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STATE OF THE CANADIAN SPACE SECTOR 2013

Canadian Space Agency
Agence spatiale canadienne

Canada

STATE OF THE CANADIAN SPACE SECTOR 2013

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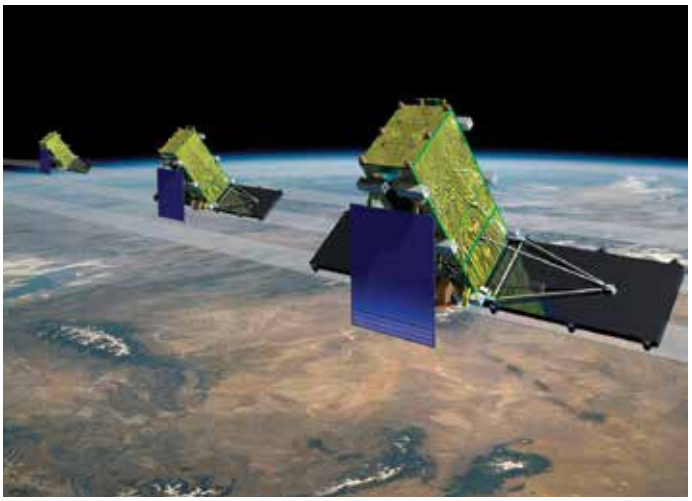
NOTE TO READER
UPCOMING TRANSITION

The Canadian Space Agency (CSA) annual report on the *State of the Canadian Space Sector* has been published for 18 years, using a consistent methodology. This allowed for long-term trend analysis and provided reliable and authoritative baseline data on the sector. Results presented in this publication are based on this historic approach.

However, the space ecosystem is evolving. Continuous work on definitions and methodologies for measuring the space economy and the derived socio-economic benefits is performed primarily under the auspices of the Organisation for Economic Co-operation and Development (OECD). The OECD will shortly be issuing a new version of its Handbook on Measuring the Space Economy reflecting this ongoing effort to which the CSA has made significant contributions.

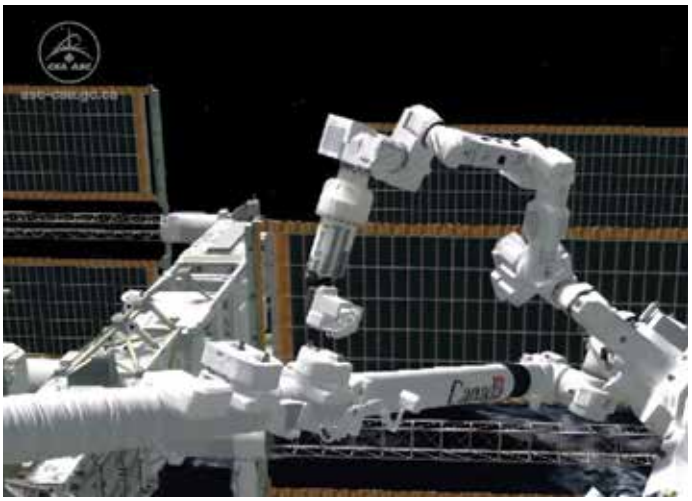
In parallel to the collaborative effort with the OECD and the Ministry of Innovation, Science and Economic Development (ISED), the CSA commissioned work in 2014–2015 to better understand the socio-economic impacts of Canadian space activities and investments. With this work, we gained valuable information on ways to characterize the space economy.

To better reflect the current best practices and for matters of consistency with the approach recommended by the OECD, the CSA will, as of next year, transition to a new methodology that characterizes Canadian space activities on the basis of an Upstream-Downstream *Value-Chain* approach. The CSA will provide the reader with tools to help bridge the historic data and reporting with the new methodology.



CSA

January 9, 2013 – The Government of Canada Launches Final Stage of RADARSAT Constellation Project



CSA

January 25, 2013 – Dextre Successfully Refuels Mock Satellite and Aces a Major Test for Space Robotics

CSA

February 25, 2013 – Canada Stays at the Forefront of Space Telescope Technology with the Launch of New Surveillance Satellite: The Near-Earth Object Surveillance Satellite (NEOSSat)

ABOUT THIS REPORT

The *State of the Canadian Space Sector* provides insight for decision makers in government and industry to help make informed, strategic choices for the future.

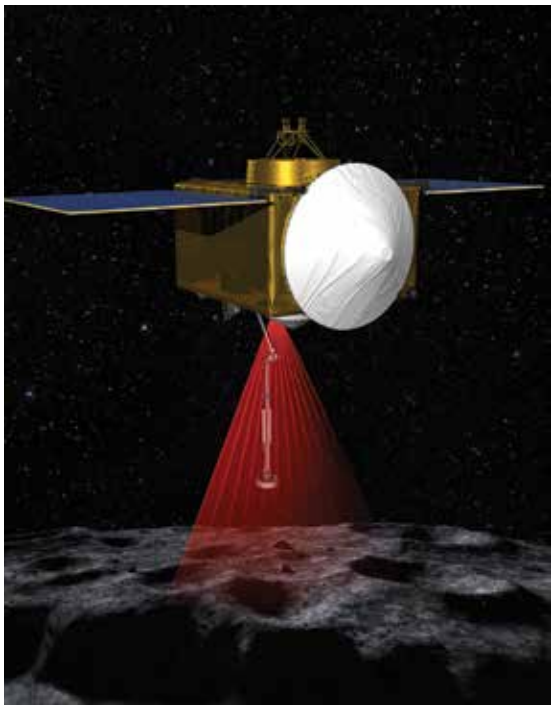
The report is a source of longitudinal data comprised of many performance indicators based on a questionnaire sent to more than 200 organizations involved in space activities across Canada, including enterprises, multinational space companies, not-for-profit organizations, research centres and universities.

FOR MORE INFORMATION

For more information about the Canadian space sector, or for an electronic copy of this report, please go to www.asc-csa.gc.ca/eng/publications.

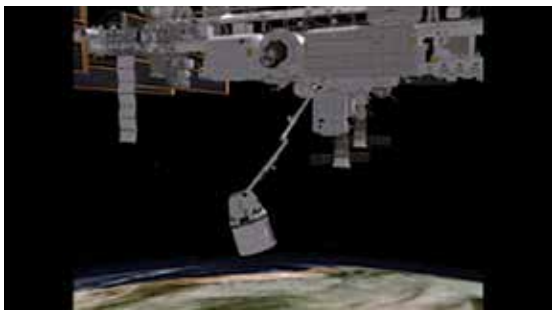
ACKNOWLEDGMENTS

The CSA wishes to acknowledge and thank all those who responded to the questionnaire. Without them, this report would not have been possible.



NASA

February 27, 2013 – A new contract to MacDonald, Dettwiler and Associates (MDA) for the design of a sophisticated mapping system known as the OSIRIS-REx Laser Altimeter



NASA

March 3, 2013 – Canadarm2 Catches a Dragon Carrying Canadian Medical Technology to the International Space Station

MESSAGE FROM THE PRESIDENT

As the President of the Canadian Space Agency (CSA), I am pleased to present the State of the Canadian Space Sector covering the results from 2013.

This annual report on the Canadian space sector measures changes in the sector on a number of indicators such as revenues by category of business and by region of Canada, workforce and exports. Results for 2013 were positive: The space sector's overall revenues peaked at $3.5B (15% absolute growth over the past 5 years), of which 47% was exports. Satellite Communications accounted for 80% of overall revenues.

The workforce reached 8,200 people, 53% of whom were highly qualified personnel (HQP). The "downstream" segment of the space value chain (e.g. broadcasting, applications for use of Earth Observation data) generated 69% of revenues. It is clear that our downstream segment plays a very important role in transforming space capacity into products and services that benefit Canadians in their daily lives and promote sales abroad.

This report is the main reference on the Canadian space sector, as data on space are usually, in Canada and worldwide, amalgamated with several other industrial statistical categories. The methodology used by the CSA for the annual assessment has been used consistently since 1996, allowing for long-term trend analysis and providing reliable and authoritative baseline data on the Canadian space sector.

The CSA report enjoys a vast distribution throughout the industry and academia and is also widely used within the government to document the level of economic activity generated by space and to illustrate the impact of space investments on the economy.

I hope you find this publication informative and useful. I would like to convey my thanks to all those who contributed to the 2013 report.

EXECUTIVE SUMMARY

In 2013, the space sector generated total revenues of $3.5B, which was a 5% increase over 2012. Gains were made especially in the top 30 companies.

Over the last five years, total revenues generated by the Canadian space sector have increased by 15%, or $462M. The Compound Annual Growth Rate (CAGR) from 2009 to 2013 was 2.9%.

In 2013, domestic revenues amounted to $1.85B, an increase of 6%. Non-governmental sources of revenue, at 80%, continued to make up the majority of domestic revenues. The remaining 20% of domestic revenues were derived from Canadian governments (federal, provincial and municipal), most of which is federal funding, notably from the CSA and the Department of National Defence.

Export revenues in 2013 increased by 3%, or $55M, totalling $1.64B. Export revenues increased in all provinces except B.C. and Newfoundland. For a second year, Ontario organizations had 56% of Canadian space exports.

The space workforce continued to grow in 2013, with a 3% increase, or 238 additional full-time positions, compared to 2012. However, contrary to the 2012 results, those new positions were mostly added in administration, marketing, management or other areas of employment as opposed to highly qualified positions.

All sectors of activity saw increased revenues except Space Exploration. Space Exploration revenues declined by $13M from 2012 to 2013 while Satellite Communications, Earth Observation, Navigation and Space Sciences increased, with Satellite Communications contributing the largest amount in terms of absolute dollar increases, reaching $2.77B.

The downstream segment, captured through Applications and Services, continues to account for the majority of space revenues at $2.4B in 2013. Space Research revenues increased by 3%, or $1M. Ground Segment revenues declined by 4%, or $14M. Space segment revenues were relatively flat, with a slight 1% increase, or $8M.

Revenues derived strictly from manufacturing activities have increased by nearly 9% over 2012 results, reaching $750M of the total $3.5B space revenues.

The majority of defence-related revenues continue to be export driven. Defence-related revenues decreased by $23M, now worth $177M. Of that amount, $111M is from exports and $66M is derived from domestic customers.

Space Research and Development expenditures totalled $180M in 2013, with 54 organizations currently undertaking space research and development projects.

METHODOLOGY

OVERVIEW OF THE REPORT

In order to measure the changes taking place in Canada's space sector, the CSA each year sends a questionnaire to Canadian space actors and analyzes and publishes the report. This edition profiles the space sector over the course of 2013, with most organizations reporting on a calendar year from January 1 to December 31, 2013, and the remainder reporting on a fiscal year, generally ending March 31, 2014.

Data are provided along the following indicators:

- Overall space revenues;
- Domestic vs. export revenues;
- Revenues of Canada's top 30 organizations developing and/or using space to generate revenues;
- Revenues by sector of activity (Satellite Communications, Space Exploration, Earth Observation, Space Science and Satellite Navigation);
- Revenues by space category (Space Segment, Ground Segment, Applications and Services, and Space Research);
- Revenues by region (British Columbia, Prairies, Ontario, Quebec and Atlantic Canada); and
- Workforce characteristics.

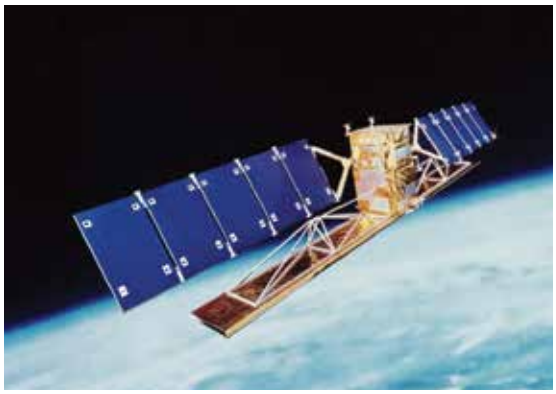
Questionnaires were sent to approximately 200 private sector enterprises, not-for-profit organizations, research organizations and universities in Canada with a defined activity in space.

It is important to note that the organization-specific information used to compile this report remains strictly confidential and will not be released in a manner other than in an aggregate form. Consequently, in certain circumstances, a detailed explanation or in-depth reporting of the results cannot be provided to protect the confidentiality of the responses to the questionnaire.

The *State of the Canadian Space Sector* has been published since 1996. Comparative analyses of trends across time typically examine 5- or 10-year periods. Consequently, in this edition, data are reported for the 2004–2013 period. Readers should consult previous editions (available on the CSA website) for information regarding results prior to 2004.

MDA Corporation

March 28, 2013 – The Government of Canada announces the renewal of its contract with MacDonald, Dettwiler and Associates (MDA) for the continuing operations and maintenance of the International Space Station's Mobile Servicing System



CSA

May 9, 2013 – RADARSAT-1 is no longer operational after 17 years of outstanding service

DEFINITION OF CANADA'S SPACE SECTOR

The Canadian space sector is defined as organizations (private, public and academic) whose activities include the development and use of space assets and/or space data:

Space Segment: Research and Development (R&D), manufacturing, testing, integration and launch of platforms (satellites, spacecraft, and robotic systems), complete systems, subsystems, and components.

Ground Segment: R&D, manufacturing, testing, and integration of facilities on Earth for controlling space-based systems and satellites, linking satellites to operational terrestrial networks, and for processing satellite-derived data.

Applications and Services: Development and/or provision of services and value-added products and technologies that are derived from the use of space systems and/or data, and the provision of consulting and engineering services.

Fundamental Space Research: Primarily research related to non-commercial or pre-commercial space activities.

CSA

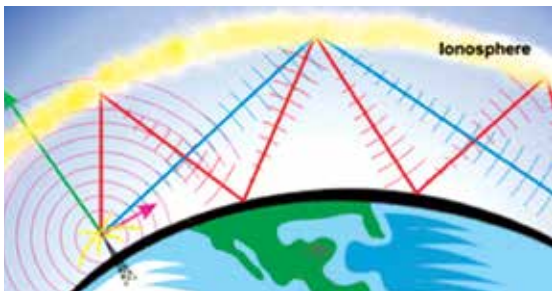
September 12, 2013 – Space Agencies Launch the First Stratospheric Balloon from Timmins, Ontario

CSA

September 29, 2013 – Successful Launch of CASSIOPE: Hybrid Satellite Mission Carrying Science and Telecommunications Payloads

CSA

November 22, 2013 – Successful Launch of the Swarm Constellation Carrying Canadian Science and Technology



CSA

December 20, 2013 – Canadian Space Agency Awards $6.2M in Contributions to Five Canadian Universities: Alberta, Calgary, Saskatchewan, New Brunswick, and Athabasca. These projects will allow Canadian scientists to better understand how space weather affects the ionosphere and the consequential impacts on technology.

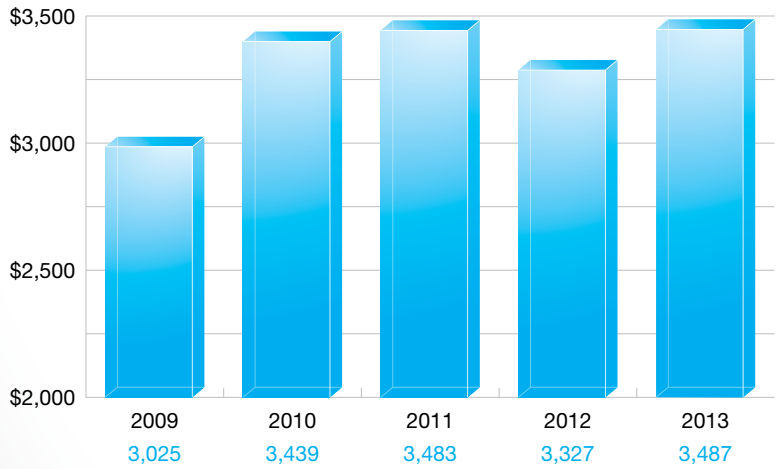
RESULTS

OVERALL REVENUES

In 2013, total revenues for the Canadian space sector were $3.49B, which was a 5% increase ($160M) over revenues in 2012. Domestic revenues drove growth, gaining an additional 6%, or $105M, while exports increased by 3%, or $55M.

The longitudinal data show that total revenues generated by the Canadian space sector over the last five years have increased by 15%, or $462M. The average growth rate calculated using the Compound Annual Growth Rate for total revenues over the past five years is 2.9% (3.8% for domestic revenues and 1.9% for exports).

Total Space Revenues:
2009-2013 (C$m)



REVENUES OF CANADA'S LEADING SPACE ORGANIZATIONS

In 2013, the top 30 Canadian space organizations generated 98% of the total space revenues and employed 90% of the space workforce, a pattern consistent with previous years regardless of changes in the composition or rank order of the top 30 organizations.

By comparison, the top 10 organizations accounted for 83% of total space revenues and 61% of workforce. There is slightly less concentration in the top 10 companies than last year, when those companies accounted for 88% of revenues and 64% of workforce.

55 organizations reported revenues in excess of $1M during 2013, one less than last year.

UNIVERSITIES AND RESEARCH CENTRES

Universities' and research centres' results vary substantially from those of private sector companies. For example, universities and research centres rely more heavily on domestic sources of funds, whereas private industry has a more even split between domestic and export revenues.

In 2013, universities and research centres accounted for $85M of domestic revenues, securing most of their funding from government sources with $73M in public funds for space activities: $62M from federal departments and $11M from provincial governments.

In 2013, universities and research centres continued to access foreign sources of funding for business and research grants with $3.6M in revenues. The European Commission, European Space Agency, the U.S. government and companies are the most important sources of foreign funding for space-related activities at Canadian universities and research organizations.

DOMESTIC VS. EXPORT REVENUES

In 2013 domestic revenues accounted for 53% of total space revenues, while exports represented 47%.

When corrected for inflation, domestic revenues over the past 10 years from 2004–2013 have experienced a growth of $398M, or 27%, representing an average annual growth rate of 2.5%. By comparison, export revenues (corrected for inflation) have grown by $220M, or 16%, at an average annual growth rate of 1.5%. See the data tables on page 21 for more information regarding inflation-adjusted amounts.

DOMESTIC REVENUES

Domestic revenues reached $1.85B in 2013, an increase of 6%, or $106M over 2012.

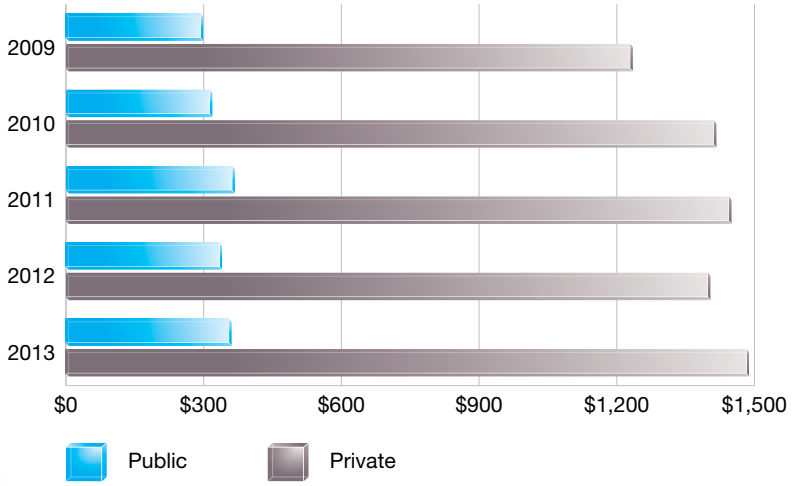
80% of the space revenues in 2013 were derived from private (non-governmental) sources and 20% from public sources.

In 2013, private (non-governmental) sources of revenues increased by 6% (from $1.4B to $1.49B); public (governmental) sources also increased by 6% (from $340M to $361M), returning to 2011 levels. The majority of funding came from federal sources: the CSA, the Department of National Defence (DND), the Natural Sciences and Engineering Research Council (NSERC), the Canadian Broadcasting Corporation (CBC) and Natural Resources Canada (NRCan) were the top five sources of federal government revenue reported by companies and universities.

Domestic vs. Export Revenues:
2009-2013 (C$m)

	2009	2010	2011	2012	2013
Domestic	1,534	1,735	1,818	1,743	1,849
Export	1,491	1,703	1,665	1,584	1,639

Sources of Domestic Revenues
Public vs. Private: 2009-2013 (C$m)



	2009	2010	2011	2012	2013
Public	299	319	368	340	361
Private	1,235	1,417	1,450	1,404	1,488

EXPORT REVENUES

In 2013, export revenues increased by 3%, or $55M, to $1.64B, which brought export revenues back up after a slight decrease in 2012. The longitudinal data show a strong export market for Canadian space-related goods and services with a Compound Annual Growth Rate (CAGR) of 1.9% over the past five years.

The most popular export markets for Canada's space organizations continue to be the U.S. and Europe. Exports to Europe continued to decline for a second year; however, exports to the U.S. and Asia increased.

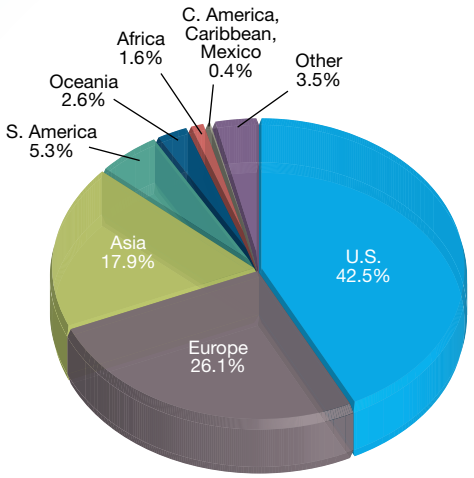
Segmentation of the $1.64B in total exports for 2013:

- U.S.: 43%, or $696M;
- Europe: 26%, or $428M;
- Asia: 18%, or $294M;
- South America: 5%, or $87M;
- Oceania: 3%, or $42M;
- Africa: 2%, or $27M;
- Central America, the Caribbean and Mexico: less than 1%, or $6M; and
- Unallocated exports amounted to 4%, or $58M, of the total.

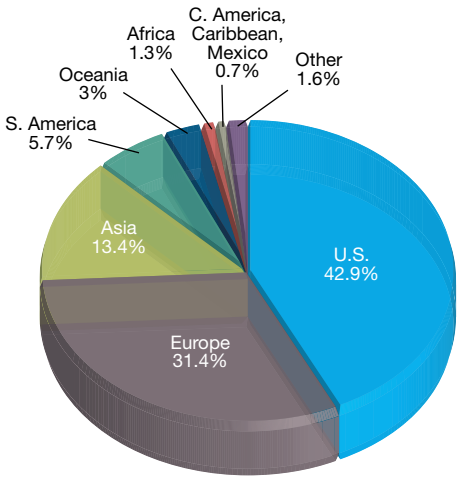
Exports to the **U.S.** increased $16M from 2012–2013. The U.S. remains the largest market for Canadian space exports, accounting for 43%, or $696M. However, the proportional share of exports to the U.S. has been continuously decreasing since 2009; the share of exports to the U.S. represented 52% of total exports in 2009.

Exports to **Europe** declined by 14%, or $69M, from $497M in 2012 to $428M in 2013. Revenues derived from Europe account for 26% of total exports.

Proportion of Export Revenues



2013



2012

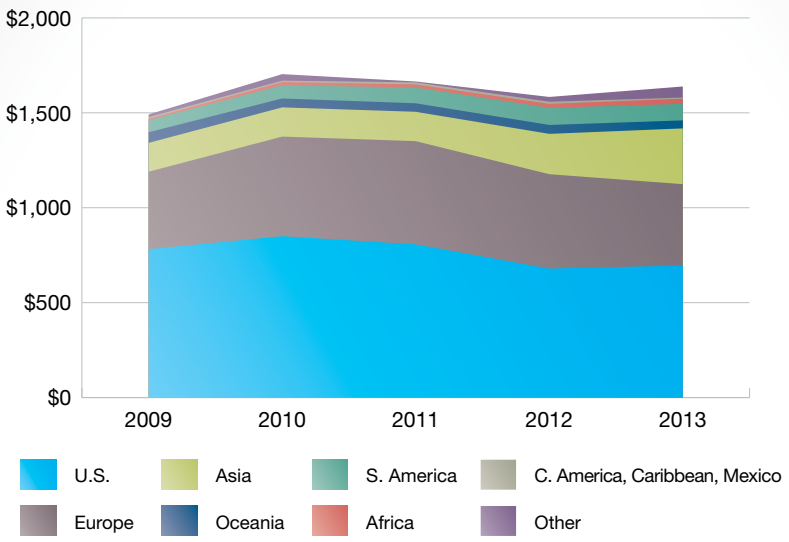
Revenues derived from exports to **Asia** grew substantially for a second year, from $212M in 2012 to $294M in 2013, representing a 38% increase. In 2013, Asia accounted for 18% of total exports compared to the 8% share it had in 2004.

Exports to **Oceania** totalled $42M, decreasing by 10%, or $4.6M, over 2012. In 2013, Oceania accounted for 3% of total export revenues.

In 2013, the **South American** export market decreased by 4%, or $3.6M, over 2012. The region accounted for 5% of total exports.

Export revenues from **Africa** increased by $6M from $21M in 2012 to $27M in 2013. Generally speaking, growth in Africa has been uneven; years of strong growth have been followed by declines and vice versa. Africa accounted for 2% of total Canadian space export revenues.

Sources of Export Revenues:
2009-2013 (C$m)



NASA

March 13, 2013 – Canadian Astronaut Chris Hadfield, First Canadian Commander of the International Space Station

REVENUES BY SPACE CATEGORY

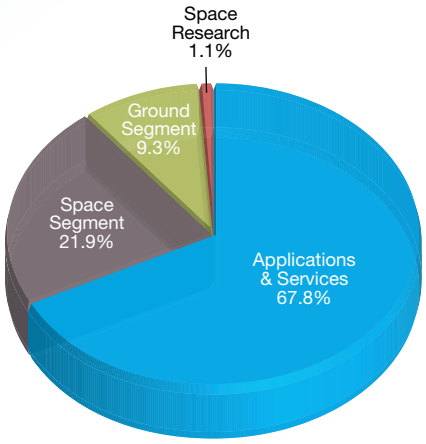
Space Segment: 2013 saw a slight increase of 1%, or $8.6M, over 2012. Space segment revenues in 2013 represented 22% of total space revenues.

Ground Segment: In 2013, revenues decreased by 4%, from $337M to $323M. Ground segment revenues represented 9% of total space revenues.

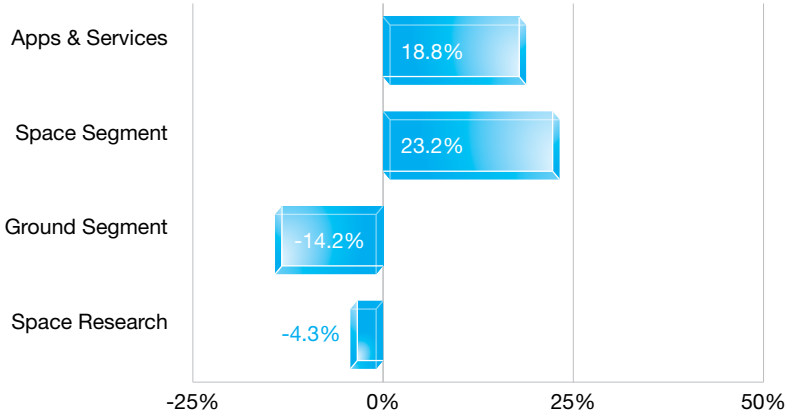
Applications and Services: Revenues in this category increased by 7% from $2.2B in 2012 to $2.4B in 2013. Applications and Services represented 68% of total space revenues.

Fundamental Space Research: Revenues in this category increased by 3%, or $1M, to $37M from 2012 to 2013. This category reflects activities at universities and research centres which rely mostly on government sources of funding. The category represents 1% of total space revenues.

Proportion of Revenues
by Space Category 2013



Percentage Change of Revenues
by Space Category over the last 5 years
(2009-2013)



DEFINITION – SECTORS

Navigation: The use of satellites for navigation, positioning and timing services. Navigation is used in air, maritime and land transport, and for the localisation of individuals or vehicles. It also provides a universal referential time and location standard for a number of systems.

Satellite Communications: The use of satellites to relay signals to and from Earth for the purpose of fixed or mobile telecommunications services (voice, data, internet, multimedia) and broadcasting (TV and radio services, video services, internet content).

Earth Observation: The use of satellites to observe Earth. EO helps to measure and monitor the lands, oceans, climate and environment for a number of purposes (i.e. resource management, mineral exploration, disaster assessment, security and defence).

Space Exploration: The investigation, by means of manned and unmanned spacecraft rovers & probes, of the universe beyond Earth's atmosphere (i.e. the moon, other planets, asteroids). This includes Robotics.

Space Science: The various science disciplines which relate to space flight or any phenomena occurring in space or on other celestial bodies (i.e. astrophysics, planetary science, space-related life science).

REVENUES BY SECTOR OF ACTIVITY

Overall space revenues grew by 5%, or $160M, and reached $3.5B in 2013. Growth was driven by Satellite Communications and Earth Observation while Space Exploration declined for a second year.

Satellite Communications: In 2013, revenues were $2.77B, amounting to an increase of 4%, or $114M. This growth was achieved through sales in the downstream Applications and Services segment while Research and Manufacturing of the space and ground segments declined.

The Satellite Communications sector represented 79% of total space revenues in 2013. Of the $2.77B in Satellite Communications revenues, $2.1B (76%) was derived from activities in Applications and Services. Of the remaining 24%, the breakdown was as follows:

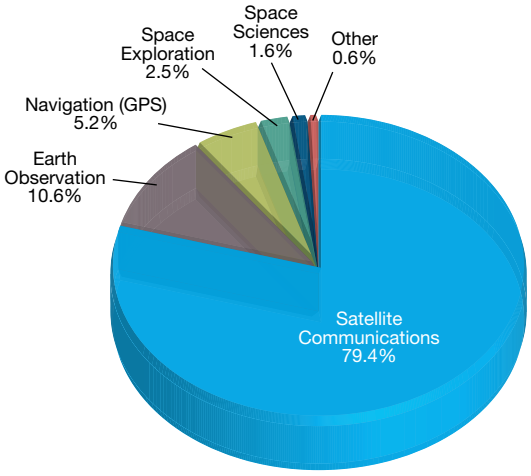
- $234M from Ground Segment activities;
- $429M from Space Segment; and
- $1.4M from Space Research Segment.

Over the last five years, Satellite Communications revenues have increased 19%, or $443M, at an average annual growth rate of 3.6%.

Earth Observation: This sector's revenues increased by 15%, or $49M, in 2013, representing 11% of total space revenues. Over the past five years, Earth Observation revenues have increased by 44%, or $113M, reaching a total of $371M.

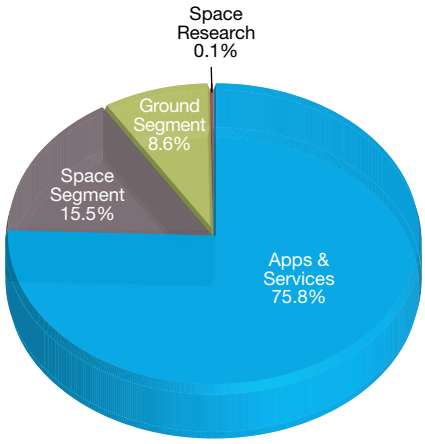
Space Exploration: Revenues decreased by 13%, or $13M, from $99M to $86M, representing 3% of total space revenues. Since 2009, revenues from this sector have decreased by $28M, or 25%.

Proportion of Revenues by Sector of Activity: 2013



2013

Breakdown of Satellite Communications Revenues: 2013



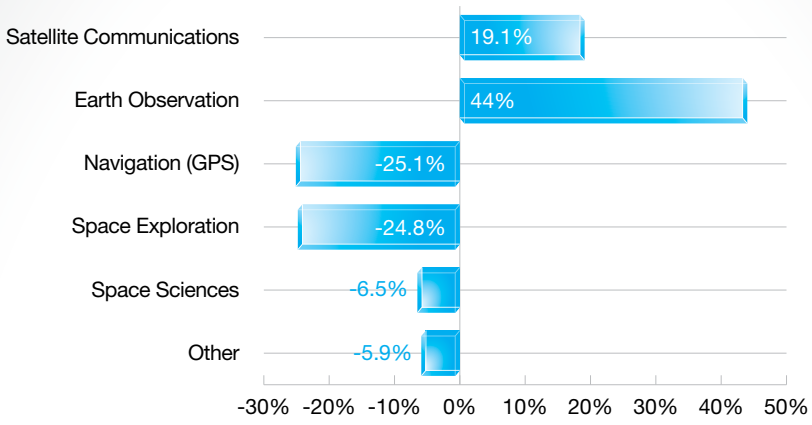
2013

Navigation: Revenues increased by 6%, or $10M, from $172M to $182M, which amounted to 5% of total space revenues. Revenues from navigation have overall decreased by 25%, or $61M, between 2009 and 2013.

Space Sciences: Revenues increased by 8%, or $4M, from 2012 to 2013. Space sciences represent 2% of total space revenues, the same as five years ago; however, space science revenues are currently 6%, or $4M, less than in 2009.

Other: Revenues decreased by 12%, or $3M, from $25M to $22M, which was less than 1% of total space revenues. Activities that fall into the "other" sector are by nature variable and subject to recategorization; therefore, changes in this sector may be less meaningful than in the traditional sectors noted above.

Percentage Change of Revenues
by Sector of Activity over the last 5 years
(2009-2013)



REVENUES BY REGION

The proportional share of total revenues by province remains relatively stable from year to year.

British Columbia: In 2013, British Columbia accounted for 7% ($226M) of total space revenues in Canada, a decrease of 5% ($11M) over 2012 revenues. Domestic revenues increased by $8M to $145M while exports decreased by 19%, or $19M, to $81M. Between 2009 and 2013, B.C.'s total revenues increased by 24% from $182M to $226M. This increase has been powered by domestic revenues, which have grown by 63% since 2009 from $88M to $145M, while export revenues declined by 14% over the same period.

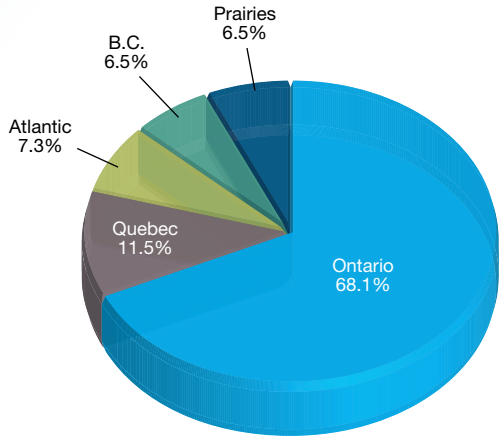
Prairies (Alberta, Saskatchewan and Manitoba): In 2013, revenues in the Prairies increased by 8%, or $17M, from 2012 to 2013. The Prairies' revenues as compared to those of the rest of Canada remained basically the same as the previous year at 7%, or $228M, of total Canadian space revenues.

In 2013:

- Alberta revenues increased by 9%, or $11M, from $127M to $138M;
- Saskatchewan revenues increased for a fourth consecutive year with gains of 4% (from $55M to $57M);
- Manitoba revenues increased for a fifth consecutive year with gains of 15% over 2012, and now totalling $33M.

Despite gains across the Prairie provinces in 2013, the five-year trend analysis reveals that total revenues have decreased slightly from $232M in 2009 to $228M in 2013: Domestic revenues went from $42M in 2009 to $61M in 2013 while Exports decreased by 12% from $190M to $167M.

Regional Proportion of Total Revenues: 2013



	2012		2013	
	Export	Domestic	Export	Domestic
B.C.	100	137	81	145
Prairies	157	54	167	61
Ontario	880	1,414	912	1,463
Quebec	270	71	313	89
Atlantic	176	68	165	91

Ontario: Revenues in Ontario increased by 4%, or $81M, to $2.38B in 2013. While the province is home to the largest number of space-related companies in Canada and accounts for the majority of the total space revenues, the province's share of Canadian earnings, now 68%, has declined slightly compared to 2009, then at 69%.

Domestic revenues increased by 4%, or $49M, from $1.41B in 2012 to $1.46B in 2013; export revenues also increased by 4%, or $32M, from $880M in 2012 to $912M in 2013.

Ontario's revenues have generally increased steadily year over year. As compared to five years ago, domestic revenues in Ontario have increased by 16%, or $200M; exports have increased by 12%, or $96M; and total revenues have increased by 14%, or $296M.

Quebec: Revenues in 2013 increased by 18%, or $61M, totalling $402M. Domestic revenues increased by 25%, or $18M, and export revenues increased by 16%, or $43M.

Quebec continued to gain steadily in relation to other regions and now has 12% of total space revenues, second only to Ontario.

Over the past five years, total revenues in Quebec have nearly doubled, from $216M in 2009 to $402M in 2013. Most years in the period were characterized by consistent growth, with the exception of last year when space revenues on the whole slowed across most of the country. In the last five years, the province's domestic revenues have increased by 79% from $50M to $89M, and exports have increased by 88% from $167M to $313M.

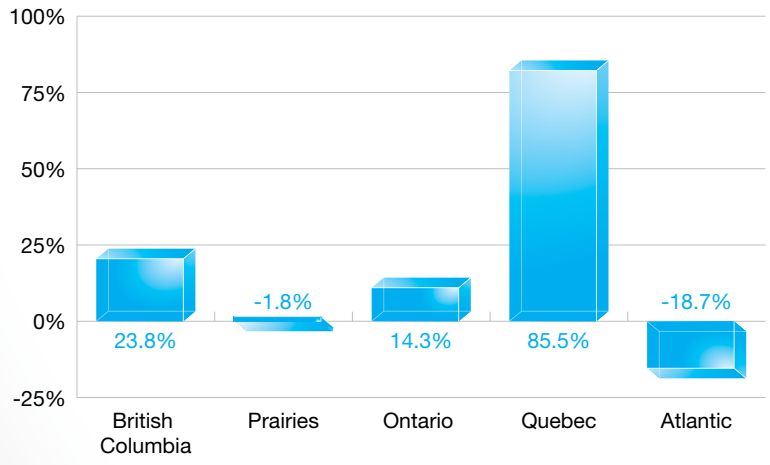
Atlantic Canada (New Brunswick, Newfoundland, Nova Scotia and PEI): In 2013, the Atlantic region saw revenues increase by 5%, or $12M. Domestic revenues drove growth, increasing by 35%, or $23M (from $68M to $91M), while exports decreased by 7% for a second year, from $176M to $165M.

Revenues in New Brunswick accounted for the domestic revenue growth in the region, with total revenues of $83M. Revenues in Newfoundland continued to decrease for the third year in a row, dropping by 7%, or $12M, and accounted for the majority of losses on the export side in the Atlantic region. Total revenues in Newfoundland are now $167M. Revenues in Nova Scotia increased by 25% to $5M.

Atlantic Canada's revenues in relation to other regions have remained the same for the last three years at 7% of total space revenues in Canada.

Looking at the five-year trend analysis, total revenues in the Atlantic region have decreased 19%, or $59M. While domestic revenues have stayed almost the same, from $90.7M in 2009 to $90.8M in 2013, export revenues have decreased by 26%, or $59M, during the same five-year period.

Percentage Change of Total Revenues by Region over the last 5 years (2009-2013)



SPACE WORK-FORCE

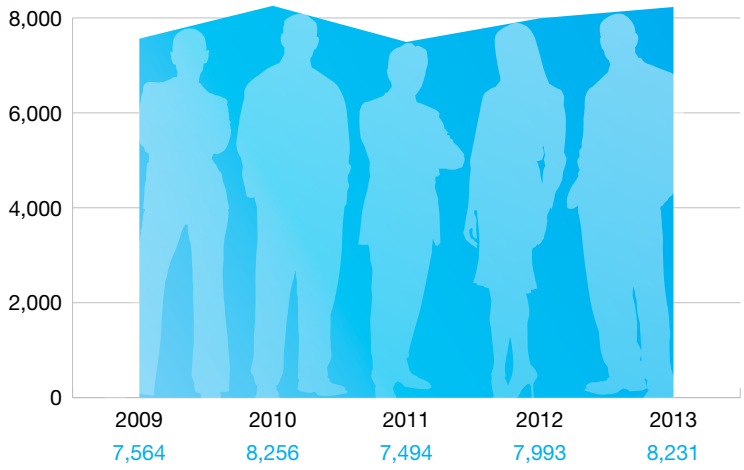
The Canadian space workforce expanded in 2013, gaining 238 positions, or 3%, across the country, for a total of 8,231 space-related employees. Growth was driven by an increased demand for employees with administration, marketing and sales skills.

WORKFORCE GROUPS

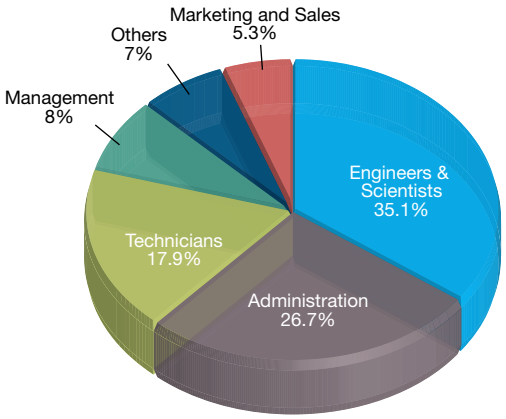
Engineers and scientists remained the largest category of employment in 2013, with 2,887 employees, representing 35% of the total space workforce. Workers in Administration make up the second largest group with 2,195 individuals or 27% of the total workforce. Technicians come third with 1,473 individuals, or 18%, of the total workforce. Management, marketing and sales, and other employees made up the remainder.

The following charts and graphs provide a breakdown of the workforce by space employment category in 2013. Note that these figures do not include individuals in the federal and provincial governments.

Workforce (2009-2013)



Workforce by Space Employment Category: 2013



WORKFORCE BY REGION FOR 2013

British Columbia: 5% (391 individuals) of Canada's space workforce, a decrease of 27%, or 143 employees, over last year.

Prairies: 10% (839 individuals), an increase of 22% (151 employees).

Ontario: 58% (4,784 individuals), an increase of 5% (213 employees).

Quebec: 20% (1,609 individuals), an increase of 7% (101 employees).

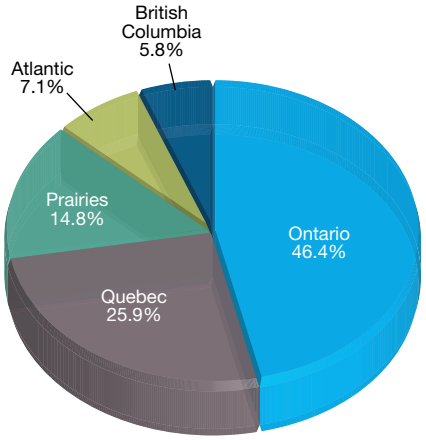
Atlantic Canada: 7% (608 individuals), a decrease of 12% (84 employees).

HIGHLY QUALIFIED PERSONNEL (HQP)

The following table reports the percentage of highly qualified personnel (HQP) in relation to each Canadian region, and relative to the national workforce. The HQP measurement consists in tracking the number of employed engineers, scientists and technicians. Note that these data do not include government employees. In 2013, HQP positions decreased slightly by 2%, totalling 4,359 positions.

- 6% of Canada's total space HQP work in B.C. while 65% of B.C.'s space workforce are HQP;
- 15% of Canada's total space HQP work in the Prairies while 77% of the Prairies' space workforce are HQP;
- 46% of Canada's total space HQP work in Ontario while 42% of Ontario's space workforce are HQP;
- 26% of Canada's total space HQP work in Quebec while 70% of Quebec's space workforce are HQP;
- 7% of Canada's total space HQP work in Atlantic Canada while 51% of Atlantic Canada's space workforce are HQP.

Highly Qualified Personnel
Space Workforce in Canada: 2013



Workforce Group by Region: 2013

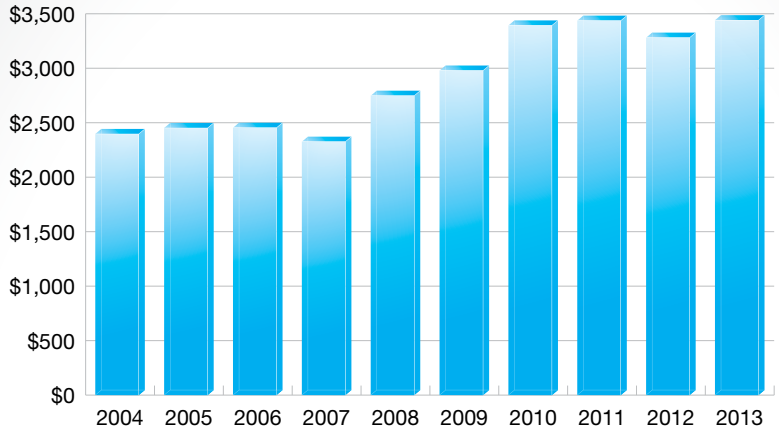
	Management	Engineers & Scientists	Technicians	Marketing and Sales	Administration	Other	Total	
B.C.	49	177	76	36	49	4	**391**	**4.8%**
Prairies	18	566	77	9	13	156	**839**	**10.2%**
Ontario	403	1,199	825	306	1,650	400	**4,784**	**58.1%**
Quebec	173	804	325	46	248	13	**1,609**	**19.5%**
Atlantic	19	140	170	37	235	7	**608**	**7.4%**
Total	**663**	**2,887**	**1,473**	**434**	**2,195**	**580**	**8,231**	

Highly Qualified Personnel Space Workforce in Canada: 2013

	Total n Workforce	Total n of HQP	% of HQP relative to its own province	% of HQP relative to national HQP
B.C.	391	253	64.7%	5.8%
Prairies	839	643	76.6%	14.8%
Ontario	4,784	2,024	42.3%	46.4%
Quebec	1,609	1,129	70.2%	25.9%
Atlantic	608	310	51.0%	7.1%
Total	**8,231**	**4,359**		

TEN-YEAR TREND : 2004-2013

Total Space Revenues 2004-2013 (C$m):
10-Year Trend



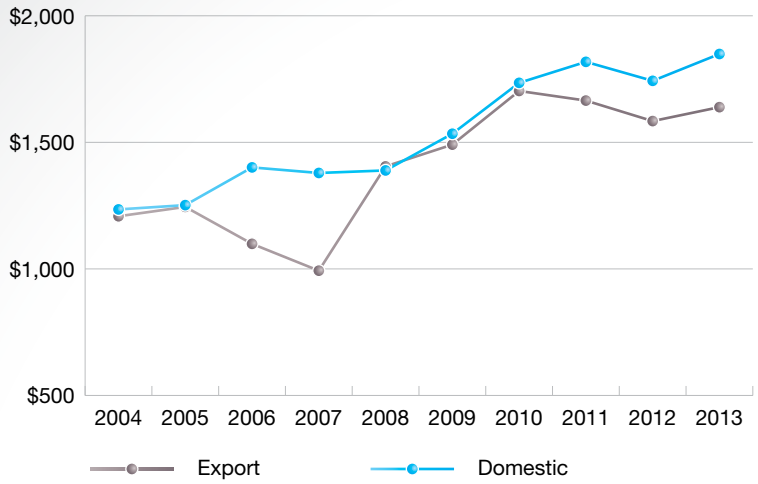
Year	Overall Revenues	Domestic Revenues		Export Revenues		Workforce
	(C$m)	(C$m)	%	(C$m)	%	n
2013	***$3,487,279,616***	***$1,848,563,816***	***53***	***$1,638,715,800***	***47***	***8,231***
2012	$3,326,974,904	$1,743,304,247	52	$1,583,670,656	48	7,993
2011	$3,483,148,034	$1,818,014,849	52	$1,665,133,185	48	7,494
2010	$3,438,260,107	$1,735,256,380	50	$1,703,325,725	50	8,256
2009	$3,024,814,669	$1,533,689,499	51	$1,491,152,468	49	7,564
2008	$2,793,722,219	$1,388,532,603	50	$1,405,189,616	50	6,742
2007	$2,372,145,807	$1,379,400,092	58	$992,745,715	42	6,481
2006	$2,500,364,235	$1,400,914,765	56	$1,099,449,470	44	6,678
2005	$2,497,711,781	$1,252,251,094	50	$1,245,460,687	50	6,710
2004	$2,442,685,155	$1,234,981,072	51	$1,207,704,083	49	8,231

** This chart reflects values not inflation-adjusted.*

Inflation-Adjusted Revenues: 2004-2013			
Year	Overall Revenues (C$m)	Domestic Revenues (C$m)	Export Revenues (C$m)
2013	***$3,487,279,616***	***$1,848,563,816***	***$1,638,715,800***
2012	3,326,974,904	1,743,304,247	1,583,670,656
2011	3,535,482,479	1,845,330,598	1,690,151,881
2010	3,598,425,170	1,815,896,522	1,782,528,649
2009	3,195,765,178	1,620,300,982	1,575,464,195
2008	2,943,818,213	1,463,133,141	1,480,685,072
2007	2,573,354,603	1,496,402,778	1,076,951,825
2006	2,771,845,388	1,553,021,386	1,218,824,002
2005	2,833,538,575	1,420,620,989	1,412,917,586
2004	2,826,535,679	1,429,049,526	1,397,486,153

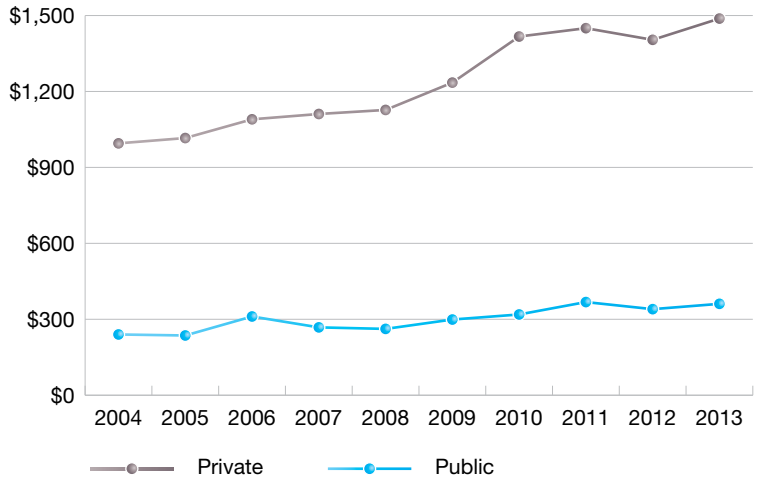
Bank of Canada Rates of Inflation-Adjusted Revenues (Consumer Price Index data)

Domestic vs. Export Revenues: 2004-2013 (C$m)



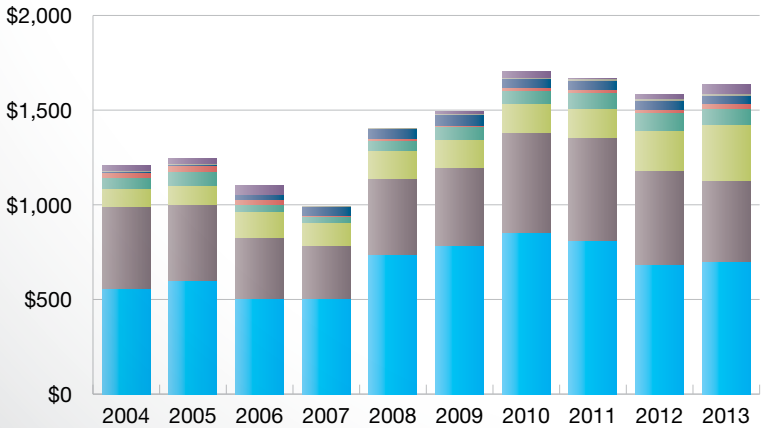
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Domestic	1,235	1,252	1,401	1,379	1,389	1,534	1,735	1,818	1,743	1,849
Export	1,208	1,245	1,099	993	1,405	1,491	1,703	1,665	1,584	1,639

Sources of Domestic Revenues Public vs. Private: 2004-2013 (C$m)



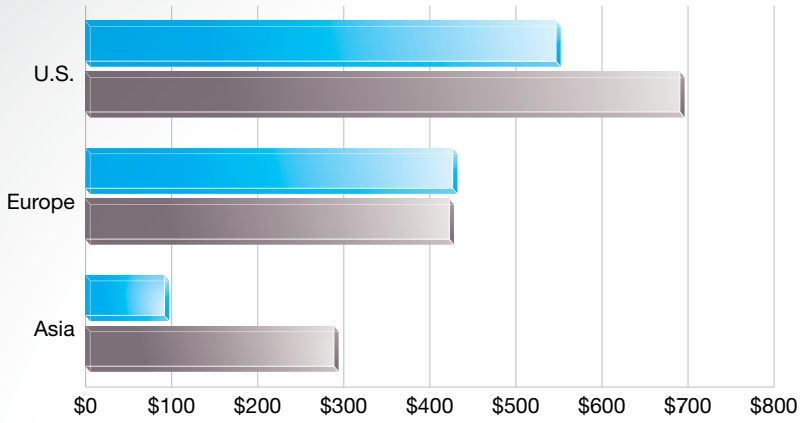
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Public	240	236	311	268	262	299	319	368	340	361
Private	995	1,016	1,090	1,111	1,127	1,235	1,417	1,450	1,404	1,488

Sources of Export Revenues: 2004-2013 (C$m)



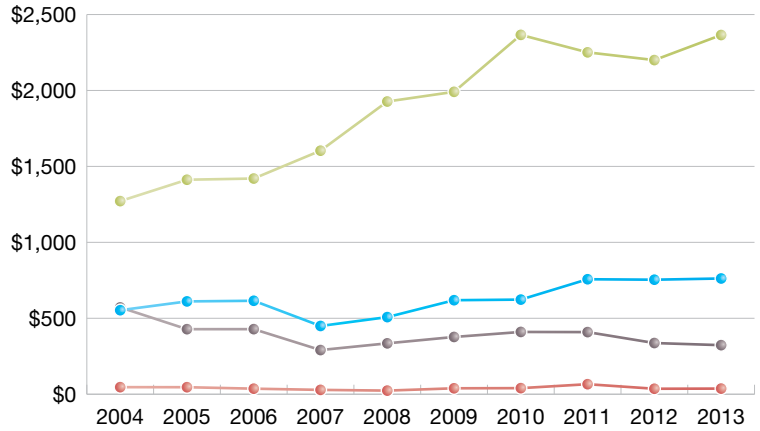
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
United States	552	593	499	499	733	782	850	807	680	696
Europe	432	401	323	283	399	408	525	544	497	428
Asia	97	100	134	120	150	152	154	155	212	294
South America	60	79	40	32	52	64	70	83	91	87
Africa	25	30	26	6	11	8	17	17	21	27
Oceania	4	6	24	48	51	56	46	45	47	42
C. Amer., Caribbean, Mex.	6	4	4	5	7	8	7	11	11	6
Other	33	33	48	0	2	14	34	5	25	58

Sources of Export Revenues: 2004-2013 (C$m)



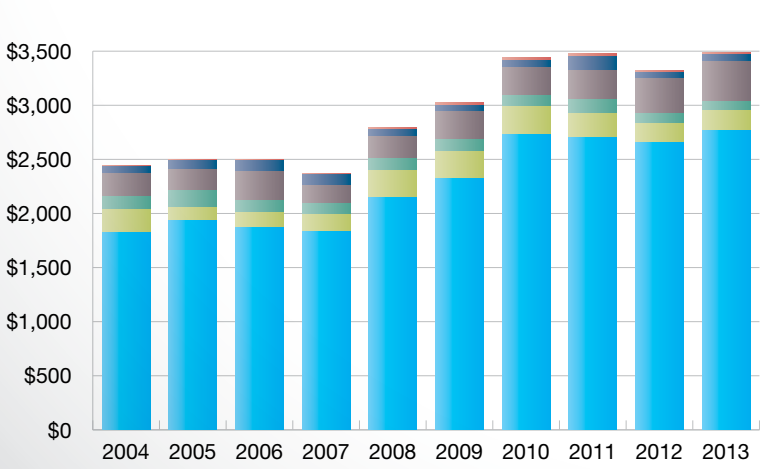
	2004	2013
U.S.	552	696
Europe	432	428
Asia	97	294

Total Revenues by Space Category: 2004-2013 (C$m)



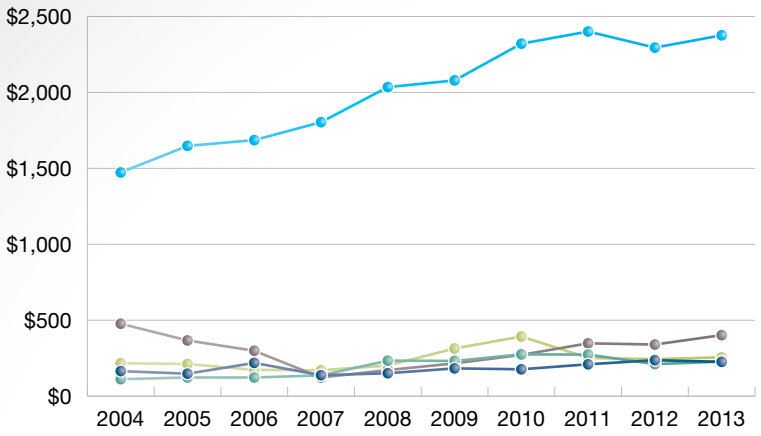
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Apps & Services	1,271	1,412	1,420	1,603	1,927	1,991	2,366	2,251	2,200	2,365
Space Segment	553	611	615	449	508	619	623	757	754	762
Ground Segment	572	428	428	291	335	377	410	409	337	323
Space Research	46	46	37	29	24	39	40	66	36	37

Revenues by Sector of Activity: 2004-2013 (C$m)



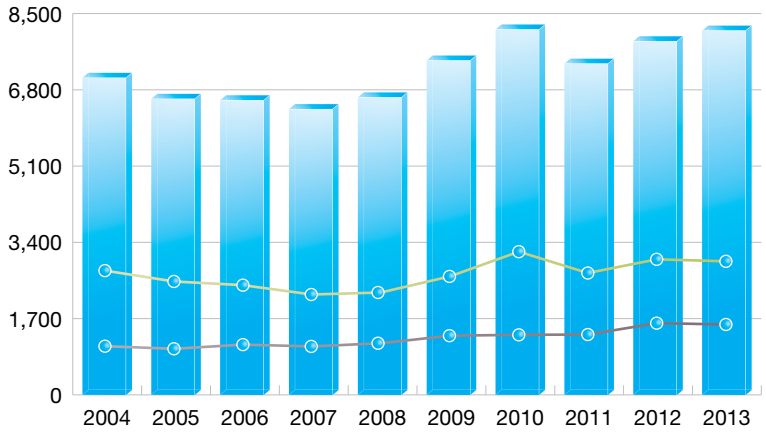
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
SatCom	1,827	1,938	1,874	1,832	2,146	2,326	2,729	2,703	2,655	2,769
Navigation (GPS)	212	120	132	155	254	243	260	225	172	182
Space Exploration	122	153	113	103	110	114	106	127	99	86
Earth Observation	211	192	269	168	200	258	256	271	322	371
Space Sciences	61	84	100	102	68	61	62	128	53	57
Other	9	11	12	13	16	24	25	29	25	22

Revenues by Canadian Region: 2004-2013 (C$m)



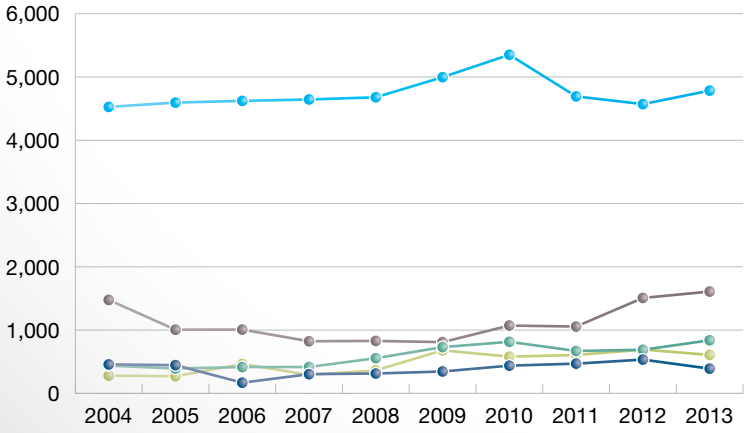
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
B.C.	165	148	219	138	151	183	177	210	237	226
Prairies	112	123	123	137	234	232	275	274	211	228
Ontario	1,473	1,648	1,686	1,804	2,035	2,079	2,327	2,401	2,295	2,376
Quebec	477	367	299	123	172	216	267	348	340	402
Atlantic	217	212	173	171	202	314	393	252	244	256

Workforce by Type of Employment: 2004-2013

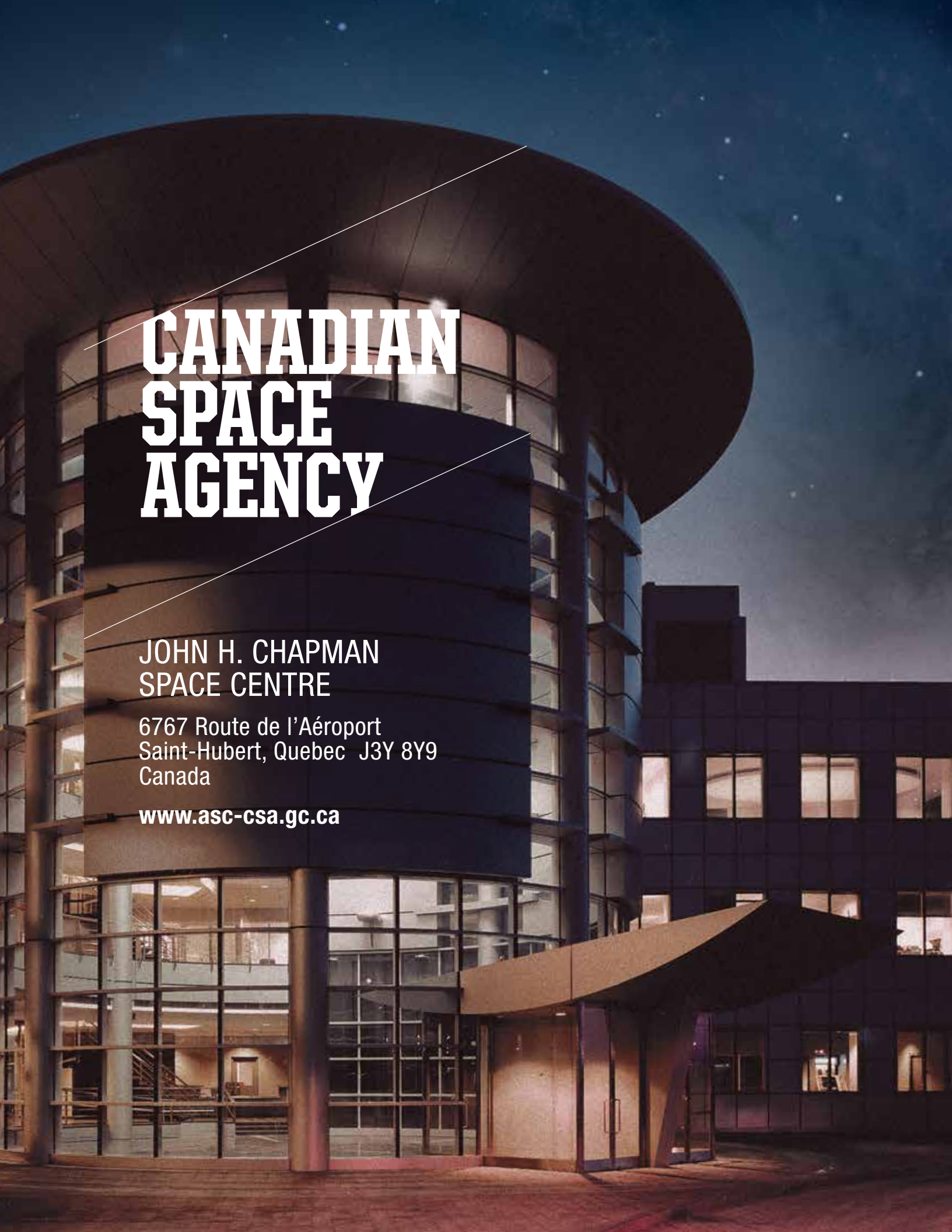


	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Workforce	7,179	6,710	6,678	6,481	6,742	7,564	8,256	7,494	7,993	8,231
Engineers & Scientists	2,679	2,436	2,353	2,144	2,189	2,549	3,103	2,625	2,932	2,887
Technicians	987	929	1,022	982	1,053	1,222	1,241	1,248	1,503	1,473

Workforce by Canadian Region: 2004-2013



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
B.C.	458	446	169	303	314	346	438	470	534	391
Prairies	438	393	416	419	557	731	815	670	689	839
Ontario	4,525	4,595	4,622	4,644	4,679	4,997	5,415	4,693	4,571	4,784
Quebec	1,479	1,006	1,008	824	829	810	1,008	1,056	1,508	1,609
Atlantic	280	271	464	291	364	680	581	606	692	608
Total	7,179	6,710	6,678	6,481	6,742	7,564	8,256	7,494	7,993	8,231



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