Socio-economic Benefits
Petroleum Industry Activity in Newfoundland & Labrador, 2011-2014
Offshore petroleum activity in Newfoundland and Labrador began in 1963, with the first exploration well being drilled in 1966. Despite fluctuating levels of exploration, the industry has made, and will continue to make, a very important contribution to the economy and society of Newfoundland and Labrador.
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INTRODUCTION

In November 2003, Petroleum Research Atlantic Canada (PRAC) released a report on the ‘Socio-Economic Benefits from Petroleum Industry Activity in Newfoundland and Labrador’ (Community Resource Services Ltd. (CRS), 2003) during the 1999 to 2002 period. The report found that the socio-economic effects of the Newfoundland and Labrador offshore petroleum industry have been ‘large, widely distributed, and long-term. It has made, and will continue to make, a very important contribution to the economy and society of Newfoundland and Labrador’ (p.viii).

The report also concluded that offshore petroleum activity had helped transform the provincial economy. Updates to this report for 2003 and 2004 (Jacques Whitford 2005), 2005-2007 (Stantec 2009) and 2008-2010 (Stantec 2012) reinforced these conclusions and determined that production activity, exporting and diversification into other industries had become increasingly important components of the industry, resulting in a more stable pattern of activity and subsequent economic benefits.

This further update has been prepared for Petroleum Research Newfoundland and Labrador (Petroleum Research) by Stantec Consulting Ltd (Stantec), with funding from Petroleum Research and the support of the Newfoundland and Labrador Department of Natural Resources. It builds on the earlier reports, providing information and analysis for 2011, 2012, 2013 and 2014 on:

- Offshore petroleum industry activity and expenditures in Newfoundland and Labrador;
- The resultant direct, indirect and induced economic benefits to the Province; and
- Other benefits-related developments in such areas as infrastructure, education, training and research and development (R&D).

This study also summarizes the involvements of a range of local companies with the offshore petroleum industry in Newfoundland and Labrador, and the ways in which interactions with the industry have led them variously to develop new goods and services, hire new personnel, provide them with further training, acquire new facilities and equipment, and improve quality, health, safety and environmental policies and practices. It also considers the way in which the resultant increases in experience and capabilities have led to them winning related work in other jurisdictions, and undertaking work in other industries, both locally and outside the Province.

It should be noted that this study is only concerned with the effects of upstream offshore petroleum activity itself; it does not document the substantial taxes and royalties oil companies paid to the Government of Newfoundland and Labrador.

These are very large, for example amounting to approximately $2.1 billion during the 2013-2014 fiscal year. The provincial government also receives income and consumption taxes from labour income generated by the offshore petroleum industry, and corporate income taxes paid on oil company profits; however, that information is confidential and hence not available for this study.

Oil companies working in Newfoundland and Labrador also make substantial contributions to local charities and community groups. During the study period, these included the following:
Chevron Canada and Stella’s Circle

Stella’s Circle provides services to adults who experience a variety of mental health issues. Chevron Canada has committed close to $1 million to enable this St. John’s non-profit agency to help people find the tools they need to change their lives for the better. Recently, the two organizations have focused their partnership on CanDo Enterprises, which provides training and paid skill development to adults facing different barriers to employment. Its services, which include landscaping, office work, painting and building maintenance, are marketed to businesses and non-profit organizations. Between 2012 and 2014, the program has created more than 12,000 person-hours of paid employment.

Hebron and the Oceans Learning Partnership

The Hebron Project, operated by ExxonMobil, supports education programs that expose young people to careers in ocean sciences, technology and engineering. In November 2013, it contributed $150,000 to the Digital Oceans Project, a media program developed by the Oceans Learning Partnership to help high school students in Newfoundland and Labrador study the marine environment. Through the project, students accessed technology and educational material from vessels and university field facilities. This initiative builds on an existing relationship with the Oceans Learning Partnership, a private-public partnership that supports and promotes the development of hands-on at-sea learning experiences for high school students. The Hebron Project previously contributed $400,000 to the Partnership’s at-sea marine education program.

Statoil and the Newfoundland and Labrador Folk Festival

Statoil is the first-ever presenting sponsor of the annual Newfoundland and Labrador Folk Festival, which aims to keep the tradition of folk music alive in the province. This enabled the launch of two youth talent initiatives. The Statoil MusicNL NewFound Talent Contest supports emerging youth performers, while the Song-Writers of Tomorrow Essay Competition sees students submit short essays indicating why they are passionate about music and songwriting, with the winners receiving passes to the Festival, where they write a song about Newfoundland and Labrador with the assistance of a local musician.

Husky Energy and the Canadian Cancer Society

Husky Energy has donated $1 million to the Canadian Cancer Society to expand its existing cancer prevention program in the province. The Husky Energy Cancer Prevention Program includes:

- Community outreach, including talking to elementary school students about sun safety awareness, cancer prevention, early cancer screening and detection;
- Education and information materials on cancer prevention and screening, shared through information booths, fairs and other public gatherings;
- WellnessFits, a workplace program that provides employees with tools and information about key cancer risk factors and how to reduce them; and
- Nutrition initiatives on healthy eating, promoted through a variety of public events.
Suncor and the Dr. H Bliss Murphy Cancer Care Foundation

In 2012, Suncor Energy made a $500,000 contribution towards the $6.1 million needed to purchase the TrueBeam Stx Radiation Therapy System. Its benefits include a shorter treatment time, greater patient comfort, and increased accuracy with minimal side effects. The new radiation treatment suite for cancer patients opened in December 2014.

Nalcor Energy and Newfoundland and Labrador Hydro and Youth Fitness

As partners with The Heart and Stroke Foundation, Nalcor and Hydro sponsored the “I Heart Fruits and Veggies” program, which gave grade four students the tools necessary to embark on a life of healthy living and smart eating habits. In other 2014 initiatives, Nalcor and Hydro contributed to the Heart and Stoke Foundation’s awareness campaign around sugar-sweetened beverages and to the Jump Rope for Heart JUMPfest. The latter initiative brought over 1,000 students to the Techniplex in St. John’s to hone their skipping skills while learning about the importance of active living and healthy eating.
PETROLEUM DEVELOPMENT IN NEWFOUNDLAND & LABRADOR

Offshore petroleum activity in Newfoundland and Labrador began in 1963, with the first exploration well being drilled in 1966. The industry has experienced fluctuating levels of exploration, development and production activity over the succeeding decades. In the first case, the pace of exploration has varied in response to varying levels of success, changing oil prices, and the availability of government support (e.g., federal Petroleum Incentive Plan grants in the 1970s). Exploration, including both drilling and seismic activity, peaked in the early-1980s, with minor other peaks in the mid-1990s and late-2000s. This exploration led to the discovery of the Hibernia oilfield in 1979, the Hebron field in 1981, the Terra Nova and White Rose fields in 1984, and discoveries in the Flemish Pass, including Mizzen (2009), Harpoon, and Bay du Nord (2013).

The first development activity did not occur until 1990. Since then, three Grand Banks oilfields, as well as satellite developments such as North Amethyst and the Hibernia South Extension, have been brought into production and a fourth is currently under development.

Hibernia

The approximately $5.2 billion development of this field, including the construction of a concrete gravity based structure (GBS) and some topsides components at Bull Arm, Trinity Bay, started in 1990. The GBS and topsides were mated in early 1997, and the complete platform was towed to the field in time for first oil production in November 1997. Total production from Hibernia in 2014 was about 42.2 million barrels of oil, while cumulative production since first oil is approximately 919 million barrels (NLDF 2015).

Terra Nova

In 1998, Petro-Canada decided to develop the Terra Nova field using a floating production storage and offloading (FPSO) vessel with a South Korean built hull but with much of the topsides fabrication and installation occurring at Bull Arm. The FPSO arrived at the field in August 2001 and produced first oil in January 2002. The total Terra Nova pre-production capital expenditures were approximately $2.8 billion. The total production of oil from Terra Nova for 2014 was 16.8 million barrels, and total production since first oil is at 366 million barrels (NLDF 2015).

White Rose

Work developing this field started in 2002. Like Terra Nova, White Rose uses an FPSO with a hull built in South Korea. Much of the topsides fabrication and installation work occurred in Marystown, Placentia Bay, while some fabrication work, and the testing of some sub-sea components, took place at Bull Arm. The project had a total capital cost of approximately $2.35 billion and first oil was produced in November 2005. In the 2014, White Rose (including North Amethyst) produced 19.9 million barrels of oil, bringing the total production to 237.9 million barrels since 2005 (NLDF 2015).

Hebron

The Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB) approved the Hebron development plan application in 2012. The project was officially sanctioned by ExxonMobil and its partners (Chevron Canada, Suncor Energy Inc., Statoil Canada, and Nalcor Energy) in 2013. Construction of the Hebron GBS began at the Bull Arm Fabrication Site in 2012, and construction of topsides also commenced during the study period. The capital cost for the project is estimated at $14 billion and first oil is scheduled for 2017.
The scale of industry expenditures has reached record levels during the study period. In 2011, they totaled approximately $2.4 billion, a 27 percent increase over the previous year. Over the study period, expenditures rose steadily to peak at approximately $6.3 billion in 2014, the highest annual expenditures on record. This was largely driven by a corresponding peak in development expenditures, which reached approximately $3.4 billion in 2014, representing a peak level of development expenditures. This resulted mostly from the continued development activity for the Hebron Project, Husky’s White Rose Extension Project, and the Hibernia South expansion (Figure 2-1). Since 1966, cumulative expenditures to the end of the study period total $45.6 billion.

Annual oil production dropped by 97.3 million barrels (3.4 percent) in 2011, as a result of natural declines at the existing developments. Combined with such declines, extended maintenance downtime at all three major offshore projects resulted in a further decrease to 72.2 million barrels in 2012. However, production rose to 83.6 million barrels in 2013 with the completion of maintenance projects. In 2014, production declined by 5.7 percent to 78.9 million barrels compared to 83.6 million barrels in 2013. This can be mainly attributed to a fall in production at Hibernia (NLDF 2015).

However, first oil from the Hibernia South Extension Unit (HSE Unit) was produced in 2011. The HSE Unit is part of the larger Hibernia South Extension, which also includes the AA blocks, which began production in 2010 (NLDF 2011). The HSE Unit and AA Blocks have an estimated 215 million barrels, which is expected to extend the life of the Hibernia field by five to ten years. The Province of Newfoundland and Labrador has a 10 percent equity stake in the HSE Unit through Nalcor Energy.

In 2013, the C-NLOPB approved a White Rose Development Plan amendment incorporating the South White Rose Extension (SWRX). It is estimated to contain approximately 33 million barrels of recoverable oil, to be developed via a subsea tieback to the SeaRose FPSO. First oil from SWRX is planned for 2015. Also in 2013, plans to develop the White Rose Extension Project progressed, with Husky Energy and the provincial government approving the development of West White Rose using a wellhead platform. The platform was expected to deliver an estimated 115 million barrels of oil over the life of the project, which had a planned production start date of late 2017. However, in late 2014 Husky Energy announced that it was delaying a project sanction decision for a year.

Continued delineation during the study period resulted in an increase in the official reserve estimates for Terra Nova. In 2013, the C-NLOPB revised reserves at the Terra Nova field to 592 million barrels from 504 million barrels, an increase of 18 percent. Initial estimates for Terra Nova had indicated that the field contained 400 million barrels of recoverable oil. Hibernia saw a similar development in 2014, when the C-NLOPB announced an increase in total recoverable oil reserves for the entire Hibernia project area, including the HSE, from 1,395 to 1,644 million barrels (NLDF 2014).

Twenty-four exploration parcels were offered during nine bidding rounds during the 2011-2014 period. This resulted in the issuance of 14 exploration licenses (ELs) with the successful bidders making expenditure commitments totaling over $1 billion (NLDF 2011; 2012; 2013; 2014). Annual exploration expenditures were $165.1 million in 2012, down 57.1 percent from the previous year. Exploration expenditures increased sharply to an all-time record $712.7 million in 2013, but then decreased to $300.4 million in 2014. Exploration activities directly generated an estimated 253 person-years of employment in 2014 (C-NLOPB 2015a).
Ten exploration wells were drilled in Newfoundland and Labrador’s offshore during the study period (Table 2.1). In addition to drilling activity, seismic exploration activity was robust. From 2012 to 2014, Nalcor Energy, in partnership with TGS and Petroleum Geo-Services conducted one of the largest 2-D seismic programs in the world. It spanned the coast of Labrador and down the southeast coast over the Orphan Basins, Flemish Pass, and the Flemish Cap. By the end of 2013 Nalcor had collected over 47,000 km of data. A total of 94,797 km of 2D seismic and 559,858 km of 3D seismic was collected during the study period (C-NLOPB 2015b).

Table 2.1   Exploration Wells in the Newfoundland and Labrador Offshore: 2011 - 2014

<table>
<thead>
<tr>
<th>Well Name</th>
<th>Area</th>
<th>Spud Date*</th>
<th>Well Termination Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Searcher C-87</td>
<td>North Grand Banks</td>
<td>08-Aug-2012</td>
<td>29-Aug-2012</td>
</tr>
<tr>
<td>Margaree A-49</td>
<td>North Grand Banks</td>
<td>16-Mar-2013</td>
<td>30-Nov-2013</td>
</tr>
<tr>
<td>Harpoon 0-85</td>
<td>Northeast Newfoundland</td>
<td>01-Apr-2013</td>
<td>15-Jun-2013</td>
</tr>
<tr>
<td>Federation K-87</td>
<td>North Grand Banks</td>
<td>20-Jun-2013</td>
<td>11-Jul-2013</td>
</tr>
<tr>
<td>Bay du Nord C-78</td>
<td>North Grand Banks</td>
<td>18-Jul-2013</td>
<td>11-Sep-2013</td>
</tr>
<tr>
<td>Bay du Nord C-78Z</td>
<td>North Grand Banks</td>
<td>16-Sep-2013</td>
<td>03-Oct-2013</td>
</tr>
<tr>
<td>Bay de Verde F-67</td>
<td>North Grand Banks</td>
<td>04-Nov-2014</td>
<td>01-Dec-2014</td>
</tr>
<tr>
<td>Bay de Verde F-67Z</td>
<td>North Grand Banks</td>
<td>14-Dec-2014</td>
<td>N/A</td>
</tr>
<tr>
<td>Aster C-93A</td>
<td>North Grand Banks</td>
<td>19-Dec-2014</td>
<td>03-Feb-2015</td>
</tr>
</tbody>
</table>

*Start of drilling

Environmental work continued to be an important element in the development of the offshore. In 2012, the C-NLOPB initiated updates of the Strategic Environmental Assessments (SEA) for the Western Newfoundland and Offshore Labrador Area. An SEA considers the larger ecological setting of an area and is used to inform strategic decisions, such as the issuance of exploration licenses in previously un-assessed offshore areas. After a period of public consultation, the C-NLOPB invited comments on a draft update report in 2013 and the draft document was released in during the 2013-14 fiscal year. The C-NLOPB also initiated the Eastern Newfoundland SEA, including an update of the 2003 SEA on the Orphan Basin. In addition to this update, operators continued routine environmental effects monitoring programs at producing fields.

Diversity has continued to be an important issue for both operators and contractors, who actively encourage the employment of women, Aboriginal people, persons with disabilities and visible minorities, and business access by companies they own or operate. During the study period, Husky Energy continued the successful implementation of the White Rose Diversity Plan, and the Hebron Project proceeded with development of its Diversity Plan, working with its major contractors and such groups as the Women in Resource Development Corporation, the Independent Living Resource Centre and the NL Organization of Women Entrepreneurs, to incorporate diversity into the Project as early as possible.
ECONOMIC BENEFITS: 2011 - 2014

This section of the report provides a more detailed picture of the economic effects of offshore petroleum activity on Newfoundland and Labrador during the 2011 to 2014 period. These findings are presented in the context of a revised analysis of the impacts discussed in the earlier reports.

The analysis was prepared by the Economic Research and Analysis Division, Department of Finance, Government of Newfoundland and Labrador. It examines the direct, indirect, and induced effects of offshore petroleum industry activity between 2006 and 2014 (the 2006-2014 period).
Direct Impacts

This analysis of the total economic impacts of offshore petroleum activity on Newfoundland and Labrador is based on its direct impacts during the years 2006 to 2014 (Table 3.1), established using information from ExxonMobil, Suncor, Husky Energy, Chevron, the C-NLOPB and Statistics Canada. This information included data on costs related to production, which shows a general pattern of increase in its overall contribution to the provincial economy, and data related to exploration and development activity, which have been more susceptible to fluctuations over time and are influenced by such factors as drilling and labour costs. Although production had previously showed a pattern of relatively consistent increases to a peak of 134.5 million barrels in 2007, a general decline has followed. As was noted above, 2011 saw a total production of 97.3 million barrels, with a further decrease to 72.2 million barrels (i.e. only 53.7 percent of the 2007 figure) the following year. In 2013, production recovered to 83.6 million barrels, but there was a further slight decline to 78.9 million barrels in 2014.

As has been discussed above, the level of exploration activity in Newfoundland and Labrador has varied since it began in the 1960s. The direct economic impact of exploration continued to fluctuate during the study period, although such factors as increasing rig costs resulted in higher costs overall. Exploration spending peaked at a record $713 million in 2013, compared to only $165 million the previous year, but this was followed by a decline to only $300 million in 2014.

The expenditures associated with development activity increased rapidly over the 2011-2014 period because of the Hebron construction project. Such expenditures totaled only $568 million in 2011, but even that was a much higher figure than the $177 million spent the previous year. There were then increases to $1.0 billion in 2012, $3.0 billion in 2013, and a record $3.4 billion in 2014. Wages, salaries, and benefits associated with development activity increased steadily over the study period, from $48 million in 2011 to $835 million in 2014.

Over the course of the study period, production activity costs fluctuated while showing an overall pattern of growth, from $608 million in 2011 to $848 million in 2014, an increase of 39 percent. Wages, salaries, and benefits associated with production also grew, from $369 million in 2001 to $528 million in 2014, an increase of 27 percent.

The size of industry activity in terms of total expenditures (i.e., capital plus operating costs) peaked at $4.6 billion in 2014, slightly more than in 2013 ($4.5 billion) and an increase of almost $3.0 billion over 2011.

Indirect Impacts

A substantial portion of the local benefits from the offshore petroleum industry activity accrues to companies providing goods and services to oil companies. Supplier impacts, or indirect impacts, are dependent on non-wage operating spending and capital spending by oil companies. The provincial Department of Finance’s Newfoundland and Labrador Input-Output Model (NALIOM) was used to obtain indirect employment, gross domestic product (GDP) and labour income impacts.

The main types of businesses providing services to the offshore petroleum industry included: services incidental to mining and oil and gas; miscellaneous business services; air transport; water transport; wholesaling; storage; and architectural, scientific, and engineering services. In 2014, the direct and indirect nominal GDP impacts were $11.1 billion.
Table 3.1 Direct Impacts of Offshore Petroleum Industry, Newfoundland and Labrador, 2006-2014

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tr>
<td><strong>Capital Costs ($ Millions)</strong></td>
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<td></td>
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<tr>
<td>Exploration</td>
<td>241.4</td>
<td>122.3</td>
<td>92.1</td>
<td>384.3</td>
<td>333.9</td>
<td>385.5</td>
<td>165.1</td>
<td>712.7</td>
<td>300.4</td>
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<td>Development</td>
<td>2.3</td>
<td>54.4</td>
<td>252.9</td>
<td>449.9</td>
<td>177.1</td>
<td>568.0</td>
<td>1046.2</td>
<td>3,027.4</td>
<td>3,416.0</td>
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<tr>
<td>Production (Sustaining)</td>
<td>815.8</td>
<td>587.4</td>
<td>627.8</td>
<td>606.4</td>
<td>497.2</td>
<td>607.8</td>
<td>932.9</td>
<td>772.2</td>
<td>847.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,059.5</strong></td>
<td><strong>764.1</strong></td>
<td><strong>972.8</strong></td>
<td><strong>1,440.6</strong></td>
<td><strong>1,008.2</strong></td>
<td><strong>1,561.3</strong></td>
<td><strong>2,144.2</strong></td>
<td><strong>4,512.3</strong></td>
<td><strong>4,564.0</strong></td>
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<td><strong>Employment (person years)</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td>15</td>
<td>100</td>
<td>326</td>
<td>328</td>
<td>352</td>
<td>467</td>
<td>1,069</td>
<td>4,414</td>
<td>6,565</td>
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<tr>
<td>Production</td>
<td>2,839</td>
<td>2,516</td>
<td>2,641</td>
<td>2,813</td>
<td>2,839</td>
<td>3,092</td>
<td>3,796</td>
<td>3,345</td>
<td>3,608</td>
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<tr>
<td>Total</td>
<td>2,854</td>
<td>2,616</td>
<td>2,967</td>
<td>3,141</td>
<td>3,191</td>
<td>3,559</td>
<td>4,865</td>
<td>7,759</td>
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<td><strong>Oil Production (millions of bbl)</strong></td>
<td>110.8</td>
<td>134.5</td>
<td>125.2</td>
<td>97.7</td>
<td>100.7</td>
<td>97.3</td>
<td>72.2</td>
<td>83.6</td>
<td>78.9</td>
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<td><strong>Operating costs ($ Millions)</strong></td>
<td>621.0</td>
<td>602.7</td>
<td>701.4</td>
<td>707.1</td>
<td>686.9</td>
<td>694.0</td>
<td>730.1</td>
<td>758.0</td>
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<td><strong>Wages/Salaries &amp; Employee Benefits ($ Millions)</strong></td>
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</tr>
<tr>
<td>Development</td>
<td>1.1</td>
<td>7.7</td>
<td>27.8</td>
<td>29.7</td>
<td>31.2</td>
<td>48.1</td>
<td>126.9</td>
<td>544.8</td>
<td>834.6</td>
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<tr>
<td>Production</td>
<td>317.3</td>
<td>270.9</td>
<td>289.1</td>
<td>324.8</td>
<td>336.9</td>
<td>368.7</td>
<td>485.0</td>
<td>456.5</td>
<td>528.1</td>
</tr>
<tr>
<td>Total</td>
<td>318.4</td>
<td>278.6</td>
<td>316.8</td>
<td>354.4</td>
<td>368.1</td>
<td>416.8</td>
<td>611.9</td>
<td>1,001.3</td>
<td>1,362.9</td>
</tr>
</tbody>
</table>

Analysis shows that offshore petroleum industry is making a substantial contribution to the Newfoundland and Labrador economy, particularly in relation to GDP and employment.
**Total Impacts**

Data on direct and indirect economic impacts are key inputs to the simulation of the overall effects of the offshore petroleum industry on the economy of the Province, using the Department of Finance’s Newfoundland and Labrador Econometric Model (NALEM). The model provides measures of the total (i.e., direct, indirect and induced) effect of the industry on a wide range of indicators, including GDP, employment, personal income, consumer spending and population change (Table 3.2), for the 2006 to 2014 period. It also provides averages for that period.

The macroeconomic impact estimates presented in Table 3.2 point to a substantial impact on the provincial economy. Nominal GDP was, on average, approximately $10 billion per year higher over the 2006 to 2014 period, and $11.8 billion higher in 2014, as a result of offshore oil activity. Oil development and production activities generated 35.7 percent of the province’s nominal GDP between 2006 and 2014. During the 2011-2014 period that is the main focus of this study, GDP impacts (i.e., the business and labour income earned within the geographic boundaries of the Province) peaked in 2011, and then decreased from 29.2 percent of the total GDP (Real GDP chained) to 23.8 percent in 2012. However, it then recovered to 28.2 percent in 2013 and 28.6 percent in 2014.

GDP represents the business and labour income earned within the geographic boundaries of the province. However, much of the business income earned in Newfoundland and Labrador’s offshore petroleum industry accrues to non-resident companies. Because of this, business income directly related to the industry generally would not accrue to residents and therefore is not reflected in the personal income impact. Personal income impacts, primarily wages and salaries, reflect only income received by provincial residents. Consequently, the personal income impacts are smaller than the GDP impacts.

Household income was roughly $1.5 billion per year higher over the 2006-2014 period as a result of the offshore oil industry, representing 7.7 percent of all provincial household income. The impacts were somewhat higher in 2013 and 2014 at approximately 12.0 percent and 14.5 percent respectively due to the fact that Hebron construction activity was near its peak. Capital spending impacts are expected to decline following the completion of Hebron construction.

The income impacts mainly reflect the boost to labour income resulting from the oil industry’s high wages as well as labour income from spinoff employment (indirect and induced). Annual disposable income, which is household income after payment of direct taxes (income tax, EI, CPP premiums), was on average $1.2 billion higher over the 2006 to 2014 period. Consequently, consumer spending in the form of annual retail sales was about $648 million or 8.3 percent higher on average.

The estimated annual employment impact averaged approximately 16,000 over the 2006-2014 period (7.0 percent of all provincial employment). On average, the unemployment rate was 2.1 percentage points lower as a result. The decline in unemployment would have been greater except that increased employment, higher average wages and a larger population encouraged more labour force participation. The rise in the labour force was about two-thirds as large as the gain in employment.

The housing starts attributed to industry activity ranged from 122 and 145 units from 2006 to 2011, but then jumped to 200 units in 2012, 317 units in 2013 and 394 units in 2014.

The population effects of offshore petroleum industry activity are more difficult to model. Any increase in economic activity and employment in the province will tend to reduce out-migration and increase in-migration. Net migration is modelled in NALEM as a function of the difference in average wages and employment rates between Newfoundland and Labrador and Canada as a whole. Both of these differences were smaller than they would have been in the absence of oil industry activity. Changes in migration led to a population that was roughly 6.8 percent higher in 2014. It should be noted, however, that since migration is a difficult variable to model there is a high margin of error associated with the estimated population impact. Consequently, a number of other indicators that are affected by changes in population, such as labour force, the unemployment rate and housing starts, also have a higher margin of error.
### Table 3.2: Total Economic Impacts Related to the Offshore Petroleum Industry in Newfoundland and Labrador

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GDP ($ Millions)</strong></td>
<td>8,179</td>
<td>10,295</td>
<td>12,932</td>
<td>6,829</td>
<td>8,598</td>
<td>11,266</td>
<td>10,414</td>
<td>12,452</td>
<td>11,777</td>
<td>10,305</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>36.4</td>
<td>36.9</td>
<td>43.6</td>
<td>29.5</td>
<td>31.8</td>
<td>35.8</td>
<td>34.4</td>
<td>37.0</td>
<td>36.1</td>
<td>35.7</td>
</tr>
<tr>
<td><strong>Real GDP Chained ($2007 Millions)</strong></td>
<td>8,962</td>
<td>10,295</td>
<td>9,813</td>
<td>7,782</td>
<td>7,837</td>
<td>7,917</td>
<td>6,202</td>
<td>7,855</td>
<td>7,734</td>
<td>8,266</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>35.1</td>
<td>36.8</td>
<td>35.3</td>
<td>31.2</td>
<td>29.8</td>
<td>29.2</td>
<td>23.8</td>
<td>28.2</td>
<td>28.6</td>
<td>30.9</td>
</tr>
<tr>
<td><strong>Household Income ($ Millions)</strong></td>
<td>1,018</td>
<td>888</td>
<td>987</td>
<td>1,050</td>
<td>1,011</td>
<td>1,160</td>
<td>1,635</td>
<td>2,640</td>
<td>3,338</td>
<td>1,525</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>6.2</td>
<td>5.4</td>
<td>6.0</td>
<td>6.0</td>
<td>5.6</td>
<td>5.9</td>
<td>7.9</td>
<td>12.0</td>
<td>14.5</td>
<td>7.7</td>
</tr>
<tr>
<td><strong>Labour Income ($ Millions)</strong></td>
<td>763</td>
<td>666</td>
<td>740</td>
<td>788</td>
<td>759</td>
<td>870</td>
<td>1,226</td>
<td>1,980</td>
<td>2,503</td>
<td>1,144</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>7.0</td>
<td>6.3</td>
<td>7.0</td>
<td>7.1</td>
<td>6.5</td>
<td>6.9</td>
<td>9.0</td>
<td>13.5</td>
<td>16.3</td>
<td>8.8</td>
</tr>
<tr>
<td><strong>Other Income ($ Millions)</strong></td>
<td>254</td>
<td>222</td>
<td>247</td>
<td>263</td>
<td>253</td>
<td>290</td>
<td>409</td>
<td>660</td>
<td>834</td>
<td>381</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>4.7</td>
<td>3.8</td>
<td>4.1</td>
<td>4.1</td>
<td>3.9</td>
<td>4.2</td>
<td>5.7</td>
<td>8.9</td>
<td>10.7</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Disposable Income ($ Millions)</strong></td>
<td>788</td>
<td>677</td>
<td>741</td>
<td>799</td>
<td>770</td>
<td>877</td>
<td>1,238</td>
<td>2,000</td>
<td>2,528</td>
<td>1,158</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>6.2</td>
<td>5.4</td>
<td>6.0</td>
<td>6.0</td>
<td>5.6</td>
<td>5.9</td>
<td>7.9</td>
<td>12.0</td>
<td>14.5</td>
<td>7.7</td>
</tr>
<tr>
<td><strong>Retail Sales ($ Millions)</strong></td>
<td>442</td>
<td>379</td>
<td>415</td>
<td>448</td>
<td>431</td>
<td>491</td>
<td>693</td>
<td>1,120</td>
<td>1,416</td>
<td>648</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>7.3</td>
<td>5.8</td>
<td>5.9</td>
<td>6.3</td>
<td>5.8</td>
<td>6.3</td>
<td>8.5</td>
<td>13.0</td>
<td>15.9</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>Housing Starts</strong></td>
<td>144</td>
<td>122</td>
<td>130</td>
<td>140</td>
<td>131</td>
<td>145</td>
<td>200</td>
<td>317</td>
<td>394</td>
<td>191</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>6.4</td>
<td>4.6</td>
<td>4.0</td>
<td>4.6</td>
<td>3.6</td>
<td>4.1</td>
<td>5.1</td>
<td>11.1</td>
<td>18.6</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Employment (000s)</strong></td>
<td>14.0</td>
<td>11.9</td>
<td>12.7</td>
<td>11.9</td>
<td>11.0</td>
<td>12.4</td>
<td>16.0</td>
<td>24.7</td>
<td>29.6</td>
<td>16.0</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>6.5</td>
<td>5.5</td>
<td>5.7</td>
<td>5.5</td>
<td>5.0</td>
<td>5.3</td>
<td>6.6</td>
<td>10.2</td>
<td>12.4</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>Labour Force (000s)</strong></td>
<td>11.0</td>
<td>9.3</td>
<td>9.8</td>
<td>9.8</td>
<td>9.3</td>
<td>10.4</td>
<td>13.3</td>
<td>18.1</td>
<td>21.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>4.4</td>
<td>3.7</td>
<td>3.8</td>
<td>3.9</td>
<td>3.6</td>
<td>3.9</td>
<td>4.8</td>
<td>6.6</td>
<td>8.0</td>
<td>4.7</td>
</tr>
<tr>
<td><strong>Unemployment Rate (%)</strong></td>
<td>-1.9</td>
<td>-1.7</td>
<td>-1.8</td>
<td>-1.5</td>
<td>-1.2</td>
<td>-1.3</td>
<td>-1.6</td>
<td>-3.4</td>
<td>-4.3</td>
<td>-2.1</td>
</tr>
<tr>
<td><strong>Population (000s)</strong></td>
<td>18.3</td>
<td>15.4</td>
<td>16.3</td>
<td>16.4</td>
<td>15.6</td>
<td>17.3</td>
<td>22.2</td>
<td>30.1</td>
<td>35.9</td>
<td>20.8</td>
</tr>
<tr>
<td>Share of Total (%)</td>
<td>3.6</td>
<td>3.0</td>
<td>3.2</td>
<td>3.2</td>
<td>3.0</td>
<td>3.3</td>
<td>4.2</td>
<td>5.7</td>
<td>6.8</td>
<td>4.0</td>
</tr>
</tbody>
</table>
INFRASTRUCTURE, EDUCATION & TRAINING, AND RESEARCH & DEVELOPMENT

The following pages outline the impacts that have been influenced by, and have influenced, oil & gas activity in the province from 2011 to 2014.
The ongoing development of the Newfoundland and Labrador offshore petroleum industry is supported by, and has made a substantial contribution to, infrastructure development in Newfoundland and Labrador. This contribution has been documented in previous reports in this series (see Section 1.0). Over the long term, the availability of infrastructure reduces the costs of development, increases the likelihood of additional petroleum industry investment in Atlantic Canada, and ultimately increases Newfoundland and Labrador’s participation in the industry. Some of this infrastructure has also contributed to the diversification of Newfoundland and Labrador’s business community. For example, many Newfoundland and Labrador companies have successfully leveraged harsh environment engineering expertise developed in provincial facilities to gain additional experience in Arctic environments.

The 2011-2014 period saw continued development and growth in supporting infrastructure for the Newfoundland and Labrador offshore petroleum industry. For example, in 2011, the Hebron Project co-venturers announced an investment of $2 million to develop two world-class oil and gas training facilities at the College of the North Atlantic’s (CNA). These are the Hebron Process Operations and Applied Research Laboratory located at CNA’s Petroleum Training Centre in Seal Cove, and the Hebron Process Analyzers Laboratory, to be located at the Engineering Technology Centre, on Ridge Road in St. John’s (CNA 2011).

Offshore engineering research in Newfoundland and Labrador received a $6.8-million investment by Suncor Energy and the Research & Development Corporation of Newfoundland and Labrador (RDC) in 2011 to expand Memorial University’s S.J. Carew Building, which is the location of the Faculty of Engineering and Applied Science. The new Suncor Energy Offshore Research and Development Centre opened in 2014. It provides dedicated space for innovative research and industry collaboration related to the ocean technology and offshore petroleum sectors. The focus areas of research centre include offshore safety in harsh environments, and durability in ice-prone waters. The new Centre will help to position the province as a global leader in offshore petroleum research, attract and develop more researchers to study in these areas, and facilitate long-term investment in Newfoundland and Labrador.

In 2013, RDC and the Hibernia Management and Development Company Ltd. (HMDC) announced that they are investing $1.6 million and $1.7 million, respectively, for the creation of a state-of-the-art enhanced oil recovery research centre at Memorial University’s St. John’s campus. Research efforts in the new laboratory will focus on enhanced oil recovery, which is utilized to increase the amount of crude oil extracted from an oil field and extend the field life. This is in addition to HMDC’s investment of more than $11 million for the purchase of laboratory equipment and to undertake research into enhanced oil recovery, which was announced in December 2012 (RDC 2013a).

Also in 2012, RDC and the American Bureau of Shipping (ABS) made a $600,000 investment in the ABS Harsh Environment Technology Centre on the St. John’s Memorial University campus. It is also being used to fund an associated research program, which will focus on how ship and offshore structures can be improved to work more effectively in volatile ocean conditions, such as the North Atlantic (MUN 2012).
That same year, the Centre for Marine Simulation at the Marine Institute received $3 million each from the Atlantic Innovation Fund and Petroleum Research to support a project to develop dynamic positioning system technologies specifically for ice-rich environments. This system enables vessels engaged in the exploration and production phases of the offshore petroleum industry to operate safely and efficiently in ice. A training simulator has been developed for prototype testing and for the preliminary training of appropriate personnel (Fisheries and Marine Institute of Memorial University of Newfoundland 2012).

In January, 2014, the Marine Institute announced that it had received funding to build a new simulator to train personnel in tasks related to offshore facilities and production support. The $6.1 million Hibernia Offshore Operations Simulator was made possible through a $4.4 million donation from the HMDC, $750,000 from the Provincial Government’s Infrastructure Funding Program, and $1.0 million through the Atlantic Canada Opportunity Agency (ACOA) Innovative Communities Fund. The simulator will train personnel in complex tasks such as positioning and mooring offshore structures, supply transfers, iceberg management, seismic surveys, and subsea operations. The new simulation will not only help employees gain skills and training in key industries for the province, but it will allow the province to spearhead R&D in the offshore petroleum sector (Oceans Advance, 2014).

Investment in infrastructure that supports oil industry projects increases the Province’s ability to be involved in their construction, fabrication and operations activities and opens the door for participation in other industries. For example, Pennecon Energy Marine Base expanded its operations in Bay Bulls with the construction of a third dock to allow for additional projects at the terminal. The Provincial Government announced a $500,000 contribution in July 2011 to help Pennecon create 15 new full-time permanent jobs over the following three years and 23 jobs by 2015. The expansion will allow Pennecon the flexibility to support two large projects simultaneously, to continue to attract oil industry projects, and to explore new customers and related export opportunities in the Arctic (Newfoundland and Labrador Department of Business 2011).

C-CORE, which has long worked to address the technological challenges of oil industry activity offshore Newfoundland and Labrador, has been evolving to address new research and is now a multi-disciplinary organization with world-leading capability in Remote Sensing, Ice Engineering and Geotechnical Engineering. Along with the creation of the Centre for Arctic Resource Development (CARD) in 2011, C-CORE received funding that year to launch its Leading Operational Observations and Knowledge for the North (LOOKNorth) Centre, which is dedicated to the research, development, and commercialization of technologies and services to maximize the potential of northern resources.
Investments in education infrastructure, such as those described above, enhance the training abilities of education institutions. They help them to address skill gaps and plan for future needs in the oil and other industries. For instance, the 2011 investment in laboratories at CNA by the Hebron Project co-venturers have enhanced CNA’s training abilities as they relate to the resource sector and increase its petroleum-related applied research capacity through a stronger college/industry partnership. CNA has been able to implement its Chemical Process Engineering Technology (CPET) program, which equips graduates with the theoretical and practical skills necessary to perform as process operators and technologists (CNA 2011).

The study period also saw a range of further investments in education and training, including funding for student awards and scholarships, the creation of work-terms and internships, and investments in new research and training programs.

In 2012, HMDC made a $1.03-million investment in two CNA initiatives that aim to expand access to training opportunities for women, individuals with Aboriginal status, persons with disabilities, and members of visible minorities. The first initiative, the Hibernia Project Diversity Endowment Fund, established two bursaries: the Hibernia Project Diversity Bursary Program and the Hibernia Project Women in Industrial Trades and Engineering Technology Bursary, with an investment of $880,000. An additional $150,000 established the Hibernia Project Assistive Technologies Fund to support individuals who have disabilities (Hibernia 2012).

In October 2013, RDC announced an investment of $890,000 in support of 15 graduate and doctoral researchers at Memorial University. The awards are granted under RDC’s Ocean Industries Student Research Awards program, which supports qualified science, engineering and technology students at post-secondary institutions in Newfoundland and Labrador. Awards range from up to $20,000 per year for master’s candidates and up to $30,000 per year for doctoral candidates (RDC 2013b).

Opportunities for training in other regions of the world were also being developed during the study period. In 2012, CNA and the Building and Construction School of Greenland signed a Memorandum of Understanding (MOU), which will see both institutions explore oil industry training possibilities over the following five years (CNA 2012). Undergraduate enrollment in the Faculty of Engineering and Applied Science at Memorial University was relatively constant during the study period with 1,075 full-time students in 2011, 1,086 in 2012 and 1,069 in 2013. During this period, the Faculty awarded 587 undergraduate engineering degrees (CIAP 2013). Approximately 400 Memorial University co-op students were placed with oil companies in each year. Up to 90 percent of these positions went to engineering students, while the remainder went to business students (Anil Raheja, pers comm).
Between 2011 and 2014, Newfoundland and Labrador’s infrastructure and education facilities received investment from oil and gas companies. Examples of some of the contributions include:

- **HUSKY ENERGY, ACOA, RDC, & MEMORIAL**
  - **2011**: $7.2MN
    - Research in ship and structure design for Arctic operations at Memorial University
  - **2012**: $11.0MN
    - Enhanced oil recovery lab
  - **2013**: $3.3MN
    - Oil Recovery Research Centre at Memorial University
  - **2014**: $11.0MN
    - Offshore Research & Development Centre

- **HEBRON**
  - **2011**: $2.0MN
    - Two oil & gas training facilities

- **RDC & ABS**
  - **2012**: $600K
    - ABS Harsh Environment Technology Centre

- **SUNCOR ENERGY & RDC**
  - **2014**: $6.8MN
    - Suncor Energy Offshore Research & Development Centre

- **HIBERNIA**
  - **2011**: $2.0MN
    - Two oil & gas training facilities
  - **2013**: $5.0MN
    - R&D to address key technological gaps in Arctic oil and gas development

**INFRARED, R&D, AND EDUCATION AND TRAINING**

"Investment in infrastructure that supports oil industry projects increases the Province’s ability to be involved in their construction, fabrication, and operations activities...

A range of investment focuses on education and training: student awards, scholarships, work-terms, internships, research, and training programs.

"C-CORE, which has long worked to address the technological challenges of oil industry activity offshore Newfoundland and Labrador, is now a multi-disciplinary organization with world-leading capability in Remote Sensing, Ice Engineering, and Geotechnical Engineering."
Between 2011 and 2014, R&D was an area of high activity in the provincial offshore petroleum industry, with industry, educational institutions, and research organizations providing support for the advancement of industry locally, as well as providing a mechanism for the transfer of local expertise into international markets.

In June 2011, RDC launched GeoEXPLORE, a three-year program to enhance geoscience capacity, collaboration and industry innovation in support of both petroleum and mining exploration and development. It targets five areas for R&D investment: research team awards; geoscience research tools and equipment; collaborative research opportunities; post-doctoral researchers; and industry-led R&D, technology development and demonstration. Through this program, $312,900 was invested in August 2011 to fund two research projects led by the Marine Institute and C-CORE. The first investigated natural gas hydrates on Newfoundland and Labrador’s continental margin, while the second saw seafloor mapping to assess the petroleum resource potential of Western Newfoundland (RDC 2011d).

In 2011, Memorial University’s Ocean and Naval Architectural Engineering Department partnered with Husky Energy Inc. and other industry and private sector partners on a research project focused on developing tools for designing ships and offshore structures for year-round Arctic operations. ACOA, RDC and Memorial University are the funding partners providing $7.2 million to the project over five years (OceansAdvance 2011). Results of the project will help determine the viability of Arctic oil and gas projects.

Also in 2011, RDC and Statoil funded the establishment of the Statoil Chair and Associate Chair in Reservoir Engineering at Memorial University, to foster the development of a new Petroleum Engineering Research Program in the Faculty of Engineering and Applied Science. Statoil Canada and RDC each committed to contribute $1 million over the following five year period. The program will further develop Newfoundland and Labrador’s research expertise in reservoir and Arctic operations (RDC 2011).

As was noted above (Section 4.1), C-CORE founded the Centre for Arctic Resource Development (CARD) with core funding of $12.5 million over five years from the Hibernia and Terra Nova projects. The Centre was established to pursue research activities to study challenges to development in the Arctic and harsh environments, including challenges associated with Arctic oil and gas development.

The RDC also funds local businesses undertaking research or developing technologies that support the oil industry. In July 2012, for example, RDC provided Clarenville-based SubC Control Ltd. $116,000 for the creation of an underwater single-lens reflex camera, capable of taking high-definition still photos and videos by being mounted on a remotely operated vehicle. The high-technology camera will allow the inspection of the integrity of underwater structures, including: leak monitoring; confined space inspections; scientific studies of target underwater areas and ongoing rig and pipeline maintenance (RDC 2012a).

Also in 2012, Mount Pearl-based GRI Simulations Inc. received $250,000 from RDC’s Proof of Concept program to support the development of a 3-D simulation software product that will enhance offshore petroleum installation design and operations. This software kit will address an oil industry need to improve efficiency in the design, fabrication and installation of fields and field components in a range of harsh environments, particularly in preparation for well-capping and pipeline repair contingencies (RDC 2012b).

St. John’s-based start-up Go Beyond Consulting Inc. is developing new underwater machine vision technology that will allow autonomous underwater vehicles to photograph the ocean floor and create wide area illustrations. The software is also able to analyze the images and perform tasks...
like automatically counting benthic organisms, which can help improve environmental effects monitoring programs. In 2014, RDC invested over $245,000 to help develop supporting technology to help extend autonomous missions, reduce the amount of time needed for image-gathering operations, and potentially allow the acquiring of information safely from deep and harsh water environments (RDC 2014a).

In 2013, Statoil announced that it will invest $5 million in private sector-led R&D in Newfoundland and Labrador to address key technological gaps in Arctic oil and gas development. The initiative is called Statoil Arctic R&D Step Up and it focuses on two research areas: remote sensing technology for safe Arctic operations, such as ice monitoring and management solutions, and the design of subsea production systems that are robust enough for Arctic conditions. Newfoundland-based technology providers were invited to submit proposals through an Expression of Interest, with the selected projects also being considered for co-funding by RDC through either RDC’s ArcticTECH or Petroleum R&D Accelerator programs (OceansAdvance 2013).

There were further advancements in this initiative in 2014 as Statoil invested $2.4 million, along with $1.5 million from RDC, into three research projects aimed at improving Arctic and harsh-environment offshore oil operations in Newfoundland and Labrador and globally. These projects focus in the development of technology for Arctic subsea oil and gas separation and storage, monitoring and predicting ice floe and pan drifts, and developing an ice surveillance system that integrates remote sensing, forecasting technology, and risk assessment (RDC 2014b).

In May 2014, CARD launched an ice rubble research project in order to improve expertise related ice conditions in harsh offshore working conditions. Ice rubble is the accumulation of ice fragments that form when an intact ice sheet comes into contact with an obstacle, and this project will research the mechanics and behavior of ice rubble when it interacts with structures on the sea floor. CARD, along with the HMDC and RDC, have provided the $1.3 million funding for the project, with the goal that the knowledge acquired will help facilitate the design of infrastructure that can better withstand hazardous ice conditions of Arctic and sub-Arctic waters (CARD 2014).

Petroleum Research has continued to fund projects with application in both the Newfoundland and Labrador offshore and in Arctic areas such as Greenland, where Newfoundland and Labrador companies have begun to operate in support of exploration activities. With Petroleum Research funding, Kraken Sonar Systems Inc. began developing a high resolution acoustic sensor for 3D seabed survey and underside ice profiling. High resolution imagery and topography are useful for seabed exploration, infrastructure survey, characterization of ice thickness and composition, and potentially for detecting oil spills either on the seabed or at the ice/seawater interface (Petroleum Research, no date).

Additional R&D work undertaken by such private-sector and non-profit companies as Oceanic, C-CORE, PAL and VMT is described in the following section of this report.
CASE STUDIES

The success of the offshore petroleum industry in Newfoundland and Labrador is both a result of, and exemplified by, the success of local companies. There is now a large provincial supply and service sector, the interests of which are represented by the Newfoundland and Labrador Oil Industry Association (NOIA), which has grown from 566 member companies in 2011 to 652 in 2014 (B. Bishop, pers comm), an average annual growth rate of 4.8 percent.

This section of the study summarizes the involvements a range of such companies with the offshore petroleum industry in Newfoundland and Labrador, and the ways in which interactions with the industry have led them variously to develop new goods and services, hire new personnel, provide them with further training, acquire new facilities and equipment, and improve quality, health, safety and environmental policies and practices. It also considers the way in which the resultant increases in experience and capabilities have led to them winning petroleum industry work in other jurisdictions, and undertaking work in other industries, both locally and outside the Province.

The case study companies have been selected to reflect the diversity of activity in and around the oil industry. This includes companies of different sizes, engaged in construction, manufacturing and the provision of technical and professional services, located in St. John’s and elsewhere in Newfoundland and Labrador. Some of them are engaged in cutting edge engineering and R&D activity, while others provide important but more mundane services in such areas as real estate, hotel accommodations, photography and catering.
One of the most striking examples of a Newfoundland and Labrador company that has flourished because of the oil industry is the Cahill Group. It grew out of a small electrical company, focused on residential work, founded in 1953. In 1991, it was successful in bidding the electrical work on the initial Bull Arm Hibernia construction site work camp. Building on that opportunity, it went on to work on the construction site swimming pool and gym, the Hibernia topsides, and the final Hibernia hook-up, and it is still undertaking offshore work on the Hibernia platform. It then expanded into a range of electrical, mechanical installation, industrial mechanical and pipe fabrication work, including the construction of a White Rose FPSO topsides module, additional Terra Nova FPSO accommodations, and subsea manifolds for the North Amethyst Tie-back Satellite development.

Based on its success in Newfoundland and Labrador, 2005 saw the company make a strategic decision to expand to Alberta. It successfully bid sophisticated work on three oil sands projects for Canadian Natural Resources Limited, benefitting from the rigorous quality and other systems it had had put in place in Newfoundland and Labrador, and allowing the company to build its capacity, resources and balance sheet and help deal with cyclical variations in demand in both provinces. The company has also undertaken a range of oil industry work in the Maritimes, including on the Sable Gas compression platform and Tier 2, the Imperial Oil refinery in Dartmouth, Nova Scotia, and the Irving Oil refinery in Saint John, New Brunswick.

The Cahill Group’s locally-developed capabilities and resources have also allowed it to expand into non-oil industry activity, including work on the Voisey’s Bay and Long Harbour projects, the Newfoundland Refinery and Iron Ore Company of Canada’s (IOC) iron ore mine in western Labrador. Strategic partnerships have also assisted in capturing further oil industry work, for example Husky Energy maintenance and modifications work. Outside of Newfoundland and Labrador, the Cahill Group assisted in the construction of waste and water treatment plants across Atlantic Canada, and was responsible for the electrical and instrumentation, mechanical and piping work on the Wuskwatim Generation Project, a joint venture between Manitoba Hydro and the Cree Nation at Taskingigup Falls.
The Cahill Group has three divisions:

- **Cahill Construction** manages multi-trade industrial and commercial projects, with experience in design-build installations, mechanical completion and commissioning of industrial facilities, and managing turnarounds and shutdowns. The company’s construction partnerships and subsidiaries include: Wood Group Cahill, Lynk and Iskuetu.

- **Cahill Fabrication** specializes in piping, structural steel, HVAC, and assembly services, providing a diverse range of solutions for industrial, institutional, and heavy commercial markets, including complex subsea structures, exotic pipe and industrial HVAC. NEAL (a partnership of North Eastern Constructors Limited (NECL) and Apply Leirvik) has the EPC contract for the Hebron living quarters module and for an oil sands project in Alberta.

- **Cahill Technical** provides industrial automation systems engineering and maintenance services to commercial and industrial clients, and offers onshore and offshore engineering, project management, shop and field services. Complete life cycle support for industrial process systems is provided through partnerships and subsidiaries, including: Cahill Technical Services, Newfoundland Service Alliance, Rawdon Technologies, New Valve, and ISMI Iskuetu-Quant.

The Cahill Group has its Corporate Office in the re-developed St. Bride’s College, re-named as The Tower Corporate Campus at Waterford Valley. The company has come full circle with the purchase of the property; in the late 1960s, GJ Cahill was selected as the sole electrical contractor for the installation of the electrical systems for the construction of St. Bride’s College, owned and operated by The Sisters of Mercy, one of the largest institutional projects of the time. The 12,000 m² Tower Corporate Campus provided the home to many of the companies involved in the Hebron project.

The Cahill Group has about 200 full-time staff, plus at any time it employs between approximately 600 and 1,200 tradespersons in Newfoundland and Labrador. As of 2014, it also employed about 70 to 80 people in Manitoba and 40 to 50 in Alberta. This diversity of activity is seen as being critical to attracting and retaining talent in an increasingly competitive labour market. The company also seeks to promote itself to new industry entrants through a range of supports to the Memorial University Faculty of Engineering and Applied Sciences and the Cahill Engineering Technical Communications Center.
There are a number of other companies engaged in petroleum industry-related construction and fabrication activity. For example, C&W Offshore provides custom or client design steel and aluminum fabrication, and undertakes some piping work. It was incorporated in 2004 as a spin-off of C&W Industrial in Bay Bulls, Newfoundland and Labrador, on the basis of opportunities that company President Steve Crane identified while he was working in Texas. It was soon undertaking work for the oil industry, fabricating subsea components for the White Rose project for Technip, as well as undertaking specialist work for drilling company GlobalSantaFe. In order to achieve this success, the company had initially to introduce quality and safety standards much more rigorous than were common in metal fabrication in the Province at the time. There has been a subsequent requirement to introduce new welding procedures, and C&W estimates it spends $20,000 to $30,000 a year on training.

Subsequent oil industry work has included the fabrication of lifeboat decks for a drilling rig (for TransOcean), subsea assemblies for Husky Energy’s North Amethyst satellite development (for Technip), custom ROV components (for Oceaneering) and components for the Hibernia gas lift (for Wood Group/PSN). C&W Offshore has also undertaken work for projects outside Newfoundland and Labrador, both for the oil industry, in the form of ROV and launch recovery system components for Oceaneering in Morgan City, Louisiana, and for the mining industry, fabricating steel tanks for a mine in the Northwest Territories. Overall, the oil industry accounts for over 95 percent of C&W’s business, which provides employment to 10 to 25 people. It recently moved into a custom-built 1,500 m2 building, including a 1,100 m2 fabrication space with a 50 tonne crane.
In support of offshore petroleum construction and fabrication activity Pennecon Energy, part of a major Newfoundland and Labrador-based heavy civil, energy and real estate company, has developed and operates a Marine Base in Bay Bulls, approximately 30 km south of St. John’s. It supports a wide range of marine operations, which have included such oil industry activity as drilling rig servicing, rock dumping, chain inspection, pipe inspection and other support for a range of offshore construction and maintenance projects. The clients for this work have included Husky Energy, Technip, Tideway, Transocean, Rowan and GlobalSantaFe.

This work has seen a progressive expansion and improvement in the Marine Base, with increased ocean frontage, water depth, bollards and crane pads, and the construction of an office/warehouse and a garage. An encapsulated sewer system and ISPS-certified security provisions have been put in place. These have helped the base attract work on both oil and non-oil industry related activity, with the latter including work on fishing vessels and the transshipment of wind turbines. However, the oil industry still provides approximately 90 percent of the base’s business.

In 2011 Pennecon Energy received federal and provincial government support for a $2.1-million expansion project at the Marine Base, to help it handle increasing business from Arctic and other northern oil projects. This has resulted in an expansion of capacity of about 30 per cent, while assisting with the flow of vehicular traffic. The work has seen the construction of a third dock, and the creation of an expected 23 permanent full-time jobs by 2015. Such employment, together with Penney Energy’s public investments, has made a substantial contribution to the economic and social well-being of the Bay Bulls area.
Marine activity is also the focus of oil industry work by the A. Harvey Group. Since the 1860s, A. Harvey & Company Limited has been one of Newfoundland and Labrador’s most successful business enterprises, currently including companies involved in customs brokering, freezers and terminals, home heating and plumbing, manufacturing and bottling, auto carrying and the operation of the A. Harvey Marine Base, Newfoundland and Labrador’s largest offshore supply base. The company first became involved in offshore petroleum activity in the 1960s, acting as ships agents and customs brokers, and providing crewing, for drill-ships engaged in exploration off Labrador. While the Port of St. John’s was the home of a number of single-operator supply bases over the years, increased asset sharing led to A. Harvey becoming the main provider to all the oil companies operating in the Newfoundland and Labrador offshore.

The A. Harvey Marine Base encompasses almost five hectares of waterfront property in St. John’s Harbour. It has 435 m of dock frontage, able to accommodate five offshore supply vessels. The base can provide water via pipeline, drilling bulks (barite, bentonite and cement), 24 hour-security, and a heavy lift dock capable of 44-tonne lift. It can also provide container rentals and (through sub-contractor Newtrans Equipment Carriers Ltd.) trucking services. A. Harvey has been active in offshore logistics since the start of exploration, with experience in vessel operations, cargo planning, safe rigging and slinging practices, container repairs and certification, heavy lift management, freight forwarding, oil spill response, and crane and equipment maintenance. The company’s success in the industry has required, and is attributed to, the adoption of ‘best in class’ quality and safety systems and equipment.

The Marine Base directly employs 33 company personnel and eleven stevedores. Its operations are supported by a five-person management team that is also involved in other A. Harvey business activities. The company is optimistic about the St. John’s facility and related to its waterfront property in Argentia, approximately 130 km west of St. John’s. This was used to transship imported steel for use on the Hebron platform construction project and to support the construction of the Vale Long Harbour nickel processing plant in Long Harbour.
The Oceanic Consulting Corporation has an over twenty-year history undertaking marine R&D in Newfoundland and Labrador. Its researchers, engineers, and technical personnel, working with what is one of the world’s most comprehensive collections of hydrodynamic research facilities located in St. John’s, have made the company an international leader in commercial R&D. Today, Oceanic, and its parent Fleetway Inc., are members of the J.D. Irving, Limited Group of companies.

Over the years, the company had undertaken a range of work in the oil industry, starting with evaluation studies for Global Marine, Noble Drilling and for the Terra Nova FPSO in the late 1990s. Subsequently, it undertook studies for the White Rose project followed by work on the Hebron GBS and Hibernia offshore loading system.

In the study period Oceanic conducted work on a wide array of oil and gas projects which included optimization studies for the Gulfstar SPAR oil platform, floating liquefied natural gas (FLNG) seakeeping and offloading studies, motion and mooring load investigations for new harsh environment semisubmersible designs, experiments to investigate the mitigation of vortex-induced vibration in subsea risers, and loading and offloading experiments of the newly-constructed Dockwise Vanguard semi-submersible heavy lift ship.

Oceanic has worked on more than 70 significant FPSO- and FLNG-related projects worldwide for such clients as ExxonMobil, Husky Energy, Single Buoy Moorings, Suncor, Saipem Eni, ConocoPhilips, Shell and Woodside Energy. The company’s work has reached as far as the Tatar Strait, the South China Sea, the Sea of Okhotsk, the North Sea as well as Australia, Brazil, Italy, West Africa, Indonesia, and Norway.

The company has carried out a range of physical modeling and numerical simulation research including:

- Offshore structure mooring analysis for FPSOs in waves and ice;
- Sea-keeping studies (with one or more floating or fixed structures);
- Free running and captive ship manoeuvering tests;
- Evaluations of current loads on moored structures;
- Hull resistance in level and pack ice as well as in open water;
- Ship performance in ridged ice;
- Ice abrasion studies; and
- Analysis of moorings and risers for vortex induced vibration.

Oceanic employs approximately twenty-five people. Over half of its business is in export markets, while the oil industry both domestically and internationally is responsible for approximately two-thirds of its overall business.
Not all offshore oil industry activity is in the St. John's metropolitan area. For example, construction activity for the Hibernia, Terra Nova, White Rose and North Amethyst projects was concentrated around the Isthmus of Avalon and Marystown areas, rig mobilization and refurbishment work has occurred at both Bull Arm and Marystown, and oil transshipment occurs at a terminal near Arnold’s Cove on Placentia Bay. And Dynamic Air Shelters, based in Grand Bank on the Burin Peninsula, approximately 360 km west of St. John’s, is an example of a company outside St. John’s that is providing goods and services to the oil industry.

Dynamic is another company that received its start with the local offshore petroleum industry, but has branched out substantially, both in terms of client-base and geography. Its core products are currently its blast resistant air shelters, but it also builds inflatable shelters for rapid emergency response, as well as for promotional purposes. Involvement with the oil industry has had an important influence on product development, and it was through the industry that this Calgary-based company first began working in Newfoundland and Labrador in 2002, eventually leading to moving its manufacturing operations to Grand Bank in 2004.

The company evolved from Aero Dynamics Inflatable Shelters Inc., which was formed in Calgary in 2000. Aero Dynamics initially focused on designing and manufacturing inflatable shelters for promotional events, using technology and engineering adapted from hot air balloon production and design. The company began engineering and testing their shelters for explosion resistance in response to growing oil industry demand. A turning point came when the company demonstrated that it could produce a structure that could withstand pressures from an explosion of up to four pounds per square inch (psi), with later tests by global petroleum companies concluded that the structure would likely withstand blast pressures of up to nine or ten psi. Dynamic shelters are now used on work sites for offices, lunch rooms and warehouses.

Engineering and manufacturing capabilities originally developed to meet oil industry requirements have helped Dynamic market their product to other sectors. Blast resistant structures are also in demand for construction and fabrication industries, and the company has also worked with the Canadian Armed Forces to provide protective structures for use in military operations. The company estimates that about 25 percent of its business comes from construction and fabrication projects, many of which are linked to the oil industry, while the remaining 25 percent is split between military applications, promotional structures, and emergency response shelters.
In 2009, the American Petroleum Institute initiated an extensive study on the use of soft-walled structures in over pressure zones, and in 2014 it released a best practices document (API 756) to help occupational health and safety officials regulate site facilities. Dynamic’s recent growth can be attributed to this API initiative, combined with repeat sales in the North America and including new sales in foreign markets; non-North American customers now account for 15 percent of sales (Table 5.1).

Table 3.1  Total Sales by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Sales (%)</th>
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<tbody>
<tr>
<td>North America</td>
<td>85</td>
</tr>
<tr>
<td>Caribbean</td>
<td>10</td>
</tr>
<tr>
<td>Middle East</td>
<td>3</td>
</tr>
<tr>
<td>UK</td>
<td>1</td>
</tr>
<tr>
<td>Other Europe</td>
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</tbody>
</table>

Dynamic’s 2014 Newfoundland and Labrador payroll was in excess of $2.2 million. The Burin Peninsula operation (which currently includes activity in both Grand Bank and Fortune) employed 75 individuals full-time and another five are available for call-in during peak production. The company supports local business where possible, including local purchases of: wooden crates; truck, taxi and bus transportation; restaurant meals; and, hotel and B&B accommodations.
C-CORE

A number of other companies are working directly for the industry developing and delivering the results of R&D activity. For example, C-CORE, which was founded in 1975 under a Devonian Foundation grant to address challenges facing oil and gas development offshore Newfoundland and Labrador and other ice-prone regions, and incorporated as a federal non-profit in 1992, has become a major international player in the fields of remote sensing, ice engineering and geotechnical engineering. Incorporated as a federal not-for-profit corporation in 1991, C-CORE has become a major international player in the fields of remote sensing, ice engineering and geotechnical engineering and leads the world in understanding and mitigating ice risk.

During 2011-2014, C-CORE undertook more than 400 R&D projects, with an average $13.5 million in expenditures annually, as single client or multi-participant joint industry projects. Of these projects, some 40 percent were directly concerned with the Newfoundland and Labrador offshore.

Sample projects included:

- **CARD:** Established in 2011, CARD conducts medium/long-term R&D addressing barriers to the development of hydrocarbon resources in ice and iceberg prone regions. In 2012, it developed an Arctic Development Roadmap to identify and prioritize key Arctic R&D issues. The Roadmap informs CARD’s five-year research plan, which focuses on programs in the areas of ice mechanics and loading, ice management and station-keeping in ice, where investigation can significantly improve safety, environmental protection and cost-effectiveness in Arctic operations.

- **Iceberg Profiling:** In 2012, in collaboration with Fugro and Pro-Dive, C-CORE carried out a 3D iceberg profiling project funded by HMDC. C-CORE was responsible for software development, data collection and production of the above-water portion of the iceberg profile. The program established 28 complete iceberg profiles and greatly improved the quality of iceberg shape data. These data reduce uncertainty in iceberg impact load estimates, enhance key iceberg simulation models, and identify areas where future test data would be most beneficial. Reducing such uncertainties is very important to demonstrating the viability of new activity offshore of Newfoundland and Labrador, and will develop local industry skills to provide expertise worldwide.
• **Pipe-Soil Interaction Analysis for High Temperature Pipeline:** In 2013 C-CORE undertook geotechnical research on the properties of pipeline trench backfill material to enable more accurate predictions of pipe restraint and movement during thermal cycles. The program included field testing in northern Alberta, using specialized equipment developed by C-CORE to measure the stiffness and strength of backfill materials. Advanced numerical models were then used to predict pipeline movement and develop appropriate mitigation strategies. The project contributes to increased safety and performance of northern pipelines and builds Newfoundland and Labrador expertise to support onshore oil and gas development worldwide.

• **Petroleum Research Enhanced Satellite Monitoring Program:** From 2011 to 2013, C-CORE led a project to enhance capabilities for monitoring sea ice and icebergs using satellite radar. Although such monitoring has been used extensively to map ice conditions, it has seen limited use supporting oil industry activities offshore Newfoundland and Labrador. Based on the results of the research and feedback from industry and airborne ice monitoring contractor Provincial Aerospace, C-CORE recommended services that could provide additional valuable information in support of oil industry operations in ice-prone regions.

C-CORE is committed to maintaining and expanding Newfoundland and Labrador’s knowledge base for offshore engineering, particularly ice and geotechnical engineering aspects. This knowledge base includes a unique understanding of Atlantic Canada and a growing understanding of engineering considerations for other harsh cold environments, including the Barents, Beaufort, Caspian, Chukchi and Kara seas.

C-CORE’s mandate includes helping develop young innovators and future Arctic experts. During the study period, it provided annual support for six post-doctoral fellows and 28 graduate students to conduct research on a range of offshore engineering problems, particularly related to ice and icebergs. Over the same period, C-CORE also employed 27 work term and other undergraduate students, investing $1 million in salaries as well as extensive supervision time, laboratory access, and office space, equipment and other support in their career development.

As of 2014, C-CORE had an annual turnover of approximately $13 million, of which oil industry work accounted for 50-60 percent. The company employed 80 people in St. John’s and also had offices in Halifax and Ottawa. The total payroll in Newfoundland and Labrador was approximately $7 million.
The aviation sector is also important to, and a beneficiary of, the oil industry. PAL Aerospace Ltd. started life in 1972 as a St. John’s flying school with less than 10 employees but, primarily thanks to opportunities presented by the oil industry, it has developed into a global leader in aerospace and defence. It now provides highly tailored airborne and maritime surveillance solutions, including custom aircraft design and modification, mission system design and integration, and mission operations, training and support. It has more than 900 employees, approximately 750 of them in Newfoundland and Labrador, and has domestic operating bases in St. John’s, Goose Bay, Halifax, Montreal and Comox, British Columbia. It also has an engineering base in Mississauga, Ontario, and international operating bases in Barbados, Trinidad and Tobago, Netherlands Antilles, and the United Arab Emirates (UAE). PAL has stations at 19 airports across Canada as the parent company to Provincial Airlines, the largest regional airline in Eastern Canada.

The company’s involvements with the oil industry started with ice surveillance flights in the early 1980s, working for such companies as Mobil Oil and Husky Bow Valley. The requirement for this service grew as the industry’s activity increased and in the wake of the Ocean Ranger disaster, which resulted in greater safety-related requirements, including in the area of ice response. This provided a challenge to which PAL responded by adapting military anti-submarine technology to ice surveillance in a harsh environment. This also saw PAL moving away from simple ice data collection to ice management and coordinating appropriate responses.

With the decline in oil industry exploration activity in the late 1980s, PAL used its oil-related expertise to diversify into fisheries monitoring. This increased business stability and allowed the company to develop Provincial Airlines. PAL subsequently further extended its operations into products and services related to sovereignty protection, search and rescue, maritime security, environmental management, pollution detection and monitoring, drug interdiction and smuggling, customs and immigration patrol, disaster relief and general law enforcement.

This has included, for example, a 2009 $370-million contract with the UAE for the design, modification, and integration of two Dash-8 Q300 aircraft as well as training and integrated logistics support. A feature of the UAE program is the incorporation of design innovations that PAL developed over its 25-year history modifying and operating maritime patrol aircraft. The base PAL has established in the UAE is viewed as strategic for capturing work in that area of the world, supporting both the UAE base and the company’s Canadian operations.
The company continues to explore the use of new technologies and innovations. This includes moving forward with commercial applications of military drone technology, and investigating the challenges posed by distant deep-water activity, as in the case of Statoil’s Bay du Nord find in the Flemish Pass, which is approximately 550 kilometers offshore. PAL is also taking on larger and larger projects, as exemplified by its partnership with Airbus Defence and Space of Toulouse, France, in bidding the federal government’s Fixed-Wing Search and Rescue aircraft requirement.

Given this diversification, the oil industry is now directly or indirectly responsible for only approximately 15 percent of PAL’s aerospace and defence work. This includes work in Newfoundland and Labrador, across Canada and internationally. The last has included work in Greenland for Cairn Energy, Husky Energy and Shell.

**Examples of PAL Industry Clients:**
- AMOCO Canada
- British Petroleum
- Canterra Energy
- Chevron Canada
- ExxonMobil
- Geco-Prakla
- HMDC
- Husky Energy
- Jean d’Arc Basin Operations
- Marathon Canada
- Norsk Hydro
- Petro-Canada
- PGS Exploration A/S
- Schlumberger Canada
- Sedco-Forex Canada
- Terra Nova Alliance
- Texaco Canada Inc.
- Total Eastcan

**Examples of PAL Military and Government Clients:**
- AMOCO Canada
- British Petroleum
- Canterra Energy
- Chevron Canada
- ExxonMobil
- Geco-Prakla
- HMDC
- Husky Energy
- Jean d’Arc Basin Operations
- Marathon Canada
- Norsk Hydro
- Petro-Canada
- PGS Exploration A/S
- Schlumberger Canada
- Sedco-Forex Canada
- Terra Nova Alliance
- Texaco Canada Inc.
- Total Eastcan
VMT is another, more recent, Newfoundland and Labrador-based R&D company, a simulation specialist that grew out of the Marine Institute, Memorial University and Institute of Ocean Technology. It was founded in 2004 as a result of offshore oil industry interest, reflected in funding from PRAC (now Petroleum Research), in developing a lifeboat simulator. It is now engaged in lifeboat (SurvivalQuest), fast response craft (MissionQuest) and electronic navigation (NetSim) simulation for the oil, defence and commercial shipping industries. This includes the development and sales of hardware, software and teaching curriculum. During the study period, VMT’s ongoing R&D included the successful completion of two Petroleum Research Joint Industry Projects (JIPs), and it has been awarded continued work for JIPs to be executed in 2014-2016.

VMT’s simulators have been recognized by the International Maritime Organization and approved for use by the USGC in Proficiency and Survival Craft Training. Since 2011, VMT has deployed them in eight countries, including lifeboat simulators sold to oil and gas training institutes and companies operating in the North Sea and the Gulf of Mexico, and autonomous simulators deployed on three offshore platforms, including two on the Grand Banks of Newfoundland.

In addition to servicing companies in the oil industry, VMT continues to expand its military simulations. VMT works directly with original equipment manufacturers to deliver simulation solutions for military contracts executed in Canada, the United Kingdom and Germany.
The wide range of other oil industry services available locally include those provided by PF Collins, a longstanding family business based in St. John’s. Newfoundland was still a colony of Great Britain when PF Collins was appointed Customs Broker for Newfoundland in 1921. International transport to and from Newfoundland was still largely marine at that time, with St. John’s the key port of entry, and PF Collins participated in the development of Newfoundland’s early industrial diversification and helped arrange the movement of imported goods to points around the island. After Confederation with Canada in 1949, Newfoundland’s trading patterns and transportation systems began to change significantly, providing new opportunities. The company participated in such early industrial developments as the pulp and paper mills, the U.S. military bases, refineries at Holyrood and Come-By-Chance, and the Churchill Falls Hydro development.

In the 1970s, Bernard J. Collins joined the family business and took responsibility for developing its involvement in offshore petroleum exploration activities. During the 1970s, working with operators and government legislators, the company initiated many operational procedures to accommodate the then “customs-free zone” on the Continental Shelf. As the company continued to grow, it expanded services and capabilities and its international network of agents and affiliates. At the same time, the company initiated a program to incorporate the latest advances in technology and automation into its operations.

PF Collins now provides custom brokerage, freight services, warehouse and distribution services, project logistics, project administration, marine agency services, compliance consulting services and immigration consulting, with the last seeing rapid recent growth. In the last decade the company has invested approximately $10 million in land, offices, warehouses and equipment to support its expanding operations. As of the end of the study period, PF Collins has annual revenues of approximately $14 million, and employed about 100 people in Newfoundland and Labrador, with a total payroll of approximately $7 million. The company has expanded to Nova Scotia and Alberta, where it has nine and three employees respectively. Company management is proud of the fact that more than half of its employees are women, including many holding senior positions.
Atlantic Offshore Medical Services (AOMS) was founded in 1978 and was successful in capturing work on the Hibernia project. The company now offers a range of harsh environment occupational health and emergency medical services, both onshore and offshore. They include audits of occupational health and safety practices, pre-employment examinations, health surveillance programs, periodic medical examinations, independent medical examinations, disability management programs, health promotion programs, workplace drug testing, occupational therapy, vaccinations and immunizations. AOMS also provides response teams for medical emergencies at remote sites, and it has extensive experience in setting up medical services for offshore drilling rigs, including the design and establishment of sick bays and the provision of medical staff.

The company has provided its services to all the oil companies, and on all the offshore rigs and platforms, operating in the Newfoundland and Labrador offshore. It also provides medical services at the Hebron platform construction site at Bull Arm, and to the North Atlantic Refining Limited refinery in Come–by–Chance, Newfoundland. AOMS also has a Halifax-based Nova Scotia affiliate, Atlantic Offshore Medical (NS) Ltd., which has supported ExxonMobil and Imperial Oil on the Sable gas project and Subsea7 on the Deep Panuke gas project. Other AOMS offshore oil industry clients include Atlantic Towing, DOF Subsea, Secunda Canada and Technip. Drawing on its Newfoundland and Labrador-developed expertise, AOMS has also provided medical support in the form of camp clinics for the Sunrise (Husky Energy) and Peace River (Shell) oil sands projects in Alberta.

Overall, the oil industry played ‘a huge role’ in the growth of the company, and it has used its expertise to expand into other sectors, working for such organizations as workers compensation commissions in both Newfoundland and Labrador and Nova Scotia, and for the Cities of St. John’s and Mount Pearl. However, the oil industry is still responsible for about half of its work and 60 percent of all company revenues. Over the study period, AOMS had between 75 and 105 employees. Of these, 65 were located in Newfoundland and Labrador, and many of those in other locations were Newfoundlanders and Labradorians.
EAST COAST CATERING

East Coast Catering (ECC) was established in St. John’s in 1984, largely on the basis of perceived opportunities related to offshore oil exploration activity. As of 2014, the company had operations in seven Canadian provinces and in Ireland, and it is the dominant workforce catering service provider to the offshore oil industry in Atlantic Canada, supporting three of the region’s four producing projects as well as many of the drilling rigs operating in the region. ECC’s oil industry clients include or have included ExxonMobil, Suncor, Husky Energy, Canship Ugland, Transocean, GlobalSantaFe, Petrodrill, Sedco and Rigco. It has also provided camp facilities for drilling rig refit work at the Bull Arm construction site.

The company has long recognized that the oil industry is very demanding, for example in the areas of safety and training; ECC estimates that it spends approximately $5,000 per employee per year on the latter. These standards do not stand still, as exemplified by the recent need to ship food in refrigerated containers. However, the adoption of such standards for the oil industry has been beneficial in bidding work in both that industry and historically less demanding sectors. This has helped the company to expand into other jurisdictions and to get work on mining, hydro and other projects. In the former case, ECC operates four camps associated with onshore oil activity in Alberta and British Columbia.

In an early example of work in other industries, ECC provided accommodations, catering and housekeeping services for the Hope Brook gold mine in southwestern Newfoundland from 1992 to 1997. The company has subsequently provided similar services for the construction and/or operation of the Voisey’s Bay nickel mine, the Long Harbour minerals processing project and a range of mining developments in western Labrador, as well as mining projects in the Ontario, Manitoba, British Columbia and Northwest Territories. ECC’s hydro work has included involvement in the Granite Lake, Gull Island and Star Lake projects in Newfoundland and Labrador. ECC also provided workforce accommodations for the Confederation Bridge construction project in PEI, and East Coast (Ireland) Limited has operated a centre, camps and apartments for asylum seekers for the Irish Department of Justice since 2002. ECC has an annual turnover of approximately $100 million and employs a total of almost 600 people, including approximately 220 in Newfoundland and Labrador.
A number of much smaller companies provide specialist services to the industry. For example, Strategic Concepts is a highly-specialized company that was originally established in 1990 to assist small businesses with business planning and marketing. However, the company’s principals soon recognized that there were opportunities associated with forecasting and demonstrating the economic impacts of large resource development projects for their proponents and interested stakeholders. Strategic Concepts has subsequently expanded its offerings to include the following services for such projects: cash flow and economic impacts analysis; the provision of strategic advice with respect to advancing projects; the development and provision of software to monitor project benefits and commitments, and contacts management; specialist studies, for example of project labour requirements and potential supply; and the negotiation and implementation of Impact and Benefits Agreements. Local oil industry clients of Strategic Concepts have included Hibernia, Hebron, White Rose and Petroleum Research, and local success has led to its benefits monitoring software being adopted for projects elsewhere in Canada, including the Kearl oil sands projects for ExxonMobil and the Surmont oil sands project for ConocoPhillips. However, non-oil projects, such as Vale’s Voisey’s Bay Mine and Mill and Nalcor’s Muskrat Falls hydro development, both in Labrador, and Emera’s Maritime Link power transmission project, have become increasingly important. As a result, by the end of the study period oil industry work was only responsible for 20 to 25 percent of the company’s turnover, but 40 percent of its software business.
In another example of a small specialist company working in the oil and other industries, Canning & Pitt was established in 1991, largely to support the Hibernia development project in its relations with fisheries interests. Since that time it has worked for such oil companies as Husky Energy, Suncor, ConocoPhillips, ExxonMobil and Newfoundland Transshipment Limited, and such seismic companies as Schlumberger Petro Technical Services (PTS)/WesternGeco and PGS Marine Geophysical, as well as for the Canadian Association of Petroleum Producers and the C-NLOPB, developing and supporting operational management plans and compensation programs, providing consultation and single-point-of-contact services, and assisting in the development of environmental assessments. While the oil industry accounts for approximately 90 percent of the company’s business, it has diversified into work on subsea transmission line and minerals processing projects, the latter including work on Vale’s Long Harbour project. Canning & Pitt only has one full-time employee, but it uses a wide range of local sub-contractors such as Geo-Matics Services Ltd.
The Murray Premises Hotel in downtown St. John’s opened in 2001 with 28 rooms, but it has subsequently expanded to its current 69 rooms. It immediately attracted oil industry clients, although it is only more recently that it has targeted the industry, through its membership of NOIA and agreements with such companies as Suncor, Husky Energy, ExxonMobil and Arup. By the end of 2013, the industry was directly responsible for approximately half of its business, an increase from an estimated 20 percent in 2010. It is likely that many other guests were in St. John’s as a result of oil industry events and activity. The operators of the hotel believe it has benefitted from the fact that St. John’s became ‘a booming corporate town’ as a result of resource industry activity and revenues. The hotel currently provides employment to approximately 20 people.
The Hungry Heart Café opened its doors to the public in April 2008 and continues to be an increasingly popular food service social enterprise in St. John’s. As an employment training program of Stella’s Circle, the Café provides workplace-based training and experience for individuals who have experienced interrupted career paths due to such personal barriers as mental health issues, addictions, limited education and poverty. As of the end of the study period, the Café employed twelve staff, four of whom were former Stella’s Circle program participants. All training opportunities are created through revenues generated by the Café, off-site catering, contract meals, private bookings and theme dinners offered to the growing customer base. The support of the oil industry has been key in the Café’s capacity to increase the employability skills and food service knowledge of its participants through Café activities. From 2011 until 2014, more than 45 individuals availed of Café training and supports; over the same period catering sales increased by about 40 percent and retail Café sales by 25 percent.

The petroleum industry’s support of this social enterprise has been demonstrated through opportunities to provide catering for meetings and special events for such customers as ExxonMobil, Chevron, Hebron, Husky Energy, Suncor, Statoil, Schlumberger, HMDC and Transocean. In addition to the support of the business activities of Café, Chevron Canada Limited renewed its commitment to its programs and services in 2014, announcing a new multi-year partnership. Husky Energy also made a major contribution to Stella’s Circle in support of the new Cabot Street building where the Employment Services program is based.
As was noted in the introduction, the oil industry supply and service sector is not just comprised of companies engaged in industry-specific activity. For example, Greg Locke was originally a freelance photographer and reporter, working for the Globe and Mail, Maclean’s and other newspapers and magazines. He increasingly became involved in corporate photography, including for such companies as Ford, Toyota and Imperial Oil, while based in Ottawa. Greg moved back to Newfoundland in 1988 and in the 1990s he found himself involved in local photography for the oil industry, including taking pictures of Hibernia construction site preparation for HMDC. This led to work for Chevron, Petro-Canada, GJ Cahill, Texas Instruments, Schlumberger, Baker Hughes, and other companies engaged in oil industry activity. Greg’s work has included what he calls ‘engineering telemedicine’, taking photographs of damaged offshore equipment for evaluation by experts onshore.

Working in such a demanding industry also drove Greg’s professional development, further expanding his business. For example, Greg has had to acquire suitable equipment for working offshore (where, for example, flash cannot be used because it might set off sensors) and to maintain current safety training certification for working offshore. Having these has helped Greg get work at other types of industrial sites, within and outside the Province, including when undertaking work for such companies as Caterpillar, Teck-Cominco, Sandwell Engineering, and Schneider Electric. However, the importance of the oil industry to Greg Locke has been quite variable, representing between 10 and 60 percent of his total business income. This figure has fallen of late, given the difficulties that rigorous and onerous HSE, insurance, workers compensation and insurance requirements pose for small companies and independent operators.
CONCLUSION

The 2011-2014 period saw a continuation of the pattern of growth of offshore oil industry expenditures that Newfoundland and Labrador has experienced since 1990. Fueled in particular by the Hebron construction project, annual expenditures in the province reached a record $6.3 billion in 2014. This pattern of growth was reflected in the industry’s contribution to a range of economic indicators, such as the employment rate, household incomes and retail sales, all of which reached record levels in 2014. The high levels of industry spending also resulted in new infrastructure, education, training, R&D and other initiatives.

Mid-2014 saw the start of steep declines in oil prices, with increasingly negative effects on industry spending and government revenues. However, work continues on developing the Hebron field, with planned first oil in 2017 and a production life of at least 30 years. And while local companies have been negatively affected by the fall in oil industry expenditures, the effects on many companies have been cushioned by the substantial supply and service community focus on supporting ongoing long-term production, and by success in using oil industry-developed expertise to diversify into other markets and industries. Market pressures have also driven greater efficiencies, leading to increased competitiveness.

Continued exploration success, exemplified by Statoil’s Bay du Nord discovery and record spending commitments in bidding for new exploration rights, also make clear that the offshore oil industry will continue to be a major contributor to the economy of, and economic development in, Newfoundland and Labrador for decades to come.