Exploring Issues Related to Local Benefit Capture in Atlantic Canada's Oil and Gas Industry

Prepared by

Wade Locke and Strategic Concepts, Inc

This policy research is sponsored by the Atlantic Canada Opportunity Agency (ACOA) under the Atlantic Policy Research Initiative, which provides a vehicle for the analysis of key socio-economic policy issues in Atlantic Canada. The views expressed in this study do not necessarily reflect the views of ACOA or of the Government of Canada.

Final Report

Exploring Issues Related to Local Benefit Capture in Atlantic Canada's Oil and Gas Industry[1]

A Discussion Paper Prepared for

Petroleum Research Atlantic Canada

Prepared by

Wade Locke and Strategic Concepts, Inc

April 18, 2004

[1] The authors acknowledge having received helpful comments from the steering committee. Any errors or omissions that remain are the sole responsibility of the authors. As well, any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of Petroleum Research Atlantic Canada or members of the Steering Committee and the organizations they represent.

Table of Contents

List of Tables

Executive Summary

This study, prepared by Dr. Wade Locke and Strategic Concepts, Inc. for Petroleum Research Atlantic Canada (PRAC), is forward-looking and focused on what can be done in the future to optimize industrial opportunities for local firms. The purpose of this study is not to criticize the capture rates achieved by the Atlantic Canadian industry to date; rather, the study investigates how to build on the experiences from past projects and to enhance the economic benefits derived by the region as the oil and gas industry evolves and matures. In addition, based upon available secondary sources of information, this analysis provides an assessment of how other offshore oil and gas regions have worked to capture benefits locally and, where possible, it highlights lessons that could be learned from these other jurisdictions. As well, this study explains the issues pertaining to the methodology surrounding the calculation of capture rates and helps define realistic expectations of capture rates within Newfoundland and Labrador and Nova Scotia and how they are constrained by the industrial structure of the province, etc. In addition, this study reports on project-specific capture rates for Atlantic Canadian projects and evaluates the approach used currently to calculate capture rates within Atlantic Canada and provides a brief analysis of the strengths and weaknesses of the current methodology and other alternatives that have been suggested. Furthermore, this study provides insight into the fact that oil and gas benefit capture needs to be considered in the context of local capacity and will help provide the general public and various levels of government with an appreciation that what is reasonable for one project may be totally different for another because of technology, location or other factors.

There were two major objectives of the study. The first was to provide a quantitative and qualitative analysis of the benefit capture rates associated with oil and gas development in Newfoundland and Labrador and Nova Scotia. These capture rates were to be assessed in light of the technology used, the state of evolution of the offshore industry in the region and the capability and capacity of the local supply community. The second was to provide a comparison of the experiences in Atlantic Canada with that observed in selected international jurisdictions. In support of these two primary objectives, the following goals were also identified:

- to review and analyze the salient factors with respect to local content of the offshore oil and gas industry in a number of other jurisdictions;
- to undertake a review of the literature to determine and report on local capture rates experienced in Atlantic Canada's oil and gas industry;
- to evaluate the Canadian General Standards Board (CGSB) methodology currently utilized by the Offshore Boards for calculating capture rates in Atlantic Canada; and
- to assess the Cash Flow/Head Count alternative for calculating and monitoring local benefit capture rates.

There are numerous benefits that Atlantic Canada has received through the exploitation of its offshore oil and gas resources. These have included employment and income effects, additional government revenue, education and training, technology transfer and research and development. The local benefits captured in Atlantic Canada are presented in Tables ES1 and ES2:

Table ES1: Local Content for Offshore Oil – Newfoundland and Labrador

	Local Employment Capture		Local Expenditure Capture	
	Person-Years	*Percent of Total*	*Dollars (M)*	*Percent of Total*
Hibernia				
Development Phase	20,800	66%	2,700	47%
Annual Operations	675	85%	325	54%[2]
White Rose				
Development Phase	2,930	57%	770	33%[3]
Annual Operations	350	84%		
Terra Nova				
Development Phase	4,023	62%	791	27%
Annual Operations	765	82%	285	48%[4]
Combined				
Development Phase	27,753	64%	4,261	39%
Annual Operations	1,790	84%	610[5]	51%

Table ES2: Local Content for Offshore Oil and Gas – Nova Scotia

	Local Employment Capture		Local Expenditure Capture	
	Person-Years	*Percent of Total*	*Dollars (M)*	*Percent of Total*
Deep Panuke				
Total (forecast)			627	37%[6]
Sable Offshore Energy Project				
Total Project to Date	5,985	57%	1,300	36.5%[7]
Cohasset				
Total Project to Date	3,727	78%	552	38%[8]
Combined				
Total	9,712	64%	2,479	37%

[2] The Newfoundland and Labrador content estimate for the development phase and the employment estimate for the operations phase of the Hibernia project are taken from CNOPB website. The local content for the operating phase expenditure estimates were taken from Pricewaterhouse Coopers (2001, p. 9) and were based on the operating expenditure for Hibernia for 1999-2000, which was in the range of $300 - $350 million.

[3] The employment and expenditure estimates for the White Rose project were derived from a letter written to the federal Minister of Natural Resources and the provincial Minister of Mines and Energy by James Blair that was appended to the CNOPB (2001), Decision 2001.01, Application for Approval White Rose Canada-Newfoundland Benefits Plan and White Rose Development Plan.

[4] The Terra Nova content numbers were provided by Donna Stuckless of Petro Canada. The development phase estimates correspond to cumulative expenditures and employment to December 31, 2001 and the operations estimate for employment is based on the average head count for 2002 and 2003 and the expenditures are based on operating expenditures for 2002 and up to September 2003. These numbers different from those available from the CNOPB website and represent an update on those estimates.

[5] The combined expenditures include only Hibernia and Terra Nova.

[6] LeBlanc (2003) reports that Nova Scotia expenditure on the Deep Panuke project is expected to reach $627million and will represent a 37% capture rate.

[7] The content estimates for the Sable project are for combined operating and development expenditure and employment. They are measured using cumulative employment and expenditure to September 30, 2003 and were provided by the Nova Scotia Department of Energy. The CNSOPB website: Report on Regulatory Regime and Employment and Industrial Benefits notes that Nova Scotia expenditure capture rate is expected to increase to 42% in the next phase of the project, by 2009 and to be in excess of 50% over the life of the project.

[8] The Cohasset estimates were taken from CNSOPB website: Report on Regulatory Regime and Employment and Industrial Benefits.

The Offshore Boards have adopted the CGSB approach to measuring benefits associated with project expenditures. Based on Consulting and Audit Canada's (CAC) periodic audits, the Offshore Boards report local benefit capture as a percentage of the expenditures incurred to date for each of the offshore oil and gas projects in Atlantic Canada. For the most part this approach is sound and appropriate. It provides a reasonable estimate of employment and net expenditure, i.e., net of most imports, occurring within each province.

As well, an evaluation of the Cash Flow/Head Count proposal to replace the Offshore Boards' current approach was undertaken and from that assessment, it is clear that this alternative is subject to several problems of its own and it does not represent an improvement over the CGSB frameworks currently being utilized by the Offshore Boards. However, there are some modifications to how the information collected and reported by the Offshore Boards can be improved. First, the local capture rate needs to be specified in terms of the amount of the expenditure that the province has the current technological capacity to provide or that can be developed within a reasonable period. Secondly, the capture rate should be decomposed into the percent captured by categories of expenditures associated with offshore oil and gas activities – e.g., Nova Scotia captures x percent of seismic expenditures, y percent of expenditure on pipes, etc. Thirdly, the information collected by the Offshore Boards ought to be subjected to additional input-output analysis to obtain a more precise picture of the economic impacts associated with the expenditures that occur within the region. Fourthly, the Offshore Boards should consider switching to the web-based inventory method already used in the mining industry for receiving information from the operators and their subcontractors and suppliers with respect to local expenditure impacts.

The approach taken by the various jurisdictions to developing a domestic offshore oil and gas supply industry have been as varied as the resources upon which each region's industry has been built. These approaches range from the cautious, interventionist approach taken by the Norwegians, which relied heavily on state intervention and ownership through state-owned oil companies to the laissez-faire Australian approach in which the government specifically states in its regulations that there is no local content policy in place. The differences in approaches stem from a number of factors, including: the relative size of the resource base, the philosophical underpinnings of the governments in question, the time period in which the industry began; the structure of the domestic economy; and various technological factors.

The recommendation that flows out of this report is:

The Offshore Boards should modify their approach to collecting, analyzing and reporting local capture rates for offshore oil and gas activities by:

- **reporting the benefits relative to technological capacity of the region;[9]**

[9] If there is no possibility of supplying certain types of goods and services in Atlantic Canada, then these types of expenditures should be excluded. However, one would have to be careful not to exclude items that are currently not supplied because local suppliers are currently uncompetitive in terms of price, quality and

- **implementing a more disaggregated reporting structure;**[10]
- **undertaking additional input-output analysis of the data;**[11] **and**
- **utilizing a web-base invoice method for receiving expenditure information from offshore operators and their subcontractors.**[12]

delivery, but might become so with sufficient investment and an opportunity to gain experience and expertise in the industry.

[10] Rather that reporting that the Hibernia had 47% content for the development phase, for example, it would be more useful to report that the local content on drilling services is x percent, for example.

[11] Input-output analysis will remove any residual import content from the expenditures.

[12] This web-base approach is already employed in the mining industry and should help allay some of the concerns over the reporting structure that is in place currently.

1. Introduction

This report is in response to Petroleum Research Atlantic Canada's (PRAC) open call for research proposals. Based on feedback from PRAC's Policy Proposal Evaluation Committee, the original proposal was amended accordingly and PRAC agreed to provide funding support representing 30% of the research project costs with the balance being provided by the Atlantic Canada Opportunities Agency on behalf of Natural Resources Canada, Industry Canada and themselves. As a result of issues related to data availability further clarifications and changes were made to the purpose and scope of the project, and are reflected in the study objectives described below.

1.1 Background

Since the mid 1960's, development of Atlantic Canada's oil and gas resources has spawned an integrated industry that provides a range of goods and services in support of both upstream (e.g., exploration, development and production) and downstream (e.g., refining, transportation, etc.) activities. The relative potential of East Coast offshore oil and gas reserves and the potential for high production rates are two factors expected to provide an ongoing source of new investment for many years. This positive investment climate is enhanced by the critical mass of infrastructure that was created to develop the Hibernia Project and Sable Offshore Energy Project in Newfoundland and Labrador and Nova Scotia, respectively. The challenge now facing governments is to put in place policies that encourage local suppliers to take advantage of the opportunities that currently exist and that will become available as the industry continues to develop. The Canada-Newfoundland Offshore Petroleum Board (CNOPB) estimates that, in 2002 alone, in excess of $1.3 billion was spent in the Newfoundland offshore area on Hibernia, Terra Nova, and other exploration and development activities, bringing the cumulative total to $16 billion since 1966.

While these aggregate numbers are impressive, the level of Atlantic Canada content in the region's oil and gas projects has raised concerns amongst stakeholders within the region. During the development phase of the Hibernia project, for example, 47% of total project expenditures were sourced from Newfoundland and Labrador, which had has risen to 54% during ongoing operations. In comparison, to the end of December 2001 the local expenditures for the development phase of the Terra Nova projects was 27% and the local content for the operations expenditures incurred during 2002 and 2003 had increased to 48%. The Nova Scotia capture rate for the Sable project on the combined development and operations expenditure to September 30, 2003 was 36.5%. Whether the capture rates achieved in Atlantic Canada are considered high or low requires a consideration of technology, maturity of the industry, phase of development and industrial structure and capabilities of the local economy. However, even taking these issues into account, it is necessary to acknowledge that the level of industrial benefits that can reasonably be captured by an area is a concern that must be addressed to ensure that economic opportunities available to the region are optimized. Moreover, it is important for government and other key stakeholders to analyze and review the level of benefits captured to determine if additional policy measures are needed to further enhance the benefits from offshore oil and gas activity.

What is needed, therefore, is a comprehensive study to review the situation, both in Atlantic Canada and in other jurisdictions. The findings from this study could contribute to the development of a coherent strategy that will help optimize industrial benefits captured by local businesses, maintain the region's competitiveness as a potential investment site for internationally mobile capital, and respect the need for operators to minimize costs. The need for an analysis of local capture rates has been advocated by the region's supply and service associations in the report, "Harnessing the Potential: Atlantic Canada's Oil and Gas Industry", January 1999. That joint industry-government study provided an historic overview and comprehensive assessment of the region's oil and gas sector, and supporting research and development (R&D) facilities. More than 60 categories of goods and services were evaluated to provide an overview of the industry's requirements within the context of Atlantic Canada-based capabilities. This comparative analysis provided a "road map" of the region's upstream and downstream capabilities, labour force, training institutions, and R&D facilities.

Given this background, the ever-present desire to optimize local benefit capture from resource projects and the significant amount of misunderstanding and ambiguity surrounding the issue of capture rates, the time was right to undertake a comprehensive assessment of how other offshore oil and gas regions worked to capture benefits locally. As well, this study will help explain the issues pertaining to the methodology surrounding the calculation of capture rates and help define realistic expectations of capture rates within Newfoundland and Labrador and Nova Scotia and how they are constrained by the industrial structure of the province, etc.

1.2 Study Objectives

There are two major objectives of the study. The first is to provide a quantitative and qualitative analysis of the benefit capture rates associated with oil and gas development in Newfoundland and Labrador and Nova Scotia. These capture rates are to be assessed in light of the technology used, the state of evolution of the offshore industry in the region and the capability and capacity of the local supply community. The second is to provide a comparison of the experiences in Atlantic Canada with that observed in selected international jurisdictions. Based upon available secondary sources of information, this was to include an assessment of how other offshore oil and gas regions have worked to capture benefits locally and, where possible, it was to highlight lessons that could be learned from these other jurisdictions.

In support of these two primary objectives, the following goals were also identified:

- to review and analyze the salient factors with respect to local content of the offshore oil and gas industry in a number of other jurisdictions;
- to undertake a review of the literature to determine and report on local capture rates experienced in Atlantic Canada's oil and gas industry;
- to evaluate the Canadian General Standards Board (CGSB) methodology currently utilized by the Offshore Boards for calculating capture rates in Atlantic Canada; and
- to assess the Cash Flow/Head Count alternative for calculating and monitoring local benefit capture rates.

1.3 Study Scope and Limitations

It should be noted that the lessons learned from the study will be forward-looking and focused on what can be done in the future to optimize industrial opportunities for local firms. The purpose of this study is not to criticize the results achieved by Atlantic Canadian industry to date; rather, the study investigates how to build on the experiences from past projects and to enhance the economic benefits derived by the region as the oil and gas industry evolves and matures. Furthermore, this study provides insight into the fact that oil and gas benefit capture needs to be considered in the context of local capacity and will help provide the general public and various levels of government with an appreciation that what is reasonable for one project may be totally different for another because of technology, location or other factors.

This study, within the constraints of secondary data available publicly, reports on project-specific capture rates for Atlantic Canadian projects. As well, this study evaluates the approach used currently to calculate capture rates within Atlantic Canada and provides a brief analysis of the strengths and weaknesses of the current methodology. The analysis centers on what are reasonable capture rates for the area given the maturity of the industry, the phase of development and the mode of development. In this context, the capture rates that may be achievable within a particular area are, of course, conditioned by these characteristics. Hence, it was not appropriate to consider that a one-size-fits-all approach to capture rates would be appropriate for any given area. This assessment takes into account the industrial capacity of the region and its implication for potential capture rates. The explicit calculation of capture rates in jurisdictions outside of Nova Scotia and Newfoundland and Labrador, however, is not part of this proposal. Yet, to the extent that estimates were available from the literature and web-based searches, they are presented as part of this study.

This paper consists of 11 sections, which includes the Introduction. An overview of the global oil and gas industry is provided in the next section. Following this, in Section 2, is a discussion of the types of benefits that could be expected to be captured by local jurisdictions that are adjacent to oil and gas developments. Sections 4 and 5, respectively, provide a description of and an assessment of the practice currently employed by the Offshore Boards in monitoring and reporting local content from oil and gas developments in Atlantic Canada. This is followed in Sections 6 and 7 with a description and assessment of the Cash Flow/Head Count approach for monitoring and reporting local benefits in Atlantic Canada. As well, Section 8 introduces yet another way of monitoring and reporting local benefits for Atlantic Canada's offshore oil and gas industry. Section 9 presents estimates derived from secondary sources for the local content achieved by each of the projects operating in offshore Atlantic Canada. A description of what has happened in other jurisdictions is provided in Section 10 and Section 11 contains the conclusion and recommendation that flows out of the analysis.

2. Global Offshore Oil Industry Overview

To provide a backdrop to the report, it is helpful to gain an understanding of the global offshore oil and gas industry, including its history, size, structure and key players. An understanding of this helps put the current situation facing the Atlantic Canadian supply industry in perspective.

2.1. History[13]

While the first over-water oil drill was operated in 1896 off the coast of California, the real birthplace of the offshore oil and gas industry was the Gulf of Mexico. The first over-water project in the Gulf region occurred not in the ocean, but in Caddo Lake in northwestern Louisiana. This development took place in the 1910s and the technical challenges encountered and met helped spur the initial saltwater offshore oil and gas programs in the Gulf of Mexico. The initial exploration efforts took place in shallow coastal waters and in the marshy swamps that were a feature of coastal Louisiana during the 1920s and 30s. Because the search for oil and gas over water required a new technology, the local expertise developed by necessity in Louisiana and Texas. Additionally with the growth of the onshore oil and gas industry in Texas, it was natural that much of the required expertise was developed within the region.

The move to offshore waters began in 1938 with the drilling of a well one mile offshore Louisiana. Although it was drilled in only nine feet of water, it was the first step towards deep-water drilling in more distant waters. Gradual innovations continued until 1945 when Louisiana offered its first land sale offshore. In 1947, a well was drilled nine miles offshore, thus proving that the technology could work in offshore waters. This event is generally heralded as the beginning of the offshore oil and gas industry. During the next decade, technological innovations continued such that by 1954 over 200 structures were operating in the Gulf of Mexico.

2.2. Current Structure

Since that time, offshore oil and gas activity has increased tremendously. Today, offshore oil and gas production is a worldwide activity with oil and gas being produced in over 110 countries on over 14,000 platforms and in over 6,700 fields.[14] Worldwide, there are over 650 offshore drilling rigs available for contract work with current utilization rates over 80%.[15] The global offshore oil and gas industry has a production value of some $300 billion and annual expenditures between $80 to $120 billion, including both capital and operating expenditures.[16]

---

[13] Gramling, Robert: "Oil on the Edge: Offshore Development, Conflict, Gridlock", 1996.
[14] Infield.com.
[15] Rigzone.com
[16] Douglas-Westwood Ltd, "Global Markets for Marine Technologies", June 2003.

2.3. Industry Trends

As the industry has evolved, a number of broader trends are evident in the global offshore oil and gas industry. Some of these trends include the following:

- increased reliance on deepwater fields;
- increased use of subsea technology;
- increased emphasis on cost reduction;[17]
- increased use of floating production systems;
- a move to "new" offshore areas from traditional producing regions (e.g. from the North Sea to West Africa);
- a trend towards turnkey solutions in which operators are looking for contractors to design, build and install complete production systems for lump sums;[18]
- an overall skills shortage in the industry that is effecting ability to complete projects on time and within budget;[19]
- huge consolidations that took place between 1998 and 2000 in response to the low oil price environment and, as a result, companies were forced too revise drastically operational costs, core areas and their exploration and production strategies;[20]
- a flurry of mergers and acquisitions among the largest firms, creating such mega-energy companies as ExxonMobil, ChevronTexaco, BPAmoco and TotalFinaElf;[21] and
- supply companies are also undergoing consolidation and oil company-contractor relationships are increasingly becoming strategic partnerships. As a result, contractor companies cannot be wholly dissociated from the oil production sector.[22]

---

[17] Steven (1999), Cameron (1986, p.10), and Longwell (2002, p. 103) have all emphasize the role that cost reduction continues to play in the oil and gas sector.

[18] Steven (1999) notes that projects were changed to introduce incentives for subcontractors to share risk and reduce cost. In areas such as the North Sea this translated into industry-wide programs to investigate costs cutting such as "Cost Reduction Initiative for the New Era" (CRINE). In addition, the UK tradepartners government website (www.tradepartners.gov.uk/oilandgas/profile/index/worldmarkets.shtml) suggests that "In recent years the continued pressures on costs has encouraged sharing of responsibilities between oil companies and their major contractors, under initiatives such as LOGIC and PILOT in the UK." As well, in the context of Scotland, Brown et al. (2000, p. 27) argues that the recent trends towards concentration of the various supply chains in single integrated contractors seem to have worked to the detriment of indigenous [Scottish] suppliers.

[19] Douglas-Westwood Ltd. "Global Offshore Prospects", March 2003.

[20] International Labour Organization (2002, p.3) and Price Waterhouse (2003, p.1).

[21] International Labour Organization (2002, p.8).

2.4. Offshore Industry Stages

The complex tasks involved with finding and exploiting offshore oil reserves can be classified into four stages: exploration, development, production and decommissioning. Because of the distinct activities, expertise and technologies required for each of these stages, it is relevant to use this distinction when analyzing the offshore oil and gas supply industry. While theses phases are presented as distinct components, there is overlap between them, both in terms of the types of goods and services required and the activities undertaken within each stage. For example the initial engineering work involved with designing a production facility can be considered a function of exploration as it is undertaken during early stage appraisal activities and is based on the geological structure of the resources identified. In fact, the first three stages can be considered to be on a continuum with a gradual movement between phases as opposed to sharp divisions. Furthermore, some of the required inputs are similar throughout each phase. Helicopter services, for example, are required throughout the entire spectrum of activities, from early exploration to decommissioning.

2.4.a. Exploration

The exploration phase covers the activities involved with finding and delineating oil and gas reserves. Included in this phase are activities related to surveying, drilling and analysis/appraisal.

2.4.b. Development

The development phase involves activities related to designing, constructing and installing production facilities that will be used to extract the reserves identified in the exploration phase.

2.4.c. Operations

The operations phase involves those activities related to extracting the resources through the day-to-day operation of the facilities built during the development phase.

2.4.d. Decommissioning

The decommissioning phase involves activities relating to removing production facilities once the resource has been exhausted.

2.5. Worldwide Offshore Supply Industry

The offshore oil and gas supply and service industry includes many firms located throughout the world. Much of the industry is dominated by large, multi-national firms with operations located throughout the world. The US is the world's leading supplier of

[22] International Labour Organization (2002, p.12).

goods and services with many of the company's headquarters located in Texas and Louisiana.

The capital-intensive nature of the industry lends itself to large companies because of the huge investments required to explore for, delineate and develop the production facilities required. In the industry's early stages, drilling rigs were fixed platforms that could only be used at one location. The advent of the mobile drilling rigs during the 1950's and still in use today opened up the industry and began its spread worldwide. This mobility remains an overriding feature of the industry in that the equipment and people used in the industry can move between locations. This feature has led to a structure in which the key companies retain their headquarters in their home base and set up offices and/or joint ventures in parts of the world where they are competing for work. This mobility feature of the industry has meant that the development of a local industry has not necessarily been guaranteed in areas where significant exploration, development and production activities have taken place.

An example of the inability of local areas to attract all aspects of the offshore oil and gas supply industry is in the fabrication of the large structures required, which would include platforms, floating production vessels and other large modules. Because of the capital-intensive nature of large shipyards and other fabrication yards, it makes economic sense to use and reuse them for long periods of time. As an example, one of the first fabrication facilities built near Morgan City, Louisiana is still in operation today, supplying not only the Gulf of Mexico but also projects in other areas of the world.

A study undertaken by the University of Aberdeen in 1986[23], which looked at the characteristics of companies in the Aberdeen area, indicated that many of the over 1,000 oil-related companies in Aberdeen were affiliates of large international (mainly US-based) businesses.[24] The study also found that most of the locally-owned companies were concentrated in non-core oil and gas activities (e.g., insurance, catering), while the core oil and gas activities were predominantly undertaken by foreign affiliates.

This study was undertaken at a time when Aberdeen was considered to be the oil capital of Europe and when oil production in the UKCS was at its peak, 15 years after production began. The significance of this study is that it demonstrates that the barriers to entry for local firms in such a capital-intensive (and more recently, technologically-intensive) industry are significant, even with an aggressive local preference policy and a significant pool of producing facilities.

There are thousands of companies involved in the global offshore oil and gas supply and services industry. While there is no definitive analysis available as to the exact structure of the industry in terms of the location of key players and their relative size, a review of industry directories on the Internet provides an interesting picture. One such site

[23] Hallwood, Paul, " The Offshore Oil Supply Industry in Aberdeen: The Affiliates - Their Characteristics and Importance, University of Aberdeen, 1986.

[24] Brown et al. (2000, p. 19) also found that the Scottish oil and gas has been dominated by foreign-owned companies.

analyzed was the rigzone.com website which is dedicated to the broader oil and gas industry as oppose to the offshore industry. A summary of the over 6,000 companies listed in their directory indicates that two-thirds of the companies listed are in the United States or the United Kingdom. Table 4 below lists the total number of companies and proportion by location.

Table 1
Oil and Gas Industry Suppliers by Country

Country/Region	No. of Companies Listed	% of Total	Cumulative %
US	2,977	49.1%	49.1%
UK	1,038	17.1%	66.2%
Canada	772	12.7%	79.0%
Other Europe	149	2.5%	81.4%
Australia	146	2.4%	83.8%
France	124	2.0%	85.9%
Norway	108	1.8%	87.7%
Netherlands	96	1.6%	89.3%
Singapore	94	1.6%	90.8%
Other South America	61	1.0%	91.8%
China	54	0.9%	92.7%
Germany	45	0.7%	93.4%
Italy	40	0.7%	94.1%
Indonesia	38	0.6%	94.7%
South Africa	30	0.5%	95.2%
Other Asia	27	0.4%	95.7%
Venezuela	26	0.4%	96.1%
Russia	26	0.4%	96.5%
Other Central Asia	26	0.4%	97.0%
Brazil	23	0.4%	97.3%
Denmark	22	0.4%	97.7%
Mexico	21	0.3%	98.1%
Other Africa	21	0.3%	98.4%
Nigeria	18	0.3%	98.7%
Malaysia	18	0.3%	99.0%
Thailand	18	0.3%	99.3%
New Zealand	17	0.3%	99.6%
South Korea	13	0.2%	99.8%
Trinidad and Tobago	7	0.1%	99.9%
Other North America	6	0.1%	100.0%
Total	**6,061**		

Source: www.rigzone.com

While this list has limitations in that it contains companies involved in both the offshore and onshore oil and gas industry and it does not claim to include all companies involved

in the industry, it does, however, give a representative snapshot of the global oil and gas service and supply industry. As a final note, most of the Canadian companies are located in Western Canada and are generally focused on the onshore industry.

It should also be highlighted that many of these companies have offices in many locations throughout the world. This fact reflects the international nature of the industry and the importance of expertise in this very mobile industry.

Another difficulty in trying to identify and classify the industry is the definition of what constitutes an oil and gas supply or service company. Typically, there are three types of companies involved in the offshore oil and gas industry:

1) those that supply exclusively to offshore oil and gas industry (e.g., subsea flowlines)
2) those that supply other heavy industries, of which offshore oil and gas production is one (e.g., fire safety equipment)
3) those that supply to a wide range of industries, of which oil and gas is one (e.g., insurance)

3. What are the Benefits of the Offshore Oil and Gas Industry that are Captured Locally?

It is important to have a reasonable understanding of what constitutes a benefit that can be derived by a jurisdiction from exploiting its offshore oil and gas resources. Typically, the benefits attributed to the development and operations of oil and gas projects are:[25]

1. employment – sometimes this is decomposed into its direct, indirect and induced components;
2. incomes to local factors of production – again, this can be broken into direct, indirect and induced effects;
3. research and development benefits;
4. technology transfer benefits;
5. productivity or competitiveness benefits
6. education and training benefits;
7. provision of certain types of infrastructure;
8. industrial benefits, which are really subsumed under (1) and (2);
9. economy-wide or GDP benefits; and
10. reduced dependency benefits.

While all of these effects are important for evaluating the impacts of Atlantic Canada's oil and gas industry, the current approach to benefits monitoring in Atlantic Canada tends to focus on employment (normally direct employment) and industrial benefits. However, though not reported as part of the benefits captured by the region, there is also a focus on

[25] The World Bank Group (2001) reports these benefits and other types of benefits that would flow from a properly managed oil and gas development. As well, Shrimpton (2003) highlights the GDP, income and employment effects associated with oil and gas development in Newfoundland and Labrador. He also points to the additional infrastructure, business activity and government revenues that Newfoundland and Labrador has received.

the research and development activities and education and training, primarily because these items are explicitly mentioned in the Offshore Accords. In addition, the GDP impacts associated with oil and gas activities are identified as one of the major benefits associated with oil and gas developments in Atlantic Canada.

Since one of the economic indicators often cited as a benefit to either Newfoundland and Labrador or Nova Scotia is the increase in provincial GDP that has accompanied oil and gas development in Atlantic Canada, it is important to understand what GDP is and what it is not. GDP is simply a measure of the economic activity occurring within a particular geographic area, such as within the boundaries of a province, for a defined period of time, such as a year. Normally GDP is determined by summing all the expenditures on final goods and services that occurred within a province over the previous year for example. The national income accountants decompose expenditure on final goods and services into four main types: consumption (C), investment (I), government expenditure on goods and services (G) and net exports (X-IM). A typical introductory economics textbook would represent this relationship by the following equation:

$$GDP = C + I + G + X - IM \cdots\cdots eqn.(1)$$

According to this equation, oil and gas activity increases provincial GDP through investment undertaken by the oil and gas industry less the value of those investment goods that are imported from outside of the province. As well, when oil and gas are produced, they are exported and the value of exports adds directly to GDP. However, any imported goods and services used in the production of this oil and gas will reduce the GDP impact associated with this production. In other words, it is necessary to deduct the import component of goods and services utilized by the oil and gas sector to get a measure of the true value of economic activity that can be attributed to the province as a result of the oil and gas industry. Nevertheless, this does not imply that all of the GDP, even if accurately measured, would be considered a benefit to the region.

Another adjustment that would have to be made is to allow for the fact that as workers and entrepreneurs receive incomes from supplying goods and services to the oil and gas industry, they will further stimulate GDP through the additional goods and services that they consume. This is normally captured through the induced GDP, income and employment effects sometimes reported for various projects. Finally, the government receives additional revenues through taxes and royalties and some of this may translate into additional goods and services being purchased within the local economy.

While these adjustments give a reasonable estimate of the value of economic activity that takes place within a province or region that can be plausibly connected to the activities of the offshore oil and gas sector, it is still not synonymous with the benefits captured by the local economy. To more accurately reflect this, it is important to translate the GDP impact into local income and employment impacts. To do this, consider that the value of GDP in any given year is more or less equivalent to the incomes that flow from that activity. In other words, with some minor accounting adjustments, it is possible to demonstrate that the value of GDP in any given year is equal to the sum of wages and

salaries, profits, interest and rent paid to all factors of production operating within that jurisdiction within the year. Some of this income goes to employ labor (directly, indirectly and induced) within the province. Some GDP accrues to the operators as profits and some goes to profits for the entrepreneurs who provide goods and services to the oil and gas industry. The rest shows up as interest payments and rent. From the profits, the government will receive various taxes and royalties.

It is important to recognize that the income flows that any company can pay out is determined by the firm's value added, which equals its revenue minus the value of any inputs that it purchases from other firms. The significance of this is that any payments to firms outside of the region for inputs purchased from them do not show up as either income or employment benefits for local residents. Consequently, to get a true measure of the income and employment impacts felt within the region, it is necessary to deduct off the direct and indirect import component of goods and services supplied to the offshore oil and gas industry. For example, if a drill ship were manned and supplied out of New York and owned by a New Orleans company, but was leased through a local agent, then all of the expenditures associated with this lease would flow out of the region with the exception of the agent's commission or mark up. Therefore, it is imperative that the import content of expenditures be deducted before calculating income and employment impacts associated with expenditures, even if the expenditure occurs within the region.

Another adjustment that is required is to recognize that a significant portion of the profit will be retained by the operators and suppliers and will be remitted out of the region. Even though these profits add to GDP, they do not represent a local income impact and as such, these remittances need to be deducted before ascribing income or industrial benefits to the local factors of production. Keeping these adjustments in mind will enable one to better assess various methodologies that might be considered for monitoring and reporting the value of local benefits captured.

Before commenting on the merits of current or proposed methods for monitoring and reporting local benefit capture from offshore oil and gas activity, it is important to first reflect on why government agencies, such as the Offshore Boards, might monitor offshore expenditures in the first place. There are at least four reasons why indicators may be calculated and reported. The first is that legislation may require that local content be monitored and reported. Even if the government agency is legislatively obligated to collect and report local content estimates, the way benefits are measured and reported may not be specified within the legislation and depending upon the purpose of the legislation, the types of indicators calculated and reported can be different.

The second and most obvious reason for monitoring the types of goods and services purchased by the offshore oil and gas industry and the percentage of each that accrues to provincial factors of production is that the operators may have made a commitment to meet particular benefits targets. This, for example, could have been due to the fact that the government provided implicit or explicit subsidization of certain types of activities

associated with the offshore project.[26] In this case, the monitoring activity is really an auditing process to determine whether the oil and gas operators are meeting their commitments.

A third reason for monitoring and reporting local capture rates is that, based on experiences elsewhere, one would normally expect that if local firms were given a full and fair opportunity to participate in the offshore oil and gas industry, then there should be a reasonable evolution and progression of local participation in an industry that is adjacent to a particular jurisdiction. Hence, the monitoring and reporting procedures would be required to determine whether these expectations were being met.[27] As well, if these expectations were not being met, then the government, the industry and the regulators have the opportunity to investigate why and depending on the outcome of this investigation, it might point toward particular corrective measures to be implemented by the operators, the government or the regulators.[28]

The fourth rationale for monitoring and reporting local content is that local benefit capture through the supply of goods and services represents one legitimate means of capturing wealth and income benefits that could flow from the offshore oil and gas industry.[29] Consequently, recognizing that the local residents ought to be the primary beneficiaries from the exploitation of any resource developments that are adjacent to their provinces, the monitoring and reporting process would be an integral component of ensuring that local benefits are maximized. Specifically, the reporting and monitoring process can be used to measure progress towards this end and to measure the effectiveness of various measures that have been put in place to increase local participation in the offshore oil and gas industries.[30] However, it is important to recognize that not all countries have established active policies and some countries have shifted from an active to a more passive, market-driven policy over time. Furthermore, it is important to acknowledge that not everyone would agree that an active policy is necessary to enhance local content. For instance, the offshore operators might suggest that over time the local industry will capture a greater share of the goods and services

[26] The Hibernia capital subsidy of 25% up to a maximum of $1.04 billion, the loan guarantee and the Offshore Technology Transfer Fund would fit into this category. In exchange for this government support, according to the CNOPB website, the operators of the Hibernia project committed to ensuring that major portions of the construction and operating expenditures and employment be received by Canadian and Newfoundland and Labrador workers and businesses and that almost two million engineering hours associated with the Hibernia project would occur in the province.

[27] As Larcombe points out, "The issue of local content is always high on the agenda of governments with a developing oil and gas industry. Foreign companies, driven by the demanding timescales of the project themselves, often give this much lower priority."

[28] For example, the expectation about local participation might not be met because of the way that bid packages are being bundled. The operators and developers of offshore project might be able to better package the contract requirements to enable a greater local participation. On the other hand, local workers may not have sufficient training to fully participate in the industry. This might require the government to put in place additional training facilities for local residents.

[29] As Cameron (1986, p. 10) suggests, "All government in producing countries, outside of the US, now accept the need for a significant and increasing element of local content in their petroleum sectors: They differ only in the forms of encouragement they adopt and the intensity with which they promote them."

[30] This might include, for example, a supplier development program or a local preference policy.

utilized in the oil and gas sector, even in the absence of an active policy to promote local benefit capture. Olaf Fjell, Chief Executive, Statoil (2000) illustrated this view with respect to local content when he suggested that "the industry invests vast sums in infrastructure and maintains large operating budgets, which contribute to the creation of jobs and can aid the development of local industry and institutions – so called "local content"…But as companies we hope to contribute to development primarily by the very "trickle down" effect of our business activities." On the other hand, other industry stakeholders might not be so quick to agree with Mr. Fjell's optimism. For example, Bates (2000, p.3) reports that his review of oil projects occurring in Newfoundland and Labrador reveals that local content was low. He, Bates (2000, p.11), further pointed out that "for Hibernia the bulk of major equipment was ordered from manufacturers with little or no opportunity for local suppliers."[31] As well, the Atlantic Energy Roundtable (2002, p. 11) reports that recently only "8 of 360 bid packages or bid packages originating from a Korean contractor were awarded to local suppliers."[32] This perspective was also echoed in a recent interview with Mr. Paul McEachern, Executive Director of OTANS where he suggested "…local companies are being shut out because the new bidding contracts bundle the entire package together instead of breaking it down so specific elements could be done locally."[33]

4. Current Practice for Measuring and Monitoring Local Content

Offshore oil and gas activity in Atlantic Canada occurs primarily in two provinces – Nova Scotia and Newfoundland and Labrador. Each area is regulated by a joint federal-provincial board – the Canada Nova Scotia Offshore Petroleum Board (CNSOPB) for offshore Nova Scotia, which was established in 1990 to administer the Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act, S.N.S. (1987) and the Canada-Nova Scotia Offshore Petroleum Resources Implementation Act, S.C.(1988) and the Canada-Newfoundland Offshore Petroleum Board (CNOPB) for Newfoundland and Labrador, which was established in 1985 to administer the Canada-Newfoundland Atlantic Accord Implementation Acts.

In both jurisdictions, offshore oil and gas operators are required to submit a "Benefits Plan" to the relevant Board before any work authorization can be issued and, most significantly, before a development plan can be approved to allow the field to be developed. As part of this process, the proponent must establish an office with an

[31] In the context of this statement, it is important to recognize, as pointed out by a member of the Steering Committee, that it may be more cost effective to deal directly with international suppliers than with local agents and there may also be warranty considerations that would favour the approach adopted by the industry.

[32] Moreover, the capacity to supply goods and services to the offshore appears to be significant. For example, the Atlantic Energy Roundtable (2002, p.12) reports that more than 87% of offshore services and supply categories are well represented within the region, while 37% of onshore support categories are represented to some degree."

[33] He also suggested that local companies have an enhanced capacity to provide engineering and fabrication services. Specifically, he said, "What we can do here is the engineering and fabrication." Mr. McEachern said. "One of the significant advancements in the local industry over recent years has been the level of engineering work local firms have proven capable of." Taken from "Local Firms are being shut out of offshore work, OTANS says." The Halifax Herald Limited, August 28,2003.

appropriate level of decision-making authority in the province that has jurisdictional authority over the project. As well, the proponents are required to undertake, within the province, research and development activities and education and training, with first consideration being given to the residents of the province. In addition, the proponents, in acquiring goods and services for their projects, have to give "full and fair opportunity" to provincial manufacturers, consultants, contractors and service providers. Furthermore, in satisfying their procurement requirements, the proponents have to ensure that first consideration is given to services provided from within the province and to goods manufactured in the province so long as those goods and services are competitive in terms of fair market price, quality and delivery.

While the proponents are required to submit their benefits plans before developing and operating projects in offshore Atlantic Canada, it is important to understand that the various pieces of legislation governing the Boards do not empower them with the authority to set targets for the appropriate level of benefits or to force an operator into contracts for goods or services that are not competitive. As well, it is important to acknowledge that the provisions, as they currently exist under the Offshore Accords, may not be very effective in ensuring that local companies capture a reasonable share of the procurement opportunities available in the offshore oil and gas industry. Concerns with respect to this, for example, were raised by the Atlantic Energy Roundtable (2002, p.9-10), where it was suggested that "the first consideration clause for service and supply contracts has never been used to decide between equally 'price, quality and delivery' competitive contracts."

The Offshore Boards have the responsibility of monitoring industrial benefits associated with offshore oil and gas activity. To date this has involved specifying guidelines for the operators for recording expenditure content consistent with the Canadian General Standards Boards (CGSB)[34] and retaining Consulting and Audit Canada (CAC) to audit periodically the industrial benefits derived by each of the projects operating in offshore Atlantic Canada. The approach used by CAC and the industrial benefits considered are described below.[35]

In auditing the industrial benefits achieved by offshore oil and gas projects in offshore Atlantic Canada, CAC utilizes company information derived from Generally Accepted Accounting Principles (GAAP) and which is available from the company's books through the various job charges recorded therein. In addition, the auditing procedure

[34] Note that CNSOPB (1994) provides a general set of guidelines for determining and reporting the content associated with industrial benefits and employment. The CNOPB, on the other hand, issues a set of reporting guidelines for each project that are consistent with the CGSB approach. The most recent of these guidelines, CNOPB (2002), relate to the White Rose project and are utilized for the purpose of this analysis.

[35] The following discussion is taken primarily from a presentation by Consulting and Audit Canada to the Canada-Nova Scotia Offshore Petroleum Board on Industrial Benefits. However, where relevant, it is supplemented with the CNSOPB's Industrial Benefits and Employment Plan Guidelines and the CNOPB's Procurement Reporting Guidelines – White Rose Development Project.

follows the "Cost Incurred Approach" recommended by the CGSB.[36] Local content, in this context, is "the portion of the selling price of a product or service associated with work performed in Canada." More specifically, CNSOPB (1999) defines Canadian content as: "that portion of the cost of a product associated with the work performed in Canada by contractors, subcontractors and suppliers." Nova Scotia content and foreign content are defined analogously. Likewise, CNOPB (2002, p.5) specifies that Newfoundland content "shall be the same definition as "Canadian Content" except that "imported costs" refer to costs incurred in all areas outside the Province of Newfoundland and Labrador."[37]

The industrial benefits considered by CAC are:

- Direct Industrial Benefits activities associated with the project costs;
- Offset Industrial Benefits activities attributable to the project;
- Technology transfer;
- Research and Development; and
- Capital acquisitions.

In this context, direct labour benefit or labour employment content, expressed in person-hours, is determined on the basis of the employee's residence.[38] However, as explained

[36] The CGSB suggests two ways in which Canadian content can be calculated: (1) the "Selling Price Method", which involves determining the selling price less foreign costs and (2) the "Cost Incurred Method", which involves calculating the Canadian costs incurred plus Canadian profits.

[37] The specific definition of Canadian content in the Newfoundland and Labrador guidelines, as detailed in Appendix F of CNOPB (2002), is: "Canadian Content is that portion of the selling price of a product or service associated with the work performed in Canada. Canadian Content may also be calculated as the selling price less the cost of directly and indirectly imported materials, labour, services, overhead and profit not taxable in Canada."

[38] As specified by CNSOPB (1994), "a Canadian citizen is a person who was born in Canada and who has not relinquished his/her Canadian citizenship; or a person who has been granted permanent residence status (landed immigrant status)." A Nova Scotia (or Newfoundland and Labrador) resident is a Canadian citizen or landed immigrant who meets the residency requirements for voting in a provincial election, as defined by the Election Act of Nova Scotia (Newfoundland and Labrador) which states: A Canadian citizen or landed immigrant who has resided n the Province for the immediately preceding six month period. In addition, as specified in CNSOPB (1999), a Canadian who has resided in the Province should be reported for the first six months as Other Canadian and after six months should be reported as a Nova Scotia (Newfoundland and Labrador) resident. Non-Canadian should always be reported as non-Canadian regardless of the location of work. Finally, Nova Scotians, Newfoundlanders and Labradorians or Canadians who work outside of Canada should be reported as Canadian or Nova Scotian or Newfoundlanders and Labradorian, as applicable, for the first six months and after six months should be reported as a Non-Canadian.
As well, the CNSOPB (1994) specifies a Canadian corporation as: "an entity that has an operating office in Canada, that is duly registered with appropriate authorities to conduct business in Canada and that has its controlling shareholders as residents of Canada…" While it was not possible to find a comparable definition for Newfoundland and Labrador, Nova Scotia corporations, as per CNSOPB (1994), are defined as: "an entity that has an operating office in the province , that is duly registered with the register of Joint Stock Operation of Nova Scotia to conduct business in the Province and that has its controlling shareholders as residents of the province."

in CNSOPB (1999) labour expenditure content, expressed in dollars, is based on where the labour is performed.[39]

The benefits claimed for direct materials and equipment, and subcontracts are to be adjusted for the appropriate percentages of both Canadian and Nova Scotia or Newfoundland and Labrador content, which involve deducting the direct and indirect import component[40] associated with these expenditures.[41] As well, to the extent that there are other direct costs which are "material", these should be included in calculations of local content. Likewise, overhead cost is to be prorated to the project on the basis of labour costs or cost of sales. Finally, the benefit claimed for profit is to be based on the actual profit recorded on the project in the company's books of account in accordance with GAAP. Profit recorded by companies owned and operated in Canada (Nova Scotia or Newfoundland and Labrador) is considered to 100% Canada (Nova Scotia or Newfoundland and Labrador) content.

5. The Current Monitoring and Reporting Approach Utilized by the Offshore Boards

The approach to monitoring adopted by the Offshore Boards and CAC provides estimates of the employment impacts that are felt locally, which for the most part reflect the employment benefits captured by the local economy.[42] As well, the CGSB method

[39] In other words, if an operator spends money on labour services within Nova Scotia, for example, then this is considered to be Nova Scotian labour expenditure content, independent of whether this labour is performed by Nova Scotians, other Canadians or non-Canadians. The exception to this is when the labour activity takes place on a rig or vessel on which the crew lives in isolation. In that case, the labour expenditure content is determined only by the residency status of the labourer.

[40] According to the CNOPB (2002), direct import cost is the portion of the selling price that can be attributed to directly imported materials, labour services and overhead, while indirect imports account for those materials, labour, services and overhead that were obtained from a local supplier, but had originated outside Canada (Newfoundland and Labrador or Nova Scotia).

[41] To further clarify what it means by provincial and Canadian content, CAC and CNSOPB (1999) provided a number of examples that are worth repeating. In the first example, a foreign owned company provides a fully equipped supply vessel to the offshore. In this case, the local content would result only from the vessel operating costs, with the remaining being assigned to foreign content. However, if the vessel had been chartered from a local company, CAC indicates that the profit on the charter would also be included as local content. The second example relates to the leasing of office space. If the office building is entirely owned by a provincial corporation, then all of the rental costs would be included in local content. On the other hand, the building were owned by a non-provincial corporation, then the profits earned on the lease would have to be deducted from the lease in deriving an estimate of local content. The other examples provided also illustrate that CAC and CNSOPB attempt to deduct the import content of expenditures in deriving local content estimates associated with offshore oil and gas expenditures. As well, they offer general guidelines for determining content such as: 15% Nova Scotia content for equipment purchased or rented from a Nova Scotia vendor that was manufactured elsewhere; 75% Nova Scotia content for food and catering; 35% Nova Scotia content for consumables; 100% any services performed in Nova Scotia and the Nova Scotia of transportation depends on the ownership and location of the carrier.

[42] A job that is filled by a local person who was previously fully employed would not be considered a benefit to society unless the job he/she vacated was filled from the ranks of the unemployed. Even then, the full salary would not count because there is presumably some opportunity cost to society of utilizing the unemployed individuals. However, attempting to determine this level of detail would be considered to be

attempts to deduct the obvious import content associated with goods and services.[43] In our assessment, based on our review of the literature, our experience in measuring economic impacts associated with offshore oil and gas activities and notwithstanding the concerns of the operators, the CGSB approach to benefits monitoring is valid, meaningful and representative of the true benefits captured locally. Consequently, in our opinion, this approach provides plausible estimates of the true expenditures impacts that are captured within each province.

However, based on our review of the reporting and monitoring approach currently utilized by the Boards, it appears that the approach does have room for improvement. The first improvement is to subject the information that they currently collect to further analysis through the use of an input-output model.[44] This additional analysis will remove the residual import content from the project expenditures and, as such, the direct and indirect impacts so derived would be a closer approximation of the true benefit capture being achieved within each province.

Further, our observations of the current approach employed by the Boards indicate that while data is collected in considerable detail, capture rates by category of expenditure are not being reported separately. Rather, capture rates are being reported as a single content estimate. Instead, capture rates could be collected and reported as a percentage of expenditures on specific goods and services. For example, they could report local firms capture 20 percent of the expenditure on seismic activity, 45 percent of drilling equipment, etc., compared to the current approach which reports capture as a global percentage of total expenditure, such as project x has a 30 percent local capture rate. The greater the detail the more useful the information is to potential suppliers and to government. More detailed information may point to areas in which provincial businesses and labour are capturing a greater share of expenditures or to areas in which they may not be doing as well. The public dissemination of this type of information may encourage some local entrepreneurs to develop strategies to penetrate the local market and take advantage of these missed opportunities. Unfortunately, detailed expenditure profiles of this type are not currently available from secondary sources. The Offshore Boards typically collect detailed information, but report it in aggregate amounts as illustrated in Tables 1 and 2. Furthermore, by providing more detailed information, it might point in a particular direction for government policy in order to capitalize on the wealth generation potential emanating from the offshore oil and gas supplies industry.

The third type of improvement is to provide some context from a technological perspective for the benefits that are captured locally. Our review of secondary sources of information also suggests that technological considerations are not reported by the Offshore Boards when describing capture rates. If technological constraints, in part, define the level of economic benefits that can be captured within a particular jurisdiction,

---

unreasonable and the level of jobs created for local residents would be a close, even though not a perfect, indicator of the employment benefits received within the province.

[43] As was the case for employment, one would also have to deduct the opportunity cost of the inputs that were used to produce those goods and services, but this may be more than is needed in this context.

[44] This approach is discussed further below in the Invoice Method described in Section 8.

then the capture rates reported by the Offshore Boards ought to be reported on a qualified basis. That is, the capture rate should be reported conditional on only those expenditures that can reasonably emanate from within the jurisdiction based on technological capacity in the foreseeable future. For instance, when reporting on capture rates associated with the construction of the hull for an FPSO, it is necessary to recognize that there are no shipyards in Atlantic Canada that currently can construct this vessel and the investment cost associated with constructing the yard would be prohibitive. As such, it does not make sense to include this portion of the expenditures in the estimates of local capture rates. It is as if this portion of expenditures somehow represents a missed opportunity, when, in fact, it is not. Including these expenditures does paint the potential contribution of the offshore oil and gas sector in a more negative light than is fair or reasonable and may deflect public attention away from those areas where there is a reasonable probability of increasing the local share of expenditures. However, in applying the capacity rule as a qualifier to the reporting of local benefits, it is important that the Offshore Boards only include those items for which there in not now, nor likely to be in the near future, any local capacity to supply. Other goods and services which cannot currently be supplied competitively, but could be supplied in the future as local firms obtain more experience and expertise ought not to be excluded from consideration in reporting local capture rates. By way of illustration, the Offshore Boards should not exclude certain types of engineering activity that could be supplied from within Atlantic Canada within a reasonable period of time, even if it cannot currently be supplied by Atlantic Canadian companies.

6. The Cash Flow/Head Count Alternative for Measuring and Monitoring Local Content

In a number of recent presentations and submissions, the Canadian Association of Petroleum Producers (CAPP) has been suggestion that the way in which industrial benefits are recorded and monitored in Atlantic Canada's offshore oil and gas sector needs to be modified.[45] Specifically, their submission to the Atlantic Energy Roundtable (CAPP, 2002a) suggested that "CAPP is proposing a change in the method of benefits reporting that measures cash flow for expenditure and head count for employment levels." As well, in their various presentations, CAPP has suggested that the CGSB approach currently utilized by the Offshore Boards has a number of problems associated with it. Specifically, they argue that:

1. by concentrating on the percent of local content achieved, the CGSB approach is not very effective in portraying the true participation of local businesses and labour in Atlantic Canada's offshore oil and gas industry;
2. the administrative and reporting requirements of the current approach put local firms at a competitive disadvantage. This results from the fact that Atlantic Canadian firms have to incur extra costs in trying to distinguish between local and non-local expenditure shares when their international competitors can simply declare all of their expenditures as foreign content;
3. there is an administrative burden imposed upon the oil and gas companies in having to submit hundreds of reports summarizing the industrial benefits of each

[45] See, for example, CAPP (2002a), CAPP (2002b) and CAPP (2002c).

contract in excess of $100,000, when, in fact, it does not effect the contract award decisions;
4. there is an onerous auditing process associated with monitoring industrial benefits associated with industrial activity;
5. the current procedure is very time consuming and may even delay the awarding of contracts;
6. the CGSB approach to reporting local content may disadvantage all stakeholders in the offshore oil and gas industry in terms of a public communications perspective;
7. it is not really fair to the oil and gas industry in that other industries and governments in Atlantic Canada are not required to undertake this type of reporting process when discussing the impacts of their industries on the local economy; and
8. the local supplies industry has been very successful in achieving contracts with the offshore oil and gas industry and, as such, the current level of scrutiny is no longer warranted.

The alternative approach to benefits measurement and monitoring being proposed would look at the cash flow of expenditures and utilize a head count for employment and business contracts.[46] Under this approach, the value of expenditures by the oil and gas industry contracted to local companies for goods and services would be recorded as a local benefit. In this context, a $1 million contract awarded to a Nova Scotia firm, for instance, would constitute a Nova Scotia benefit. It would also involve counting only direct employment – e.g., workers from Nova Scotia or Newfoundland and Labrador, other Canadian provinces and the rest of the world. In addition, the reporting of local benefits would incorporate a count of the number of businesses by location that supply goods and services to the offshore oil and gas industry – e.g., the benefits of Project A would, under this alternative approach, include 10 contracts received by firms in Nova Scotia or Newfoundland and Labrador, 20 contracts awarded to firms in the rest of Canada and 50 international companies that satisfied the remaining procurement requirements. As well, without explaining exactly how one would measure capacity, the Cash Flow/Head Count approach would see these expenditure benefits discussed in the context of the capacity of the local industry to supplies these goods and services.[47] Bruce (2002) does, however, illustrate how the operators might use local content relative to

[46] CAPP (2002a, p.23).

[47] To illustrate the significance of this point, consider how it is possible to measure capacity. Is it at the start of the project, before any goods and services are supplied to the industry? Without the experience and learning that is possible through participation in the industry, then the local capacity would be low. Consequently, even though Atlantic Canadian firms may be supplying only 10 percent of the goods and services required, this may be reported as 100 percent of the good and services that they have the capacity of supplying. However, if local firms are given an opportunity to participate in the industry, then their capacity to supply goods and services could increase dramatically as their acquire experience and their operating costs are lowered though "learning-by-doing". Suppose, for example, that their potential capacity is 40 percent. In this case, the 10 percent figure would only represent 25 percent of potential capacity, which gets reported as 100 percent of actual capacity at a point in time. In fact, with full and fair opportunity, local firms should always be capturing 100 percent of the goods and services for which there is a local capacity to supply the industry because capacity is presumably defined in terms of price, quality and deliverability.

capacity when he describes the local content achieved by the Terra Nova project as follows: "…27% may not sound like a lot, but…we estimated that if we purchased all the goods and services we could in this Province we could achieve 30% of total expenditures. So in terms of capital expenditures, we are very close to having accomplished 90% of what could have been done in Newfoundland and Labrador."

The advantages for the Cash Flow/Head Count approach are described as:[48]

1. cash flow and head counts are key indicators of financial and economic health;
2. the indicators proposed in this approach are the standards by which most sectors measure activity and growth;
3. these criteria provide a more realistic measure of the contribution of the offshore oil and gas sector to the local economy;
4. the proposed alternative reporting structure will enable the public to better appreciate the economic impact that flows from the offshore oil and gas industry in Atlantic Canada;
5. the competitiveness of local suppliers will be improved because of the lower costs associated with the reduced reporting burden; and
6. the whole reporting and monitoring procedures are less onerous and expensive for suppliers and operators.

7. An Assessment of the Cash Flow/Head Count Proposal

The Cash Flow/Head Count alternative needs to be assessed in terms of whether it is an improvement over the current system employed by the Offshore Boards. This includes an assessment of: (1) the deficiencies of the current CGSB process that the Cash Flow/Head Count proposal is trying to remedy; (2) the feasibility and appropriateness of Cash Flow/Head Count alternative; and (3) an evaluation of the suggested benefits associated with Cash Flow/Head Count procedure.

There are some aspects of the Cash Flow/Head Count proposal that are positive and should be incorporated into any revised benefits monitoring process adopted by the Offshore Boards. However, there are many parts of the proposal that do not appear to represent improvements over the current system. The idea that benefits ought to be measured in relation to technological capacity is a good suggestion. This provides a realistic benchmark that the local industry can strive to achieve. It is not reasonable to expect that local firms could ever or should ever supply 100 percent of the goods and services utilized in the offshore oil and gas industry. Yet, one does have to be careful to distinguish between technological capacity constraints and financial or performance constraints – the former are not likely to be overcome in the near term and the latter could be overcome with the right policies and strategies.

It is surprising to read in proposals that advocate the Cash Flow/Head Count alternative that local companies, vis-à-vis foreign suppliers, are disadvantaged by having to determine local versus non-local components of their supplies, especially since it does not appear to affect the contract award. If this is true, then one should really ask why

[48] CAPP (2002a, 2002b).

collect information on local content if it has no bearing on who get awarded contracts. To the extent that this point being raised is correct, then it highlights the need for both the Offshore Boards and the operators to re-examine how procurement decisions are being made in Atlantic Canada's offshore. Specifically, one would think that being local would give the firm some type of advantage in acquiring contracts to service the local oil and gas sector, especially if they were similar in regards to other criteria used.

Although there is an additional administrative costs associated with the monitoring procedure, whether it is onerous is open to interpretation given the due diligence that would be required in the first instance to ensure that bidders are qualified to bid on the contract. It may be an annoyance, but whether it is onerous is debatable.

The proponents of the Cash Flow/Head Count alternative also suggests that the current monitoring procedure is not fair because the oil and gas sector is being asked to provide indicators describing its impact on the local economy that other industries are not.[49] As a result, they suggest that the Offshore Boards adopt a set of "standard," but key economic indicators. Clearly, fairness is a value judgment and where you stand on the issue depends, to some degree, on where you sit. For instance, a local entrepreneur might consider it to be unfair that he/she cannot get a contract with the offshore oil and gas industry even though they feel that their company can supply the good or service needed. Moreover, the indicators being suggested by proponents of the Cash Flow/Head Count approach do not demonstrate whether benefits are being captured locally. At the very least, one does have to deduct the direct and indirect import content from the contracts awarded locally. It is also necessary to weight the number of contracts awarded locally by their value because one big contract can swamp many times over a thousand small contracts. Consequently, being told that, say, $100 million worth of contracts were awarded to 100 companies with offices located in Newfoundland and Labrador, but with fabrication facilities elsewhere, does not really indicate the true extent of local benefit capture within the province.

The final point to be addressed in this assessment is that the current process of benefits monitoring puts the oil and gas companies at a public relations disadvantage because their performance is being measured against 100 percent of project expenditure, which is impossible to achieve. It has been further suggested that given the way local content is being reported, it is not clear that the public fully understands the true benefits associated with the oil and gas industry. However, the proponents of this new approach argue that the public does understand expenditures, number of contracts awarded locally and number of workers. While there is an element of truth to this concern, one needs to be careful before accepting fully this claim. Where the oil and gas industry is relatively new, it is not clear whether the public is able, for example, to translate an increase in activity in this industry into what it might mean on average for the local economy. This is especially true given that most of the profits from the industry will be remitted outside

[49] It is important to note that the oil and gas sector is somewhat unique in that it exploits non-renewable resources that are publicly owned and this, in turn, entails higher expectations.

the region.[50] As well, it is not clear how much of the new goods and services supplied from with the regional economy actually stay within the region as income benefits. However, there does need to be some kind of adjustment for technological capacity and there needs to be a more detailed reporting of capture rates by activity.

In summary, some aspects of the Cash Flow/Head Count proposal are worthy of incorporating into a revised benefits monitoring scheme. But, on the whole, this alternative approach does not improve upon the procedures currently being used.

8. Invoice Method for Reporting and Monitoring of Local Capture Rates

There is an ever-present desire for the public to understand how resource projects benefit local economies through the capture of employment and project expenditures. Clearly, the CNOPB and CNSOPB have exclusive jurisdiction, in their respective areas, to collect, monitor and disseminate information required to determine capture rates. Annual reports and other secondary sources of information indicate that benchmark data is being collected by regulatory authorities. The issue with attempting to calculate capture rates from secondary sources of information may not be with the collection process as much as it is with the reporting process. Currently, government legislation requires the Offshore Boards to collect, interpret and report on expenditures. Whether the Offshore Boards are in the best position to report on local benefits does require further investigation. The data required to make informed business, education, training and policy decisions based on capture rates is not available to the public from secondary sources. Primary interviews with representatives of the Offshore Boards suggest that while a great deal of information regarding project expenditures is collected, only required information is being disseminated and, as such, the public does not have a clear understanding of how well workers and firms are doing with respect to capturing expenditures in specific categories.

In analyzing the data available from secondary sources, as shown in the tables below, it is possible to demonstrate that on average,[51] between 64 percent and 83 percent of oil and gas employment is captured in Atlantic Canada and on average, between 37 percent and 51 percent of expenditure is being captured by local firms. While sounding impressive, reporting at these aggregate levels raises three specific issues:

- Is there a need for the oil and gas industry to continue with this type of reporting? Information being reported indicates that capture rates are relatively stable across

[50] For example, the growth in Newfoundland and Labrador's GDP per capita has been phenomenal, being driven in large part by offshore oil activity. However, the growth in its personal income per capita has been less spectacular. This divergence is explained by the fact that retained corporate profits that are remitted outside of the province are not part of personal income. It is question, to say the least, whether many people would appreciate this distinction or understand the connection.

[51] These estimates are based on the combined estimates from Tables 2 and 3 presented below. Note that the local content for the development phase expenditures range from 27 percent to 47 percent. The corresponding range for production is 48 to 54 percent. The Nova Scotia content estimates for combined development and operations expenditures range from 36 to 38 percent. The Newfoundland capture rate for employment during the development phase is 57 to 66 percent and this rises to 82 to 85 percent during project operations. The capture rate for Nova Scotia employment for development and operation is 57 to 78 percent.

projects.[52] This would imply that in order to change capture rates for employment and expenditures, on an aggregate basis, there would have to a fundamental shift in how projects are developed before a noticeable difference in capture rates are realized. On the other hand, it raises the question of whether or not more information is required by the public to make informed decisions about where to concentrate efforts on where to obtain employment and take advantage of business opportunities. Efforts to capture expenditures in areas where comparative advantages exist are at risk of going unnoticed in aggregate totals.

- The current reporting process does not provide the public with the necessary knowledge to form realistic expectations for capturing employment and business expenditures. The ability to capture employment and project expenditures in a local economy is dependent on the history of the industry, its resource characteristics, government policy and local supply capabilities. Rather than having the Offshore Boards report on the aggregate percent of local content achieved, consideration needs to be given to managing expectations and reporting on activities that local workers and businesses have the capacity to capture and improve upon given the stage of the oil and gas industry.[53]

- The current reporting process does not adequately reflect other downstream benefits from oil and gas activities such as the development of infrastructure, training, research and development, the establishment of institutional facilities and so on. These benefits are essential for the industry to progress and need to be monitored and communicated to the public.

To accurately reflect capture rates, regulatory authorities, whether they are governments or appointed Boards, have to be given the authority to collect, interpret and release quantitative data in an expansive format. Capture rates have a quantitative element (as defined by number of employees and amount of expenditures), but also has a qualitative measure in assessing the ability of the local economy to maximize the supply of goods, services and workers. It is difficult to determine from secondary sources the full extent of information being collected by Offshore Boards.

While a contentious issue has always been the onerous or administrative burden being placed on local firms and operators to monitor industrial benefits, monitoring these benefits is, however, increasingly becoming a requirement of developing major resource projects in Atlantic Canada. With this in mind, it might be appropriate to consider a web-based invoice system for monitoring industrial benefits. With this system, all operators, suppliers, contractors and subcontractors working on a project with monthly invoicing exceeding a designated amount are required to input information such as project-related employment statistics and values for purchased goods and services through a specific

[52] All of the estimates for expenditure and employment in Atlantic Canada are with 20 to 30 percentage points of each other,

[53] As pointed out by a member of the Steering Committee, the Boards and the governments may have a joint role to play here and, in fact, government might be better suited to managing expectations and reporting on activities to improve local benefit capture.

website. Contractors whose invoices fall below designated values are not required to complete questionnaires. For these companies, the project operator is required to collect basic corporate information, classify the vendor by type of expenditure and then enter the vendors invoiced amounts into the industrial benefits monitoring system. All invoices are recorded and analyzed according to predetermined industry profiles and key econometric indicators.

The invoice system requires the project operator to establish a process for collecting and entering basic system support information including the following:

Company information - Where practical, all operators, suppliers, contractors and sub-contractors are identified and profiled. Information about company structures, locations of operations, goods and services provided, skills/occupations available, primary contacts and other identifying details is collected and entered in to the system. The data is generally entered only once by the vendor.

Employment - Direct and indirect employment (where possible) is entered by gender, area of residence, occupation/job category, work history, hours of work and training activity. Employee records contain basic source data that are required to determine how well workers in a specific region are performing in terms of capturing employment by activity or expenditure.

Expenditures - Expenditures made by project operators whether directly or indirectly by suppliers, contractors or sub-contractors need to be collected and analyzed by expenditure type and geographic content. Ideally, operators and regulators must collect and report project expenditures in the greatest detail possible.

Web-based data collection systems that monitor employment and procurement activities by expenditure and phase of activity are readily available alternatives to current systems used to monitor employment and expenditures in the offshore oil and gas industry. In this type of system, all vendors and expenditures are captured and analyzed for reporting purposes. Reports are then generated according to desired levels of detail and can be supplemented with input-output analysis to provide a reasonable estimate of the true local benefit derived by type of activity. These reports often contain qualitative statements regarding extenuating circumstances that affect capture rates including statements concerning project life cycles, the capacity of workers and businesses in a region and related institutional and industrial activity. Discussions with representatives of Voisey's Bay Nickel Company, which currently maintains a web-based monitoring system, suggest that this type of system provides an absolute portrayal of local participation in projects and is very efficient in terms of data collection, analysis and reporting.

9. Local Content Observed in Atlantic Canada

This section presents the results of an analysis of secondary information sources that were used to determine the level of oil and gas expenditures in Nova Scotia and Newfoundland and Labrador that were captured by the local economy. This information is presented in Tables 2 and 3 below.

Table 2: Local Content Estimates for Offshore Oil – Newfoundland and Labrador

	Local Employment Capture		Local Expenditure Capture	
	Person-Years	*Percent of Total*	*Dollars (M)*	*Percent of Total*
Hibernia				
Development Phase	20,800	66%	2,700	47%
Annual Operations	675	85%	325	54%[54]
White Rose				
Development Phase	2,930	57%	770	33%[55]
Annual Operations	350	84%		
Terra Nova				
Development Phase	4,023	62%	791	27%
Annual Operations	765	82%	285	48%[56]
Combined				
Development Phase	27,753	64%	4,261	39%
Annual Operations	1,790	84%	610[57]	51%

Table 3: Local Content Estimates for Offshore Oil and Gas – Nova Scotia

	Local Employment Capture		Local Expenditure Capture	
	Person-Years	*Percent of Total*	*Dollars (M)*	*Percent of Total*
Deep Panuke				
Total (forecast)			627	37%[58]
Sable Offshore Energy Project				
Total Project to Date	5,985	57%	1,300	36.5%[59]
Cohasset				
Total Project to Date	3,727	78%	552	38%[60]
Combined				
Total	9,712	64%	2,479	37%

[54] The local content estimate for the development phase and the employment estimate for the operations phase of the Hibernia project are taken from CNOPB website. The local content for the operating phase expenditure estimates were taken from Pricewaterhouse Coopers (2001, p. 9) and were based on the operating expenditure for Hibernia for 1999-2000, which was in the range of $300 - $350 million.

[55] The employment and expenditure estimates for the White Rose project were derived from a letter written to the federal Minister of Natural Resources and the provincial Minister of Mines and Energy by James Blair that was appended to the CNOPB (2001), Decision 2001.01, Application for Approval White Rose Canada-Newfoundland Benefits Plan and White Rose Development Plan.

[56] The Terra Nova content numbers were provided by Donna Stuckless of Petro Canada. The development phase estimates correspond to cumulative expenditures and employment to December 31, 2001 and the operations estimate for employment is based on the average head count for 2002 and 2003 and the expenditures are based on operating expenditures for 2002 and up to September 2003. These numbers different from those available from the CNOPB website and represent an update on those estimates.

[57] The combined expenditures include only Hibernia and Terra Nova.

[58] LeBlanc (2003) reports that Nova Scotia expenditure on the Deep Panuke project is expected to reach $627million and will represent a 37% capture rate.

[59] The content estimates for the Sable project are for combined operating and development expenditure and employment. They are measured using cumulative employment and expenditure to September 30, 2003 and were provided by the Nova Scotia Department of Energy. The CNSOPB website: Report on Regulatory Regime and Employment and Industrial Benefits notes that Nova Scotia expenditure capture rate is expected to increase to 42% in the next phase of the project, by 2009 and to be in excess of 50% over the life of the project.

[60] The Cohasset estimates were taken from CNSOPB website: Report on Regulatory Regime and Employment and Industrial Benefits.

As of September 30, 2003, the current estimate for Nova Scotia's Sable project was 36.5% on development and operations expenditure combined. This is slightly lower than the 47% achieved during the Hibernia development phase but above the 27% reported for Terra Nova's development phase. It should not be surprising that the Hibernia project achieved one of the highest local capture rates because it had to meet defined benefit targets that accompanied the financial support the project received from the provincial and federal governments.

Finally, another source of information for capture rates achieved in Atlantic Canada was obtained directly from the Governments of Nova Scotia and Newfoundland and Labrador. This information contains estimates of the Atlantic Canadian content calculated for the 2002 annual operating expenditure for Hibernia, Terra Nova and SOEP. The figure calculated was 51% ($225 million of $445 million). As well, it estimated that the Atlantic Canadian annual operating content for the White Rose and Deep Panuke projects would be 54% ($75 million of $140 million). In addition, the Governments of Newfoundland and Labrador and Nova Scotia examined the local content by type of contract for all contracts captured in their benefits monitoring databases. This is presented in the following table.

Table 4: Local Content in Atlantic Canada's Oil and Gas Industry by Type of Contract

Category	Percent of Expenditure Captured Locally[61]
Tubulars/Linepipe/Steel plate	7%
Drilling Rig/Ships	14%
Seismic Acquis./Process.	21%
Mechanical Equipment	10%
Electrical Equipment	6%
Instrumentation	22%
Heavy Lift/Dredging/Pipe lay/Flotels	11%
Drilling Equipment and Services	43%
Civil/Structural	84%
General Fabrication/HVAC/Pipe Spools	35%
Off. Plat. Com./Decks/Modules	28%
Insul. & Coating Contractors	46%
Mechan. & Electric Contractors	94%
Engineering & Tech. Services	66%
Transportation Service (ex. Marine)	68%
Offshore Helicopter	42%
Supply Vessels/Tugs/Barges	59%
Diving/ROV	52%
Other Marine Equip.	81%
Indus. Supplies & Serv.	38%
General Office Services	73%

[61] It is important to recognize that some of the categories in Table 4, such as, Tubulars/Linepipes/Steel Plates, electrical equipment, etc, have such low capture rates because they are simply not made in either Nova Scotia or Newfoundland and Labrador

All information above, with the exception of the aggregated Nova Scotia and Newfoundland and Labrador provincial databases (Table 4), has been gathered from publicly available sources.[62]

Caution must be used when interpreting the data in Tables 2 and 3, as the tables are derived from multiple sources that are based on different criteria, measurement units and time scales. In particular, it is important to acknowledge that local content estimates may vary by source of information, date of reporting and stage of development for each of the projects. For example, CNOPB (2001) reported in a News Release that the 1999 Newfoundland and Labrador content estimates for the Terra Nova project were being revised downward from 15.7% to 11.7%, but the local content for that project by the end of 2000 was 20.8%. By 2002, Petro-Canada was reporting a Newfoundland and Labrador content of 27% for the Terra Nova project.[63]

10.0. Local Capture Rates – Experiences and Policies in Select Jurisdictions

10.1. Introduction

This section of the report outlines the findings from the analysis of other offshore oil and gas producing jurisdictions. Specifically, this section addresses the following study objectives:

- For selected international jurisdictions and using secondary sources:
  - to determine the methodology used to define and calculate local benefits capture;
  - to determine the level of local benefits capture;
  - to trace how local benefits capture methodology has evolved over time;
  - to trace how the level of local benefits capture has changed over time;
  - to identify policy considerations or lessons learned; and

- to compare the results to those for Atlantic Canada and place them in context.

10.2. Jurisdictions Reviewed

Although over 110 countries are involved in the offshore oil and gas industry, this study involved a review of the following jurisdictions:

– United Kingdom Continental Shelf (UKCS)
– Norwegian Continental Shelf (NCS)
– United States (Gulf of Mexico)
– Australia

[62] Pricewaterhouse Coopers (2001), CNOPB (www.cnopb.nfnet.com/general/media/benefits), Hibernia Management and Development Website (www.hibernia.ca), Strategic Concepts et al. (1999), Mining Society of Nova Scotia website, CNSOPB Employee Benefits Summary, 2002, Gardiner Pinfold (2003), CNOPB (2001) News Release, CNOPB (2001), Terra Nova (1999) and the Supplier Development Report (2003).
[63] Bruce (2002).

– Denmark
– Brazil
– Nigeria
– Malaysia
– Other jurisdictions

10.3. Comparative Analysis Framework

To provide context to this analysis, an understanding of the characteristics of each jurisdiction in terms of relative size, history and stage of maturity is necessary. This background was complemented with a review of the evolution of government policy with respect to how each jurisdiction viewed local content benefits in the supply industry and what initiatives were put in place to encourage local content, monitor compliance and how local content was defined. As such, the findings for each jurisdiction are presented as follows:

- History
- Current Structure
- Resource Characteristics
- Evolution of Government Policy (with an emphasis on policies related to local benefits)
- Supply Industry and Capture Rates

This section concludes with a summary of how the experiences of the identified jurisdictions compares in an Atlantic Canadian context and a summary of the lessons learned that could be applied to Atlantic Canada.

10.4. Jurisdictional Analysis

10.4.1 United Kingdom Continental Shelf

History[64]

Interest in the North Sea was initiated following the 1959 discovery of a major gas field in the Netherlands. The geological structure suggested that the North Sea could contain significant oil and gas resources. Exploration on the UKCS began in the early 1960s when seismic survey activity was first undertaken in the Southern Basin. The encouraging seismic results led to the first well which was spudded in late 1964. Less than one year later a major gas field was discovered. This was quickly followed by several more fields in the same Southern Basin region. The first commercial oil discovery was made in 1969 at what later became part of the Arbroath field. The floodgates opened, however, with the 1970 discovery of the Forties field - a field that has produced over 2.4 billion barrels of oil since it started production in 1975.[65]

[64] Noreng, Oystein. "The Oil Industry and Government Strategy in the North Sea"

[65] By way of comparison, the total discovered resources on the Grand Banks of Newfoundland is approximately 2.1 billion barrels.

In the early 1960s when North Sea exploration began, offshore oil drilling was still an evolving technology. As such, the North Sea became a testing ground for the development of exploration and production technologies in harsher marine environment than encountered in the Gulf of Mexico. The only real supplier of offshore drilling expertise at the time was the United States.

Up to the end of 2002, cumulative oil production on the UKCS totaled over 19 billion barrels of oil and condensates and 64 Tcf of natural gas.

Current Structure[66]

As of the end of 2002, there were 96 platforms in operation producing oil and gas from over 140 fields on the UKCS. Total production in 2002 was approximately 790 million barrels of oil and condensates and 3.8 Tcf of natural gas. Operating expenditures for 2002 were £4.6 billion while capital costs were £3.6 billion and exploration and appraisal expenditures totaled £400 million for a total of £8.6 billion ($5.7 US billion at the average exchange rate for 2002).

The UKCS has developed a considerable amount of infrastructure, including over 10,000 kilometres of oil and gas pipelines and a number of onshore terminals. Given its mature stage of development, the UK offshore is characterized by smaller fields which require innovative and cost-effective methods of development. The first fields developed were typically larger fields with good economics, however, as the industry has matured, the challenge now facing the UK industry is the economic exploitation of smaller fields.

Resource Characteristics[67]

Since 1965, the UKCS has had a very high overall exploration success rate in the 23% range. This rate of success averaged almost 25% during the 1970s and 1980s but subsequently declined in the 1990s to approximately 19%. In the late 90s and the early 2000s, however, the success rate has been increasing to over 25%, albeit with a smaller number of wells being drilled. This success rate compares quite favourably to other success rates encountered in other jurisdictions. It is this high success rate that continues to make the North Sea an attractive place to explore for hydrocarbons.

At the end of 2002, the UKCS had 4.7 billion barrels in proven reserves and when combined with probable and possible reserves, the total is 10.5 billion barrels. The gas resources at the same time totaled 22.2 trillion cubic feet (Tcf) of proven reserves with a maximum of 46.9 Tcf when probable and possible reserves are included.

Evolution of Government Policy

In the early 1960s when exploration first began, the United Kingdom had no offshore oil policies or regulations. Following the initial discoveries of gas in the Southern Basin region in 1965, the government moved to develop a licensing system and fiscal regime that both encouraged exploration and provided adequate taxation revenue for the UK

[66] United Kingdom Department of Trade and Industry, "Development of the Oil and Gas Resources of the United Kingdom" 2001.
[67] IBID

government. The UK government implemented a discretionary licensing system whereby the government allocated the blocks to prospective oil companies. The government of the day felt that by using the so-called Discretionary System, they would retain greater control over the exploration activities than they would under an auction system which relied entirely on market forces. Inherent in the Discretionary System was the ability of the government to wield influence in granting license blocks to favour companies who were more committed to a rapid exploration program and to those companies that made use of UK-based suppliers. This was the first local supplier-development feature of UK oil and gas policy. To encourage companies to aggressively explore their parcels of land, the legislation contained incentives for companies to undertake exploration activities and disincentives to sit on land holdings.

The first licenses were awarded in 1964 with the first drilling having been undertaken in late 1964. The new government of the day did a review of petroleum policy and added some criteria to the second licensing round. These criteria included consideration of the companies' contribution to the UK economy and involvement of UK companies. These criteria further strengthened the supplier-development aspect of the licensing system.

In the early 1970s, a number of factors prompted changes in British offshore policy. These environmental changes included the discovery of two massive oil fields (Forties and Brent), the OPEC oil shocks and a growing realization that British firms were not capturing a significant amount of work supplying goods and services to the ever-expanding industry. In 1973, the government acted upon a report commissioned in 1972 to examine the offshore supplies industry. In response to this report, the government enacted three measures aimed at bolstering the UK share of the offshore oil and gas supply industry. These included:

1. the establishment of the Offshore Supplies Office (OSO);[68]
2. the introduction of an auditing procedure for monitoring purchases made by oil companies; and
3. the provision of financial assistance to the UK supplies industry.

As a follow-up to these policy measures, the UK government and the United Kingdom Offshore Operators Association (UKOOA) signed a Memorandum of Understanding that formalized the auditing procedure and the concept of full and fair opportunity. It also resulted in the implementation of a code of practice that defined the procedures which operators would undertake in the tendering and contract award process. The code of practice required that operators ensured that:

---

[68] According to Cameron (1986, p.33-4) The OSO had six main objectives:

1. through the full and fair opportunity policy, to help UK firms capture as large a share of the offshore market as possible;
2. to assist operators to identify UK suppliers of offshore oil and gas equipment and support services;
3. to promote new ventures to increase UK involvement in supplying the offshore market;
4. to provide advice on joint ventures and licensing arrangements;
5. to develop the UK industry's capability to win orders on the UKCS and other markets worldwide; and
6. to assist companies in meeting their research and development requirements.

- all potential suppliers received full bid documents in English;
- specifications were to be made in accordance with industry or UK standards and that consideration were to be given to accepting equivalent standards;
- specifications were to be drawn up to not preclude UK suppliers from bidding;
- any tender amendments were to be made available promptly to all bidders;
- all bidders were to be given an equal and reasonable period of time during which to prepare bids;
- delivery requirements not be made more stringent than required;
- when a reasonable number of UK suppliers could not be identified, the operator had to consult the OSO;
- the bid documents were to require that bidders estimate the value of UK content;
- the operator were to inform the OSO of any award to be made to a non-UK firm and was to give the OSO a reasonable time to evaluate the reasons why; and
- the operators were to make available to the OSO information on upcoming tenders

The auditing procedure was undertaken by the OSO and required the oil companies to submit quarterly reports listing contracts in excess of £100,000 (£50,000 for maintenance), the successful bidder and the list of UK firms who had bid on the contract or who had been approached by the oil companies. In addition to the monitoring aspect, the OSO took an aggressive approach in following up with both oil companies and prospective UK suppliers to understand why UK firms were successful or not so that they can apply successes to other bids and to attempt to overcome any deficiencies in the UK supply capability. In the monitoring procedure, the UK share was defined as "representing the value of contracts and main sub-contracts placed with companies which make a substantial contribution to the UK economy through employment, manufacturing, or sub-contracting".

The auditing or monitoring activities were backed up by an implicit understanding that companies which were doing more to develop the UK supply industry would be looked at more favourably in future licensing rounds. In fact, as Cameron (1986, p. 49) points out there were no legal sanctions that could be imposed on companies that did not meet the assurance for local content that the UK government were expecting. However, these companies might expect difficulties in being successful in future bidding rounds. Cameron (1986, p.50) notes that Sun Oil was a case in point. It experienced problems when it used a Swedish firm to build a production vessel when a Scottish yard, according to the government, had the capability to fulfill this requirement. As reported by Cameron

(1986, p.50), the minister of state suggested that "any application from Sun Oil for an exploration license or for a future development plan will obviously be considered in light of the way they have performed over this…project." Cameron (1986, p. 51) also notes that in 1985, it is believed that Shell felt pressure to accept bids from British firms that may not have been competitive on commercial grounds.

When the United Kingdom joined the EU in the early 1990s, their ability to influence local procurement policies was diminished. As such, the government's focus has changed from promoting local content within the UK offshore oil and gas industry to helping UK companies develop export markets. Other government initiatives include sharing infrastructure and expertise, both within the UK sector and with Norway, to facilitate the efficient and economic extraction of the remaining resources in the North Sea. These initiatives are based on the understanding that the remaining resources are found in smaller fields and therefore will require cooperation and innovative approaches to ensuring that they can be economically extracted.

Supply Industry and Capture Rates[69]

Today, the UK offshore oil and gas supply industry is well developed with numerous firms involved directly in the industry. Most of these companies are located in the Aberdeen region, which has become the centre for the UK oil and gas industry. The current focus of the UK government and industry is on maximizing opportunities from the North Sea as well as the exploitation of foreign-based opportunities for UK firms. This is being undertaken through the PILOT Task Force initiative.[70] The PILOT Task Force is a joint-government industry partnership that has as its main goal the maintenance of a long-term, sustainable offshore industry in the UK. This goal is currently being achieved through a focus on cost control, the development of export markets for UK suppliers and cooperation with industry to ensure maximum utilization of the UK hydrocarbon resource.

Until the early 1990s, the OSO calculated UK supply shares through its auditing procedure of company contracts. When the EU passed its Open Market Act in the early 1990s, the UK stopped monitoring contracts for UK supply because it was in contravention to the EU rules. The last capture rates calculated in the late 1980s and early 1990s through the OSO indicate that the UK share of contacts was in the 80% range. In the early 1970s, the share was estimated at 30 to 40%. More recently, informal estimates by the United Kingdom Department of Trade and Industry (DTI) indicate that the rate is in the 60 to 70% range. Table 5 shows the capture rates achieved for selected years from 1976 to 1991 by type of activity. Notice that the local capture rates in all phases of activity have grown from 1977 to 1991.

[69] United Kingdom Department of Energy. "Development of the Oil and Gas Resources of the United Kingdom", 1988-2001

[70] More information on PILOT can be found at www.pilottaskforce.co.uk.

Table 5: Local Capture Rates for UKCS – Selected Years

Category	1977	1981	1986	1991
Exploration				
Surveying	67%	47%	83%	71%
Exploration and appraisal drilling	26%	31%	92%	76%
Subtotal - Exploration	**33%**	**32%**	**89%**	**74%**
Development				
Production platforms	63%	77%	82%	77%
Installation operations	66%	66%	77%	56%
Plant and Equipment	72%	78%	86%	82%
Submarine pipelines	16%	56%	59%	59%
Development drilling	35%	71%	92%	80%
Terminals	96%	98%	85%	85%
Subtotal - Development	**69%**	**75%**	**80%**	**75%**
Production				
Maintenance and production	33%	88%	97%	99%
Subtotal - Production	**33%**	**88%**	**97%**	**99%**
General Services				
Transportation	56%	73%	88%	77%
Diving and underwater services	49%	81%	90%	94%
Drilling tools and Equipment	57%	69%	78%	75%
Support of personnel offshore	44%	51%	67%	67%
Miscellaneous	81%	92%	91%	99%
Subtotal General Services	**56%**	**72%**	**82%**	**78%**
Grand Total	**62%**	**67%**	**82%**	**78%**

Source: United Kingdom Department of Energy. "Development of the Oil and Gas Resources of the United Kingdom", (1976-1992)

The current focus of government is to assist in the development of UK industry through the provision of financial support and by assisting with export initiatives aimed at increasing the presence of UK companies in international projects. To this end, their goal is to increase the UK share of the international oil services market from 4% to 6%.

10.4.2 Norwegian Continental Shelf

History[71]

The Norwegian offshore oil industry had its origins in 1962 when Phillips Petroleum made a proposal to the Norwegian government to explore in the Norwegian North Sea. A

[71] Norwegian Ministry of Petroleum and Energy. "Norwegian Petroleum Activity Fact Sheet", 2002.

year later, the Norwegian government, having claimed jurisdiction over its Continental Shelf, issued 10 exploration licenses. In the cautious approach that came to typify the Norwegian model, these licenses were restricted to seismic activity only. No wells were permitted until the government had a chance to understand the industry, its potential and to determine ownership of offshore resources.

Following agreements to divide the North Sea with the UK and Denmark in 1965, the government held the first licensing round shortly after. This led to the first well in the Norwegian Continental Shelf, which was spudded in 1966. Some minor discoveries were made in the early years, however it was not until December 1969 that a major discovery - Ekofisk - was made.

Since that first major discovery, the Norwegian offshore oil and gas industry has grown tremendously to become by far the dominant industry in Norway. In 2001, the Norwegian petroleum sector accounted for 23% of the country's GDP, 45% of its exports and 2% of its total investment.[72]

Current Structure[73]

Today, the Norwegian Continental Shelf is one of the world's leading petroleum producers. Norway is the sixth largest producer of crude oil and, because of its relatively small size and volume of domestic use, the second largest exporter of crude oil in the world following Saudi Arabia.

Up to the end of 2002, the Norwegian North Sea has produced over 16 billion barrels of oil, including 1.2 billion barrels in 2002. To illustrate the growth in production, the total production for Norway in 1971 is now produced in about three days. Norway is also a significant producer of natural gas, having produced and sold 2.3 Tcf in 2002. Gas is increasingly becoming more important for the Norwegian North Sea sector as sales were up 23% in 2003 and are projected to rise to 3.8 Tcf by 2010. Cumulative gas sales have totaled 25.8 Tcf since gas production began in the Norwegian North Sea in 1977.

In producing these quantities of hydrocarbon resources, Norway has built up a considerable amount of infrastructure since the mid 1960s including pipelines, onshore terminals and fabrication yards as well as considerable expertise and a supply and services industry.

Resource Characteristics[74]

After 30 years of production, the Norwegian Continental Shelf remains one of the world's best areas for oil and gas exploration. According to the United States Geological Survey (USGS), Norway ranked as the 8th most prospective area for oil and gas exploration in the world with 50 billion barrels of oil equivalent (boe) in exploration potential.

---

[72] Norwegian Ministry of Petroleum and Energy. "Norwegian Petroleum Activity Fact Sheet", 2002.
[73] Norwegian Ministry of Petroleum and Energy. "Norwegian Petroleum Activity Fact Sheet", 2002.
[74] Norwegian Ministry of Petroleum and Energy. "Norwegian Petroleum Activity Fact Sheet", 2002.

Norway's reserves and resources are summarized in Table 6 below.

Table 6: Norwegian Resource Accounts at 1 January 2003

Total recoverable potential	**Oil** (mill bbls)	**Gas** (Tcf)	**NGL** (mill bbls)	**Cond** (mill boe)
Reserve Category				
Produced	16,015	28	473	372
Remaining reserves**	8,228	75	885	819
Contingent resources in fields	1,588	7	165	76
Contingent resources in discoveries	1,071	30	120	403
Possible future measures for improved recovery*	2,520	18	-	-
Undiscovered	8,946	89	-	-
Total NCS	**38,367**	**246**	**1,643**	**1,670**

Notes
** Includes resource categories 1 (Reserves in production), 2 (Reserves with an approved plan for development and operation) and 3 (Reserves which the licensees have decided to develop).
* Resources from future IOR measures are registered at the aggregate level, and no division has been made between the various regions.
Source: Norwegian Petroleum Directorate

Between 1966 when the first well was spudded until the end of 2002, 648 exploration wells were spudded in the Norwegian Continental Shelf. Of this total, 263 yielded discoveries. This remarkable success rate of 40% by industry standards has remained relatively constant over time and has in fact risen in recent years. Between 1999 and 2003 for example, a total of 143 exploration wells were spudded with 88 showing oil, gas, condensates or a combination thereof. This consistent exploration success rate explains why the region continues to attract exploration interest. While most recent discoveries are of smaller fields, the consistently high exploration success rate bodes well for the future prospects of the Norwegian Continental Shelf.

Supporting this drilling activity has been seismic activity, which to the end of 2002 had totaled almost 7.8 million kilometres.

Evolution of Government Policy[75]

The Norwegian government was very careful and calculated in the development of its oil policies. These policies began with the establishment of a licensing system in 1965 that was similar to the British system in that it was designed to attract exploration without giving away too much state control. After the discovery of Ekofisk in late 1969, the Norwegian government worked to adjust their legislative environment to reflect the more certain geological potential that was clearly demonstrated by the Ekofisk discovery.

The same events that triggered the UK to modify their policies in the early 1970s were also at play for the Norwegian Continental Shelf. The Norwegian government based its policies on the need for state participation, which it did through Statoil and Norsk Hydro. These companies were supported by the government in various ways but all were given

[75] Lind, T. and G.A. Mackay. "Norwegian Oil Policies", 1979 and Svein S. Andersen. "The Struggle Over North Sea Oil and Gas : Government Strategies in Denmark, Britain, and Norway" 1993.

preference in licensing decisions. The intent was to give these Norwegian companies direct stakes in the development of offshore resources and thereby increasing the chances for Norwegian-based suppliers to become involved in the industry.

With respect to policies and regulations affecting the development of the Norwegian supply and service industry, they were developed following a Royal Decree in 1972. Article 54 of the Royal Decree dealt with Norwegian content and directed the government to pursue the goal of ensuring that Norwegian goods and services should have preference provided they are competitive in terms of price, quality, schedule and service.

To implement Article 54, the Norwegian government directed the Ministry of Petroleum and Energy to establish the Goods and Services office. The key functions of the Goods and Services office were to oversee the key tenets of the Norwegian policy towards developing a Norwegian oil and gas capability which included:

- co-operating closely with international oil companies to develop a domestic industry;[76]
- stimulating the local supply industry through joint ventures between large international companies and local Norwegian firms;
- encouraging R&D and technology transfer;
- establishing interventionist policies through government agencies that reviewed tendering procedures and ensuring that Norwegian companies received full and fair opportunity to bid;[77]
- establishing targets for local participation;
- providing state-owned and established oil companies with operatorships in certain oil fields and shares in others to encourage use of Norwegian suppliers;[78] and
- using strict licensing and certification standards that favoured Norwegian suppliers.[79]

---

[76] Cameron,(1986, p.81) For all contracts valued over of NOK 1m (about $120,000), the operator must inform the Ministry of the names of all companies invited to tender. The Ministry has the power to add names of Norwegian companies to the bidding lists…When the operator has decided which company is to be awarded the contract, it must inform the Ministry of its choice. In certain circumstances the Ministry can request the operator to justify its choice, and may strongly recommend that a bid from a Norwegian company be reconsidered and perhaps be slightly altered so as to make it competitive with the bid of a foreign competitor. As well, as pointed out by Ramm (2001) oil companies were told that their goods and services practices would influence their opportunities to get new licenses. This "brownie point system", as explained by Ramm (2001), was a very powerful tool that no doubt made the companies make a strong extra effort to source goods and services locally.

[77] As noted by Cameron (1986, p. 79) legislation required that tenders or inquiries for the supply of goods and services be sent to a reasonable number of Norwegian suppliers and the government had the authority to add Norwegian companies to the list and in the extreme, the government could even prohibit the award of the contract if Norwegian firms were not accorded equal treatment (see, for example, Cameron (1986, p.80).

[78] Cameron (1986, p.85) One of its (Statoil) important functions was to provide Norwegian supply firms with the opportunity to gain experience in order to compete with foreign supply firms.

[79] Cameron,(1986, p.91) The licensing and certification standards employed in the Norwegian sector are extremely demanding and inflexible…these requirements and procedures favor Norwegian suppliers and their products.

In 1994 when Norway entered the European Economic Area (EEA), Article 54 was rendered invalid and the ability of the government to undertake the measures included in the Act was curtailed.

Supply Industry[80]

The Norwegian offshore oil and gas supply industry today is a well developed industry with companies providing many of the goods and services required for offshore oil and gas development. This mature world-leading industry did not happen by accident. It was the result of a number of factors which came together to develop the Norwegian oil and gas service industry. These include:

- Norway has had a long history of maritime involvement and as such when the first oil and gas exploration activities occurred, Norway had a well established maritime industry with expertise in shipbuilding and other marine industries. This established industrial capability was critical to the evolution of the industry.

- When exploration began in the early 1960s, the offshore oil and gas industry was in its relative infancy. The Gulf of Mexico was well developed but beyond that region, there was limited offshore activity elsewhere in the world. This provided local industry with the chance to develop competencies and compete. The environmental conditions on the Norwegian Continental Shelf were also unique in the world and, as such, required the natural growth of local industry for the development of technologies from within Norway.

- Although initial wells were unsuccessful, the ultimate exploration success, consistently in excess of 40%, resulted in ongoing exploration and development activity year after year

- Early on, the Government of Norway made it a policy to develop a Norwegian-based oil and gas service industry. This included state participation in projects through the formation of Statoil, which greatly assisted Norwegian companies to develop expertise in the industry.

All of these factors contributed to the success that is the Norwegian offshore oil and gas supply and service industry that today is a world leader in many areas and is now exporting this expertise to other parts of the world. Today, the Norwegian petroleum supply industry consists of a number of world-class companies specializing in subsea development, platform construction, and mechanical engineering. In 2001, it was estimated that the Norwegian supply industry employs some 60,000 people. Most of the Norwegian petroleum services sector has historically been focused on domestic operations, however, in recent years as the Norwegian Continental Shelf has matured, the focus has been on the internationalization of the industry. In 2001, it is estimated that the

[80] Norwegian Ministry of Petroleum and Energy. "Government Policies in the Development of the Norwegian Oil Supply Industry". June 2000.

Norwegian petroleum services sector had an international turnover of 35 billion NOK (or approximately $5 billion (USD).[81]

There are not many estimates available for the local capture rate achieved by the Norwegian supplies industry. Cameron (1986) reports that the Norwegian content was in excess of 60% in the mid 1980s, while Olsen (2003) indicates that the 60% figure has been maintained since the 1980s. Another estimate for Norwegian content, provided in Roed (2003), was 68.5%, but this related to Statoil procurement only. Another reference to the level of local content was that it "at times exceeded 70%"[82] indicates that the overall level of local content would appear to be in the 65-70% range. There is no breakdown available from the secondary sources referenced in this study.

Based on a review of Norwegian expertise, it appears that they would have excelled in marine fabrication, subsea technology and the supply of consumables. The areas of exploratory drilling, engineering were initially areas of weakness, however, the government's commitment to building an industry involved encouraging relationships between foreign companies and Norwegian companies. The Norwegian government's approach also relied heavily on technology, especially in recent years. This focus on niche areas is also helping Norwegian suppliers build international markets for their goods and services. With the continuing growth in the global industry, which is projected to reach $110 billion USD by 2005,[83] the Norwegian strategy is based on developing leading-edge technology at home in specialized areas and then exporting that expertise elsewhere. The benefits from such a strategy are twofold. First, they help with the economic extraction of their own oil and gas resources through such areas as improved recovery techniques and deep water development. Secondly, they provide access to the much larger international market for oil and gas goods and services.

10.4.3 Gulf of Mexico

History[84]

The Gulf of Mexico is widely regarded as the birthplace of the modern offshore oil and gas industry as it was the location of the first offshore oil exploration and development projects in the world. With a well established onshore industry in place in neighbouring Texas, the move to the offshore was a relatively easy one and it was natural that the companies supplying the onshore oil and gas industry would move to become involved with the offshore industry.

Because they were the offshore pioneers and had an established onshore industry in place, the neighbouring Gulf of Mexico states (primarily Louisiana and Texas) became the world leaders in the offshore oil and gas industry with many of the technological

---

[81] Steensnaes, Einar, Minister of Petroleum and Energy, Government of Norway. "How to secure future growth in the NCS and support the internalization of the oil and gas industry", 2002.
[82] Hagen, Peter, Regional Director Intsok. "Norway's Experience in Developing Local Content", 2001.
[83] Steensnaes, Einar, Minister of Petroleum and Energy, Government of Norway. "Developing a sustainable oil and gas industry" (from a speech given at the Offshore Technology Conference in Houston) May 2002.
[84] Gramling, Robert. "Oil on the Edge: Offshore Development, Conflict, Gridlock", 1996.

developments having occurred there during the early stages of the industry's development in the 1930s and 1940s.

Current Structure[85]

The Gulf of Mexico today is still a leading producer of oil and gas within the United States. In recent years, exploration and development activity have moved to deep water locations where there is considerable interest in the geological potential of these previously inaccessible waters.

Today, the Gulf of Mexico offshore oil industry has over 4,000 production platforms in operation with a well developed infrastructure base that includes pipelines, fabrication yards, onshore terminals and the world's only Offshore Superport located in Louisiana.

In Louisiana alone there are over 7,600 miles of natural gas pipelines and 3,450 miles of oil pipelines. The Henry Hub located in Louisiana is the gathering place for many offshore gas pipelines and the price at this point of entry to land is used as a benchmark for North American gas prices.

As of the end of 2002, the US Gulf of Mexico had produced over 13.0 billion barrels of oil and condensates and 152 Tcf of natural gas. In 2002 alone, the region produced 1.5 million barrels per day or approximately 550 million barrels for the entire year while total annual gas production reached approximately 4.5 Tcf.

Resource Characteristics[86]

The resources of the Gulf of Mexico are still substantial. With the move to deep water since the mid-1990s, the region has been given a new lease on life, which is indicated by the extent of exploration, development and production activities that are ongoing. It is also illustrated by the most recent land sales which were held in August 2003. In that sale, 335 tracts of land were bid on generating $148 million. It should be noted that the United States uses a different bidding process than that used in Atlantic Canada whereby cash bonus bids are made with the money being paid directly to the government.

At the end of December 2002, the US Minerals Management Service (MMS) reported that remaining proved reserves were estimated at 4.9 billion barrels of oil (including condensates) and 29.8 trillion cubic feet of gas. A total of 1,050 fields were included in this analysis.

Evolution of Government Policy[87]

Given the position of the US as a world leader in offshore engineering, design, construction and supply, there has never been a need to have formal policies for developing a local supply industry. With their head start, the US industry has developed

---

[85] United States Minerals Management Service

[86] United States Minerals Management Service

[87] Cameron, Peter. "The Oil Supplies Industry: A Comparative Study of Legislative Restrictions and Their Impacts". 1986.

from within the United States. The age-old American tradition of not interfering with the private sector has also fostered the development of this industry.

The only measures that can be considered protectionist in the United States stem from environmental and other industrial standards that often preclude foreign companies from competing. Occupational Health and Safety, environmental protection, and other technical standards are examples of some of the standards than can be quite rigid and given their experience with them, US suppliers tend to have an advantage over foreign firms.

The Jones Act of 1920 is one act that is often cited as being protectionist in favour of US firms. The Jones Act requires that no vessels built outside the US or owned by non-US interests are prohibited from engaging in any offshore-related business in US waters. Given the age of the act, it was clearly not designed with the offshore oil and gas industry in mind, however, it has had the effect of limiting foreign involvement in certain sectors of the offshore oil and gas industry. It also demonstrates how the United States government uses more implicit approaches of assisting local industry as opposed to the more overt approaches used by many other jurisdictions.

Supply Industry

The supply and services industry for the oil and gas sector is well established in the Gulf of Mexico region. These activities primarily occur in Louisiana and Texas, however, there is also a significant base of offshore services provided from neighbouring Alabama and Florida.

A recent study[88] undertaken on the Louisiana economy indicates that there are over 6,000 companies identified as vendors to the offshore oil and gas industry, representing 4.3% of all businesses in Louisiana. The supply and servicing of the Gulf of Mexico offshore industry accounted for 45% of total revenues in the firms identified in this study. Furthermore, the total economic benefit of $6.0 billion to the State from the Gulf of Mexico offshore was identified, of which 80% was generated by businesses and only 20% in labour income. While there are no capture rate or local content figures available for either of the Gulf of Mexico states, it can be hypothesized that the region captures the vast majority of benefits from offshore activity, in addition to being an exporter of goods and services.

Another indicator of the extent to which the industry is concentrated in Louisiana and Texas is the membership list of the National Oceans Industries Association in the US. A review of the location of members on the membership list indicates that of the 320 members on the list, 280 (87%) of all members are located in either Texas or Louisiana with the remaining 40 members coming from 12 other states or provinces, including Alabama and Florida. The National Ocean Industries Association is an industry group representing the interests of the offshore oil and gas sector in the United States. While their membership is not a complete list of companies in the industry, it certainly provides

[88] Scott, Loren C., "The Energy Sector: Still a Giant Economic Engine for the Louisiana Economy", April 2002.

a representative sample of the industry suppliers which clearly are found predominantly in the Gulf of Mexico region.

Many of these companies are large and well established and in aggregate, they cover virtually all supply and service aspects of the offshore oil and gas industry. Because of the breadth of capability found within domestic firms, the United States offshore oil and gas supply industry can be considered self-sufficient. This is not to say that there are no foreign firms competing in the US market, rather that the US supply industry alone could accommodate virtually all goods and services required by the offshore oil and gas industry.

With a head start on every other region of the world, backed by access to capital and an open market system, the US offshore supply industry is the world leader and has been exporting this knowledge and expertise around the world in virtually every other region with offshore activity. As a result, there has been no need for formal government intervention in the industry. Rather than a formalized government-driven initiative to develop domestic expertise and capability, the industry has developed its own informal preference system. Having dealt with the same suppliers over many years, US operators will typically go back to their familiar suppliers and use the goods and services to which they have become accustomed and which serve their needs adequately.

10.4.4 Australia

History[89]

The offshore petroleum industry began in Australia in 1965 with the discovery of the first offshore field in Australian waters. Production began from this first discovery four years later in 1969. Since that time there have been over 240 significant discoveries made in Australia's six offshore basins, which are located at various parts around Australia's large coastline.

Australia also boasts a fairly significant onshore oil and gas industry. In 2000, for example, development expenditure offshore totaled almost $1.1 billion ($A) while onshore development totaled over $700 million ($A). In 2001, there were 59 offshore exploration wells drilled and 67 onshore. This blend of onshore and offshore activity has implications for the development of the industry, in particular the supply and services industry.

Resource Characteristics[90]

Australia's remaining proven reserves of oil are not as substantial compared to many other regions of the world. At the end of 2000, Australia's total commercial reserves of oil and condensate were 2.5 billion barrels and 30 Tcf of natural gas. There were another 3.8 billion in non-commercial resources and 111 Tcf in natural gas.

[89] Geoscience Australia. "Oil and Gas Resources of Australia, 2001".
[90] Geoscience Australia. "Oil and Gas Resources of Australia, 2001".

Current Structure[91]

Oil and gas production offshore Australia occurs on over 50 producing platforms which in aggregate produced 716,000 barrels of oil and condensate per day (260 million for the year) and 3.5 Bcf of natural gas per day (1.3 Tcf for the year) in 2001. Total expenditure in the Australian offshore totaled ($A)1.8 billion in 2000, including $740 million on exploration and $1.09 billion on production and development.

Evolution of Government Policy[92]

Australia has no local content policy in place. The Petroleum regulations specifically state that there is no local preference policy. Rather, operators are encouraged to use Australian suppliers and manufacturers to the greatest extent possible. The policy is based on the belief that in the long run, the development of a competitive local supply industry benefits both project operators and local industry. As stated in the "Offshore Petroleum Guidelines for Grant of a Production License and Grant of an Infrastructure License" under Section 4.0 Role of Government:

> *4.3 There are no government mandates on local content requirements. However, the Commonwealth, States and Territories signed the Australian Industry Participation Framework on 27 April 2001. The central objective of the Framework is to provide Australian industry with full, fair and reasonable opportunity to participate in major investment projects. Further information on the Framework is available at http://www.aip.gov.au .*

As such, Australia uses a soft approach to encourage local participation in large resource projects, including oil and gas (no distinction is made for offshore oil and gas projects). To assist in the process of encouraging the use of local suppliers, the federal and state governments of Australia established the Industrial Supplies Office (ISO) in 1984. The ISO is an independent agency funded by the state and federal governments that acts as a facilitator for both project developers and local industry.

The idea for the ISO was generated from the UK model of the Offshore Supplies Office, however, it did not use implicit threats regarding future licensing decisions as were used in the UK. Instead, the ISO uses softer approaches such as providing information on Australian suppliers to project operators, assisting Australian firms to identify opportunities, encouraging local companies to form joint ventures and other licensing opportunities to make them more competitive and assisting Australian companies with the tendering process.

Since a 1989 report entitled "Sea of Lost Opportunities" was produced by the Standing Committee of Australia's House of Representatives, there has been considerable debate in Australia over the level of government involvement to encourage local content, the methodology used to calculate local content, the roles of the federal and state governments and the monitoring of local content.

---

[91] Geoscience Australia. "Oil and Gas Resources of Australia, 2001".

[92] Government of Australia, Department of Industry, Tourism and Resources. "Offshore Petroleum Guidelines for Grant of a Production License and Grant of an Infrastructure License". May 2002

The definition of local content, even after many years of debate and reports, remains an elusive and undefined concept for the Australian government. Add to this the fact that the operators provide estimates which are rarely monitored by the government, and it is becomes very difficult to assess the level of local content, both over time and by expenditure type. Another difficulty in determining local content is that there is no standard measurement applicable across the entire country.

A more recent example of the Australian governments' policies towards fostering local industrial development is the Australian Industry Participation Framework (AIPF). This framework articulates government policies and strategic directions towards enhancing the level of participation of Australian industry in large investment projects. Agreed to by all state governments in 2001, the AIPF lists a number of guiding principles, including the principle of Full, Fair and Reasonable Opportunity. This principle differs from the more common principle of "full and fair opportunity". The term Reasonable is different from that used in Atlantic Canada and it refers to the principle of ensuring that "tenders are free from non-market burdens that might rule out Australian industry and are structured in such a way as to provide Australian industries the opportunity to participate in investment projects".

Supply Industry

On the surface, this soft model appears to be effective in that the Australian offshore oil and gas industry is growing with a number of projects being developed. The extent to which this can be attributed to the resource characteristics, stable government policies or the competitiveness of the local industry is debatable. However, it does appear that Australian firms are acquiring a reasonable amount of work related to their offshore oil and gas projects. It also appears to be effective given that according to the US Department of Commerce in its market assessment report on the Australian Oil and Gas Field Equipment market, local content ranges from 30 to 50% for FPSOs, 60 to 74% for large projects and 80% for smaller projects[93].

The Australian Department of Industry, Science and Tourism (DIST) estimated that Australian content for the North West Shelf Project (one of the largest projects in Australia that had three phases totaling over $AU7 billion) totaled 70% but that they fell to 35% for the FPSO phase of the project. As stated previously, with no formal standard mechanisms in place to monitor local content, there is no consistent data indicating what the capture rates are and how they have evolved over time.

10.4.5 Denmark[94]

History

Denmark was unique in the North Sea environment in that it awarded an exclusive license to a single company with minimal regulatory requirements. This led to the development of the Dutch Underground Consortium (DUC) as the exclusive developer of

[93] US Department of Commerce Market Assessment Report 1998.
[94] Danish Energy Authority. "Oil and Gas Production in Denmark 2002." May 2003.

offshore resources in the Danish North Sea. Exploration in the Danish North Sea began in 1965 with the first well drilled offshore. Production began in 1972 from the Dan field, which is still in production in 2003. Danish production generally lagged that of both the UK and Norwegian sectors. This was due to a combination of factors including resource potential, and in part to the lack of a formal energy policy and the provision of the entire license to a single company. The system was reformed in the early 1980s when an agreement was reached with DUC to open up certain areas of the Danish North Sea to exploration by other companies.

Current Structure
At the end of 2002, there were 17 fields in production in the Danish offshore, producing 135 million barrels of crude oil and 404 billion cubic feet of natural gas annually. Cumulative production to the end of 2002 has totaled 1.3 billion barrels of oil and condensates and 4.8 Tcf of natural gas. This places Denmark well below most of the other jurisdictions identified in this report.

Resource Characteristics
At the end of 2002, total reserves in the Danish offshore were estimated at 1.8 billion barrels of oil and 4.8 Tcf of natural gas.

Evolution of Government Policy
Government policy and regulations are developed and enforced by the Danish Energy Administration (DEA). The DEA has no local preference or purchasing policies in place and is, according the US Department of Commerce "among the most open and transparent markets in the world". In the beginning of the industry, much of the work was performed locally, however, as Denmark's economy evolved within the EU, import restrictions and local preference policies became irrelevant. Larger platforms and structures are usually supplied by European companies while Danish suppliers have become competent suppliers in services and as suppliers of small to medium sized structures and equipment.

Supply Industry
The DEA does not calculate capture rates or levels of local involvement in the industry and as such no data is available. The Danish industry's strengths are related to the supply of services, smaller equipment and general materials and supplies.

10.4.6 Brazil[95]

History
The history of Brazil's oil and gas industry cannot be discussed without looking at the history of the state-owned oil monopoly - Petrobras. Petrobras was formed in 1953 when the government enacted a national petroleum policy, including the formation of a state-owned national oil company. Petrobras was granted exploration and production licenses throughout the entire country. The company was also responsible for refining, transportation and distribution.

[95] Government of Brazil National Petroleum Agency.

The offshore oil industry began in the late 1960's when exploration for hydrocarbons off the coast of Brazil resulted in the discovery of the Guaricema field. In 1974, after 20 small-to-medium sized discoveries had been made, the discovery of the Garoupa field in the Campos Basin accelerated Petrobras' offshore activity and started the development of Brazil's offshore oil and gas industry when production from the Enchova field began in 1977. Since that time, Brazil's offshore oil and gas industry has continued to grow. The most important feature of the Brazilian offshore sector is the deep-water and ultra deep-water drilling and production capability that they have developed. Initial deep-water technology was developed with international expertise, however, since that time, Petrobras has become a world leader in deep-water drilling. In 1999, Petrobras achieved what was then a new deep-water record with production from its Roncador field at depths in excess of 1,850 metres

Current Structure

Brazil's oil and gas industry was significantly changed in 1997 when the government opened up the state monopoly held by Petrobras and allowed foreign companies to explore for and develop the country's oil and gas resources through the sale of exploration blocks. As part of the country's reforms, the National Petroleum Agency (ANP) was established in 1998 to regulate petroleum activity in the country.

Today, Brazil produces approximately 1.5 million barrels of oil and 44 million cubic metres of natural gas per day (550 million and 0.6 Tcf annually) and is the 15th leading oil producer in the world. The Brazilian offshore has about 100 producing platforms, most of which are in the Campos Basin and many are deep-water reserves up to 1,800 metres, which account for 80% of Brazil's offshore production.

Petrobras has an aggressive investment program in place and expects to spend almost $7 billion ($US) annually between 2002 and 2007 to increase production to 1.8 million barrels per day. Half of this projected expenditure will be on downstream and the remainder on upstream investments. In other words, not all of this investment was directed at increased production; half of it went to refineries, pipelines, etc.

Petrobras remains the predominant player in the Brazilian industry, despite the opening up of the industry in 1997. Petrobras is capitalizing on its deepwater experience and has operations in a number of other countries, including Nigeria, Argentina, Columbia and the United States.

Since the 1997 opening up of the market, about 50 international oil companies have entered the Brazilian market through the five licensing rounds which have been held. The first major amount of production from an international oil company began in August 2003 when Shell Oil's Bijupira-Salema field began production.

Resource Characteristics

Brazil's offshore resources are significant with total proved oil reserves of approximately 8.5 billion barrels of oil at the end of 2002, most of which is held by Petrobras. Brazil also has proved natural gas reserves of 8.1 Tcf at the end of 2002

Evolution of Government Policy[96]

The Brazilian government has maintained a very active role in the overall development of the Brazilian oil and gas industry ever since the industry's inception in the early 1950s and the nationalization of the industry through the formation of Petrobras. In 1997, the industry was opened up to foreign oil companies and through land sales. The most recent land auction (Round 5), held in August 2003 generated the least level of interest of any of the four previous rounds with only six companies submitting bids. This compares to an average of 37 companies having bid in the previous four rounds. This has been attributed to a change in the structure of the auctions. One change involved smaller parcels of land - an initiative designed to open up bidding to smaller local oil companies, however, this may have also made them less attractive to the large international players. A second change related to an increase in local content requirements to a minimum 30% Brazilian content for offshore projects and 70% for onshore. Another important change was the increase in the weight attributed to local content from 15% to 40%. The local content commitment that won concessions in the fifth round of licensing are displayed in Table 7.

Table 7: Local Content Commitments – Brazil's Fifth Licensing Round[97]

Category	Deep Water	Shallow Water	Onshore
Geological & geophysical analysis	100%	78%	92%
Drilling	30%	55%	88%
Development – Engineering	90%	89%	97%
Development – drilling, platforms & risers	50%	55%	88%

Supply Industry[98]

The Brazilian offshore oil and gas supply industry has been protected by the Brazilian government and Petrobras for many years. With the 1997 reforms and the establishment of the ANP, the responsibility for ensuring local benefits has fallen to the ANP. In the initial licensing rounds, the ANP used the bidder's commitment to local content in the award decision. The weight attached to the percentage of commitment for the purchase of local goods and services for exploration and development (the local content) was 15% with the remaining 85% weight attributed to the bonus price offered for each concession.[99] There was a minimum requirement for exploration and development of 30% for offshore and 70% for onshore.[100]

With the recent election of a socialist government, there is a growing trend in Brazil to increase local content for offshore oil and gas development projects. In the spring of 2003, bids for two deepwater production platforms were cancelled because, after a review by ANP, it was determined that Brazilian-based shipyards did have the technical capability to design and build the platforms. The contracts were re-tendered and

[96] Petroleumworld.com. "Brazil ANP: 13 bidders have applied for August oil ESP. round". June 10, 2003.

[97] Alexander's Gas and Oil Connection, September 19, 2003.

[98] Offshore Engineer. "Petrobras renegotiates the political tightrope". March 25, 2003.

[99] Silva and de Almeida (2002).

[100] Latin America Oil and Gas Newsletter, March 27, 2003.

minimum local content requirements were added which required that 75% of electrical energy generation modules were to be performed in Brazil and 60% for structural engineering work. Exemptions were made for other project components that are not manufactured in Brazil, including turbines and motor compressors.

Interestingly, these local content provisions did seem to have the desired effect of increasing local content. For example, Norwegian and Singapore engineering companies acquired an interest or a larger interest in Brazilian shipyards as a result of this policy[101] and British and American companies set up businesses in Brazil as a result of the local content requirements.[102]

10.4.7 Nigeria

History

Nigeria's oil and gas industry began in the 1930s when Royal/Dutch Shell began exploration in Nigeria's onshore areas, primarily in the Niger Delta region. Production began in 1958 at 5,100 barrels per day. Other fields were subsequently discovered and developed over the following years such that by 1972, Nigeria was producing 2 million barrels per day and had become one of the world's major oil producers.

Until the early 1990's, virtually all of Nigeria's oil production had come from onshore and shallow water sites. In 1993, the government offered land concessions in offshore waters for the first time. Two years later, Shell discovered the massive Bonga Field which could contain upwards of 1 billion barrels of oil. This discovery led to a move from onshore to offshore operations in Nigeria. This move was also fuelled by growing levels of violence at oil production facilities onshore. This violence has been brought on by a feeling of disenchantment by the vast majority of Nigerians who feel that they have not participated in the economic benefits of oil production. The violent activities include takeover of oil production facilities and abductions, which at some times resulted in a one-third reduction in output.

Current Structure

Today, Nigeria's focus is on its offshore producing regions, including deepwater resources such as Shell's Bonga project which is currently under development. Daily production in Nigeria is limited by its OPEC quota (Nigeria joined OPEC in the early 1970s) which averaged 2.0 million barrels per day in 2002 (740 million total for 2002). Oil revenues account for up to 95% of the country's foreign exchange revenue and 50% of its GDP so it is clearly very important to the overall economic well-being of the country.

Resource Characteristics

Nigeria has total reserves of 25-30 billion barrels contained within 250 fields, of which 120 are in production. With the move offshore, the government is targeting to increase these reserves to 40 billion barrels by 2010. Nigeria's natural gas reserves are currently

[101] Latin America Oil and Gas Newsletter, March 12, 2003.
[102] Business News Americas, October 13, 2003.

estimated at up to 120 Tcf (45 Tcf recoverable) making its natural gas reserves the 9th largest in the world.

Evolution of Government Policy[103]

The Nigerian National Oil Corporation (NNOC) was established in 1971 as part of Nigeria's responsibilities that it acquired when joining OPEC in that same year. In its initial years, the NNPC had little control over the activities of the major oil companies operating in the country. In 1977, the government of Nigeria replaced the NNOC with the Nigerian National Petroleum Corporation (NNPC) and empowered the new entity to take equity shares in Nigeria's oil projects. By 1979, the NNPC had purchased 60% of the equity In most of the country's oil projects. Until the late 1990's, however the state role was limited to its equity stake and its royalty payments. No attention was placed on increasing local supply content or generating other benefits for the Nigerian economy beyond the royalty payments. This situation, coupled with an undeveloped infrastructure base and an immature supply industry, resulted in very little spin-off benefits for Nigerian suppliers.

Supply Industry

Historically, Nigeria's oil and gas supply industry has received a very small share of benefits from oil and gas expenditures made in the country. Speaking at a conference in the spring of 2001, the Group Managing Director of the NNPC said that Nigerian companies received less than 5% of the $3 billion annual expenditures made by oil companies operating in Nigeria.[104] As well, Chevron Nigeria expected this to rise to 90% by 2007.[105]

With a growing sense that his level of local benefits was not reasonable, the new government of Nigeria (elected in 1999) has moved to increase this share significantly and is targeting the massive offshore projects currently in development as the vehicle for achieving improved local content. One initiative aimed at increasing local content was the establishment of the Local Business Development/Global Procurement Unit by Chevron Nigeria Ltd. and the NNPC. This initiative included activities relating to the actual award of contracts to Nigerian firms, the farming out of oil fields to local Nigerian oil companies, facilitating technology transfer and holding Local Content Development fairs. The results indicate success as Chevron Nigeria increased its local Nigerian content from 25% in 1997 to 82% by 2001.[106] The differences in the local content participation figures (5% up to 2000) and 82% for Chevron's expenditures in 2001 highlight the lack of monitoring and standard definitions for measuring local content in Nigeria. It also reflects the new commitment to local content that has been initiated since 1999. With no set definition of local content, the figures presented by different parties can be vary considerably as illustrated by the differences in the two examples illustrated above.

---

[103] Ikein, Augustine A. "The impact of oil on a developing country: The case for Nigeria." 1990.

[104] Alexander's Oil and Gas Connections, Vol 6, Issue 9. "Less than 5% is invested in local content in Nigeria by oil companies". May 8, 2001.

[105] Alexander's Gas and Oil Connection, Vol. 7, #19, October 1, 2002.

[106] American Petroleum Institute. "Local Content Development". 2001

Another recent initiative to encourage local content development is the establishment of the Onne Oil and Gas Free Zone in 1997. Its main tax benefit includes exemptions from import duties, however, it is more important in that it is becoming a base for infrastructure, which has been notoriously lacking in the impoverished country. Given the government's new commitment to local content, international oil companies and supply companies are realizing the benefits and are establishing operations in this strategically located area. Since its inception, over 80 companies have located in the area and a cluster of expertise is developing, in addition to thousands of job opportunities for local residents.

More recently, in 2003, Chevron Nigeria announced that it is undertaking three projects with the NNPC, including the development of the deepwater Agbami field. To meet its local content targets, Chevron has taken some extraordinary measures including bringing in up to ten companies from around the world to review the feasibility of establishing fabrication yards in Nigeria. Additionally, Chevron Nigeria has indicated that it will relocate its deepwater activities from Houston to Nigeria. Finally, the company has also included in its tender documents the requirement for local content, which will be factored into contract award decisions[107].

For the industry as a whole, the government of Nigeria has set a local content target of 50% by 2005 and 25% for 2003. By 2003, the local content was 30% but US companies were establishing fabrication yards in Nigeria as a result of the local content rules[108] and it was felt that this policy was already paying off.[109]

10.4.8 Malaysia

History

Malaysia's offshore oil and gas industry began in the 1950s. The industry started to focus its efforts offshore after numerous years of limited success exploring onshore. In 1954 the first seismic surveys were undertaken and in 1962, the first offshore oil discoveries were made. These were followed by a number of other discoveries, most notably several large gas discoveries.

Current Structure

In 2002, Malaysia's crude oil and condensate production averaged approximately 800,000 bbls/day or 250 million barrels for the entire year. Annual gas production has grown considerably in recent years, reaching 2.1 Tcf in 2002.[110] There are currently 47 oil and 11 gas fields under production in the Malaysian offshore with several additional fields under development.[111]

---

[107] Oduniyi, Mike. "Chevron begins Development of $2,5b Agbami Field". www.thisdayonline.com
[108] Thisdayonline, August 8, 2003.
[109] Alexander's Gas and Oil Connections, Vol 7, #21, November 7, 2001.
[110] Energy Information Administration. "Country Analysis Briefs: Malaysia". November 2003.
[111] Thong and Kay Hian. "Oil and gas sector: Malaysia". July 2003

Resource Characteristics
Malaysia's proven oil reserves were 3.4 billion barrels at the end of 2002 with another 89 Tcf of natural gas remaining in proven reserves. All reserves included to date have been discovered in the Continental Shelf. Over the past few years, deepwater exploration has increased and some potentially significant finds have been recently announced. In August 2003, Murphy Oil announced a major discovery that has the potential to increase Malaysia's oil reserves by up to 15%. This find has triggered a shift to deepwater where additional resources are expected to be discovered.

Evolution of Government Policy
Prior to 1974, oil companies were operating in Malaysia under a concession system in which the government made land available to oil companies in return for royalties. Under this system, the government had very little control over the industry and the companies operated as they wished. In 1974, following the first OPEC oil shocks, a renewed sense of nationalism arose in Malaysia (and other oil producing countries) and the government responded by bringing in the Petroleum Development Act (1974). Under this act, the Malaysian government formed its own wholly owned national oil company - Petronas - and gave it full ownership and rights to all lands in Malaysia, both onshore and offshore, for oil exploration and development. As a result, Petronas has an ownership interest in all offshore developments in Malaysia.

Ever since its inception in the mid 1970's, Petronas has made use of production-sharing contracts (PSCs). PSCs are agreements entered into with international oil companies to undertake exploration, development and production activities in partnership with Petronas. The current system for negotiating PSCs is based on the "revenue over cost" (R/C) concept. The R/C concept is designed to encourage additional investment in upstream activities and allows the oil companies to accelerate their cost recovery if they perform within certain cost targets. In other words, the system provides the oil companies with a higher share of profits when the profitability is low and a lower share when the profitability is high. To date, Petronas has signed over 60 PSCs with its own exploration and production (E&P) subsidiary as well as major international oil companies and smaller independent oil companies such as Murphy Oil.

Supply Industry and Capture Rates
Malaysia's oil and gas supply industry has been developing for over 30 years and has been nurtured by an active government. The objectives of Malaysia's oil and gas policy were straightforward: to maximize local benefits through the development of local capabilities and an industrial base to support the growing offshore oil and gas industry. The main vehicle for developing the industry has been Petronas - the state-owned national oil company. Local supplier development was encouraged through the use of a licensing system whereby in order to become a registered bidder for any oil and gas supply activity, companies had to register with Petronas. Prerequisites to obtaining a license included:

- establishment of an incorporated business in Malaysia with sufficient local equity participation to the satisfaction of Petronas;

- agreement to observe official guidelines regarding management, employment and the use of local resources; and
- agreement to acquire all materials and supplies locally and if not available locally, to purchase them directly from the manufacturer

Local content was also encouraged through the PSC agreements formed between Petronas and the oil companies. As part of the PSC agreements, oil companies are required to purchase goods and services locally to the maximum extent possible. Finally, Petronas also required that all contracts valued over a pre-determined amount (RM 150,000 or approximately $50,000) required the approval of Petronas before being awarded outside the country.[112]

As a result of the aggressive government role in the development of the country's offshore resources, Malaysia has developed a considerable supply industry that supplies not only Malaysian needs but also competes for projects elsewhere in the world. Malaysia Shipyard and Engineering, Sabah Shipyard, Penang Shipbuilding and Construction and others are some of the larger players that have developed expertise as a result of servicing Malaysia's offshore oil and gas industry.

10.5 Local Content in Other Jurisdictions

In addition to the jurisdictions discussed above, many other oil and gas jurisdiction have had local content policies directed at their oil and gas industry. Some of these are listed below:

10.5.1 Trinidad and Tobago

The Government of Trinidad and Tobago have stated publicly that it will institute measures to ensure that a significant portion of capital expenditure for investment in the energy sector is channeled into the local economy.[113]

10.5.2 Iran

Foreign contractors are obliged by law to utilize Iranian subcontractors for their projects. This policy appear to be successful in that the level of local content has been pushed up from 30% in 1998 to 40% in 2000, and 51% in 2001.[114] In addition, the Ministry of Petroleum has put emphasis on capacity building in local industries by obliging foreign companies involved in subcontracting and equipment manufacturing to transfer their technologies to their Iranian partners.

[112] Cameron (1986).
[113] Williams (2003) speech
[114] Khajehpour (2002)

10.5.3 Venezuela

The Government of Venezuela has stated that it wants national companies to supply as much as possible of the equipment needed for the Platforma Deltana project. It is thought that as much as 65 percent of the material used could be sourced in Venezuela.[115] As well, the local preference policy in Venezuela has been ongoing for some time. For example, Cameron (1986, p.224) that in the mid 1980s the government policy was to discriminate firmly in favour of local contractors whenever this was possible.

10.5.4 Indonesia

The Indonesian Government, as noted in Cameron (1986, p. 195), actively encouraged the local oil-related industry and the preferential or mandatory sourcing of certain goods and services locally. It was their policy that to the maximum extent, all procurement was to come from Indonesian sources and where import were required, they had to be purchased through Indonesian agents.

10.5.5 Argentina

As explained in Cameron (1986, p. 222), the policy of the Government of Argentina was to maximize domestic content and to increase local capability. In order to achieve this, suppliers are required to operate through a local company or joint venture and to incorporate local contractors and suppliers to the maximum extent.

10.5.6 Mexico

Mexico's state oil company, Pemex, had a policy of not purchasing goods and services from abroad if they were available from local firms. However, if there were no local firms, Pemex would favour companies that had established, or intend to establish, joint ventures with local Mexican firms and which produced goods and services that were manufactured or assembled (to some extent) in Mexico.[116]

10.6 Comparative Analysis Summary

As the preceding jurisdictional summaries have illustrated, the approach taken by the various jurisdictions to developing a domestic offshore oil and gas supply industry have been as varied as the resources upon which each region's industry has been built. These approaches range from the cautious, interventionist approach taken by the Norwegians which relied heavily on state intervention and ownership through state-owned oil companies to the Australian model approach in which the government specifically states in its regulations that there is no local content policy in place.

[115] tradepartners.gov.uk
[116] Cameron (1986, p.224).

The differences in approaches stem from a number of factors, including: the relative size of the resource base, the philosophical underpinnings of the governments in question, and the size, the time when the industry began, and nature of the domestic economy.

In terms of calculating "capture rates", there appears to be no standard procedures across jurisdictions for doing so and few of the jurisdictions reviewed employ a rigorous system for tracking the level of local content. The reasons for this have varied from the UK, which used to do so, however, since joining the EU, they are no longer permitted to do so, to the US system which by its very nature and size captures virtually all of its expenditures in the domestic US market.

A summary of the findings from the analysis is provided below in Table 8.

Table 8: Summary of Jurisdictional Analysis

Country/ Population/ GDP/ Per Capita GDP	1st Offshore Well	1st Offshore Production	Reserves Oil (B bbls) Gas (Tcf)	Annual and Cumulative Production Oil (M bbls) Gas (Tcf)	Annual Expenditure (billions $US)	Benefits Capture/Local Content Discussion
UK 60 million $1,520 billion $25,300	1964	1975 (oil) 1968 (gas)	End 2002: 10.5 (oil) 46.9 (gas)	Yr: 2002: 770 (oil) 3.8 (gas) Cumulative: 19,100 (oil) 64.3 (gas)	Yr: 2002 £4.6 (opex) £3.6 (capex) £0.4 (expl) $US $3.1 (opex) $2.4 (capex) $0.3 (expl)	- Monitoring procedure established in mid 1970s and remained in place until 1992 - Voluntary agreement reached with operators to monitor contracts for UK content - All contracts over £100,000 (£50,000 for maintenance contracts) were monitored for local content. - Implicit threats that non-use of UK suppliers would negatively affect awards in future licensing rounds - Grew from 30% range in early 1970s to 80% in early 1990s - No formal local content calculations since early 1990s after UK joined EU - Informal estimates place it at 70% currently - Full and fair opportunity concept originated in UK - UK model also used the Offshore Supplies Office (OSO) to provide monitoring and also to assist UK industry, acting in an advocacy role - Current government focus is on building export markets for UK goods and services

Country/ Population/ GDP/ Per Capita GDP	1st Offshore Well	1st Offshore Production	Reserves Oil (B bbls) Gas (Tcf)	Annual and Cumulative Production Oil (M bbls) Gas (Tcf)	Annual Expenditure (billions $US)	Benefits Capture/Local Content Discussion
Norway 4.5 million $143 billion $31,600	1966	1971 (oil) 1977 (gas)	End 2002: 22.3 (oil, including 8.9 classified as undiscovered) 218 (gas, including 89 classified as undiscovered)	Yr: 2002: 1,200 (oil) 2.3 (gas) Cumulative: 16,300 (oil) 25.8 (gas)	Yr: 2002 NOK30 (opex) NOK60 (capex) $US $3.8 (opex) $7.6 (capex)	- Since early-mid 1980s, Nor content in excess of 60% and has at times exceeded 80% - Initial focus of Norwegian government in 1960s and 70s on developing a local industry - One of the Nor govt's main vehicles was the use of state-owned oil companies with ownership in fields to assist Norwegian industry - Open, transparent and consistent local content regulations - Encouragement of cooperation between international oil companies and suppliers with Norwegian firms to develop local capabilities through technology and skills transfer - Nor govt took an interventionist approach through a direct role in contract monitoring. - All contracts over NOK 1 million were vetted through govt, who maintained power to add Nor suppliers to bid list - As in UK, commitment to local content was used in evaluating future licensing decisions - Use of Norwegian standards and certifications used to encourage local suppliers - Leveraged their long maritime history to adapt to offshore oil and gas industry - Current focus of govt efforts is on international expansion of Nor supply industry - Focus on technology and niche fields where specialized expertise can be developed (e.g. subsea)
United States Gulf of Mexico 290 million $10,400 billion $37,600	1947	1947 (oil) 1951 (gas)	End 2002: 4.9 (oil) 29.8 (gas) Note: 4.4 (oil) and 25 (gas) of proven gas reserves are located in deepwater	2002: 552 (oil) 4.5 (gas) Cumulative: 13,000 (oil) 152 (gas)	NA	- No information available on local capture rates - Local content measurement a redundant exercise given the dominance of US in global industry - First area for offshore exploration and development gave the US a technical lead in the field, which continues to this day - In typical US manner, no explicit local preference policies - US standards and other implicit measures such as the continued use of traditional US suppliers may serve as barriers - Houston is the world headquarters for the offshore oil and gas industry

Country/ Population/ GDP/ Per Capita GDP	1st Offshore Well	1st Offshore Production	Reserves Oil (B bbls) Gas (Tcf)	Annual and Cumulative Production Oil (M bbls) Gas (Tcf)	Annual Expenditure (billions $US)	Benefits Capture/Local Content Discussion
Australia 20 million $528 billion $27,000	1965	1969 (oil) 1969 (gas)	End 2000: 2.5 (oil) 30 (gas)	2000: 261 (oil) 1.3 (gas) Cumulative:	Yr: 2000: $AU740 (expl) $AU160 (capex) $AU930 (opex) $AU1,830 (total) $US $430 (expl) $90 (capex) $540 (opex) $1,060 (total)	- No standardized benefits capture measuring and monitoring - Estimates range from 30% for FPSOs to 80% for smaller projects - Considerable debate since a 1989 report and an updated 1998 report on the Australian govt's policies regarding local content development - In 2001, all AU govts (state and federal) agreed to the Australian Industry Participation Framework (AIPF), including a commitment to "Full, fair and reasonable" opportunity for AU suppliers but no mandated levels of local content and no use of local content history in awarding licenses - Policy driven by belief that industry participation is best left with the private sector - Govt focus has been on advocacy and assisting Australian businesses through intermediary activities through the Industrial Supplies Office, assisting with the identification of opportunities and generally supporting Australian capabilities
Denmark 5.4 million $156 billion $29,000	1965	1972 (oil) 1972 (gas)	End 2002: 1.8 (oil) 4.8 (gas)	2002: 135 (oil) 0.4 (gas) Cumulative: 1,330 (oil) 4.8 (gas)	Yr: 2002: DKK965 (expl) DKK5,500 (capex) DKK2,730 (opex) DKK9,195 (total) $US $120 (expl) $700 (capex) $350 (opex) $1,170 (total)	- No figures available on Danish share of supply industry - Danish suppliers strong in supplying and servicing to small to medium size structures with strength in services - Most large structures built elsewhere in Europe - No formal government policy on local content - US Dept of Commerce calls the Danish offshore petroleum market as one of the most open and transparent markets in the world - Given relatively small size of offshore sector compared to other offshore producing nations, it would be more difficult for Danish firms to gain expertise from their own operations.

Country/ Population/ GDP/ Per Capita GDP	1st Offshore Well	1st Offshore Production	Reserves Oil (B bbls) Gas (Tcf)	Annual and Cumulative Production Oil (M bbls) Gas (Tcf)	Annual Expenditure (billions $US)	Benefits Capture/Local Content Discussion

Brazil
183 million
$1,340 billion
$7,600
	1968	1977 (oil)	End 2002:
			8.5 (oil)
			8.1 (gas)
				2002:
				548 (oil)
				0.6 (gas)
				Cumulative:
				NA
					NA	- Brazilian national oil company - Petrobras - has heavy influence on industry through direct involvement in all field developments
						- Petrobras' monopoly removed in 1997 when offshore acreage opened to competitive bidding
						- Goal was to increase international presence and to encourage small independent local firms. However, Petrobras remains dominant player despite opening up of market and has won most licenses.
						- Since election of socialist government in 2002, local content requirements increased
						- New rules established in 2003 for latest licensing round (Round 5) increased local content requirements to 30% for offshore projects and greater weight placed on local content in evaluating bids. Round 5 was not well taken up due to a variety of factors, some of which may have been the increased local content requirements.
						- Foreign bidders required to have a legal representative in Brazil.
						- In 2003 two contracts which had been awarded for production platforms were cancelled by the govt due to insufficient local content.
						- Import duty of 18% on imported oil production equipment imposed in June 2003.
						- Recent contract for construction of the P-53 production platform has a mandated 65-75% local content
						- Avg local content commitments in Round 5 licensing (Aug 2003):
						  - Exploration 78-100%
						  - Drilling 30-55%
						  - Development 50-90%

Country/ Population/ GDP/ Per Capita GDP	1st Offshore Well	1st Offshore Production	Reserves Oil (B bbls) Gas (Tcf)	Annual and Cumulative Production Oil (M bbls) Gas (Tcf)	Annual Expenditure (billions $US)	Benefits Capture/Local Content Discussion

Nigeria
136 million
$106 billion
$815
		1958 (oil)
		1976 (gas)
			End 2000:
			27.0 (oil)
			120 (gas)
				2002:
				740 (oil)
				0.6 (gas)
				Cumulative:
				NA
					NA	- Member of OPEC since 1971
						- Govt formed the Nigerian National Petroleum Corp in 1977, which holds 57% stake in upstream sector and operates through Production Sharing Contracts with international oil companies
						- In a 2001 speech, Group Managing Director of NNPC said that Nigeria was only receiving 5% local content
						- Recent efforts to improve local content with goal to reach 50% by 2005
						- Initiatives to increase foreign content in recent years:
						  - Establishment of a Free Trade Zone which is becoming a hub of offshore suppliers and service providers
						  - Encouraging JVs with local firms and international suppliers
						  - Reviewing feasibility of building fabrication yards and other key infrastructure
						  - New guidelines in 2003 require that companies bidding on Nigerian contracts must demonstrate 40% local content
						  - As of Jan/04, technical evaluation of oil projects must be carried out in Nigeria
						- Chevron is in a JV with NNPC to develop the massive 1 billion bbl Agbami deepwater field; Govt appears to be using the massive resource potential of the region's deep water resources to leverage increased local content commitments and are apparently being successful in doing so.

Country/ Population/ GDP/ Per Capita GDP	1st Offshore Well	1st Offshore Production	Reserves Oil (B bbls) Gas (Tcf)	Annual and Cumulative Production Oil (M bbls) Gas (Tcf)	Annual Expenditure (billions $US)	Benefits Capture/Local Content Discussion
Malaysia 23 million $200 billion $8,800	Late 1950s	1962 (oil) 1983 (gas)	End 2002: 3.4 (oil) 89.0 (gas)	Yr: 2002: 290 (oil) 2.1 (gas) Cumulative: NA	Yr: 2001/02: RM 8.46B (upstream) $US $2.2 billion	- No local content figures available - General strength in shipyards which are globally competitive - 30 years experience provides Malaysia with a mature supply industry - New developments in deep water will require expertise not currently available in Malaysia - In 1974, Malaysia govt vested ownership of all petroleum resources to Petronas, the national oil company, which is wholly owned by the Govt of Malaysia - Govt actively encourages local participation through the operations of Petronas - Petronas enters into Production Sharing Contracts (PSCs) with international oil companies - Govt goals are to encourage fabrication, manufacturing and services locally and to strengthen local capabilities - All contracts above RM 150,000 require Petronas approval of both tender documents and on tender selection - Some sectors of supply market are practically closed to foreign companies - Companies selling to oil and gas industry need a license from Petronas and are required to have a Malaysian presence

Notes:

All figures in $US unless otherwise noted

11. Conclusion and Recommendations

The summary and conclusion presented below are structured along the lines of the discussion provided in the text of the paper. The recommendations are provided at the end of the summary. Overall, the above research demonstrates that the oil and gas sector has had a significant and substantial impact on the Atlantic Canadian economy. It points out ways to improve the reporting and monitoring of local benefits.

Benefits

There are numerous benefits that Atlantic Canada has received through the exploitation of its offshore oil and gas resources. These have included employment and income effects, additional government revenue, education and training, technology transfer and research and development. While all of these impacts would have beneficial impacts associated with them, it is important to distinguish between higher expenditures associated with oil and gas activities and benefits to the local economy. They need not be the same. For example, the higher expenditure may be supplied through an increase in imports into the region and the beneficial impact of this is limited to a very small fraction of the level of this expenditure. Therefore, in specifying the benefits associated with the offshore oil and gas sector, it is necessary to present a fair picture of the true benefits that the industry has provided to Atlantic Canada, but it is essential not to exaggerate them. As well, we need to realize that improvements in GDP are not necessarily equivalent to an increase in benefits to Atlantic Canada. In translating the GDP impacts into local benefits, it is important to take into account retained corporate profits that are remitted outside of the region and used elsewhere or paid out as dividends to individuals who are not residents of Atlantic Canada.

Current practice in monitoring and reporting local benefits

The Offshore Boards adopt the CGSB approach to measuring benefits and based on CAC's periodic audits, they report local benefit capture as a percentage of the expenditures incurred to date on each of the offshore oil and gas projects in Atlantic Canada. For the most part this approach is sound and appropriate. It provides a reasonable estimate of the employment impacts and expenditure impacts net of most imports that occur within the provinces that come under the jurisdiction of the respective Offshore Board. As well, an evaluation of the Cash Flow/Head Count proposal to replace the Offshore Boards current approach was undertaken and from that assessment, it is clear that the Cash Flow/Head Count alternative is subject to several problems of its own and it does not represent and improvement over the CGSB frameworks being utilized by the Offshore Boards.

However, there are some improvements to how the information is collected and reported by the Offshore Boards. First, the local capture rate needs to be specified in terms of the amount of the expenditure that province has a current technological capacity to provide or that can be developed within a reasonable period. Secondly, the capture rate should be

decomposed into the percent captured by categories of expenditures associated with offshore oil and gas activities – e.g., Nova Scotia captures x percent of seismic expenditures, y percent of expenditure on pipes, etc. Thirdly, the Offshore Boards ought to subject the information they collect to additional input-output analysis to obtain a more precise picture of the economic impacts associated with the expenditures that occur within the region. Fourthly, the Offshore Boards should consider switching to the web-based inventory method already used in the mining industry for receiving information from the operators and their subcontractors and suppliers with respect to local expenditure impacts.

Local content – Atlantic Canada

The local capture rates reported by the Offshore Boards for offshore oil and gas activity within Atlantic Canada vary by project, by phase of project, by maturity of the industry and by province. For example, the development phase expenditure capture rates in Newfoundland and Labrador range from 27 percent for the Terra Nova project to 47 percent for the Hibernia project and White Rose is expected to come in at 33 percent for its construction activity. These estimates imply that Newfoundland and Labrador has captured an average of 39% of development phase expenditures from it offshore oil and gas industry. During the operation phase, share of expenditure captured local increases. For example, Hibernia's local capture rate increases to 54% and the Terra Nova project has had a local capture of 48% on operations for an overall average of 51%. Nova Scotia, on the other hand, is capturing 37% of the development and operations expenditures from its offshore projects. When the share of employment captured locally is considered, both Newfoundland and Labrador and Nova Scotia do better. For instance, Newfoundland and Labrador's share of employment during the development phase was 64% and this increased to 84% for the operations phase. Nova Scotia, on the other hand, has captured approximately 64% of the employment associated with its offshore oil and gas sector.

The public's understanding of the composition of expenditures by phase of offshore oil and gas activity is an essential requirement for deriving benefits from offshore oil and gas activities. The better the public's understanding of the true benefits available for capture from different offshore oil and gas activities within the region, the more likely it is that real opportunities for wealth generation can identified and exploited for the benefit of residents of the region. For example, information pertaining to the composition of expenditures, that is currently available publicly from secondary sources, is insufficient to effectively analyze how well employment and business opportunities are being captured at the regional level. With more accurate and appropriate information, people's energies can be focused on those things that have a higher probability of increasing well being within the region.

Barring a fundamental shift in the way offshore oil and gas projects are developed and operated, capture rates will only be altered as the industry matures, the economy expands or a concentrated effort is made towards ensuring regional participation in areas where core competencies exist or can be developed. Expenditures on training, institutional and

industrial activities in support of offshore oil and gas activities need to be taken into consideration when analyzing capture rates. Regulatory authorities or other government agencies must be provided with the capacity to collect, analyze and disseminate information in substantially greater detail than is currently required. Web-based employment and industrial benefits monitoring systems exist and could be modified by project operators to collect information from vendors in sufficient detail to facilitate a greater understanding of capture rates.

Jurisdictional Analysis Summary

As the preceding jurisdictional summaries have illustrated, the approaches taken by the various jurisdictions to developing a domestic offshore oil and gas supply industry have been as varied as the resources upon which each region's industry has been built. These approaches range from the cautious, interventionist approach taken by the Norwegians, which relied heavily on state intervention and ownership through state-owned oil companies, to the laissez-faire Australian approach in which the government specifically states in its regulations that there is no local content policy in place.

The differences in approaches stem from a number of factors, including: the relative size of the resource base, the philosophical underpinnings of the governments in question, the time period in which the industry began to operate, the maturity of the industry, the structure of the domestic economy and technological factors. Each of these factors is discussed in turn.

Size of Resource Base

The size of the resource base has major implications for both the willingness of a jurisdiction to press for local benefits and its ability to extract commitments for local benefits from oil companies. In regions where the resource base is massive and profitable to exploit, everything else being equal, the jurisdiction with the more promising resource base will be able to extract more significant levels of local commitment than a similar jurisdiction with a less certain resource base. As the resource base becomes better understood through exploration, jurisdictions are better able to assess their bargaining positions. A related observation is that those jurisdictions that have a solid geological understanding of their own resources are more likely to be on an even playing field with the oil companies and therefore are in a better negotiation position. If the jurisdiction is relying entirely on the information provided by the operators, it is at a significant disadvantage in terms of information and, therefore, its negotiating position will be compromised. Given the information that was available for this study, it is not possible to say whether Atlantic Canada is a position to adopt a stronger stance on local benefits. In order to answer this question, one would have to look at the project economics surrounding current and potential offshore projects and that information is just not available publicly. In addition, one would have to consider the area’s prospectivity, which would include an assessment of the success rates achieved within the regions and the total resource that are available in the offshore area. Given the relatively limited

exploration that has occurred within the region, these is a large degree of uncertainty about the resource potential of Atlantic Canada's offshore.

Government Philosophy

The philosophical underpinning of the government in question will also have an impact on their insistence on local content requirements. Typically, those jurisdictions with a left-leaning government will be more likely to attempt to maximize local benefits while right-leaning governments will typically let businesses operate as they see fit. Even within jurisdictions, changes in government have resulted in changes in policy. For example the election of the socialist party in Brazil in Oct 2002 has led to changes in offshore oil and gas regulations in Brazil with a move towards increased local participation. Similarly, in the UK in the early 1970s when the Labour Party formed the government, they initiated some of the more proactive local content regulations in the UK North Sea.

Time of Discovery

The time period in which the initial discoveries were made also influences the ability of a jurisdiction to extract local content benefits from oil company operators. For example, the US Gulf of Mexico region was the first major offshore oil and gas region and therefore the expertise developed locally because there was no other source of expertise from which to draw. In other areas, where more recent discoveries have been made, the requisite expertise has been available from other areas where exploration, development and production activities had already been undertaken and the expertise has developed. Over time, this lead in expertise and experience has proven difficult to overcome for many jurisdictions. However, with proactive local supply initiatives, a significant resource base, a commitment to research and development and a well developed industrial structure, the "head start" afforded many companies who were positioned in the first offshore oil and gas areas can be reduced.

Nature of Domestic Economy

The supply and service requirements of the offshore oil and gas industry can be massive. With development costs that can run into the billions, drilling costs which can exceed $50 million per well and substantial operating costs, many segments of the offshore oil and gas supply industry are, by their very nature, conducive to large companies. This is particularly true with respect to some development activities which require infrastructure such as large fabrication yards or deep-water docking facilities and the mobilization of a large skilled workforce for short periods of time. In this context, a small economy such as that found in Atlantic Canada with slightly more than 2 million people and a relatively undeveloped industrial base will be precluded from certain aspects of offshore oil and gas supply requirements. Conversely, a large industrialized economy such as that found in the United Kingdom with over 50 million people and a more developed industrial base will have a much better chance of successfully attracting more work locally. In other words, in comparing the local benefits that are captured by the region to those derived by

other jurisdictions, it is important to recognize that the comparisons being made are between a relatively small region comprised of four provinces versus nations which in most cases are substantially larger.

Technology

Technological advancements in the offshore oil and gas industry also have a considerable impact on a region's ability to generate economic activity related to offshore development and production activities. In the industry's infancy and into its first phases of development beyond the Gulf of Mexico, the technological advances made by the industry pioneers in the Gulf were critical aspects of their ability to export their expertise to other areas of the world. As each new area evolved, new technological advances have created opportunities for those companies which kept pace with technological advancements and conversely, it spelled the demise for those companies and regions that did not keep pace. Today, the effects of technological advances are similar. Those companies and countries that have focused on leading edge technologies are now exporting their expertise around the world. Some of these modern technological developments include the move to subsea systems, the increasing prevalence of deep-water exploration and production, the use of floating production systems, the use of horizontal drilling and the use of improved drilling and exploration techniques. Those countries and companies that make a concerted effort at research and development of new technologies are the leaders in the global industry.

Capture Rates

The findings with respect to capture rates begin with an overview of the definition of capture rates or local content, including an overview of some of the difficulties in measuring local benefits. The summary then discusses the level of local capture rates identified through the study process and also reviews some of the regulatory policy options that have been used to encourage local participation.

Defining Local Content

The definition of local content is obviously important in all jurisdictions that place emphasis on measuring and monitoring local industrial benefits. Without a consistent and sound methodology for measuring local content, it is difficult to compare jurisdictions with each other and in some cases as definitions change, it is even difficult to get time-series information for a single jurisdiction. Having said that, local content is typically calculated using the first level of supply with no attempts to determine the source of the goods and services in question. Rather, the location of the supplier who issued the invoice is typically used to measure the location of goods or services. This approach is inherently simple, however, with this level of simplicity come certain problems. For example, a supplier could have a post office box in a jurisdiction with nothing more than a one-person office for processing invoices. In an extreme case, a company could acquire a $200 million contract to fabricate a hull for an FPSO at an offshore shipyard and, if the invoice was addressed from the one-man office, the

monitoring system would measure the content as being local. Clearly, if meaningful measurements of local content are desired, this method has the potential to be misleading.

Going farther down the supply chain creates many difficulties when measuring local content. The main source of difficulty is how far down the chain should the monitoring procedures go. The level of complexity increases tremendously by going down the supply chain, however, it also presents a much better picture of the actual source of economic activity resulting from the actual work activity. For example, assume that an order for a process module is placed with a local distributor. If an accurate assessment of the value that went into that product is to be acquired, it would require that each component of that module be reviewed for its source. The steel, for example, would have come from a steel mill and its location could probably be ascertained. However, what about the raw materials which go into that steel? Where was it mined? What was the source of the power that went into that steel mill? Clearly, this process can become quite complex. An alternative is the use of Input/Output models which measure the source of economic activity and give a reasonable approximation of benefits based on economy-wide information on the structure of the economy and the inputs that go into most goods and services. When combined with a system that tracks the source of expenditures, an I/O model could be very useful to measure the impacts down the supply chain.

Regulatory Policy Options

Through the course of the study, a number of regulatory policies were identified and used by various jurisdictions. In summary, these regulatory policies can be classified into the following categories:

Use of Local Content in Licensing Rounds - This policy option is based on the premise that if companies want to be granted rights to explore and ultimately develop hydrocarbon resources, they are required to demonstrate their commitments to local content. This policy option can be done either explicitly with bids being evaluated based in part on local content commitments, or implicitly through the use of moral suasion. In order for it be effective, however, there must be significant geological potential and a real interest by the oil companies bidding for parcels of offshore acreage.

R&D Support - By supporting research and development, a government can help the industry achieve several goals. Firstly, it may make the development of its resource more economical and therefore create more opportunities by merely making the pie bigger. This approach, however, is more long term in nature and is also more subtle. Long-term, however, it is perhaps the best approach to take and can lead to significant long-term benefits. The Norwegian example demonstrates this commitment to R&D and their current status as one of the world leaders in subsea and floating production systems - expertise which they are now exporting around the world.

State-Owned Oil Companies - The use of state-owned oil companies with ownership of offshore resources is a very common regulatory/policy option that has been used by most

jurisdictions reviewed.[117] The structure and use of a state-owned oil company to effect policy vary by jurisdiction.

Recommendations

The recommendation that flow out of this report is:

The Offshore Boards should modify their approach to collecting, analyzing and reporting information concerning local benefit capture from the offshore oil and gas industry. This would include:

- **reporting the benefits relative to technological capacity of the region;[118]**
- **a more disaggregated reporting structure;[119]**
- **additional input-output analysis of the data;[120] and**
- **utilize a web-base invoice method for receiving expenditure information from offshore operators and their subcontractors.[121]**

[117] Nova Scotia took a working interest in Panuke-Cohasset, but it did not appear to be successful in increasing the capture of local benefits within Nova Scotia.
[118] If there is no possibility of supplying certain types of goods and services in Atlantic Canada, then these types of expenditures should be excluded. However, one would have to be careful not to exclude items that are currently not supplied because local suppliers are currently uncompetitive in terms of price, quality and delivery, but might become so with sufficient investment and an opportunity to gain experience and expertise in the industry.
[119] Rather that reporting that the Hibernia had 47% content for the development phase, for example, it would be more useful to report that the local content on drilling services is x percent, for example.
[120] The additional input-output analysis will remove the import content from the expenditures recorded in each province in order to give a more accurate picture of the benefits of oil and gas activity captured locally.
[121] This web-base approach is already employed in the mining industry and should help allay some of the concerns over the onerous reporting structure that is in place currently.

Bibliography

Abugu, Uwakwe. "Nigeria loses $5.5b annually to poor local content in oil industry", Daily Independent. (http://www.dailyindependentng.com/dailyindependent/news/nnoct150313.htm)

Africa Online. "Nigeria shifts towards offshore oil production", 08-Jul-02, Africa Online. (http://www.africaonline.com/site/Articles/1,3,48526.jsp)

Ajanaku, L. (2003), "FG may sanction oil firms over local content", www.dailytimesofNigeria.com, 6-Oct-03.

Alexander's Gas and Oil Connections. "Less than 5% is invested on local content in Nigeria by Oil Companies", 08-May-01, Alexander's Oil and Gas Connections (www.gasandoil.com/goc/company/cna11953.htm)

Alexander's Gas and Oil Connections. "What Nigeria's oil industry must do now", 08-Aug-03. (www.gasandoil.com/goc/company/cna33214.htm)

Alexander's Gas and Oil Connections. "Petrobas dominates Brazil's fifth licensing round", 19-Sept-03.

Alexander's Gas and Oil Connections. "Nigerian local content policy begins to yield results", 07-Nov-01.

Alexander's Gas and Oil Connections. "Chevron targets 90% local content by 2007 in Nigeria", 01-Oct-02.

AllAfrica.com. "Oil and Gas: Federal Government Moves to Enact Local Content Law", Feb 24, 2004. (http://allafrica.com/stories/printable/200402240633.html).

American Petroleum Institute. "Local content development", 2001, American Petroleum Institute (http://api-ec.api.org/environ/index.cfm?objectid=87563095-5A7B-4F02-B7934CEA0F7D5F2A&method=display_body&er=1&bitmask=001003001003003000)

Anderen, L. and Meza, M., (2001), *The Natural* Gas Sector in Bolivia: An Overview, a paper prepared for the Andean Competitiveness Project, Instituto de Investigaciones Socio-Economicas, Universidad Catolica Boliviana.

Andersen, Svein S., (1993) The Struggle over North Sea and Gas: Government Strategies in Denmark, Britain, and Norway", Oxford University Press.

Atlantic Energy Roundtable, (2002), Perspectives of the Service and Supply Sector of East Coast Oil and Gas Industry, World Trade & Convention Centre, Halifax, November 22, 2002.

Atlantic Oil and Gas Works Online – Engineering, “Minister Urges Ottawa to Eliminate Obstacles”, www.oilworks.com/NewMag/publisectormay.html.

Atlantic Oil and Gas Works Online – International News, October 21, 2002.

Atlantic Provinces Economic Council, (2002) “How Do We Create the Best Environemnt for maximizing the Benefits of Offshore Oil and Gas Developments?,” APEC Spring/Summer Atlantic Report, Halifax.

Australia Industry Champions Group. "Heavy Engineering and Infrastructure Action Agenda: Focus Groups Reports to the Industry Champions Group, Volume 2: Market Access", March 2000.

Australian Government Standing Committee on Industry, Science and Resources., A sea of indifference - Australian industry participation in the North West Shelf project, Mar-98. (http://www.aph.gov.au/house/committee/isr/Nws/report/)

Barker, Terry and Brailovsky, Vladimir. Oil or Industry: Energy, Industrialization and Economic Policy in Canada, Mexico, the Netherlands, Norway and the United Kingdom

Barker, Terry and Dunne, Paul. The British Economy After Oil: Manufacturing or Services, 1988, Croom Helm Ltd.

Bates, David, (2000), Final Report: Project No. ARB-4035215-1, NOIA.

Beredjick, Nicky (ed.) and Walde, Thomas, Petroleum Investment Policies in Developing Countries, 1988, Graham & Trotman, London.

Brasileiro, Adriana and Eric Smith. "Brazil ANP: 13 bidders have applied for Aug oil E&P round", Petroleumworld.com. (http://www.petroleumworld.com/storyT824.htm)

Bruce, G., (2002), “The Terra Nova Project”, presentation to NOIA, February 21, 2002.

Business News Americas. "Suppliers differ on local content rules in Brazil", 13-Oct-03, Rigzone.com. (http://www.rigzone.com/news/article_pf.asp?a_id=8864)

Cairns, J.A , Harris A.H and Williams, H.C. Barriers to Entry in the North Sea Offshore Oil Supply Industry, 1987, University of Aberdeen.

Cameron, Peter., The Oil Supplies Industry: A Comparative Study of Legislative Restrictions and Their Impact, 1986, Financial Times Business Information Ltd..

Canadian Association of Petroleum Producers (2002a), Submission to the Atlantic Energy Roundtable, November 2002.

Canadian Association of Petroleum Producers, Presentation to the CNOPB, June 11, 2002b, “Approach to Benefits Measurement”

Canadian Association of Petroleum Producers, OGAAC Update, November 6, 2002c, "Alternative to Benefits Content Reporting"

Canada-Newfoundland Offshore Petroleum Board, (2001), "CNOPB Reports on the Verification of Industrial Benefits for the Terra Nova Project", New Release, July 10, 2001.

Canada-Newfoundland Offshore Petroleum Board, (2001), "Terra Nova Development: Verification of Industrial Benefits", presentation to NOIA July 2001.

Canada-Newfoundland Offshore Petroleum Board, (2002), "Procurement Reporting Guidelines: White Rose Development Project", April 2002.

Canada-Newfoundland Offshore Petroleum Board website (www.cnopb.nfnet.com/general/media/benefits.htm).

Canada-Newfoundland Offshore Petroleum Board website (www.cnopb.nfnet.com/stats/off_exp.pdf).

Canada-Nova Scotia Offshore Petroleum Board Employee Benefits Summary, 2002

Canada-Nova Scotia Offshore Petroleum Board, (1994), Industrial Benefits and Employment Plan Guidelines – Nova Scotia Offshore Area, www.cnsopb.ns.ca/Generalinfo/general.html.

Canada-Nova Scotia Offshore Petroleum Board, (1999), Industrial Benefits Information Bulletin, www.cnsopb.ns.ca/Benefits/benefits.html.

Canada-Nova Scotia Offshore Petroleum Board, Regulatory Regime and Employment and Industrial Benefits, www.cnsopb.ns.ca/Benefits/benefits.html.

Chevron, "ChevronTexaco helps strengthen Kazak suppliers to build economic ties with Karaxhaganak and Tengiz", www.chevrontexaco.com.

Consulting and Audit Canada, "Presentation on Industrial Benefits on Behalf of the Canada-Nova Scotia Offshore Petroleum Board."

Clio, Albert., Oil Economics and Policy, 2000.

Danish Energy Authority. "Oil and Gas Production in Denmark 2002", Jun-03. (http://www.ens.dk/graphics/publikationer/olie_gas_uk/oilandgas/index.htm)

Douglas-Westwood Associates. "Global Ocean Markets", Jan-02, The Hydrographic Journal. (http://www.hydrographicsociety.org/Articles/journal/2002/103-2.htm)

Douglas-Westwood Associates. "UK Marine Industries World Export Market Potential", Oct-00, Foresight Marine Panel.

Economist Intelligence Unit. "Before the Oil Runs Out: Prospects for the North Sea's Offshore Industry", 1988, Economist Intelligence Unit, Great Britain.

Energy Information Administration. "U.S. Crude Oil, Natural Gas and Natural Gas Liquids Reserves 2002 Annual Report", 2002. (http://www.eia.doe.gov/pub/oil_gas/natural_gas/data_publications/crude_oil_natural_gas_reserves/current/pdf/arr.pdf).

Energy Information Administration. "Natural Gas 1998: Issues and Trends", Aug-99. (http://www.eia.doe.gov/oil_gas/natural_gas/analysis_publications/natural_gas_1998_issues_and_trends/it98.html)

Energy Information Administration. "Country Analysis Briefs: Malaysia", November 2003.

Fjell, O., Chief Executive Statoil, speech at the 16th World Petroleum Congress in Calgary, Canada, June 14, 2000, "Social Responsibility in an International Market Economy", www.statoil.com

Galenson, Walter. A Welfare State Strikes Oil: The Norwegian Experience, 1986, University Press of America.

Galway, L., "The Challenge of the Atlantic Wave", presentation to NOIA.

Gardner Pinfold Consulting Economists Limited, Economic Impact of Offshore Oil and Gas Development on Nova Scotia, 1990 - 2000, Halifax, Nova Scotia Department of Finance, November 2002, 81 Pages.

Geoscience Australia, (2002) "Offshore Petroleum Guidelines for Grant of a Production License and Grnat of an Infrastructure License", Department of Industry, Tourism and Resources (Australia).

Geoscience Australia. "Oil and gas resources of Australia 2001", 2002, Department of Industry, Tourism and Resources (Australia). (http://www.ga.gov.au/pdf/OC0035.pdf)

Government of Australia. "Australian Industry Participation National Framework", Apr-01. http://www.aip.gov.au/framework/framework.doc?ois=no)

Government of Malaysia, National Economic Action Council. "National Economic Recovery Plan", 01-Jul-98, Government of Malaysia. (http://www.mir.com.my/lb/econ_plan/contents/chapter7/g_pg2.htm)

Government of Norway. "Report No. 38 to the Storting (2001-2002) Oil and Gas Activities", 2002, Government of Norway.

Government of United States, Energy Information Administration. "Country Analysis Briefs: Malaysia", 01-Nov-03. (http://www.eia.doe.gov/emeu/cabs/malaysia.htm)l

Gramling, Robert. Oil on the Edge: Offshore Development, Conflict, Gridlock, 1996, State University of New York Press.

Hagen, Per. "Norway's Experience in Developing Local Content", from a presentation presented to the National Workshop on Improvement of Local Content and Indigenous Participation in the Upstream Sector of the Oil and Gas Industry, Aug 2001, Abuja, Nigeria.

Hagland, Jan. "Norwegian Oil and Gas Enters a New Century", Nov-99, Norwegian Petroleum Directorate. (http://odin.dep.no/odin/engelsk/norway/economy/032005-990443/index-dok000-b-n-a.html)

Halifax Herald, (2003) "Local Firms are Being Shut Out of Offshore Work, OTANS says", August 28, 2003 www.halifaxherald.com/stories/2003/08/f214.raw.html.

Hallwood, Paul. The Offshore Oil Supply Industry in Aberdeen: The Affiliates- Their Characteristics and Importance, 1986, University of Aberdeen.

Hann, Danny. Government and North Sea Oil, 1986, The MacMillan Press Ltd.

Hibernia Management and Development Website (www.hibernia.ca)

Husky Oil Operations Limited, Canada - Newfoundland and Labrador Benefits Guidelines, St. John's, Husky Energy, July, 2002, 19 Pages.

Ikein, Augustine A. The Impact of Oil on a Developing Country: The Case of Nigeria, 1990, Praeger Publishers.

Industry Canada. "Country Commercial Guide - Brazil". (http://strategis.ic.gc.ca/SSG/da90239e.htm)l

International Labour Organization (2002), The Promotion of Good Industrial Relations in Oil and Gas Production and Oil Refining, a report for discussion at the Tripartite meeting on the Promotion of Good Industrial Relations in Oil and Gas production and Oil Refining, Geneva, 2002.

Kemp, A.G, Hallwood, C.P, and Wood, P.W. The Benefits of North Sea Oil, 1982 University of Aberdeen, Aberdeen.

Kemp, Alex and Fiona Smith. North Sea Oil and the Aberdeen Economy in Retrospect, 2002, University of Aberdeen.

Kemp, Alexander G. Twenty-Five Years on: An Assessment of UK North Sea Oil and Gas Policies. University of Aberdeen.

Kemp, Alexander G. and Stephen, Linda. The Prospect for Activity Levels in the UKCS: the 2002 Perspective. University of Aberdeen.

Khajehpour, B., (2002), "The Future Role of Oil and Gas in Iran's Economy", www.iranmania.com.

Larcombe, S., General Manager, Kazakhstan BG Group plc, "Local Content Issues – BG's Experience in Kazakhstan", presentation to Conference: Caspian Region Present and Future – Local Content, January 31, 2003, Centre fro Euro-Asian Studies, The University of Reading, UK

Latin America Oil and Gas Newsletter, (2003), Issue 49.

Latin America Oil and Gas Newsletter, (2003), "Petrobas changes rig tender rules", Issue 49.

LeBlanc, L, (2003), "EnCana in Atlantic Canada", presentation to the Annual Meeting, The Society of Certified Engineering Technicians and Technologists of Nova Scotia, January 25, 2003.

Lind, T. and Mackay, G.A. Norwegian Oil Policies, 1979, C. Hurst & Co. (Publishers) Ltd.

Longwell, H. (2002), "The Future of the Oil and Gas Industry: Past Approaches, New Challenges", World Energy, vol 5, No 3, p. 100-104.

Louisiana Mid-Continent Oil and Gas Association. "The Energy Sector: Still a Giant Economic Engine for the Louisiana Economy", Apr-02. (http://www.lmoga.com/home.html)

Lind, T. and MacKay, G.A. (1979), "Norwegian Oil Polices".

Malik, Qamar, Ph.D, "Atlantic Region's Hydrocarbon Potential," Sydney, Nova Scotia, University College of Cape Breton, April, 2001

Mbendi Information Services. "Nigeria: Oil and Gas Industry" July 2000. (http://www.mbendi.co.za/indy/oilg/af/ng/p0005.htm)

Mining Society of Nova Scotia, (2001), "Atlantic Region's Hydrocarbon Potential"

Moutinho dos Santos, Dr. Edmilson. Should the Brazilian National Petroleum Agency explore new contracting formulas?, University of Sao Paulo.

Mueller, John. "Malaysian Fabricators Broaden horizons Part I and II", 25-Nov-02, Asian Oil and Gas. (http://www.oilonline.com/news/features/aog/20021125.Malaysia.10117.asp)

National Ocean Industries Association. "About Offshore Oil and Gas". (http://www.noia.org/info/default.asp)

Nelsen, Brent F. The State Offshore: Petroleum, Politics and State Intervention on the British and Norwegian Continental Shelves, 1991, Praeger Publishers.

Newlands, David; Shaw, Robert and Jones, Peter. The North Sea Oil and Gas Supply Industry, 1977-1990, University of Aberdeen

Nexant Ltd. National Oil and Gas Policy Draft Report, 01-Jan-03, Government of Nigeria, The Bureau of Public Enterprises.

Nigeria News Now. "Brief History of the Onne Oil and Gas Free Zone", (http://nigerianewsnow.com/News/January03/990103_onneoilgas.htm)

Nigerian Oil and Gas Online. "Exploration", Nigerian Oil and Gas Online. (http://www.nigerianoil-gas.com/exploration/deepwater.htm)

Nigerian Oil and Gas Online. "Industry Profile", Nigerian Oil and Gas Online. (http://www.nigerianoil-gas.com/industryprofile/index.htm)

Nigerian Oil and Gas Online. "Investment", Nigerian Oil and Gas Online. (http://www.nigerianoil-gas.com/investment/index.htm)

Nigerian Oil and Gas Online. "Upstream", Nigerian Oil and Gas Online. (http://www.nigerianoil-gas.com/upstream/index.htm)

NOIA (1998), Positive Economic Impact of Oil and Gas development Within the Province of Newfoundland and Labrador, Position Statement, NOIA, St. John's.

Noreng, Oystein. The Oil Industry and Government Strategy in the North Sea, 1980, Croom Helm Ltd.

Norwegian Ministry of Petroleum and Energy. "Government Policies in the Development of the Norwegian Oil Supply Industry", Jun-00, Government of Norway. (http://odin.dep.no/odinarkiv/norsk/dep/oed/2000/taler/026031-090011/index-dok000-b-n-a.html)

Norwegian Ministry of Petroleum and Energy. "Norwegian Petroleum Activity Fact Sheet", 2002.

Norwegian Ministry of Petroleum and Energy. "Oil and Gas Activities", Report No.38 to the Sorting, Government of Norway.

Norwegian Petroleum Directorate. "A brief history", 2002. (http://www.npd.no/English/Om+OD/Nyttig/Olje-ABC/Norsk+oljehistorie/coverpage_norsk_+oljehist_eng.htm)

Norwegian Petroleum Directorate. "Fact Sheet 2002 Norwegian Petroleum Activity". (http://www.dep.no/oed/engelsk/p10002017/p10002019/026031-990013/index-dok000-b-n-a.html)

Norwegian Petroleum Directorate. "Offshore Norway 2002: The Norwegian Petroleum Directorate Annual Report", 2003. (http://www.npd.no/English/Produkter+og+tjenester/Publikasjoner/ODs+aarsberetning/2002/norsk-sokkel-2002.htm)

Nzeshi, Onwuka. "Oil: Nigeria's participation still minimal , say experts", 13-Oct-03, Naija Post. (www.naijapost.com/news/publish/article_759.shtml)

Oduniyi, Mike. "Chevron Begins Development of $2.5b Agbami Field", 30-Oct-03, This Day Online. (http://www.thisdayonline.com/news/20031030news03.html)

Oduniyi, Mike. "NNPC restructures tendering procedures for award of contracts", 21-Aug-03, Alexander's Oil and Gas Connections. (www.gasandoil.com/goc/company/cna33423.htm)

Offodile, Chudi. "Still on the commercial status of NNPC", 04-Aug-03, This Day Online. (www.thisdayonline.com/archive/2002/06/09/20020609dis01.html)

Offshore Engineer. "Petrobras renegotiates the political tightrope", 25-Mar-03, Petroleumworld.com. (http://www.petroleumworld.com/SDY052503.htm)

Oil and Gas Journal. "Petroleum Encyclopedia 2000". (http://orc.pennnet.com/Articles/Article_Display.cfm?Section=Articles&ARTICLE_ID=114043)

Oil and Gas Journal. "Petroleum Encyclopedia 2000". (http://orc.pennnet.com/Articles/Article_Display.cfm?Section=Articles&ARTICLE_ID=114065)

Oil and Gas Journal. "Petroleum Encyclopedia 2000". (http://orc.pennnet.com/Articles/Article_Display.cfm?Section=Articles&ARTICLE_ID=114063)

Oil and Gas Journal Editors, (2003), "IEA projects $5.3 trillion investment needed for oil and gas by 2030", Oil and Gas Journal Online, www.ogj.pennet.com.

Oladele, Afolabi.O.R. "Opportunities for Indigenous Participation", from a presentation presented to the National Workshop on Improvement of Local Content and Indigenous Participation in the Upstream Sector of the Oil and Gas Industry, Aug 2001, Abuja, Nigeria Olsen, W., Senior Advisor, Statoil, "Statoil – Its Grapple with Local Content", presentation to Conference: Caspian Region Present and Future – Local Content, January 31, 2003, Centre fro Euro-Asian Studies, The University of Reading, UK

Omene, G.E. "Definition of the Scope of Local Content and Indigenous Company in the Upstream Sector of the Petroleum Industry" from a presentation presented to the National Workshop on Improvement of Local Content and Indigenous Participation in the Upstream Sector of the Oil and Gas Industry, Aug 2001, Abuja, Nigeria.

Petrakis, E., Rasmusen, E. and Roy, S., (1995), The Learning Curve in a Competitive Industry, mimeo

Petrobras. "About Petrobras". (http://www2.petrobras.com.br/portal/ingles/petrobras.htm)

Petronas. "Petronas Background". (http://www.petronas.com.my/internet/corp/corpweb3.nsf/frameset_corp_lev1?OpenFrameset)

Petroleumworld.com (2003), "Venezuela's ChevronTexaco to evaluate local industry capabilities to participate in Deltana's oil development", 10/03/03.

Petroleumworld.com (2003), "Brazil ANP: 13 bidders have applied for August oil ESP round", 10/06/03.

Price Waterhouse Coopers, A Study into Optimizing Technology Transfer For Atlantic Canada's Oil & Gas Industry, St. John's, NOIA, ACOA, OTANS, ARIA, NRC, IC, CME, April 2001, 99 Pages

Ramm, H. H. (2001), *Industrial Effects of the Petroleum Activities*, Presentation for a Venezuelan government delegation at a Ministry of Petroleum and Energy seminar 18 June 2001, www.rammcom.com/rk/vendel.htm, 11/8/2003.

Ramm, H.H., *Changing the Rules of the Game to Unlock More Value*, a presentation to Offshore Northern Seas Conference, August 28, 2002, Stavanger, www.rammcom.com

Roed, E., Statoil, "How Statoil involved the Norwegian industry in the offshore development" presentation to Camara Petrolera de Venezuela, Caracas, May 12, 2003, www.camarapetrolera.org

Resources Division, Department of Industry, Tourism and Resources (Australia). "Offshore Petroleum Guideline for Grant of a Production License and Grant of an

Infrastructure License", May-02. (http://www.industry.gov.au/assets/documents/itrinternet/PLguidelinefinal502.pdf)

Scott, L. C., (2002), "The Energy Sector: Still a Giant Economic Engine for the Louisiana Economy".

Shrimpton, M., (2003), Socio-Economic Benefits From Petroleum Industry Activity in Newfoundland and Labrador, report prepared for Petroleum Research Atlantic Canada.

Silva, C.S., and de Almeida, E.L.F., (2002), Targets and Challenges of the Regulatory Reform in Brazilian Oil Sector, a paper presented at the 25th Annual IAEE Conference (Innovation and Maturity in Energy Markets: Experience and Prospects), University of Aberdeen, Scotland.

Steensnaes, Einar. "Developing a sustainable oil and gas industry", May-02, Government of Norway. (http://odin.dep.no/oed/engelsk/aktuelt/p10002021/statsraad_a/026031-090041/index-dok000-b-n-a.html)

Steensnaes, Wunar, (2002), Mininstry if Petroleum and Energy, Government of Norway, "How to Secure Future Growth in the NCS and Support the Internationalization of the Oil and Gas Industry".

Steensnaes, Einar. "Perspectives on industry dynamics and competitiveness", May-02, Government of Norway. (http://odin.dep.no/oed/engelsk/aktuelt/p10002021/statsraad_a/026031-090040/index-dok000-b-n-a.html)

Steensnaes, Einar. "The international challenge for the Norwegian Petroleum Cluster", Dec-02, Government of Norway. (http://odin.dep.no/oed/engelsk/aktuelt/p10002021/statsraad_a/026031-090058/index-dok000-b-n-a.html)

Stevens, P., (1999), A Low Oil Price World, Oil Company Mergers and Oil Market Implications, Centre for Energy, Petroleum & Mineral Law and Policy Internet Journal, Volume 4, No. 13.

Strategic Concepts (Carl Sheppard), Wade Locke and, Community Resource Services (Mark Shrimption), (1999), Harnessing the Potential: Atlantic Canada's Oil and Gas Industry. Newfoundland Offshore Industries Association.

Strohmeyer, John. Extreme Conditions: Big Oil and the Transformation of Alaska, 1993, Simon & Schuster.

Sullivan, John. "Offshore oil rig use on rise in Gulf, report says", 28-Aug-03, Lafayette Daily Advertiser. (http://www.theadvertiser.com/business/html/2D9C96A0-D386-4112-9AC9-61BC5238D8A1.shtml)

Superbrands. "Malaysia, Petronas". Superbrands.com. (http://superbrands.com.my/brands/PDF/petronas.pdf)

Superbrands. "Malaysia, Shell". Superbrands.com. (http://superbrands.com.my/brands/PDF/shell.pdf)

Supplier Development Committee, (2003), Supplier Development Committee Report, Submitted to the Industrial Opportunities Task Force, Oct 28, 2003.

Terra Nova, (1999), "Terra Nova Development Review," a presentation to the Canada-Newfoundland Offshore Petroleum Board, Government of Newfoundland and Labrador and Government of Canada, May 28, 1999.

This Day. "NNPC and Chevron to invest in three oil projects", 17-Feb-03, This Day Online. ((http://www.gasandoil.com/goc/company/cna31006.htm)
This Day (2003), "20 US Oil Firms in Nigeria Feb", August 8, 2003.

Thong & Kay Hian Securities. "Oil and Gas Sector: Malaysia", 01-Jul-03, Thong & Kay Hian Securities. (http://www.thongkh.com.my/pdf/OilGasSector0307.pdf)

Trade and Business Services. "The Latin America Oil and Gas Newsletter", 27-Mar-03, Canning House. (http://www.canninghouse.com/TBSfiles/latoil49.pdf)

Udofia, Joshua R. "Shell Petroleum Development Company of Nigeria (SPDC)'s Strategies for Enhancing Local Content Development in the Upstream Sector of the Oil and Gas Industry", from a presentation presented to the National Workshop on Improvement of Local Content and Indigenous Participation in the Upstream Sector of the Oil and Gas Industry, Aug 2001, Abuja, Nigeria.

UK Department of Energy. "Development of the Oil and Gas Resources of the United Kingdom", 2001, Her Majesty's Stationery Office.

UK Department of Energy. "Development of the Oil and Gas Resources of the United Kingdom", 1976-1991, Her Majesty's Stationery Office

UK Department of Trade and Industry. "A Strategy for the Offshore Engineering Services Sector", May 2002, (http://www.og.dti.gov.uk/sponsorship/docs/Engreport.pdf)

UK Trade and Investment. "Oil, Gas, Refining and Petrochemical (plant design and construction) market in Nigeria". (http://www.tradepartners.gov.uk/oilandgas/nigeria/profile/overview.shtml)

UK Trade and Investment. "Oil, Gas, Refining and Petrochemical (plant design and construction) market in Malaysia", 01-Jul-03. (http://www.tradepartners.gov.uk/oilandgas/malaysia/profile/overview.shtml)

UK Trade and Investment. "Oil, Gas, Refining and Petrochemical (plant design and construction) market in Brazil". (http://www.tradepartners.gov.uk/oilandgas/brazil/profile/overview.shtml)

UK Trade and Investment. "Oil, Gas, Refining and Petrochemical (plant design and construction) market in Venezuela", (http://www.tradepartners.gov.uk/oilandgas/)

UK Trade and Investment. "Oil & Gas Sector Profile –World Overview" (http://www.tradepartners.gov.uk/oilandgas/profile/index/worldmarkets.html)

United Kingdom Offshore Operators Association (2002) Economic Report – Competitiveness, www.ukooa.co.uk/issues/economic/econ02/econ02_competitiveness.htm.

United States Department of Commerce, International Trade Administration. "Country Commercial Guide and Market Research Report - Oil and Gas Field Equipment: Denmark", 1998. (http://strategis.ic.gc.ca/SSG/dd76693e.html)

United States Energy Information Administration. "Country Analysis Briefs - North Sea", Jun-03. (http://www.eia.doe.gov/cabs/northsea.html)

United States Minerals Management Service. "Outer Continental Shelf: Estimated Oil and Gas Reserves, Gulf of Mexico", December 31, 2000. United States Department of the Interior. (http://www.gomr.mms.gov/homepg/whatsnew/techann/2003-050.pdf)

United States Trade Representative. "2002 National Trade Estimate Report on Foreign Trade Barriers", 2002, United States Trade Representative. (http://www.ustr.gov/reports/nte/2002/)

Weatherill, A., Shell Kazakhstan Development "Developing Local Suppliers", presentation to Conference: Caspian Region Present and Future – Local Content, January 31, 2003, Centre fro Euro-Asian Studies, The University of Reading, UK

Western Australian Technology and Industry Advisory Council. "Western Australia's Minerals and Energy Expertise: How can it be optimized?", Jun-99. (http://www.wa.gov.au/tiac/minerals2/minerals-26.html#TopOfPage)

Williams, Michael D. North Africa Oil and Gas, 1997, OECD.

Wood McKenzie. "Brazil Round 5. Where next for the ANP?", Rigzone.com. (http://www.rigzone.com/insight/insight.asp?i_id=46)

World Bank Group (2001), Background paper: World Bank Group Activities in the Extractive Industries, www.worldbank.org/ogmc/socialandeconomicimpact.htm.

World Energy Council. Survey of Energy Resources 2001, 2002, World Energy Council. (http://www.worldenergy.org/wec-geis/edc/countries/Malaysia.asp)