22</sup>

This programme was established and funded with Budget 2017. The Budget 2017 foresees CAN\$29.5 million (€25 million) over a period of 5 years starting in 2017-2018. With this programme Canada aims to support basic and advanced education on digital skills to fill the digital divides, especially for seniors, low-income Canadians, Indigenous people and for people living in the not yet properly connected Northern regions. This will not only fill the gap around skills, but it will enable Canadians to make more informed decisions especially when asked consent to collect and tread data.

#### Global Skills Strategy<sup>23</sup>

This strategy was early announced in the 2016 Fall Economic Statement with the scope to attract and get access to larger talent pools from foreign countries for high-skilled workers and retain the talents already within the Canadian borders. With Budget 2019, the Canadian government has moved this strategy into a permanent programme to foster the economy and strengthen businesses. Thanks to the Global Skills Strategy, Canada was able to increase the share of foreign skilled workers adding more than 30 000 people to their current workforce. With Budget 2019, Canada committed to invest CAN\$35.2 million over five

<sup>20</sup> [https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00109.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00109.html)

<sup>21</sup> [https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00109.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00109.html)

<sup>22</sup> <https://www.ic.gc.ca/eic/site/102.nsf/eng/home>

<sup>23</sup> <https://www.investcanada.ca/programs-incentives/global-skills-strategy>



years (€29 million) beginning in 2019-2020 with CAN\$7.4 million (€6.2 million) a year.

### **National Cyber Security Strategy<sup>24</sup>**

In 2018, the government announced this strategy to create a framework to protect both citizens and businesses from cyber threats but also leverage opportunities created by the digital economy. In Budget 2019, it was envisioned to fund the creation of a critical infrastructure, for telecommunications, energy and transport sectors but also security guidance for SMEs, consolidation of different government-led operations into a single and new Canadian Centre for Cyber Security and a Cybercrime unit. This will be possible thanks to the strengthening of private-academic partnerships created to enhance R&D, commercialisation of technologies and creation of talent pipelines. On a more theoretical level, the National Cyber Security Strategy will create opportunities to renew or define new codes of practices, certifications and standards to create an agile and principle-based framework. Originally, in Budget 2018 the Canadian government committed a 5-year investment for a total of CAN\$507.7 million (€431 million) for strengthening cyber security and to that it added CAN\$108.8 million (€92 million) thereafter to fund the National Cyber Security Strategy. With Budget 2019, it was proposed to further consolidate the investments already made in Budget 2018 and it added CAN\$144.9 million (€123 million) over five years started in 2019-2020.

### **Cyber Security Innovation Network**

To support the constant growth of Canada's focus on cyber security, the Cyber Security Innovation Network is planned to enhance research and development, increase commercialisation and further support the development of skilled cyber security talent across Canada. This network will support research and development in cyber security by encouraging collaboration between Canada's post-secondary institutions, the private sector and other partners in order to accelerate the development of innovative cyber security products and services.

The Cyber Security Innovation Network, which will be formed by a combination of non-federal government partners like private sector, institutional governments and others, such as not-for-profit organisations and Canadian post-secondary institutions, is expected to have a contribution agreement up to CAN\$80 million (€54 million) over four years (2021-22 to 2024-25)

<sup>24</sup> <https://www.canada.ca/en/public-safety-canada/news/2018/06/national-cyber-security-strategy.html>

### **Innovation Superclusters Initiative<sup>25</sup>**

Originally included in the Budget 2017 under the Innovation and Skills Plan – other horizontal initiatives – it was transformed in a self-standing initiative – still under the Innovation and Skills Plan – in Budget 2018. With Budget 2019, the project obtained a federal investment of CAN\$950 million (€806 million) to operationalise the five industry-led innovation superclusters – digital technologies, food production, advanced manufacturing, artificial intelligence in supply chain management and ocean industries. These five clusters are expected to create more than 50 000 jobs and being worth around CAN\$50 billion (€42 billion) by 2029. These superclusters are intended to act as engines for growth as they should incentivise large-scale industry partnerships enlarging the industry reach to further key Canadian – and foreign – ecosystem players. Among the superclusters, the one dedicated to AI is shaping Canada as worldwide recognised hub for AI clustering it around four pivotal areas: Toronto-Waterloo, Montréal, Edmonton and Vancouver.

### **Innovative Solutions Canada<sup>26</sup>**

This project was started with Budget 2017 with a suggested investment up to CAN\$50 million (€42 million), starting from 2017-2018. The aim of this project is to build a government procurement programme able to allocate resources to early-stage research and development and late-stage prototypes directly sourced from Canadian (and foreigners living in Canada) innovators and entrepreneurs. As the government is allocating funds directly in sourcing these innovations it will have the chance to access to the latest and top-notch sources for products and services, creating a win-win solution for both the institution but also citizens and businesses. This project was already conceived to allow a greater scalability and extending the access to innovation sources to other lower level Canadian jurisdictions. With Budget 2019, this programme was moved under the bigger Innovation and Skills Plan umbrella with a rise in the monetary resources available to procure innovation. By the end of March 2020, funds to the programme was supposed to be raised over CAN\$100 million (€85 million) a year and up to the publication of Budget 2019, it launched 42 challenges in areas such as sustainable fishing, aquaculture, high energy lasers and plant pest detection.

<sup>25</sup> <https://www.ic.gc.ca/eic/site/093.nsf/eng/home>

<sup>26</sup> <https://www.ic.gc.ca/eic/site/101.nsf/eng/home>



### Intellectual Property Strategy<sup>27</sup>

The strategy was launched in 2018 to help entrepreneurs and businesses to better understand the complex intellectual property law and to ease the filing process for patents and trademarks. Canadian government committed to create the right cultural environment for businesses, creators, innovators and entrepreneurs to leverage the best possible resources in the Intellectual Property (IP) journey, especially when considering collective patents. Budget 2018 envisions the investment of CAN\$85.3 million (€72 million) over five years, beginning with 2018-2019 and foresees CAN\$10 million (€8.5 million) per year ongoing.

### Innovation Canada<sup>28</sup>

Budget 2017 suggests the establishment of a new platform led by the Innovation, Science and Economic Development Canada as coordinator of the entire project.

This is a programme launched in 2018 and from January 2018 to October 2019 the programme supported organisations and citizens in saving CAN\$340 000 million (€289 000 million) in hours spent in browsing for the right government support and schemes<sup>29</sup> as it works as one-stop-shop for innovators and innovative organisations. Innovation Canada acts also as a trusted service provider for SMEs to access to government tenders, innovation challenges, research themes and campaigns, export promotion support and other services that SMEs struggle to achieve on their own due to the small business size. With Budget 2018, Innovation Canada was repurposed into a consolidated programme with CAN\$13.5 million (€11.5 million) over 5 years, starting in 2018-2019 and provided with further funding of CAN\$3 million (€2.6 million) a year.

### Venture Capital Catalyst Initiative

Within the Innovation and Skills plan, the government of Canada is helping Canadian small and medium-sized businesses to scale up and access new markets through a strong venture capital ecosystem.

In fact, in 2019, Canada saw a total of CAN\$6.2 billion (€4 billion) of VC investment in

Canadian start-ups. Canada is now ranked third for VC investment according to the OECD<sup>30</sup>.

Canadian Government has made available CAN\$450 million (€382 million) through the Venture Capital Catalyst Initiative (VCCI) investing in large funds-of-funds that will support Canadian VC fund managers and in emerging and diverse managers, underserved regions and sectors alternative fund structures and clean technology firms.

### Pan-Canadian Artificial Intelligence Strategy<sup>31</sup>

This strategy is led by the Canadian Institute for Advanced Research (CIFAR) and is worth CAN\$125 million (€106 million). This strategy aims to promote collaboration, talent building and retention, information transfer, commercialisation of AI systems and solutions within and outside Canadian borders and shading the lights upon the four AI hubs (Innovative Superclusters Initiative). This strategy envisioned the creation of the International Panel on Artificial Intelligence (IPAI) that will lead the discussion around ethics, human-centricity in AI solutions and the role of responsibility in AI systems following the principles of human rights, inclusions, diversity, innovation and economic growth.

### Digital Research Infrastructure<sup>32</sup>

The Digital Research infrastructure (DRI) is a selection of big data tools and services to be deployed to transform big data into real breakthroughs. Funded with Budget 2018, the DRI envisioned CAN\$572.5 million (€486 million) over five years, plus CAN\$52 million (€44 million) per year to strengthen and integrate the backbone digital infrastructure for the research. This enables increased availability and openness of data sources and pools of data and equitable access to computing power across the Canadian regions. One of the most common examples of application is medical research in genomics which will be able to access advanced computing power to analyse genetic sequences into DNA chains.

<sup>27</sup> <https://www.ic.gc.ca/eic/site/108.nsf/eng/home>

<sup>28</sup> <https://www.ic.gc.ca/eic/site/080.nsf/eng/home>

<sup>29</sup> [https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00109.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00109.html)

<sup>30</sup>

[https://stats.oecd.org/Index.aspx?DataSetCode=VC\\_INVES](https://stats.oecd.org/Index.aspx?DataSetCode=VC_INVES)  
T

<sup>31</sup> <https://www.cifar.ca/ai/pan-canadian-artificial-intelligence-strategy>

<sup>32</sup> <https://www.ic.gc.ca/eic/site/136.nsf/eng/home>



## Bibliography

www.Canada.ca1Government of Canada for Innovation, Science and Economic Development  
« Innovation for a better Canada » available at  
[https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00051.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00051.html)

OECD 'Canada - Country statistical profile' <https://data.oecd.org/canada.htm>

KPMG 'Canada's Digital Future' <https://assets.kpmg/content/dam/kpmg/ca/pdf/2019/04/canadas-digital-future.pdf>

Deloitte 'Canada's AI Imperative: From Predictions to Prosperity'  
<https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/canada>

Global Legal Insights 'AI, Machine Learning and Big Data 2020'  
<https://www.globallegalinsights.com/practice-areas/ai-machine-learning-and-big-data-laws-and-regulations/canada>

Government of Canada – Renewable energy facts <https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/renewable-energy-facts/20069>

Government of Canada- Building a strong Middle Class 'Skills, Innovation and Middle Class Jobs'  
<https://www.budget.gc.ca/2017/docs/plan/chap-01-en.html>

Government of Canada – Innovation, Science and Economic Development Canada  
[https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00051.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00051.html)

Government of Canada – Canada's Digital Charter in Action: A Plan by Canadians, for Canadians -  
[https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00109.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00109.html)

Government of Canada – Digital Literacy Exchange Program  
<https://www.ic.gc.ca/eic/site/102.nsf/eng/home>

Invest in Canada – Global Skills Strategy <https://www.investcanada.ca/programs-incentives/global-skills-strategy>

Government of Canada- National Cyber Security Strategy <https://www.canada.ca/en/public-safety-canada/news/2018/06/national-cyber-security-strategy.html>

Government of Canada – Innovation Superclusters Initiative  
<https://www.ic.gc.ca/eic/site/093.nsf/eng/home>

Government of Canada – Innovative Solutions Canada <https://www.ic.gc.ca/eic/site/101.nsf/eng/home>

Government of Canada – Intellectual Property Strategy  
<https://www.ic.gc.ca/eic/site/108.nsf/eng/home>

Government of Canada – Innovation, Science and Economic Development Canada  
<https://www.ic.gc.ca/eic/site/080.nsf/eng/home>

Government of Canada – Canada's Digital Charter in Action  
[https://www.ic.gc.ca/eic/site/062.nsf/eng/h\\_00109.html](https://www.ic.gc.ca/eic/site/062.nsf/eng/h_00109.html)

Minister of Finance, House of Commons 'Investing in the Middle Class' Budget 2019  
<https://www.budget.gc.ca/2019/docs/plan/budget-2019-en.pdf>

Minister of Finance, House of Commons 'Equality Growth – a Strong Middle Class' Budget 2018  
<https://www.budget.gc.ca/2018/docs/plan/budget-2018-en.pdf>

Minister of Finance, House of Commons 'Building a strong Middle class' Budget 2017  
<https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>



## About the 'Advanced Technologies for Industry' project

The EU's industrial policy strategy promotes the creation of a competitive European industry. In order to properly support the implementation of policies and initiatives, a systematic monitoring of technological trends and reliable, up-to-date data on advanced technologies is needed. To this end, the Advanced Technologies for Industry (ATI) project has been set up. The project provides policymakers, industry representatives and academia with:

- Statistical data on the production and use of advanced technologies including enabling conditions such as skills, investment or entrepreneurship;
- Analytical reports such as on technological trends, sectoral insights and products;
- Analyses of policy measures and policy tools related to the uptake of advanced technologies;
- Analysis of technological trends in competing economies such as in the US, China or Japan;
- Access to technology centres and innovation hubs across EU countries.

You may find more information about the 16 technologies here: <https://ati.ec.europa.eu>.

The project is undertaken on behalf of the European Commission, Directorate General for Internal Market, Industry, Entrepreneurship and SMEs and the European Innovation Council and Small and Medium-sized Enterprises Executive Agency (EISMEA) by IDC, Technopolis Group, Capgemini, Fraunhofer, IDEA Consult and NESTA.

