

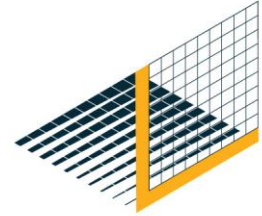
# **DONKIN COAL PROJECT SOCIO-ECONOMIC IMPACT ANALYSIS**

***Submitted to:***

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# ***EXECUTIVE SUMMARY***

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## ***1. BACKGROUND***

The Donkin Coal Project is located on Cape Breton Island, Nova Scotia. The deposit contains a saleable reserve of 48 million tonnes and further inferred resources of 254 million tonnes suggesting an operational mine life of at least 29 years.

The US Energy Information Association reported in August 2011 that global energy consumption is expected to rise 53% by 2035, with fossil fuels accounting for 78% of that growth. The report states world coal consumption will increase from 139 quadrillion BTU in 2008 to 209 quadrillion BTU in 2035 (average annual rate of 1.5%). Prices over this time period are expected to remain strong at levels three to four times higher than they were in 2000 (World Bank, 2011). Coal producers with access to deep tidewater marine shipping will have the best near-to medium term opportunities.

## ***2. PROJECT AND SOCIO-ECONOMIC CONTEXT***

The Project is expected to produce high quality thermal coal and coking coal. The coking coal is classified as high volatile A bituminous, high-sulphur, medium-ash coal with excellent coking coal properties. Continuous miners will be added incrementally until the peak production level is reached within about six years. The peak production is expected to generate 3 Mt of washed export grade coking coal and thermal coal (75% and 25% respectively).

Two transportation options have been evaluated in the Marston technical report (2011); a rail options and a marine option. The economic impacts associated with each of the approaches are presented separately.

The total capital investment over 30 years is expected to be \$849 million for the rail approach or \$796 million for the marine approach. Over 29 years of production the operational costs are expected to be \$3,897 million for the rail approach or \$3,481 million for the marine approach. The average annual operational expenditures will be \$134 million for the rail approach or \$120 million for the marine approach.

There has been a gradual decline in Cape Breton's employment in primary and manufacturing industries, two historically important sectors. The decline has led to: population out-migration in the working age groups (15 to 64), unemployment rates 189% higher than the provincial rate, and median household incomes 14% lower than the provincial level. Well-paying jobs from a large scale and long-term development in Cape Breton will greatly assist to reverse many of the negative socio-economic trends in the region.

## ***3. METHODOLOGY***

Economic impacts have been estimated separately for both capital construction activity as well as for annual operation. The impacts are reported according to conventional indicators including GDP, employment, provincial and federal tax revenues. The analysis generates direct and spinoff impact estimates based on Statistics Canada's Interprovincial Input-Output Model.

## 4. SUMMARY OF IMPACTS

The combined capital construction and operations expenditures over a 30-year period will have a substantial economic impact on Cape Breton Island and the rest of the province (see table below).

**Rail:** Combined 30-year spending of nearly \$4.7 billion will mean about \$158 million is spent on average each year. The mine would provide over 24,000 person-years of employment. The GDP associated with this approach is nearly \$2.0 billion. Provincial taxes of \$1.25 billion and federal taxes of \$1.15 billion would be generated.

**Marine:** Combined 30-year spending of over \$4.3 billion will mean about \$143 million is spent on average each year. The mine would provide almost 23,000 person-years of employment. The GDP associated with this approach is nearly \$1.8 billion. Provincial taxes of \$1.31 billion and federal taxes of \$1.20 billion would be generated.

(PY, \$ millions)	30-Yr Annual Average	30-Yr Total
<b>Rail</b>		
<b>Employment (PY)</b>	<b>810</b>	<b>24,286</b>
<b>GDP (\$ millions)</b>	<b>\$66</b>	<b>\$1,993</b>
<b>Taxes (\$millions)</b>		
Prov (Payroll/HST/Excise)	\$7	\$203
Prov (CorpTax & Royalties) <sup>1</sup>	\$35	\$1,043
Total Provincial Taxes	\$42	\$1,246
Fed (Payroll/HST/Excise)	\$8	\$250
Fed (Corp Tax) <sup>1</sup>	\$30	\$900
Total Federal Taxes	\$38	\$1,151
<b>Total Taxes (\$ millions)</b>	<b>\$80</b>	<b>\$2,397</b>
<b>Marine</b>		
<b>Employment</b>	<b>765</b>	<b>22,953</b>
<b>GDP (\$ millions)</b>	<b>\$60</b>	<b>\$1,809</b>
<b>Taxes (\$millions)</b>		
Provincial (Payroll/HST/Excise)	\$6	\$193
Provincial (Corporate Income Tax & Royalties) <sup>1</sup>	\$37	\$1,118
Total Provincial Taxes	\$44	\$1,311
Federal (Payroll/HST/Excise)	\$8	\$234
Federal (Corporate Income Tax) <sup>1</sup>	\$32	\$971
Total Federal Taxes	\$40	\$1,205
<b>Total Taxes (\$ millions)</b>	<b>\$84</b>	<b>\$2,516</b>

Sources: Statistics Canada input-output model; 1. Adapted from Marston Technical Report

The corporate income taxes, royalties and lease costs have been taken directly from the Marston technical report, and are separate from the Gardner Pinfold economic input-output analysis. According to the Marston report, corporate taxes begin flowing in the sixth year once net cash flow after tax turns positive.

Overall the economic impacts to Nova Scotia are higher for the rail approach, for instance, GDP impacts are 10.2% higher than for marine. Cape Breton is expected to capture nearly two-thirds of the economic impacts including 63% of GDP and employment for either approach. The

Marston technical report suggests a greater total tax contribution to government will occur with the marine approach.

## **5. CONCLUSIONS**

There are very few single prospects in Nova Scotia with the potential to provide economic impacts of this scale and extended period. The setting in Cape Breton is ideal for supporting rural communities with opportunities for excellent employment income, retention of skilled labour, and tax revenues to support community infrastructure and programs. Any local use of the finished coal product will also offset the need to import coal from abroad. Minimizing such economic leakages from the province will bolster local economies and stimulate further development.



# ECONOMIC IMPACTS OF DONKIN COAL PROJECT

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## 1. BACKGROUND

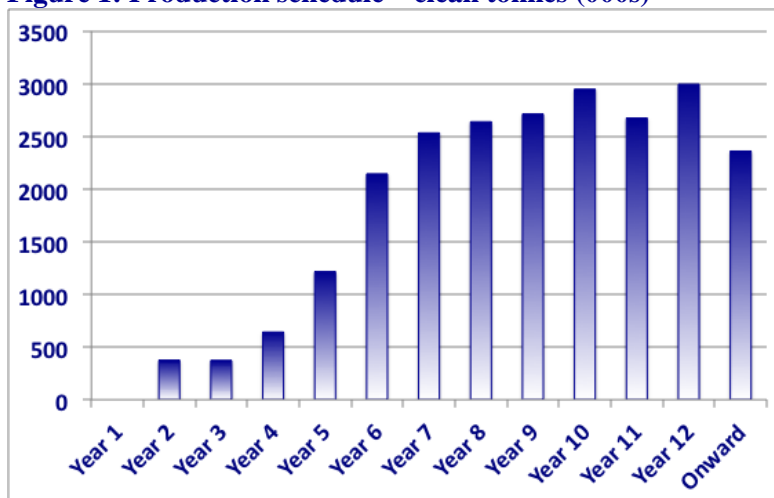
The Donkin Coal Project is located on Cape Breton Island, Nova Scotia. The mine has a deposit with saleable reserves of 48 million tonnes providing an estimated mine life of at least 20 years. Inferred resources total 254 million tonnes, suggesting a substantially longer mine life is possible.

Global demand for coal is expected to grow for the next decade. Prices over this time period are also expected to remain strong at levels three to four times higher than they were in 2000 (World Bank, 2011). Coal producers with access to deep tidewater marine shipping will have the best near-to medium term opportunities.

## 2. PROJECT DESCRIPTION

The Donkin Coal Project is expected to produce coking coal classified as high volatile A bituminous, high-sulphur, medium-ash coal with excellent coking coal properties. Continuous miners will be added incrementally until the peak production level is reached within about six years. The annual production schedule is shown in Figure 1 with a peak of 3 Mt of washed export grade coking coal and thermal coal (75% and 25% respectively). All project information is based on the Marston “Technical Report Donkin Coal Project Cape Breton, Nova Scotia”<sup>1</sup>.

**Figure 1: Production schedule – clean tonnes (000s)**



Source: Marston Technical Report, 2011

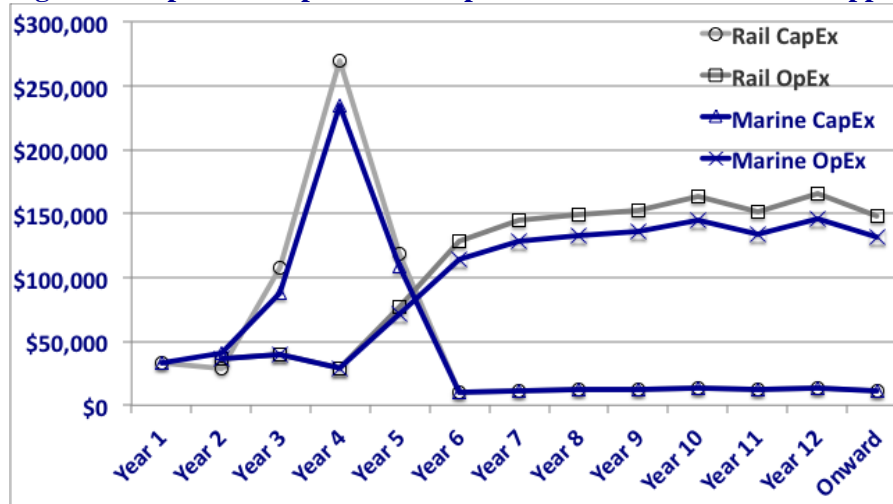
Two possible approaches to transporting finished product by rail or marine transport are considered in this analysis. The economic impacts associated with each of the approaches are

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<sup>1</sup> Marston, 2001. Technical Report: Donkin Coal Project – Cape Breton, Nova Scotia, Canada, for Xstrata Coal Donkin Management Ltd and Erdene Resource Development Corporation. ([www.erdene.com/news10/presentations12.php](http://www.erdene.com/news10/presentations12.php))

presented. The analysis begins with the projected capital and operational expenditures for rail or marine approaches (Figure 2).

**Figure 2: Capital and operational expenditures for rail or marine approaches (CAD \$000s)**



Source: Marston Technical Report, 2011

The expenditure profile for both approaches is similar where large capital expenditures take place in the first five years including a peak in the fourth year. Maintenance level capital investments occur from the sixth year onward. Operational expenditures for both approaches rise in the fifth and sixth years to a stable peak production level for the remainder of the project.

The total capital investment over 30 years is expected to be \$849 million for the rail approach or \$796 million for the marine approach. Over 29 years of production the operational costs are expected to be \$3,897 million for the rail approach or \$3,481 million for the marine approach. The average annual operational expenditures will be \$134 million for the rail approach or \$120 million for the marine approach.

### 3. SOCIO-ECONOMIC CONTEXT

Through the years, there has been a gradual decline in Cape Breton's employment in primary and manufacturing industries, two historically important sectors. The decline in stable well-paying jobs has shaped Cape Breton in several ways:

- ❑ **Population out-migration** - The overall loss of Cape Breton population over the decade from 1996 to 2006 was driven in large part by a 9% decline in the working age population (age 15 to 64), while the province gained 3% in the same age cohort.
- ❑ **Unemployment** - In 2006, unemployment in Cape Breton was 189% higher than in the Province as a whole.
- ❑ **Lower household income** - Cape Breton averaged \$34,987 over the ten-year period ending in 2006, which is 14% lower than the provincial average (\$40,516). Both rose over 30% from 1996 to 2006.

More detailed socio-economic information is contained in Appendix A for Cape Breton and Nova Scotia.

## 4. METHODOLOGY

### ***Economic impacts are primarily based on Statistics Canada's input-output model***

Statistics Canada maintains interprovincial economic input-output models that may be run for custom analysis. Determining the economic impacts requires the Project expenditures to be linked to the model according to North American Industry Classification Codes (NAICS). Once this is complete the model may be “shocked” with the expenditure values to calculate economic impacts according to conventional indicators.

### ***Economic impacts are reported according to conventional indicators***

The economic input-output analysis calculates how the initial spending (output) flows through the economy triggering demand for goods and services. Following conventional practice, the economic impact is measured with three indicators:

- ❑ **GDP:** an industry's contribution to Gross Domestic Product represents its broadest measure of economic impact. The domestic product of an industry captures the value it adds to purchased inputs through the application of labour and capital. GDP represents the sum of the value added by each industry. GDP is typically lower than the gross output (spending) since many goods and services are brought in from other parts of the country and abroad. GDP represents the value that stays within each province or region.
- ❑ **Employment:** industry employment is important politically because of the significance generally attached to jobs, but from an economic impact perspective, the significance lies in the economic impact generated through the spending of employment income. The greater the employment and higher the average income, the more significant the industry in terms of economic impact. Employment is measured in full-time equivalents (FTE).
- ❑ **Taxes (payroll, HST, excise):** provincial and federal tax revenue impacts are estimated by the input-output model. Taxes are generated from purchased goods, including harmonized sales tax, excise taxes and duties. Taxes are also generated on income. Municipal taxes are not calculated by the model.
- ❑ **Corporate taxes and other revenues (royalties, lease costs):** were taken directly from the Marston technical report, which included a cash flow analysis for both rail and marine transport approaches. The analysis provided corporate income taxable earnings for year six onward. Royalties are based on Nova Scotia charges for coal produced at \$1.20 per tonne.

Economic impacts are generated through direct, indirect and induced (spinoff) demand in the economy expressed in terms of industry and consumer purchases of goods and services.

- ❑ **Direct impact:** refers to impact arising from the expenditures made by firms in the subject industries on the goods and services needed to produce industry outputs. For example, mining buys equipment from manufacturers and buys fuel from refineries.
- ❑ **Indirect and induced (Spinoff) impacts:** Indirect impact refers to the inter-industry purchases triggered by the direct demand. For example, equipment manufacturers buy sheet metal from suppliers, and refineries buy services from maintenance contractors.

Induced impact refers to the demand created in the broader economy through consumer spending of incomes earned by those employed in direct and indirect activities. Indirect and induced impacts are often referred to as “spinoff” impacts.

Impacts are summarized according to Cape Breton, the rest of Nova Scotia, and combined totals for Nova Scotia as a whole. All impacts are expressed in current Canadian dollars.

### ***Based on Marston technical report***

The expenditure information from the Marston technical report is the foundation for the economic input-output analysis and some tax results where indicated in this report. The Marston report provided the year-by-year breakdowns for major expenditure types according to each approach (rail or marine).

## **5. SUMMARY OF IMPACTS**

The combined capital construction and operations expenditures over a 30-year period will have a substantial economic impact on Cape Breton Island and the rest of the province. There are two transport approaches for finished coal including rail or marine, and the associated impacts are summarized as follows.

**Rail:** Combined 30-year spending of nearly \$4.7 billion will mean about \$158 million is spent on average each year. The mine would provide over 24,000 person-years of employment. The GDP associated with this approach is nearly \$2.0 billion. Provincial taxes of \$1.25 billion and federal taxes of \$1.15 billion would be generated.

**Marine:** Combined 30-year spending of over \$4.3 billion will mean about \$143 million is spent on average each year. The mine would provide almost 23,000 person-years of employment. The GDP associated with this approach is nearly \$1.8 billion. Provincial taxes of \$1.31 billion and federal taxes of \$1.20 billion would be generated.

The corporate income taxes, royalties and lease costs have been taken directly from the Marston technical report, and are separate from the Gardner Pinfold economic input-output analysis. According to the Marston report, corporate taxes begin flowing in the sixth year once net cash flow after tax turns positive.

Overall the economic impacts to Nova Scotia are higher for the rail approach, for instance, GDP impacts are 10.2% higher than for marine. Cape Breton is expected to capture nearly two-thirds of the economic impacts including 63% of GDP and employment for either approach. The Marston technical report suggests a greater total contribution to government will occur with the marine approach.

**Table 1: Summary of Economic Impacts for Donkin Combined CapEx and OpEx**

(PY, \$ millions)	30-Yr Annual Average			Total 30-Yr CapEx & 29-Yr OpEx		
	Direct	Spinoff	Total	Direct	Spinoff	Total
<b>Rail</b>						
<b>Employment (PY)</b>	382	428	810	11,458	12,828	24,286
<b>GDP (\$ millions)</b>	\$39	\$28	\$66	\$1,169	\$824	\$1,993
<b>Taxes (\$millions)</b>						
Prov (Payroll/HST/Excise)	\$4	\$3	\$7	\$107	\$96	\$203
Prov (CorpTax & Royalties) <sup>1</sup>	\$35	unknown	\$35	\$1,043	unknown	\$1,043
<b>Total Provincial Taxes</b>	<b>\$38</b>	<b>\$3</b>	<b>\$42</b>	<b>\$1,150</b>	<b>\$96</b>	<b>\$1,246</b>
Fed (Payroll/HST/Excise)	\$5	\$4	\$8	\$134	\$116	\$250
Fed (Corp Tax) <sup>1</sup>	\$30	unknown	\$30	\$900	unknown	\$900
<b>Total Federal Taxes</b>	<b>\$35</b>	<b>\$4</b>	<b>\$38</b>	<b>\$1,035</b>	<b>\$116</b>	<b>\$1,151</b>
<b>Total Taxes (\$ millions)</b>	<b>\$73</b>	<b>\$7</b>	<b>\$80</b>	<b>\$2,185</b>	<b>\$212</b>	<b>\$2,397</b>
<b>Marine</b>						
<b>Employment (PY)</b>	375	390	765	11,264	11,689	22,953
<b>GDP (\$ millions)</b>	\$35	\$25	\$60	\$1,061	\$748	\$1,809
<b>Taxes (\$ millions)</b>						
Prov (Payroll/HST/Excise)	\$4	\$3	\$6	\$105	\$88	\$193
Prov (CorpTax & Royalties) <sup>1</sup>	\$37	unknown	\$37	\$1,118	unknown	\$1,118
<b>Total Provincial Taxes</b>	<b>\$41</b>	<b>\$3</b>	<b>\$44</b>	<b>\$1,223</b>	<b>\$88</b>	<b>\$1,311</b>
Fed (Payroll/HST/Excise)	\$4	\$3	\$8	\$131	\$103	\$234
Fed (Corp Tax) <sup>1</sup>	\$32	unknown	\$32	\$971	unknown	\$971
<b>Total Federal Taxes</b>	<b>\$37</b>	<b>\$3</b>	<b>\$40</b>	<b>\$1,102</b>	<b>\$103</b>	<b>\$1,205</b>
<b>Total Taxes (\$ millions)</b>	<b>\$78</b>	<b>\$6</b>	<b>\$84</b>	<b>\$2,325</b>	<b>\$192</b>	<b>\$2,516</b>

Sources: Statistics Canada input-output model; 1. Adapted from Marston Technical Report

## 6. CONSTRUCTION IMPACTS

### Capital Construction Expenditures

The construction impacts are based on the capital expenditures (CapEx) anticipated according to each transportation approach (Table 2). The main expenditure categories are: mining equipment, surface infrastructure, distribution (rail or marine), other expenditures, and project management. These are presented according to the first five-year construction phase, the 30-year total, and an annual average for the first five years.

Capital expenditures rise to a peak in the fourth year for both operations, then decline to maintenance levels by year six for the remainder of the mine operation. Capital expenditures are 6.6% higher for the rail option than for the marine option. The difference is owing to distribution infrastructure, other expenditures and project management, while expenditures for mining equipment and surface infrastructure remain the same for both approaches.

**Table 2: Capital Expenditures (CapEx) Summary (\$000s)**

<b>Rail</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>30-Yr Total</b>	<b>1st 5-Yr Average</b>
Equip & Infrastructure	\$15,000	\$11,000	\$16,500	\$68,000	\$62,500	\$173,000	\$34,600
Surface Infrastructure	\$0	\$0	\$12,567	\$64,433	\$15,000	\$92,000	\$18,400
Distribution - <b>Rail</b>	\$0	\$0	\$11,216	\$56,081	\$15,703	\$83,000	\$16,600
Other	\$11,000	\$4,750	\$26,150	\$43,750	\$5,250	\$90,900	\$18,180
Project Management	\$7,350	\$12,713	\$41,015	\$37,731	\$20,245	\$409,634	\$23,811
<b>Total</b>	<b>\$33,350</b>	<b>\$28,463</b>	<b>\$107,448</b>	<b>\$269,995</b>	<b>\$118,698</b>	<b>\$848,534</b>	<b>\$111,591</b>
<b>Marine</b>							
Equip & Infrastructure	\$15,000	\$11,000	\$16,500	\$68,000	\$62,500	\$173,000	\$34,600
Surface Infrastructure	\$0	\$0	\$12,567	\$64,433	\$15,000	\$92,000	\$18,400
Distribution - <b>Marine</b>	\$0	\$0	\$5,000	\$25,000	\$7,000	\$37,000	\$7,400
Other	\$11,000	\$4,750	\$26,150	\$51,750	\$5,250	\$98,900	\$19,780
Project Management	\$7,350	\$25,363	\$27,433	\$25,069	\$18,940	\$394,735	\$20,831
<b>Total</b>	<b>\$33,350</b>	<b>\$41,113</b>	<b>\$87,650</b>	<b>\$234,252</b>	<b>\$108,690</b>	<b>\$795,635</b>	<b>\$101,011</b>

Source: Marston Technical Report, 2011

## Construction Employment Impacts

Consistent with the higher capital expenditures for the rail approach, the average and total employment impacts during the first five-year construction phase are higher (Table 3). In both approaches the majority of employment is directly associated with activities at the mine, 4,038 person-years (PY) for rail and 3,844 PY for marine.

There are substantial spinoffs for other supply industries in the province benefiting from spending of the earned incomes. Spinoffs contribute to the overall 7,309 total PY for rail and 6,982 PY for the marine approach. This also represents an annual average of 961 PY of employment for rail and 895 PY for marine. For either rail or marine 62% of employment impacts will be captured in Cape Breton. The average salaries expected during the construction phase will be about \$40,000 reflecting the range of trades and labour market in Nova Scotia and Cape Breton.

**Table 3: 5-Year Construction Phase Average and 30-Year Total CapEx Direct, Spin-off and Total Employment (Person-Years)**

<b>Rail</b>	<b>Cape Breton</b>		<b>Rest of Nova Scotia</b>		<b>Nova Scotia</b>	
	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>
Direct	465	3,674	46	363	511	4,038
Spin-off	117	872	332	2,400	450	3,272
<b>Total</b>	<b>582</b>	<b>4,546</b>	<b>378</b>	<b>2,764</b>	<b>961</b>	<b>7,309</b>
<b>Marine</b>						
	<b>Cape Breton</b>		<b>Rest of Nova Scotia</b>		<b>Nova Scotia</b>	
	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>
Direct	430	3,498	43	346	472	3,844
Spin-off	110	834	313	2,304	423	3,138
<b>Total</b>	<b>540</b>	<b>4,332</b>	<b>356</b>	<b>2,650</b>	<b>895</b>	<b>6,982</b>

Source: Statistics Canada input-output model

## Construction GDP Impacts

Gross Domestic Product is an important measure of economic activity; it includes income for households (gross wages and salaries plus supplementary labour income), private sector income (gross profits plus depreciation) and government indirect tax revenues (less subsidies).

Table 4 provides detailed GDP impacts for both the rail and marine approaches in Cape Breton, the rest of Nova Scotia, and for the province as a whole. The total annual construction GDP impact for the province of Nova Scotia is \$70 million for the rail approach, and \$64 million for the marine approach. The 30-year total GDP for Nova Scotia is \$576 million or \$546 million for the rail or marine approach respectively.

**Table 4: 5-Year Construction Phase Average and 30-Year Total CapEx Direct, Spin-off and Total GDP (\$ million)**

Rail	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total
Direct	\$31.1	\$249.2	\$10.0	\$79.8	\$41.1	\$329.0
Spin-off	\$9.3	\$77.5	\$19.5	\$169.3	\$28.7	\$246.9
<b>Total</b>	<b>\$40.4</b>	<b>\$326.8</b>	<b>\$29.4</b>	<b>\$249.1</b>	<b>\$69.9</b>	<b>\$575.9</b>
Marine	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total
Direct	\$28.7	\$237.0	\$9.2	\$75.9	\$37.9	\$312.8
Spin-off	\$8.5	\$73.5	\$17.6	\$159.9	\$26.0	\$233.4
<b>Total</b>	<b>\$37.2</b>	<b>\$310.5</b>	<b>\$26.8</b>	<b>\$235.8</b>	<b>\$63.9</b>	<b>\$546.2</b>

Source: Statistics Canada input-output model

## Construction Provincial and Federal Tax Revenues

The construction activity attributable to the Donkin Project will generate tax revenue for the provincial and federal governments. Table 5 sets out the estimate of tax revenues generated in Cape Breton, the rest of the province, and for Nova Scotia as a whole. Tax revenues are shown separately for the rail and marine approaches, and are calculated as averages for the first five-year construction phase and then for the total 30 years of capital investments.

**Rail:** The average provincial and federal tax revenues in the first five years are \$5.4 million and \$8.2 million respectively. The total provincial and federal tax revenues over 30 years are \$44.0 million and \$67.3 million respectively.

**Marine:** The average provincial and federal tax revenues in the first five years are \$4.9 million and \$7.5 million respectively. The total provincial and federal tax revenues over 30 years are \$41.6 million and \$63.4 million respectively.

**Table 5: 5-Year Construction Phase Average and 30-Year Total CapEx Provincial and Federal Tax Revenues (\$ million)**

<b>Rail</b>	<b>Cape Breton</b>		<b>Rest of Nova Scotia</b>		<b>Nova Scotia</b>	
Provincial tax	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>
Direct	\$2.7	\$21.8	\$0.4	\$3.6	\$3.2	\$25.4
Spin-off	\$0.6	\$5.0	\$1.6	\$13.6	\$2.2	\$18.6
<b>Total</b>	<b>\$3.3</b>	<b>\$26.8</b>	<b>\$2.0</b>	<b>\$17.2</b>	<b>\$5.4</b>	<b>\$44.0</b>
Federal tax	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>
Direct	\$3.8	\$30.5	\$1.1	\$9.1	\$4.9	\$39.6
Spin-off	\$0.8	\$7.0	\$2.4	\$20.7	\$3.3	\$27.7
<b>Total</b>	<b>\$4.6</b>	<b>\$37.4</b>	<b>\$3.6</b>	<b>\$29.8</b>	<b>\$8.2</b>	<b>\$67.3</b>
<b>Marine</b>	<b>Cape Breton</b>		<b>Rest of Nova Scotia</b>		<b>Nova Scotia</b>	
Provincial tax	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>
Direct	\$2.5	\$21.1	\$0.4	\$3.5	\$3.0	\$24.6
Spin-off	\$0.5	\$4.6	\$1.4	\$12.4	\$1.9	\$17.0
<b>Total</b>	<b>\$3.1</b>	<b>\$25.7</b>	<b>\$1.8</b>	<b>\$15.9</b>	<b>\$4.9</b>	<b>\$41.6</b>
Federal tax	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>	<b>5-Yr Avg</b>	<b>30-Yr Total</b>
Direct	\$3.5	\$28.8	\$1.0	\$8.6	\$4.5	\$37.4
Spin-off	\$0.8	\$6.5	\$2.2	\$19.4	\$3.0	\$26.0
<b>Total</b>	<b>\$4.2</b>	<b>\$35.3</b>	<b>\$3.2</b>	<b>\$28.0</b>	<b>\$7.5</b>	<b>\$63.4</b>

Source: Statistics Canada input-output model

## 7. OPERATION IMPACTS

### Operating Expenditures

The operational impacts are based on the operational expenditures (OpEx) year by year for 29 years of production. The main expenditure categories are for: pit top costs, the coal handling and preparation plant, overheads, and other expenditures including a total of \$82 million in royalties over 29 years. The operational expenditures for the rail and marine approaches are shown for every second year in the early years ramping up to peak production, the 29-year total, and 29-year annual average (Table 6).

**Table 6: Operational Expenditures (OpEx) Summary (\$000s)**

<b>Rail</b>	<b>Year 2</b>	<b>Year 4</b>	<b>Year 6</b>	<b>Year 8</b>	<b>Peak</b>	<b>29-Yr Total</b>	<b>29-Yr Avg</b>
Pit top costs	\$28,565	17,751	\$69,536	\$79,425	\$86,569	\$2,107,639	\$72,677
CHPP*	\$2,250	3,855	\$12,603	\$14,834	\$16,445	\$383,693	\$13,231
Overheads	\$4,802	6,711	\$17,973	\$21,102	\$23,363	\$551,483	\$19,017
Other	\$458	784	\$27,944	\$34,394	\$39,053	\$854,660	\$29,471
<b>Total</b>	<b>\$36,075</b>	<b>\$29,101</b>	<b>\$128,056</b>	<b>\$149,755</b>	<b>\$165,430</b>	<b>\$3,897,475</b>	<b>\$134,396</b>
<b>Marine</b>							
Pit top costs	\$28,565	17,751	\$69,536	\$79,425	\$86,569	\$2,107,639	\$72,677
CHPP*	\$2,250	3,855	\$12,603	\$14,834	\$16,445	\$383,693	\$13,231
Overheads	\$4,802	6,711	\$17,973	\$21,102	\$23,363	\$551,483	\$19,017
Other	\$458	784	\$14,280	\$17,576	\$19,957	\$437,838	\$15,098
<b>Total</b>	<b>\$36,075</b>	<b>\$29,101</b>	<b>\$114,392</b>	<b>\$132,937</b>	<b>\$146,334</b>	<b>\$3,480,653</b>	<b>\$120,023</b>

Source: Marston Technical Report, 2011

\*CHPP: Coal handling and preparation plant

## Operations Employment Impact

The estimate of annual direct employment for operations at the mine (280) is based on the Marston Technical report rather than the results of economic input-output analysis. Models rely on industry averages, however in this case more specific employment information is available for the mine project and the staff requirements.

The employment for both rail and marine operations is expected to be very similar, as presented in Table 7. Operations will generate over 600 PY annually in Nova Scotia, with just over half occurring in Cape Breton (52%). Over 29 years of production the total person-years of employment for Cape Breton will be 8,732 to 8,912 for marine or rail, and 15,971 to 16,976 for the province as a whole.

The employment associated with the mine is also expected to provide well-paying jobs with average salaries around \$60,000 per year. This not only reflects the skilled labour required but also the competitive labour market including recruitment of Nova Scotian's by oil and gas companies in western Canada as well as Newfoundland and Labrador.

**Table 7: 29-Year Average and 29-Year Total OpEx  
Direct, Spin-off, and Total Employment (Person-years)**

Rail	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total
Direct	272	7,197	8	223	280	7,420
Spin-off	65	1,714	296	7,842	361	9,556
<b>Total</b>	<b>336</b>	<b>8,912</b>	<b>304</b>	<b>8,064</b>	<b>641</b>	<b>16,976</b>
Marine	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total	5-Yr Avg	30-Yr Total
Direct	272	7,197	8	223	280	7,420
Spin-off	58	1,534	265	7,017	323	8,551
<b>Total</b>	<b>329</b>	<b>8,732</b>	<b>273</b>	<b>7,240</b>	<b>603</b>	<b>15,971</b>

Source: Statistics Canada input-output model

## Operations GDP Impact

The value added (GDP) in Nova Scotia will be substantial regardless of whether the rail or marine option is pursued. The GDP impacts in the Nova Scotia economy stemming from 29 years of mine operations are expected to be \$1.4 billion for rail and nearly \$1.3 billion for the marine approach (Table 8). This translates to average annual GDP of \$48.9 and \$43.5 for the rail and marine approaches respectively. Most of this impact is directly associated with the mine (58%) for both options, and two-thirds (65%) is captured in Cape Breton.

**Table 8: 29-Year Average and 29-Year Total OpEx  
Direct, Spin-off and Total GDP (\$ million)**

Rail	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	Average	Total	Average	Total	Average	Total
Direct	\$27.5	\$796.7	\$1.5	\$43.1	\$29.0	\$839.7
Spin-off	\$4.4	\$129.0	\$15.5	\$448.4	\$19.9	\$577.4
<b>Total</b>	<b>\$31.9</b>	<b>\$925.6</b>	<b>\$16.9</b>	<b>\$491.5</b>	<b>\$48.9</b>	<b>\$1,417.1</b>
Marine	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	Average	Total	Average	Total	Average	Total
Direct	\$24.5	\$709.6	\$1.3	\$38.4	\$25.8	\$748.0
Spin-off	\$4.0	\$114.9	\$13.8	\$399.4	\$17.7	\$514.3
<b>Total</b>	<b>\$28.4</b>	<b>\$824.5</b>	<b>\$15.1</b>	<b>\$437.8</b>	<b>\$43.5</b>	<b>\$1,262.3</b>

Source: Statistics Canada input-output model

## Operations Provincial and Federal Tax Revenues

The operations at the Donkin mine will generate tax revenue for the provincial and federal governments. Table 9 sets out the estimate of tax revenues generated in Cape Breton, the rest of the province, and for Nova Scotia as a whole. Tax revenues are shown separately for the rail and marine approaches, and are calculated as averages and totals for 29 years of operation. Combined government revenues include provincial and federal payroll taxes, HST, excise taxes, corporate taxes, and provincial royalties.

**Rail:** The 29 year average annual provincial and federal tax revenues are \$42.0 million and \$74.4 million respectively. The total provincial and federal tax revenues over 29 years are \$1.2 billion and \$1.9 billion respectively.

**Marine:** The 29-year average annual provincial and federal tax revenues are \$44.2 million and \$39.9 million respectively. The total provincial and federal tax revenues over 29 years are \$1.3 billion and \$2.0 billion respectively.

**Royalties:** Already included in the above, both approaches generate the same provincial royalties of \$2.8 million on average each year, and \$82.1 million in total over 29 years of production.

The corporate income taxes, royalties and lease costs have been taken directly from the Marston technical report, and are separate from the Gardner Pinfold economic input-output analysis. According to the Marston report, corporate taxes begin flowing in the sixth year once net cash flow after tax turns positive. The Marston technical report suggests a greater total contribution to government will occur with the marine approach owing to the higher corporate taxes that are generated.

**Table 9: 29-Year Average and Total OpEx  
Provincial and Federal Tax Revenues (\$ million)**

Rail	Cape Breton		Rest of Nova Scotia		Nova Scotia	
	Average	Total	Average	Total	Average	Total
<b>Taxes (\$million)</b>						
Prov (Payroll/HST/Excise)						
Direct	\$3.1	\$81.9	\$0.0	\$0.0	\$3.1	\$81.9
Spin-off	\$0.8	\$22.0	\$2.1	\$55.1	\$2.9	\$77.1
Prov (CorpTax & Royalties) <sup>1</sup>	\$36.0	\$1,042.7	unknown	unknown	\$36.0	\$1,042.7
<b>Provincial Total</b>	<b>\$39.9</b>	<b>\$1,146.6</b>	<b>\$2.1</b>	<b>\$55.1</b>	<b>\$42.0</b>	<b>\$1,201.7</b>
Fed (Payroll/HST/Excise)						
Direct	\$3.6	\$94.5	\$0.0	\$0.0	\$3.6	\$94.5
Spin-off	\$0.9	\$24.2	\$2.4	\$64.3	\$3.3	\$88.6
Fed (Corp Tax) <sup>1</sup>	\$31.1	\$900.5	unknown	unknown	\$31.1	\$900.5
<b>Federal Total</b>	<b>\$35.6</b>	<b>\$1,019.2</b>	<b>\$2.4</b>	<b>\$64.3</b>	<b>\$38.0</b>	<b>\$1,083.6</b>
<b>Total Taxes (\$ million)</b>	<b>\$75.4</b>	<b>\$2,165.8</b>	<b>\$4.5</b>	<b>\$119.4</b>	<b>\$74.4</b>	<b>\$1,861.0</b>
Marine	Cape Breton		Rest of Nova Scotia		Nova Scotia	
Taxes (\$million)	Average	Total	Average	Total	Average	Total
Prov (Payroll/HST/Excise)						
Direct	\$3.0	\$80.2	\$0.0	\$0.0	\$3.0	\$80.2
Spin-off	\$0.8	\$20.4	\$1.9	\$51.0	\$2.7	\$71.4
Prov (CorpTax & Royalties) <sup>1</sup>	\$38.5	\$1,117.8	unknown	unknown	\$38.5	\$1,117.8
<b>Provincial Total</b>	<b>\$42.3</b>	<b>\$1,218.4</b>	<b>\$1.9</b>	<b>\$51.0</b>	<b>\$44.2</b>	<b>\$1,269.4</b>
Fed (Payroll/HST/Excise)						
Direct	\$3.5	\$93.7	\$0.0	\$0.0	\$3.5	\$93.8
Spin-off	\$0.8	\$21.1	\$2.1	\$56.0	\$2.9	\$77.1
Fed (Corp Tax) <sup>1</sup>	\$33.5	\$971.0	unknown	unknown	\$33.5	\$971.0
<b>Federal Total</b>	<b>\$37.8</b>	<b>\$1,085.8</b>	<b>\$2.1</b>	<b>\$56.0</b>	<b>\$39.9</b>	<b>\$1,141.9</b>
<b>Total Taxes (\$ million)</b>	<b>\$80.1</b>	<b>\$2,304.2</b>	<b>\$4.0</b>	<b>\$107.0</b>	<b>\$80.1</b>	<b>\$2,002.0</b>

Sources: Statistics Canada input-output model; 1. Adapted from Marston Technical Report

## 8. CONCLUSIONS

There are very few single prospects in Nova Scotia with the potential to provide economic impacts of this scale and extended period. The setting in Cape Breton is ideal for supporting rural communities with opportunities for excellent employment income, retention of skilled labour, and tax revenues to support community infrastructure and programs. Any local use of the finished coal product will also offset the need to import coal from offshore. Minimizing such economic leakages from the province will bolster local economies and stimulate further development.

# ***APPENDIX A – SOCIO-ECONOMIC ANALYSIS***

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## ***1. BACKGROUND***

Accounting for nearly one-fifth of the land area of the Province of Nova Scotia, Cape Breton is a large, economically active area whose economy incorporates the fisheries, arts and culture, agriculture, technology and innovation, tourism, energy, as well as the public service sector. Through the years, there has been a gradual decline in employment in primary and manufacturing industries, two historically important sectors.

It is possible to obtain a broad indication of how the structure of the Cape Breton economy is changing by understanding how industry has changed over time in the region. Goods producing industries are much less important as sources of employment and income than they were 30 years ago. An increasingly important service sector is emerging as it has elsewhere in Canada, though it is evolving more slowly on the island. The expansion of service sector activities is marked by growth in the knowledge-based industries such as information technology, multi-media, environmental services, health services and entertainment and culture industries.

In recent years, Cape Breton has seen a general decline in population marked by out-migration of the working aged cohort (15 to 64 years). High unemployment through the years, coupled with low participation rates, have resulted in the region being challenged to diversify its economy and adapt to this shift away from the more traditional sectors. When local jobs are lost, migration out of the town or county often results, depleting the community of valuable skills and a population base for schools, programs, and service delivery. This pattern becomes a downward spiral, as one round of decline engenders another.

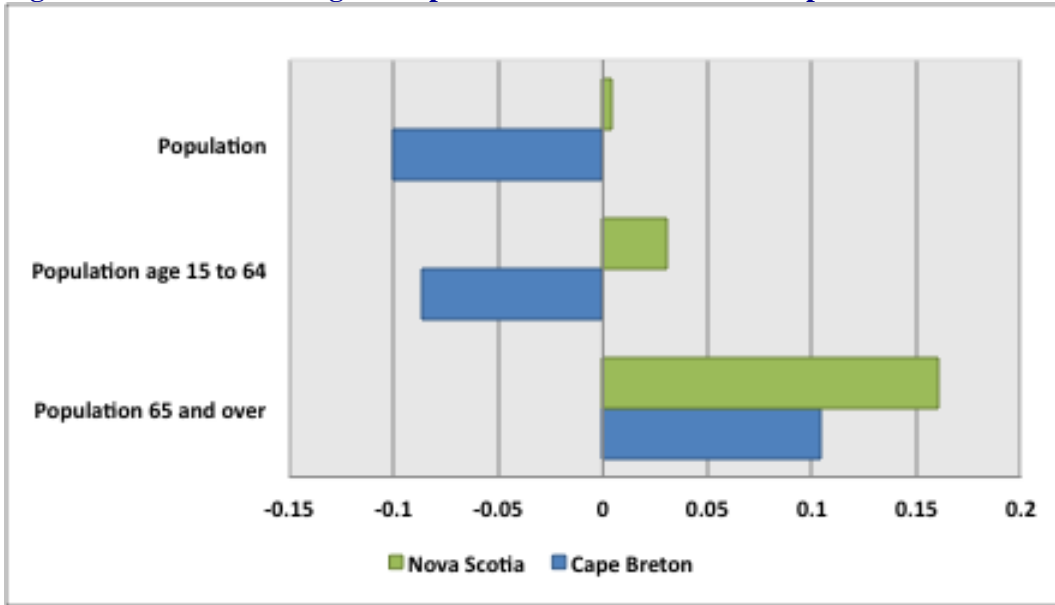
## ***2. POPULATION***

Population loss and a shift in the demographic profile toward a workforce with older workers are challenges facing many rural communities in Nova Scotia. The scale of this shift in Cape Breton has been particularly stark.

From 1996 to 2006, the population of the region declined 10%, from 158,270 to 142,300 compared to a population gain of 0.5% for the province as a whole (Figure A-1). While this loss alone underscores the major socio-economic changes that have taken place, analysis of how the age distribution of the population has changed provides further insight into the depth of the problem.

The overall loss of population over the decade was driven in large part by a 9% decline in the working age population (age 15 to 64), while the province gained 3% in the same age cohort. As this economically active segment moved away, the region saw a 10% increase in the over-64 aged population, which is 6 percentage points lower than the increase in this cohort province-wide.

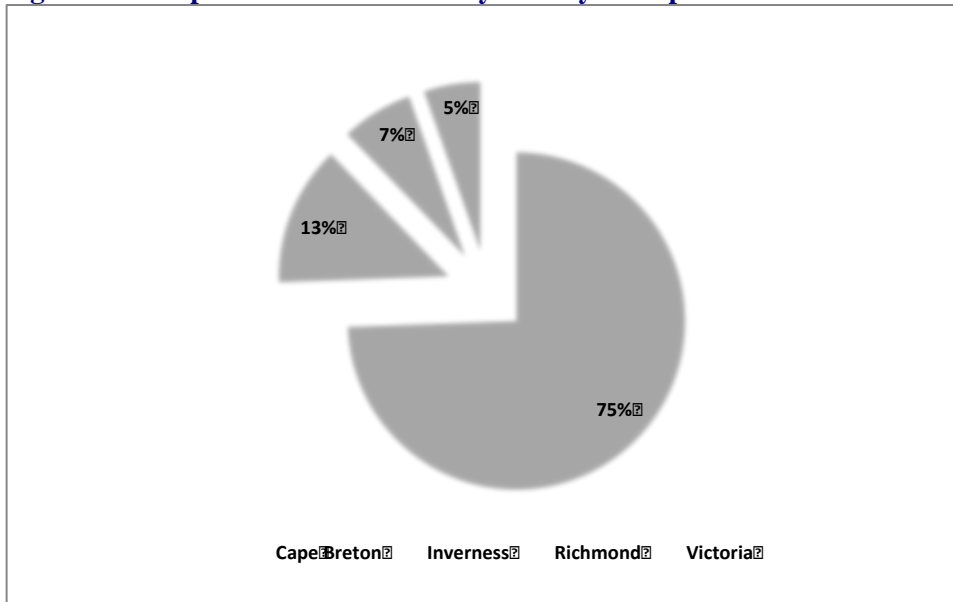
**Figure A-1: Percent Change in Population Characteristics in Cape Breton – 1996 to 2006**



Source: Statistics Canada, *Census of Population*.

In terms of population distribution, the vast majority of people living in Cape Breton reside in Cape Breton County, which incorporates the Cape Breton Regional Municipality (CBRM). Figure A-2 illustrates the concentration of population around the region’s urban centre.

**Figure A-2: Population Distribution by County in Cape Breton - 2006**



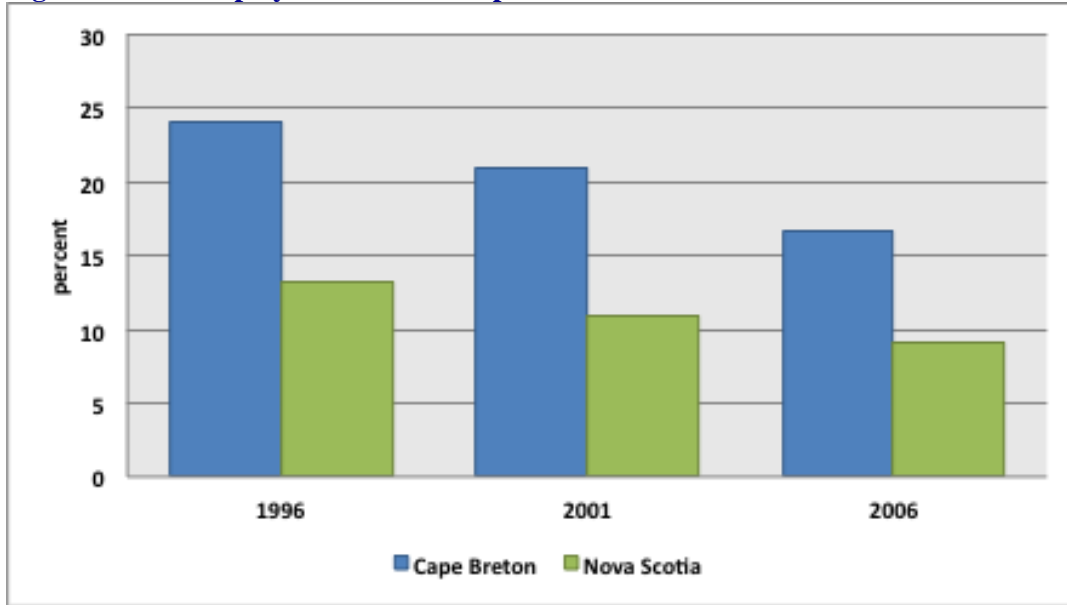
Source: Statistics Canada, *Census of Population*.

The economic implications of the demographic changes in Cape Breton cannot be overstated. Put simply, the outmigration of the community’s most economically active people has decreased the productive capacity and tax base of the region while the costs of supporting an ageing population continue to rise.

### 3. LABOUR

While the Province of Nova Scotia experienced relatively stable unemployment over the decade from 1996 to 2006, Cape Breton faced much higher rates of joblessness. The rate of unemployment in the region (24%) nearly doubled the provincial average (13%) in 1996 (Figure A-3). Five years later, while the province saw a 2% decline in unemployment, Cape Breton's unemployment rate remained above 20%, dropping 12% from its 1996 high. In 2006, unemployment in Cape Breton was 189% higher than in the Province as a whole.

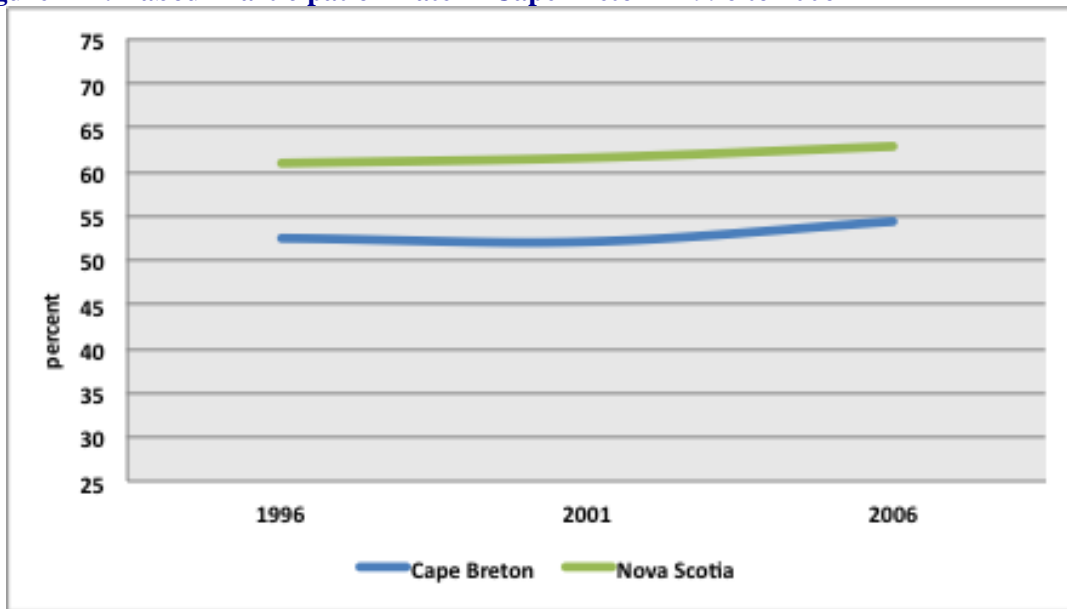
**Figure A-3: Unemployment Rate in Cape Breton – 1996 to 2006**



Source: Statistics Canada, *Census of Population*.

Though the unemployment rate in the region declined over the decade from 1996 to 2006, this apparent gain can only be understood when placed in the context of the size of the overall labour force (Figure A-4). Although changes in labour force participation in Cape Breton were similar to that of the rest of the province (3% increase), participation rates are much lower, with a regional ten-year average of 53% compared to 62% for the rest of Nova Scotia.

**Figure A-4: Labour Participation Rate in Cape Breton – 1996 to 2006**

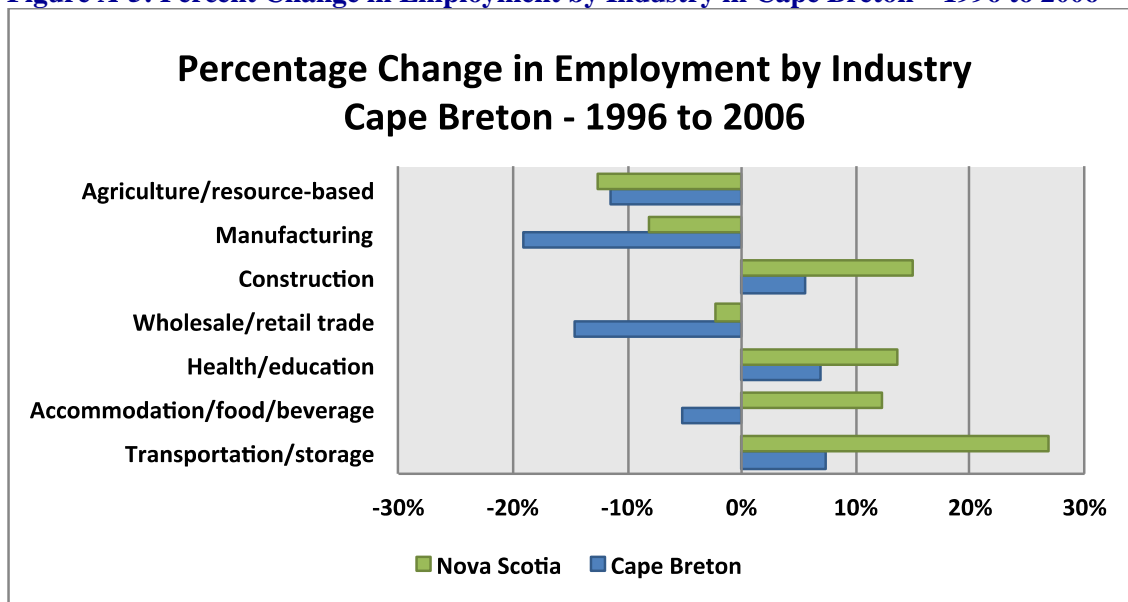


Source: Statistics Canada, *Census of Population*.

The high level of unemployment in Cape Breton from 1996 to 2006 was reflected in notable changes across a number of key industries (Figure A-5). The hardest hit sector over the ten-year period was manufacturing, which saw a loss of nearly 20%, while the Province averaged a much smaller decline (8%).

A number of other sectors experienced declines in employment over the same period, including wholesale and retail trade (-14%); and agriculture and resource based (-11%); and accommodation, food, and beverage (-5%). Employment gains were made in health and education (7%); transportation and storage (7%); and construction (6%), but these increases were, at most, half of that seen in the same sectors in the Province as a whole.

**Figure A-5: Percent Change in Employment by Industry in Cape Breton – 1996 to 2006**

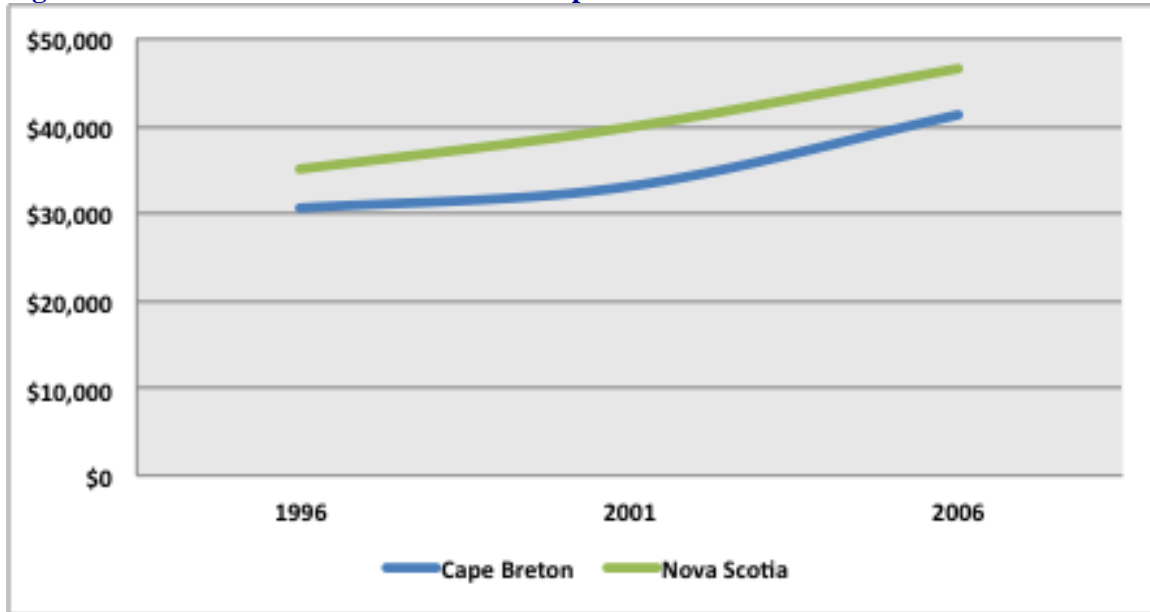


Source: Statistics Canada, *Census of Population*.

## 4. INCOME

Median household income in Cape Breton averaged \$34,987 over the ten-year period ending in 2006, which is 14% lower than the provincial average (\$40,516). Both rose over 30% from 1996 to 2006. The chart below (Figure A-6) depicts how median household income growth in Cape Breton tracked the rest of Nova Scotia but remained much lower overall.

**Figure A-6: Median Household Income in Cape Breton - 1996 to 2006**



Source: Statistics Canada, *Census of Population*.