
QUÉBEC AEROSPACE STRATEGY

REDEFINING THE

HORIZON

2016-2026

The Government of Québec would like to thank the organizations that provided the photos for this document.

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QUÉBEC AEROSPACE STRATEGY

REDEFINING THE
HORIZON

2016-2026



REDEFINING THE **HORIZON**

REDEFINING THE HORIZON MEANS IMPLEMENTING CONCRETE MEASURES TODAY TO ENSURE THE FUTURE PROSPERITY OF QUÉBEC'S AEROSPACE INDUSTRY, TO CREATE QUALITY JOBS AND WEALTH FOR ALL, AND TO HELP QUÉBEC STAND OUT EVEN MORE ON THE WORLD STAGE. REDEFINING THE HORIZON MEANS TAKING ACTION NOW TO LOOK TO THE FUTURE WITH CONFIDENCE.

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A WORD FROM THE PREMIER



Competitive industries are the foundation of any strong economy. Such industries generate wealth and create quality jobs. In the last 25 years, the aerospace industry has definitely stood out in this regard. But the rapidly evolving global landscape has prompted us to step up support to the industry by introducing the Québec Aerospace Strategy, which will help it soar to new heights and achieve its full growth potential.

This strategy stems from a large-scale mobilization of industry stakeholders, whose observations, ideas, and aspirations contributed to the development of about thirty concrete measures that will help us address current challenges and achieve our objectives. The strategy therefore reflects the ambitions of industry stakeholders responsible for promoting Québec's aerospace expertise and know-how throughout the world.

The time has come to join together and reinvent the horizon, seizing business opportunities today that will fuel tomorrow's success—success that will make us proud—proud of seeing an innovative homegrown industry establish itself as a world leader in its field.

A handwritten signature in black ink, consisting of a stylized 'P' and 'C'.

Philippe Couillard
Premier of Québec

REDEFINING THE
HORIZON

A WORD FROM THE MINISTER



Firmly rooted in Québec and especially in the Greater Montreal Area, the aerospace industry draws its strength above all from the remarkable synergy that exists between its various stakeholders. The latter roll out countless project initiatives that are highly beneficial to our economy. The Government of Québec is therefore taking it upon itself to support these innovative initiatives, guided by its three pillars of economic action: innovative manufacturers, exports, and entrepreneurship.

In addition to recognizing the industry and continuing industry consultations, the Québec Aerospace Strategy will bolster growth in this key sector, namely by supporting major investment projects and preparing a qualified workforce for the future. Industry diversification is also a priority, as the Government of Québec hopes to attract more major suppliers and take over emerging markets like the UAV market.

SME development will of course remain a focal point of government interventions while the Strategy will encourage the transition to Industry 4.0, boost exports, and foster SME innovation, namely through the development of new products and processes. Successful SMEs are undoubtedly key to a competitive and thriving industry.

A handwritten signature in blue ink, appearing to read 'D. Anglade'.

Dominique Anglade
Minister of Economy, Science, and Innovation
Minister responsible for the Digital Strategy

THE QUÉBEC AEROSPACE INDUSTRY: A SOURCE OF PRIDE

THE GOVERNMENT IS RELEASING THE 2016–2026 QUÉBEC AEROSPACE STRATEGY SO AS TO BUILD TOMORROW'S SUCCESS ON TODAY'S PERFORMANCES. ALONG WITH THE STRATEGY, THE GOVERNMENT HAS DEFINED AN INTERVENTION FRAMEWORK AND PRIORITIES TO SUPPORT AND STIMULATE FUTURE GROWTH IN THE SECTOR.

THE 2016–2026 QUÉBEC AEROSPACE STRATEGY IS ACCOMPANIED BY THE 2016–2021 FINANCIAL FRAMEWORK, WHICH SETS OUT THE MEASURES IMPLEMENTED OVER A FIVE-YEAR HORIZON AND CLARIFIES HOW THESE WILL BE FUNDED.



PHOTO:
Bombardier

The aerospace industry is a great source of pride for Québec. Having accomplished much and established a strong reputation within Canada and on the world stage, the industry showcases Québec's know-how and its ability to carve out a place for itself in the high-tech sector.

ONE OF THE MAIN INDUSTRIES DRIVING GROWTH AND PROSPERITY IN QUÉBEC

The aerospace sector plays a strategic role in Québec's economy as one of the main industries driving province-wide growth and wealth creation.

In 2015, the aerospace sector contributed 40,160 jobs to Québec, most of them skilled and well-paid. The sector comprised 190 companies with \$15.5 billion in total sales.

In 2014, over 80% of aerospace production was exported, accounting for 13.6% of Québec's manufacturing exports.

The aerospace industry is one of the most vibrant in Québec. Over the years, local stakeholders have made tremendous contributions to the global aerospace sector, positioning Québec as an industry leader.

Most Canadian aerospace operations are located in Québec. Québec companies are responsible for roughly 70% of Canada's R&D activities in this sector. In 2015, Québec accounted for more than half of Canadian aerospace sales and jobs.

A SPECIAL SYNERGY BETWEEN THE VARIOUS STAKEHOLDERS

Québec's aerospace industry is a genuine ecosystem featuring three groups of companies that have established close ties with one another:

- Four prime contractors lead the sector: Bombardier (commercial and business aircraft), Bell Helicopter Textron Canada (helicopters), CAE (flight simulators and training), and Pratt & Whitney Canada (engines). In 2015, these contractors accounted for about 73% of the sector's total sales.
- The second group includes about ten Tier 1 suppliers, equipment manufacturers, and major MRO (Maintenance, Repair & Overhaul) specialists. Tier 1 suppliers take charge of major components of projects led by prime contractors, sharing with them the risks inherent to new programs, both technical and financial. They account for 15% of the sector's sales.
- The third group of companies features Tier 2 or 3 suppliers, which are less directly involved in project implementation. The group also includes SMEs serving primarily as subcontractors for prime contractors and suppliers, directly or indirectly. This group accounts for nearly 12% of the sector's sales.

TABLE 1

QUÉBEC AEROSPACE SECTOR IN 2015		
CATEGORIES	COMPANIES	SALES (in \$billions)
Prime contractors	4	11.3
Tier 1 suppliers, equipment manufacturers, and major MRO specialists	10	2.3
Subcontractors (including SMEs)	177	1.9
TOTAL	191	15.5

Source: Direction du transport et de la logistique, Ministère de l'Économie, de la Science et de l'Innovation.



PHOTO: CAE

FOUR PRIME CONTRACTORS, TRUE LEADERS OF QUÉBEC'S AEROSPACE SECTOR

Québec's aerospace sector is structured around four prime contractors: Bombardier, Bell Helicopter Textron Canada, CAE, and Pratt & Whitney Canada.

Together, these four companies employ nearly 24,600 people in Québec.

BOMBARDIER

Headquartered in Montréal, Bombardier is a global leader in plane and train manufacturing. The company's aerospace activities are broken down into three main divisions: business aircraft (Challenger, Global, and Learjet), commercial aircraft (C Series, CRJ, and Q400), and, aerostructures and engineering services. The company has 70,900 employees worldwide, including 23,000 in Canada.

BELL HELICOPTER TEXTRON CANADA

Headquartered in Fort Worth, Texas, Bell Helicopter Textron has over 7,500 employees worldwide, including 950 at its Mirabel plant in Québec, where it assembles civil helicopters. Bell Helicopter Textron Canada is also world-renowned for its expertise in other fields such as cell design, certification, composite parts manufacturing, customization, and technical support. The Mirabel plant also provides technical support to the Department of National Defence for its fleet of Bell CH146 (Griffon) aircraft.

CAE

Headquartered in Montréal, CAE is a global leader in civil aviation, defence, security, and healthcare training delivery. The company has chiefly built its reputation on simulation technology. It has 8,000 employees worldwide, a network of 160 facilities and training centres across 35 countries, and the largest fleet of full-flight simulators in the world. Each year, CAE trains over 120,000 civil and military crew members and thousands of healthcare professionals.

PRATT & WHITNEY CANADA

Pratt & Whitney Canada is wholly owned by United Technologies Corporation, which is headquartered in Farmington, Connecticut. The company produces engines for regional transport aircraft, general and business aviation, and helicopters. Based in Longueuil, Québec, Pratt & Whitney Canada employs 8,800 people worldwide, including 6,200 in Canada.

MDA: A MAJOR PLAYER IN THE CANADIAN SPACE SECTOR

MacDonald, Dettwiler and Associates (MDA) is an information and communications company providing operational solutions to commercial and government organizations around the world. Headquartered in Richmond, British Columbia, it has over 4,800 employees spread across 11 locations, most of which are in Canada or the United States. Its Satellite Systems division in Sainte-Anne-de-Bellevue, which employs nearly 800 employees and is part of its communications component, specializes in satellite system manufacturing and assembly.

CONSULTATION NETWORKS AND ORGANIZATIONS

The Québec aerospace sector is structured around consensus networks and organizations.

- Various organizations mobilize the sector, including Aéro Montréal and Comité sectoriel de main-d'œuvre en aérospatiale du Québec (CAMAQ).
- Some sectoral groups also play a role in the industry mobilization, such as Consortium de recherche et d'innovation en aérospatiale au Québec (CRIAQ).



PHOTO: MDA

THREE SECTORAL CONSULTATION AND MOBILIZATION ORGANIZATIONS

The Government of Québec has set up three organizations to oversee Québec aerospace industry consultation and mobilization.

AÉRO MONTRÉAL

Aéro Montréal is a strategic forum bringing together the leading figures of Québec's aerospace industry, educational institutions, research centres, associations, and unions. Aéro Montréal's mission is to mobilize Québec's aerospace cluster with a view to sustaining the sector's growth and raising its profile on the world stage. Aéro Montréal also serves as the industrial cluster's voice with respect to various entities, in particular governments and the media.

COMITÉ SECTORIEL DE MAIN-D'ŒUVRE EN AÉROSPATIALE DU QUÉBEC (CAMAQ)

CAMAQ (Québec aerospace human resources sectoral committee) includes representatives of aerospace, air transport, and airport companies and employees. Its mission is to promote workforce excellence and development to meet worker and business needs. CAMAQ addresses industry workforce and training needs by facilitating dialogue between company, union, and academic representatives.

CONSORTIUM DE RECHERCHE ET D'INNOVATION EN AÉROSPATIALE AU QUÉBEC (CRIAQ)

CRIAQ (Québec consortium for aerospace research and innovation) is an organization promoting collaborative research between companies of all sizes, universities, colleges, and research centres. Its goals are to boost industry competitiveness, improve collective knowledge, and train the next generation of workers. CRIAQ optimizes collaborative research between universities and the industry.

CRIAQ inspired the Consortium for Aerospace Research and Innovation in Canada (CARIC), which is identical in purpose and structure but covers all of Canada.

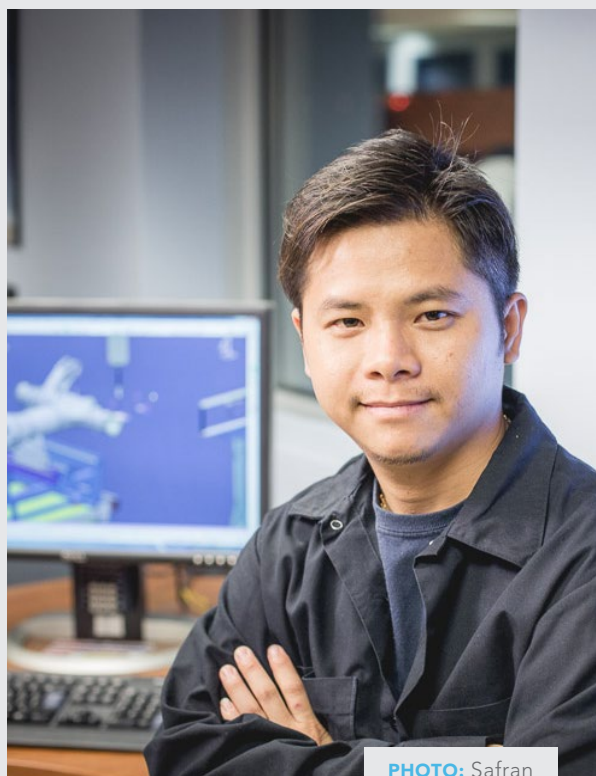


PHOTO: Safran

A WORLD-CLASS EDUCATIONAL SYSTEM FOR TOP-QUALITY TRAINING

Québec's aerospace workforce is highly skilled, benefitting from excellent training programs offered at universities, colleges, and vocational schools. Many educational institutions offer a range of aerospace programs.

ORGANIZATIONS SUPPORTING INNOVATION

Many organizations support SME innovation, such as Centre technologique en aérospatiale (aerospace technology centre) and National Research Council Canada's Aerospace Manufacturing Technologies Centre.

INTERNATIONAL ORGANIZATIONS

A number of well-known international aviation organizations are headquartered in Montréal. Prominent ones include the International Civil Aviation Organization (ICAO), the International Air Transport Organization (IATA), and the International Federation of Air Line Pilots' Associations (IFALPA).

AEROSPACE STUDY PROGRAMS

A full range of high school-, college-, and university-level aerospace programs are available in Québec.

HIGH SCHOOL

At the high school level, École des métiers de l'aérospatiale de Montréal trains skilled and specialized workers to meet the industry's special needs. The facility is Canada's very first school plant. École des métiers de l'aérospatiale de Montréal offers various training programs leading to vocational diplomas or attestations of vocational specialization.

COLLEGE

At the college level, École nationale d'aérotechnique is the largest aerotechnical learning institution in North America. In Québec, École nationale d'aérotechnique is the only educational institution training aviation technicians. It's also one of the rare schools the Department of National Defence has authorized to train military personnel in aircraft maintenance.

UNIVERSITY (UNDERGRADUATE)

Many undergraduate programs offer basic engineering training and aerospace specialization courses. Also, Concordia University and École polytechnique de Montréal both offer a full aerospace engineering undergraduate program.

UNIVERSITY (GRADUATE)

Joint master's and doctoral programs in aerospace engineering are offered at École de technologie supérieure, École polytechnique de Montréal, Concordia University, Université Laval, McGill University, and Université de Sherbrooke.

TAX INCENTIVES AND LOW OPERATING COSTS

Québec's aerospace sector benefits from tax incentives and low operating costs to help attract investment. Taxes and operating costs are key factors in determining where companies establish new subsidiaries and major projects. In both regards, the province of Québec and its major cities have a serious competitive edge.

In its most recent Competitive Alternatives study,¹ KPMG ranked Québec City and Montréal first and fourth in terms of manufacturing business costs compared to many cities in the U.S. Northeast and Canada. It also ranked Montréal third in relation to major international cities. In Canada, Montréal is ahead of Toronto and Vancouver. Internationally, Montréal is only surpassed by two Mexican cities.

Manufacturers enjoy many attractive benefits in Québec that help promote the aerospace sector. Here are the main ones:

- Tax holidays for major investment projects
- Tax credits for scientific research and experimental development
- Tax credits for private precompetitive research partnerships
- Tax holidays for foreign researchers and experts



PHOTO:

Pratt and Whitney Canada

PLANNING FOR A SUCCESSFUL TOMORROW

Québec has built an impressive aerospace industry that plays a key role on the global stage. The Government of Québec intends to leverage its outstanding results so as to ensure future success.

The international aerospace industry is going through some major changes. The supply chain is going global and is increasingly reliant on a handful of prime contractors and Tier 1 suppliers, production is moving to countries with low labour costs, and environmental regulations — especially those relating to GHG emissions — present an added challenge for the industry.

1. KPMG, *Competitive Alternatives 2016*, March 2016.

To benefit from growing demand, Québec companies and organizations must adapt to and take advantage of major global trends, namely by innovating, investing in the workforce, diversifying itself, and becoming more competitive. For its part, the Government of Québec must support companies and organizations and provide them with suitable tools to reinforce their strong position and make the most of new business opportunities.

By adopting the 2016–2026 Québec Aerospace Strategy and allocating substantial resources to it, the government is looking to maintain Québec's aerospace industry as one of the most innovative, competitive, and diversified in the world.

The future success of Québec's aerospace sector will benefit Québec's economy as a whole, creating jobs and wealth and contributing to Québec's prosperity.

STRENGTHEN AND DIVERSIFY THE INDUSTRY STRUCTURE

BOLSTER INDUSTRY GROWTH: SUPPORT PROJECTS AND INVEST IN THE WORKFORCE

ASSIST SMEs IN THEIR DEVELOPMENT

PROMOTE INNOVATION

FOUR PRIORITIES

The 2016–2026 Québec Aerospace Strategy revolves around four priorities aimed at making the most of Québec's current assets and the growth opportunities emerging from the changing global market.

STRENGTHEN AND DIVERSIFY THE INDUSTRY STRUCTURE

The industry structure must be strengthened and diversified. In today's ecosystem, Québec has everything to gain from encouraging prime contractors and businesses to set up shop in the province so as to fully expand its network of prime contractors and Tier 1 and 2 suppliers.

Québec's aerospace sector must also take advantage of new products and needs to further diversify its activities. The Québec Aerospace Strategy specifically targets security and defence activities, as well as the very promising UAV industry and civil UAV applications.

BOLSTER INDUSTRY GROWTH: SUPPORT PROJECTS AND INVEST IN THE WORKFORCE

The government will support business projects and invest in the workforce to bolster aerospace industry growth.

The aerospace sector will be developed through major projects often requiring substantial technical and financial resources. Thus, the Québec Aerospace Strategy's second priority is to bolster industry growth by supporting major projects of companies of any size.

Bombardier's C Series project is a great example of what Government of Québec funding can help accomplish. The aerospace industry's future depends on its ability to carry out projects that will allow businesses to meet future markets' needs.

The Québec aerospace industry's greatest asset is its skilled workforce. Human resource development, including training the next generation of workers, will be key to bolstering industry growth.

ASSIST SMEs IN THEIR DEVELOPMENT

Québec aerospace SMEs are subcontracted for a fraction of the sector's activities. The vitality of Québec's aerospace sector depends in part on SME innovation and their ability to adapt to new industry practices.

Aerospace SMEs have many challenges ahead. They need to get more integrated into the global supply chain, meaning that they will have to be bigger, stronger, and more competitive. To become established at the international level, they will need to successfully transition to new information and communications technology and adopt effective policies to conquer export markets.

The Québec Aerospace Strategy's third priority is dedicated to SMEs and aims to help them integrate new information and communications technology, i.e., to help them transition to Industry 4.0, complete mergers and acquisitions essential to growth, and increase their share of export markets.

PROMOTE INNOVATION

Innovation will be the key to any future success. For Québec's aerospace industry to grow, companies will have to innovate, invest in the development of new products and processes, and use research findings to drive innovation.

This push for innovation—the fourth priority—applies to all companies in the sector, big or small.

A \$250 MILLION FINANCIAL FRAMEWORK

The government has defined specific objectives based on the four identified priorities and developed a set of measures, which it is now announcing along with funding for the 2016–2021 period.

The 2016–2026 Québec Aerospace Strategy will operate within a financial framework of some \$250 million for the period of 2016–2021, including both self-financing measures and additional contributions which will help support an estimated \$2.8 billion in investments. The framework was announced in the 2016–2017 Budget, and the government is now providing details on its various components.

It should be noted that the 2016–2026 Québec Aerospace Strategy will be implemented in such a manner as to be consistent with economically related government strategies, in particular the future Québec Digital Strategy and Export Strategy.

THE QUÉBEC AERONAUTICAL INDUSTRY DEVELOPMENT STRATEGY (2006)

Over the last ten years, government involvement in the aerospace sector has been guided by the Québec Aeronautical Industry Development Strategy, adopted in 2006.

From 2006 to 2016, the government contributed over \$700 million to aerospace business projects with a total value of \$5.7 billion.

A STRATEGY BASED ON EXTENSIVE INDUSTRY CONSULTATION

The 2016–2026 Québec Aerospace Strategy is based on extensive industry consultation. The government felt it was crucial that the observations, ideas, and visions of businesses and organizations in the aerospace industry be taken into account.

Industry stakeholders were given the opportunity to contribute at every phase of the strategy's development.

35 ORGANIZATIONS CONSULTED

To develop the strategy, the government consulted 35 organizations, including companies, associations, educational institutions, unions, and a technology transfer college centre.

RENDEZ-VOUS DE L'AÉROSPATIALE

The consultation produced over 150 proposals that were analyzed, synthesized, and approved by about 60 key industry stakeholders at the Aerospace Event held March 7, 2016.

A large white aircraft fuselage section is mounted on a complex test rig in a wind tunnel. The rig features several black hydraulic arms and yellow flexible hoses. The aircraft section has a spiral staircase on its side and is labeled 'AW139' and 'ROTORSIM'. The background shows the interior of a large industrial facility with a high ceiling and other structural elements.

1

STRENGTHEN AND DIVERSIFY THE INDUSTRY STRUCTURE

PHOTO: CAE

1

STRENGTHEN AND DIVERSIFY THE INDUSTRY STRUCTURE

The 2016–2026 Québec Aerospace Strategy’s first priority is to both strengthen and diversify the industry structure.

For this purpose, the government has established three objectives:

- Attract prime contractors and Tier 1 and 2 suppliers
- Promote and reinforce the defence and security sectors
- Develop the UAV sector and civil UAV applications

1.1 ATTRACT PRIME CONTRACTORS AND TIER 1 AND 2 SUPPLIERS

The strategy’s first objective is to strengthen Québec’s aerospace sector by acting upon its ecosystem.

We have highlighted the key role prime contractors and Tier 1 suppliers play. The four current prime contractors, who account for three quarters of sales, are the true leaders of Québec’s aerospace industry. Many Tier 1 suppliers share development and financing risks with these prime contractors by taking charge of major components of their projects.

The government’s strategy is to reinforce the ecosystem by attracting new prime contractors to Québec, by rounding out the range of Tier 1 suppliers already established in Québec, and by extending these prospecting efforts to Tier 2 suppliers.

To that end, the government has developed three initiatives.

AEROSPACE TASK FORCE

With a view to coordinating prospecting efforts intended to attract prime contractors and Tier 1 and 2 suppliers, the government will establish an aerospace task force to be administered by Ministère de l’Économie, de la Science et de l’Innovation.

The task force will comprise actors involved in foreign investment prospecting, namely Investissement Québec and Montréal International, and will work in partnership with the industry.

The task force will establish the means required to attract desired investments.



PHOTO:

Pratt and Whitney Canada

INVESTISSEMENT QUÉBEC AND MONTRÉAL INTERNATIONAL

INVESTISSEMENT QUÉBEC

Investissement Québec's mission is to contribute to Québec's economic growth, in accordance with the government policy. To accomplish its mission, Investissement Québec supports the creation and development of businesses of all sizes through adapted solutions and investments in order to complete its partners' offerings.

In accordance with its government mandate, Investissement Québec also prospects for foreign investment and carries out strategic interventions.

In 2014-2015, Investissement Québec's prospecting activities helped shape 62 international company projects with a total value of \$1 billion. These projects should ultimately create or sustain 3,400 jobs.

MONTRÉAL INTERNATIONAL

Montréal International is a non-profit organization funded by the Government of Québec, Communauté métropolitaine de Montréal, Ville de Montréal, the Government of Canada, and the private sector.

Montréal International's mandate is to attract foreign investment, international organizations, and strategic talent to the metropolitan area, and to promote Greater Montréal's competitive environment. In 2015, Montréal International supported the establishment, expansion, and retention of 48 foreign company subsidiaries in Greater Montréal, helping bring in \$1 billion in direct foreign investment. These projects will help to create or sustain close to 3,500 jobs in the next three years. Nearly three quarters of announced investments concern high-tech sectors.



SUPPORT FOR FEASIBILITY STUDIES TO ENCOURAGE INVESTMENT IN QUÉBEC

Feasibility studies are conducted before investment decisions are made. These studies can include market analyses; process, technology, and user fee assessments; site selection analyses; and legal and regulatory framework studies.

Ministère de l'Économie, de la Science et de l'Innovation supports businesses looking to invest in Québec through the Investment Project Realization Support component of the PME en Action Program.

Above all, this funding is meant to encourage foreign businesses to thoroughly assess the benefits of setting up operations in Québec.

FINANCIAL SUPPORT TO ATTRACT FOREIGN INVESTMENT

With a view to attracting prime contractors and Tier 1 and 2 suppliers, Ministère de l'Économie, de la Science et de l'Innovation will be committing \$150 million to a funding envelope over five years as part of the Economic Development Fund.

This financial support should help attract an estimated \$825 million in private investments over the same period. The measure will have an estimated \$57.4 million budgetary impact for the period 2016–2021.

The funding envelope will allow the ministry to move quickly to attract target investments based on opportunities discovered through prospecting.

PROMOTION OF QUÉBEC AEROSPACE INDUSTRY

Major international aerospace events are an opportunity to promote the strengths of Québec's aerospace industry—especially its highly skilled workforce—and to meet leaders of major international companies already established in Québec or likely to move into the region.

Such events are also of great interest to participating SMEs as they allow them to target potential business partners, promote sales in foreign markets, and stay abreast of the industry's latest technology and market trends.



PHOTO: Shutterstock

Under the Québec Aerospace Strategy, the Government of Québec will help promote Québec's industry and its strengths at major international trade shows such as:

- The International Paris Air Show in France
- The Farnborough International Airshow in the United Kingdom
- The NBAA Convention & Exhibition in the United States

Ministère de l'Économie, de la Science et de l'Innovation will invest \$1.7 million to this end over the next five years.

1.2 PROMOTE AND REINFORCE THE SECURITY AND DEFENCE SECTORS

THE DEFENCE SECTOR

The defence component of the aerospace industry is quite substantial. However, this component is underdeveloped in Québec, accounting for only 7% of all aerospace revenues in 2015.

The federal government has no military aircraft development program. As such, Québec's aerospace industry must rely on Canada's Industrial and Technological Benefits Policy to take advantage of foreign aircraft defence procurement contracts.

Canada's Industrial and Technological Benefits Policy aims to ensure that companies awarded defence procurement contracts valued over \$100 million undertake business activity in Canada worth at least as much. The Québec Aerospace Strategy will use this lever to diversify the industry in Québec by increasing access to defence and security markets.

THE SECURITY INDUSTRY

The security industry includes all suppliers of goods and services intended to protect people, facilities, institutions, and companies.

Some components of the security industry are connected to the aerospace sector, including anything related to remote sensing systems, guidance systems, communications protection systems, optoelectronics, tracking technology, and artificial intelligence.

The security industry also covers airport security, i.e., access control systems, video surveillance, and baggage and passenger inspection systems.

The defence and security industries are closely connected. Maximizing defence sector industrial benefits should therefore also produce benefits for security companies.

The government is announcing four initiatives to promote and reinforce the defence and security sectors.

CAE: A MAJOR DEFENCE STAKEHOLDER

CAE's Defence and Security division helps customers be fully prepared for any mission. CAE is a world-class training system integrator offering a wide range of training centres and services and simulation products in the air force, army, navy, and public security market segments.

ESTABLISHMENT OF CROISSANCE SÉCURITÉ DÉFENSE QUÉBEC

In collaboration with the industry, Ministère de l'Économie, de la Science et de l'Innovation will be establishing Croissance Sécurité Défense Québec, an online portal providing a range of services to businesses and organizations looking to expand their operations in the defence and security sectors.

- Croissance Sécurité Défense Québec will provide technical information, support, and representation services.
- The portal will include a map of Québec's defence and security sectors, showcasing Québec's strengths and making it easier to promote them at major international trade events.
- Croissance Sécurité Défense Québec will inform businesses, especially SMEs, about Canada's Industrial and Technological Benefits Policy, to make sure they take full advantage of defence procurement contracts awarded by the Government of Canada.
- Croissance Sécurité Défense Québec will work together with Canada Economic Development for Quebec Regions to promote the portal and maximize its content.

In the next three years, Ministère de l'Économie, de la Science et de l'Innovation will invest \$600,000 in the portal and its support services.

DEVELOPMENT FUND FOR SECURITY AND DEFENCE SECTORS

Efforts will be made so Québec can make the most of the Industrial and Technological Benefits Policy.

The Government of Québec will assess the possibility of establishing an investment fund in partnership with private investors and with the participation of generally foreign contractors having obtained defence procurement contracts from the federal government, which makes them subject to the Industrial and Technological Benefits Policy.

The fund's purpose would be to stimulate investments providing industrial and technological benefits to Québec SMEs and to boost business opportunities through market diversification.

It could invest in Québec businesses, in particular to strengthen supply chains in the defence and security sectors.

The government will be initiating discussions with major contractors in the coming months.

COOPERATION WITH CANADA ECONOMIC DEVELOPMENT

It is crucial that Québec businesses involved in high-value-added sectors—such as the aerospace sector—be kept abreast of federal defence contract-related business opportunities.

Together with Canada Economic Development for Quebec Regions, Ministère de l'Économie, de la Science et de l'Innovation will be formalizing a collaborative information sharing and dissemination process. The goal is to better target business opportunities for Québec businesses and to help the latter make the most of the Industrial and Technological Benefits Policy.

INTERACTION WITH FEDERAL GOVERNMENT

The Government of Québec will engage with the federal government to make sure Québec fully benefits from any direct or indirect industrial and technological benefits arising from federal defence and security procurement programs, especially with regard to the space industry.



PHOTO: CAE

1.3 DEVELOP THE UAV SECTOR AND CIVIL UAV APPLICATIONS

The UAV sector is one of the main emerging aerospace markets. Global UAV sales hit US\$4 billion in 2015. According to Teal Group, that number should more than triple, increasing to US\$25 billion by 2025.

The UAV market is primarily focused on military needs. However, civil UAVs are expected to experience the strongest growth in the next ten years.

The UAV sector, especially with respect to civil UAVs, is very promising for the Québec aerospace industry. The fact that UAV technology will likely find application in other aerospace sectors makes it all the more appealing. It should be noted that civil UAV applications will be immensely beneficial to many industries, some of which are well-established in Québec. These include the energy, telecommunications, natural resource, security, and surveillance sectors

To further diversify Québec's aerospace sector and seize the most promising growth opportunities, the Québec Aerospace Strategy features two initiatives aimed at developing a strong UAV sector in Québec. The strategy specifically targets civil UAV applications.

DEVELOPMENT SUPPORT FOR THE CIVIL UAV INDUSTRY

The Saguenay–Lac-Saint-Jean region has built a reputation for its UAV expertise, in particular with the establishment of the UAS Centre of Excellence in Alma.

The Government of Québec will invest in this expertise by supporting the development of a regional ecosystem dedicated to civil UAVs. Ministère de l'Économie, de la Science et de l'Innovation will invest \$1 million in the sector over the next five years.



PHOTO:

UAS Centre of Excellence

UAV SYSTEM PREQUALIFICATION CENTRE

With the UAS Centre of Excellence in Alma, Québec has the only facility dedicated to civil and commercial UAVs in eastern Canada.

To take advantage of this asset, the Government of Québec will work together with the UAS Centre of Excellence and Transport Canada to develop a UAV system prequalification test centre whose mission will be as follows:

- Help develop sector regulations and introduce new quality standards.
- Give the industry the ability to test equipment and research results in operating situations. To that end, the centre will build facilities that reflect actual working environments.

It will take an estimated \$2.5 million in investment to establish the UAV system prequalification centre. Ministère de l'Économie, de la Science et de l'Innovation will cover a third of this investment, for a contribution of \$800,000.

UAS CENTRE OF EXCELLENCE IN ALMA

The UAS Centre of Excellence in Alma opened in 2011. Its mission is to become an international centre of knowledge, services, and innovation for everything relating to UAV design, application, and operation.

The Centre performs both ground and flight tests. Its activities are focused on UAV R&D, maintenance, and operation.

It provides hangar space for storing or altering aircraft. Operations specialists are also available, as is training for operators and technical staff.

The UAS Centre of Excellence recently acquired the rights to restricted airspace. Thanks to this initiative, the Centre is now the only place in Québec where UAVs can be flown out of sight.



PHOTO:

UAS Centre of Excellence

TABLE 2

**FINANCIAL IMPACT OF THE QUÉBEC
AEROSPACE STRATEGY – PRIORITY 1** (in \$million)

	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL ¹
1. STRENGTHEN AND DIVERSIFY THE INDUSTRY STRUCTURE						
1.1. ATTRACT PRIME CONTRACTORS AND TIER 1 AND 2 SUPPLIERS						
• Aerospace task force	-	-	-	-	-	-
• Financial support to attract foreign investment	6.7	10.7	13.4	13.4	13.4	57.4
• Promotion of Québec aerospace industry	0.3	0.3	0.3	0.3	0.3	1.7
1.2. Promote and reinforce the defence and security sectors						
• Establishment of Croissance Sécurité Défense Québec	0.2	0.2	0.2	-	-	0.6
• Development fund for security and defence sectors	-	-	-	-	-	-
• Cooperation with Canada Economic Development	-	-	-	-	-	-
• Interaction with federal government	-	-	-	-	-	-
1.3. Develop the UAV sector and civil UAV applications						
• Development support for the civil UAV industry	0.2	0.2	0.2	0.2	0.2	1.0
• UAV system prequalification centre	0.4	0.4	-	-	-	0.8
TOTAL – PRIORITY 1¹	7.8	11.8	14.1	13.9	13.9	61.5
Including additional budgetary allocation	0.8	0.8	0.4	0.2	0.2	2.4

Note: Unless otherwise noted, Ministère de l'Économie, de la Science et de l'Innovation is in charge of implementing the measures.

1. Data rounded to nearest tenth—totals based on actual values.

2

BOLSTER INDUSTRY GROWTH:

SUPPORT PROJECTS
AND INVEST IN THE
WORKFORCE

PHOTO:

École nationale d'aérotechnique

2

BOLSTER INDUSTRY GROWTH: SUPPORT PROJECTS AND INVEST IN THE WORKFORCE

The 2016–2026 Québec Aerospace Strategy’s second priority involves bolstering industry growth by supporting projects and investing in the workforce.

The government has two objectives to bolster industry growth:

- Support the projects of companies of all sizes
- Invest in the workforce, the industry’s greatest asset

2.1 SUPPORT PROJECTS

Aerospace sector development is structured around investment projects, especially those involving the design, development, and production of aircraft models meeting target market needs.

Overall, growth prospects for the aerospace market look promising. According to IATA, global air transport demand went up 6.5% in 2015.

- Over the next 20 years, an estimated 38,000 commercial planes (of all sizes) will have to be purchased around the world to meet demand.
- Demand for 100–150-seaters is expected to soar as current models become obsolete and planes equipped with new technology are introduced.



PHOTO: Safran

- Growth prospects for business aviation are also positive. According to Bombardier and Embraer’s most recent forecasts, nearly 9,000 business jets should be delivered from 2015 to 2024. According to Bombardier, midsize, large-cabin business jets should account for 85% of sales in the medium term.
- According to Honeywell Aerospace, global civil helicopter production should reach 4,300 to 4,800 units between 2016 and 2020, a 12% increase compared to the previous five-year period.

Growth forecasts for the global aerospace market are therefore encouraging—the challenge will be in designing and building aircraft that meet the future needs of target markets.

SUPPORT FOR MAJOR INVESTMENT PROJECTS

The Government of Québec's support in developing Bombardier's C Series demonstrates its willingness to back major investment projects, on which the sector's future growth and development will depend.

When it decided to develop the C Series, Bombardier invested heavily in a highly promising vision of commercial aviation, targeting a specific niche and deploying the considerable technical and financial resources required to make it happen. The aircraft's technical results have shown that the investment was worth it. The new plane has exceeded target performance levels. Now, the ambitious project is picking up steam—the CS100 was just certified and the CS300 should soon follow.

Much of Québec's aerospace sector's future will hinge on C Series' success, so supporting it was an easy decision: the Government of Québec contributed US\$1 billion to the project.

SUPPORTING PROJECTS

This assistance is directly in line with the government strategy to support major Québec aerospace investment projects.

The Québec Aerospace Strategy provides for \$210 million in government contributions over the next five years, for a budget impact of \$68.6 million over the same period.

To support major investment projects, the government will make contributions through the Economic Development Fund, with Investissement Québec acting on its behalf. Some of this funding is associated with Ministère de l'Économie, de la Science et de l'Innovation's ESSOR Program. The purpose of the ESSOR Program is to support investment projects in Québec to promote competitiveness, job creation, and sustainable development.

According to estimates, the \$210 million earmarked for major investment projects under the Strategy should help implement private investment projects with a total value of nearly \$1.2 billion.



PHOTO: Sonaca

PERFORM STRATEGY SERVICES

Ministère de l'Économie, de la Science et de l'Innovation's perform strategy provides many ways to support SME projects:

- Strategic support and advice through the preliminary analysis of seven corporate functions to determine their respective challenges and needs and set financing priorities accordingly
- Made-to-measure financial package in collaboration with Investissement Québec
- Advanced training
- Access to a network of acknowledged experts

Businesses benefitting from the perform strategy can count on the support of a fast-track team made up of Investissement Québec, Export Québec, and Emploi-Québec representatives.

SUPPORT FOR SME GROWTH PROJECTS

Project support is not limited to big companies. The Québec Aerospace Strategy is intended to support SME projects as well.

- Dynamic Québec aerospace SMEs can get support for their projects as part of the perform strategy, a fast-track strategy for successful company projects. The goal is to establish business partnerships with innovative organizations and exporters recognized for their excellence by their peers.
- Together with five investment partners, the government announced on February 12, 2015, that a \$50 million fund would be established so SMEs—including those in Québec's aerospace industry—could have access to the capital they need to finance their projects. The five investment partners are Caisse de dépôt et placement du Québec, Capital régional et coopératif Desjardins, Fondation CSN, Fonds de solidarité FTQ, and Investissement Québec.



PHOTO:

Bell Helicopter Textron Canada

2.2 INVEST IN THE WORKFORCE

The Québec Aerospace Strategy calls for investment in the workforce—the industry’s greatest asset—through a series of initiatives concerning the next generation of workers, including in-house human capital development.

INITIATIVES TO AROUSE YOUTH INTEREST IN AEROSPACE

By being successful, innovative, and stimulating, the aerospace sector is inspiring all of us, as well as creating high-quality, well-paid jobs.

To ensure that the next generation is ready to step in and sustain the industry’s long-term growth, the government will be introducing or continuing awareness initiatives aimed at attracting young people to the aerospace sector. These initiatives will start as early as primary school.

The Québec Aerospace Strategy has earmarked \$600,000 for this purpose for the next five years.



PHOTO:

École polytechnique de Montréal

PASSION FOR FLIGHT

Passion for Flight is a Bombardier project implemented in collaboration with Aéro Montréal to generate youth interest in science and technology—especially aerospace—while also encouraging student retention.

Passion for Flight leverages the industry’s high profile in Québec to inspire today’s youth to pursue a career in the strategic sector later on.

PROMOTION OF AEROSPACE TRADES AND ASSOCIATED STUDY PROGRAMS

Many people have no idea of the quality and diversity of aerospace jobs. As part of the Québec Aerospace Strategy, the Government of Québec will do more to promote these jobs, especially those in high demand.

These initiatives will be aimed at the general public, but will specifically target women, adults returning to school, and immigrants, in order to get more of them involved in the aerospace industry.

The government has had a process for determining company needs since 2011. In collaboration with Emploi-Québec and Ministère de l'Éducation et de l'Enseignement supérieur, Commission des partenaires du marché du travail carries out prioritization exercises on vocational and technical training needs. The idea is to make sure the training offering better reflects market needs. A trades list is submitted to Ministère de l'Éducation et de l'Enseignement supérieur so that vocational and technical training can be developed accordingly.

TWO JOBS IN HIGH DEMAND

Many aerospace professions need more skilled workers. This is particularly true of the following two specializations, for which study programs are available.

Aircraft instrument, electrical, and avionics mechanics, technicians, and inspectors (technical diploma in avionics)

These workers install, adjust, repair, and overhaul aircraft instrument, electrical, or avionics systems. This category also includes avionics inspectors who inspect instrument, electrical, and avionics systems following assembly, modification, repair, or overhaul. These specialists are employed by aircraft manufacturing, maintenance, repair, and overhaul establishments and by airlines and other aircraft operators.

Aircraft mechanics and aircraft inspectors (technical diploma in aircraft maintenance)

Aircraft mechanics maintain, repair, overhaul, modify, and test aircraft structural, mechanical, and hydraulic systems. Aircraft inspectors inspect aircraft and aircraft systems following manufacture, modification, maintenance, repair, or overhaul. These specialists are employed by aircraft manufacturing, maintenance, repair, and overhaul establishments, and by airlines and other aircraft operators.

INTERNSHIPS

Learning on the job is beneficial in a number of ways.

- Students who get the opportunity to do internships or part of their training in the workplace are better prepared to meet company needs.
- Companies that accept interns have easier access to skilled workers who meet their needs.

Under the Québec Aerospace Strategy, the government will lean on two programs to promote internships:

- The vocational and technical internship incentive program, the purpose of which is to help companies by covering part of the costs associated with providing internships.
- Ministère de l'Économie, de la Science et de l'Innovation's innovation internships program, designed to give college and university students the opportunity to get hands-on experience during their studies, facilitating knowledge transfer.

The ministries in question are responsible for funding their own programs.



PHOTO: Safran

IN-HOUSE SKILLS DEVELOPMENT

TRAINING FOR MAJOR PROJECTS

Carrying out major economic projects often means having to teach employees new skills.

The Québec Aerospace Strategy provides for this by funding in-house training relating to growth, new market development, facility upgrades, or business process re-engineering.

This support is provided by the major economic project training program, managed by Emploi-Québec. Over the last three years, nine major economic projects by aerospace product manufacturers have been approved by Commission des partenaires du marché du travail. A total of \$7.4 million has been awarded to these projects as grants, creating 2,295 new jobs and saving 375 more.

ONGOING SKILLS DEVELOPMENT

The Québec Aerospace Strategy will rely on various tools managed by Emploi-Québec, Commission des partenaires du marché du travail, and Ministère de l'Économie, de la Science et de l'Innovation for in-house human capital development.

- Commission des partenaires du marché du travail provides financial support for training projects related to the arrival of new technology. For grants to be awarded, investments made by companies initiating training must boost competitiveness, provide a competitive edge, and bring about substantial change.
- Emploi-Québec can also fund training projects related to the arrival of new technology so employees can update their skills, especially in cases where employees are low-skilled and could lose their jobs.
- Ministère de l'Économie, de la Science et de l'Innovation provides a made-to-measure management skills development training program for SMEs. The best business practices program provides over 30 training courses delivered by professional instructors, covering topics such as administration, financial management, and human resource management.



PHOTO:

Pratt and Whitney Canada

TABLE 3

FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY – PRIORITY 2 (in \$million)						
	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL
2. BOLSTER INDUSTRY GROWTH: SUPPORT PROJECTS AND INVEST IN THE WORKFORCE						
2.1. Support projects						
• Support for major investment projects	8.0	12.8	16.0	15.9	15.9	68.6
• Support for SME growth projects ¹	-	-	-	-	-	-
2.2. Invest in the workforce						
• Initiatives to arouse youth interest in aerospace	0.2	0.1	0.1	0.1	0.1	0.6
• Promotion of aerospace trades and associated study programs ^{1,2}	-	-	-	-	-	-
• Internships ^{1,3}	-	-	-	-	-	-
• In-house skills development ^{1,3}	-	-	-	-	-	-
TOTAL – PRIORITY 2	8.2	12.9	16.1	16.0	16.0	69.2
Including additional budgetary allocation	0.2	0.1	0.1	0.1	0.1	0.6

Note: Unless otherwise noted, Ministère de l'Économie, de la Science et de l'Innovation is in charge of implementing the measures.

1. Given that these measures cover multiple economic sectors, no specific budgets have been allocated to them.

2. Ministère de l'Éducation et de l'Enseignement supérieur is in charge of implementing this measure.

3. Commission des partenaires du marché du travail and Emploi-Québec are also responsible for implementing this measure.



3

ASSIST SMEs IN THEIR DEVELOPMENT

PHOTO: Sonaca

3

ASSIST SMEs IN THEIR DEVELOPMENT

The 2016–2026 Québec Aerospace Strategy’s third priority is dedicated to SMEs and is aimed at enhancing competitiveness and facilitating adaptation to new technology. This will allow aerospace SMEs to expand their role in the global supply chain and to boost exports.

To assist SMEs in their development, the government has established three objectives:

- Encourage SMEs to make the transition to Industry 4.0
- Encourage mergers and acquisitions
- Boost exports

3.1 ENCOURAGE SMEs TO MAKE THE TRANSITION TO INDUSTRY 4.0

Industry 4.0 is a new way to organize the means of production, namely by implementing smart factories where production can quickly be adapted to needs and resources are more efficiently allocated.

Typical 4.0 factories can, for instance, link up manufacturing PLCs, sensors gathering information (for use or transmission), product life-cycle management software, and advanced emerging manufacturing technology.

The term digital business refers to an optimal operating model whereby digital data is used to integrate information systems throughout the chain of operation, from initial decisions to service production and delivery.

As part of the Québec Aerospace Strategy, the government is launching three initiatives to help aerospace SMEs transition to Industry 4.0, thereby developing an innovative manufacturing sector.

SPONSORSHIPS AND SUPPORT FOR SMEs MAKING THE TRANSITION TO INDUSTRY 4.0

The Government of Québec is backing the new SME competitiveness approach, MACH FAB 4.0, based on Aéro Montréal’s MACH initiative.

MACH FAB 4.0 provides sponsorships and made-to-measure support to SMEs. The goal is to encourage participating SMEs to implement digital technology and advanced manufacturing, namely by training the workforce to use new digital tools.

Aéro Montréal will be in charge of implementing this new initiative and will work together with Sous-traitance industrielle au Québec (STIQ), Centre facilitant la recherche et l’innovation dans les organisations (CEFRIQ), and École de technologie supérieure.

The Québec Aerospace Strategy calls for Ministère de l'Économie, de la Science et de l'Innovation to provide \$9.5 million in funding over five years, matching an equal contribution from the private sector.

The MACH FAB 4.0 initiative will help 50 aerospace SMEs embrace the digital technology that will drive tomorrow's industry.



MACH INITIATIVE

The purpose of Aéro Montréal's MACH initiative is to strengthen SMEs and reinforce the supply chain structure in Québec by developing special ties between customers and suppliers through suitable projects and strategies.

To date, MACH has helped bolster cooperation between 47 SMEs and their 28 sponsors by backing nearly 380 projects, representing over \$4 million in direct investments.

PARTNERS IN SPONSORING AND SUPPORTING SMEs MAKING THE TRANSITION TO INDUSTRY 4.0

Aéro Montréal will be in charge of the MACH FAB 4.0 initiative. Three partners will be involved in its implementation: Sous-traitance industrielle au Québec (STIQ), Centre facilitant la recherche et l'innovation dans les organisations (CEFRIO), and École de technologie supérieure by way of AEROETS.

SOUS-TRAITANCE INDUSTRIELLE AU QUÉBEC (STIQ)

Founded in 1987, STIQ is a multi-industry association of Québec-based manufacturers whose mission is to improve the competitiveness of manufacturing supply chains in order to promote economic growth in Québec.

CENTRE FACILITANT LA RECHERCHE ET L'INNOVATION DANS LES ORGANISATIONS (CEFRIO)

CEFRIO was established in 1987. Since then, the organization has built a reputation for its expertise in digital technology adoption and use. CEFRIO's mission is to promote progress in Québec by using new digital technology as leverage for innovation and organizational adaptation.

AEROETS

A component of École de technologie supérieure, AEROETS group's mission is to represent, promote, and integrate ÉTS's educational and research-related aerospace activities. AEROETS brings together 54 professors and nearly 1,500 interns and researchers who work together with over 70 aerospace companies.

SPECIAL DIGITAL INTERVENTION SQUADS

To encourage SMEs to make the transition to Industry 4.0, Ministère de l'Économie, de la Science et de l'Innovation will set up special multidisciplinary digital intervention squads.

These squads will assist SMEs, in particular those in the aerospace industry, by providing assessments and developing strategic plans.

The Québec Aerospace Strategy has set aside \$4 million to finance this measure over the next five years.

INVESTMENT SUPPORT FOR TRANSITIONING TO INDUSTRY 4.0

The transition to Industry 4.0 will be a major investment for SMEs.

Under the Québec Aerospace Strategy, Ministère de l'Économie, de la Science et de l'Innovation will provide financial support to SMEs having been assessed and established strategic plans as part of MACH FAB 4.0 or with the support of special digital intervention squads.

Financial support will enable SMEs to acquire the requisite equipment and software to carry out digital transformation projects and implement initiatives to boost competitiveness, all with a view to developing an innovative manufacturing sector.



PHOTO: Shutterstock

THE SME 2.0 PILOT PROJECT

Under the SME 2.0 pilot project, CEFRIO was mandated by Ministère de l'Économie, de la Science et de l'Innovation to assist 30 aerospace and fashion and clothing companies in their digital transitions. The pilot project lasted from 2012 to 2015. During this initial phase, companies invested over \$10 million toward their digital transitions.

The SME 2.0 project was renewed for another three years in the 2015–2016 Budget.

3.2 ENCOURAGE MERGERS AND ACQUISITIONS

It is crucial that SMEs in Québec's aerospace sector expand their role in local and global supply chains. They currently rely on too few customers, which is risky for their medium- and long-term development.

To accomplish this, SMEs will need to be bigger, stronger, and more competitive. They will need access to sufficient resources to assume the technological and financial risks associated with full integration into new aerospace programs.

The size of Québec SMEs is therefore a major challenge to their long-term growth and that of the industry as a whole. For SMEs to expand, mergers and acquisitions will be key, and those can be costly in terms of time and resources.

As part of the Québec Aerospace Strategy, the Government of Québec is implementing two initiatives aimed at helping SMEs complete mergers and acquisitions vital to growth.

MERGERS AND ACQUISITIONS CONSULTANTS

The government will cover part of the costs of the external professional services required for mergers and acquisitions in Québec, i.e., the costs of hiring mergers and acquisitions consultants.

A \$2 million budget envelope has been set aside for this purpose for the next five years, which will allow the government to assist 20 aerospace SMEs with their mergers and acquisitions.

SUPPORT FOR STRATEGIC FOREIGN ACQUISITIONS

At the international level, the government intends on helping Québec SMEs make strategic acquisitions or establish strategic partnership agreements. Such acquisitions and partnerships are often effective ways for SMEs to integrate themselves into the global supply chain, with the idea being to help create or sustain jobs in Québec.

Ministère de l'Économie, de la Science et de l'Innovation will assist SMEs looking to make acquisitions or negotiate strategic partnerships. The ministry will also cover part of the acquisition costs through loans or loan guarantees provided by the Economic Development Fund.

To that end, the Québec Aerospace Strategy provides for \$55 million in funds for the next five years. The government's contributions will make it possible to carry out projects worth an estimated \$130 million.

The measure's budget impact is valued at \$19.8 million over the next five years.

3.3 BOOST EXPORTS

To assist SMEs in their development, the government has established a third objective aimed specifically at exports. The government intends to boost exports by aerospace SMEs through a variety of targeted initiatives.

These initiatives will be integral to the future export strategy, and will be presented in detail as part of this strategy. We already know that the government has established five priority initiatives for the aerospace sector.

STRATEGIC INFORMATION ON BUSINESS OPPORTUNITIES

Export Québec, a unit of Ministère de l'Économie, de la Science et de l'Innovation, will take stock of business opportunities relating to the global supply chain.

To do this, Export Québec will acquire and maintain specialized databases on the industry's main niches, making sure to keep them up to date. This strategic information will be made available to the industry.

COMPLIANCE WITH INTERNATIONAL STANDARDS

Prime contractors and Tier 1 suppliers require that the companies they do business with meet specific standards.

This can be very costly in terms of time and money—often a major hurdle for SMEs.

Export Québec will set aside a funding envelope to provide financial support to aerospace SMEs that need to invest to meet these standards.

PROSPECTING TARGET CUSTOMERS ABROAD

As part of its Export Program, Export Québec will set aside a funding envelope and make specialists available to help aerospace SMEs develop business links with target customers abroad, especially with Tier 1 and 2 suppliers not based in Québec.

FOCUSED TRADE MISSIONS AND HOSTED VISITS BY PRIME CONTRACTORS AND TIER 1 SUPPLIERS

Export Québec will help aerospace SMEs promote Québec's offering on international markets.

- Export Québec will organize focused trade missions for prime contractors and Tier 1 suppliers established outside Québec based on previously identified business opportunities.
- To promote Québec's businesses and industrial capacity, Export Québec will design a tool specially tailored for the characteristics and strengths of Québec aerospace SMEs. This promotion tool will target contractors not based in Québec.

NETWORK OF PROSPECTORS SPECIALIZING IN AEROSPACE

Export Québec will target a group of economic representatives at Québec's offices abroad to have them broaden their knowledge of aerospace businesses and markets in their respective areas.

These economic representatives will establish targeted relationships within global aerospace supply chains, especially in the United States and Europe. Their job will be to help Québec SMEs make the right export decisions, and to implement expansion strategies in external markets.



PHOTO: Shutterstock

TABLE 4

**FINANCIAL IMPACT OF THE QUÉBEC
AEROSPACE STRATEGY – PRIORITY 3** (in \$million)

	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL ¹
3. ASSIST SMEs IN THEIR DEVELOPMENT						
3.1. Encourage SMEs to make the transition to Industry 4.0						
• Sponsorships and support for SMEs making the transition to Industry 4.0	1.0	1.5	2.0	2.5	2.5	9.5
• Special digital intervention squads ¹	0.8	0.8	0.8	0.8	0.8	4.0
• Investment support for transitioning to Industry 4.0 ^{1,2}	-	-	-	-	-	-
3.2. Encourage mergers and acquisitions						
• Mergers and acquisitions consultants	0.2	0.6	0.6	0.6		2.0
• Support for strategic foreign acquisitions	1.3	4.7	4.6	4.3	4.9	19.8
3.3. Boost exports						
• Strategic information on business opportunities ³	-	-	-	-	-	-
• Compliance with international standards ³	-	-	-	-	-	-
• Prospecting target customers abroad ³	-	-	-	-	-	-
• Focused trade missions and hosted visits by prime contractors and Tier 1 suppliers ³	-	-	-	-	-	-
• Network of prospectors specializing in aerospace ³	-	-	-	-	-	-
TOTAL – PRIORITY 3	3.3	7.6	8.0	8.2	8.2	35.3
Including additional budgetary allocation	2.5	6.8	7.2	7.4	7.4	31.3 ⁴

Note: Unless otherwise noted, Ministère de l'Économie, de la Science et de l'Innovation is in charge of implementing the measures.

1. Budget contribution linked to digital strategy's first measures.

2. Given that this measure covers multiple economic sectors, no specific budget has been allocated to it.

3. Measures funded by future export strategy.

4. \$35.3 million in total when including the \$4 million from the digital strategy's first measures announced in the 2016–2017 Budget.

4

PROMOTE INNOVATION

PHOTO:
Heroux-Devtek

4

PROMOTE INNOVATION

The fourth priority of the 2016–2026 Québec Aerospace Strategy is to promote innovation within companies to ensure future growth.

Innovation is crucial to the competitiveness and development of Québec's aerospace industry.

The government has established two objectives for promoting innovation in the aerospace sector:

- Stimulate the development of new products and methods
- Foster innovation within SMEs

4.1 STIMULATE THE DEVELOPMENT OF NEW PRODUCTS AND METHODS

The Québec Aerospace Strategy sets out the three following initiatives.

WORKING GROUP ON PROMISING MARKETS FOR THE INDUSTRY

Innovation is central to developing new aircraft such as UAVs.

Ministère de l'Économie, de la Science et de l'Innovation will form a working group consisting of key aerospace sector stakeholders in order to identify promising markets for the industry. The group will include representatives of companies of all sizes as well as training specialists.

PRECOMPETITIVE RESEARCH PARTNERSHIP

Ministère de l'Économie, de la Science et de l'Innovation will fund the activities of sectoral industrial research groups and their collaborative innovation projects.

The ministry will also support collaborative projects that bring together multiple sectoral industrial research groups so as to foster interindustrial synergy. For instance, support will be given to projects involving a variety of sectors like that of aerospace, information, communications, advanced materials, metal processing, and aluminum.

The ministry will allocate \$2.5 million to this initiative over the next five years.



PHOTO: MDA

SECTORAL INDUSTRIAL RESEARCH GROUPS

The purpose of sectoral industrial research groups is to develop research partnerships between SMÉs, major universities, and colleges. Positioned at the very heart of their sector's innovation network, these institutions are well-suited to guide and support SME innovation initiatives.

The following are the main active sectoral industrial research groups in the aerospace industry:

- Consortium de recherche et d'innovation en aérospatiale au Québec (CRIAQ)
- Pôle recherche innovation en matériaux avancés (PRIMA Québec)
- Partenariat de recherche orientée en microélectronique, photonique et télécommunications (PROMPT)
- Consortium de recherche et d'innovation en transformation métallique (CRITM)
- Centre québécois de recherche et de développement de l'aluminium (CQRDA)

PHOTO:
Pratt and Whitney Canada



PHASE 1 OF THE GREENER AIRCRAFT PROJECT – THE SA²GE PROJECT

Established in 2010, the SA²GE project has bolstered the aerospace sector's innovation chain by backing research at the technology demonstration stage.

By the end of Phase 1 in 2015, many technological demonstrators had been developed for:

- Fuselage structures of aircraft made from composite parts (Bombardier and Bell Helicopter Textron Canada)
- Future landing gear (Héroux Devtek)
- Next-generation compressors (Pratt & Whitney Canada)
- Integrated modular avionics for critical systems (Bombardier and Thales Canada)
- Integrated cockpit avionics (Esterline CMC Electronics)

Industry mobilization and results have been impressive:

- The project provided \$150 million in investments—\$70 million from the Government of Québec and \$80 million from the industry.
- The project created or saved 150 highly skilled jobs and brought in 138 students.
- About 6.3% of the project's value was allocated to seven universities, eight research centres, and one professional training centre.
- In total, 28 SMEs contributed to the development process.

GREENER AIRCRAFT CATALYST PROJECT

The Government of Québec has established the concept of catalyst projects as a way to support innovation through major and promising technological demonstration projects.

Once projects have been identified, the Government of Québec provides financial support to companies so they can join their efforts, working together with universities, research centres, and SME suppliers.

The greener aircraft catalyst project—known as SA²GE for *Système aéronautique d'avant-garde pour l'environnement* (cutting-edge green aviation system)—was conceived by CRIAQ, with support from Aéro Montréal, after requests by many major companies. Phase 1 of the project received government support as part of the 2010–2013 Québec Research and Innovation Strategy.

Under the Québec Aerospace Strategy, the government will use the SA²GE project to increase cooperation in the area of aerospace innovation.

- The government intends to launch Phase 2 of the SA²GE project. A total of \$80 million will be invested in Phase 2—half from the government and half from industry stakeholders. Government support for this catalyst project stems from the 2015–2016 Budget and the 2013–2020 Climate Change Action Plan financed by the Green Fund.
- From 2018–2019 on, the SA²GE project will be maintained through annual calls for proposals. The calls will mainly be addressed to prime contractors and suppliers investing in innovation, and will mobilize SMEs, universities, and research centres in Québec.

The government will invest \$65 million over the next five years to finance the catalyst project's second phase and calls for proposals from 2018–2019 on. Private sector investments will be equal in value, so the green aircraft project should receive \$130 million in contributions by 2020–2021.



PHOTO:
Pratt and Whitney Canada



PHOTO: Shutterstock

4.2 FOSTER INNOVATION WITHIN SMEs

The fourth priority for promoting innovation is to foster its growth within SMEs.

Under the Québec Aerospace Strategy, the government will undertake the four following initiatives.

ACCESS TO QUÉBECINNOVE NETWORK SERVICES AND EQUIPMENT

Many aerospace SMEs are hesitant to invest in innovation because they lack the required human, financial, and material resources.

The Québec Aerospace Strategy includes \$2.9 million in contributions over five years to facilitate SME access to QuébecInnove services and equipment through Passeport Innovation.

Passeport Innovation aims to provide efficient support for innovative technological projects and facilitate quick access to a range of services and equipment supporting experimental, demonstration, applied research, and test projects. QuébecInnove member organizations will support SMEs by sharing their expertise with them.

QUÉBECINNOVE

QuébecInnove is a network recognized by the Government of Québec. It brings together organizations actively involved in research and innovation in order to help organizations and businesses—SMEs in particular—in need of assistance in these areas.

The network is made up of:

- Research organizations
- Technology transfer college centres
- Universities
- Technological innovation intermediaries
- Social innovation intermediaries
- University research commercialization corporations

A TECHNOLOGY TRANSFER COLLEGE CENTRE: CENTRE TECHNOLOGIQUE EN AÉROSPATIALE

Centre technologique en aérospatiale is a technology transfer college centre affiliated to Cégep Édouard-Montpetit. It is located on campus at École nationale d'aérotechnique.

Centre technologique en aérospatiale's mission is to support the aerospace industry so as to make it more competitive at the international level.

Every year, Centre technologique en aérospatiale and its staff of 50 carry out over 200 projects with the industry.



PHOTO: Safran

INTEGRATION OF SMEs INTO THE QUÉBEC INNOVATION NETWORK

The government intends to encourage SMEs in the aerospace industry to join in on collaborative innovation projects.

As part of the Québec Aerospace Strategy, Ministère de l'Économie, de la Science et de l'Innovation will fund technological demonstration projects that meet SME needs. This includes, for example, the development of technological demonstrators for large-scale additive manufacturing using renewable materials.

These projects could open up new research areas in fields like materials engineering, industrial design, robotics, and architecture.

The Québec Aerospace Strategy calls for Ministère de l'Économie, de la Science et de l'Innovation to contribute \$8.2 million over the next five years to fund technological demonstration projects meeting SME needs. This initiative should provide nearly \$16 million in investment.

SME PARTICIPATION IN GLOBAL INNOVATION NETWORK

The government also wants to encourage aerospace SMEs to participate in international collaborative innovation projects.

Ministère de l'Économie, de la Science et de l'Innovation intends to support international research and innovation jointly carried out by key players in the higher education, research, and aerospace sectors. It also intends to encourage high-level industrial partnerships by backing strategic international initiatives.

Under the Québec Aerospace Strategy, a \$2.5 million funding envelope will be established over five years to encourage aerospace SMEs to participate in the global innovation network.



PHOTO: Safran

PROMOTION OF PROGRAMS TO COMPANIES

Many government programs and strategies include provisions that could support efforts to encourage aerospace SME innovation. Several of these programs are managed by Ministère de l'Économie, de la Science et de l'Innovation.

As part of the Québec Aerospace Strategy, the ministry will invest in promoting its programs and strategies to aerospace SMEs to raise their awareness of them and make sure they take advantage of them.

THE NOVASCIENCE PROGRAM

The NovaScience program is managed by Ministère de l'Économie, de la Science et de l'Innovation.

Its goal is to provide financial support to projects that promote science and technology to young people and the general public, and to train the next generation of workers in these fields.

The program has three components:

- Organization support
- Project support
- Partnership initiatives



PHOTO: Safran

THE CRÉATIVITÉ QUÉBEC PROGRAM

The Créativité Québec program is managed by Investissement Québec as part of the Economic Development Fund.

Its goal is to help businesses carry out innovative projects, whether it be acquiring new technology or developing or improving products or methods.

The program was implemented to:

- Breed a culture of innovation
- Encourage partnerships between universities, research centres, and companies
- Support companies with the development, improvement, pre-commercialization, and acquisition of new technology

TABLE 5

FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY – PRIORITY 4 (in \$million)						
	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL ¹
4. PROMOTE INNOVATION						
4.1. Stimulate the development of new products and methods						
• Working group on promising markets for the industry	-	-	-	-	-	-
• Precompetitive research partnership	0.5	0.5	0.5	0.5	0.5	2.5
• Greener aircraft catalyst project ¹	10.0	10.0	15.0	20.0	10.0	65.0
4.2. Foster innovation within SMEs						
• Access to QuébecInnove network services and equipment	0.7	0.7	0.5	0.5	0.5	2.9
• Integration of SMEs into the Québec innovation network	1.0	1.8	1.8	1.8	1.8	8.2
• SME participation in global innovation network	0.5	0.5	0.5	0.5	0.5	2.5
• Promotion of programs to companies	-	-	-	-	-	-
TOTAL – PRIORITY 4	12.7	13.5	18.3	23.3	13.3	81.1
Including additional budgetary allocation	1.5	2.3	7.3	12.3	12.3	35.7

Note: Unless otherwise noted, Ministère de l'Économie, de la Science et de l'Innovation is in charge of implementing the measures.

1. Includes Phase 2 of SA²GE project announced in 2015–2016 Budget.

5

INDUSTRY CONSULTATION AND STRATEGY IMPLEMENTATION

PHOTO:
UAS Centre of Excellence

5

INDUSTRY CONSULTATION AND STRATEGY IMPLEMENTATION

The Québec Aerospace Strategy is the result of extensive industry consultation. Consultation and mobilization are integral to the strategy and will proceed as the various intervention priorities are implemented.

It is crucial that the various announced measures and their impacts be closely monitored.

INDUSTRY CONSULTATION AND MOBILIZATION

The Government of Québec has established three key organizations to oversee aerospace industry consultation and mobilization: Aéro Montréal, Comité sectoriel de main d'œuvre en aérospatiale du Québec (CAMAQ), and Consortium de recherche et d'innovation en aérospatiale au Québec (CRIAQ).

Under the Québec Aerospace Strategy, the government will continue to fund the activities of these organizations. CRIAQ will receive funding through the precompetitive research partnership initiative. The government will also contribute \$3 million in funding to Aéro Montréal and CAMAQ over the next five years.

The government also wants to encourage greater cooperation between Québec's various industrial clusters, in particular between committees, so Québec's aerospace sector can take advantage of potential synergies with other high-powered Québec industries.

STRATEGY MONITORING COMMITTEE

The government is establishing a Strategy Monitoring Committee under the supervision of Ministère de l'Économie, de la Science et de l'Innovation. The committee will meet annually, bringing together aerospace industry representatives and various ministries and organizations affected by the announced measures.



PHOTO: Shutterstock

TABLE 6

**FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY –
CONSULTATION AND IMPLEMENTATION** (in \$million)

	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL
INDUSTRY CONSULTATION AND STRATEGY IMPLEMENTATION						
• Industry consultation and mobilization ¹	0.6	0.6	0.6	0.6	0.6	3.0
• Strategy Monitoring Committee	-	-	-	-	-	-
TOTAL – CONSULTATION AND IMPLEMENTATION	0.6	0.6	0.6	0.6	0.6	3.0
Including additional budgetary allocation	-	-	-	-	-	-

Note: Unless otherwise noted, Ministère de l'Économie, de la Science et de l'Innovation is in charge of implementing the measures.

1. Commission des partenaires du marché du travail is also responsible for implementing this measure.



PHOTO:
Bombardier

CONCLUSION



CONCLUSION

The aerospace industry is one of Québec's strongest. With its skilled workforce and blue-chip companies known for their innovation, Québec's aerospace sector has carved out a place for itself on the international stage. Most Canadian aerospace activities are concentrated in Québec.

Québec's aerospace sector faces major challenges. Competition from countries with cheap labour has been fierce, the global supply chain is being restructured, and Québec's emerging ecosystem has shown to be lacking in many areas.

The government is implementing the 2016–2026 Québec Aerospace Strategy to help companies overcome these challenges, the idea being to leverage what the industry has already accomplished to prepare for the future and guarantee success.

A STRATEGY WITH SERIOUS FINANCIAL SUPPORT

The 2016–2026 Québec Aerospace Strategy revolves around four priorities:

- Strengthen and diversify the industry structure
- Bolster industry growth by supporting projects and investing in the workforce
- Assist SMEs in their development
- Promote innovation

Drawing on a \$250 million financial framework for the period of 2016–2021, the government has established ten objectives and defined over thirty measures to build on these four priorities.

The government is confident that the new strategy will provide the sector with valuable support as it continues to develop in the coming years, maintaining and reinforcing Québec's position in the Canadian and global aerospace industries.

With the 2016–2026 Québec Aerospace Strategy, the government is setting in motion various initiatives aimed at stimulating the economy and creating jobs so Quebecers can enjoy wealth and prosperity in the future.



PHOTO:

Bell Helicopter Textron Canada

APPENDIX

PHOTO:
Bombardier

APPENDIX 1 – FINANCIAL FRAMEWORK

TABLE 7

FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY (in \$million)						
	2016–2017	2017–2018	2018–2019	2019–2020	2020–2021	TOTAL ¹
1. STRENGTHEN AND DIVERSIFY THE INDUSTRY STRUCTURE						
1.1. Attract prime contractors and Tier 1 and 2 suppliers						
• Aerospace task force	-	-	-	-	-	-
• Financial support to attract foreign investment	6.7	10.7	13.4	13.4	13.4	57.4
• Promotion of Québec aerospace industry	0.3	0.3	0.3	0.3	0.3	1.7
1.2. Promote and reinforce the defence and security sectors						
• Establishment of Croissance Sécurité Défense Québec	0.2	0.2	0.2	-	-	0.6
• Development fund for security and defence sectors	-	-	-	-	-	-
• Cooperation with Canada Economic Development	-	-	-	-	-	-
• Interaction with federal government	-	-	-	-	-	-
1.3. Develop the UAV sector and civil UAV applications						
• Development support for the civil UAV industry	0.2	0.2	0.2	0.2	0.2	1.0
• UAV system prequalification centre	0.4	0.4	-	-	-	0.8
Subtotal¹	7.8	11.8	14.1	13.9	13.9	61.5

FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY (in \$million)

	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL ¹
2. BOLSTER INDUSTRY GROWTH: SUPPORT PROJECTS AND INVEST IN THE WORKFORCE						
2.1. Support projects						
• Support for major investment projects	8.0	12.8	16.0	15.9	15.9	68.6
• Support for SME growth projects ²	-	-	-	-	-	-
2.2. Invest in the workforce						
• Initiatives to arouse youth interest in aerospace	0.2	0.1	0.1	0.1	0.1	0.6
• Promotion of aerospace trades and associated study programs ^{2,3}	-	-	-	-	-	-
• Internships ^{2,4}	-	-	-	-	-	-
• In-house skills development ^{2,4}	-	-	-	-	-	-
Subtotal	8.2	12.9	16.1	16.0	16.0	69.2
3. ASSIST SMEs IN THEIR DEVELOPMENT						
3.1. Encourage SMEs to make the transition to Industry 4.0						
• Sponsorships and support for SMEs making the transition to Industry 4.0	1.0	1.5	2.0	2.5	2.5	9.5
• Special digital intervention squads ⁵	0.8	0.8	0.8	0.8	0.8	4.0
• Investment support for transitioning to Industry 4.0 ^{2,5}	-	-	-	-	-	-
3.2. Encourage mergers and acquisitions						
• Mergers and acquisitions consultants	0.2	0.6	0.6	0.6		2.0
• Support for strategic foreign acquisitions	1.3	4.7	4.6	4.3	4.9	19.8

FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY (in \$million)

	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL ¹
3.3. Boost exports						
• Strategic information on business opportunities ⁶	-	-	-	-	-	-
• Compliance with international standards ⁶	-	-	-	-	-	-
• Prospecting target customers abroad ⁶	-	-	-	-	-	-
• Focused trade missions and hosted visits by prime contractors and Tier 1 suppliers ⁶	-	-	-	-	-	-
• Network of prospectors specializing in aerospace ⁶	-	-	-	-	-	-
Subtotal	3.3	7.6	8.0	8.2	8.2	35.3
4. PROMOTE INNOVATION						
4.1. Stimulate the development of new products and methods						
• Working group on promising markets for the industry	-	-	-	-	-	-
• Precompetitive research partnership	0.5	0.5	0.5	0.5	0.5	2.5
• Greener aircraft catalyst project ⁷	10.0	10.0	15.0	20.0	10.0	65.0
4.2. Foster innovation within SMEs						
• Access to QuébecInnove network services and equipment	0.7	0.7	0.5	0.5	0.5	2.9
• Integration of SMEs into the Québec innovation network	1.0	1.8	1.8	1.8	1.8	8.2
• SME participation in global innovation network	0.5	0.5	0.5	0.5	0.5	2.5
• Promotion of programs to companies	-	-	-	-	-	-
Subtotal	12.7	13.5	18.3	23.3	13.3	81.1
INDUSTRY CONSULTATION AND STRATEGY IMPLEMENTATION						
• Industry consultation and mobilization ⁸	0.6	0.6	0.6	0.6	0.6	3.0
• Strategy Monitoring Committee	-	-	-	-	-	-

FINANCIAL IMPACT OF THE QUÉBEC AEROSPACE STRATEGY (in \$million)

	2016– 2017	2017– 2018	2018– 2019	2019– 2020	2020– 2021	TOTAL ¹
Subtotal	0.6	0.6	0.6	0.6	0.6	3.0
TOTAL¹	32.6	46.4	57.1	62.0	52.0	250.1
Including additional budgetary allocation	5.0	10.0	15.0	20.0	20.0	70.0 ⁹

Note: Unless otherwise noted, Ministère de l'Économie, de la Science et de l'Innovation is in charge of implementing the measures.

1. Data rounded to nearest tenth—totals based on actual values.
2. Given that these measures cover multiple economic sectors, no specific budgets have been allocated to them.
3. Ministère de l'Éducation et de l'Enseignement supérieur is in charge of implementing this measure.
4. Commission des partenaires du marché du travail and Emploi-Québec are also responsible for implementing this measure.
5. Budget contribution linked to digital strategy's first measures.
6. Measures funded by future export strategy.
7. Includes Phase 2 of SA²GE project announced in 2015–2016 Budget.
8. Commission des partenaires du marché du travail is also responsible for implementing this measure.
9. \$74 million in total, including \$4 million from digital strategy's first measures announced in 2016–2017 Budget.



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