

THE PRINCE EDWARD ISLAND AEROSPACE AND DEFENCE INDUSTRY

Economic Impact Analysis

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Table of Contents

	<u>Page</u>
Executive Summary	2
1. Introduction	4
1.1 Purpose of this report.....	4
1.2 The economic impact model	4
3. Economic impact analysis of the PEI aerospace and defence industry	6
3.1 Economic impact model parameters.....	6
3.2 Industry output and GDP impacts	7
3.3 Employment and labour income effects.....	8
3.4 Taxation effects	9
3.5 Consumer spending effects	10
4. The PEI aerospace and defence industry: Broader impacts	12
4.1 The PEI aerospace and defence industry: An economic development success story	12
4.2 The PEI aerospace and defence industry: A driver of international exports	12
4.3 The PEI aerospace and defence industry: A major employer on the Island	15
4.4 The PEI aerospace and defence industry: Attracting national and international investment.....	17
5. The value proposition for aerospace and defence on PEI	18
5.1 Industry elements	18
5.2 Operating cost environment.....	18
5.3 The talent pipeline.....	19
5.4 Supportive government.....	20
6. Conclusion: Fostering growth in the aerospace and defence industry	21
Appendix A: The Economic Impact Model.....	22

Executive Summary

Since the conversion of CFB Summerside to Slemon Park in the early 1990s, the aerospace and defence industry on PEI has grown to become one of the most important industrial sectors on the Island. As an example of this growth, the value of aerospace parts exports rose from just over \$1 million in 1992 to \$74 million in 2014. Engine, turbine and power transmission equipment exports rose from just \$160,000 in 1992 to more than \$83 million in 2014. No other industry has grown faster over the last 20 years. As this report will show, among the 10 provinces PEI now has the second largest aerospace manufacturing and services industry in the country.

In 2013, the 12 firms comprising the core of the PEI aerospace and defence industry (as defined in Section 1) directly employed 931 people and generated \$405 million worth of sales. This output created significant economic value on PEI as it directly boosted provincial gross domestic product (GDP) by \$106 million. Adding in supply chain and induced economic activity, the total GDP impact increased to \$149.4 million or 3.3 percent of the entire PEI GDP. The 12 firms that comprise the core of the aerospace and defence industry boosted Island GDP by 4.7 percent.

Including supply chain and induced spending, total full time equivalent employment supported by the aerospace and defence industry was 1,364 in 2013 and total employment income was more than \$76 million. These 12 firms along with their PEI supply chain and induced spending effects boosted government tax revenues by an estimated \$29 million. The employment income generated by the industry supported more than \$57 million worth of consumer spending on PEI.

Table 1: PEI Aerospace and Defence Industry Economic Impact Summary (2013)

Output & GDP Impacts (PEI only)		Taxes generated on PEI***	
Direct industry output	\$405.7 million	Personal income tax (PIT)	\$ 12.3 million
Direct GDP	\$106.3 million	Harmonized sales tax (HST)	\$ 6.0 million
Direct & indirect GDP	\$128.5 million	Property taxes (residential)	\$ 2.0 million
Total GDP**	\$149.4 million	Indirect taxes****	\$ 8.7 million
		Total taxes	\$ 29.0 million
		<i>Taxes as a percentage of GDP</i>	19.5%

Employment and labour income supported on PEI		Estimated consumer spending on PEI***	
Direct sector employment*	931	Total consumer spending	\$ 57.3 million
Direct and indirect employment (FTE**)	1,166	Food expenditures	\$ 9.0 million
Total employment on PEI (FTE)**	1,364	Shelter	\$ 12.2 million
<i>Employment multiplier</i>	1.5	Transportation	\$ 12.1 million
Direct & indirect labour income	\$ 68.5 million	Health and personal care	\$ 3.4 million
Total labour income supported on PEI***	\$ 76.4 million	Recreation	\$ 6.5 million

*Direct employment for 2014. **Full time equivalent employment. ***Includes indirect and induced effects.

****See Section 3.4 for a definition of indirect taxes.

The PEI aerospace and defence industry's direct GDP contribution on PEI is more than the seafood product preparation and packaging sector, fishing sector and animal production sector. The aerospace and defence sector accounts for the vast majority of durable goods manufacturing GDP on the Island.

Executive Summary (cont.)

The PEI aerospace and defence industry generates above average wages (Section 3.3). In 2013, the average employment income in the industry was 22 percent higher than for an average worker across Prince Edward Island.

Private sector revenue in the PEI aerospace and defence industry has been growing strongly. As an example of this growth, international export revenue is up by more than 300 percent¹ in the past five years (2010 to 2014) (Section 4.2). On a per capita basis, PEI now ranks second to Quebec among the ten provinces for aerospace parts and products manufacturing exports and first among the ten for engine, turbine and power transmission equipment manufacturing exports. Aerospace and defence related products now make up four of the top 10 international export industries from PEI.

The PEI aerospace and defence industry has built a skilled labour pool (Section 4.3). In 2011, the PEI labour market had a higher percentage of aircraft mechanics and aircraft inspectors than any of the other 10 provinces. Adjusted for the size of the overall labour market, there were more people working in aerospace product and parts manufacturing on PEI than all other provinces in Canada. There is another interesting workforce attribute associated with the PEI aerospace and defence sector. The aerospace and defence workforce on PEI is the youngest in Canada by a wide margin. In 2011, 42 percent of the workforce was under the age of 34 compared to 24 percent in Quebec and only 17 percent in Nova Scotia. This industry is attracting young Islanders and keeping them home to pursue their careers.

The value proposition for investment into the PEI aerospace and defence industry has been strengthened in recent years by the work of the ADAPEI supported by a number of key stakeholders including: the provincial government, Atlantic Canada Opportunities Agency, Holland College and the University of Prince Edward Island.

In addition to the labour pool and cluster development activities, aerospace and defence firms can take advantage of one of the most competitive operating cost environments in North America and Europe (Section 5.2). The 2014 KPMG Competitive Alternatives report recently concluded that a typical aerospace parts manufacturing facility in Boston will face a cost environment 35 percent higher than in Charlottetown. Other aerospace and defence industries in places such as Montreal, San Diego and London in the United Kingdom also face higher cost environments compared to Prince Edward Island.

Prince Edward Island needs growth industries to provide tax revenues and good quality career opportunities. The PEI aerospace and defence industry is well positioned for continued growth into the future.

¹ Includes NAICS 33641 - Aerospace Product and Parts Manufacturing, NAICS 33361 - Engine, Turbine and Power Transmission Equipment and All Other Electrical Equipment and Components (NAICS 33599).

1. Introduction

1.1 Purpose of this report

The objective of the project is to estimate the economic contribution of the aerospace and defence sector to the Prince Edward Island economy including direct, indirect, and induced economic activity. This report provides data on sector output and gross domestic product (GDP) as well as employment, employment income, taxation and consumer spending. In addition, the report includes a broader set of data to tell the story of the contribution the PEI aerospace and defence industry makes to the Island economy.

The aerospace and defence sector has been a significant driver of the provincial economy over the past few years. There has been substantial growth in sector revenue, GDP contribution and exports. In addition, the sector now features hundreds of skilled workers earning above average wages. Prince Edward Island now has a higher concentration of aircraft mechanics and aircraft inspectors than any other province in Canada relative to the size of its labour market (see Section 5 below for details).

Leveraging the conversion of CFB Summerside into the largest commercial aerospace sector in Atlantic Canada, the PEI aerospace and defence industry is a great example of how a focused effort can drive economic growth and prosperity even in smaller markets that are outside the geographic orbit of North America's big aerospace and defence industries. The sector is growing, internationalized and diversified.

This report also briefly discusses the value proposition for the PEI aerospace and defence industry. The 'case' for this sector's investment on the Island has been significantly strengthened in recent years due to strategic investments and support infrastructure and cluster development. As measured by international exports per capita, PEI is nipping at the heels of Quebec - the largest aerospace and defence industry in Canada.

1.2 The economic impact model

The primary purpose of this report is to develop an economic impact model estimating the contribution of the aerospace and defence industry to the economy of Prince Edward Island. The economic impact model is based on Statistics Canada's Input-Output (I-O) tables that provide a detailed profile of how expenditures in specific sectors flow through the provincial and national economy as well as by international trade.

The I-O tables are developed using actual spending patterns within specific industries and provinces and therefore estimates of new economic activity are based on the expenditure profile of previous activity in those industries. If there is reason to believe a certain project will dramatically deviate in its expenditure profile, the efficacy of the Input-Output tables as predictor of economic impact should be called into question. There is no reason to believe this is the case with the firms and industries reviewed in this report.

The economic impact model evaluates the direct, indirect, and induced economic impacts, using the following parameters:

- *Direct impact* measures the value-added to the economy from the industry that is attributed directly from the employees, the wages earned, and the revenues generated. In certain cases, direct impacts are not published by Statistics Canada due to privacy considerations.
- *Indirect impact* measures the value-added the aerospace and defence sector generates within the PEI economy through the firm and organizational demand for intermediate inputs or other support services (e.g. the supply chain).
- *Induced impacts* are derived when employees in the aforementioned industries spend their earnings and owners spend their profits. These purchases lead to more employment, higher wages, and increased income and tax revenues, and can be felt across a wide range of industries.

The I-O tables trace the impact of economic activity (output shock) on the provincial and national economies (including imports and exports). In addition to the output, GDP and employment impacts, the economic impact model estimates the amount of tax revenue supported by the industry as well as consumer spending impacts.

NOTE: Due to the size of the economy on Prince Edward Island, for many industries the direct multipliers are unavailable (due to confidentiality concerns). However, the combined direct and indirect multipliers are available and are used in this report.

Table 2: The Economic Impact Model

Direct effect -within province (where available)	Simple multipliers (direct and indirect) - within province and rest of Canada	Total multipliers (direct, indirect and induced) - within province and rest of Canada
⇒ Output	⇒ Output	⇒ Output
⇒ GDP basic price	⇒ GDP basic price	⇒ GDP basic price
⇒ Labour income	⇒ Labour income	⇒ Labour income
⇒ Jobs	⇒ Jobs	⇒ Jobs
⇒ International imports	⇒ International imports	⇒ International imports
⇒ Export shares		

There are over 200 industries for which detailed I-O data is available. Each firm in the PEI aerospace and defence industry was assigned to its most relevant industry classification (using the NAICS classification system²) and the spending of those organizations was analyzed to determine economic impacts. Finally, it is important to point out that no company-specific information is included in this report nor can it be inferred from the data. The report is meant to derive the overall economic impact of the aerospace and defence sector on PEI.

² North American Industrial Classification System (NAICS).

3. Economic impact analysis of the PEI aerospace and defence industry

3.1 Economic impact model parameters

The Aerospace & Defence Association of PEI provided 2013 data on firm employment³, payroll and revenue for each of the 12 firms in the industry. Using the description of the firms' business operations on PEI, each was segmented into appropriate four-digit NAICS industry groups to provide an accurate assessment of their economic impact.

Table 3 shows a list of industries used in the model. Nearly 60 percent of industry revenue falls into the aerospace products and parts manufacturing sector. Maintenance, repair and overhaul (MRO) operations are classified under "support activities for transportation".

Table 3: Sectors included in the economic impact model

<u>Sub-sector:</u>	<u>NAICS classification:</u>
Aerospace product and parts manufacturing	BS336400
Engine, turbine and power transmission equipment manufacturing	BS333600
Motor vehicle electrical and electronic equipment manufacturing	BS336320
Communications equipment manufacturing	BS334200
Other chemical product manufacturing	BS325900
Support activities for transportation	BS488000

Once segmented into their proper industry group, each firm was analyzed to determine its indirect and induced employment on PEI; direct, indirect and induced gross domestic product (GDP) impact and other impacts.

It is important to point out that this sector features a significant import component. According to the I-O multipliers, for every dollar of direct output in the PEI aerospace product and parts manufacturing sector, there is 33 cents worth of imports. This is common in a high value sectors such as this as products are part of a global supply chain.

³ Employment figures are for 2014.

3.2 Industry output and GDP impacts

In 2013, the PEI aerospace and defence industry generated \$406 million worth of output. The industry directly generates an estimated four percent of the total Island economic output.

In 2013, the \$406 million worth of output generated by the aerospace and defence sector on PEI resulted in \$106.3 million worth of gross domestic product (GDP) on the Island. GDP represents the value added from industry output that stays on Prince Edward Island. This direct GDP contribution was higher than the entire wholesale trade industry (\$102.8 million), the fishing sector (\$88.3 million), animal production (\$72.5 million) and seafood manufacturing (\$51.7 million (Figure 1)).

Including on Island supply chain spending, GDP impact rises to \$128.5 million. Including induced economic effects on PEI, the industry generated an estimated \$149.4 million worth of GDP on PEI (Table 4).

Figure 1: Selected industries by annual direct GDP contribution on PEI (2013) \$Million



*Aerospace and defence firms in the industry account for the bulk of durable goods manufacturing GDP on the Island. Sources: Direct GDP contribution derived from Statistics Canada CANSIM Table 379-0030.

Table 4: Aerospace and defence industry output and GDP on PEI (2013)

Direct industry output	\$405,713,630
Direct GDP	\$106,275,304
Direct & indirect GDP	\$128,454,670
Total GDP*	\$149,373,293

*Combined direct, indirect and induced effects.

Derived using Statistics Canada's I-O Tables at the M level (2010) and other Statistics Canada CANSIM tables relating to taxation and spending. See Appendix A for a full source list.

Total PEI aerospace and defence industry GDP (including direct, indirect and induced effects) represents over three percent of total GDP on the Island and nearly five percent of private sector generated GDP.

3.3 Employment and labour income effects

The PEI aerospace and defence industry has become an important employer on the Island. In 2014, the 12 firms employed 931 people at well above industry average wages.

This represented 154 out of every 10,000 workers across Prince Edward Island. Including indirect and induced employment effects, 227 out of every 10,000 jobs on the Island are supported by the PEI aerospace and defence industry. Figure 2 shows the number of persons employed by the PEI aerospace and defence industry relative to other sectors of the economy. The industry employs more people than the entire banking sector on the Island and twice as many as the entire architectural, engineering and related services sector.

A significant percentage of the jobs in the industry require highly skilled workers which pushes up average wages. The total wage bill (labour income) generated directly and indirectly by the industry on PEI in 2013 was \$68.5 million. Including induced economic effects, the total labour income supported by the industry rises to \$76.4 million.

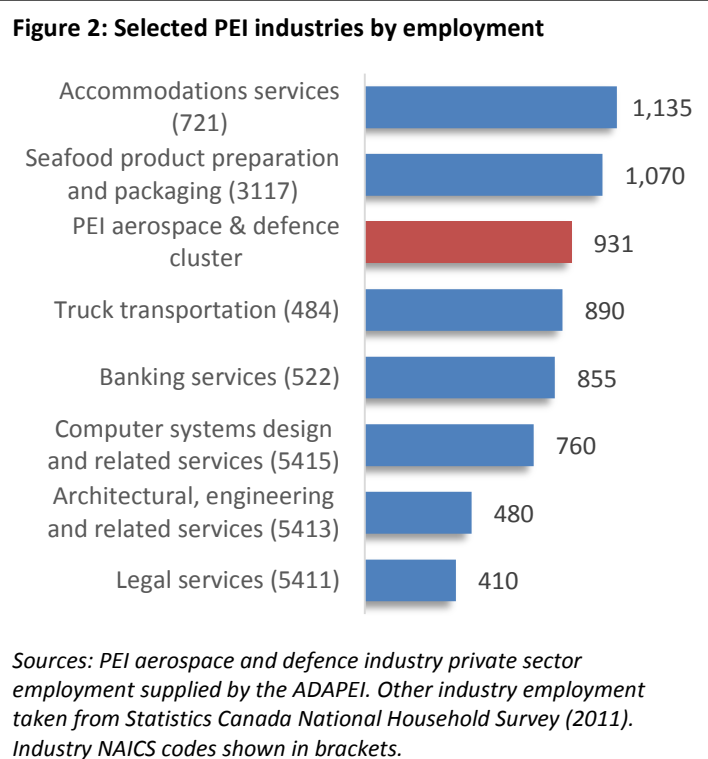


Table 5: PEI aerospace and defence industry employment and labour income supported on PEI (2013)

Direct sector employment	931
Direct and indirect employment (FTE*)	1,166
Total employment on PEI (FTE)**	1,364
Employment multiplier	1.5
Direct & indirect labour income	\$68,461,181
Total labour income supported on PEI**	\$76,416,983

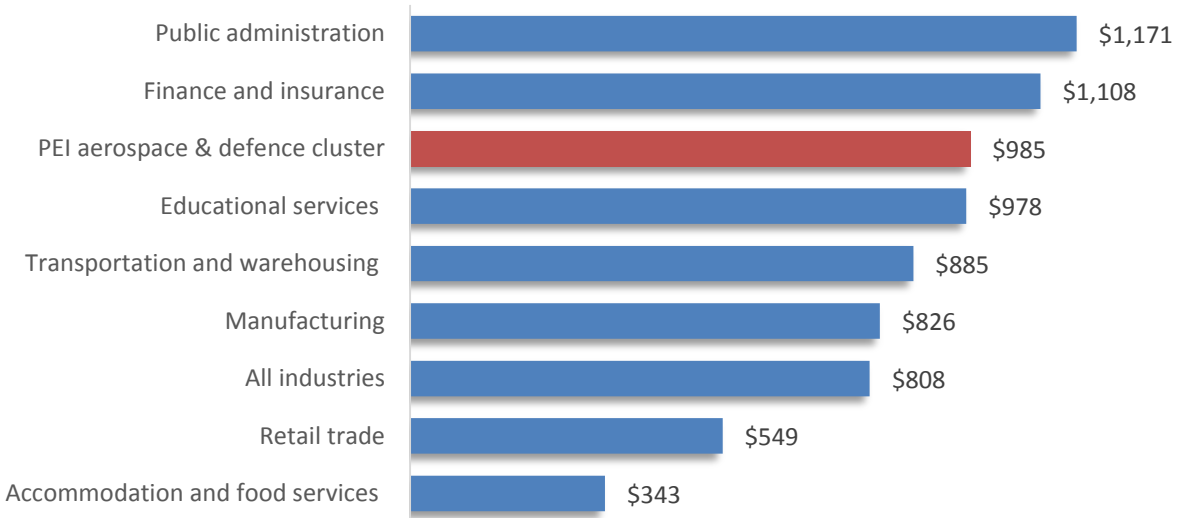
*Full time equivalent employment.

**Combined direct, indirect and induced effects.

Derived using Statistics Canada's I-O Tables at the M level (2009) and other Statistics Canada CANSIM tables relating to taxation and spending. See Appendix A for a full source list.

Figure 3 shows the average weekly employment income generated by the PEI aerospace and defence industry compared to other industries on the Island. The average wage for an aerospace and defence sector worker is 22 percent higher than for an average worker across Prince Edward Island. The average wage is nearly three times higher compared to the accommodation and food services sector on the Island.

Figure 3: Average weekly employment income comparison (2013)



*Average weekly employment income (direct) for the aerospace and defence sector in 2013. Average weekly employment income for other sectors taken from Statistics Canada CANSIM Table 281-0026.

3.4 Taxation effects

The aerospace and defence sector provides a significant boost to government tax revenue each year. Table 6 shows the estimated total taxes generated by the PEI aerospace and defence industry in 2013. The industry contributed an estimated \$12.3 million in personal income tax (PIT) to federal and provincial governments as well as nearly \$6 million worth of harmonized sales taxes (HST). Local governments on PEI benefitted from over \$2 million worth of residential property taxes in 2013. Finally, indirect taxes generated from the PEI aerospace and defence industry accounted for \$5.6 million worth of revenue to federal and provincial governments (Figure 4).

In total, taxes generated by the PEI aerospace and defence industry exceeded \$29 million or an amount equivalent to 19.5 percent of the industry's GDP contribution.

Figure 4: Taxes generated by the PEI aerospace and defence industry (% of total)

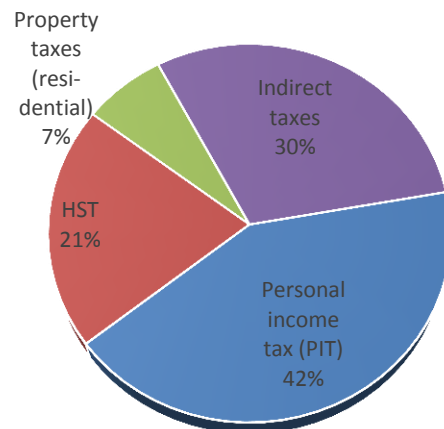


Table 6: Aerospace and defence industry taxes generated on PEI (2013)*

Personal income tax (PIT)	\$12,277,307
Harmonized sales tax (HST)	\$6,036,942
Property taxes (residential)	\$2,014,649
Indirect taxes**	<u>\$8,729,747</u>
Total taxes	\$29,058,644

Taxes as a percentage of GDP **19.5%**

**Combined direct, indirect and induced effects. Derived using Statistics Canada's I-O Tables at the M level (2010) and other Statistics Canada CANSIM tables relating to taxation and spending. See Appendix A for a full source list.*

***In addition to non-refundable HST, indirect taxes include business-related property taxes, fuel taxes and other fees and levies. Note that corporate income tax is not included in the model nor is the impact of any tax incentives or subsidies.*

NOTE: The aerospace and defence sector on PEI generates tax revenue in other provinces. This additional revenue for federal and provincial governments was not included in the economic impact model.

3.5 Consumer spending effects

The employment income generated by the aerospace and defence sector on PEI in 2013 supported a wide variety of consumer spending on the Island. Table 7 shows the estimated direct, indirect and induced consumer spending activity supported by the industry by major expenditure category. The figures are based on the average household expenditures on PEI and on the assumption that the industry's employment income would be spent in a similar pattern to the average household across the Island.

In total, the employment income generated by the industry supported \$57 million worth of consumer spending during the year. This included \$9 million on food (groceries and restaurants), \$12.2 million in housing-related expenditures such as mortgage payments, utilities and furniture and over \$12 million on transportation costs that are mostly related to vehicle purchases, operations and maintenance. As shown in Table 7, the industry supported \$5.4 million worth of spending on insurance and retirement savings and another \$3.4 million on health and personal care.

Figure 5: Consumer spending generated by the PEI aerospace and defence industry (% of total)

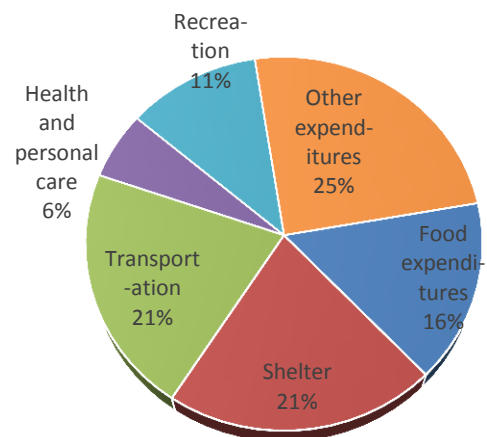


Table 7: Estimated consumer spending arising from the aerospace and defence sector economic activity on PEI (2013)

Total consumer spending	\$57,266,400
Food expenditures	\$8,952,648
<i>Food purchased from stores</i>	\$6,501,195
<i>Food purchased from restaurants</i>	\$2,451,453
Shelter	\$12,187,412
<i>Water, fuel and electricity for principal accommodation</i>	\$3,521,636
<i>Household operations</i>	\$4,440,000
<i>Communications</i>	\$1,915,897
<i>Household furnishings and equipment</i>	\$1,900,994
Clothing and accessories	\$3,922,139
Transportation	\$12,114,763
Health and personal care	\$3,369,817
Recreation	\$6,505,852
Education	\$927,678
Personal insurance payments and pension contributions	\$5,413,316
Gifts of money, support payments and charitable contributions	\$1,883,297

Source: Derived using Statistics Canada's I-O Tables at the national M level (2010) and CANSIM Table 203-0021 Survey of household spending (SHS), household spending (2012). See Appendix A for a full source list.

4. The PEI aerospace and defence industry: Broader impacts

4.1 The PEI aerospace and defence industry: An economic development success story

Aerospace and defence industries are a major driver of the global economy. According to the consulting firm PwC, the top 100 aerospace and defence companies globally generate some \$700 billion worth of annual revenue. Four of the top 100 companies are based in Canada including: Bombardier Aerospace, CAE, MacDonald Dettwiler & Associates and Magellan Aerospace Corp. Historically the only small concentration of aerospace and defence firms in the Maritime Provinces was located in the Halifax area. After the closure of CFB Summerside, the new Slemmon Park became a catalyst for the fastest growing aerospace industry in Canada.

4.2 The PEI aerospace and defence industry: A driver of international exports

Key to this growth has been the expansion of international exports from PEI. In 1992, the *aerospace product and parts manufacturing sector* (NAICS 33641) and the *engine, turbine and power transmission equipment sector* (NAICS 33361) on PEI generated only \$1.3 million worth of international export revenue. By 2014, the total value of international exports from these two sectors had jumped to more than \$157 million. Research undertaken for the preparation of this report finds that the 12 core firms in the PEI aerospace and defence industry generated \$300 million worth of international exports in 2014 and over \$105 million worth of domestic exports.

Figure 6: Value of international exports from PEI by year – aerospace parts and products/engine, turbine and power equipment manufacturing (\$000s)



* For NAICS 33641 - Aerospace Product and Parts Manufacturing and NAICS 33361 - Engine, Turbine and Power Transmission Equipment. Source: Industry Canada Trade Data Online.

As shown in Table 8, aerospace and defence related products now make up four of the top 10 international export industries from PEI*. Importantly, they are also the four fastest growing generators of international export revenue.

Table 8: Value of international exports from PEI by year – top 10 industries by value (\$Millions)

Industry:	2010	2011	2012	2013	2014	% Change
31141 - Frozen Food Manufacturing	\$197.0	\$182.6	\$208.8	\$222.1	\$218.8	+11%
31171 - Seafood Products	\$138.8	\$122.6	\$140.8	\$146.3	\$198.1	+43%
33361 - Engine, Turbine and Power Transmission Equipment	\$16.2	\$31.5	\$64.7	\$65.0	\$83.2	+414%
33641 - Aerospace Product and Parts Manufacturing	\$27.6	\$39.6	\$63.5	\$65.2	\$73.9	+167%
11121 - Vegetable and Melon Farming	\$53.3	\$88.3	\$59.7	\$65.5	\$65.1	+22%
32541 - Pharmaceutical and Medicine Manufacturing	\$36.3	\$32.1	\$30.0	\$30.8	\$50.2	+38%
32519 - Other Basic Organic Chemical Manufacturing*	\$10.9	\$10.1	\$18.2	\$20.6	\$47.8	+338%
11251 - Animal Aquaculture	\$30.8	\$32.8	\$35.0	\$35.9	\$37.4	+21%
33599 - All Other Electrical Equipment and Components	\$1.5	\$2.7	\$9.3	\$1.7	\$33.2	+2114%
11411 - Fishing	\$18.4	\$16.5	\$21.9	\$21.6	\$25.0	+35%

*One firm in the PEI aerospace and defence sector is classified under this NAICS code. Source: Industry Canada Trade Data Online.

In addition, the aerospace and defence sector is more diversified by international market. Only just over half the value of exports was derived from the U.S. market in 2014 compared to 61 percent for all PEI exports. In the last few years, South Korea, Australia and France have emerged as important markets for PEI aerospace and defence products (Table 9).

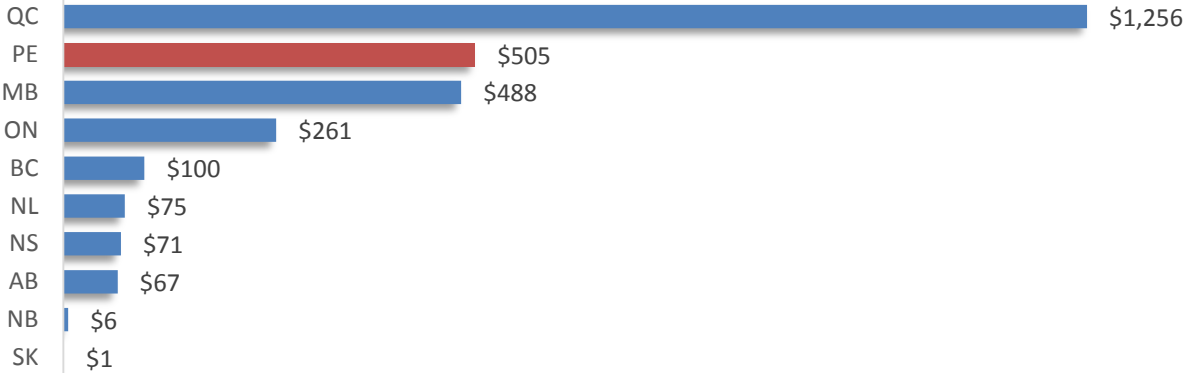
Table 9: Value of international aerospace and defence exports from PEI by year and country (\$Millions)

Country:	2010	2011	2012	2013	2014	% Change
United States	\$33.6	\$37.1	\$48.1	\$59.2	\$51.1	52%
South Korea	\$1.4	n/a	\$8.5	\$0.1	\$29.2	1924%
Australia	\$0.0	\$2.9	\$5.4	\$4.5	\$15.8	41791%
France	\$0.1	\$2.9	\$3.5	\$6.5	\$11.9	10566%
Kenya	\$1.2	\$5.5	\$13.5	\$8.2	\$9.9	730%
South Africa	\$1.0	\$1.1	\$3.6	\$4.9	\$9.8	905%
Indonesia	\$0.0	\$1.6	\$6.7	\$1.6	\$5.8	67955%
United Kingdom	\$3.2	\$5.1	\$4.4	\$5.6	\$5.3	66%
Netherlands	\$0.1	\$0.8	\$0.0	\$1.0	\$5.0	3853%
Germany	\$0.4	\$0.7	\$2.3	\$0.7	\$4.8	1132%
Sub-total	\$41.1	\$57.7	\$96.0	\$92.2	\$148.7	262%
Others	\$4.2	\$16.1	\$41.5	\$39.8	\$41.6	887%
Total All Countries	\$45.3	\$73.8	\$137.5	\$131.9	\$190.3	320%

* Includes NAICS 33641 - Aerospace Product and Parts Manufacturing, NAICS 33361 - Engine, Turbine and Power Transmission Equipment and All Other Electrical Equipment and Components (NAICS 33599). Source: Industry Canada Trade Data Online.

Adjusted for the size of the economy, PEI’s aerospace and defence international exports are among the highest of the 10 provinces across Canada. In 2014, the Island exported \$74 million worth of products in the *Aerospace Product and Parts Manufacturing* (NAICS 33641) sector. On a per capita basis this was a higher export value than any other province except Quebec (Figure 7). In addition, the value of exports grew by 167 percent between 2010 and 2014 – the fastest growth rate among the 10 provinces during that timeframe.

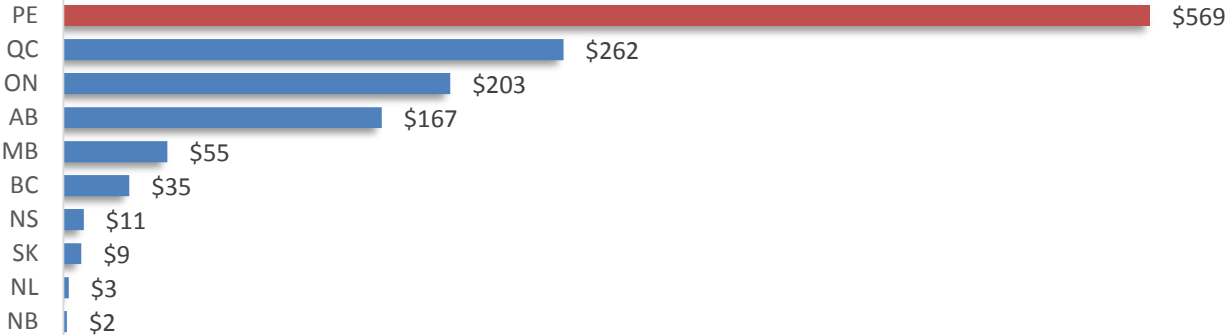
Figure 7: Per capita value of international exports (2014) – aerospace parts and products manufacturing



Source: Industry Canada Trade Data Online.

The international exports of products in the *Engine, Turbine and Power Transmission Equipment Manufacturing* (NAICS 33361) grew even faster over the past five years. Between 2010 and 2014, the total value of international exports grew by over 400 percent – the fastest growth rate by a wide margin among the 10 provinces during that timeframe. On a per capita basis, PEI now generates more than twice as much export revenue in this sector compared to its nearest competitor province (Figure 8). In total, more than \$83 million worth of international exports from this sector were shipped from PEI in 2014.

Figure 8: Per capita value of international exports (2014) – engine, turbine and power transmission equipment manufacturing



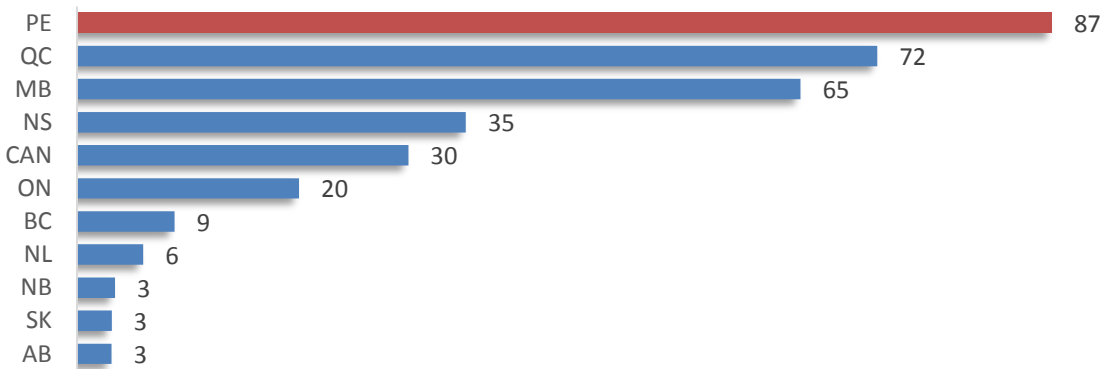
Source: Industry Canada Trade Data Online.

4.3 The PEI aerospace and defence industry: A major employer on the Island

As developed in Section 3.3 above, the 12 core firms in the PEI aerospace and defence industry have 931 employees and support a total of nearly 1,400 full time equivalent jobs across Prince Edward Island. Using data from the 2011 National Household Survey from Statistics Canada, the aerospace and defence workforce can be compared to other provinces. In 2011, there were 600 Islanders employed in the aerospace product and parts manufacturing industry (NAICS 3364). Adjusted for the size of the overall labour market, there were more people working in this sector on PEI than all other provinces in Canada (Figure 9). Eighty-seven out of every 10,000 workers were employed in aerospace product and parts manufacturing on PEI compared to 72 per 10,000 in Quebec and 65 per 10,000 in Manitoba.

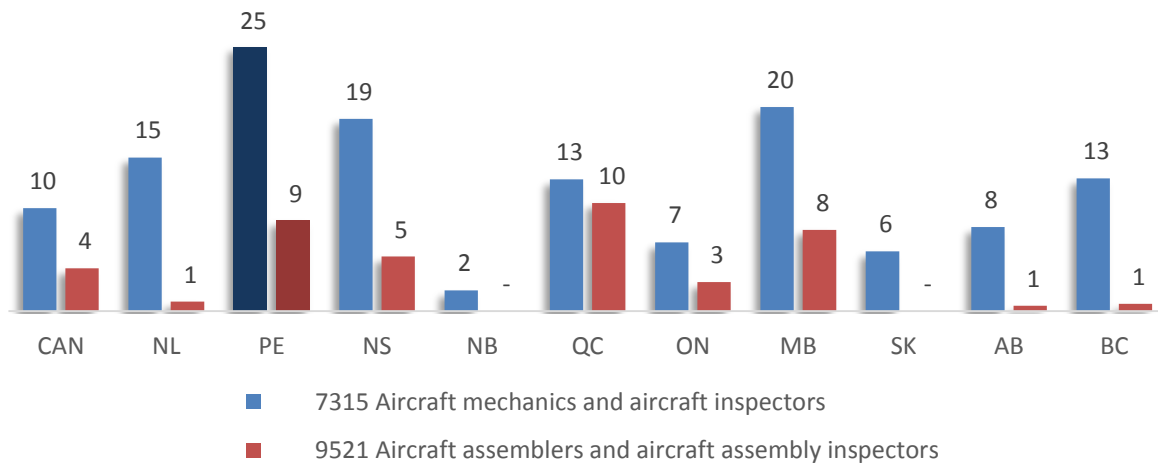
The same analysis can be done with aerospace-related occupations. Figure 10 shows the employment intensity for two key related occupations: aircraft mechanics and aircraft inspectors (NOC 7315 and aircraft assemblers and aircraft assembly inspectors (NOC 9521). Adjusted for the size of the labour market, PEI has more persons working in NOC 7315 than all other provinces. The Island has the second most workers in NOC 9521.

Figure 9: Aerospace product and parts manufacturing employment (per 10,000 in the overall labour market)



Source: Statistics Canada National Household Survey (2011).

Figure 10: Employment per 10,000 in the overall labour market - aerospace-related occupations



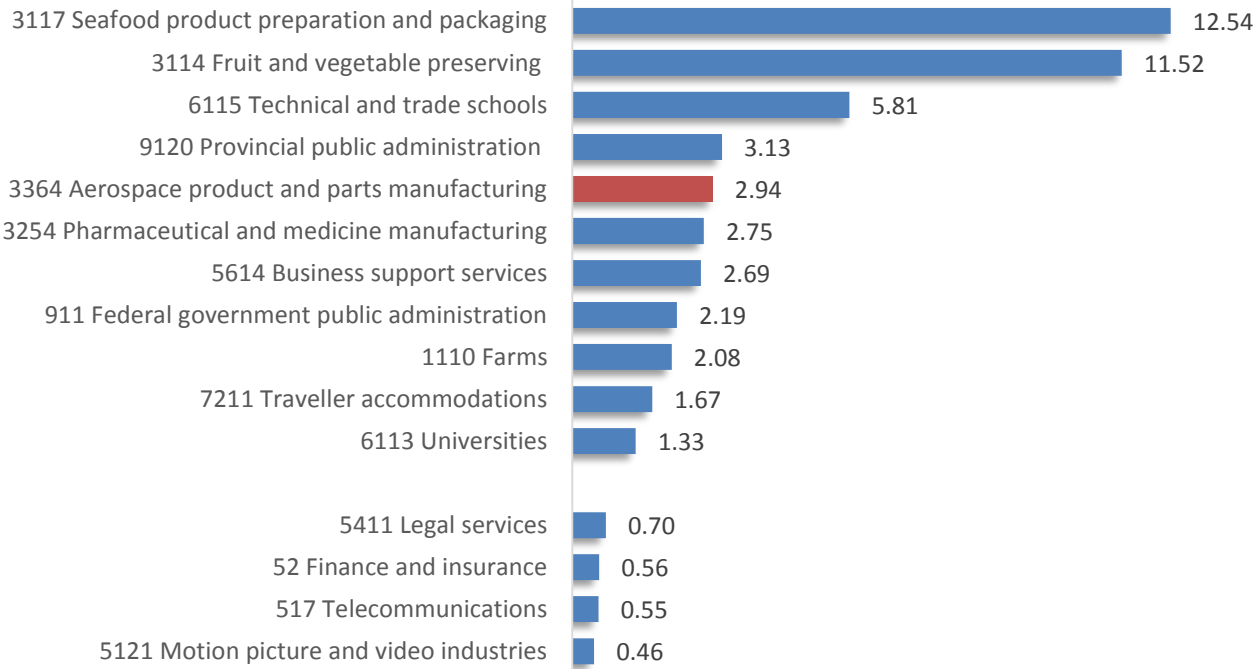
Source: Statistics Canada National Household Survey (2011).

How does aerospace industry employment compare to other industries on the Island? Using the national labour market as the base, a comparative analysis can be done using a technique called “Location Quotient” analysis which compares the intensity of employment in various industries to the national labour market. A value greater than 1.00 means the jurisdiction has more employment in this industry relative to the size of its overall labour market compared to the national labour market.

Figure 11 shows the Location Quotient (LQ) for a few selected industries on PEI. As would be expected, the Island has very high LQs for fishing (not shown on the chart), seafood production and French Fry production (grouped under NAICS 3114 fruit and vegetable preserving). Aerospace product and parts manufacturing employment has grown from virtually nothing in the early 1990s to now nearly three times as much employment compared to the overall national labour market (LQ = 2.94). The aerospace manufacturing LQ is much higher than tourism-related sectors such as traveller accommodations and also more than farming.

Figure 11 also shows some of the industries with very low LQs such as legal services, finance and insurance and telecommunications. Because the Island has a small economy, there is considerable ‘leakage’ of economic activity from these sectors to other provinces that have greater scale and more specialization. This shows the importance of PEI developing its own industries such as aerospace and defence to offset the relatively low impact of these other sectors and foster a strong overall economy.

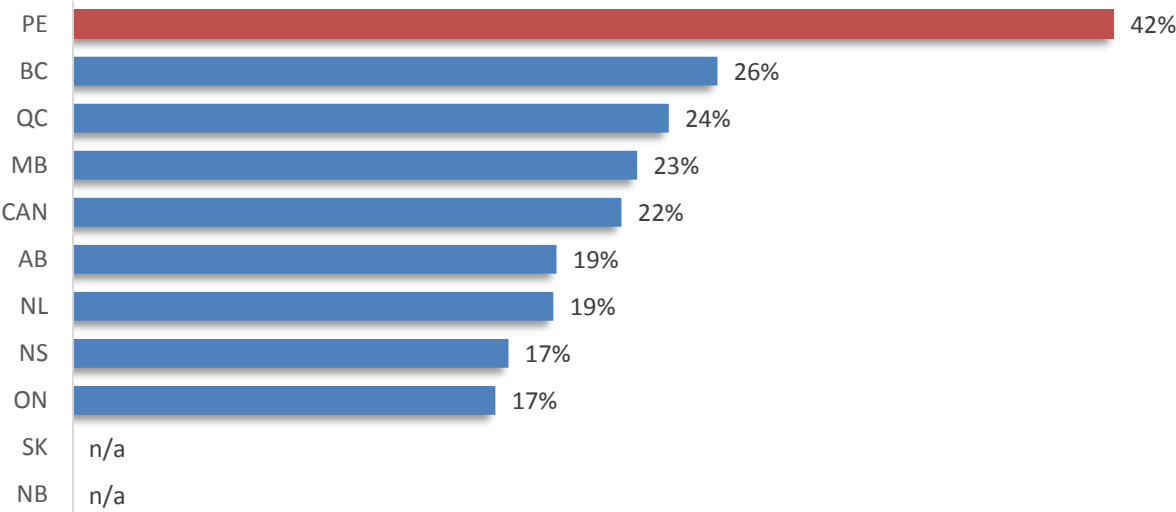
Figure 11: PEI Location Quotient (LQ) – Selected industries (Canadian labour market = 1.00)



Source: Statistics Canada National Household Survey (2011).

There is another interesting workforce attribute associated with the PEI aerospace and defence sector. The 2011 National Household Survey from Statistics Canada provides employment by industry and age group. The aerospace and defence workforce on PEI is the youngest in Canada by a wide margin. In 2011, 42 percent of the workforce was under the age of 34 (Figure 12) compared to 24 percent in Quebec and only 17 percent in Nova Scotia. This industry is attracting young Islanders and keeping them home to pursue their careers.

Figure 12: Percentage of the Aerospace product and parts manufacturing workforce under the age of 34



Source: Statistics Canada National Household Survey (2011).

4.4 The PEI aerospace and defence industry: Attracting national and international investment

The PEI aerospace and defence industry has been an important catalyst for the attraction of national and international investment to Prince Edward Island. Of the 12 core aerospace and defence firms in the industry, six are based on PEI, three are headquartered in Ontario, one in Quebec, one in the USA and one in the United Kingdom. This international profile of the industry and its connection into global supply chains is a key benefit.

In 2015 the 12 core firms in the PEI aerospace and defence industry are deploying an estimated \$12.5 million worth of capital building on a pattern of solid investment in recent years.

5. The value proposition for aerospace and defence on PEI

5.1 Industry elements

The aerospace and defence industry on PEI has led to the development of a number of broader industry supports. As an example the Aerospace and Defence Association of PEI (ADAPEI) was set up to support the collective interests of the industry. The ADAPEI facilitates and provides a forum to advance collaborative sector business development, marketing and workforce development initiatives on behalf of the industry. This kind of organization provides an important role ensuring the value proposition for investment into the sector remains strong.

Many other firms on the Island have become suppliers to the core aerospace and defence firms. The economic impact model estimates these 12 firms did more than \$22 million worth of supply chain spending on PEI in 2013.

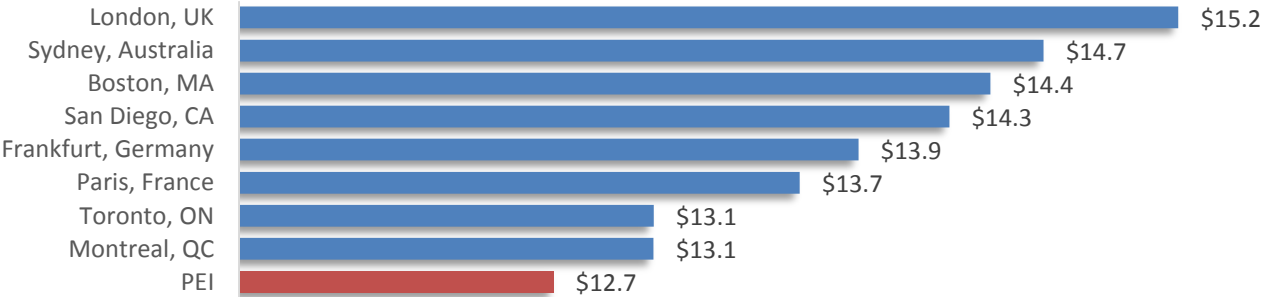
5.2 Operating cost environment

The operating cost environment in a jurisdiction is an important factor to the global aerospace and defence sector as well as other business factors such as the talent pool, supply chain, access to capital, research and development support, market access and other industry elements.

From a business perspective, locating on PEI allows firms to run leaner operations compared to the well-known industry locations such as Boston and Montreal. From a talent perspective, PEI provides highly skilled workers with a much lower cost of living compared to most other locations in North America.

The KPMG Competitive Alternatives report in 2014 revealed the operating cost advantages of locating on PEI. The report modelled operating costs for aerospace-related manufacturing operations in over 200 jurisdictions around the world. For all of them, PEI came out as one of the most competitive locations. The average aerospace manufacturing facility in Boston will face a cost environment 35 percent higher compared to Prince Edward Island. Aerospace manufacturers in London will spend 31 percent more on location-sensitive operating costs compared to PEI.

Figure 13: Location sensitive operating costs – Example aerospace manufacturing operation (\$Millions)
Shown in US dollars

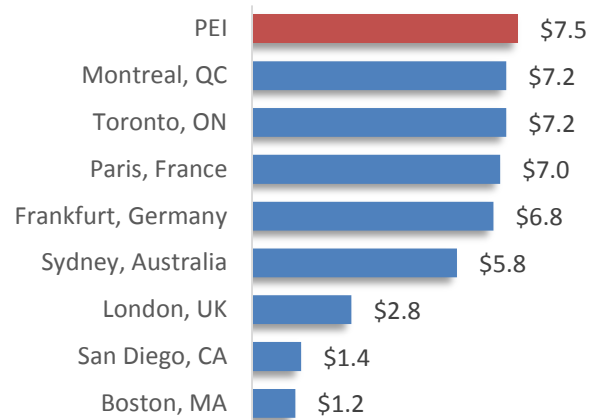


**based on an 85 person, 76,500 square foot facility. Currency conversion as of March 13, 2015. Source: KPMG Competitive Alternatives Report (2014).*

Figure 13 shows the total location-sensitive operating costs for an aerospace manufacturing facility in each location. In PEI, the facility features \$12.7 million in location-sensitive operating costs (in USD) compared to \$13.7 million in France, \$14.4 million in Boston and \$15.2 million in London, UK.

This lower cost environment translates into significantly increased after tax profits. The KPMG comparative cost model estimated the after tax profits that would arise from an aerospace parts manufacturing facility in various location around the world. As shown in Figure 14, the PEI location would generate substantially more profit compared to places such as Sydney, Australia and Boston, Massachusetts.

Figure 14: After tax profits (\$US Millions) – Sample aerospace parts manufacturing facility



Currency conversion as of March 13, 2015. Source: KPMG Competitive Alternatives 2014.

5.3 The talent pipeline

The education and training industry on PEI is developing tailored programs to ensure the industry has the talent it needs to grow into the future. Holland College offers its *Aircraft Gas Turbine Engine Repair and Overhaul Technology Program*, *Precision Machinist Program* and *Electromechanical Technology Program* to feed the talent pipeline. The University of Prince Edward Island is expanding its engineering program to support the needs of the aerospace and defence sector as well as other industries in the Island. The Nova Scotia Community College in nearby Nova Scotia offers an Aircraft Maintenance Program (AME) that turns out qualified aircraft maintenance personnel.

In addition, there is evidence the industry is attracting talent from outside the province. Between 2006 and 2011, PEI attracted 200 immigrants with an engineering educational background. This was more than four times as many as were attracted between 2001 and 2006⁴.

⁴ Source: Statistics Canada National Household Survey.

5.4 Supportive government

The PEI aerospace and defence industry benefits from a supportive government at the local, provincial and federal levels. The industry is one of four priority sectors for economic development in PEI. The provincial government is a key ally in helping to promote the industry across Canada and around the world.

In addition, the provincial government offers the industry Canada's only aerospace tax rebate program. The Aerospace Tax Rebate Program provides a full rebate annually on all corporate income tax paid to the province for operations conducted in Prince Edward Island to eligible aviation-related companies. Companies also receive a full annual rebate of all property tax attributable to ownership or rental of facilities in Prince Edward Island. In 2012, the Aerospace Tax Rebate Program was extended for another 10 years.

The provincial and federal governments have also made a number of strategic investments to bolster the industry. The Government of Canada, through ACOA's Business Development Program and the Atlantic Innovation Fund, has invested in a number of projects to support expansion and the purchase of equipment. The Government of Prince Edward Island, through the Departments of Innovation and Advanced Learning and Innovation PEI have also provided assistance to support growth.

Finally, the government supports industry development through investment in new education and training programming and infrastructure support.

6. Conclusion: Fostering growth in the aerospace and defence industry

PEI needs to foster growth in the economy. Although the provinces' economic growth in recent years has outperformed the rest of Atlantic Canada, it has not been at a rate that will provide the strong fiscal base needed to sustainably fund health care and other public services as well as high quality public infrastructure. Demographic forces are further complicating the province's growth potential. Prince Edward Island needs growth industries and it needs to attract a new wave of population to counterbalance demographic trends.

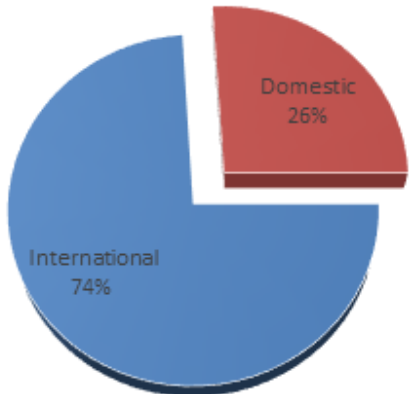
The aerospace and defence industry on PEI is an excellent example of an industry that can grow and prosper. By targeting specific areas of opportunity and supporting the sector through strategic investments, the industry has grown to an industry with more than \$400 million worth of annual sales. It is attracting firm investment and highly skilled talent and is providing career and supply chain opportunities for people at home.

In 2013, the PEI aerospace and defence industry generated over \$149 million worth of GDP on the Island, supported 1,364 FTE jobs, over \$76 million in employment income and \$29.1 million in tax revenue for local, provincial and national governments. It also stimulated an estimated \$57 million worth of consumer spending – supporting hundreds of small and medium sized businesses all across the Island.

The aerospace and defence industry is well-positioned for continued growth. All of the 12 core firms in the industry are exporting into international markets. Seventy-four percent of all sales are from outside Canada (Figure 15).

The aerospace and defence industry is high value because it generates well above average wages. These wages translate into higher taxes for government and jobs that are attractive both to keep young Islanders at home and to b talent from abroad.

Figure 15: Export profile of PEI aerospace and defence industry (2014) - % of total sales



Source: Aerospace & Defence Association of PEI

Appendix A: The Economic Impact Model

<u>Statistic:</u>	<u>Description:</u>
Employment, wages, output and export figures for the industry (2013)	Supplied by the ADAPEI. Employment figures are for 2014.
Other aerospace and defence sector data	Including historical sales and employment data. Supplied by the ADAPEI.
Indirect and induced GDP, employment and income estimates	Uses Statistics Canada Input-Output multiplier and impact estimates at the M industry level. Provincial Input-Output Multipliers, 2010. Catalogue no. 15F0046XDB. Industry Accounts Division. Statistics Canada.
HST paid	Based on the ratio of HST collected to total provincial personal income in 2014 (Source: provincial budget documents and Statistic Canada).
Personal income taxes paid	Derived using several sources including Statistics Canada CANSIM Table 202-0501 - Income tax, by economic family type and CANSIM Table 202-0707 and Statistics Canada CANSIM Table 203-0022 - Survey of household spending (SHS) for 2012.
Property taxes paid (from employment income)	Derived using Statistics Canada CANSIM Table 203-0022 - Survey of household spending (SHS) for 2012.
Indirect taxes	Source: Statistics Canada Input-Output tables. These indirect taxes are levied on the business activity (not employment income) and include such tax areas as: business property taxes, fuel taxes, vehicle license fees, land transfer taxes, and any sales taxes arising out of the corporate activity.
Estimated consumer spending impacts	Derived using Statistics Canada CANSIM Table 203-0022 - Survey of household spending (SHS) for 2012.
Provincial output by industry comparison	Uses Statistics Canada CANSIM Table 381-0031 Provincial gross output, by sector and industry.
Provincial GDP by industry comparison	Uses Statistics Canada CANSIM Table 379-0030 Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS).
Export data by industry	Statistics Canada data as published in Industry Canada's Trade Data Online.
International operating cost comparison	2014 KMPG Competitive Alternatives Report.
Occupational comparisons	Source: Statistics Canada. 2011 National Household Survey.
Average annual employment income data	Source: Statistics Canada CANSIM Table 281-0027 Average weekly earnings (SEPH), by type of employee for selected industries. Annualized for comparison.