A Study to Identify Key Sectors of Opportunity for Atlantic Canadian Firms in India

*Prepared by To Be Canada Inc*

This report has been prepared for, The Canada-Atlantic Provinces Agreement on International Business Development (IBDA). Atlantic Canadian businesses are looking at expanding their operations and providing services to markets beyond developed economies such as the United States. Since India is one such market, this study was conducted to identify the potential opportunities available to Atlantic Canadian businesses to export to India.
Disclaimer

This report provides an overview and guideline information and must not be relied on to cover specific situations. Application of the guideline will depend upon the individual circumstances for which professional advice must be obtained before making decisions, acting or refraining from acting on any of the information in this publication. We could offer readers help on how to apply the guidelines set out in this publication to their specific circumstances. No responsibility will be accepted for any liability or loss occurred to any person or entity acting or refraining from action as a result of any information in this document.
Executive Summary

This report is prepared for The Canada-Atlantic Provinces Agreement on International Business Development (IBDA). The Governments of Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island are highly cognizant of the changing dimensions of the global economy and are looking at growing trade with newer economies. Atlantic Canadian businesses are also looking at expanding their operations and providing services to markets beyond developed economies such as the United States. Since India is one such market, a study was conducted to identify the potential available to Atlantic Canadian businesses to export to India in eight specific sectors and to identify opportunities and strategies to attract Foreign Direct Investment (FDI) to the Atlantic Canadian provinces. The eight sectors are:

1. Aerospace, Defense and Security
2. Agriculture, Food and Beverages (including seafood)
3. Education
4. Information and Communications Technologies
5. Life Sciences and Biotechnology
6. Ocean Technology
7. Power and Renewable Energy
8. Transportation Infrastructure

This report was prepared after reviewing vast amount of literature and information; relevant and useful articles were studied with a goal to provide readers with information in a user-friendly and succinct manner. The secondary research was supplemented and validated by primary research that included interviewing key stakeholders and business owners in Atlantic Canada and India who provided valuable insights into the selected sectors and the Indian market. Please refer to Appendix “I” – List of Companies Interviewed for Primary Research for a list of executives interviewed for the study.
The findings of this study validate the potential in the Indian market and possible opportunities available to Atlantic Canadian organizations in each of the identified sectors.

**Aerospace, Defense and Security**

There are several opportunities in the Aerospace, Defense and Security sector in India and many of these demands can be met by Atlantic Canadian firms. Some prominent opportunities include: new technologies for the aircraft and defence sector; parts, components and maintenance and repair overhaul for civil and military aircrafts especially in the state of Karnataka, training simulators, engines, and spares and technology, equipment and parts for internal and online security.

**Agriculture, Food and Beverages**

The demand for foreign food and food technology is expected to grow in India. Some prominent opportunities Atlantic Canadian companies can pursue include: ready to eat foods and snacks; pulses; exotic fruits such as blueberries and cranberries; niche dairy and cheese products; export of quality seafood (lobsters and shrimp) to the restaurant industry; and technologies for supply chain management, food storage and food processing.

**Education**

Opportunities that Atlantic Canadian companies can pursue in the Indian education sector include: higher education; vocational and technical training in sectors such as civil aviation, construction, nursing, banking and finance, and retail. There is also a need for contemporary curriculum design and content creation, and technologies for eLearning and virtual classrooms.

**Information and Communications Technologies (ICT)**

Atlantic Canadian firms have strengths in ICT sector and prominent opportunities in the Indian market include: communication and network infrastructure; value added services and applications for mobility and gaming; internet and data security; eLearning and distance
education; ecommerce and banking security technology; egovernance; geomatic technologies; and holistic geospatial solutions for the telecommunications and utilities sectors.

**Life Sciences and Biotechnology**

Atlantic Canadian companies have pioneered several innovations in the life sciences and biotechnology sector which presents various prospects in the Indian market, which include: partnering with Indian pharmaceutical and biotechnology companies for low cost manufacturing services; contract research services in formulation development, bioequivalence testing, stability studies centers; analytical equipment and specialized machinery such as sterile vial, fermenters, pre-filled vials; medical equipment for cancer diagnostics, medical imaging, ultrasonic scanning, plastic surgery equipment and polymerase chain reaction technologies. There is also a shortage of skilled workforce in the biotechnology industry providing opportunities for training and educational services.

**Ocean Technology**

Many of the opportunities available in the ocean technologies industry in India are aligned to the strengths of Atlantic Canadian companies. These opportunities include: acoustic equipment, sensors, information technology and forecasting models; sensor, buoys, equipment and research vessel for the Antarctic; equipment and resources for the oil & gas industry; computer and information modeling, deep sea capable equipment and acoustics & sensors. Atlantic Canada’s reputation and expertise in the ocean technologies sectors provides it with opportunities to collaborate with the public and private sectors for technology transfers.

**Power and Renewable Energy**

India is expected to have renewable energy account for 20 percent of its generating capacity by 2020. This is expected to introduce several opportunities for Atlantic Canadian companies and include: expertise, niche technologies and project development consulting in wind energy, nuclear power, clean energy solutions, geo thermal, tidal power, hydro-power and water
management initiatives; training services to develop skills and educate personnel in this sector; research and development of customized solutions for Indian energy requirements.

**Transportation Infrastructure**

The Transportation Infrastructure sector as a whole offers countless at the state and national level for opportunities to Atlantic Canadian equipment, service and system providers. Prominent opportunities in road transportation include expertise in highway planning and strategy; Intelligent Transport System (ITS) products. Opportunities in the railway sector include consulting for long-term planning and architectural. The ports sector requires construction equipment, and project planning. Modern air traffic control equipment, models and information systems are required for air transportation and finally construction and operation of river terminals & ports, waterway development are required for the inland water transport.

**Foreign Direct Investment (FDI)**

The flow of FDI from India to Canada is expected to increase with favorable government initiatives and Indian companies are showing keen interest in investing in certain sectors, such as ICT, biotechnology, clean technology and natural resources, infrastructure development and the food industry. Atlantic Canada can attract FDI by launching targeted promotions with an emphasis on export oriented units and green field projects; attracting R&D intensive investments and creating a fund similar to Ontario-India Research Collaboration Fund, and keeping a balance between investment stimulation and regulations. These strategies when integrated to form a cohesive FDI attraction strategy and implemented effectively will establish Atlantic Canada as a competitive host for investors.

**Establishing and Conducting Business in India**

This report also provides Atlantic Canadian business leaders with information on establishing and conducting business in India and includes information on the Indian tax structure, import regulations and logistics, import programs, licensed custom brokers, government incentives, and foreign operation costs evaluation.
Finally, the document provides essential information such as a list of professionals that can be contacted for services in India, information on trade fairs and other useful information for business leaders exploring opportunities in India.
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Section I – Overview of India
1. India – An Overview

India is also known as the Republic of India and Bharatiya Ganarajya or Bharat in Hindi. India is located in Southern Asia, bordering the Arabian Sea and the Bay of Bengal, between Burma and Pakistan and covers a total area of 3.3 million square kilometers. India is a federal republic and its capital is New Delhi. Mumbai is known as the commercial capital of India. Hindi is the official language of the country and is spoken by 41 percent of the population. English is subsidiary official language and is widely used for national, political and business communication. India also has 14 other official languages which include Bengali, Telugu, Marathi, Tamil, Urdu, Gujarati, Malayalam, Kannada, Oriya, Punjabi, Assamese, Kashmiri, Sindhi, and Sanskrit. The standard time zone is GMT +5.5 hours and India does not observe daylight saving time. India’s currency is the Rupee (₹) and the conversion rate is 1 Canadian dollar ($) = 54 INR (₹).1 In India the units 1 Lakh = 100,000 and 1 Crore = 10,000,000

1.1 Administrative Divisions

India has 28 states and seven union territories*:

<table>
<thead>
<tr>
<th>Andaman and Nicobar Islands*</th>
<th>Goa</th>
<th>Meghalaya</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andhra Pradesh</td>
<td>Gujarat</td>
<td>Mizoram</td>
</tr>
<tr>
<td>Arunachal Pradesh</td>
<td>Haryana</td>
<td>Nagaland</td>
</tr>
<tr>
<td>Assam</td>
<td>Himachal Pradesh</td>
<td>Odisha</td>
</tr>
<tr>
<td>Bihar</td>
<td>Jammu and Kashmir</td>
<td>Puducherry*</td>
</tr>
<tr>
<td>Chandigarh*</td>
<td>Jharkhand</td>
<td>Punjab</td>
</tr>
<tr>
<td>Chhattisgarh</td>
<td>Karnataka</td>
<td>Rajasthan</td>
</tr>
<tr>
<td>Dadra and Nagar Haveli*</td>
<td>Kerala</td>
<td>Sikkim</td>
</tr>
<tr>
<td>Daman and Diu*</td>
<td>Lakshadweep*</td>
<td>Tamil Nadu</td>
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<tr>
<td>Delhi**</td>
<td>Madhya Pradesh</td>
<td>Tripura</td>
</tr>
<tr>
<td></td>
<td>Maharashtra</td>
<td>Uttarakhand</td>
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** although Delhi is an union territory, its official name is National Capital Territory of Delhi
1.2 Economic Overview

Starting in the 1990’s, India has undertaken several economic liberalization initiatives such as industrial deregulation, privatization of state-owned enterprises, and reduced controls on foreign trade and investment. This has established India’s position as an open market economy. India has grown at an annual rate of 7 percent since 1997. It was able to recover from the global financial crisis quite smoothly and in 2010 exceeded 8 percent year-on-year growth due to strong domestic demand. India’s economy includes traditional village farming, modern agriculture, handicrafts, several modern industries, and a variety of services. Information technology and software is the highest contributors in the services industry largely due to the large educated English speaking population. Thirty percent of its total population (1.2 billion) is based in urban areas. A little more than 50 percent of the workforce is involved in agriculture; however, half of India’s output comes from services with participation of only one-third of the workforce. In 2011, India’s growth slowed slightly due to high inflation and interest rates coupled with high international crude oil prices which contributed to a higher fiscal deficit. Additionally, corruption scandals by the ruling federal party stalled any planned reforms.

Although, there is much to be optimistic about the Indian economy, there are several challenges such as poverty, lack of infrastructure, insufficient non-agricultural employment opportunities, inadequate access to quality education, and improved planning to accommodate rural-to-urban migration that must be addressed.
1.3 Trade Relations

An overview of India’s trade relations are provided in Table 1: India's Trade Relations

<table>
<thead>
<tr>
<th>Table 1: India’s Trade Relations</th>
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<tbody>
<tr>
<td><strong>Exports</strong></td>
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<tr>
<td>Value (2011 est.)</td>
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<tr>
<td>Commodities</td>
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<tr>
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1.4 India’s 2012 Index of Economic Freedom

The Index of economic freedom published by the Heritage Foundation and the Wall Street Journal examines three fundamental principles of economic freedom—empowerment of the individual, non-discrimination, and open competition. India’s economic freedom score is 54.6, making its economy the 123rd freest in the 2012 Index out of 184 countries. Its score remained the same as last year despite improvements in labour freedom. The gains from this dimension were overshadowed by reduced scores on five other areas including business freedom, freedom from corruption, government spending, and monetary freedom. India is ranked 25th out of 41 countries in the Asia Pacific region, and its overall score is below the world average. An overview of India’s scores of each dimension are provided in
Table 2: India 2012 World Economic Index

<table>
<thead>
<tr>
<th>Economic Dimensions</th>
<th>Score</th>
<th>Change</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Freedom</td>
<td>35.5</td>
<td>− 1.4</td>
<td>168</td>
</tr>
<tr>
<td>Trade Freedom</td>
<td>64.1</td>
<td>− 0.1</td>
<td>146</td>
</tr>
<tr>
<td>Fiscal Freedom</td>
<td>76.1</td>
<td>+ 0.7</td>
<td>105</td>
</tr>
<tr>
<td>Government Spending</td>
<td>74.8</td>
<td>− 3.0</td>
<td>63</td>
</tr>
<tr>
<td>Monetary Freedom</td>
<td>62.9</td>
<td>− 2.2</td>
<td>169</td>
</tr>
<tr>
<td>Investment Freedom</td>
<td>35.0</td>
<td>No change</td>
<td>123</td>
</tr>
<tr>
<td>Financial Freedom</td>
<td>40.0</td>
<td>No change</td>
<td>105</td>
</tr>
<tr>
<td>Property Rights</td>
<td>50.0</td>
<td>No change</td>
<td>53</td>
</tr>
<tr>
<td>Freedom from Corruption</td>
<td>33.0</td>
<td>− 1.0</td>
<td>89</td>
</tr>
<tr>
<td>Labor Freedom</td>
<td>74.2</td>
<td>+ 7.0</td>
<td>49</td>
</tr>
</tbody>
</table>

For a detailed explanation on each of these scores please visit:

http://www.heritage.org/index/pdf/2012/countries/india.pdf

1.5 Cultural Facts

Indians are very friendly when communicating with others and will maintain eye contact. The only exception is women from a traditional or rural background. Business associates maintain similar physical distance as in Canada, however, personal space is smaller when Indians interact with people they like or have personal relationships. Avoid initiating physical contact (hugging or touching during a conversation) with women unless you are sure that she is comfortable with it.

Public display of affection should be avoided especially in smaller cities. However, it is common for adult friends of the same sex to hold hands or hug in public without any sexual connotation.
Colleagues and managers may be addressed by their first name however; observe the culture to be sure as in some organizations senior managers and older colleagues may be addressed as Sir, Madam, Mr. or Mrs. The dress code at most organizations is business casual and it is preferably to dress conservatively (avoid shorts or revealing clothes).

Punctuality is usually practiced when arriving at work. However, meetings may sometimes start 15 – 20 minutes late and additional delays are possible when meeting with government officials. It may be necessary to confirm appointments one day prior to the meeting. Face to face meetings are more popular than telephonic or online communication. Most important decisions are made at the top level of management; therefore it is best to set up meetings with a senior leader for faster decision making. Deadlines tend to be flexible depending on the circumstances; however delays must be discussed with stakeholders at the earliest time.

Gender, religion, class and ethnicity issues don’t usually appear in the work environment, however, they do exist under the surface. Women sometimes face discrimination in the workplace and tend to hold more administrative jobs and fewer managerial positions. Religious opinions or discriminations are usually avoided at work however, Hindu – Muslim tensions could emerge occasionally. Opinions and beliefs about caste system are not dominant in the urban and work environment; however, the discrimination based on caste is common in rural areas.

Personal relationships based on trust are a precursor to long-term and lasting professional relationships. Favours and preferential treatment is expected by colleagues, clients and employees who have established personal relationships. However, in formal corporate environments it is essential for leaders to justify all hiring or business decisions and preferential treatment may be questioned. Indians avoid conflicts as much as possible and may not be upfront with colleagues about their disagreements or concerns. It is important to create a safe and conducive environment when seeking or providing feedback. It is also important to be cognizant of subtle hints and nonverbal cues to gauge if colleagues have any problems.
2. Canada - India Relations

Canada and India share a significant trade relationship and considers education, clean technologies, renewable energy, information and communications technology and infrastructure as priority sectors. Prime Minister of Canada and India met on several occasions in 2009 and 2010 and have established agreements which are expected to increase combined annual trade to $15 billion by 2015. Canada and India signed the “Canada-India Agreement for Scientific and Technological Cooperation in November 2005 to promote bilateral Science and Technology cooperation in nanoscience and nanomedicine; information and communications technology; biotechnology, health research and medical devices; sustainable and alternative energy and environmental technologies; and earth sciences and disaster management.”

See Figure 1: Canada - India Trade Balance in Billions from 2006 to 2010

Figure 1: Canada - India Trade Balance in Billions

Source: Industry Canada Trade Data Online
In 2011, Canada’s bilateral merchandise trade with India was almost $ 5.2 billion. Canadian merchandise exports to India increased by 28 percent to $2.63 billion. Canadian merchandise imports from India increased by 19 percent and were close to $ 2.53 billion in 2011. The chart above shows a trend in which Canadian Exports have been rising steadily from 2007 except in 2009 and 2010 (due to the recession). However, 2011 figures indicate a rebound to higher than pre-recession levels. The trade balance in 2011 was about $ 95 million and indicates a possibility that more products and services are being exported from Canada to India.
3. Atlantic Canadian Export Capabilities

Atlantic Canada withstood the global recession and has seen recovery in 2010 and 2011. Atlantic Canada’s total exports for 2011 were $32 billion, a 19 percent increase from 2010. As expected, the United States (US) is the largest importer of Atlantic Canadian products and services; importing almost 76 percent ($24 Billion) of total exports. Considering that developing countries such as Brazil, Russia, India and China (BRIC) have shown a sustained growth in international trade volume, it could be beneficial to invest time and effort in developing exports to these countries. See Figure 2: Atlantic Canada Export Percentage in 2011 - Top 10 Countries

Source: Industry Canada Trade Data Online
Atlantic Canada has specific export strengths especially in Petroleum refineries and oil and gas extraction as well as seafood product and preparation, frozen food manufacturing and fishing. Top Atlantic Canadian exports in 2011 are illustrated in Figure 3: Atlantic Canada Top 10 Exports in 2011 (Billions)

**Source:** Industry Canada Trade Data Online

Exports from Atlantic Canada to India tend to fluctuate, however there have always been trade surpluses. These trends are positive and additional trade activities can help to increase exports to India. See Figure 4: Atlantic Canada - India Trade Balance in Millions. To learn more see Appendix “A” - Top 25 Industry exports from Atlantic Canada to India
Figure 4: Atlantic Canada - India Trade Balance in Millions

Atlantic Canada - India Trade Balance in Millions

Source: Industry Canada Trade Data Online
Section II – Sector Overview in India
4. Aerospace, Defence and Security

4.1 Introduction

The Aerospace & Defense (A&D) sector is defined as revenues earned by manufacturers from civil and military aerospace and defense procurements which include equipment, parts, and maintenance (EPM).\(^5\)

The aerospace and defence industry is one of the largest industries in the world and depending on which sub-sector is analyzed, there is reason for optimism or concern. With the emergence of the Indian economy, the industry is set to expand.

4.2 Subsectors

The Aerospace and Defence industry consists of the aerospace sector and the defence and security sector. The aerospace sector includes the commercial airline sector, the business and private jet sector, and the air traffic control sector. The defence and security sector involves government spending on the military and the technologies it uses to ensure the safety of its citizens. The private security sector includes corporate and individual security provided by private security guards. This sector also includes Maintenance, Repair and Overhaul (MRO), helicopter manufacturing and parts manufacturing.

4.3 Global Context

In 2012, the global Aerospace and Defence industry appears to be moving in different directions. According to Deloitte, the commercial aircraft industry had strong production in 2011, but the defence industry declined due to the reduction in spending, mainly in the United States and Europe. The financial performance of the top 20 firms in aerospace and defence are expected to perform similarly to 2011. Although the defence industry is experiencing a decline of revenues from defense, it is maintaining margins by cost cutting and implementing aggressive growth strategies.\(^6\)
Airbus and Boeing have recently announced that they will be increasing production in the coming year (2012), which is a positive sign that the commercial airline industry as a whole will expect an increase in orders and in production. Top airline manufacturers also forecast that over the next 20 years, between 26,000 and 34,000 aircraft will be produced. One trend in the industry is that airlines are requesting new aircraft to be more fuel efficient to counter rising fuel costs. As a result, new aircraft are being equipped with “next generation engine technology” that cuts fuel consumption by approximately 15 percent (these are among the best selling products in the industry).

Defence spending in 2012 is expected to level off or possibly decline due to the reduction in spending in the United States, Britain and Europe. Increases are expected in China, India, Saudi Arabia, the United Arab Emirates, Japan and Brazil. Global defence spending in 2010 was approximated at US $1.6 trillion, led by the United States (US $698 billion) and China (US $119.4 billion). India spent approximately US $41.2 billion. Emerging markets such as Brazil, India and South Korea are increasing their spending on defence due to their increased wealth and to counter military threats to their national security.

In 2011, Frost & Sullivan estimated that the security industry was estimated at US$ 150 billion and was expected to grow at a Compounded Annual Growth rate (CAGR) of 10 to 12 percent. Growth is expected to peak in countries such as India, South Africa, China, Middle East, South America and some other South Asian countries.

4.4 The Indian Aerospace, Defence and Security Sector

The Indian aerospace industry is one of the fastest growing industries in the world, and this expansion has attracted major aerospace companies to the country. The emergence of the aerospace industry is due to an “increase in defence spending, a booming commercial aviation market, and rising technological and manufacturing capabilities among local companies.”

India has one of the largest military budgets in the world and spends approximately 2.4 percent of its GDP on defence procurement. Safety of Indian citizens has been a growing concern due
to rise in terrorist attacks in recent years generating higher spending both by government and the private sector on security.

4.4.1 Aerospace

In 2010, the civil aviation industry in India generated a CAGR of 18 percent, and the industry carried approximately 8 million passengers in January-February 2010, compared with 6.7 million passengers in the same period in 2009.\textsuperscript{13}

Domestic air travel increased from 3.20 million passengers in 2009 to 3.90 million passengers in 2010, an increase of 21.20 percent, partly due to the country’s economic recovery. In 2011, domestic air traffic was expected to increase by approximately 15 percent and international air traffic by 10 – 12 percent.\textsuperscript{14} An increase in the number of passengers will likely lead to the increased demand for skilled workers in the industry, including pilots, engineers, cabin crew, air traffic controllers, and management. By 2020 India is expected to become the third largest domestic aviation market, behind the United States and China, with the commercial aviation market predicted to expand by 18 percent.\textsuperscript{15}

The aerospace industry is expected to increase its orders for new aircraft over the next 20 years through the purchase of approximately 1,320 planes for about US $150 billion. The private general aviation market and the business jet market is expected to increase and account for about 12 percent of the global market by 2020 (with the expected purchase of up to 2,000 planes, up from 650 in mid-2011).\textsuperscript{16}

India also supports a Maintenance, Repair and Overhaul (MRO) section of the aerospace industry and currently services its own aircraft with the potential to service aircraft from neighbouring regions. This is due to the fact that labour is cheap and highly skilled in the country.\textsuperscript{17}

Airfreight and logistics in India is expected to grow as the country continues to increase its international trade and as domestic demand continues to rise.\textsuperscript{18}
Domestic firms present in the Indian aerospace industry include Airworks, GMR, GVK, Hindustan Aeronautics Ltd (HAL), HBL, HCL, Infosys, Jupiter, Larsen & Toubro (L&T), Mahindra, National Aerospace Laboratories (NAL), Quest, Reliance, ROLTA, Taneja Aerospace and Aviation Limited (TAAL), TATA and WIPRO. Cades, HCL, Infosys, Quest, Mahindra WIPRO and TCS are focusing on engineering and design services in the aerospace sector. Foreign firms that are present in the market include Airbus, Boeing, Bombardier, BAE, CAE, Capgemini, Eurocopter, Embraer, GE, Honeywell, Lufthansa, Magellan, Malaysian Airlines, PWC, Rolls Royce, Star Aviation and Saffron.¹⁹

4.4.2 Defence

The government is expected to spend approximately US $100 billion over the next five years on defence and homeland security requirements, mainly on upgrades and to acquire new equipment. Approximately 70 percent of military hardware purchased is imported, with the remainder from government factories. India imports military products from Russia, Israel, France, Germany, the United States and South Africa. Currently the government procures military equipment through a Defence Procurement Process (DPP). Foreign partners include LTA (Israel), RAC MIG (Russia), Rosenboron (Russia), Boeing (U.S.), Fincantieri (Italy), Israel Aerospace Industries (Israel) and Lockheed Martin (U.S.).²⁰

Private domestic companies in the defence and security sector include Larsen and Toubro, Mahindra and Mahindra, Tata, Bharat Forge, Ashok Leyland, Godrej, Kirloskar, HCL, Wipro, Max Aerospace, Samtel & MKU. Foreign companies have recently entered into joint partnerships with both public and private sector companies, and the most recognizable ventures include SNECMA and Hindustan Aeronautics Ltd (HAL), Lockheed Martin and Wipro Technologies, Boeing and Tata Industries, Thales and Samtel Industries, and SAAB and Tata Consultancy Services.²¹

Six central police forces in India are planning to modernize their forces, which could be an opportunity to supply equipment, services and training. It is predicted that the homeland security market in India could be valued at US $10 billion by 2016.²²
4.4.3 Security

In 2010, the Indian Private Security Industry was estimated at US$ 3 billion and has grown at the rate of about 20 percent annually from 2005 – 2010 and is projected to grow at about 17 percent by 2015. The market is highly fragmented and the top 10 players hold less than 25 percent of the market. The security sector in India include services such as manned guarding, electronic security services, cash handling and manufacturing such as locks, perimeter or entrance security, secure storage, cash automation, electronic surveillance systems and systems integration and installation\(^{23}\)

Safety of Indian citizens has been a growing concern due to rise in terrorist attacks in recent years. Corporate and individual demand for private security has also been growing. In 2011, India had more than 5.5 million security guards employed by about 15,000 security companies. The Private Security Agencies Regulation Act, 2005 (PSAR) was created to combat the problem of untrained and severally underpaid security guards.\(^{24}\)

4.5 Macroeconomic Environment

4.5.1 Political

The Defence Procurement Procedure (DPP) in 2012 is likely to introduce specific “standard global practices and provisions for foreign exchange risk.”\(^{25}\) The domestic defence sector is looking for support from the Ministry of Defence through the “awarding of contracts, providing tax incentives, issuing industrial licenses, increasing foreign direct investment, and building up the indigenous defense industrial base.”\(^{26}\) There may be an advantage for foreign firms to partner with domestic organizations to land these government projects.\(^{27}\)

The Government of India has set up a Defence Acquisition Council (DAC), led by the Minister of Defence to provide a degree of transparency and cost effectiveness “to the acquisition process [for] equipment, weapons, and weapon systems.”\(^{28}\)
The national offset policy of the government requires a 30 percent investment by foreign firms into the defence industry. As a result, foreign partners are able to choose which Indian partners to deal with.  

The PSAR was created with an aim of improving private security standards and implemented licensing and mandatory training of 160 hours for security guards. However, the Central Association of Private Security Industry (CAPSI) views these laws as minimum standards rather than adequate and recommends at least 60 days of training of guards prior to placement. The PSAR also mandates that major shareholders of private security companies must be Indian citizens, however there no restrictions on foreign firms partnering with Indian companies.

4.5.2 Economic

As the global economy continues to recover from the economic downturn in 2008, India is expected to lead the demand for aircraft in the Asian economy, especially over the next 20 years. According to PricewaterhouseCoopers, the aerospace and defence industry could offer cost savings of approximately 15 to 25 percent to manufacturing companies in India (specifically IT companies and corporations that offer “implementation activities in the value chain”\(^{31}\)).

The 2009-2010 budget for defence spending was US $23.42 billion, of which US $10.22 billion was committed to capital ‘acquisitions’ (i.e., new weapons, systems and equipment). Over the next five years, it is estimated that the total budget spending in these areas would be approximately US $45.85 billion and contribute to the overall Indian economy.\(^{33}\)

The government of India is expected to spend approximately US $100 billion over the next decade on defence equipment, and the country is believed to be the “second largest buyer of weaponry.”\(^{34}\) The ultimate goal of the Indian government is to become self-sustainable and rely on domestic firms for defence products.
4.5.3 Socio Cultural

The rise of the middle class, increased corporate profitability and tourism in India will lead to business opportunities in the aircraft sector of the aerospace industry.

Approximately 500,000 English-speaking engineers graduate each year, which provides the aerospace and defence industry with a pool of talent to choose from. Aerospace companies in India (specifically in MRO) are actually working with local universities to help students secure work through employment programs.

India does have a strong aerospace industry that is supported by engineering, science and IT graduates, and these graduates are contributing to the supply of “parts and components, robust manufacturing expertise, [and] production systems.” As a result, many international companies are looking to India as a manufacturing, repair and overhaul destination. Some have begun to utilize India as an outsourcing location.

4.5.4 Technological

In 2012, India and the US are collaborating to improve their defence sales relationship to over US$ 8 billion. There are agreements in place for the sales of maritime surveillance and transport aircraft such as the C-130 transport aircraft and P8-I maritime surveillance aircraft. “Lockheed Martin, Sikorsky and India's Tata Group are already jointly manufacturing spare parts for transport aircraft in Hyderabad.”

India is also collaborating with many other countries to augment its defence technologies. Some examples include:

- Over the next 10 years the Indian Air Force (IAF) plan to spend over US$ 40 billion for modernization of its equipment and technologies which includes purchasing fighter jets such as the 126 medium multi-role combat aircraft (MMRCA). The IAF is also working with an Israeli firm Israeli Aircraft Industries (IAI) to maintain and upgrade more than 150 Unmanned Aerial Vehicles (UAVs) for a project cost of approximately US$ 1 billion.
• The Indian Navy is planning to add 46 ships and submarines to its fleet in 2012. Vice-Admiral Anil Chopra said, “In the near future, the Command will be home to additional strategic platforms, anti-submarine corvettes, P8i long range maritime reconnaissance aircrafts, MiG-29K fighter jets and advanced jet trainers”.

• Defence Research and Development Organisation (DRDO) is planning to implement a Ballistic Missile Defence system in Delhi and Mumbai in order to “ensure maximum protection against air-borne threats”.

• Unmanned aerial vehicle "Rustom" and pilot-less target aircraft "Lakhsya" have generated keen interest from countries such as Brazil, Canada and Israel. Senior Trade Commissioner at the Canadian High Commission in New Delhi said he saw "a good potential" for collaboration between India and Canada in developing these technologies further.

4.6 SWOT Analysis

4.6.1 Strengths

The Indian aerospace industry offers lower operating costs and skilled talent and also provides strategic partnerships through its Information Technology firms. In addition, it has a competitive advantage due to its high domestic demand.

The Indian government is believed to be one of the biggest spenders on defence and weaponry, and its goal is to become a self-sustaining industry, relying on domestic firms to satisfy the needs of the military.  

India can leverage its geographic location to provide a strategic advantage for MRO operations. With it being placed between Europe and the Asia-Pacific region, it can be an ideal place for international carriers to service their aircraft, since they are increasing their flight paths over India. Domestic carriers also have the advantage of their planes being serviced within the country.  

Canadian companies that provide MRO operations can partner with Indian
companies to provide their services and technologies and position themselves to gain exposure to the European and Asian-Pacific airlines that have their aircraft serviced in India.

### 4.6.2 Weaknesses

Several challenges to the Indian aerospace industry include a lack of infrastructure, state border entry permits, customs clearance (for exports and imports), complex tax laws, quality assurance and reliability and supply chain management.\(^{43}\)

In addition, some companies are deterred from entering the Indian market or from outsourcing their manufacturing to Indian companies due to the slow approval process of manufacturing processes and of specific products.\(^{44}\)

The domestic defence industry in India has not matured in comparison to the foreign firms that can provide better products and services to the military. The lack of cutting edge technologies developed by Indian aerospace firms does not allow these firms to compete on an international stage. They have utilized licensed technology from global leaders, but need to develop their own technologies. The large demand for capital funds for start-up and to address a firm’s working capital requirements can be viewed as a barrier to entry for companies looking to enter the Indian market.\(^{45}\) In addition, the slow approval process for processes and specific parts can deter international companies from partnering with Indian manufacturers or from opening operations in that country.

The aerospace industry is evolving in the State of Karnataka, but the infrastructure is underdeveloped and needs to be upgraded for it to become an even more robust region. There is also a demand for land in this region in order to attract more business.\(^{46}\)

### 4.6.3 Threats

The government still relies heavily on imported military products and services, and this is expected to continue in the near future. The purchase of foreign equipment and services by the Indian government does have additional drawbacks. Purchases from foreign companies can
be more expensive than domestic competitors and there could also be shipping or production delays. Such delays have led to a lack of spending on military equipment in the past. In addition, the acquisition of equipment must go through several approval procedures, often set out in the Defence Procurement Process (usually two to three years). This could be a threat to the success of foreign firms looking to conduct business in India. Domestic firms do receive tax breaks that allow them to compete with foreign firms, which could also lead to slow growth or loss of profit for foreign competitors.

The Defence Public Sector Undertakings (DPSUs) in India have “historically dominated Indian aerospace, shipbuilding, communications and electronics,” and the government has protected these undertakings to the extent that they almost have a monopoly status. However, these DPSUs have relied on outdated technology when supplying the military, which have led to cost overruns and delays.

Indian-based software companies do compete in avionics and are also “aggressively trying to increase their share of the engineering services outsourced (ESO) market.” Many big players in the market have set up aerospace divisions to compete in this area, and foreign companies will face competition from other global giants that offer state of the art technology.

4.7 Key Business Opportunities in India

There is an increasing demand in India for aerospace products, and Canadian companies have an opportunity to invest in order to increase market share and remain competitive on the global stage. The industry has also focused on the development of ‘green’ technologies to increase fuel efficiency as fuel costs increase.

The increase in air traffic in India would allow for foreign training providers to explore the Indian market. CAE, a Canadian pilot simulator training company, currently operates in India and at least four other international operators are exploring investment opportunities (including Airbus and Boeing). The rise of the middle class, increased corporate profitability and tourism in India will lead to business opportunities in the aircraft sector of the aerospace
industry. Successful Canadian companies in the design and production of aircraft and turbine engines, in Maintenance, Repair and Overhaul, and in education and training in the sector have an opportunity to enter the Indian market and succeed.

India possesses the potential to “service a fleet of 1,000 commercial and 500 general aviation aircraft.” Relatively cheap labour and a highly skilled workforce provides the cornerstone for the Maintenance, Repair and Overhaul segment to grow, with the potential for revenue of US $2.6 billion by 2020.

There is an opportunity to grow international express freight operations in India as demand increases and as government regulations appeal to international companies.

As the aviation sector of the aerospace industry continues to grow, there will be an increased demand for trained manpower, including pilots, aircraft maintenance engineers, computer-aided design (CAD) and computer-aided manufacturing (CAM) engineers, airline staff and airport staff. In 2012, there is a projected demand for 5,300 pilots and 30,000 to 40,000 engineers. This could open an opportunity for Canadian firms to enter the market, as India currently has a shortage of domestic pilot training facilities. According to the Canadian Trade Commissioner Service, opportunities may exist for Canadian firms to partner with an existing training academy or open a new training facility.

The defence and security sector in India is emerging as a key player in the region. Both the United States and European companies view India as a strategic market and a manufacturing partner. India has the third highest procurement budget in Asia, and is one of the global heavyweights in military spending. The government is also looking to purchase “sophisticated defence electronics and communication systems” for the military and there is opportunity for foreign firms to provide equipment and services to the government and military of India. Foreign firms are expected to have an edge over domestic firms in the short term due to their advanced, specialized knowledge.
The Indian Air Force (IAF) has traditionally sourced its aircraft from Russia, but is looking to expand its vendor base, mainly from firms in the United States, Israel and Europe. There is an opportunity for Canadian companies that work with these global aircraft producers to sign new contracts that would supply to the IAF. There would also be an opportunity to provide trainer aircrafts, offer the technology to upgrade the current equipment, and to procure “airborne early warning aircraft.”

Future spending by the Indian military is planned for upgrades and purchases of new equipment, including hand-held “battlefield surveillance radars, hand-held thermal imaging devices for night vision, integrated observation equipment, short range secure radio sets,” and tactical equipment. Canadian companies that have products in these areas, or who partner with companies that do, would have an opportunity to grow their business in India.

By 2020, the Indian navy plans to expand its fleet and purchase “sonar equipment, navigational radars with Low Probability of Intercept technology (LPI), and multi-functional radars.” The Coast Guard plans to increase its personnel and “add coastal surveillance radars and long-range electro-optic solutions” for offshore security.

With the Indian government looking to modernize their military and police forces, there is an opportunity for Canadian companies that supply equipment, services and training to offer similar services and to enter the Indian market.

There is an advantage of building products to the design requirements of the country, and India possesses these “‘build to specifications’ capabilities in space and missile systems.”

The Security equipment market imports CCTVs, Access control systems, Metal detectors, Intrusion detection systems, door intercoms from countries such as Israel, China, Taiwan, Korea, UK and US and imported gadgets form about 35 percent of the total market. Imports are expected to increase to approximately US$ 2.5 billion by 2012.
4.7.1 Indian Industry Stakeholder Perspective

Senior executives in the Indian aviation, avionics training and security solutions for homeland security and enterprise solutions felt that opportunities in the defense sector are opening up with changes in the Defense Procurement Policy (D.P.P). Although certain policy changes such as Public Private Participation (PPP) model for airports have emerged, they have mostly been focused on the commercial aviation segment. Respondents felt that the sector needs a policy environment that will enable the Business Aviation and Maintenance, Repair and Overhaul (MRO) industry. Stakeholders also indicated that Atlantic Canadian companies interested in participating in the Indian aerospace, defence and security sector will require patience and a long term perspective.

Respondents indicated that opportunities are available to Atlantic Canadian companies in security solutions & services for cyber world, high speed data processing, big data problems and core technology solutions such as digital signal processing boards. Additionally, inter-operability testing (IOT) certified solution providers can partner with large companies for the deployment of enterprise solutions. The allocation of a large budget for modernization of defence and police departments offers opportunities for homeland security solutions, machinery and equipment. The aviation infrastructure and manufacturing sector has also seen increased demand for heliports and aircraft manufacturing expertise for stylized and quality aircraft interiors and in flight products. There is also a requirement for training simulators, engines, and spares for the aviation sector.

Atlantic Canadian companies can also consider establishing training facilities that are compliant to international standards, for general aviation, commercial, mission or fleet training. Additionally, these facilities can be leveraged as hubs across South East Asia and the Middle East markets.

Atlantic Canadian companies could participate in the Indian market via partnership with an Indian company for market intelligence and distribution capabilities and offer new and validated technology support. The sector is R&D centric and capital intensive therefore strategic
technology partnerships and financial investments are welcome. There is a tremendous opportunity to utilize India’s technically competent manpower to build pre and post-sale service hubs for Asia & Middle East in the long run.

4.8 The Atlantic Canadian Aerospace, Defence and Security Sector

The Canadian Aerospace and Defence industry has over 400 companies, including “Original Equipment Manufacturers (OEMs).” It employs approximately 80,000 employees and generates about CAN $24 billion. The commercial aircraft industry accounts for about 83 percent of its revenue.

The Atlantic Alliance of Aerospace and Defence Associations (AAADA) is a group of over 200 companies partnered with government organizations that provide services to clients in the aerospace and defence sector both locally and around the world. These companies work together to provide superior service and constantly build strong relationships with global clients. Annual revenue of the AAADA is around one billion dollars, and daily exports are approximately $107 million. The AAADA employs around 24,000 people and works with an annual budget of approximately $1.6 billion. These companies provide services in Design, Engineering and Manufacturing of aircraft engines, of shipbuilding, of electrical systems, of ocean mapping and charting, of cold-water engineering, and of maritime surveillance. They also provide Maintenance, Repair and Overhaul (MRO) services for fixed and rotary wing aircraft, for land-based military vehicles and for ships. The AAADA also provides advanced technologies including Aerospace and Defence Mission Systems, communications, advanced learning technologies, modeling and simulation, training systems integration and information systems integration. Key clients include Air Canada Jazz, Boeing, Bombardier, Airbus, Thales, Lockheed Martin, Pratt and Whitney, Honeywell and General Electric.

The New Brunswick Aerospace and Defence Association (NBADA) is a joint venture between the provincial and federal governments and consists of companies that contribute in aerospace and defence fields including “metal fabrication, precision machining, development of e-learning systems, electronics/avionics assembly, aerospace design, advanced composites research and
secure communications research." The NBADA is a point of contact for companies in the province that service the sector. In addition, the province is strategically placed to service the North American and European markets, and “trans-border air access at its five ports” can service the globe.

Newfoundland and Labrador contributes to the industry through the Aerospace and Defence Industry Association of Newfoundland and Labrador (ADIANL). This organization partners with the provincial and federal governments to enhance the industry profile on a global stage and to identify opportunities that will benefit the province and the industry. Members of ADIANL provide services including Maintenance, Manufacturing, Repair, Overhaul and Information Technology in the industry.

The Aerospace and Defence Industries Association of Nova Scotia (ADIANS) has a mandate to “advance the development and promotion of the Nova Scotia aerospace and defence industry” by working with local industry organizations, the provincial and federal governments and the community. It employs approximately 6,000 people and generates approximately $600 million in revenues. It is seeking to grow in the marine security and the oceans and space technologies sectors. It aims to pair its large aerospace and defence companies seeking strategic partnerships in international markets by providing access to government programs.

The Aerospace Association of Prince Edward Island (APEI) is responsible for working with its member companies to further “business development and promotional opportunities for the betterment of the aerospace” industry in Prince Edward Island (PEI) and it is a member of the AAADA. The aerospace industry of PEI competes on a global stage and the sector focuses on manufacturing, maintenance, repair and overhaul services, and design engineering. The Aerospace sector is concentrated just outside of Summerside, PEI in Slemon Park.
4.8.1 Atlantic Canadian Industry Stakeholder Perspective

Stakeholders in the Atlantic Canadian Aerospace and Security sector reported that there has been a stagnation in the international market due to the sluggish economy, however as the economy improves aerospace and defense sector is expected to grow proportionately. The industry has been identified as a target for growth by the Atlantic Canadian governments because traditional markets have declined. Overall the aerospace industry is composed of manufacturing and maintenance companies for smaller civilian aircraft. Exports from Atlantic Canada include research and design, aircraft parts, wiring systems, leading edge flat fair empennage, maintenance and overhaul equipment, and software. Importers include the US, Europe, Asia, South Africa, South America, Ireland, Britain, and other provinces. Advantages include qualified and stable workforce with high level of expertise and excellent levels of education, competitive costs, infrastructure, low turnover, and internal workers being able to contribute to the industry instead of contracting out. One respondent felt that having ACOA support the industry, talent pool other Atlantic Canada initiatives were the biggest advantages in Atlantic Canada.

Cost saving is one of the biggest advantages of niche and high end technologies as the Government subcontracts projects and the private sector must to justify its costs. Electronics continue to get lighter and smaller on the hardware side whereas on the system side interactivity, customization and interoperability on multiple platforms is important. This trend has encouraged retrofitting of older systems where several different systems may be put together; flexibility is key for such system integrations.

Vector is a large company in Atlantic Canada with a global presence in the US, Europe, and Asia, and there are several other companies that support them. Prince Edward Island (PEI) and Atlantic Canada are very small markets and therefore exporting internationally is important. Atlantic Canada’s competitive edge is its skilled workers, collaborative technologies, strong reputation for quality and labor costs. The aerospace industry in PEI is examining opportunities for maintenance contracts for smaller facilities, which is its industry focus.
Respondents have conducted some research on the Indian market in the past which primarily involved speaking with larger partners, the trade commissioners and Indian firm representing Canadian companies in India about their experiences. Respondents received some generic advice on what to expect and were considering whether they should venture into the market independently or partner with a larger associate on joint projects. Preliminary research revealed great market potential and interest in their specific products. However, they also received cautionary advice about some of the difficulties of conducting business in India. These problems include concerns over corruption, preferences given to homegrown companies, and lack of Intellectual Property protection. Overall, it was felt the risk would be worthwhile for companies that were sufficiently large and therefore respondents felt the best approach would be to wait for one of their larger partners to establish connections and business in India and they support their initiatives as subcontractors.

4.9 Recommendations and Market Entry Strategies

Atlantic Canadian companies in the aerospace and defence industry do have an opportunity to enter the Indian market and sell its products and services. With the emergence of India on the global economic stage, Atlantic Canadian companies can utilize their strengths to introduce new technologies into the aircraft sector and the defence sector.

The State of Karnataka is becoming a high tech and aerospace region (including manufacturing and MRO activities), and its main businesses include joint ventures with foreign firms, robust Research and Development manufacturing centres, IT design and outsourcing services, and component and landing gear production. Canadian companies in the aerospace and defence industry that are looking to enter the Indian market should consider partnering with Indian companies in this region.

Karnataka Udyog Mitra (KUM) is a government of Karnataka organization created to promote, facilitate and assist investors in the region. Its role is to “facilitate investments and execute initiatives to enable a smooth transition, from receiving an investment proposal to the eventual implementation of the project.”
In order to participate in the Indian defence acquisition process, the first step should be appointing an Indian Sales Representative who would work with the Atlantic Canadian company to raise awareness of the brand and products, and work as an intermediary between the company and various contacts within the Indian Department of Defence (i.e., project officers or members of other commercial departments). Personal contact is a major avenue for doing business in India.

Some prominent defence trade show and fairs are listed below:

**Aero India 2013 (International Aerospace and Defence Exhibition)**
Bangalore
6 – 9 February 2013
[www.aeroindia.in](http://www.aeroindia.in)

**Defexpo India 2014**
New Delhi
March 2014
[www.defexpoindia.in](http://www.defexpoindia.in)

**IICDES 2013 (India International Civil & Defense Equipment & Systems)**
New Delhi
November 2013

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5. Agriculture, Food and Beverage (Including Seafood)

5.1 Introduction

Since India gained independence in 1947 it has consistently focused on food self-sufficiency, relying on rice and wheat.\textsuperscript{82} Over the years the agriculture market has grown and it will continue to expand. In addition, there is an opportunity to expand the Seafood market in that country. The health benefits from consuming seafood are leading to a greater consumption of various fish and seafood species by Indians.

5.2 Subsectors

The Food and Beverage Industry is the largest global business, with food subsectors in agriculture, seafood, food processing, wholesale and distribution, and retail. The Beverage industry can be broken down into soft drinks, bottled water and juices, and alcoholic (including beer, wine, and spirits). Fish Farming or Aquaculture includes the farming of fish, shellfish, and aquatic plants in marine or fresh water.\textsuperscript{83}

The major players in the global market include Nestle, Pepsico, Unilever, Kraft, Dupont, Dole Food Company, JBS SA and General Mills.\textsuperscript{84}

5.3 Global Context

The agriculture industry is one of the largest in the World, and as of 2012, global grain production reached 2.3 billion metric tons and is predicted to remain the same in 2013, ranging from 2.24 billion to 2.3 billion metric tons.\textsuperscript{85} According to the Food and Agriculture Organization, the world was supplied with 154 million tons of fish in 2011. In 2009, approximately two thirds of the world’s fish consumption was from Asian countries and in 2010 Asia accounted for about 89 percent of the world’s aquaculture production by volume.\textsuperscript{86}
As of 2007, the global packaged foods industry was “valued at US $1.6 trillion. Meanwhile, the World Bank [values] the food agriculture sector at approximately ten percent of global GDP (or US$4.8 trillion).”

Emerging nations such as China, India, Brazil and Russia (the BRIC nations) are becoming wealthier, and are changing their eating habits. In particular, they're buying more packaged foods and consuming more meat. Companies like Wal-Mart and Carrefour have been expanding and building more supermarkets around the world. As a result, there is a ‘double benefit’ of population growth and increased standards of living, which add up to growth in modern retailing. Private labels and healthy lifestyle products are key food categories to pursue and have become more popular recently as consumers seek opportunities to eat at home. “Wellness or healthy lifestyle foods are a significant global trend, as the growing number of middle-class and affluent consumers in emerging markets are looking to healthy choices in food products as the next step in their purchasing evolution.”

5.4 The Indian Agriculture and Food Sector

The agriculture sector in India accounts for approximately 16 percent of GDP and 10 percent of export earnings. The country also possesses the second largest amount of arable land in the world at 159.7 million hectares (behind the United States), or 49 percent of the entire Indian territory. The total grain production in India in 2011 was 233.3 million tons, and is expected to “increase by 2012 to 233.9 million tons.” India only contributes “about 1.4 percent to overall world trade as of 2010.” Agricultural imports in 2010 were valued at $11 billion and exports were valued at $15.9 billion.

In 2009, the top Indian imports included fish and crustaceans, grains and cereals, and tea and coffee. The industry does expect to continue to grow, and several Indian agribusiness companies are “looking at new ways to reach out to farmers and consumers, including setting up agri-food retail chains.” Private sector investment in ready-to-eat food products is growing
in response to the increased demand for these products due to a rise in family incomes and to these families moving to urban centres.  

The Canadian Trade Commissioner Service indicates that India services about 50 percent of its pulse needs with imports from Canada. In addition, it also imports about 55 percent of its available edible oils. The import tariff on these oils have decreased from “85 percent to 7.5 percent” in recent years.  

In 2009, Brazil supplied 64 percent of all India’s imported food goods (including processed food and beverages), and other suppliers included Thailand (7 percent), Britain (4 percent) and the US (3 percent).  

5.4.1 Retail Market  
Large retailers account for approximately 5 percent of the market, but this number is increasing as economies of scale are permitting them to offer products at lower prices. The major players in the Indian market are Reliance, RPG Retail (including Food World, Spencers, and Nilgiris), Pantaloon, the Aditya Birla Group (including the Trinethra Supermarket), Subhiksha Trading, Spar and ITC (Choupal Fresh stores, which procure fruits & vegetables directly from farmers). The companies prevalent in the nutraceuticals industry include Reliance Wellness, Dabur, Avesthagen Himalaya, Ranbaxy Laboratories, Dr Reddy’s Laboratories, Wockhardt, GNC India and Guardian Lifecare. Supermarkets include Metro AG of Germany (Cash and Carry Hypermarket), Bharti-Walmart (Cash and Carry JV), Shoprite of South Africa (Shoprite Hyperstore), Bookers, and Tesco (which has a partnership with Trent, part of the Tata Group).  

5.4.2 Alcoholic Beverages  
The alcoholic beverages industry in India (including beer) is classified as one of the largest in the world, mainly due to its high whiskey consumption. The country consumes approximately 70 – 75 million cases of whiskey each year, and approximately 300,000 cases are imported. These imports are increasing at a rate of about 35 – 40 percent each year. There is potential for the
expansion in the beer market as well. In 2011, the market was expected to grow at a rate of approximately 17 percent. In 2010, Singapore exported the most wine to India (52 percent of all imported wine). The other top suppliers of wine to India were France (17 per cent), Australia (10 percent) and Italy (7 percent). The wine sector was worth approximately CAN $259.5 million in 2011 and is expected to grow to approximately CAN $413.2 million by 2015 (based on a current exchange rate of INR 56 equal to CAN $1).

5.4.3 Snacks and Processed Foods

In 2011, the packaged foods industry in India was valued at US $24 billion, and expected to grow to US $38.5 billion by 2016. The three sectors with the highest values were the dairy sector (US $9.1 billion), the bakery sector (US $4.9 billion), and the oils and fats sector (US $4.1 billion).

The food processing industry in India is “one of the largest sectors ... in terms of production, growth, consumption, and export.” The government has approved proposals since August of 1991 for “joint ventures, foreign collaboration and industrial licenses.” There is a growing demand for processed and convenience food in India, and as a result there is a need for cold storage, packaging, processing and transportation of such goods. Strong supply chain, warehousing and waste management systems are critical to keep food safe and prevent spoilage. Food companies are setting up small, local production facilities because the cost to distribute the product is high.

Competitors in the packaged food market in India include: “Hindustan Unilever, Gujarat Co-operative Milk Marketing Federation, Frito-Lay India, GlaxoSmithKline Consumer Healthcare Ltd, Britannia Industries Ltd, MTR Foods and Karnataka Cooperative Milk Producers Federation Ltd.” Private label brands hold a small share of the market (about 1 percent in 2009). Popular suppliers of confectionery products include Perfetti, Parrys, Parle, Nutrine, Candico, Ravalgaon, Wrigley, Nestle and Cadbury.
In 2008, the snack food market was estimated to be US$ 3 billion of which the organized sector accounted for 50 percent and was expected to grow at the rate of 15 to 20 percent per year. The availability of a variety of domestic snacks at comparatively lower costs compounded by high import tariffs and “a complex distribution network” has impacted the pace at which the imported snack market has grown (US$ 30 million).\textsuperscript{110}

The dessert market is lucrative in India. In 2010, the confectionery and chocolate market was estimated at approximately $489.6 million, with sugar confectionery accounting for 61 percent of that amount. The Indian biscuit market is valued at approximately $940.8 million and approximately 90 percent of Indians purchase biscuit products.\textsuperscript{111}

5.4.4 Dairy and Milk Products

The lower- to middle-class in India is expected to increase its dairy consumption between 2011 and 2014. Tetra Pak offers food processing and packaging for a variety of milk and milk products to the Indian market, including milk, liquid dairy products (liquid cream, yoghurt-based drinks), soy drinks, rice grain and seed drinks, soft drinks (carbonated, juice, nectar and still drinks, tea) wine and spirits, cheese (semi-hard cheese, cheddar cheese, cottage cheese, fresh cheese, hard cheese, pizza cheese, whey), ice cream, soups and sauces, tomato products, olive oil, and pasta sauces.\textsuperscript{112} Popular imported cheese brands include Pilgrims Choice, Laughing Cow, Kraft, Gruyeri, and Lebon.\textsuperscript{113}

5.4.5 Seafood

Coastal areas consume the most fish and seafood as compared to the interiors due to the “lack of (cold) chain and storage infrastructure” that would allow for transport to the Indian interior. Inland fishing is gaining popularity, and is expected to grow as purchasing power of the Indian middle class continues to grow. Consumers seem to prefer the taste of fresh fish, but also enjoy fish fingers, breaded fish fillets, cutlets and nuggets.\textsuperscript{114} In 2010, China supplied India with approximately 34 percent of its aquaculture products, and Bangladesh supplied it with the most
fish and seafood (61 percent). Besides Canada, India imports seafood from Norway, Thailand and Indonesia.

Seafood, particularly salmon, lobster, tuna and sea bass, are increasing in popularity in India. From 2003 – 2009, demand for imported seafood increased at a compounded “rate of 24 percent with a total market size of US $13 million in 2009.” In 2009, the Indian economy imported US $7.58 million in frozen shrimp and prawns, US $2.32 million in salmon, and US $1.13 million in processed seafood.

5.4.6 Meat

In 2007 – 2008, India imported only US$ 2.54 million worth of meat. These insignificant imports are attributed to government restrictions as well as the predominantly vegetarian Indian population. Beef and products containing beef are prohibited from being imported due to religious reasons, and lamb is restricted from being imported due to India’s sanitary regulations.

5.4.7 Fresh Fruits

According to the USDA Foreign Agricultural Service, although India is a net exporter of fresh fruits, India imported 77,450 tons of fresh fruit in 2007 – 2008. Apples, grapes, pears and oranges constitute more than 90 percent of total fruit imports of which apples alone constitute 75 percent. “Other fruits like plums, apricots, cherries, various berries, kiwi, durians, dates, figs, etc. are imported in small quantities. Cherries, apricots and some berries are imported in very small quantities due to their highly perishable nature and high cost. Nonetheless, some fresh fruit importers have shown their increased interest in these fruits. These fruits are mainly imported by air so the freight costs inflate their prices.”
5.5 Macroeconomic Environment

5.5.1 Political

Effective January 2012, 100 percent FDI in single-brand retail trading companies is permitted in India subject to specific conditions such as preferred requirements “for foreign investors to source 30 percent investments to cottage industries, artisans, craftsmen and small and medium enterprises (SMEs), if their FDI is beyond 51 percent.”

After several months of delay the central government has decided to allow “51 percent FDI in multi-brand retail, which would allow super-chains like WalMart to partner with a local company and sell directly to the Indian customer.” This move has been vehemently resisted by both the opposition party as well as some allies of the coalition government. However, it will be up to the state governments to decide whether they wish to implement FDI in multi-brand retail in their states. Please refer to Appendix “B” – Indian States For or Against FDI in Multi-Brand Retail.

The government of India has undertaken the following e-Governance initiatives in Rural Agricultural Development:

- Rashtriya Krishi Vikas Yojana (National Agricultural Development Plan)
- Information to farmers on Govt. Programmes and Schemes
- Agricultural Marketing Information Network
- Agriculture Credit
- Agriculture Marketing
- Drought Management
- Macro Management Unit
- Networking of Directorates and Field Units
- Seeds
- Kisan Call Center
- Agricultural Census
- Registration of Pesticides
- Integrated Nutrient Management
• Rainfed Farming System
• Cooperation
• Horticulture Development

Exporting processed food to India will usually not require certification except livestock “that require[s] export certificates from the country of origin.” The Food Safety Standards Authority of India (FSSAI) controls the import of foods and beverages, and they have documents on their website that outline the requirements for food imports (www.fssai.gov.in).

5.5.2 Economic

The agriculture sector in India accounts for approximately 16 percent of GDP and 10 percent of export earnings. The National Cooperative Development Corporation (NCDC) has provided between 75 and 90 percent of financial assistance to State Governments to assist with the modernization of cold storage facilities by cooperatives, and has worked with the National Horticulture Board to administer funds.

“India’s strong economic growth is increasing consumers’ incomes. It is estimated that by 2025, India will have 583 million people living on incomes of above US$4,380 (around US$23,530 after accounting for the purchasing power parity. This growth is likely to increase the demand for different varieties and unique foods in the Indian Market.

5.5.3 Socio Cultural

There is room in India for the agriculture, food and beverage industry to expand. Canadian companies looking to enter the market need to be cognizant of the fact that there are different food preferences from region to region. There is also a changing attitude toward imported foods and with the emergence of the middle class. More Indians are interested in purchasing imported foods, especially seafood (lobster, salmon, tuna and sea bass).

There are several trends currently driving industry growth in India. As incomes rise, purchasing power increases and drives up the demand for some products. The Indian society is being
exposed to western culture, which has led to an increase in the purchase of processed food, branded food and beverages. In addition, with more women entering the workforce there is a growing demand for processed foods like canned foods and ready to eat meals. Indians are very health conscious and are seeking to consume healthier food products.\textsuperscript{128}

The young demographic is more accepting of different food choices, and they are beginning to demand more international products.\textsuperscript{129} Men between 30 and 50 tend to consume the most wine, but there has been an increase of consumption by young professionals in urban centres (it can be seen as a status symbol).\textsuperscript{130}

According to the USDA Foreign Agricultural Service, “Indian consumers are very price sensitive and spend just four percent of their monthly food expenditure on fresh fruits. Therefore, per capita fruit consumption in India is low compared to other markets.”\textsuperscript{131}

\subsection*{5.5.4 Technological}

Information and Communication Technology is utilized in the agriculture sector in order to provide farmers with advisories and agriculture-related information in order to improve their businesses. Examples of this service include the development of Common Services Centres, Internet Kiosks and Sediment Monitoring Stations (SMSs).\textsuperscript{132} Some other services provided include “information on pesticides, fertilizers and seeds, weather advisories, information on prices, monitoring programs, and fishery inputs.”\textsuperscript{133} The Department of Agriculture and Cooperation (DAC) has also developed about 80 portals in its head office and field offices to support the agricultural industry, including a Farmers’ Portal that provides information about crops, fertilizers, machinery, etc.\textsuperscript{134}

In 2005, the National Horticulture Mission implemented initiatives to provide inputs in areas such as research, production, post-harvest management, processing and marketing and hoped to impact infrastructure aspects like cold chains, pack houses, grading and packing units, cold storages, refrigerated vans. These initiatives in conjunction with tax benefits and assistance for
the capital investment from the Government were expected to double horticulture production by 2011.\textsuperscript{135}

5.6 SWOT Analysis

5.6.1 Strengths

The large food processing industry in India is evident with the production, consumption and export of its products.\textsuperscript{136} Demand for locally produced packaged goods and for international products is continuing to grow. Indians are consuming more fish and seafood in coastal regions than in interior regions due to the lack of infrastructure and proper storage facilities. However, inland fishing is a growing sector in the country as cold storage and transportation facilities improve.\textsuperscript{137}

Alcoholic beverages market is in a position to expand with young professionals contributing to the increase in red wine consumption due to its health benefits.\textsuperscript{138}

The dairy industry is large and offers a variety of milk and milk products including milk, liquid dairy products, cheese and ice cream. The federal and state governments of India are offering programs to increase the productivity of farms and to expand the dairy product offerings of dairy industry unions and cooperatives.

5.6.2 Weaknesses

One significant barrier to entry is the infrastructure in India. The urban areas have the roads to support commerce, but there is a lack of this infrastructure in rural communities. Additionally, organizations seeking to enter the market need to abide by regulatory and foreign investment controls. Companies that are seeking to introduce products for small-scale industries may face delays in having their product approved, and labour market disputes could negatively impact profits.
A weakness in the fisheries sector is the lack of development of sustainable technologies necessary for fin and shellfish culture and the lack of infrastructure for harvest and post-harvest operations.\textsuperscript{139} As a result, the population in the interior does not have access to fresh seafood. However, they do purchase fish from the inland fishing sector.

The milk processing industry has increased its production over the last ten years, but there is still room for quality improvement. The “microbiological quality of milk is poor due to lack of knowledge about clean milk production and lack of post milking chilling facilities in the villages.”\textsuperscript{140} In order to compete, the industry needs to implement international processing standards.

The East and Northeast are among the least developed regions in the country, and therefore the demand for packaged goods is low.

\textbf{5.6.3 Threats}

Natural disasters are ongoing concerns, especially in the agriculture industry. Droughts, flash floods, severe thunderstorms, flooding from monsoon rains and earthquakes are the main concerns. Too much or too little rain can cause havoc to the agriculture industry and drive up food prices as a result. The current drought conditions in India will likely cause “further inflationary pressures on food prices.”\textsuperscript{141}

For companies looking to penetrate the processed food industry, high tariffs and initial low sales volumes would pose a threat to success in the early years. There would also be competition from suppliers in Australia, UK, France, Italy, and South East Asia.\textsuperscript{142} Canadian companies looking to export pulses to India would face competition from French, Turkish and Ukrainian companies.\textsuperscript{143}

Moreover, the food and beverage industry in India consists of small family-owned businesses, which consist of about 65 percent of the market share. There are about eight million independent neighbourhood stores in the country that offer consumers specialised services
such as home delivery and credit facilities in addition to providing low costs and these small family owned stores may not sell imported food and beverage products.\textsuperscript{144,145}

Price points need to be assessed carefully because consumers in India are very price sensitive. Any new product needs to appeal to the target demographic and the financial position of the target market. Advertising, promotion and brand-building are the most costly expenses in the initial years of introducing and raising awareness of a new product. The same processed food would not necessarily be popular from one region to the next, and a company looking to introduce a specific product would need to be aware of the local customs and food preferences. The lack of an efficient cold supply chain system also poses a threat to the storage and transportation of processed and frozen food.\textsuperscript{146}

High taxes on imported wines can pose a threat to growth in this sector, where higher wine costs due to the higher taxes will deter consumers from purchasing more expensive wines. If consumers are only able to purchase cheaper wines, this may lead to a poor wine tasting experience, and they may not purchase wine in the future.\textsuperscript{147}

5.7 Key Business Opportunities in India

Food production in India is expected to double by 2020, and there is an opportunity to increase the “range of foods available to improve overall nutrition.”\textsuperscript{148} Over 300 million middle and upper-class consumers eat processed foods in India and this sector is experiencing a 20 percent annual growth rate.\textsuperscript{149} There is also a market for sugar-free confectionary and snack products.\textsuperscript{150}

India is a major importer of pulses, fertilizers, horticulture products and processed foods, and at the moment it does not have any import duties on pulses. There is an opportunity for Canadian businesses to increase its supply to India.\textsuperscript{151}

There is room for growth in the sector through supermarkets and hyper stores. The Canadian Trade Commissioner Service predicted that the food and grocery industry is the “fastest
growing retail segment in India,” with projected growth of organized retail by 2015 expected to
be US $36 billion.\textsuperscript{152} There are under-developed subsectors in India including baked goods,
processed cereals and pasta.\textsuperscript{153} Some products and services very high in demand in India
include “grain handling and storage services, pulses and canola oil.”\textsuperscript{154} For Atlantic Canadian
companies, there is the potential to form partnerships with fruit distributors to introduce
Maritime blueberries and cranberries.

The Indian consumer is beginning to focus more on the consumption of Omega-3 fatty acids,
and imported seafood is becoming a popular choice (specifically salmon, lobster, tuna and sea
bass).\textsuperscript{155} The Hotel Restaurant industry in India imports the most high-quality seafood and also
receives duty exemptions on these products.\textsuperscript{156} There is also an opportunity for Canadian
companies to lend their expertise to the fisheries sector, mainly in the development of
sustainable technologies in yield optimization and in harvest and post-harvest operations.\textsuperscript{157}

With the increased milk production and consumption in India, there is room for companies to
enter the dairy market. Companies in dairy production could provide expertise to companies
looking to expand production.\textsuperscript{158} In addition, there is an opportunity to sell dairy products,
such as cheese, yogurt, butter and ice cream. The lower- to middle-class in India is expected to
increase its dairy consumption between 2011 and 2014.\textsuperscript{159}

The processed food industry is “at a nascent stage with only about two percent of total produce
being processed.”\textsuperscript{160} Potential exists for Atlantic Canadian companies that offer canned
products (i.e., seafood), maple syrup, sauces and condiments, gourmet specialty products,
juices, confectionary, and ready-to-eat meals to succeed in the Indian market. In addition,
baked goods, processed cereals, and pasta categories are under-developed.\textsuperscript{161} Canadian
companies could form partnerships with Indian distributors as well as “joint food processing
ventures with local companies.”\textsuperscript{162}
With the increase in demand for both whiskey and beer, and the deregulation of the alcohol industry, there is an opportunity for companies seeking to enter this market and sell beer, wine and whiskey.¹⁶³

5.7.1 Indian Industry Stakeholder Perspective

Senior Executives, interviewed in the Indian agriculture, food and beverages sectors, who are involved in organic farming, prepackaged food manufacturing and logistics & cold storage infrastructure believe that the sector has seen increased demand, especially in the ready-to-eat food category. However, export demand for organic products has been depressed due to the global economic environment. The key driver for enhanced domestic demand has been the advent of organized retail. Industry participants commented that there remained challenges on finding and catering to large homogeneous markets along with lack of large established supply chain and logistic interconnections. However, respondents also felt that demand is likely to consolidate as large retail formats emerge to support demand and also drive growth for logistics and supply chain solutions.

Stakeholders felt that the industry is in a position to take advantage of machinery and equipment imports for better cold chain & processing technology, food processing machinery and components to produce Indian food in bulk, automation solutions for harvesting produce and microbiological organism products and nutrients for organic farming. Atlantic Canadian companies could also consider building ready-to-eat food brands targeted at the Indian population in Canada. Stakeholders also felt that logistics and backend processing and investments in supply chain and cold storage infrastructure would enable organized retailing and make manufacturing more viable by bringing down breakage and wastage overheads.

Atlantic Canadian companies also have the opportunity to provide technical training and consulting in nutrient and pest management for organic farming as well as vocational and technical training in industry specific supply chain processes.
Atlantic Canadian companies could participate in the Indian market via a tie up or joint venture with a reseller or strong local partner. The reseller or distributor will have access to market intelligence and a ready distribution set up to make initial strides into the market prior to a long term financial investment.

5.8 The Atlantic Canadian Agriculture and Seafood Sector

In 2009, the Atlantic Canada Agriculture and Agri-Food industry consisted of approximately 9,000 farms, of which 41 percent produced crops and the rest contained livestock. Overall, the profit from this sector amounted to approximately one billion dollars in exports. The major crop production includes potatoes, dairy, poultry, beef, eggs, fruits and berries and vegetables. In 2009, 56 percent of farm crop receipts were from potatoes, and nine percent were from fruits and berries. Dairy production was 45 percent of total livestock production.

In Nova Scotia it is predicted that agri-food exports in 2012 (minus seafood and fishing) will reach $230 million, and agriculture production will be $539 million. In 2010, the province’s seafood exports were valued at $793.8 million, about 21 per cent of Canada’s total seafood exports. Nova Scotia also produces and exports blueberries, apples, fur, and high-end value-added products. The Atlantic Food and Horticulture Research Centre in Kentville, Nova Scotia contributes to the success of the agriculture industry by conducting research and addressing problems in “primary production, crop protection, soil and water evaluation, post-harvest storage, food quality assessment, and consumer safety.”

The federal government, in partnership with the provincial government, will invest $5.5 million in the Nova Scotia Agriculture sector aimed at improving farm profitability through agricultural innovation. In 2010, The Department of Agriculture of Nova Scotia also developed a ten year strategy known as “Homegrown Success” to assist the Agriculture industry to be more competitive and seize new market opportunities on a global scale.

New Brunswick’s agriculture industry includes the production and sale of blueberries, cranberries and salmon, and the province is looking to sell these “value-added products”.

Current technology is allowing for the development of new varieties of existing agricultural products. In 2009, the most profitable products were potatoes ($134.9 million), dairy ($94.4 million) and poultry ($64.2 million). The fisheries and aquaculture sector also contributes to the economic success of the province, and New Brunswick is the second largest aquaculture producer in Canada. Its seafood products include lobster, snow crab, herring, Atlantic salmon, oysters and shrimp. In 2011, the GDP of the Value-Added Food Sector was $690 million.

The seafood industry in Prince Edward Island (PEI) is significant. In 2010, agriculture and fishing exports consisted of 67.5 percent or $467.9 million, of all provincial international exported goods. Potato production accounted for approximately $215.8 million in 2009, followed by dairy production ($71.2) and beef production ($19.1 million). Prince Edward Island is more diverse and its strengths are in “Frozen Food Manufacturing, Seafood Product Preparation, Vegetable and Melon Farming, and Animal Aquaculture and Fishing.”

In 2011, seafood production in Newfoundland amounted to one billion dollars (an increase of 7.3 percent over 2010), and Aquaculture production was valued at $120 million. Newfoundland’s seafood is exported to over 50 countries, with the top five destinations being the United States, China, Great Britain, Russia and Japan. The outlook for 2012 is positive due to a strong demand for seafood in international markets.

The Department of Fisheries and Aquaculture invested $1.2 million into fisheries research and development projects in 2011. The Fisheries Technology and New Opportunities Program (FTNOP) received renewed funding to provide support to the industry for “harvesting, processing and marketing initiatives” to ensure the industry is sustainable in the future. Newfoundland is geographically positioned in a unique location, as it is able to connect to international shipping lanes and has access to the global market.

Newfoundland’s export strength is seafood and aquaculture products, and Nova Scotia’s strength includes seafood and aquaculture, agriculture and fur. New Brunswick’s strength is in
fruit and seafood production. Prince Edward Island is more diverse and its strengths are in “Frozen Food Manufacturing, Seafood Product Preparation, Vegetable and Melon Farming, and Animal Aquaculture and Fishing.” Food processing plants exist in various business parks throughout the province, and vegetable production includes potato farming.

5.8.1 Atlantic Canadian Industry Stakeholder Perspective

The agriculture, food and beverage industry has been growing each year. Atlantic Canadian exports have improved with growing demand for Atlantic Canadian fish and potatoes, especially since the recession in US has improved. Fish and potatoes make up a large market share of the Atlantic Canadian food industry. Exporting has been an essential activity for the food sector for many years because the domestic market in Atlantic Canada is very small. Other Atlantic Canadian exports include fruits, vegetables, and meat. Traditional importers have been the US and central Canada. Other importers include the EU, China and Japan. Competitive advantages include: having large quantities of high quality food, the lower supply in other countries due to labor, water or other concerns. The Atlantic Canadian brand has been associated with food safety and quality; additionally its export experience has been instrumental in improving the reputation of Atlantic Canadian products.

Respondent felt that one of the biggest concerns of the industry is access to capital. Moreover, for Atlantic Canadian companies to meet global demands they need to be able to automate several processes. Most of the subsidies are reserved for farmers, which though essential, mean that processing companies can become a bottleneck when there isn’t enough capacity to package and transport food overseas. Seafood is in great demand worldwide however, it has been difficult for companies to ship the products effectively; similarly automation and capacity expansion has also been a concern for wineries and other goods.

One of the companies interviewed had a large set up in India. Since India is a large and growing market it is a target for food companies. Export interests include sales and joint ventures for production and distribution of processed and frozen food products. One of the respondents felt that there is limited demand for seafood from Atlantic Canada in India.
Import guidelines in India especially in the food and agricultural sectors are stringent. A large number of laws are applicable, and a good customs clearing partner is critical. Further, regulations are under development and may be frequently revised as the regulatory framework develops, and therefore a good regulatory consultant is essential.

While there have been significant improvements in logistics in India, it still needs substantial improvements and investments. India needs more reefer vehicles and costs of moving refrigerated products are high, but declining. While the number of reefer vehicles has increased, demand continues to outstrip supply by large margins.

Atlantic Canadian businesses must be prepared to overlook service omissions at the outset of operations, as long as the basic service parameters are being met. Businesses must focus on locating long term partners; creating long term relationships and contracts, in addition to investing in training of partners. Long term relationships will encourage vendors to invest more readily.

5.9 Recommendations and Market Entry Strategies

Atlantic Canadian companies have several opportunities in the Indian food sector as the market grows due to the expansion of the middle class, an increase in purchasing power and the trend toward buying healthier and international products. However, there are some important issues to consider prior to market penetration.

The Indian market is extremely price sensitive, and there are mark-ups for imported products. Extensive research must be undertaken to understand the Indian Market in order to localise products and identify appropriate prices points for the market.

Companies looking to enter the Indian market should determine which market within India to enter and deal with a reliable agent or distribution partner. Many food and beverage importers are not well established in the Indian market because the Indian government removed the ban on imported foods and beverages only in 2000, and as a result it has taken time for Indian
importers to develop relationships with foreign firms. Established importers that have a national reach are looking to expand product lines in the country.\textsuperscript{183}

With India classified as one of the emerging economies of the world, the market is becoming flooded with international products. In order for a product to gain exposure in the market, brand awareness must occur through “large promotions, offers and sampling activities, for which a reasonably large budget is necessary.” In addition, in order for a new entrant to gain high sales volumes, the product needs to be exposed to the market for at least one year.\textsuperscript{184}

Atlantic Canadian companies need to identify niche export opportunities in the Indian market such as export of quality seafood to the hotel and restaurant industry; production of Omega 3 supplements and export of blueberries, cranberries & high end value added products. There are also opportunities to provide consulting in sustainable technologies necessary for fin and shellfish culture, inland fishing & aquaculture, development of new varieties of aquaculture, harvesting and processing. Atlantic Canadian companies can look for opportunities to enter into JVs and consulting projects in food processing, especially potatoes, fruits and seafood.

Companies can build relationships with local contacts with the assistance of Export Development Canada & Trade Commissioner Services who have a strong base in India. Trade shows in the food and beverage industry within India are an excellent way to learn about the complex food and beverage market. Some annual tradeshows include:\textsuperscript{185}

**International FoodTec India - International Trade Fair**
Technology suppliers to the Food Processing and Packaging industry
Mumbai, India
[www.foodtecindia.com](http://www.foodtecindia.com)

**Taste Expo**
Bombay Exhibition Centre
Mumbai

**Flora Expo / Horti Expo**
January 2013
Pragati Maidan
New Delhi
www.floraexpo.com

**Food & Technology Expo**
Pragati Maidan
New Delhi
www.foodandtechnologyexpo.com

**Annapoorna - World of Food India**
Bombay Exhibition Centre
Mumbai, India
www.worldoffoodindia.com

**AAHAR 2013**
March 11-15, 2013
Pragati Maidan
New Delhi

For more trade shows refer to http://www.tradeshows-biz.com

Additional Indian organizations that can provide information about exporting to India include the Ministry of Consumer Affairs, Food and Public Distribution (www.fcamin.nic.in), Plant Quarantine Organization of India (www.plantquarantineindia.org), Department of Animal Husbandry, Dairying and Fisheries (www.dahd.nic.in), and the Central Board of Excise and Customs (www.cbec.gov.in).186
6. Education

6.1 Introduction

Formal and non-formal education are both covered under the International Standard Classification of Education (ISCED) 2011 and include educational programs from pre-primary to the highest level of tertiary education. The educational programs include, “initial education, regular education, second chance programmes, literacy programmes, adult education, continuing education, open and distance education, apprenticeships, technical or vocational education, training, or special needs education.”

6.2 Subsectors

According to the North American Industry Classification System (NAICS), the education sector is classified into the following subsectors:

- **Elementary and Secondary Schools (NAICS 6111)** – kindergarten through 12th grade and includes school boards and school districts.
- **Community Colleges and C.E.G.E.P.s (NAICS 6112)** – academic, or academic and technical, courses and granting associate degrees, certificates or diplomas that are below the university level.
- **Universities (NAICS 6113)** – academic courses and granting degrees at baccalaureate or graduate levels.
- **Business Schools and Computer and Management Training (NAICS 6114)** - courses in office procedures and secretarial and stenographic skills; short-duration courses and seminars for management and professional development.
- **Technical and Trade Schools (NAICS 6115)** –vocational and technical training in a variety of technical subjects and trades.
- **Other Schools and Instruction (NAICS 6116)** instruction in the fine arts; athletics and sports; languages; and other instruction (except academic, business, computer,
management, and technical and trade instruction); and providing services, such as tutoring and exam preparation.

- **Educational Support Services (NAICS 6117)** – non-instructional services that support educational processes or systems.

### 6.3 Global Context

According to UNESCO’s Institute of Statistics, Governments of the world invested the equivalent of 4.4 percent of global GDP in Purchasing Power Parities (PPP). This number reflects only public education expenditure and not private investments.\(^\text{189}\)

According to the Education Industry Association (EIA), "education is a rapidly expanding business in the US and many countries. It is quickly becoming a US$1 trillion industry, representing 10 percent of U.S. gross domestic product, and is second in size to the health care industry. In the US, federal and state expenditures for education exceed US$750 billion."\(^\text{190}\)

Despite the economic downturn, the education industry is one of the fastest growing sectors worldwide and has seen increased demand in foreign education, e-learning and test preparation markets. In 2007-08, the US represented 60 percent of the global market and Europe accounted for about 15 percent.\(^\text{191}\)

### 6.4 The Indian Education Sector

Education holds an important place in Indian society and is second only to food and groceries in terms of spending in middle class families. However, quality education in India is difficult to acquire since there is a huge “demand and supply gap” between the number of spots available at top quality institutes and the number of applicants that aspire to attend them. Premium institutes such as Indian Institute of Management (IIMs) have application to admission ratios as high as 150:1 as compared to 10:1 for Massachusetts Institute of Technology (MIT). Due to this discrepancy, it is estimated that over 450,000 student spend over US $ 13 billion to study in foreign institutes.\(^\text{192}\)
Universities and university-level institutions in India include 20 Central Universities, 215 State Universities, 100 Deemed Universities, 5 institutions established under State Act and 13 institutes of national importance apart from around 17,000 colleges including 1800 women's colleges.\(^{193}\)

The Indian education sector can be classified into formal and informal education also known as core and non-core. These can be further classified into the following subsectors\(^{194,195}\):

1. Formal
   a. K-12
   b. Higher Education
2. Informal
   a. Preschools
   b. Coaching Institutions
   c. Vocational Education

For more details see Figure 5: India Education Sector - Market Size in 2008\(^{196}\).

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**Figure 5: India Education Sector - Market Size in 2008**

![Bar Chart: India Education Sector - Market Size in 2008](chart.png)
6.4.1 Role of Public and Private Sector

The public and private sectors both play an important role in India’s educational sector.

Public Sector

From financial year (FY) 2004 – 2005 to 2009 – 2010 the central and state governments have spent about 4 percent of the India’s GDP on education which is much lower than developed nations.\(^{197}\) The government spends 90 percent of its public education budget on the K-12 level.\(^{198}\)

To contend with the demand supply gap mentioned above the government of India plans to establish over “6,000 schools at block level as model schools to benchmark excellence. Of these, 2,500 will be set up under Public Private Partnership.” In the FY 2012 – 2013 budget there is also a proposal to form of a Credit Guarantee Fund to facilitate education loan facilities for students.\(^{199}\) Additionally, Sam Pitroda, Chairman of the National Knowledge Commission has stated, “Understanding the need for immediate impetus to all educational initiatives, the Government of India has decided to spend around US$ 67 billion in the next five years on education”.\(^{200}\)

Private Sector

Consulting firm Technopak estimates that private education sector is likely to be worth US$ 70 billion by 2013 and US$ 115 billion by 2018. Furthermore, Technopak also estimates that by 2018 enrollments in K-12 will grow to 351 million, creating a requirement for an additional 34 million seats.\(^{201}\) Additionally, the Planning Commission estimates that by the end of the Eleventh Plan (2012), almost half the incremental enrolment target will be met through private institutions.\(^{202}\)

6.4.2 Higher Education

Based on 2001 census estimates, in 2011 India’s population was expected to have about 144 million between the ages of 18 to 23 a primary target for the higher education sector. Based on
estimates by PricewaterhousCoopers (PwC) government (US $ 7 billion) and private spend (US$ 6.76 billion) in the higher education sector is about US $ 13.8 billion each year. Although, official estimates are unavailable for the unregulated market, based on PwC discussions with industry experts the value of three services alone i.e. the skill enhancement and vocational training; test preparation and textbooks and content is estimated at US $ 25 billion.²⁰³

Please see Appendix “C” – Regulated & Unregulated Sectors

6.4.3 Executive Education and workplace training

A 2010 report by Austrade estimates that the corporate training industry is worth approximately US $ 2.6 billion. Additionally, companies outsource about 50 percent of their training requirements.²⁰⁴ The 2009 Austrade report estimated that one-third of the training market was focused on behavioral and soft skills training and about 35 percent of market was directed towards IT training. “It is estimated that Indian IT and ITES companies spend three to five per cent of their revenues on training in comparison to 0.5 to two per cent spent in non-IT companies.”²⁰⁵

Individual consultants account for over 90 percent of the local training industry which makes the sector rather unorganized. However, local consultants are not always able to meet demands and there is a demand for international expertise. Considering that English is the predominant business language, international companies do not have communication barriers.²⁰⁶

6.5 Macroeconomic Environment

6.5.1 Political²⁰⁷

The government allows up to 100 percent FDI in education. The government has also set up the National Knowledge Commission, which has recommended the increase in the number of universities to 1500 by 2015.
Education is a joint responsibility of both the central and state governments. Key policy and standardization agencies include:

- The National Policy on Education is formulated by the Ministry of Human Resource Development (Higher Education Department)
- Collaboration between the Union and the States is managed by the Central Advisory Board of Education (CABE)
- Collaboration among the Government, Universities and the apex regulatory agencies is the responsibility of the State Councils for Higher Education

There is substantial political consensus with regard to educational initiatives and policies aimed at attracting “greater enrolment, attendance and participation” at the school and higher educational levels. The government is encouraging the private sector to participate in the sector both independently as well as through PPP arrangements. The government has provided funding for technical and vocational training and in June 2012, the United Grants Commission (UGC) approved Promotion and Maintenance of Standards of Academic Collaboration between Indian and Foreign educational Institutions Regulations, 2012. However, there is concern about this regulation, “for its perceived discrimination between privately-funded institutions and public institutions, and infringement of autonomy.” Moreover, the guideline makes it mandatory for the foreign institution “to be among the top 500 institutions as ranked by only two specified ranking methods: the Times Higher Education Supplement (THES) or the Academic Ranking published by the Center for World-Class Universities (CWCU) of Shanghai Jiao Tong University.”

\[6.5.2 \text{ Economic}\]

India’s economic growth is strongly tied to the growth of the education sector. Over the next decade as the economy expands, the formal and informal sectors in the education industry are expected grow exponentially. In 2010, private equity investments in the education sector increased to US $ 183 million from US$ 129 in 2009. Recent examples of such investments include, “PremjiInvest's US$ 43 million investment in Manipal Education and India Equity
Partners’ US$ 37 million investment in IL&FS Education and Technology Services.” By 2012, the regulated segment is estimated to grow to US$ 65 billion and the unregulated market to US$ 20 billion at a CAGR of 13 percent and 18 percent respectively.  

For higher education, an expenditure of US$ 37.13 billion has been projected to achieve the proposed objectives during the 12th Five Year Plan (2012-17).

6.5.3 Socio Cultural

Traditionally education has been valued in the country. Middle class Indians curtail other expenditure to invest in the education of children and young adults. Education not only brings prestige but also provides opportunities to get high paying jobs in the country. Professional degrees and good quality education is much sought after by urban Indians. According to the 2011 Census, India has literacy levels of about 74 percent. Ten states and union territories, including Kerala, Lakshadweep, Mizoram, Tripura, Goa, Daman and Diu, Puducherry, Chandigarh, National Capital Territory of Delhi and the Andaman and Nicobar Islands, have attained literacy rate of above 85 per cent, the target set by the Planning Commission to be achieved by 2011-12.

6.5.4 Technological

Increasing awareness of technology and internet penetration has positively impacted the eLearning market in India. The eLearning market in India is growing at a CAGR of around 5.6 percent and that is expected to rise in future. According to Indian Distance Learning Market Analysis, “the distance education market in India is expected to grow at the rate of around 24 percent during 2011-12 to 2015-16. Technological development, increased awareness and use of technology, fewer qualified faculty and increase in internet usage is expected to grow the market to US$ 1.6 billion by the end of 2015-16. However, the government’s aim to raise its current Gross Enrollment Rate (GER) from around 13 percent to 30 percent by 2020 will also fuel the growth of distance education in India.”
The government has commissioned an ambitious project to connect 1,500 educational institutions with high speed data communication network. The National Mission on Education through Information and Communication Technology (NMEICT) is also looking at providing low cost tablet like devices (PC Aakash) to colleges and schools at subsidized costs for low income students.\(^{215}\)

### 6.6 SWOT Analysis

**6.6.1 Strengths**

Knowledge and education are considered extremely important in India and families are willing to spend a substantial portion of their income on high quality educational services. With the rise in income for the middle class there is a propensity to spend on education both in India and abroad. Given the demand in the market, there will be considerable investments in education both by the government as well as private players. Corporations are also willing to invest substantial money for vocational and technical training of their employees.

**6.6.2 Weaknesses\(^{216}\)**

There is a shortage of faculty in Indian universities; in 2007 – 2008 almost half of the positions for professors, readers and lecturers were vacant. Almost 50 percent of universities and 70 percent of colleges do not have adequate infrastructure and facilities to meet the needs of the students. The educational programs are often obsolete and not aligned to industry requirements with causes low employability rates. Libraries are not equipped with the latest or for that matter even enough material. There are not enough accredited institutions to meet the growing demand of quality education in India. As of March 2011, only 161 universities and 4,371 colleges had been accredited by the National Assessment and Accreditation Council (NAAC).
6.6.3 Threats

Despite 100 percent FDI and some positive changes in recent regulations, there are several constraints for institutes that wish to set up operations in India. In some case there are also inconsistencies in the policy framework, e.g. although 100 percent FDI is allowed the All India Council for Technical Education (AICTE) prohibits direct or indirect foreign participation in joint ventures in Indian Institutions. There are also different rules for private and publically fund domestic institutions collaborating with foreign institutions. Additionally, foreign institutions must be within position 500 on two specific rankings lists; this is likely to prevent quality institutes who refrain from participating in these rankings from entering the Indian market. There is also a requirement for foreign institutions to deposit of US$ 10 million in a Corpus Fund. Additionally it is mandated that all formal educational institutes in India must be run as not for profit, public trust or section 25-company. This makes it almost impossible for investors to provide dividends or return on investment to its stakeholders. 218219

6.7 Key Business Opportunities in India

India is one of the largest services markets in terms of the educational sector. There is a combined market size of 450 million students and US$ 50 billion per annum. Strong growth rates of over 10 to 15 percent annually are expected over the next 10 years. Many opportunities for private and foreign player arise from the huge demand and supply gap in the market. There is a requirement of investment up to US$ 100 billion by 2014 to meet the anticipated demand. The regulatory environment is being revised to close inconsistencies and is open to participation from foreign institutions. The higher education market has the greatest potential for growth and return on investment. 220

The vocational and training subsector also has immense potential in the Indian market. There are many opportunities available in, “skill-based vocational training in civil aviation, construction, nursing, etc. as well as sector-focused management education such as construction and aviation management, retail and finance.” These opportunities can be provided within India through tie-ups with skill-based institutions or through recruitment of
students for campuses in Canada. However, students who seek vocational and technical training could be from lower economic backgrounds and may find it difficult to afford the fees to stay and study in Canada. There are also opportunities to provide “curriculum, in-country curriculum collaboration or joint delivery, as well as partnership opportunities with industry.”

There are also opportunities in the soft skills area across all industries, specifically in “Financial services (Banking and finance, Insurance, Wealth management), Retail, Biotechnology, Education, Healthcare and Pharma, Chemicals (Plastics, Glass, Paper and textiles) and Infrastructure (Environment, Oil and gas, Engineering, Renewable energy, Mining).”

Urban centers like Mumbai and Delhi offer the most potential; however, as the consumer base grows, tier one, two and three cities such as Chennai, Bangalore, Hyderabad, Pune, Vadodara and Lucknow also offer opportunities.

6.7.1 Indian Industry Stakeholder Perspective

Senior executives in the Indian education sector indicated that India has one of the largest higher education systems in the world and has been growing at a CAGR of over 6 percent as measured by enrolments over the past decade. However, the education policies have not seen major changes since 1985 and there are multiple regulations and regulators including UGC (UGC Act 1956), State Acts, All India Council for Technical Education (AICTE) and six industry councils that regulate professional education.

Despite the growth the sector has experienced, it needs policy reforms to allow a framework that empowers institutions to define and drive policies impacting curriculum design, instruction methods, faculty selection and development. Also, a serious effort is required to enable access to education in smaller locations and encourage multiple campus strategies.

Respondents who are actively engaged in delivery and administration of multi-disciplinary education in India felt that Atlantic Canadian companies could provide Indian institutes with specialized services such as faculty development systems, councils, leadership development
and processes and standards in pedagogy development. There are opportunities to design and
develop a four year undergraduate Bachelors in Business Administration program and pre-
extisting and advanced multidiscipline course content for post graduate programs. Additionally,
there are requirements for industry relevant skill building vocational training. Universities and
Colleges are also looking at specific processes and systems to evaluate and shortlist qualified
candidates.

Atlantic Canadian companies could participate in the Indian market via partnerships or joint
ventures with similar sized companies or institutes.

6.8 The Atlantic Canadian Education Sector

Members of the Education and Training sectors of New Brunswick, Nova Scotia, Prince Edward
Island and Newfoundland and Labrador are willing to collaborate on possible international
opportunities. There is also funding available through the IDBA to assist Atlantic Canadian
businesses to enter, explore and succeed in international markets. 223

The Association of Atlantic Universities “represents the interests of universities across the
(Atlantic) region, ensuring public visibility for the important role they play in preparing future
leaders of our communities, in path-breaking research and innovation, and in contributing to
the economic prosperity of life in Atlantic Canada.” This collaboration of universities has
strengthened research and technology in the Atlantic region through initiatives such as:224

- **Springboard** - a network of 14 universities throughout Atlantic Canada working together
to enhance technology transfer and promote commercialization.

- **The Atlantic RURAL Centre** - a collaboration of eight partners is focused on research and
  programs investigating air and water quality in rural areas; changing rural populations;
  and rural work and employment.

- **The Atlantic Computational Excellence Network (ACEnet)** - a collaborative association
  and has a profound effect on research and high-performance computing in Atlantic
  Canada
• *Petroleum Research Atlantic Canada (PRAC)* - a private-public partnership created by industry, academia and government to explore ways to build regional R&D capacity in the petroleum sector

• *The Atlantic Regional Training Centre ARTC* - promotes an interdisciplinary approach to investigating issues in health services research and training students to have a broad understanding of issues in health service policy, administration and delivery.

In 2011, Atlantic Canadian universities received almost $177 million from the federal and provincial governments. As part of the Knowledge Infrastructure Program (KIP) the federal government provided $81 million of the $177 million in funding for university infrastructure and facilities such as contemporary classrooms, state-of-the-art labs, ‘green’ buildings and deployment of leading edge technologies.\(^{225}\)

Nova Scotia has 11 universities, 13 community college campuses despite having a population of less than 1 million people – "more, per capita, than anywhere else in Canada". The province is gaining recognition and respect as it engages with the international community and showcases its expertise.\(^{226}\)

According to an article by Arupa Tesolin, educational exports are an area of huge opportunities to Atlantic Canadian firms. There is a demand for and great respect for Canadian educational products across the globe. Popular exports include curriculum development, textbooks and education resources, and Canadian schools operating in remote areas and in other countries. There is also a scope for e-learning and blended learning capabilities emerging among universities and K-12.\(^ {227}\)

### 6.8.1 Atlantic Canadian Industry Stakeholder Perspective

According to stakeholders in the Atlantic Canadian Education sector, globalization has changed the way students approach education. Today, there are many Canadian students looking for exposure to developing economies and international education experience is no longer limited to International students seeking North American exposure. Recessionary times do not affect
the education sector negatively and many individuals prefer to enhance their education when
the job market gets bad. Although the recession has affected funding these costs are usually
transferred to students.

Atlantic Canadian institutes are actively pursuing recruitment of different types of students,
right from high school up to graduate schools. Institutes also provide shared research and
collaboration with other schools, teacher exchanges. Governments in other countries are
seeking to develop their workforce by importing expertise from other countries to train their
teachers. Currently, exports include education and training services such as international
student recruitment, and contract training. The largest influx of students is from China, and
Saudi Arabia which offers free education for any students who wants to come to Canada. Saudi
Arabia in particular has filled up the larger central and western Canada schools and Atlantic
Canadian schools are benefiting from the overflow. Competitive advantages include an
educated population, accessibility to post-secondary education, the Canadian brand being
associated with high quality and receiving substantial capital from the provinces.

The number of students arriving from India to Atlantic Canada has doubled in the last four
years. This could be a result of factors such as bad publicity regarding several racially motivated
incidents against Indian students in Australia and the UK tightening up its application process.
Additionally, Indian students are attracted to Canadian institutes because of their strong
reputation, relatively lower fees, and student friendly government policies that allow students
to work part-time while studying. One of the respondents commented that they were not really
focusing on recruitment in India since the number of Indian students seeking admissions were
increasing spontaneously. Another respondent commented that in the past Indian were
focused only on larger and more prestigious graduate programs to partner with and this has
meant limited interest in Atlantic Canadian institutes, however, recently this has been changing
and more undergraduate programs in India are seeking out international partnerships.
6.9 Recommendations and Market Entry Strategies

Considering the constraints in the regulated primary and higher education sector, as a first step it may be practical for universities and colleges to focus on recruiting students rather than setting up collaborations or campuses in India. Agents and education fairs are the primary source for institutes to recruit Indian students for various types of courses.

The vocational and corporate training market in India is extremely price sensitive and it is important for companies operating in the corporate training domain to establish ways to deliver training at lower costs by entering into franchisee agreements, joint ventures, content licensing, train the trainer and eLearning models.\(^{228}\)

Although there are a lot of opportunities in the Indian market there is also plenty of competition from both domestic players as well as companies from countries such as the US, Australia, the UK, and Singapore.\(^{229}\) Therefore, it is important to provide unique and niche offering in the Indian market, either with innovative concepts or newer learning delivery formats. However, it is also equally important to provided localized and customized content for the Indian markets with relevant domestic and industry specific case studies and example.\(^{230}\)

A strong web presence is recommended as clients and students are likely to conduct preliminary research about training organizations and universities online; they are primarily interested in ranking, overall industry reputation and testimonials. It is also important to have a local presence and the ability to provide local support.\(^{231}\)

Some prominent educational trade show and fairs are:

**Times Education Boutique**
Various Cities
[www.timeseducation.org](http://www.timeseducation.org)

**Indo-Global Education Expo**
Hyderabad (2012)
[http://www.indus.org](http://www.indus.org)
QS World Grad Tour India
Various Cities
http://graduateschool.topuniversities.com/world-grad-school-tour

Education Worldwide India
Various Cities
www.eduworldwideindia.com

FICCI Higher Education Summit
New Delhi
5th and 6th November 2012
http://www.ficci.com/events-page.asp?evid=20957

World Schools Resources Expo
Gurgaon
6th – 7th December 2012
http://www.wsreindia.com

For more trade shows refer to http://www.tradeshows-biz.com
7. Information and Communications Technologies (ICT)

7.1 Introduction

According to the North American Industry Classification System (NAICS) standards the Information and communication Technologies (ICT) sector constitutes of Manufacturing, Intangible Services and Goods Related Services. ICT sector can be defined as the interplay and interdependence of manufacturing and services sector that electronically capture, store, transmit and display information. \(^{232}\)

7.2 Subsectors

As per the definition agreed to be used during the transition from the 1980 Canadian Standard Industrial Classification (1980 SIC) to the new North American Industry Classification System (NAICS), prominent subsectors within the Canadian ICT sector are below:

Prominent subsectors in the ICT Sector within Canada are: \(^{233}\)

**ICT Manufacturing**

- Commercial and Service Industry Machinery Manufacturing
- Computer and Peripheral Equipment Manufacturing
- Telephone Apparatus Manufacturing (Wired Communications Equipment)
- Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing
- Audio and Video Equipment Manufacturing
- Semiconductor and Other Electronic Component Manufacturing
- Navigational, Measuring, Medical and Control Instruments Manufacturing
- Communication and Energy Wire and Cable Manufacturing
ICT Services

- Software Publishers
- Communications Services
- Data Processing, Hosting and Related Services
- Computer Systems Design and Related Services

7.3 Global Context

The ICT industry refers to the relationship and codependence between the information and communication technology sub-sectors.\(^\text{234}\)

The global ICT market grew from US $ 2.4 trillion in 2004 to US $ 3.6 trillion in 2008. Against a backdrop of maturing demand and slowing economic conditions the ICT sector was pegged for consolidation and moderate growth, but 2009 saw a sharp contraction (about US $ 108 billion) in ICT spends and the sector experienced a three percent negative growth. Though the Americas (North, Latin, and Central) continue to be the largest market for ICT products and services, they are experiencing slower growth in demand along with Europe whereas the Asia Pacific region is expected to grow its share of the Global ICT market from 28.8 percent in 2009 to 31.1 percent by 2013.\(^\text{235}\)

Globally, ICT sector has seen the emergence of strong and sustained demand from developing countries. Although developing countries trail developed countries in density of users per 100 inhabitants, they have seen much higher growth and added many new subscriptions across Mobile Cellular, Internet and Broadband users. Mobile cellular telephony has emerged as the fastest growing technology with global mobile density of 85.7 subscriptions per 100 inhabitants and total subscriptions going up from 719 million in 2000 to 5,972 million in 2011.

The fixed telephony subscriptions per 100 inhabitants continues to decline since 2001 in developed countries and a similar trend is also experienced across developing countries from 2007 onwards. Overall user density as defined by subscriptions per 100 inhabitants has declined
by 8.3 percent since 2007. From the above trends, it can be inferred that mobile cellular telephony has grown at the cost of fixed line subscriptions. In 2009, of the estimated US$ 1.5 trillion world electronic production, telecom & data processing equipment are the two largest segments accounting for 25 percent & 21 percent respectively.

The Global ICT trends are illustrated in Figure 6: Global ICT Developments, 2001 - 2011

![Global ICT developments, 2001-2011](Source: ITU World Telecommunication /ICT Indicators database)

7.4 The Indian ICT Sector

India had the world’s third largest GDP in 2007 - 08 at US$ 4.16 trillion (PPP terms) with the services sector contributing 55.7 percent. ‘Invisible’ exports (services) were US$ 148.6 billion in 2007 - 08. The ICT sector mirrors this trend as it is dominated by the services sector, with manufacturing forming a very small proportion of the sector.

The sector saw consolidated revenue (including hardware) of US$ 88 billion contributing 7.1 percent to India’s GDP in FY 2011 from a mere 1.2 percent in FY 1998. India increased its share of the global sourcing industry to 58 percent in FY 2011 from 51 percent in FY 2009, highlighting India’s competitive edge. The sector continued to grow on the back of strong contribution from
software & services by approximately 90 percent. The sector is expected to add 230,000 new jobs in FY 2012 and thus provide direct employment to about 2.8 million totally, and indirectly employ 8.9 million people.\textsuperscript{239}

The ICT sector in India is represented by different electronic tools coming together to enable information processing and communications and includes the following sub sectors:\textsuperscript{240}

- ICT Manufacturing industries
- ICT Trade industries
- ICT Services industries - This includes telecom, software, IT Enabled Services (ITES) and Business Process Outsourcing (BPO) and Knowledge Process Outsourcing (KPO)

The Indian ICT industry has broadly undergone three phases of growth viz.:\textsuperscript{241}

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Mainly controlled and run by the government with not much differentiation made between software and hardware.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 1984</td>
<td></td>
</tr>
<tr>
<td>Phase 2</td>
<td>The government realized that software was a viable option for income generation and technological capability enhancement.</td>
</tr>
<tr>
<td>1984 – 1990</td>
<td></td>
</tr>
<tr>
<td>Phase 3</td>
<td>Planned focus on software export by the central and state governments, eventually leading to marginalization of hardware and domestic sector, despite their huge potential.</td>
</tr>
<tr>
<td>After 1990</td>
<td></td>
</tr>
</tbody>
</table>

The current phase of the India ICT sector is reflected in the data points below for years 2000 – 2001 to 2007 – 2008:

- The ICT sector’s GDP increased from US$ 14.4 billion in 2000-01 to US$ 62.9 billion in 2007-08 with a Compound Annual Growth Rate (CAGR) of 21.3 percent. ICT services led this growth with increases of 23 to 26 percent year on year (YoY). The share of ICT services to total ICT GDP has shown an upward trend from 89.4 percent in 2000 – 01 to
94.2 percent in 2007 - 08. In contrast, the share of ICT manufacturing to total ICT GDP has contracted from 10.6 percent in 2000 – 01 to 5.8 percent in 2007 - 08. The share of ICT manufacturing sector to GDP stagnated at about 0.35 percent.\textsuperscript{242}

- The estimated share of ICT services GDP to Service sector GDP has increased from 6 percent in 2000-01 to 10 percent in 2007-08.\textsuperscript{243}

- Contribution of the ICT sector to GDP increased from 3.4 percent to 5.9 percent. The share of ICT services sector to total GDP increased from 3.05 percent to 5.5 percent. Contribution of exports in total ICT sector has increased from 64.5 percent in 2004-05 to 66.1 percent in 2008-09.\textsuperscript{244}

- In 2004, a policy of no customs duty on all IT hardware imports was implemented, which exposed the local industry to global competition and has turned India into a large importer of ICT components and finished equipment.\textsuperscript{245}

ICT firms are prominent in six geographic clusters, Bangalore in Karnataka, Mumbai and Pune in Maharashtra, Chennai in Tamil Nadu, Hyderabad in Andhra Pradesh and the National Capital Region including New Delhi (Delhi), Noida in Uttar Pradesh and Gurgaon in Haryana. Almost 97 percent of the export revenue comes from these regions. Other cities like Mysore, Visakhapatnam, Coimbatore, and Ahmadabad are also developing ICT clusters.\textsuperscript{246}

\subsection*{7.5 Macroeconomic Environment}

\subsubsection*{7.5.1 Political}

India is recognized as the world’s largest democracy and the government has several legislations in place to enable the ICT sector. The 12\textsuperscript{th} five year plan continues to focus and promote investments in IT services and products towards better governance, education, security, inclusion and other policy initiatives. India has signed the Information Technology Agreement (ITA) of the World Trade Organization and is successfully promoting reforms across the sector.\textsuperscript{247}

Many policies have been established to promote investments in the sector such as:
• The Ministry of Communications & Information Technology in its annual report, 2010-11 Information Technology Investment Regions (ITIRs) is offering superior infrastructure and a friendly policy environment across the country. No Customs duty on 217 specified items (PC’s, servers etc.) under ITA since March 1, 2005.\textsuperscript{248}

• A liberalized FDI policy allows 100 percent foreign equity in the ICT sector (in specified segments). Investments can come through the direct approval route. FDI, including wholly owned subsidiaries, is allowed under automatic routes. 100 percent direct FDI in Telecom Equipment Manufacturing is allowed but the Government has set sector specific caps on foreign equity in basic and cellular telecommunication services, ISPs with Gate ways, Radio Paging and end to end Bandwidth, with FDI beyond 49 percent needing approvals.\textsuperscript{249}

• National Manufacturing Competitiveness Council (NMCC) to provide a forum for policy dialogue. No reservation policy for public sector and abolition of industrial licensing except in specified sector.\textsuperscript{250}

\textbf{7.5.2 Economic}

The ICT sector continues to grow with domestic demand coming from enterprises, consumers and government projects. The sector is expected to see a domestic demand of US$ 30.66 billion in FY 2012. This growth is contributed to by demand for software, services and hardware.\textsuperscript{251}

The ICT sector continues to benefit from the government’s focus on upgrading and e-enabling all its departments. The Government of India (GOI) and the World Bank on May 10, 2011 signed an agreement for US $ 150 million for ‘e-Delivery of Public Services Development Policy Loan’ under the NeGP. E-education, e-security and e-inclusion are also important aspects of the 12\textsuperscript{th} five year plan. The 12\textsuperscript{th} five year plan’s projected outlay is approximately US$ 2,843 million towards manpower development for ICT industry.\textsuperscript{252}
7.5.3 Socio Cultural

India has a population of approximately 1.2 billion (July 2011 est.) with 65 percent in the employable category (15-64 years) and a small aging population of 5.5 percent (65 years and over). English enjoys the status of official and commercial language. This availability of young educated manpower has both contributed positively and benefited from the growth in the sector.\textsuperscript{253}

As per a release by Internet and Mobile Association of India (IAMAI) on September 6, 2012, India’s internet subscriptions have grown to 137 million in June 2012.\textsuperscript{254} As per TRAI, there has been a sharp increase in mobile (919.17 million) and total broadband subscriber base has grown to 13.79 million in March 2012.\textsuperscript{255}

Ecommerce is growing fast at an estimated CAGR of 40 percent to 45 percent and total value pegged at US$ 10 billion in 2011. This growth is fuelled by a large middle class who has disposable income with internet access and constraints on time.\textsuperscript{256}

7.5.4 Technological

The domestic demand for hardware is estimated at US$ 400 billion by 2020. This translates to a manpower requirement of 12.3 million by 2020 from the current level of 2.5 million.\textsuperscript{257}

Existing projects to enable quality manpower include setting up of Regional Institutes of e-Learning and Information Technology (RIELIT) in the states of Nagaland, Tripura and Rajasthan, 18 projects for IT mass literacy and many more state level programs. The National Knowledge Network (NKN) initiative approved on 25 March 2010 aims to connect all stakeholders in the education and governance space on a nationwide high speed data network. The government has also made available an affordable android based tablet ‘Aakash’ to students as part of the India’s aim to link colleges and universities in an eLearning program. The National e-Governance Plan (NeGP) with 8 core components and 27 Mission Mode Programs (MMPs) has already been rolled out, with a vision to make all Government services accessible to the citizens
in their local areas along with the benefits of transparency, efficiency and reliability at low cost. State Wide Area Networks (SWANs) across the country, at a total outlay of US$ 0.63 billion have been approved under NeGP. State e-Mission teams and e-District projects have also been instituted.258

7.6 SWOT Analysis

7.6.1 Strengths

The Indian ICT sector enjoys many positives. It has access to a large pool of young human capital, technically trained and proficient in English skills. Indian companies have embraced quality standards to align themselves with international standards, India based centers constitute the largest number of quality certifications achieved by a single country. The sector has also used cost arbitrage to their advantage and overall services are available at competitive prices. The industry has been supported by a progressive reform process to keep pace with growth and also enabled easier access to capital by allowing 100% FDI.

7.6.2 Weaknesses

Although the ICT sector has grown aggressively, manufacturing contributes less than 10 percent to the ICT revenues and have been marginalized over years.259

The sector lacks indigenous Telecom Manufacturing and R&D Infrastructure bottlenecks including non-availability of adequate power supply for Telecom Services adds to the cost of infrastructure and does not allow large facilities to take advantage of economy of scale.260

Most patents have been filed by multinationals and very few Indian companies have developed patents in their own name.261

Most Indian companies are still small based on revenue and size. This creates challenges in acquiring large client mandates and manpower retention. High attrition rate takes away from the company’s ability to be competitive on account of high training costs.262
7.6.3 Threats

Emerging competition from economies such as China and Philippines can offset the advantage Indian BPO industry enjoys. Since IT and ITeS requires low investments business can migrate easily to these shores.\(^{263}\)

The industry has a concentration risk as it is concentrated in 6 cities contributing to 97 percent of the industry output. Also, the R&D expenditures in the sector are very low. Innovation is incremental in nature and threats are emerging from markets such as China.\(^{264}\)

7.7 Key Business Opportunities in India

The ICT sector has seen rapid growth on the back of domestic and international demand. A combination of policy initiatives and India’s demographic advantage offer many opportunities in the sector.

Increased demand for mobility solutions along with access to data is driving wired and wireless broadband demand in Telecommunication Infrastructure Backbone for broadband & Wi-Fi access. Recent policy directive on digitization is also driving the placing of optical networks.\(^{265}\)

Engineering and R&D (ER&D) exports crossed US$ 10 billion is 2012 and have seen a 12 percent CAGR since FY 2008. Availability of skilled manpower with English language skills and decline of skilled manpower in developed countries makes India an ideal R&D hub. Opportunities lend themselves in the automotive, semiconductor, energy and utilities sector.\(^{266}\)

A combination of factors such as large mobile base, large mobile internet user’s, increased demand for handheld devices, need for differentiation (carriers & device manufacturers) offer a large opportunity in Value Added Services (VAS). High tele-density presents a large market for embedded software for mobile applications.\(^{267}\) The Mobile VAS market is estimated to grow from US$ 3.9 billion in 2011 to approximately US$ 5.2 billion in 2012. Value addition is the key differentiator for service providers and consumer device manufacturers. Consumer demand for content including gaming, applications and entertainment is growing at a significant pace.
Opportunities are emerging in data based content for Health, Education, Edutainment (requiring higher bandwidth), Governance, interactive advertisements, local language content and services for the rural consumer.  

A user base of 137 million internet users, increase in Broadband subscriber base (grew by 14.8 percent over March 2011 to 13.79 million in March 2012), large number of ISP’s (over 150), a robust banking system, combined with a young population with disposable income is driving ecommerce in India. Ecommerce market is estimated to be US$ 10 billion in 2011 by Internet & Mobile Association of India (IAMAI).

The government has a mandate to make quality education available to the masses in a cost efficient manner. This mandate to create a national knowledge network connecting education institutions also offers many opportunities. Key opportunities lie with investments in grass root education delivery models using technology and also tying up for content development with focus on digitization of content, language translation, network backbones, connectivity solutions etc.

India is just opening up to the potential of geomatic applications and currently has very limited access to content and applications as the government has recently opened up and allowed access to mapping data and information. In India, some large programs by the Indian government are driving demand for cadastral mapping, urban planning and mapping solutions. The 12th Five Year Plan India is expected to invest around $1 trillion in infrastructure which will help the geospatial industry grow further. Demand for holistic geospatial solutions will come from utilities and telecom sector.

7.7.1 Indian Industry Stakeholder Perspective

Senior Executives in the Indian ICT market commented that the sector has grown rapidly and has emerged as a large contributor to the Indian economy. The sector is broadly divided into software services and hardware solutions and predominantly the growth has been experienced in the IT and telecom services. Stakeholders also commented that the sector saw enormous
growth in the mobility services industry as large telecom carriers established voice based networks. However, since 2011, the mobility sector has experienced a general slowdown of capital investments and capacity additions because of government policies as well as concerns about specific events such as cancellation of 2G licenses, retrospective taxation, and General Anti Avoidance Rule (GAAR) guidelines.

Respondents also felt that supportive policy initiatives such as tax holidays and IT parks have mostly enabled service and software solution providers, and not equipment manufacturers. Additionally, early policy initiatives allowing cheap equipment imports coupled with infrastructure hurdles has prevented large scale manufacturing capability from flourishing. There are currently large multinational players with significant presence in the telecom and software services industry, but large investments in the equipment manufacturing are minimal and most equipment is imported from China. However, companies from Europe and the US are preferred partners for high end technology and equipment.

Respondents were mostly unaware of Canadian expertise in this space and only know of a few Canadian brands such as Blackberry.

There are several opportunities available to Atlantic Canadian companies in software and hardware production. Designing VAS content for telecom service and equipment manufacturers also provide substantial prospects in the ICT sectors. Investments in R&D hubs backed by favorable FDI norms and combined with the availability of skilled manpower offer many opportunities to create Intellectual Property across various domains for local and international consumption.

The best approach for Atlantic Canadian firms to participate in the ICT sector is through collaborative understanding or joint ventures with a local partner offering a strong understanding of the regulatory framework along with instant access to a widely spread local market. Investments should be made keeping in mind local demand as well as the possibility of developing a global hub for exports.
7.8 The Atlantic Canadian ICT Sector

The Atlantic Provinces Economic Council (APEC) reported in 2010 that Atlantic Canada's ICT industry grew nearly twice as fast as the overall economy between 2003 and 2008, contributing an estimated $2.65 billion to Atlantic Canada's GDP in 2008. Furthermore, the region’s ICT industry employs over 32,000 individuals in over 2,000 firms. About 70 percent of the ICT employees work in urban areas (such as Halifax, Saint John, Moncton, Fredericton, St. John’s and Charlottetown). BellAliant, Eastlink and Rogers lead the telecommunication sector with almost 30 percent of all ICT employees in the Atlantic region. Longtail Studios and HB Studios are involved in software development and Keane, Research in Motion and Innovatia provide ICT services. Nautel and Rutter are the largest ICT manufacturers in the region.

Atlantic Canadian companies in the ICT sector perform various services such as security, e-learning, IT services, multimedia, geomatics, advanced technology and business solutions. Telecommunications infrastructures in Atlantic Canada are world class with 100 percent digital telecommunication network, high-speed digital links, broadband networks, and mobile and marine communications.

Advanced research and development by universities, research institutes and the business world enhance the competitiveness of the industry. CGI Group Inc., Canada’s largest IT firm, is headquartered in Moncton, New Brunswick and the University of New Brunswick’s Computer Science Department is a national leader in IT and advanced software research.

Charlottetown, PEI currently has five companies classified under the Entertainment Software Industry and has strong support from the provincial government. The University of PEI is now offering a video game programming specialization and a digital art program. One of the largest companies in this sector is Other Ocean Interactive.

ACOA cites an Industry Canada report which states that, "From 1997 to 2004, the ICT industry in Atlantic Canada experienced an 11 percent Compounded Annual Growth Rate (CAGR) in exports and a 9.4 percent CAGR in employment in software and computer services. The highly
skilled labor force has one of the lowest rates of turnover and absenteeism in North America.\textsuperscript{275}

7.8.1 Atlantic Canadian Industry Stakeholder Perspective

Business leaders in the ICT sector mentioned that they were exporting their services globally with most companies interviewed either focused on the US, Europe or other English speaking countries, such as the UK, Australia and New Zealand. Reasons for focusing on these areas included existing contacts, ease of business (English & Customs) and feeling more comfortable with these countries IP laws.

Competitive advantages in this industry include Universities which are used as a resource for inexpensive R&D as well as providing an abundance of skilled technical labour. Atlantic Canadian ICT companies are relatively small in comparison to their competitors and market themselves as providing technically superior products, often focused on niche applications.

Business leaders interviewed in the ICT industry in Atlantic Canada, more so than other sectors, spoke of the increased challenges to accessing capital since the slowdown. Some people felt that this was in part due to the lack of physical assets to use as collateral.

Some companies mentioned that they had looked at entering into the Indian market but felt that doing business in Indian is comparatively more difficult than their current markets. Reasons for not pursuing the Indian market include: IP protection, corruption, and challenges with working with the government. The theme “difficult to get started” was mentioned by many companies in this sector. One representative spoke of their decision to prioritize smaller markets over India, based in large part on the comparative ease of access into the other regions. Several respondents talked about the complementary nature of their product/services and that if one of their larger partners were pursuing an opportunity in India, they would support the bid as a subcontractor.
The ICT sector offers up opportunities for companies looking to outsource programming and software development costs. One start-up company had leveraged a relationship in Atlantic Canada who had access to a network of programmers in India. This start-up company was able to successfully create and refine the software, using the team in India. By giving up the distribution rights for India, this company was able to negotiate a discounted fee and benefit from a partner which was invested in the success of the project.

7.9 Recommendations and Market Entry Strategies

The Indian ICT sector is poised for development and is open to new opportunities. The rapidly growing tele-density along with mobile and broadband penetration are key drivers for future growth in both software and hardware applications. Future demand will continue to be fuelled by e-governance, enterprise and young consumers paving the way for opportunity in consumer devices, software, Value-added Services, IPR, Communication and Network Infrastructure.

Canadian firms have the advantage of being recognized for high product quality and technology standards. Also, language is not a large barrier as English is well accepted as the common language for commerce.

The best approach for Canadian firms is to participate in the sector through collaborative understanding or joint ventures with a strong local partner offering an understanding of the regulatory framework along with access to the widely spread local market. Investments should be made with an eye on local demand and the possibility of developing a global hub for exports.

India offers many opportunities that complement the strengths of Canadian firms. Canadian firms must leverage their recognized strengths to benefit from the opportunities listed below:

Atlantic Canadian firms can participate as technology partners in building up a large scale digital network while working with institutions in the private and public domain for Telecommunication Infrastructure Backbone for broadband & Wi-Fi access.
Value addition is the key differentiator for service providers and consumer device manufacturers. Canadian firms can add value and explore tie ups in the gaming (multi user, networked) and application (such as geo-tagging, streaming, e-vouchers etc.) content space.

Canadian firms can offer technology and security software solutions to enable a more secure and robust ecommerce ecosystem to support enhanced credit and debit card transactions.

Companies can participate in content development (eLearning) with focus on digitization of content, language translation, network backbones and connectivity solutions.

Companies can offer hardware for acquiring and processing high quality content. Offer good quality online / updated content to enable geomatic applications for eGovernance projects, utilities and enterprise solutions.

Some prominent ICT trade shows are:

**Information Technology & Communication Expo Haridwar**
02 - 04 November 2012
Rishikul Ground, Haridwar, India

**eINDIA Exhibition**
07 - 09 November, 2012
Bangalore KTPO Trade Centre, Bengaluru, India

**Telematics India 2012, Bangalore (TI2012, Bangalore)**
29-30 November, 2012
The Lalit Ashok, Bangalore
[http://www.allconferences.com/conferences/2012/20120614061547](http://www.allconferences.com/conferences/2012/20120614061547)

**INFOCOM – Kolkata**
06 - 09 December 2012
Milan Mela Complex Kolkata, India
COM-IT EXPO
13 - 16 December 2012
Bombay Exhibition Center (BEC), Mumbai, India
http://www.biztradeshows.com/trade-events/comit-expo-mumbai.html

India Telecom-New Delhi
13 - 15 December, 2012
Pragati Maidan, Near Delhi Zoological Park, New Delhi, India
http://www.indiatelecom.org/

21st Convergence India 2013
16-18 January, 2013
Pragati Maidan, Near Delhi Zoological Park, Mathura Road, New Delhi, India
http://convergenceindia.org/

Ibex India 2013
17-19 January, 2013
Bandra Kurla Complex, Mumbai, India
http://www.ibexindia.com/

For more trade shows refer to http://www.tradeshows-biz.com
8. Life Sciences and Biotechnology

8.1 Introduction

The Life Sciences industry has been characterized by advances in technology and R&D processes, thus intensifying market competition and fueling innovation. Simultaneously, growing consumer demand and shifting demographics are exerting greater pressure to fulfill the promise of efficient and accessible healthcare solutions.\(^{276}\)

8.2 Subsectors

The Life Sciences sector includes companies in the fields of biotechnology, pharmaceuticals, biomedical technologies, life systems technologies, nutraceuticals, food processing, environmental, biomedical devices and equipment; involved in various stages of research, development, technology transfer and commercialization.\(^{277}\)

"Biotechnology is sometimes not considered a distinct sector but more a collection of technologies that enhance the discovery and development of new medicines, and diagnosing and treating patients more effectively."\(^{278}\) IBIS World’s definition of the sector, “Biotechnology is also the application of science and technology to living organisms as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge and biotechnology products and services. The definition of biotechnology as used by the US Census Bureau and the National Science Foundation is - the application of molecular and cellular processes to solve problems, conduct research, and create goods and services.”\(^{279}\)

This report groups the life sciences sector into pharmaceuticals, biotechnology and medical equipment. It should be noted that many of the larger pharmaceutical companies now produce biopharmaceuticals and the distinction between the pharmaceutical and biopharmaceutical sectors is blurring as the market and technologies mature.\(^{280}\)

8.3 Global Context

In 2011, the global life sciences and biotechnology market generated US$ 1,107 billion in revenues. The market grew at a Compound Annual Growth Rate (CAGR) of 6.7 percent from
2007 to 2011. The overall industry’s growth is expected to accelerate over the next five years. The projected CAGR of 6.8 percent will grow the market to a value of US$ 1,535.7 billion by 2016.281

The pharmaceutical segment accounted for almost 72.1 percent of the life sciences sector with an estimated US$ 797.7 billion in revenues from 2007 to 2011.282 The pharmaceutical market is forecasted to be worth US$ 1,800 billion by 2020.283 The largest recipient of Foreign Direct Investment (FDI) for the Pharmaceutical market is the United States, accounting for 35 percent of the world’s inward FDI. India is the fourth largest recipient of FDI and Canada places ninth.

8.4 The Indian Life Sciences and Biotechnology Sector
The Indian life sciences and biotechnology sector is largely dominated by the pharmaceutical industry, and in particular, producers of generic brands and vaccines.284 Currently, India produces 20 percent of the world’s generic drugs.285 Of India’s top 20 life science companies, 19 are listed as pharmaceutical companies, with one listed as a biopharmaceutical company. India is also seeing a change in the wealth and needs of its own population which is growing the demand for new drugs and health solutions.286

8.4.1 Pharmaceuticals
In 2009, India’s Pharmaceutical industry ranked 14th in global revenue with sales of almost US$ 19 billion. By 2020, it is expected to reach US$ 50 billion and be one of the top ten markets in the world.287 Currently, India accounts for 1.5 percent of the global market by value but 10 percent by volume. This is in large part due to India’s strong generic market. Recently, the industry has begun to focus more on R&D and niche areas, such as oncology, infectious diseases and diabetes. It is estimated that India accounts for 25 percent of the new abbreviated drug applications filed globally.288 Imports are a minor source of pharmaceuticals for the country and most demand is met by the domestic producers. Major product exports from India are active pharmaceutical ingredients (APIs), drug intermediates, finished dose formulations and clinical services.
In 2005, the Patent (Amendment) Act was brought into law. It was designed to better protect drug manufacturers and their intellectual property (IP). Although considered a great improvement, there continue to be ongoing issues.\textsuperscript{289} It is estimated that 3.1 percent of drugs sold in India are counterfeit.\textsuperscript{290} In order to attract foreign investment the Indian government has set up nine Special Economic Zones (SEZs) specifically for the pharmaceutical industry. The largest of these facilities is located near Visakhapatnam. There are three more SEZs located near Andhra Pradesh, four in Maharashtra and one on the outskirts of Dehradun in Uttarakhand.\textsuperscript{291}

### 8.4.2 Biotechnology

In 2000, it was estimated there were only 30 biotechnology companies of mention in India. Currently India has over 380 companies active in the biotechnology market.\textsuperscript{292} Biotechnology is comprised of companies in the following sectors: biopharmaceuticals, bioindustrial, bioagriculture, bioservices and bioinformatics. In 2008, the Indian biotechnology market grew by 18 percent to US$ 2.67 billion. Biopharmaceutical accounted for 65 percent of the biotechnology sector with revenues of US$ 1.73 billion. A look at the different sectors in India’s biotechnology industry can be seen in Figure 7: Biotechnology Revenue by Sector (2008).\textsuperscript{293294}

![Biotechnology Revenue by Sector (2008)](image)

- **Biopharmaceuticals**: vaccines, therapeutics, diagnostics, and animal health care products
- **Bioagriculture**: Bt cotton seeds, bio-pesticides, biofertilisers (excludes hybrid seeds)
- **Bioservices**: clinical research, contract research and contract manufacturing
- **Bioindustrial**: enzymes, organic amino acids, yeast, yeast-based enzymes, yeast based
Bioservices continues to grow in importance and as a percentage of the market. The fastest growing segment is bioagriculture which saw its percentage of biotechnology revenue grow from less than five percent to 14 percent, in five years. The bioagriculture segment in India gained prominence in 2002 when transgenic cotton, which was resistant to Bacillus thuringiensis (Bt), was approved. There will be additional focus on this sector with the likely approval of India’s “first genetically modified (GM) food crop, a BT Brinjal” (Eggplant).

In 2009, India held 2 percent of the world’s biotechnology market with approximately US$ four billion in revenue. By the end of 2010, the market was expected to reach US$ five billion. Growth of the biotechnology sector can be seen in Figure 8: India's Biotechnology Market.

![India's Biotechnology Market](image)

**Figure 8: India’s Biotechnology Market**

8.4.3 Medical Devices & Equipment

In 2011, India’s medical devices & equipment industry (Medtech) saw revenues of approximately US$ 3 billion. Annual growth in this sector is exceeding 15 percent per annum and is expected to have a CAGR of almost 16 percent for the next five years. India’s Medtech sector ranks as one of the top three emerging nations in terms of FDI by large multinationals. In comparison to other BRIC nations, India has a higher contribution from local Medtech suppliers, benefiting from a technically adept and strong supply base. In comparison to the
regulations for pharmaceuticals, regulations for medical equipment and devices are far less developed.\(^{303}\)

Currently the greatest growth in the Medtech industry has been seen in private health care facilities located in urban areas, servicing the more wealthy and affluent. It is estimated that 95 percent of the new hospital bed capacity is coming from the private sector. In a recent survey by Pricewaterhouse Coopers, CEO’s from the Medtech industry saw the greatest potential in the growing middle class. As the middle class population and wealth grows, it is expected to fuel the demand for more modern equipment and facilities.\(^{302}\)

### 8.5 Macroeconomic Environment

#### 8.5.1 Political

The government allows 100 percent FDI via the automatic route in the biotechnology sector. To boost the growth of the biotechnology industry in India, a separate Department of Biotechnology (DBT) was set up under the Ministry of Science and Technology. According to the Federation of Indian Chambers of Commerce and Industry (FICCI), “(The) department has launched several schemes to promote Innovations in Biotechnology in India like Small Business Innovation Research Initiative (SBIRI), Biotechnology Industry Partnership Programme (BIPP), Biotechnology Industry Research Assistance Council (BIRAC) and Biotechnology Industry Research Assistance Program (BIRAP).”\(^{303}\)

In 2005, India created the Product Patent Act which enforced royalty fees on generic drugs made in the country. Although a vast improvement over the previous regulations, there are patent issues currently being fought in the courts and India’s patent laws are still considered less developed than other nations.\(^{304}\)

India has set up nine SEZs specifically for the pharmaceutical and biopharmaceutical industries. Recently the Drugs & Pharmaceuticals Manufacturers Association (DPMA) of India entered into a Memorandum of Understanding (MoU) with the German Technical Cooperation; with a purpose to help develop small and medium sized enterprises (SMEs) in the Indian market.\(^{305}\)
8.5.2 Economic

India is one of the world leaders in the production of generics and vaccines. As well as being a large producer of pharmaceuticals, India’s internal market continues to grow and by 2020 it is expected to be one of the top 10 markets for pharmaceuticals. In the past few years there have been more international companies purchasing Indian life science companies. This trend is expected to continue, as companies look to benefit from the lower R&D and production costs and position themselves to capitalize on the growing domestic market.

Along with the major producers of drugs and pharmaceuticals, it is estimated there are an additional 80,000 small scale units engaged in production, supply, support and other value added chain activities for the industry.

From 2007 to 2010, India placed fourth globally when measuring FDI; behind USA, China and Singapore. For a look at the composition of foreign national investments in India’s pharmaceutical sector, see Figure 9: Composition of India's Pharmaceutical FDI, 2007 - 2010.

Figure 9: Composition of India’s Pharmaceutical FDI, 2007 - 2010

![Composition of India's Pharmaceutical FDI, 2007 - 2010](image)
8.5.3 Socio Cultural

India’s epidemiological needs are changing due to a population that is aging and becoming wealthier. Demand is expected to grow in drugs for cardio-vascular problems, disorders of the central nervous system and other chronic diseases. India currently has the largest number of diabetic patients in the world and by 2020, is expected to have 60 percent of the heart patients worldwide.311312

Most modern healthcare facilities in India are private and not available to the less affluent and rural populations. However, India’s middle class is growing, and along with it, its desire for modern medicine and equipment will also increase.313 These factors are part of the reason that India’s market place is considered so promising for the life sciences industry.314

8.5.4 Technological

India has world class manufacturing and R&D pharmaceutical facilities. According to the Organisation of Pharmaceutical Producers of India, the country has more US FDA certified plants than any other country outside North America.315 In addition, India has the highest FDA approval on drugs manufactured outside the US estimated at 25 percent.316 India is receiving significant attention and investments from large global medical technology (Medtech) companies, due its demographics, which has improved the technical capabilities of Indian companies.317

8.6 SWOT Analysis

8.6.1 Strengths

India is a global leader in the manufacturing of pharmaceuticals and is a major supplier of the world’s generics and vaccines. Recently the industry has seen growth in R&D and new drug patents. As a whole, the pharmaceutical & biopharmaceutical markets have benefited from standardized practices across the industry including: Good Laboratory Practices (GLP), current Good Manufacturing Practice (cGMP) and Good Clinical Practices (GCP). A well-defined regulatory framework, along with an emerging stringent Intellectual Property Right (IPR) regime is also contributing to the improvements in the biopharmaceutical markets.318
Additionally, there is an increasing amount of FDI inflow and a growing internal need for modern medicine and equipment that has contributed to strengthening the industry.

### 8.6.2 Weakness

India’s Medtech regulations are a lot less developed than those compared to the pharmaceutical and biopharmaceutical sectors. Despite India’s improvements to patent laws for pharmaceuticals, the courts are not consistent with global patent standards. One example is that Indian law does not allow companies to patent the modification of known chemical compositions. This has resulted in a six year court battle with Novartis over its cancer drug Glives. In 2001, Glives was patented in the United States but was later refused a patent in India as it was not considered a new drug.\(^{319,320}\) Another recent ruling gave a license for a low-cost version of Bayer’s Nexavar (sorafenib), despite the fact that it was still under patent. This drug is used in the treatment of liver and kidney cancer and the ruling was given to ensure a more affordable substitute in the interest of public health.\(^{321,322,323}\)

According to FICCI, some of the challenges that the Indian Biotechnology currently faces include poor infrastructure, lack of collaboration and partnerships, poor IP strategies, lack of skilled manpower and limited implementation of the “single window clearance” and inadequate availability of soft loans.\(^{324}\)

The Associated Chambers of Commerce and Industry of India (ASSOCHAM) predicts that there is a huge requirement for skilled workers in technology related fields, including biotechnology.\(^{325}\) There is a need for 80 percent more scientists with doctorates in biotechnology.\(^{326}\)

### 8.6.3 Threats

The growth of India’s pharmaceutical sector, excluding biopharmaceuticals, has slowed slightly and is not growing as fast as many other Asian countries or that of the other BRIC nations.\(^{327}\) As local companies continue to expand their technical capabilities, they will offer more competition for “higher” end products. There are a few cases in front of the Indian courts
dealing with pharmaceutical patents, and depending on the outcome of the rulings, could worry investors.\textsuperscript{328}

Although the less affluent and rural populations have great market potential, this will be an extremely price sensitive group and companies from outside of India will face challenges when competing with local manufacturers.\textsuperscript{329,330}

In a study by Pricewaterhouse Coopers, CEO’s from the medical devices sector identified low priced local products as the biggest threat in the future. Other threats listed were: change in trade policies, regulatory policies, and the possible introduction of mandated price controls.\textsuperscript{331}

8.7 Key Business Opportunities in India

In pharmaceuticals, 70 percent of the local demand is met by domestic producers. The biggest growth areas in domestic demand are expected in chronic diseases such as heart and cardiovascular health issues.\textsuperscript{332}

There are great opportunities in partnerships with Indian companies in the pharmaceutical and biotechnology (bioagriculture, biopharmaceuticals, etc.) sectors, including low cost manufacturing services. The low cost of scientific manpower and R&D also offer attractive opportunities for contract research services in formulation development, bioequivalence testing, stability studies centers, etc., along with chemistry services such as analogue preparation, analytical chemistry, combinatorial chemistry, structural chemistry, structural drug design, computer aided drug design, high throughput screening and assay development among others. Also India is becoming a destination for clinical trials, as the cost in India is one tenth the cost as compared to Western countries and Clinical trials account for almost 70 percent of all R&D costs.\textsuperscript{333,334}

Major exports of the Indian pharmaceutical and biopharmaceutical sectors are drug intermediates, APIs, finished dosage formulations (FDFs) and clinical services.\textsuperscript{335} There are opportunities to partner with Indian companies and avail this opportunity.
In the medical equipment sector 50 percent of the medical devices are imports. There is demand for cancer diagnostics, medical imaging, ultrasonic scanning, plastic surgery equipment and polymerase chain reaction technologies. This opportunity will continue to grow in India with its growing middle class.

8.7.1 Indian Industry Stakeholder Perspective

Senior Executives in the Indian Life Sciences and Biotechnology Sector believe that there are many untapped potential opportunities available in the Indian market. However, they also felt that the market is fragmented and there are limited R & D investments. Customer buying decisions are driven primarily by affordability and brand recall. Marine biotechnology remains largely untapped with very few participants and products. India’s rich marine life offers many R&D and product development opportunities in the marine biotechnology space.

Respondents commented that Atlantic Canadian companies could seek opportunities in R&D and equity investments for bioengineering of marine microbes for high end nutraceuticals, bio organic compounds, and pharmaceutical and energy applications. Pharmaceutical companies in Atlantic Canada can also benefit from a large pool of individuals willing to participate in clinical research trails. There are also extensive opportunities to partner with Indian companies for technology collaborations for second stage extractions from bio waste and specific technologies for Bio and Nano materials. Indian companies are also looking for imported analytical equipment and specialized machinery such as sterile vial, fermenters, pre-filled vials for pharmaceutical companies. There is also a need for processing equipment for seaweed and fish as well as large fermentation units and freeze drying units for marine biotechnology applications.

The best approach for Atlantic Canadian firms to participate in the life sciences and biotechnology sector is via partnerships with existing businesses, technological collaboration and financial investments. Partnerships for milestone based drug delivery are especially important as R&D can be a long and expensive process and therefore capital infusion in a new set up or an acquisition stake in an existing venture is advisable.
8.8 The Atlantic Canadian Life Sciences and Biotechnology Sector

Canada is estimated to have over 5,200 Life Sciences related companies located throughout the country, including approximately 600 biotechnology companies, 100 medical technology companies and 200 public sector biotechnology companies. According to E&Y, Canada continued to have the second highest number of biotechnology companies in the world demonstrating a supportive business climate and Canada’s commitment to growing this vital sector.

The four Atlantic Provinces are leaders in the life sciences & biotechnology industry. Newfoundland and Labrador is recognized internationally for its expertise in marine biology. Nova Scotia’s life sciences industry is a global leader in human health, medical diagnostics and marine sciences. Prince Edward Island and New Brunswick are at the forefront of global research in agricultural biotechnology

Newfoundland and Labrador

Newfoundland and Labrador has developed a niche of expertise in marine biotechnology and human genomics. Local biotechnology companies have proven success in areas such as fish growth, pharmaceutical products, vaccine delivery systems, diagnostic testing and DNA research.

BioteCanada provides the following regional overview of the other Atlantic Canadian provinces:

Prince Edward Island

Prince Edward Island’s Bioscience Cluster is a leading center for bioactives based research, product development and commercialization for human, animal and fish health and nutrition. PEI has established an outstanding collaborative environment of business, research, academia and government organizations working together to build a strong bioscience-based economic sector in PEI.
**Nova Scotia**

*Nova Scotia is home to more than 50 life sciences companies with close to 500 products competing globally. In addition to those already in the marketplace, industry has a rich pipeline with more than 300 products at various stages of development.*

**New Brunswick**

*New Brunswick’s strong R&D and knowledge assets, coupled with abundant forestry, agriculture, and marine resources, are spawning an innovative bio-industry cluster. With plentiful forestland and proximity to the sea, New Brunswick is a world leader in tree improvement and the development of "green" technologies for forest pest protection, as well as a global leader in the development of "green" fish therapies, fish brood stock and new species for aquaculture.*

8.8.1 Atlantic Canadian Industry Stakeholder Perspective

The Life Sciences industry is a focus for Atlantic Canada with each province having companies from all of the subsectors. Each province promotes companies from all areas of the Life Sciences with some provinces developing specific expertise. Not surprisingly, much of the research and product development on the biotechnology and sciences is focused around marine and ocean life.

This industry has a lot of upfront development costs and companies are always looking at ways to speed up their ROI. One respondent commented that Canada has one of the most stringent regulations in the world for the Life Sciences industries. Since FDA (USA) approval is easier to achieve, most start-up companies are focused on developing a product for the US market first which often makes it easier to get approval in Canada. Financing was mentioned as a common problem. Many of the companies in this sector are still in the start-up stage and it was estimated that recent cuts had reduced Federal investment in the sector by 80 percent. These federal budget cuts could have serious long-term impact on the Atlantic Canadian sector.
The nutraceuticals and biosciences sectors in Atlantic Canada benefit from an abundance of resources including: fisheries, oceans, forestry, skilled labor, agriculture, farming and 27 academic institutions. From a product development point of view it was felt that Atlantic Canada was creating innovative products and the potential in future areas like bioenergy was really exciting. From the commercialization point of view, the opinions were mixed and it was felt that this could be an area for improvement.

Many of the companies in the Atlantic Canada’s Life Sciences sector are engaged in biotechnology research, including that for nutraceutical products. For these companies, entering into new markets requires not only testing but also an awareness of a country’s IP laws and regulations.

Of the non-medical technology companies spoken to, India was not a focus. The number one reason provided was inadequate IP protection; however, low prices and difficulty of doing business were also mentioned. One respondent mentioned working for a company in the past which researched the viability of entering India with a Pharmaceutical drug for the treatment of diabetes. Although there were a number of concerns the main issue at that time was they couldn’t find a market at their current prices.

### 8.9 Recommendations and Market Entry Strategies

Opportunities exist for strategic partnerships with SMEs in the biotechnology sector. This could offer smaller Atlantic Canadian companies the benefits of an Indian facility but on a per contract basis. The Indian government has worked to support SMEs by grouping them together in different parts of the country. Many of these facilities are FDA certified and Bangalore houses over half of the country’s 380 biotechnology companies and offers opportunities for companies looking for contract manufacturing, R&D or clinical trials. SMEs are also actively seeking opportunities to provide APIs and allied chemicals.

The biotechnology sector in India is growing at a rate of 15 percent CAGR. Within biotechnology the fastest growth has been seen in the production and research of
bioagricultural products. This creates an opportunity for Atlantic Canadian companies to partner with companies in production and research of bio-agricultural products.

Only 40 percent of large Medtech companies manufacture in India but over 70 percent use local third party distributors. Since most of India’s healthcare services are provided by private clinics, partnerships with local distributors can help in identifying opportunities with the different facilities. It may be necessary to consider altering existing products to better accommodate local needs, including simplifying products or removing less vital features.

There is also a shortage of skilled manpower in the biotechnology industry which provides an opportunity for Atlantic Canadian companies to provide training and educational services.

Some prominent Life Sciences and Biotechnology trade show and fairs are:

**India International Instrumentation Expo Gurgaon**
14 - 16 December, 2012
Gurgaon Leisure Valley Ground, Gurgaon, India
[http://www.3iexpo.com/](http://www.3iexpo.com/)

**Analytica Anacon India**
(7th International Trade Fair and Conference for Laboratory Technology, Analysis, Biotechnology and Diagnostics)
12-14 November, 2013
Bombay Exhibition Center, Mumbai, India

**Bangalore INDIA BIO 2013**
4-6 February, 2013
The Lalit Ashok, Bangalore, India

**Pride Of India Frontier Science & Technologies Mega Expo**
03 - 07 January 2013
Kolkata, India
Pharma Bio World Expo 2013
January 15-18, 2013
Bombay Convention & Exhibition Centre, Goregaon (East), Mumbai, India
http://chemtech-online.com/events/pharma/index.html

Chemspec India
11-12 April 2013
Bombay Exhibition Center(BEC), Mumbai, Maharashtra, India
http://www.chemspecevents.com/india/

For more trade shows refer to http://www.biztradeshows.com
9. Ocean Technology

9.1 Introduction

The Ocean Technology Sector is a broad area which crosses many different industries and focus areas. Government of Canada breaks Canada’s Ocean Technology Sector into eight sectors:

- Aquaculture
- Defense & Security
- Education and Training
- Fisheries
- Marine Recreation
- Marine Transportation
- Ocean Observation & Science
- Offshore Energy

9.2 Subsectors

The sectors can then be further broken down into more specific areas of focus and applications. Industry Canada has identified 71 subsectors listed under Ocean Technologies. Refer to Appendix “D” – Canada's Ocean Technology Sector for a list of the subsectors. In general, companies classify themselves under the subsectors versus the eight major sectors. For example, a company which supplies Modeling and Forecasting software could see their systems used in multiple sectors such as Fisheries, Offshore Energy, and Ocean Observation & Science.

9.3 Global Context

The global marine industries market was estimated to be valued at US $ 5,786 billion from 2005 – 2009. The biggest contributors of the sector include Shipping & Transport, Marine Tourism and Offshore Oil & Gas. Although this market is dominated by these key sectors many of the smaller sectors (Ocean surveys, underwater vehicles, etc.) are vital to the success of the larger sectors. See Figure 10: World Marine Industry Sector Totals 2005–2009.
The global market for ocean observation systems was estimated at approximately US$1.8 billion in 2006 and was expected to grow to US$2.2 billion by 2011. Countries prominent in this sector include the US, France, Germany, Norway, Japan, Sweden, the Netherlands, Denmark and the United Kingdom. International opportunities have increased due to environmental awareness as well as regulatory obligations across coastal regions.

9.4 The Indian Ocean Technology Sector

The Ocean Technology Sector in India covers a wide range of industries. In addition to Ocean development it also includes Shipbuilding, Naval and Offshore Oil and Gas. India groups its Ocean Technology sector differently than Canada. Ships and shipbuilding are part of Ports and
Shipping sector. Naval expenditures and oil & gas are each tracked within their own sector.\textsuperscript{349} The remainder of the industry and technologies covered in this section fall within the scope of the Department of Ocean Development.\textsuperscript{350}

India is surrounded by water and is bordered by the Arabian Sea, Bay of Bengal and the Indian Ocean; giving India an exclusive economic zone of over 2 million square kilometers. It is estimated that 37 percent of the population derives benefit from the sea.\textsuperscript{351} Almost 80 percent of the fresh water in India arrives during the rainy season via monsoons formed over the seas. Unfortunately these large storms can also bring flooding, property damage and loss of life.\textsuperscript{352,353} Because of this, much of the research on Ocean Technology funded by the Indian government is focused around the ocean’s effect on the climate.\textsuperscript{354}

India’s economic growth has fuelled confidence and a desire to become more of a participant in global affairs and issues. In the ocean technology sector this has led to several initiatives to expand India’s presence and understanding of the seas.

\textbf{9.4.1 Shipbuilding and Repair}

To help increase India’s shipbuilding and naval capacity, India has created The Maritime Agenda 2010-2020.\textsuperscript{*} Finalized in 2011, it lays out a plan to help increase India’s presence on the seas. A few of the goals laid out in the plan include increasing India’s share of global shipbuilding from 1 percent to 5 percent and increasing the percentage of Indian seafarers from approximately 6 percent to over 9 percent.\textsuperscript{355} Another major focus of this agenda is the development of India’s own shipbuilding capabilities and knowledge.

As part of The Maritime Agenda, The Indian Government has identified four areas which need to be addressed; they are the manufacturing gap, technology gap, resource gap, and skill

\textsuperscript{*} This plan also includes the building of the dock and shipping infrastructure which is covered in the transportation infrastructure section of the report.
development gap. To fill these gaps, the agenda outlines ways India can develop the skills internally and/or attract foreign investment and technology. A few of the suggestions listed in the Maritime Agenda directly related to foreign investment includes:

- The purchasing of or partnerships with foreign firms, particularly in high end segments
- Modernization and upgrade of cranes and infrastructure facilities
- Promoting ship design capabilities of both local firms as well as encouraging foreign firms to set up shop in India
- Encouraging foreign manufacturers of engines, gears, etc. to set up facilities in India

9.4.2 Offshore Oil and Energy

In 2010, 67 percent of India’s oil was produced offshore and currently 50 percent of India’s offshore basin is under offshore exploration. In order to encourage deep sea exploration, the Indian Government created the New Exploration Licensing Policy (NELP) program. Under this program the government performs an initial analysis of an area. Then through financial incentives, firms are encouraged to explore these deep sea sites. This type of exploration requires modern ships with proper imaging, instrumentation and acoustic systems.

Anchor Handling Tug (AHT), Anchor Handling Tug Supply (AHTS), Platform Supply Vessel (PSV) and Multipurpose Supply Vessel (MSV) account for almost 90 percent of the supply vessels servicing Indian offshore rigs. Approximately three quarter of these vessels are foreign registered with close to 50 percent being more than 20 years old. Many of these ships do not carry a Dynamic Positioning System and are incapable of servicing deep sea rigs.

9.4.3 Naval Forces

Currently India has one operational Aircraft carrier, which was purchased from Russia, and is currently building its first domestically built aircraft carrier. In addition, India has a fleet of submarines, missile boats, gun-ships, etc. In total, the Indian Navy has over 150 ships. In the past, India has purchased naval vessels from countries such as Russia, Italy and the United
Recently India issued a request for proposal (RFP) for four amphibious landing vehicles. These vehicles would be of a non-Indian design, but built in an Indian shipyard.

**9.4.4 Ocean Technologies – Department of Ocean Development**

The Department of Ocean Development (DOD) is an independent department under the direct charge of the Prime Minister (PM) and grouped within the Ministry of Earth Sciences (MoES). Its purpose is to coordinate and promote ocean development activities. To develop the necessary skills, technology and human resources; several technical institutes have been established that receive funding from the government. See Figure 11: Technical Institutes Focused on Ocean Technology

Each institute has its own area of focus and often works in partnership on projects, despite competing for funding. The relevant institutes and their areas of focus are:

- The National Institute of Ocean Technology (NIOT) is the technical arm and is responsible for developing and/or acquiring technology for the Ocean Technology sector.
• The Indian National Centre for Ocean & Information Services (INCIOS) is responsible for developing and refining local forecasting systems as well as collecting and disseminating all the information collected by buoys, satellites, sensors, etc.  

• The National Centre for Antarctic & Ocean Research (NCAOR) is responsible for all research, projects and expeditions associated with Antarctica.  

• In addition to the institutes under the MoES there is the National Institute of Oceanography (NIO). Despite being separate from the MoES they do share certain resources (e.g. research vessels). NIO is the main institute responsible for creating large observational and modeling systems of the ocean.  

In 2011, the MoES released a Vision Document which laid out a 10 year plan for the DOD and its institutes. Of the five main themes, Role of the Ocean in Monsoon Climates is the first one listed. In addition, monitoring of the ocean for the purposes of understanding weather patterns is a major component of four of the five themes. See Table 3: Themes for Vision Document of Ocean Sciences & Services

<table>
<thead>
<tr>
<th>Themes for Vision Document of Ocean Sciences &amp; Services</th>
<th>Sub-theme</th>
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<tbody>
<tr>
<td>Role of the Ocean in Monsoon Climate</td>
<td></td>
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<tr>
<td>Routine forecasting of the conditions in the Indian EEZ</td>
<td>Tides</td>
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<td>Estuaries</td>
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<td>Waves</td>
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<td></td>
<td>Currents, temperature and salinity</td>
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<td>Acoustics</td>
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<td>Storm surges</td>
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<td>Environmental Impact Assessment</td>
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<tr>
<td>Biogeochemistry Coastal</td>
<td>Open-sea</td>
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<td></td>
<td>Climatology</td>
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<td></td>
<td>Polar seas</td>
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Some of the infrastructure and technology gaps or needs identified in the Ocean Technology Vision Document were:

- An estimated 20 Moored Surface Buoys to better monitor and predict Monsoons, possibly something similar to either the Triangle Trans Ocean Buoy Network (TRITON) or the Woods Hole Oceanographic Institution (WHOI) design
- Tidal gauges with real-time data transmission capabilities
- Portable tools for testing of contaminants, water samples and other analysis
- Moored platforms with real-time data transmission, boats and wave rider buoys for use/placement in Estuaries
- Systems to monitor temperature and salinity including surface mooring with current meters, thermistor chains, salinity sensors, water level monitors
- Buoys/systems designed to capture wave & tidal energy
- Acoustic Doppler Current Profilers (ADCP’s) - sonar to measure the speed of ocean currents
- A network coastal passive detection devices to measure ocean ambient noise
- Bottom pressure recorders (BPRs)
- Shallow water environmental buoys
- Five to 10 coastal ships and one dedicated open water vessel for Biogeochemistry
- Biogeochemistry equipment and moorings with real-time data transmission, including sensors for CO$_2$, optodes, fluorometers, portable autoanalyzers and AWS’s
- A dedicated polar research vessel and sensor equipment for Antarctic research

India’s current weather, forecast and ocean monitoring systems are not up to international standards. All of the five main themes from the vision document list the need for upgraded ocean information systems including: predictive models, data assimilation systems, signal processing and automated warning systems.\(^{369}\)
The budget for the DOD is $190 million. In 2011, the DOD only used 75 percent of their allocated budget and less than half of their budget for Machinery & Equipment and Major Works.\textsuperscript{370}

**9.5 Macroeconomic Environment**

**9.5.1 Political**

India is committed to expanding their national production of oil and have created programs specifically designed to encourage private foreign investment in the search and discovery of deep sea oil deposits.\textsuperscript{371} In addition, India has a sizeable navy and is currently expanding and upgrading its fleet. This includes the addition of one new carrier and several nuclear submarines.\textsuperscript{372} With this growing confidence as a nation, many of India’s internal policies are focused around developing its own expertise and infrastructure. Examples of this theme can be seen in The Maritime Agenda (Docks & Shipbuilding) which states a goal of increasing India’s percentage of global shipbuilding from one percent to five percent.\textsuperscript{373}

In 1981, the Government of India created the Department of Ocean Development (DOD) to coordinate and promote ocean development. The DOD is made up of several different technical institutes and each of these institutes has a different area of focus and work in partnership on projects.

**9.5.2 Economic**

As one of the BRIC nations, India continues to experience growth and this is reflected in the Ocean Technology sector. India has committed extensive funds to the DOD but in 2011, it failed to use half of its allocated funds for Major Works or Equipment.\textsuperscript{374} It is unlikely that any government organization would consistently deliver major equipment or projects under budget. More likely there were other reasons why this spending shortfall existed i.e. internal politics, process inefficiencies, poor budgeting, etc.
The global increase in price and importance of oil continues to be a driver in the development of deep sea oil rigs off the coast of India.

### 9.5.3 Socio Cultural

India continues to grow its presence and understanding of the seas while becoming more willing to be a leader in international events. The most obvious example of this is its large Navy. While it does serve a security purpose, it is also used for relief and emergency missions for humanitarian purposes.

There is a growing awareness and understanding of the Ocean’s importance on the Indian economy, foremost with its role in the creation of Monsoons. This has led to increased focus on how to preserve, manage and benefit from the resources of its surrounding seas.

### 9.5.4 Technological

The DOD has initiated the following policy statements to institute improvements in science and technology for the Ocean technologies sector:

- **Exploratory survey, assessment and sustainable utilisation/harnessing of the ocean resources including living, non-living and renewable sources of ocean energy.**
- **Technological advances geared to the utilisation and preservation of the marine environment.**
- **Development of technology relating to instrumentation, diving systems, position fixing, materials development, oceanic data collecting devices, submersibles, etc.**
- **Establishment of an ocean related information system using indigenous and foreign sources; International co-operation in Ocean Science and Technology.**
- **Development of technologies relating to seabed mining, extractive metallurgy and conducting Environmental Impact Assessment studies.**
- **Contribution towards front ranking research in polar sciences.**
Basic and applied research in Ocean Science and Technology, Human Resource Management, creation of Centres of Excellence in academic institutions and public awareness on the potential and uses of ocean.

Furthermore, The NIOT is tasked with the development of reliable indigenous technology to solve the various engineering problems associated with harvesting of non-living and living resources in the Indian Exclusive Economic Zone (EEZ). Its focus is to create world class technologies and their applications for sustainable utilization of ocean resources.

India’s shipbuilding and ocean technology abilities have traditionally lagged behind their needs. In the past, the Navy has purchased several vessels from Russia, including a carrier. The DOD operates several research vessels built in India, but their deep water vessel, and many of their research buoys, are built by foreign manufacturers.

9.6 SWOT Analysis

9.6.1 Strengths

India is surrounded by water and is bordered by the Arabian Sea, Bay of Bengal and the Indian Ocean giving it an exclusive maritime economic zone of over 2 million square kilometers.

India is committed to growing the Ocean Technology Sector. The government has laid out plans and incentive programs to grow the major drivers of the Ocean Technology sector in India including: defense, shipping, oil & gas and climate/monsoon research. Considering that the Indian economy, especially the agriculture and food sector, depend largely on the monsoon, the government is committed to developing a better understanding of the role the ocean plays on the climate and monsoon in order to better manage its impact on the economy.

The government has established and provides funding to several technical institutes mandated to develop necessary skills, technology and human resources for ocean technology development. There is also government interest in exploring deep sea sites for oil exploration and the government provides funding to firms for deep sea site exploration.
9.6.2 Weaknesses

Many old vessels (approximately 50 percent) used in deep sea exploration of Oil and Gas sites. Most of these ships do not carry a Dynamic Positioning System and are incapable of servicing deep sea rigs.

For the DOD, shortages in manpower and resources mean that data collected is not always utilized. India also lags behind in the development of other technologies including: ocean modeling systems, information management, deep sea research vessels, monitoring buoys and cold water systems and vessels.

The DOD has a very nodal design, with each institute focusing on their area of expertise, while needing to work in partnership to deliver on projects. This could possibly lead to duplication of work and inefficient use of resources.

9.6.3 Threats

This sector is controlled by the government and there is a strong focus on developing the local infrastructure and expertise whenever possible and strong preference is given to local manufacturers versus foreign owned companies.

Currently the Navy has a long term plan of building at least two more carriers. It is unclear if the global slowdown will affect these plans and what effect decreased naval expenditures would have on the Indian shipbuilding industry.

The DOD managed to spend less than half its budget for Machinery and Equipment and Major Works in 2011. There could be other issues that need to be dealt with before the DOD can look at purchasing equipment/technology to deliver on the objectives laid out in the Ocean Technology Vision Statement.
9.7 Key Business Opportunities in India

The demand for services and equipment related to the exploration and the servicing of deep sea oil and gas operations/platforms continues to grow. Many of the existing vessels used to service offshore rigs and platforms are incapable of working in deep sea operations and will need to be upgraded or replaced.\(^378\)

India’s government has laid out ambitious plans for the development of its Ocean Technology sector. There are several areas in which the DOD is either currently or in the near future will require equipment and technology not available India. Some of the systems required include: Acoustic Equipment, Sensors, Information Technology and Forecasting Models. Indian and the DOD also lack equipment for cold water applications. India is currently seeking sensor, buoys, equipment and at least one research vessel for the Antarctic.\(^379\)

In the recent past, some of the equipment and services that have been provided to India by Foreign owned companies include:

- 15 moored buoys from Norway, partially funded by the Norwegian government
- Exploration services
- Submerged sensors and monitors (including ARGO buoys)
- Polymetallic modal mining testing equipment
- Naval ships
- State of the art deep water research vessel\(^380\)

This does not include the long list of equipment and resources for the oil & gas industry or the many naval contracts.\(^381\)\(^382\) For coastal vessels, priority will be given to regional shipyards but there is a need for computer and information modeling, deep sea capable equipment and acoustics & sensors.\(^383\)
9.7.1 Indian Industry Stakeholder Perspective

Senior Executives interviewed in the Indian Oceanography, Marine Survey Industry and the aquaculture sector believe that aquaculture is experiencing increased domestic demand and is expected to see further growth fuelled by modern retail and ready-to-eat products. However, respondents also felt that the industry requires more favorable regulations and standards.

Respondents felt that there are specific opportunities for Atlantic Canadian companies to provide software solutions for hydro graphics and the offshore industry as well as survey software packages. There are also opportunities to provide Indian companies with machinery and equipment for the aquaculture sector such as building ponds and affluent treatment or pollution control systems. Additionally, there is a need for labor saving equipment and technologies such as cleaning machines. Currently, imports of technology and equipment in the aquaculture industry are duty free. Indian companies are also looking for logistics and backend process solutions which will help bridge the gap between aqua farms and processing plants which accounts for at least 20 percent of spoilage of total produce.

Atlantic Canadian companies can enhance participation in India by attending international industry trade fairs & exhibitions in order to increase visibility of their products and services in the marine survey and oceanography components segment. There are also openings to invest in joint ventures with established Indian partners to provide technological support. Atlantic Canadian companies can also consider putting in place reseller agreements for sales and service of equipment in the Indian market and use India as a hub for the Asian and Middle East markets.

9.8 The Atlantic Canadian Ocean Technology Sector

Canada enjoys a strong international reputation and is known for its leading edge technology and expertise in Ocean Technologies. Atlantic Canada is home to a wide range of scientific research, and engineering expertise in this field, including: ocean mapping & charting, maritime security, biotechnology, cold water engineering and geophysical surveying. Some of the world’s
most modern naval vessels and their integrated electronic systems have been designed and built in this region. Atlantic Canadian companies are also designing and installing some of the most advanced integrated ocean surveillance systems on the market. Atlantic Canada’s expertise provides it with opportunities to collaborate with the public and private sectors for technology transfers.

It is estimated that, “the ocean technology industry in Atlantic Canada contributes more than $150 million to the region’s gross domestic product (GDP), and directly creates an estimated 2,200 jobs.” These firms operate in areas such as fishery technology, satellite technology, electronic navigation, acoustic and radar equipment, oceanography research (buoys, sensors, unmanned vessels, etc.), shipbuilding and the oil and gas sector.

In 2004, there were about 500 ocean technology companies estimated to be operational in Canada, of which 30 are active in Newfoundland and Labrador, five in PEI, 65 in Nova Scotia and 25 in New Brunswick.

In 2011, there were over 200 companies in the ocean technology sector in Nova Scotia alone. The sector contributes over $5 billion in revenue and employs about 14 percent of Nova Scotia’s workforce. Nova Scotia has as many as 450 PhDs in this sector and houses renowned institutes and research centers such as the Bedford Institute of Oceanography (BIO), the Halifax Marine Research Institute (HMRI), Dalhousie University (100 researchers focusing on oceans and ocean technology), and the NRC-Institute for Marine Biosciences.

Newfoundland and Labrador also has its share of world class institutions, companies and industry organizations that offer top of the line ocean technologies to the global market. The provincial government is cognizant of the important role this industry plays and has instituted policies and funding for development and expansion of the industry, OceansAdvance Inc. is one such example that has a goal of increasing the value of the industry from $ 250 million in 2009 to $ 1 billion by 2015.
“The University of New Brunswick conducts research in the development of innovative methods to process, depict and interpret ocean mapping data. Research also includes solving problems associated with high-volume seafloor bathymetric and imaging systems.”

9.8.1 Atlantic Canadian Industry Stakeholder Perspective

According to business leaders in the Ocean Technology sector, the industry has been growing almost twofold every five years, and has remained relatively untouched by the recession. Many companies in the sector are looking for business abroad in order to take advantage of funding for research and design aligned to university research. Exports include nautical charting services like chart conversion through international standards, nautical recording systems which are regulated by the International Maritime Organization (IMO), radar technology, hooks, electrical equipment, knowledge and concentration work, remodeling, simulations, maritime and port security, ocean sensing, and harsh-weather environment and arctic systems. Current importers include New Zealand, the US, Australia, Brazil, South America, the EU, Africa, Europe, Asia, India, Norway, Russia, China, Korea, Scandinavia, Korea and other Canadian provinces.

Some of the companies interviewed have had some experience with India. Companies in this sector have subject matter expertise, leading technology, ability to deal with adverse climatic conditions, niche players and dependable, integrated simulation systems. R&D and new product development which utilizes the low cost R&D through partnerships with education facilities give them an edge in the international market.

A mission from Atlantic Canada was successful in establishing contacts with representatives of National Institute of Ocean Technology Chennai and Indian Institute of Technology Chennai to explore opportunities in Ocean Engineering and Petroleum Engineering.

Some opportunities available in India this sector are skill development, niche technologies and providing consulting in offshore safety and survival (through- offshore safety and survival center), fishing gear technology.
9.9 Recommendations and Market Entry Strategies

India’s Ocean Technology Sector has a need for technologies in many of the products and services that Canadian companies are industry leaders in. Of these potential opportunities the most immediate needs are in advanced acoustic/sensors, geotechnical and climatology equipment, ocean mapping technology, information/modeling systems and equipment designed to operate in cold water.

Many countries have entered into the Indian Ocean Technology sector with the help of their own government and related organizations. As part of their National Buoy Programme, India purchased 15 advanced buoys from a Norwegian company. This purchase was partially funded by a Norwegian based foreign aid development agency.\(^{393}\)

There are several Ocean Technology Sector conferences in India that offer opportunities to meet companies from the shipping, port and ocean technology sectors in India. Of these, INMEX India is the largest and takes place every two years. The INMEX website claims to be the largest trade show for the Ocean Technology Sector in South East Asia. The next exhibition takes place in Mumbai, October 2013. Another large conference for the Ocean Technology Sector is India Maritime 2012. This conference includes companies from all aspects of the Ocean Technology sector with a focus on the shipping and ports sectors. A third conference of interest is SMM India 2012. This alternates locations annually between India and Germany and in 2012 will occur in India. In 2013, the conference returns back to Germany and offers an opportunity for companies already established in Europe to meet Indian businesses. Some prominent Ocean Technology trade shows are:

**India Maritime**
Goa, India
[http://www.indiamaritime.in/exhibition.html](http://www.indiamaritime.in/exhibition.html)
INMEX India
October 8-10, 2013
Mumbai, India
http://www.inmexindia.com

SMM India
Mumbai, India
http://smm-india.com

For more trade shows refer to http://www.tradeshows-biz.com
10. Power and Renewable Energy

10.1 Introduction

The energy industry is primed for growth as the global economy grows and energy consumption increases many fold. Growing health, environmental and price concerns over fossil and nuclear energy has prompted several countries to focus on alternate and renewable energy sources.

10.2 Subsectors

Clean energy technologies have received unprecedented attention in the last few years in India as its energy demand grows every year. India has focused on the following energy resources:

- **Non-renewable Energy Sources**
  - Coal
  - Lignite
  - Petroleum
  - Natural gas

- **Renewable Energy Sources**
  - Solar
  - Wind
  - Small hydro
  - Biomass / Cogeneration bagasse

This report will focus mainly on power and renewable energy sources.

10.3 Global Context

In 2010, almost 50 percent of new electric capacity added and 20 percent of the global electricity supply was from renewable energy sources. In 2011, renewable sources consisted of 25 percent of global capacity from all sources. “Renewable energy replaces fossil and nuclear fuels in four distinct markets: power generation, heating and cooling, transport fuels, and rural/off-grid energy services.” See Figure 12: Renewable energy Share of Global final energy Consumption, 2009.
10.4  Power and Renewable Energy Sector

India’s planning commission noted, that in order for the Indian economy to continue growing at the same rate of 9 percent the power sector will need to keep pace at least by 8.1 percent per annum.398

In 2010 – 2011 the energy available in India grew at 5.6 percent and peak demand met improved by 6 percent. In spite of this increase, India could not meet required demand and had an energy shortfall of 8.5 percent and a peak deficit of 9.8 percent. By 2011 – 2012 the energy deficit was expected to intensify to 10 percent and peak deficit to 13 percent. “The average per capita consumption of electricity in India is a mere 478 kWh (2010), compared to the world average of 2,300 kWh.”399

Between 2007 – 2012 (11th five-year plan), India is expected to add generating capacity of up to 59.7 GW in thermal, 15.6 GW in hydro, and 3.4 GW in nuclear i.e. a total of 78.8 GW. India also intends to have renewable energy account for 20 percent of generating capacity by 2020. India’s Ministry of Power has set a goal to achieve 100 percent household electrification in its “Mission 2012: Power for All”.400

In early 2011, the government of India owned over 87 percent of all installed electricity capacity. However, the government has been introducing new reforms and favourable policies...
to encourage private sector participation in the power sector leading to increased productivity in transmission and distribution. Private sector participation in installed capacity increased from 13 percent in 2006-2007 to 21 percent in 2010–2011.

The relative share of installed capacity has been illustrated in Figure 13: Share of Installed Capacity in March 2011

Figure 13: Share of Installed Capacity in March 2011

### 10.4.1 Renewable Energy

At the end of March 2011, the total potential for renewable power generation in India was estimated at 89.76 GW. Wind power accounted for about 55 percent (49.1 GW), Biomass power for about 20 percent (17.5 GW), Small Hydro Power for about 17 percent (15.4 GW) and bagasse-based cogeneration in sugar mills accounted for about 6 percent (5 GW). Gujarat has the highest share of potential at 14 percent, followed closely by Karnataka at 12 percent and Maharashtra at 11 percent (primarily due to wind).

In 2011, capacity of grid interactive renewable power increased by almost 19 percent and was estimated at 19 GW. Once again, wind power commanded the highest share at 75 percent, followed by small hydro power at 15 percent and Biomass power at 13 percent. Solar power
accounted for only 35 MW of capacity. The three states with the highest solar capacity were Tamil Nadu, Maharashtra and Karnataka.

10.4.2 Solar Energy

If India could capitalize on all the solar energy capacity it has access to, it could produce as much as 5,000 trillion kWh per year; this is mainly due to its high solar radiance. India nominally has 250 to 300 days of clear sunny weather each year. About 700 to 2100 GW of power could be generated through solar projects to be commissioned over 35,000 km² in the Thar Desert. Despite solar power’s potential, high initial set-up costs have deterred extensive generation and utilization of solar power. India has initiated the Indian Solar Cities Program which started with 20 cities in 2008 and was expected to grow to 48 cities by 2012; this initiative encourages urban local bodies to develop a guideline to help their cities become ‘renewable energy cities’ or ‘solar cities’. As per the Ministry of New and Renewable Energy (MNRE), in 2010, approximately 600,000 solar home systems and 800,000 solar lamps were purchased.

10.4.3 Wind

In 2009, India trailed only the US, China, Germany and Spain in terms of installed capacity of wind power; making it the fifth-largest worldwide. Nevertheless, India’s wind energy potential is not sufficient to meet increasing demand. South India (mainly Karnataka, Andhra Pradesh and Tamil Nadu) accounts for 54 percent of India’s onshore wind potential. Offshore wind potential has not been methodically examined; some potential has been seen on the western coast of Gujarat however it has been prone to harsh weather conditions such as cyclones. The other two facilities in Tamil Nadu and Gulf of Kutch have half the wind power densities required to provide a reasonable return on investment.

10.4.4 Hydro

India is the seventh largest in terms of technically exploitable hydro potential (almost 150 GW or 84 GW at 60 percent load capacity). However, in 2010, India’s installed hydro capacity was 36 GW and another 15 GW was under construction. India also has the potential for 15 GW from
small hydro plants (25 MW per plant over 5,400 sites). The average capacity factor of India’s hydropower has been lower due to defects “in design of old & existing hydropower plants and strong dependence on monsoon rainfalls” as well as environmental concerns, land acquisition concerns and regulatory constraints. Nearly 90 percent of the total remaining hydro potential of 98 GW is in the Himalaya mountain region.” This potential can only be accessed with the construction of new transmission capacity to transport power to the metros.

10.4.5 Biomass

It is estimated that almost 33 percent (105 million hectares) of India’s geographic area is being degraded. Current estimates suggest that biomass has the potential to sustain 25 GW of biomass power. This does not include residual biomass from agriculture and industry which has additional technical potential of approximately 5 GW through bagasse (pulp or dry refuse from sugarcane, grapes or sugar beets) cogeneration and 39 GW through other agricultural and plantation residues.

10.4.6 Upcoming Projects

The technical potential for geothermal power plants is around 10 GW. There are no geothermal power plants currently in India however; five projects with a combined capacity of 251 MW are in the planning stage.  

Theoretically, annual wave energy potential along the Indian coast has been estimated at about 60 GW. However, the realistic and economic potential is likely to be considerably less. To date, no wave energy plant exists in India. Two wave energy projects (5 MW in Gujarat and 1 MW in Maharashtra) are in the planning phase.

For tidal power, the identified economic potential in India is about 8-9 GW. Sites suitable for producing tidal energy include the Gulf of Cambay (~7 GW) and the Gulf of Kutch (~1.2 GW) on the west coast. To date, no tidal energy plant exists in India. Two tidal energy projects (50 MW in Gujarat and 3.75 MW in West Bengal) are in the planning phase.
10.5 Macroeconomic Environment

10.5.1 Political

Dr. Farooq Abdullah, Union Minister of New and Renewable Energy commented that India is committed to increasing its share of renewable power of electricity to 15 percent and has a target of 30 GW of renewable power by 2017. The MNRE and the Ministry of Power (MoP) have jointly established the Jawaharlal Nehru National Solar Mission (JNNSM) which is expected to help India comply with global specifications on carbon emissions and sustainability. The MNRE currently provides low interest loans and subsidies for renewable energy projects.

To meet the growing needs of the power market the government of India has implemented favorable policies to encourage private sector participation. Some of these policies include:

- Establishing statewide Independent State Electricity Regulatory Commissions
- Providing 10 years of tax breaks for the first 15 years of operations
- Waiving of import duties on capital goods on mega power projects.
- Allowing 100 percent FDI for generation and transmission of electricity
- Allowing 100 percent FDI through the automatic route for renewable energy

10.5.2 Economic

India has the fifth largest power generation capacity in the world and world’s third largest transmission and distribution network. Dr. Abdullah said that renewable power represents about 12 per cent of total installed power generation capacity and Ernst & Young’s all renewable Country Attractiveness Index has ranked India as the fourth most attractive investment destination.

The Indian government is estimated to allocate approximately US$ 252 billion to the power sector for the 12th Five year plan of which US$ 117.5 billion will be allocated to generation, US$ 33 billion to transmission and US$ 56.4 billion to distribution. The expected revenues from India’s power sector are expected to be US$ 294 billion during 2012 to 2017.
10.5.3 Socio Cultural

Electricity is available to only 55 percent of rural and 92 percent of urban households. More than 400 million rural residents do not have access to any electricity. Transmission and distribution (T&D) losses in India are one of the highest and more than 30 percent of electricity that is generated is lost due to inadequate networks and illegal usage. More than 50 percent of the 500,000 rural villages that do have access to the electricity grid have intermittent supply with regular outages and most receive low-voltage power supply.418

Over the last 15 years, the electricity consumption in India has grown 100 percent. Both energy consumption as well as the production of the energy resources increased from 1980 to 2005 however, it is interesting to note that the gap between consumption and production has also increased over the years.419 Consumption has been growing due to the growth of the population and the increasing percentage of middle class users who operate many more electronic gadgets now. However, production has not kept pace with consumption as large areas of the urban population face regular power shortage and many hours of no electricity due to load shedding. Consumers have begun to use their own power backup devices such as diesel generators and power inverters. Troubled by the erratic power supply, many industries have built their own on-site power generation which comprises of as much as 10 percent of total capacity.420

10.5.4 Technological421

The government is committed to invest about US$ 825 million for Research and Development during the 12th Five year plan. The R & D initiatives of the Indian government have been categorized into four different sectors:

- **Generation**
  
  Thermal, Hydro Fuel, Renewable Energy and Distributed Generation

- **Transmission**
  
  Design and development of equipment, real time simulators and controllers, creation of
data-bank, automation, pilot plant / demonstration, development of alternative materials, equipment performance, biological effects, concept proving / exploratory studies

- **Distribution:**
  Smart grid, distributed generation

- **Environment**
  Clean development mechanism, bulk utilization of fly ash, sulphur oxide gases, nitrogen oxide gases, and mercury control.

### 10.6 SWOT Analysis

#### 10.6.1 Strengths

The opportunities for investment in India’s power sector are enormous. The policy and regulatory frameworks are well defined. Private players have an opportunity to engage in all segments of the power sector such as generation, transmission, distribution, power trading or equipment manufacturing. Government reforms and initiatives such as standard bidding guidelines, open access, multi-year tariff regimes are well established and favorable for players.  

Growing per capita consumption and urbanization is leading to an increase in generation capacity. “India has made considerable progress in building up capability and uncovering opportunities for capacity additions”. In the 12th five year plan India plans to add 75 GW of power generation capacity and an additional in 2011, with a capacity of grid interactive renewable energy at 19 GW. The capacity addition plan creates opportunities for “developing evacuation capacities and supply related OEMs like conductor manufacturing, insulator manufacturing, tower fabrication and Engineering, procurement and construction (EPC).”

The 114 million families that make up India’s rural base of the pyramid population hold a total potential of US$ 4.86 billion per year for energy services and products required for daily necessities such as cooking and lighting.
10.6.2 Weaknesses

Over the years, India has missed many of its power sector targets and there are large shortages in both generation and transmission. In 2010, only 13 percent of the installed capacity was available for inter-regional transmission. Moreover, India incurs losses of more than 30 percent of its total power generation in transmission and distribution which increases to as high as 50 percent in some states. However, only about 20 percent of these losses are attributed to technical factors and the rest can be attributed to illegal tapping of lines and faulty electric meters, which leads to lower revenues. Moreover, the distribution system depends heavily on subsidies and faces severe losses due to lower tariffs (controlled by politicians). These losses were estimated at US$ 20 million and are expected to increase as a higher proportion of coal is imported and global commodity prices rise.

10.6.3 Threats

The renewable energy sector was expected to grow but has remained stagnant and has had limited access to project financing. Likewise, renewable energy players across the world are facing the impact of the global recession and many of these players have reported severe losses and are struggling to refinance high levels of debt. Mr. Tulsi Tanti, founder and chairman of Suzlon Energy in India believes that opportunities for global industry players will grow only when they are able to bring down the cost of clean energy through enhanced technology and innovations. However, until the cost of renewable energies is at par with coal it is difficult for players to compete in the global market.

In the Indian power sector, there is significant competition in the small hydropower sector, wind, and solar energy sectors from local suppliers and equipment manufacturers. Renewable energy and energy policies tend to lack coordination and integration between Indian government ministries, states, and sub-sectors. Sometimes government policies are inconstant and there may be uneven price setting across and within subsectors. Legal enforcement tends
to be lax and government departments sometimes act based on personal relationships and mutual benefit.\textsuperscript{429}

10.7 Key Business Opportunities in India

There is strong growth opportunity in power generation led by exponential development in economy, urbanization and increased power consumption.\textsuperscript{430}

- The huge capacity addition in the 12th five year plan of close to 75 GW of power generation, offers opportunity for developing evacuation capacities and supply related Original Equipment Manufacturers (OEMs) like conductor manufacturing, insulator manufacturing, tower fabrication and Engineering, Procurement and Construction (EPC).
- Private participation in the form of Independent Power Plants.
- The Government of India is offering a number of incentives to renewable energy developers to accelerate investments in renewable energy sector.
- Close to 55 percent of the installed capacity is coal based, Indian coal has a high ash and mineral content while cleaner imported coal is expensive. Hence, clean coal technologies are being promoted.
- Due to problems and bottlenecks in manufacturing, private players are opting to import supercritical equipment.
- Opportunities in renovation, modernization, upgrading and life extension of old power plants

India requires technical expertise in “installation, operations, maintenance, troubleshooting, and other aspects of clean energy implementation. Technological needs in the small hydro power sector include technology for direct drive low-speed generators for low-head sources, technology for submersible turbo-generators, and technology for variable-speed operation. There is also a need for proven high capacity wind turbines, generally greater than 1-2 MW. In addition, there is a need for turbines adapted to low-wind regimes and improved design for rotor blades, gear boxes, and control systems. In the PV sector, there is demand for thin-film
solar cell technology, technology for megawatt-scale power generation, and improvements in crystalline silicon solar cell/module technology. Building integration for PV and solar thermal systems is also an area of opportunity. For detailed information on specific geographic and technological opportunities in the clean technology sector please refer to Appendix “E” – Clean Technology Opportunities by Sector and Geography and Appendix “F” Specific Technology Opportunities in the Renewable Sector.

10.7.1 Indian Industry Stakeholder Perspective

Senior executives interviewed in the Indian Renewable Power Generation and Engineering, Procurement and Construction (EPC) of power plants and infrastructure sector felt that the policies and regulatory framework for renewable technology are largely favourable and large renewable capacity addition could be expected over the next five years. Investments in wind technology were driven by policy concessions and in addition large investments in solar technology are expected. In comparison, biomass technology has not grown due to constraints on biofuel supply and linkages, and high raw material costs. In general, the sector has been constrained by lack of adequate and inexpensive sources of capital.

Respondents felt that there is a need for foreign machinery & equipment as well as technology collaborations for hydro and renewable energy projects. There is also a need for technology related to energy plantation to produce biomass in waste land, with low gestation cycles. Atlantic Canadian companies could also provide infrastructure optimized distribution which will require modern metering systems and solutions in addition to smart grid technology that combines hardware, software and firmware.

Atlantic Canadian companies can participate in the power and renewable technology industry in India through strategic equity investments in existing power generation or EPC businesses which are likely to be available at profitable valuations. Investments in renewable energy generation are also likely to be beneficial. Additionally, Atlantic Canadian companies interested in providing technology support should consider investing in a local subsidiary.
10.8 The Atlantic Canadian Power and Renewable Energy Sector

The energy sector in Atlantic Canada is expanding and has access to “abundant sources of energy, world-class researchers and facilities, excellent business and transportation infrastructure, low business and energy costs and well-educated workers, the region is a world leader in energy production, export and research”. Atlantic Canada has one of the greatest per-capita ratios of electricity generations in the world and is the most diverse with hydro, nuclear, oil, coal, diesel, natural gas-powered generating stations and wind energy. Two cities in the Atlantic region (Halifax, Nova Scotia, and St. John’s, Newfoundland and Labrador) are part of the prestigious World Energy Cities Partnership, which promotes collaboration between 11 energy cities across the world. The Electric Power Research Institute of California has identified multiple sites in Atlantic Canada as the best sites for tidal power development also making it one of the best in North America.

Atlantic Canada’s diverse energy sector is reflected in its state of the art research facilities which include prestigious institutes such as Alliance for Marine Remote Sensing, Bedford Institute of Oceanography, Centre for Marine Compressed Natural Gas, Institute of Ocean Technology, Ocean Engineering Research Centre and the Wind Energy Institute of Canada.

The energy industry is supported by several industry associations and alliances such as The Newfoundland Ocean Industries Association, Maritimes Energy Association (formerly OTANS) and The Atlantica Centre for Energy. These associations promote and support the growth of the industry through research and development, energy efficiency, alternate energy generation, advanced manufacturing and energy advocacy.

Wind energy is PEI’s most valuable energy resource and by 2013 PEI expects to produce 500 MW of wind energy, some of which could be exported. Additionally, the innovations deployed in the region and the extensive research and development will enable specialized companies, such as Frontier Energy Systems to export advanced wind technology to the rest of the world.” Leslie Malone of Canadian Policy Associate with Environment Northeast (ENE) states, “PEI can
continue to be a leader in innovative clean energy solutions and an exporter of knowledge and capabilities.”

In March 2009, the Atlantic Energy Gateway (AEG) was introduced and was tasked with “enhancing regional cooperation towards the development of Atlantic Canada's clean and renewable energy resources.” There were several studies commissioned under this initiative including the “Regional Clean and Renewable Energy Market Opportunities (which) identified interprovincial and export opportunities for Atlantic Canadian clean and renewable energy. The key findings with respect to research, development, and demonstration projects in Atlantic Canada reveal a diversity of academic and institutional work in a number of sub-sectors. The region also encompasses leading R&D work that may hold the promise of commercialization and broader sector potential developments. Many technologies currently under development may have marketable applications outside of the region.”

10.8.1 Atlantic Canadian Industry Stakeholder Perspective

The global push for green energy has led to investment and the development of additional wind towers, solar facilities and research into harnessing tidal forces in Atlantic Canada. At the same time though there was increased scrutiny on the public side to justify costs and expenditures. Atlantic Canadian companies are well respected globally and offer energy audits, and renewable resources.

One new company was quite interested in pursuing partnerships in India during their next stage of growth. Their main product is used to decrease the time and energy required to reduce concrete and they were interested in the possibility of selling a license agreement to capitalize on this booming sector. They decided to pursue a licensing agreement and did not feel they could service their technology themselves.

For organizations offering niche contract services, the general advice was to seek out subcontracts through larger organizations. One consultant spoke of a contract he acquired through a Vietnamese company to design small hydro power plants. However, the project was
put on hold when capital dried up in 2009 - 2010. For smaller consulting companies, it was recommended to seek out subcontract opportunities to help reduce the entry barriers and avoid having to learn how to navigate the bureaucracies of the Indian government. Most large EPC firms, including those based in Canada have offices in Indian.

Although, green energy companies receive venture capital from organization specifically focused on the green sector, as well as have access to other government capital there were still some perceived challenges in seeking out partners for larger investments to fuel the next stages of growth.

10.9 Recommendations and Market Entry Strategies

India offers several opportunities in the power sector across all aspects of power generation, transmission, distribution and equipment & servicing. The Government is promoting private sector participation in transmission and distribution; transmission projects are being awarded on tariff-based bidding and privatization of distribution franchisees. There is also scope for rural electrification, combined with a focus on improving efficiency & bringing in advance technology and higher need for operational and maintenance services.435

Atlantic Canadian companies can also look at offering their expertise, niche technologies and project development consulting in wind energy, nuclear power, clean energy solutions, geothermal, tidal power, hydro-power and water management initiatives. Atlantic Canada with its research abilities can work with the Indian government and industry to research and develop customized solutions for Indian energy requirements. Further training and education institutes in renewal energy sector can look at suitable opportunities to develop skills and educate personnel that are currently working or aspire to become professionals in this sector. Also, companies in Atlantic Canada can look at export opportunities for super critical equipment required for the power sector.

“Investment opportunities are available for corporate users of power, long-term investors in power, promoters of clean power, and trading credits for emission reductions.” Atlantic
Canadian companies can set up operations as “licensee or generating companies as well as enter into a joint venture not only for renewable energy devices or products but also for manufacturing renewable-energy-based power generation projects on a build, own, and operate basis.” Although small hydropower, wind and solar energy have the maximum potential there is also tremendous local competition. There is also specific demand for energy-efficiency service companies and energy efficiency equipment suppliers for buildings and industries.436

Some prominent energy trade show and fairs are:

**Renewable Energy India**
New Delhi
http://www.biztradeshows.com/renewable-energy-india

**World Renewable Energy Technology Congress & Expo**
25 – 27 September 2013
New Delhi
http://www.biztradeshows.com/wretc

**10th EverythingAboutWater International Conference & Expo 2013**
28 February – March 02, 2013
Chennai India
http://www.eawater.com/expo

**Intersolar India**
Mumbai
http://www.intersolar.in

**India Solar Energy Summit**
New Delhi
http://www.indiasolarenergysummit.com

For more trade shows refer to http://www.tradeshows-biz.com
11. Transportation Infrastructure Sector

11.1 Introduction

Transportation infrastructure includes the systems and structures needed to transport goods and people. “Modern, efficient and reliable public infrastructure” is the cornerstone of a country’s economic stability, global competitiveness and its ability to provide its citizen and communities with adequate inter and intra city roads and highways, public transit, and bridges.437

11.2 Subsectors438439

There are many areas within transportation infrastructure and each of these subsectors requires planning and coordination in order to function properly. Refer to Figure 14: Transportation Infrastructure Subsectors for a list of the different areas included within the sector.

Figure 14: Transportation Infrastructure Subsectors
Each of these subsectors requires different types of services, structures, equipment and technologies. Some of the components of these subsectors include:

- **Roads & Highways**: bridges, signs, lights, sidewalks and tunnels.
- **Railways**: depots, stations, signaling and communications.
- **Ports**: cranes, unloading and dredging.
- **Mass Transit Systems**: subways, trams, monorails, buses and bike/car sharing.
- **Airports**: navigation/air traffic control.
- **Canals – Inland Water Transport (IWT)**: maintenance and dredging.
- **Ferries**: passenger and automotive loading/unloading facilities.
- **Paths & Walkways**: bike lanes, bike paths, pedestrian walkways.

### 11.3 Global Context

The global demand for infrastructure has been relatively consistent year over year growth. This trend is expected to continue, driven by nations forced to address their aging infrastructure and the enormous demands of developing countries like China, Brazil and India.  

The global transportation infrastructure industry was valued at US$ 945.3 billion in 2010. The compounded annual growth rate (CAGR) for the five previous years was 6.9 percent. The growth rate for the period 2010 – 2015 is expected to be 5.5 percent CAGR. In 2015 the global transportation industry is expected to have revenues of US$ 1,236.5 billion.

Roads and highways, and railways account for the largest percentage of expenditures. In 2010, these subsectors combined to make 83.9 percent of revenues, totaling US$ 792.7 billion.

### 11.4 The Indian Transportation Infrastructure Sector

With over 1.1 billion citizens, India’s transportation infrastructure sector needs to keep pace with the growing demand and economic pace. The World Bank website states that, “In 2007, the sector contributed about 5.5 percent to the nation’s GDP, with road transportation contributing the lion’s share.” By 2017, India is expected to spend over US$ 1 trillion on
infrastructure half of which is expected to be raised through the public private partnership (PPP) model.\textsuperscript{444} However, a McKinsey & Company report estimates that, If India is unable to make a concerted effort to build efficient and effective infrastructure it may cost the country almost 5 percent of its GDP in waste caused by poor logistics infrastructure by 2020.\textsuperscript{445}

Competition in the transportation infrastructure market is highly fragmented and some of the key players are illustrated in Figure 15: Key Players in Transportation Infrastructure:\textsuperscript{446}

\textbf{Figure 15: Key Players in Transportation Infrastructure}

Some Canadian players prominent in the Indian transportation infrastructure sector include SNC Lavalin, LEA Consulting and Hatch. Canada’s Bombardier and Open Text are supplying rolling stock, signaling equipment and software solutions to the Delhi Metro Rail.\textsuperscript{447}
11.4.1 Roads & Highways

India has the second largest road network in the world but only 6 percent of these roads are well developed. Furthermore, less than 0.5 percent of the 4.1 million km of roads in India have the basic two lane standard. In order to improve this situation, India has set a goal of building 20 km of road every day and it is expected that 60 percent of new interstates will be toll highways.

The Indian Government has created the National Highway Development Programme (NHDP). This program has allocated CAD$ 70 billion and includes upgrading the current road network as well as the creation of 50,000 km of new roads by 2015. Some of the projects currently underway or in the planning stage include:

- India Assam State Road Project: US$200 million loan to upgrade 800 km of state roads
- Upgrading the Golden Quadrilateral* and NS-EW Corridor to four lanes
- Upgrading 6,500 km of high density highway to 6 lanes (Golden Quadrilateral & other areas)
- Upgrading 100,000 km of national highways to four lanes and 20,000 km to two lanes
- Developing 1,000 km of new expressways as part of the Accelerated Development Programme and other Highway projects.

The upgrading of India’s roads and highways is expected to receive half of its funding from the private sector. India is planning “Road Shows” in different countries to promote and attract FDI.

The World Bank considers the Indian road industry “highly unorganized and fragmented” and finds that only about 1000 of the 250,000 contractors in India can be considered medium to large based on the number of people they employ. Furthermore, many of these firms are

* The first phase of the Golden Quadrilateral project is expected to connect the metro cities of Delhi-Mumbai-Chennai-Kolkata-Delhi
usually family owned and are not professionally managed. Subsequently, in 2008, the Indian government had a limited choice of less than 50 Indian and about 12 foreign contractors to whom it could contract work which is further limited by the fact that these companies form joint ventures and syndicates in order to qualify for contracts. The slow growth of quality contractors in Indian market can be attributed to lower profit margins of 6 to 10 percent in road construction as compared to 20 to 25 percent in real estate and about 15 percent in the hydropower and industrial sectors. Declining turnover from Indian business has been instrumental in a gradual decline of participation by foreign contractors in India since 2004 and many of the foreign companies that do operate are not bidding for new contracts.  

11.4.2 Railways

Indian Railways (IR) is the largest public corporation in Indian and the fourth largest in the world. It covers over 109,221 km and includes 6,900 stations. The rail network is overtaxed in many areas. Currently the Golden Quadrilateral accounts for 16 percent of the country’s rail lines but carries 52 percent of the passengers and 59 percent of the freight.  

Many of the rail stations in India handle more traffic than all the airports of India combined. Most of these stations have older facilities and IR has identified 50 stations which need to be upgraded and modernized. India is also expanding its coach and locomotive manufacturing capabilities, including alternative fuel locomotives.  

Through the recent economic crisis, the rails sector maintained the most stable growth rate compared to the other transportation infrastructure sectors. This was because the majority of these projects are being publicly funded. One major rail project currently underway is the Dedicated Freight Corridor (DFC). The DFC is a project to expand the shipping rails in the Delhi Mumbai Industrial Corridor and calls for almost 3500 km of dedicated freight lines.  

Other focus areas for IR include: electrifying the rail network, standardized track gauges, improved connections to ports, Special Economic Zones (SEZs) and other transport hubs, and construction of new freight terminals.
Other regional and nationally funded projects include: new tracks, high speed railways, upgraded coaches & locomotives and new terminals.\textsuperscript{460}

\subsection*{11.4.3 Mass Transit Systems}

Approximately, 41 percent of India’s population is expected to live in urban settings by 2030 and infrastructure development in most cities is not keeping pace with this growth.\textsuperscript{461} Currently, India has about 200 km of metro rail tracks but is expected to require over 7,400 km by 2030.\textsuperscript{462}

The government has planned metro services in 19 cities with a population of more than two million residents.\textsuperscript{463}

- Metro construction is under implementation in nine cities
- Detailed project report are prepared for six cities
- Planning is in Progress for four cities

Some upgrades and Greenfield projects in the planning phase include Delhi Metro extensions, Mumbai Urban Transport Plan – new and enhanced lines (see below), Bangalore Metro, Hyderabad Metro, Chennai Metro, Kolkata Metro – New line and extension of existing\textsuperscript{464}

The Mumbai Metropolitan Region is expected to surpass Tokyo as the world’s largest metropolitan region in the world. The Mumbai Urban Transport Plan has already received a loan from the World Bank to improve the Mumbai urban rail and transport system. So far they have managed to reduce the loads carried by passenger coaches. Even with these improvements, coaches still carry twice their recommended limit during peak hours.\textsuperscript{465,466}

Many smaller cities are also planning expansion of their bus rapid transit systems.\textsuperscript{467}

Some government initiatives for metro growth include\textsuperscript{468}:

- Creation of a viability gap funding (VGF). The central and state government has created a fund that would offer a private operator on a PPP model up to 40 percent of the cost
as a grant to improve the viability of a project. See Table 4: Recent PPP Projects that received VGF.

Table 4: Recent PPP Projects

<table>
<thead>
<tr>
<th>City</th>
<th>Project Cost (in USD Million)</th>
<th>Viability Gap Funding (in USD Million)</th>
<th>VGF as a % of Project Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mumbai - I</td>
<td>471</td>
<td>130</td>
<td>28%</td>
</tr>
<tr>
<td>Mumbai – II</td>
<td>1,650</td>
<td>306</td>
<td>19%</td>
</tr>
<tr>
<td>Hyderabad</td>
<td>2,428</td>
<td>285</td>
<td>12%</td>
</tr>
<tr>
<td>Delhi Airport Line</td>
<td>1,101</td>
<td>531</td>
<td>48%</td>
</tr>
</tbody>
</table>

- Reduction of custom duties for project imports
- Availability of 100 percent FDI
- Accessibility of surplus space to be developed for commercial use
- Initiation of Corporate tax incentives – no tax on projects for the first 10 years of 20 years of operation
- Creation of Dedicated Urban Transport Fund with 75 percent of the fund dedicated for the Metro

11.4.4 Ports

It is estimated that 90 percent by weight and 70 percent by value of India’s international trade is carried by maritime transport. Goods arrive in India through its 13 major ports and 176 non-major ports. The Ministry of Shipping has released the Maritime Agenda 2010 – 2020 which plans for US$ 110 billion for the development of ports and shipbuilding facilities. The ports section of the Maritime Agenda puts the highest priority on:

- Construction of new berths and terminals
- Expansion and upgrades to projects for berths including new & modern equipment
- Upgrades to higher capacity cargo handling equipment
- Mechanization of cargo handling operations
- Upgrades to computer aided systems to encourage automation in port operation
- Implementation of Vessel Traffic Management Systems (VTMS) for smooth movement of vessels
- Creation of Web-based Port community system

The ports were one of the first areas opened up to 100 percent FDI. Tax exemption of 100 percent is available for 10 years on certain projects.\(^4\)

### 11.4.5 Canals – Inland Water Transport (IWT)

India has approximately 14,500 km of navigable waterways made up of rivers, backwaters, canals, creeks, etc. About 50 billion tons of cargo was transported in 2005-2006 on India’s waterways. IWT is managed by Inland Waterways Authority of India (IWAI), through grants by the Ministry of Shipping. In general, IWT remains underdeveloped.\(^5\) Currently IWAI is looking for Public Private Partnership (PPP) opportunities for equipment, facilities and services.\(^6\)

### 11.4.6 Airports

India has committed to an airport modernization program which is focused on upgrading the metro airports to world class facilities. The plan also includes development of the airports in smaller cities and at least eight new Greenfield projects. Estimated investment for the period 2007 – 2012 is CAD $9 billion.\(^7\)

### 11.5 Macroeconomic Environment

#### 11.5.1 Political

In the past transportation infrastructure projects have suffered from red tape and lack of clarity in the bidding process. The Indian government has recognized this and is actively working to streamline the tendering process. The Indian government has opened up more PPP and Build Operate Transfer (BOT) arrangements in recent years. Currently both federal and state level governments are actively seeking out FDI and many projects are open to 100 percent FDI and offer a 10 year tax free period.\(^8\)
Private sector players have been subtly pressurizing the Indian government for reform and reduced bureaucratic roadblocks. Furthermore, many large international players have expressed interest only in mega-projects (valued at US$ 1 billion). The government has responded favorably and has invited inputs from the private sector and has redrafted contracts to accommodate industry inputs. Additionally, the government hopes to initiate at least 600 mega-projects in the future.  

11.5.2 Economic

About 27 percent of India’s industrial output comes from the infrastructure sector and over the next 10 years CAD$ 1 trillion will be spent in this sector, which includes transportation. For transportation infrastructure, the largest areas of investment are in the roads and highways, railways and metro systems. Indian Railways (IR) is the largest public corporation in India and the fourth largest in the world.

In 2011, “India (had) 1,017 PPP projects which accounted for an investment of (US$ 97 billion). According to the Private Participation in Infrastructure database of the World Bank, India is second only to China in terms of number of PPP projects and in terms of investments, it is second to Brazil.”

The government of India has estimated a requirement of approximately US$ 44 billion for modernization and updates of highways, US$ 8 billion for civil aviation; US$ 10 billion for ports; and US$ 60 billion for railways to be achieved by 2012.

11.5.3 Socio Cultural

The urban population is growing faster than the rural population and the movement of people to the cities is putting a strain on the cities’ infrastructure. The Mumbai Metropolitan Region (MMR) is expected to overtake Tokyo as the largest metropolitan region in the world. As the Indian population gets wealthier more individuals are purchasing cars, straining a road network
in need of modernization. Trains remain the primary source of transportation and many rail stations handle more traffic than all the airports in India combined.\footnote{480}

According to the World Bank, foreign contractors have faced considerable challenges managing sub-contractors and suppliers, adhering to taxation and audit procedures and adapting to the “local work culture” which highlights the difficulty of doing business in India.\footnote{481}

Land acquisition and resettlement of people in an important factor which affects almost every infrastructure improvement project in urban India especially in overcrowded metro city such as Mumbai. More than six million people in Mumbai live in unauthorized settlements on public land. Regardless of whether settlements are legal or unauthorized, it is not easy for the government to relocate its occupants.\footnote{482} Therefore, the government has recently initiated the land acquisition bill which increased the cost of land allocation to include cost of rehabilitation and mandates the consent of at least 80 percent of landowners for acquisitions over 405 square meters.\footnote{483} The government has also decided that no projects will be awarded unless 80 percent of the land has already been acquired.\footnote{484}

\textbf{11.5.4 Technological}

In 2012, the NHAI moved to a complete e-tendering mode which resulted in higher transparency of the process and improved the speed with which applications were evaluated. The government has also decided to utilize electronic toll collection (ETC) systems which use vehicle-to-roadside communication technologies to increase speed, reduce manpower requirements and provide seamless travel without the need to stop at toll plazas.\footnote{485} Also, Indian Railway is modernizing its facilities and as a first step it has identified 50 stations which it will upgrade and provide world class amenities for its passengers.
11.6 SWOT Analysis

11.6.1 Strengths

India’s infrastructure sector is huge and is expected to spend CAD$ 1 trillion over the next 10 years. Projects include all aspects of the sectors with some receiving funding from the World Bank. Many projects in the transportation infrastructure sector have no limit on FDI. The Indian Government has recognized previous challenges to attracting Foreign Direct Investment (FDI) and has begun to streamline and simplify the tendering or bidding process. The NHAI has recently introduced the annual pre-qualification system, which has not only helped speed up evaluation but also avoids situations in which a well-qualified bidder is eliminated due to a technical problem.

11.6.2 Weaknesses

Infrastructure projects have longer gestation periods than other sectors and India has traditionally suffered from corruption, lack of transparency, bureaucracy and frequent changes to the rules. It is estimated that lack of infrastructure in India currently costs the country 2 percent of its GDP per annum, which could grow to as much as 5 percent of GDP if India does not plan and execute infrastructure development seamlessly. The use of PPP to help fund projects is quite new and suffers from challenges, particularly in trying to allocate risk. Also, as mentioned, the Indian infrastructure industry is fragmented and not very well organized.

11.6.3 Threats

Future economic uncertainty could slow the growth of sectors reliant on FDI. Infrastructure projects are quite large and often too big for Canadian companies to take on alone. There have also been changes in prequalification norms for bidders and have become more stringent on both technical and financial requirements. According to Sharma and Abhisheik from BNP Paribas research,
“The new method requires taking a weighted average of scores (technical and financial) in proportion to the equity share for each member in a consortium. This means that the size of the players and their credentials need to be substantially bigger to fit the bill. The magnitude of the change can be understood from the fact that, for (an) INR50b (US$ 1 billion) project, in the past two players with a combined technical score of 5,000 would have sufficed; now in the most favourable scenario, the combined technical score would have to be 5,000, multiplied by the number of members in the consortium. This means that the requirement for financial and technical scores for a consortium has gone up by a factor equal to (or greater than) the number of members in it. We estimate only 10-15 Indian players have more than 2,500 technical points on their own to qualify for projects of INR25b (US$ 500 million). This means that rest of the players would need to form consortiums with larger players to bid for large projects and competition in these projects would be limited”

11.7 Key Business Opportunities in India

Key Opportunities in the Roads Sector:

There is a demand for companies with expertise in highway planning and strategy, traffic forecasting and road project feasibility analysis. The opening of India’s modern expressways (e.g. Delhi-Jaipur expressway) has created a demand for operation and maintenance services, including tolling services. India’s road sector also requires modern lighting, construction equipment and advisory services (environmental, structural, and architectural).

Information systems and models are in high demand for the planning and strategy portion of highway and road construction. India also needs Intelligent Transport System (ITS) products ranging from traffic signal control systems, variable message signs, automatic license plate recognition, and speed cameras. India is also currently exploring more advanced applications, such as connected vehicle technology, parking guidance, and information systems.

Key Opportunities in the Railways & Mass Transit sectors:
India’s Railways and Mass Transit sectors require construction equipment and advisory services (environmental, structural, civil, planning). These services needs include: consulting for long-term planning and architectural services focused on upgrading and building new stations.497

There is a need for electrical substation equipment, information handling systems, information models and rail & power simulation services.498

Opportunities exist in helping to upgrade or supplement India’s coach and bus manufacturing capabilities, as well as creation of new alternative energy locomotives.499

**Key opportunities in the Ports sector:**

Multiple Greenfield project for the Ports sector requires construction equipment, project planning, management expertise and other advisory services. Existing ports require upgraded equipment (cranes, berths, etc.) and there are opportunities in the consulting and construction of new warehousing buildings, dry dock facilities and the addition of specialty terminals. Almost all the Ports require modernization of their information systems, and controls. Equipment and services are also in high demand for dredging and port operations, often as part of a BOT arrangement.500

**Key opportunities in the Airports sector:**

India’s airports require modern air traffic control equipment, models and information systems. There is a need for advisory services in the construction and upgrading of India’s airports as well as operational support services. There is also a demand for construction & operational equipment.503

**Key opportunities in the IWT sector:**

India’s IWT sector has the need for expertise and management in: construction and operation of river terminals & ports, waterway development, installation & maintenance of navigational aids, dredging services and mechanized cargo handling systems. There is also a need for
integrated information systems, creation of an IWT training center and owners/operator of vessels for cargo and passengers.

11.7.1 Indian Industry Stakeholder Perspective

Senior executives in the Indian Surface Transport and Port Infrastructure sectors spoke positively about the regulatory framework and the transparency brought about in the sector recently. Investments in the road and port sector have improved due to the introduction of the Public Private Partnership (PPP) model. Improvement of maritime practices have been encouraged by state maritime boards, but regulations on costal shipping to encourage Port to Port movement of goods requires further enhancements. Respondents also felt that regulations dealing with state highways and city roads need to evolve. The sector requires large capital investments and players are open to strategic investments at the project level.

Atlantic Canadian companies can participate in various infrastructure projects such as national highways, port linkages, mass rapid transport solutions, and inter nodal transit hubs (connecting rail, road, and air terminals). There is also a need for specialized machinery and equipment such as tunnel boring machines, bridge technology, pavers, rollers, crushers, hot mix plants for surface infrastructure projects besides specialized cranes for discharge of material from ship to port and container handling equipment for port projects. Atlantic Canadian companies can take advantage of numerous opportunities to provide consulting for pre project design and Project Management for Construction (PMC). In addition, there is requirement for software solutions for multi project monitoring, optimal critical path finding, logistics and Enterprise Resource Planning (ERP) and port centric integrated technology solutions.

Participation in the surface infrastructure industry, it is strongly advised through partnership with an Indian company. Collaboration with Indian partners is advised to offer the advantage of a large brand name and gain the ability to experience the market practices first hand. Equity investments in project specific Special Purpose Vehicle (SPV) on a fixed fee basis can also be explored. Although 100 percent FDI is allowed, participation in the Ports infrastructure industry
is dependent on the specific strengths of the investor in terms of access to capital and appetite for risk.

11.8 The Atlantic Canadian Transportation Infrastructure Sector

Atlantic Canada has an advanced and diverse transportation infrastructure sector. These companies are global leaders in modern technology, equipment and services. The Ports sector in Atlantic Canada includes service companies specializing in the design, operation and security of ports. Atlantic Canada enjoys a strong reputation in this sector and operates in such areas as: advanced information systems (navigation, geospatial, communication and port management), cranes & equipment, visual systems, marine lighting, marine ready electrical components, alarms and emergency response services.

Outside of the Ports sector, Atlantic Canadian companies offer goods and service in high demand in India’s transportation infrastructure sector. These include: Integrated information systems, high efficiency lighting, advisory services (environmental, planning), aerospace and airport systems and alternative power solutions.

Furthermore, New Brunswick has implemented a 10-year (2008 – 2018) strategy in order to implement Intelligent Transportation Systems (ITS). The New Brunswick Department of Transportation (NBDOT) partnered with Transport Canada and University of New Brunswick in 2004, to establish a “National Rural ITS Research Centre”. This is the only such centre in eastern Canada and is specifically focused on Rural ITS. “New Brunswick companies have specific niche areas of expertise including, but not limited to, road weather information, infrastructure management, freight tracking/administration, software development, Geographic Information Systems, precision manufacturing, and aerospace component parts.”

* Although trucking and shipping is considered part of transportation infrastructure, for the purposes of this report, companies primarily engaged in regional trucking and shipping have not been included.
In 2009, the Atlantic Canadian and federal government established several immediate measures to promote and market international trade. Some of the initiatives are identified below:\(^{513}\)

- **Market Research Activities:** Public and private sector partners will support the Atlantic Gateway and Trade Corridor through market research and analysis. Research activity may include assessing existing trade activities and trade potential in key geographic areas; analyzing sector-specific trade and investments; and developing specific marketing strategies.

- **Trade Missions and Promotion Activities:** Canada's Atlantic Gateway and Trade Corridor's public and private sector partners have already begun collaborative marketing activities targeting travellers, containers, bulk and air freight companies in the U.S., Europe and Asia. Promotional communications products in support of these activities are being developed.

- **Atlantic Gateway and Trade Corridor International Marketing Program:** Recognizing targeted marketing as a valuable way to attract new international commerce opportunities to the Atlantic Gateway and Trade Corridor, the Government of Canada is committing up to $5 million to support strategic, pan-Atlantic Canada marketing projects and activities that promote competitive advantages and niche market strengths of Canada's Atlantic Gateway and Trade Corridor.

11.8.1 Atlantic Canadian Industry Stakeholder Perspective

Stakeholders in the Atlantic Canadian Infrastructure industry felt that the industry has generally flat lined, there were no big dips because of the economic crisis but there was no growth either. However some companies have been quite busy and predict growth in the future. There seems to be a huge demand for engineering services and there is high potential for niche engineering services.

One of the respondents represents a Port Management company and the company primarily exports to US and other parts of Canada. The respondent’s prospective clients are demanding
more solutions that can be integrated with existing systems, handhelds, smart phones, etc. There is also a huge demand for engineering services in the ports sector and the interviewed organization had received enquiries from Africa and India. They have a unique product which is able to better integrate into existing legacy port systems and is perceived to be superior to the competition.

Atlantic Canada has the advantage of lower R&D costs as companies are able to leverage their relationships with secondary schools. Labour is still inexpensive and a lot of the business planning revolves around low cost of labor. One of the respondents felt that the Federal Government is reducing funding and has put in place stringent requirements from companies that are requesting funding.

Though companies have been approached by individuals in India, these inquiries have not materialized into business. Additionally, executives remain uncertain about where to start and what is required to establish a long-term relationship. The time and effort necessary to put people on the ground and make the necessary infrastructure setup to support services has taken lower priority to local business growth activities.

**11.9 Recommendations and Market Entry Strategies**

The Transportation Infrastructure sector as a whole offers countless opportunities at the state and national level for equipment, service and system providers. These opportunities exist through BOT and PPP arrangements, subcontracts or joint bids on larger contract. The Ports subsector offers great potential for Atlantic Canadian businesses, in large part due to the number of companies in Atlantic Canada in this subsector. There are many opportunities available in consulting and construction of warehousing buildings, dry dock facilities and specialty terminals as well as modernization of information systems, controls at existing ports.

New Brunswick has significant strengths in ITS and rural ITS. Research and development for new technologies as well as consulting services in this area would be in high demand in India.
The Delhi Mumbai Industrial Corridor Development Corporation Limited (DMICDC) undertakes project development services for investment regions, industrial areas, economic regions, industrial nodes and townships, for various central government agencies and also helps in assisting state governments. To review available opportunities and request for proposals, please visit [http://www.dmicdc.com/frmTenders.aspx?pgid=36](http://www.dmicdc.com/frmTenders.aspx?pgid=36).

According to Export Development Canada (EDC), “for Canadian companies to succeed in India, they must be able to offer innovative or cost-effective technologies; manufacturing or assembly plants in India to reduce costs; partnerships with a reputable local company to deal with local business culture, labour, government bureaucracy, and have blended cost structures that are competitive with the local environment; know-how and training; on ground after sales support; and long term commitment to the market.”

Trade shows in India with a focus on transportation infrastructure are:

**Transportation**

**Constru India 2012**
November 6 – 8, 2012
Mumbai, India
[www.construindia.com/](http://www.construindia.com/)

**Urban Infra World 2013**
2013
Mumbai, India

**City Infra 2013**
2013
New Delhi, India

**Intertraffic 2013**
Autumn, 2013
New Delhi, India
[www.intertraffic.com/intertraffic-india/Pages/default.aspx](http://www.intertraffic.com/intertraffic-india/Pages/default.aspx)

**Port and Shipbuilding Industries**

**India Maritime 2012**
October 17-20, 2012
Goa, India
[www.indiamaritime.in/exhibition.html](http://www.indiamaritime.in/exhibition.html)

**INMEX India 2013**
October 8-10, 2013
Mumbai, India
[www.inmexindia.com](http://www.inmexindia.com)

For more trade shows refer to [http://www.tradeshows-biz.com](http://www.tradeshows-biz.com)
Section III – Canadian Export Experience in the Indian Market
12. Canadian Export Experience in the Indian Market

Please note that this part of the report (Section 12) is based on primary research and represents the experiences of some Canadian Businesses in India. These statements are the opinions and perceptions of respondents for the Indian market and must not be relied upon as facts.

Many Canadian companies actively export to India and India is a target market for many Canadian companies due to its growth potential as an emerging economy and entrepreneurs view it as one of the natural choices for international trade. Despite the recent slowdown of the Indian economy, it is expected to get stronger in the near future.

Canadian company executives have had varied experiences when dealing with India. Every relationship or situation in India is different; entrepreneurs have found that there are no set ways of dealing with Indian partners.

India has some unique requirements and is attempting to convert imported products to indigenous products (wants to produce products locally). Foreign companies can license their manufacturing technologies to Indian companies, get into joint venture agreements or use the build, operate transfer model. On the one hand the Indian market is extremely brand conscious for mid and high priced consumer products and on the other it is also highly price sensitive; especially for service providers and mass market consumer products. Foreign companies need to be innovative in packaging and pricing of their services and products.

India’s Information Technology industry is expanding and is a potential market for companies providing education, training, and advance and niche technology for ICT, Aviation and Security, Life Sciences and Ocean Technology. Also, the Indian Government is looking for participation in infrastructure and Indian companies are looking for expertise and foreign direct investments in food processing, biotechnology and renewable energy projects.
12.1 Challenges of Entering the Indian Market

Respondents believe that the Atlantic companies have limited knowledge of India, its culture, market, approach to business and trade. This creates incorrect perceptions and fear of the unknown. Some of the common challenges that are faced by Canadian exporters include:

12.1.1 Language and Local Customs
Most Indians do not say “No” and will try their level best to accomplish the task, even if it is beyond their capabilities. It is important to probe and ascertain if the capability and capacity actually exist to accomplish the task. Though most Indians understand Basic English, comprehension tends to vary vastly from person to person and this needs to be evaluated by asking specific questions.

12.1.2 Business culture:
India is a large and diverse country in terms of culture, practices and approach towards business; some people are very entrepreneurial, some opportunistic and many others extremely professional in their approach. Canadian companies should be meticulous and thorough in identifying a suitable partner. Some executives interviewed believe that the Indian business culture is aggressive in decision making and action (quick decision and actions), while others have had contrary experiences. Many Indians are not very punctual and a meeting could start at least 15 to 20 minutes late and this would not be considered a delay. In India, Indian Standard Time is referred to as the Indian Stretchable time, because time is considered flexible. Unpunctuality should be expected as a part of the business culture and should not be taken personally or a sign of disrespect. Most managers expect respect from their subordinates and when there is an important meeting (early or late in the day); subordinates are expected to be available for any support or contingencies.

12.1.3 Bureaucracy and Regulations:
Most companies that have dealt with the Public sector have experienced bureaucracy. Some respondents perceive Intellectual Property Rights (IPR), corruption, and difficulties in working with the government as major challenges and these are often cited as reasons for not
pursuing the Indian market. Companies looking to enter the market need to abide by guidelines set out by relevant regulatory agencies. However, other companies have had a very different experience and faced barely any obstacles, other than filling out detailed paperwork. On a positive note Indian regulations have been evolving over a couple of decade and India has become much more liberal and accessible as compared over 20 years back.

There are several taxes and fees structures that must be understood in order to conduct business in India and it is important to appoint a reputable tax accountant or advisor to avoid stumbling blocks later.

12.1.4 Infrastructure
The quality of infrastructure in India varies in urban and rural India. Urban India, including Special Economy Zones, has modern roads and a fairly developed infrastructure for business and commerce. However rural India needs far more development, and is still in the process of getting built. While setting up business in India logistics and transport are important considerations.

12.2 Best Practices of Entering the Indian Market
To be successful in India it is important to establish partnerships a local partner or to set up local operations in India. It is good practice to survey India’s potential and its markets with the help of a local consultant. Further, the consultant can also help find the company a suitable partner. Face to face meetings with shortlisted candidates are important when partnerships are being established. After the initial meetings and once rapport is built, the relationships can be maintained via video or telephone conferences. It is best for new entrants to partner with local representatives who are local and understand the Indian market well. Canadian trade commissioners can assist with establishing connections between Canadian companies and Indian partners. Participating in trade shows is an excellent way to meet industry stakeholders and enter the Indian market.
Canadian companies that wish to establish business in India must understand the culture of the specific regional markets they plan to serve which can vary from state to state. International businesses must carry out active vendor development programs. Often, partnerships will need to be nurtured and businesses must collaborate with other businesses to develop capable vendors. Relationships in India go a long way in creating success for the company and will enable companies to take advantage of the true potential of a fast expanding economy and market. Often, highly driven local entrepreneurs in India are better partners than large corporate houses with hierarchical decision making structures. This is because scaling up business requires rapid decision making, which could be faster in entrepreneurial organizations than large businesses. Further, vendor businesses run by entrepreneurs also offer better leverage for foreign companies as issues can be escalated sooner to the top decision makers.

Some companies have found that India has an inexpensive but excellent pool of competent and technical resources that can be leveraged by businesses. Manufacturing organisations should consider establishing their facilities in India to save cost; however, they must set up stringent quality control regime to ensure quality and brand reputation. To enter the Indian market, some companies have chosen to partner with large companies with complementary product and services. Companies have also found that the Indian prospects expect to receive several and detailed proposals but companies must be patient as there have been instances where it took as much as two years to build a relationship and start receiving contracts.
Section IV – Opportunities and Strategies to Attract Foreign Direct Investment and Technology Partnerships
13. Opportunities and Strategies to Attract FDI and Technology Partnerships

13.1 Introduction

Foreign Direct Investment (FDI) over the last decade has become a strong driving force of globalization and economic growth. Inward FDI, in particular, provides huge benefits to the host country. This phenomenon has prompted countries to create favorable policies to attract foreign direct investment. Recently, India has progressively become a large source of foreign direct investment to the world and this trend is expected to continue. According to a 2010 report by PricewaterhouseCoopers, “India is expected to produce the most new multinational companies, overtaking China as the emerging world’s largest source of new multinationals. Over 2,200 Indian companies are projected to open operations outside the country over the next fifteen years.”

13.2 Indian Investments Overseas

13.2.1 Position of India in Global Context

India’s Outward FDI investments have mainly been by way of equities and loans. UNCTAD’s World Investment Report 2011 ranked India 21st in the world. It based its ranking on the FDI outflows amount from India. Also, in 2010, India was placed fifth in the World in terms of value of net purchases, after the US, Canada, Japan and China.

Furthermore, over the years, the scale of overseas investment by Indian companies has increased. India with an average purchase deal of US$190 million was placed second in 2010 after China in terms of average size of net purchase deals.

13.2.2 Surge in Outward FDI Investments

With the liberalization of the Indian economy and its integration with the rest of the world there has been a growing trend of outward as well as inward flow of FDI. India, like other emerging economies has progressively become a foreign direct investor to the rest of the
world. FDI is a natural extension of the globalisation process and Indian organizations (private as well as state-owned) are looking at regional and global expansion. However, Indian company’s overseas investments have not only been driven by market-seeking motives, but also by resource-seeking or technology-seeking objectives. Recent trends show a surge in investments to acquire energy resources in Australia, Africa and Indonesia.

Two major factors that spurred outward FDI investment were: structural reforms in the Indian industry and the evolution of foreign investment policy in India. Both were brought about by the liberalization of the Indian economy.

13.2.2.1 Structural Reforms Spurring Outward FDI

The liberalization of the Indian economy, accompanied by structural reforms like industrial deregulation, trade liberalization and relaxation of regulations governing inward FDI, brought about huge transformation in the Indian industry. Many Indian companies became more effective, competitive and confident to be able to compete in the international arena.

13.2.2.2 Evolution of Outward Foreign Investment Policy

Over the last two decades, the government of India has progressively relaxed capital controls and simplified procedures for outbound investments in three distinct overlapping phases. The relaxation of controls and evolution of policies occurred when the foreign exchange reserve position for India started becoming comfortable due to a steady rise in capital inflows.

Phase I (1992 to 1995): Period of Liberalization of Indian economy

The Guidelines on outward FDI were in place before the liberalization and globalization of the Indian economy (1991-92). Since then, the policy changes have been made by keeping in view the changing needs of India’s growing economy. At this stage rules were quite restrictive; however in 1992, with the introduction of the ‘automatic route’ cash remittances of up to US$ 2 million (not exceeding US$ 0.5 million in a block of 3 years) were allowed for the first time.
Phase II (1995 to 2000): Creation of a Fast Track Route

In 1995, the Reserve Bank of India was given the responsibility of providing a single window clearance mechanism for overseas investment. A comprehensive FDI policy framework was also formulated to respond to market needs. The policy addressed the need for flexibility, transparency, recognised global developments, captured Indian realities, and provided for lessons learned from the past. The basic objective of the policy was to ensure that outflows were determined by commercial interests and not by balance of payment concerns of the country.

A fast track route was adopted for outward FDI and the limits were raised to US$ 4 million and linked to a company’s average export earnings of the preceding three years. However, cash remittance continued to be restricted to US$ 0.5 million. For proposals above US$ 4 million, a special approval was to be sought from a Special Committee comprising of the senior representatives of the Reserve Bank of India and the Ministries of Finance, External Affairs and Commerce. Proposals that exceeded US$ 15 million were considered by the Ministry of Finance (recommended by Special Committee).

In March 1997, exchange earners (besides exporters) were also brought under the fast track route. Promoters were allowed to set up second and subsequent generation companies, only if the first generation company was set up under the fast track route.

Phase III (2000 till date): Liberalized Framework under FEMA

With the introduction of the Foreign Exchange Management Act (FEMA) in 2000, the scope for outward FDI expanded rapidly. In 2002, the annual limit for automatic approval was raised to US$100 million. In March 2003, the limit was discontinued when the automatic route for outward FDI was further liberalized and Indian entities could invest up to 100 per cent of their net worth, which was later increased to 400 per cent. However, the ceiling of 400 per cent of net worth was not applicable for:
• Investments made out of balances held in the Exchange Earners’ Foreign Currency (EEFC) account or from funds raised via ADRs/GDRs.
• Indian companies engaged in the energy and natural resources sectors (prior approval of the RBI required).

Subsequently, in 2004, the External Commercial Borrowing policy was modified and funding of Joint Ventures (JVs) or Wholly Owned Subsidiaries (WOS) abroad was included as a permissible end-use of the funds raised.

At present, any Indian entity can make direct investment in any bona-fide activity except certain real estate activities (i.e., buying and selling of real estate or trading in Transferable Development Rights -TDRs) and banking business that are prohibited. Also, certain conditions by the Reserve Bank need to be adhered to for activities in the financial services sector. Further liberalization provided access to international financial markets and the Indian corporate sector was allowed to use special purpose vehicles (SPVs) to finance their overseas acquisitions. See Appendix “G” – Overseas Investment Policy in India (2004 onwards) for a summarisation of the changes made in FDI policies since 2004.

13.2.3 Trend of Outward Investments

The net outward FDI flow over the last decade shows a sharp upward trend from US$ 790 million in the year 2000 -2001 to about US$ 44 billion in 2010 -2011. Although there was a dip in India’s outward FDI during the recession years of 2009- 2010, it has rebounded well in 2010-2011. Ten year tabulation of outward FDI is given below. See Table 5: Trend of Outward Investments from India for details.
Table 5: Trend of Outward Investments from India

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<td>2000-2001</td>
<td>602.12</td>
<td>70.58</td>
<td>4.97</td>
<td>677.67</td>
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<td>2001-2002</td>
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<td>120.82</td>
<td>0.42</td>
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<td>52.49</td>
<td>16,843.37</td>
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<td>4,830.01</td>
<td>0.00</td>
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<td>29,425.32</td>
<td>85.40</td>
<td>10,4758.30</td>
<td>63,504.05</td>
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* April 2011 to February

Source (Khan, 2012)

13.2.4 Sectoral Investment Trends

Analysis of outward FDI data from 2006-07 to 2010-11 shows that funds have been invested mainly in the services and manufacturing sectors. During 2010-11, FDI investments were made in the following major sub-sectors:

- Manufacturing sectors
  - Agriculture machineries and equipment
- Basic organic chemicals, drugs, medicines & allied products
- Refined petroleum products, indigenous sugar, etc.

- Service sectors
  - Business services
  - Data processing
  - Financial services
  - Architectural
  - Engineering, engine architectural and other technical consultancy activities

Besides the sectors mentioned above, in recent years, extraction of crude petroleum, oil and gas field services and services incidental to mining have also attracted a share in the outward FDI from India. Table 6: Sector-wise Overseas Investments by Indian Companies provides details on investments made in different sectors.

| Major sector-wise overseas investments by Indian companies (amounts in billion US Dollar) |
|----------------------------------|----------------|----------------|----------------|----------------|----------------|
| Period                           | 2008-09 | 2009-10 | 2010-11 | 2011-12* | Total |
| Manufacturing                    | 10.18    | 5.35    | 5.04    | 2.74     | 23.31 |
| Financial Insurance, Real Estate Business & Business Services | 3.55 | 4.41 | 6.53 | 2.53 | 17.03 |
| Wholesale & Retail Trade, Restaurants & Hotels | 1.17 | 1.13 | 1.89 | 1.00 | 5.19 |
| Agriculture & allied activities | 2.38    | 0.95    | 1.21    | 0.41     | 4.94 |
| Transport, Communication & Storage Services | 0.31 | 0.38 | 0.82 | 1.34 | 2.85 |
| Construction                     | 0.35    | 0.36    | 0.38    | 0.37     | 1.46 |
| Community, Social & Personal Services | 0.39 | 0.18 | 0.70 | 0.18 | 1.45 |
| Electricity, Gas & Water         | 0.14    | 0.84    | 0.10    | 0.04     | 1.19 |
| Miscellaneous                    | 0.12    | 0.11    | 0.18    | 0.10     | 0.51 |
| Total                            | 18.58   | 13.71   | 16.84   | 8.73     | 57.86 |
13.2.5 Indian Outward FDI Destination Countries

Indian overseas investment has more recently started flowing to developed countries, because of the availability of assets at competitive rates in these countries. Also, Indian private and public Indian companies are now more confident and have more ambitious objectives, in terms of becoming international players and competing with other multinationals. See Table 7: Indian Outward FDI Destination Countries.

**Table 7: Indian Outward FDI Destination Countries**

<table>
<thead>
<tr>
<th>Major sector-wise overseas investments by Indian companies</th>
<th>Amounts in billion US Dollar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period</strong></td>
<td><strong>2008-09</strong></td>
</tr>
<tr>
<td>Singapore</td>
<td>4.06</td>
</tr>
<tr>
<td>Mauritius</td>
<td>2.08</td>
</tr>
<tr>
<td>Netherlands</td>
<td>2.79</td>
</tr>
<tr>
<td>United States of America</td>
<td>1.02</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>0.63</td>
</tr>
<tr>
<td>British Virgin Islands</td>
<td>0.00</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.35</td>
</tr>
<tr>
<td>Cayman Islands</td>
<td>0.00</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>0.00</td>
</tr>
<tr>
<td>Switzerland</td>
<td>0.00</td>
</tr>
<tr>
<td>Other countries</td>
<td>7.65</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18.58</strong></td>
</tr>
</tbody>
</table>

* April 2011 to February 28, 2012
13.2.6 India outward FDI to the USA\textsuperscript{526}

India invested in about 127 Greenfield projects valued at US$ 5.5 billion in the US between 2004 and 2009. However, the US accounted for only 6.5 percent of India’s outward FDI flows in FY 2010. Seventy percent of these investments were made by only 10 companies. Projects in metals, software & IT services, leisure & entertainment, industrial machinery, equipment & tools and financial services account for 80 percent of all investments. Minnesota, Virginia and Texas received the most FDI from India during this time. Furthermore, Indian companies merged with or acquired companies worth US$ 21 billion in manufacturing, IT & IT enabled services, biotech, chemicals & pharmaceuticals, automotive and telecom. India invests in the US because of easily available and abundant natural resources, large consumer markets and access to innovative technologies.

Indian outbound deals in the US are largely majority stakes paid in cash and financed with debt. However, it is expected that in the future, Indian companies will look for joint ventures and minority stakes instead of focusing only on majority stakes.

13.2.7 Strategic Investments by Indian Companies\textsuperscript{527}

When investing overseas, Indian companies tend to route the FDI either through subsidiaries, set up holding companies or used special purpose vehicles (SPVs). Most SVPs are set up in Mauritius, Singapore or the Netherlands, as these countries provide advantages in taxation, legal consideration and access to finance.

A study of the outward investments made by both Public and Private sector companies suggests that Indian organizations are driven by long-term strategic considerations rather than by short-term profitability.

Some examples of investments made by the public sector include:

a. ONGC Videsh Ltd., (fully-owned subsidiary of ONGC) has overseas investments in 33 projects in 14 countries in the Middle East, Africa, CIS & Far East and Latin America
b. Oil India Limited has presence in eight countries mainly in terms of exploration blocks in Libya, Gabon, Iran, Nigeria and Sudan

c. Coal India Limited’s subsidiary Coal Videsh Ltd. is mandated to acquire coal assets overseas and set up a JV company International Coal Ventures Ltd with other companies to acquire metallurgical and thermal coal assets

Some recent investments made by the Private sector include:

a. Adani Port and Special Economic Zone invested in Australia in the amount of $ 1.04 billion through its two wholly owned subsidiaries. The investments went towards construction, community, social and personal services

b. Varun Shipping Co via its joint-venture Varun Asia Pte., Singapore invested $ 252.62 million. The FDI was towards transport, storage and communication services

c. Escorts Heart Institute and Research Centre invested $ 89.89 million in its subsidiary Fortis Asia Healthcare Pte., Singapore

d. JSW Steel invested $ 65.46 million in a US manufacturing business. The FDI was through a joint-venture JSW Steel Holding Inc.

e. JSW Steel also invested US$ 56.45 million in Mauritius, the Netherlands and the US. FDI were in manufacturing, whole, retail, trade and restaurant businesses

f. Bharti Airtel invested US$ 300 million in the Netherlands and Singapore through its joint-venture. FDI was in communication, storage and transportation

g. Reliance Industries invested UD$ 192.42 million through its two subsidiaries in Australia and the Netherland. These investments were in agriculture, mining and manufacturing

h. Piramal Healthcare invested UD$ 145.34 million in Switzerland and the US, in the manufacturing business

i. Tata Steel made an investment of US$ 115.83 million in Singapore via its wholly-owned unit in finance, insurance and real estate
13.3 Canada–India Relationship

13.3.1 Investment Relationship

The investment relationship between Canada and India is still in its nascent stages. Canada’s investment in India was just over $600 million in 2009 out of a total Canadian outward FDI of C$593.3 billion, or about one-tenth of one per cent of Canada’s total FDI investments overseas. Similarly, India’s direct investments in Canada were also limited; however the past five years have seen an increase in FDI from India. In 2011, the FDI flow from India to Canada was substantially higher than from Canada to India. See Table 8: Canadian FDI Inflow and Outflow to India.

<table>
<thead>
<tr>
<th>Year</th>
<th>1980</th>
<th>1990</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI inward</td>
<td>-</td>
<td>-</td>
<td>6,514</td>
<td>6,217</td>
<td>4,364</td>
<td>4,396</td>
</tr>
<tr>
<td>FDI outward</td>
<td>61</td>
<td>94</td>
<td>782</td>
<td>617</td>
<td>492</td>
<td>587</td>
</tr>
</tbody>
</table>

Source (Asia Pacific Foundation of Canada, 2012)

The FDI flow from India to Canada is expected to rise as Indian companies continue to show keen interest in investing in certain Canadian sectors, particularly in the ICT, biotechnology sectors, clean technology and natural resources, including energy. India has also demonstrated interest in Canadian expertise in infrastructure development and the food industry.

In 2010, the governments of Canada and India took the next step to strengthen the relationship between the two countries, by working on the Comprehensive Economic Partnership Agreement (CEPA). Also, with the ratification of the Foreign Investment Promotion and Protection Agreement (FIPA), India will provide a framework for long term, two-way investments. “The agreement will protect foreign investors against discriminatory and arbitrary practices, provide appropriate recourse in the event of a dispute, ensure the equal treatment of
foreign and domestic investors and ensure the free movement of capital between the two countries.”

Although there are efforts being made by the Canadian government, the process can be accelerated by reducing restrictions to FDI in various sectors and promoting the opportunities Canada has to offer Indian investors. Some of the critical advantages offered by Canada are listed below:

- Canada is strategically located next to U.S. markets and has preferential access to them due to NAFTA
- Canada’s tax regime is competitive
- The Canadian workforce is knowledgeable and skilled
- Many Canadian companies and institutes nurture innovative technologies and ideas that require access to risk capital, which is available in India
- Canada offers long term investment opportunities, that include building new technologies, developing brands and offering a good return on investment

Considering the advantages that Canada has to offer, some Indian companies have already invested in the market and are reaping benefits. Some of the large Indian companies operating in Canada are provided in Table 9: Indian Companies in Canada

<table>
<thead>
<tr>
<th>SN</th>
<th>Parent Indian Company</th>
<th>In Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hindalco</td>
<td>Acquired Novelis (aluminum rolling)</td>
</tr>
<tr>
<td>2</td>
<td>Essar Group Limited</td>
<td>Essar Steel Algoma Inc.</td>
</tr>
<tr>
<td>3</td>
<td>Subex Limited</td>
<td>Syndesis Ltd.</td>
</tr>
<tr>
<td>4</td>
<td>ICICI Bank Ltd</td>
<td>ICICI Bank, Canada</td>
</tr>
<tr>
<td>5</td>
<td>Silverline Technologies Ltd</td>
<td>Omega Direct Response Inc.</td>
</tr>
<tr>
<td>6</td>
<td>Piramal Enterprise Limited</td>
<td>Piramal Healthcare Torcan</td>
</tr>
<tr>
<td>7</td>
<td>Aditya Birla Group</td>
<td>Aditya Birla Minacs</td>
</tr>
</tbody>
</table>
The investment relation between Canada and India is poised to become stronger and benefit both countries. This is the right time for entrepreneurs and organizations from both countries to be involved in FDI investments and projects that can reap rich benefits from the opportunities offered.

13.3.2 Technology Partnership\textsuperscript{531}

Canada and India have created a strong platform for Science and Technology partnerships. A Canadian body, the International Science and Technology Partnerships Canada (ISTP Canada) has partnered with the Global Innovation & Technology Alliance (GITA), Department of Science and Technology (DST); and the Department of Biotechnology (DBT), GOI to deliver the Canada-India program. From 2007 to 2012 (March), this association has facilitated and funded eight bilateral R&D projects in priority sectors such as

- Alternate Energy and Sustainable Environmental Technologies
- Biotechnology
- Health Research and Medical Devices
- Earth Sciences and Disaster Management
- Information and Communications Technologies (ICT)
- Nanotechnology

They have also conducted 20 Partnership Development Activities which have led to more than 50 collaborations to date.

13.4 Atlantic Canada and FDI\textsuperscript{532}

Inward FDI can improve employment figures, contribute to the economy and stimulate technological development in Atlantic Canada. However, steps have to be taken to refocus current policies, increase local supplier capacity and enhance research. A study conducted by Atlantic Provinces Economic Council (APEC) “analyses the extent of FDI in Atlantic Canada,
examines the determinants and impact of FDI at the sub-national level, and draws out the policy implications for the region.”

13.4.1 FDI in Atlantic Canada

Inward FDI in Atlantic Canada comes from U.S., U.K. and other European countries and is invested in resource industries, service sector, manufacturing and retail. However, Atlantic Canada’s FDI share in Canada is only about 5 percent. This is minimal when compared to a 6 percent share in GDP and 8 percent share in population.

13.4.2 Determinants of FDI

There are several factors that determine the inward flow of FDI to a region. Positive determinants for Atlantic Canada include:

- Region’s location within the North American market
- Availability of skilled labour
- Local technological and research capacity
- Industrial clustering

13.4.3 Impact of FDI

Studies indicate that FDI can play a role in positively enhancing three aspects of the Atlantic Canadian economy

- Increase in employment
- Higher output and productivity
- Better technology

While the policy to attract FDI could largely impact job creation and employment, the other two may get only a small impetus.
13.4.4 Important Issues for Attracting and Benefitting From FDI

“The Atlantic Canada Opportunities Agency (ACOA), all four Atlantic provincial governments, and various sub-provincial agencies, are actively involved in investment promotion. The research literature identifies a number of issues that are important for economic development agencies in Atlantic Canada to consider:

- Agencies must strike a balance between attracting new foreign investment and supporting existing domestic and foreign firms as the latter can be an important source of new jobs and investment.
- Providing aftercare support to foreign firms to help embed them in the local economy can help ensure their retention and future expansion.
- It may be easier to attract foreign firms that have already established operations elsewhere in Canada, as these firms are more familiar with the national business climate and culture.
- Financial resources are not the only factor behind successful investment attraction. Coordination between different levels of government is important while having prepared sites can help win large-scale projects.
- Backward linkages and technological spillovers can be enhanced through measures to provide information on local suppliers and to raise local quality and capacity. Such strategies may be particularly relevant for the offshore energy industry.”

13.5 Key Factors & Strategies to Attract FDI & Form Technological Partnership

To attract Indian FDI and form technological partnership, it is important to identify Atlantic Canada’s strengths in the key factors that attract investments. After reflecting on these factors, Atlantic Canada can showcase its strengths and minimize its weakness. Additionally, the recommended strategies will assist Atlantic Canada to achieve its objectives to attract FDI, form technological partnerships and enhance economic growth.
13.5.1 Key Factors that Drive Firms to Invest

Some of the critical key factors that drive firms to invest in a region are available market, natural resource, trained and skilled labour and efficiency.

- **Consumer market**: Although Atlantic Canada itself is not a very big market, it provides access to the large North American market, due to the trade agreements that Canada has with the U.S. This brings Atlantic Canada directly in competition with the U.S. for FDI.

- **Natural Resources**: Atlantic Canada scores high on this factor. Specific natural resources should be made available for investors and the availability of these natural resources could be leveraged to attract investments.

- **Skilled Labour**: Atlantic Canada has a ready pool of skilled and educated labour along with a policy that attracts skilled immigrants to augment its already strong labour force. The labour force can be showcased to attract industries looking for high end skills.

- **Productivity and efficiency**: With the Canadian currency becoming stronger the labour productivity drops. High cost of labour gives Atlantic Canada a disadvantage, especially when competing with developing countries.

- **Infrastructure**: Atlantic Canada has reasonably good infrastructure. The infrastructure can be further bolstered to become attractive to the investors, especially because it needs to be well connected with other areas in North America.

A strength weakness analysis of the above factors shows Atlantic Canada has strength in four of the five key factors that attract investments. By highlighting the strengths and minimize the weaknesses Atlantic Canada can become a strong contender for FDI.

13.5.2 Strategy to Attract FDI – Targeted Promotion

With competition becoming more intense, it is critical to have a strong presence in every target market. Targeted promotion could help Atlantic Canada increase its FDI share. Some of the
activities that could be adopted are general marketing, image-building, investor targeting, investment facilitation, aftercare services and policy advocacy.

Also “L.T.Wells and A.G.Wint (1990) concluded that an efficient investment promotion program can attract certain types of investors to a country at a cost that is significantly less than the value of the direct benefits the country receives from the investment. They draw a conclusion that an investment promotion program appears to be most successful in attracting investors to a country if it is focused on export-oriented investment, whether for export to world market or to regional markets.” Atlantic Canada could focus on attracting Greenfield projects by actively marketing specific clusters in Atlantic Canada with special emphasis on attracting export-oriented FDI.

13.5.3 Strategy to Attract R&D intensive investments

Since Atlantic Canada has local technological and research capacity and capabilities, combining the innovation Policy with inward investment promotion policy could make a powerful strategy. This would entail seamlessly coordinating between both policies to gain a synergistic advantage. Given below is a tabular presentation of the key policies from both areas that need to be coordinated while attracting FDI.

**Innovation Policy**

- Fiscal and financial incentives to corporate R&D
- Human capital development and attraction of foreign talent
- Enhance the research infrastructure and promote collaboration and linkages
- Improve the intellectual property rights regime

**Inward investment promotion**

- Target R&D-intensive FDI and build the image of the country as an R&D location
- Provide R&D-specific pre-investment and implementation services
- Emphasize after-care services
- Policy advocacy
Although, this path will not be an easy one (as most developed countries are claiming to be R&D hubs), it would definitely pay rich dividends if this policy is combined with targeted promotion by inward investment agencies. Further, creating a fund like “Ontario-India Research Collaboration Fund”\textsuperscript{536} could facilitate this strategy and also attract Indian Public Sector investors.

13.5.4 Strategy to Liberalize and Provide Incentives

13.5.4.1 Liberalization of investment policies

According to World Investment Report 2012 there is a liberalization of investment policies and adjustment of entry policies across the world. However, all changes are not towards liberalization, especially in the extractive industries where changes have brought about restrictive state influences. Policy makers in the past focused only on investment liberalization and quantitative growth, however nowadays the focus has changed to making FDI an instrument for qualitative and inclusive growth by finding the right balance between investment stimulation and regulating for the public good.\textsuperscript{537}

Canada’s score on the OECD’s FDI Restrictiveness Index needs improvement. This Index measures regulatory restrictions on FDI on the following\textsuperscript{538}:

- Equity restrictions
- Restrictions on foreign key personnel
- Screening and approval requirements
- Other restrictions, like limits on purchase of land and repatriation of profits and capital

Policies makers in Atlantic Canada need to consider the OECD’s FDI Restrictiveness Index and find that balance between investment stimulation and regulating for the public good to create a healthy and conducive environment for FDI.
13.5.4.2 Tax incentive for inward FDI\textsuperscript{539}

There are common incentive policies that most policies makers adopt while pursuing FDI. The policies can be categorized into

- Tax incentives to encourage FDI
- Subsidies to promote industry clusters
- Measures to encourage industrial development through export processing zones (EPZs)

The results of policy are determined by the cost benefit analysis. If the cost to attract FDI is low, then it would be a policy worth considering. “UNCTAD 1996, reports that incentives can have an effect on attracting FDI at the margin, especially when one considers the type of incentive and the type of project. Several studies find that fiscal incentives do affect location decisions, especially for export-oriented FDI, although incentives seem to play a secondary role.”

Therefore incentives are not the main driving force; however it could be used to channel investments to achieve the host’s investment objective.

The above mentioned strategies could be integrated to form a cohesive FDI attraction strategy that when effectively implemented, could make Atlantic Canada a competitive host for investors.
Section V - Establishing and Conducting Business in India
14. Establishing and Conducting Business in India

Establishing a business in India needs a thorough understanding of its unique processes, procedures, costs and pitfalls. Information and insight into the Indian market allow investors to plan and make provisions to operate in India, resulting in a successful endeavor.

14.1 “Doing Business 2012: Making a Difference for Entrepreneurs”\textsuperscript{540}

"Doing Business 2012: Making a Difference for Entrepreneurs" a recent report by the World Bank and the International Finance Corporation ranked India 132 out of 183 economies in the ease of doing Business. "Doing Business provides a quantitative measure of regulations for starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business— as they apply to domestic small and medium-size enterprises. It also looks at regulations on employing workers as well as a new measure on getting electricity." See Figure 16: Ease of Doing Business – Global Ranking for a comparison of India to global good practice economies as well as other select economies.

Figure 16: Ease of Doing Business – Global Ranking
Starting a business in India requires 12 procedures versus an average of 7 procedures in South Asia and only a single procedure in Canada. It takes 29 days to start a business, while it takes average of 24 days in South Asia and five days in Canada. The most daunting aspects of business in India are Enforcing Contracts (Ranked 182) and Dealing with Construction Permits (Ranked 181).

Within India doing business is easiest in Ludhiana, followed by Hyderabad, Bhubaneswar, Gurgaon and Ahmedabad among 17 Indian cities surveyed in Doing Business in India 2009. “The Ease of Doing Business Index for India averages each city’s percentile rankings on seven topics, giving equal weight to each”. See Table 10: Ease of Doing Business – City Ranking for ease of doing business in different procedures.

Table 10: Ease of Doing Business – City Ranking

<table>
<thead>
<tr>
<th>Economy</th>
<th>Ease of Doing Business Rank</th>
<th>Starting a Business</th>
<th>Dealing with Construction Permits</th>
<th>Registering Property</th>
<th>Paying Taxes</th>
<th>Trading Across Borders</th>
<th>Enforcing Contracts</th>
<th>Resolving Insolvency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ludhiana</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>11</td>
<td>1</td>
<td>12</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Hyderabad</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>9</td>
<td>13</td>
<td>13</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bhubaneswar</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>17</td>
<td>9</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Gurgaon</td>
<td>4</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>17</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Ahmedabad</td>
<td>5</td>
<td>14</td>
<td>4</td>
<td>2</td>
<td>11</td>
<td>3</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>New Delhi</td>
<td>6</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>7</td>
<td>14</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Jaipur</td>
<td>7</td>
<td>3</td>
<td>13</td>
<td>3</td>
<td>2</td>
<td>14</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Guwahati</td>
<td>8</td>
<td>13</td>
<td>12</td>
<td>14</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Ranchi</td>
<td>9</td>
<td>15</td>
<td>9</td>
<td>6</td>
<td>4</td>
<td>8</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Mumbai</td>
<td>10</td>
<td>12</td>
<td>17</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Indore</td>
<td>11</td>
<td>8</td>
<td>13</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Noida</td>
<td>12</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>2</td>
<td>16</td>
<td>7</td>
<td>16</td>
</tr>
</tbody>
</table>
### 14.1.1 Trading Across Borders

India is ranked 109 overall for Trading across Borders. Although it fares well when compared to the regions average, it lags behind when compared to the OECD countries’ average. See Table 11: Trading Across Borders

<table>
<thead>
<tr>
<th>Indicator</th>
<th>India</th>
<th>South Asia</th>
<th>OECD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Documents to export (number)</td>
<td>8</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Time to export (days)</td>
<td>16</td>
<td>32</td>
<td>10</td>
</tr>
<tr>
<td>Cost to export (US$ per container)</td>
<td>1095</td>
<td>1590</td>
<td>1032</td>
</tr>
<tr>
<td>Documents to import (number)</td>
<td>9</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Time to import (days)</td>
<td>20</td>
<td>33</td>
<td>11</td>
</tr>
<tr>
<td>Cost to import (US$ per container)</td>
<td>1070</td>
<td>1768</td>
<td>1085</td>
</tr>
</tbody>
</table>
14.2 Establishing a Business in India

14.2.1 Market Entry Options

The various options available to an Atlantic Canadian company to enter the Indian market are opening a Liaison Office, starting a Branch Office or Project Office, creating a Local Indian subsidiary Company, or establishing a Limited Liability Partnership.

Given below is a brief description of each of the options. For additional information refer to the comparison sheet provided below.

**Liaison Office:**

Atlantic Canadian corporations can open Liaison office in India. This office can act as a channel of communication between the Atlantic Canadian company and its Indian customers. A Liaison office promotes business interest of corporations by spreading awareness about the organization’s product/ services and by exploring opportunities with an objective to set up a more permanent presence in India. A Liaison Office is not allowed to do any business in India and cannot earn an income or a profit. A Liaison office can be opened by obtaining specific approval from Reserve Bank of India (RBI). Atlantic Canadian insurance companies can open a Liaison office by obtaining permission from Insurance Regulatory and Development Authority (IRDA); similarly banks can open a Liaison office only after obtaining approval from Department of Banking Operations and Development (DBOD), RBI.

**Branch Office:**

Atlantic Canadian corporations can open Branch offices to conduct business in India, after obtaining a specific approval from RBI. Branch offices are permitted to export and import goods; provide professional or consultancy services; Carry out research work in which the parent company is involved; promote technical and financial collaborations; represent parent company and act as buying/ selling agent; provide IT services and develop software in India; provide technical support for products and services sold by the parent company. Branch offices
cannot do retail selling or manufacturing (except manufacturing can be done in the Special Economic Zone). Branch offices are advantageous because of the ease of operations and its closing procedures are comparatively easier.

**Project Office:**

An Atlantic Canadian organization that has a contract from an Indian company to execute a project can open a project office in India. The opening of a project office does not require prior approval from RBI, however it is subjected to prescribed reporting compliance. For the set-up to qualify as a Project Office the project should be funded by inward remittance from overseas; or funded by bilateral or multilateral international financing agency; or the Indian company awarding the contract is funded by a loan granted by a public financial institution or a Bank in India; or the project is cleared by appropriate authority. If the above criteria are not met an approval has to be obtained from RBI, central office.

**Local Indian Subsidiary Company:**

Atlantic Canadian corporations can set up a Wholly Owned Subsidiary (WOS) company in India in the form of a private company, subject to the Foreign Direct Investment (FDI) guidelines. Also, Atlantic Canadian companies can set up a joint venture company with a foreign or Indian partner. For tax purposes the subsidiary company is considered a domestic company and no approvals are required for repatriation of dividends. However, internal transfer pricing regulations apply. A subsidiary company provides maximum flexibility to conduct business in India, however exit procedures are enormous.

**Limited Liability Partnership (LLP):**

LLP is a corporate body and a legal entity, which is separate from its partners and has perpetual succession. The liability of the partners is limited to the agreed contribution to the LLP. Although the Government of India passed the LLP act, 2008 in January 2009, foreign investments in LLP were not allowed until recently. Department of Industrial Policy and
Promotion has opened LLP as an alternate to foreign investors in 2011. The following conditions have to be adhered to for foreign investments in LLP:

- 100 percent FDI is allowed in sectors where 100 percent FDI is allowed under automatic route, only after prior approval from Foreign Investment Promotion Board (FIPB)
- Partners can contribute only in cash towards the capital
- LLP with FDI not allowed to invest in downstream projects
- Indian companies with FDI are allowed to make downstream investments in LLPs, only if both the LLP and Indian company are in sectors where 100 percent FDI is permitted under automatic route
- External Commercial Borrowing (ECB) is not allowed
- Foreign Institutional investors and Foreign Venture Capital Investors are not allowed to invest
- Company with FDI can be converted into LLP with prior approval from FIPB/Government of India

See Appendix “H” – Comparison of the Various Options for Investors to Enter India

14.2.2 Opening and Owning a Business in India

Foreign companies and organizations are allowed to establish businesses subject to certain sector-specific restrictions. To establish a business it is critical to obtain the required approvals and clearances from the government including incorporation of the company and registration under the State Sales Tax Act and Central and State Excise Acts. Also foreign investors are allowed to invest in real estate, which would be used for business. For Atlantic Canadian companies that plan to own industrial land and building, the following are also required:

- Register the land
- Permission for land use (when the industry is located outside an industrial area)
- Environmental site approval
- Authorization for electricity and financing
• Approvals for construction plans from state and local authorities
• Environmental approvals in compliance with the Water & Air Pollution Control Acts
• Clearance from the Ministry of Environment and Forests for petrochemical complexes, petroleum refineries, cement thermal power plants, bulk drug makers, and fertilizers, dyes, and paper industries

14.2.3 Restrictions on Foreign Investments

Foreign Direct investment (FDI) regime is being progressively liberalized over the last two decades. Currently there are a few industries where foreign investments are not allowed. Further, even investment ceilings are being gradually phased out. Given below is the list of the sectors where FDI is prohibited and also a list of permitted sector with conditions or cap.

Sectors where FDI is prohibited

1. Retail Trading (except single brand)
2. Atomic Energy and Railway transport (and other mass rapid transport systems)
3. Lottery Business
4. Gambling & Betting
5. Real estate business or construction of farm house
6. Business of Chit Fund
7. Nidhi Company
8. Trading in Transferable Development Rights (TDRs)
9. Manufacturing of Cigar, Cheroots, Cigarillos and Cigarettes of tobacco or its substitutes
10. Foreign technology collaboration in any form including licensing for franchise, trade mark, brand name, management contract for lottery business, gambling and getting activities
Sectors where FDI is permitted with conditions or cap

1. Agriculture and animal husbandry
2. Tea plantation
3. Mining
4. Manufacture of items reserved for production in Micro and Small Enterprise (MSE)
5. Defense
6. Electric generation, transmission, distributing and trading
7. Civil aviation sector
8. Asset reconstruction company
10. Broadcasting
11. Commodity exchange
12. Development of township, housing, built-up infra. & construction development projects
13. Credit information companies (CIC)
14. Industrial parks
15. Insurance
16. Petroleum and natural gas sector
17. Print Media
18. Security agencies in private sector
19. Satellite – establishing and operating
20. Telecommunication
21. Trading
22. Courier Services
23. Investment in sectors that are otherwise permitted under the automatic route through LLP.
### 14.3 Governing Laws

India has a comprehensive legal framework governing all aspects of business. Table 12: Governing Laws below lists key regulations and provides a brief description.

#### Table 12: Governing Laws

<table>
<thead>
<tr>
<th>Law</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Arbitration &amp; Reconciliation Act, 1996</strong></td>
<td>Relates to alternate redressal of disputes</td>
</tr>
<tr>
<td><strong>Central Excise Act, 1944</strong></td>
<td>Governs duty levied on the manufacture or production of goods in India</td>
</tr>
<tr>
<td><strong>Central Sales Tax, 1956</strong></td>
<td>Governs the levy of tax on all inter-state sales in India Act</td>
</tr>
<tr>
<td><strong>Companies Act, 1956</strong></td>
<td>Governs all corporate bodies in India</td>
</tr>
<tr>
<td><strong>Competition Act, 2002</strong></td>
<td>Ensures free and fair competition in the Indian market</td>
</tr>
<tr>
<td><strong>Consumer Protection Act, 1986</strong></td>
<td>Protects consumers from unscrupulous traders/manufacturers</td>
</tr>
<tr>
<td><strong>Customs Act, 1962</strong></td>
<td>Deals with import and export regulations</td>
</tr>
<tr>
<td><strong>Customs Tariff Act, 1975</strong></td>
<td>Creates a uniform commodity classification code based on the globally adopted Harmonized System of Nomenclature for use in all international trade-related transactions</td>
</tr>
<tr>
<td><strong>Direct Taxes Code Bill, 2010</strong></td>
<td>Aims to moderate tax rates and simplify tax laws. All direct taxes including wealth tax and income tax will be brought under one bill</td>
</tr>
<tr>
<td><strong>Environment Protection Act, 1986</strong></td>
<td>Provides a framework for obtaining environmental clearances Act, 1986</td>
</tr>
<tr>
<td><strong>Factories Act, 1948</strong></td>
<td>Regulates labour in factories</td>
</tr>
<tr>
<td><strong>Foreign Exchange Management Act, 1999</strong></td>
<td>Regulates foreign exchange transactions including foreign investment</td>
</tr>
<tr>
<td><strong>Indian Contract Act, 1872</strong></td>
<td>Codifies the way contracts are entered into, executed and implemented. It also codifies the effects of breach of contract</td>
</tr>
<tr>
<td>Law</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>14</td>
<td>Income Tax Act, 1961</td>
</tr>
<tr>
<td>15</td>
<td>Industrial Disputes Act &amp; Workmen Compensation Act, 1951</td>
</tr>
<tr>
<td>16</td>
<td>Industrial (Development Regulation) Act, 1951</td>
</tr>
<tr>
<td>17</td>
<td>Information Technology Act, 1999</td>
</tr>
<tr>
<td>18</td>
<td>Limited Liability Partnership Act, 2008</td>
</tr>
<tr>
<td>19</td>
<td>Prevention of Money Laundering Act, 2002</td>
</tr>
<tr>
<td>20</td>
<td>Patents Act, Copyright Act, Trade Marks Act, Design Act</td>
</tr>
<tr>
<td>21</td>
<td>Right to Information Act, 2005</td>
</tr>
<tr>
<td>22</td>
<td>Securities and Exchange Board of India Act, 1992</td>
</tr>
</tbody>
</table>
### Law Description

| Law | Special Economic Zones Act, 2005 | Governs the establishment, development and management of the Special Economic Zones (SEZs) for the promotion of exports. It provides for fiscal and economic incentives for developers of SEZ units |

### 14.4 Government Agencies

Some critical government agencies that foreign investors would be dealing with are:

- Central Board of Direct Taxes
- Competition Commission of India
- Foreign Investment Promotion Board
- Insurance Regulatory and Development Authority
- Ministry of Finance
- Ministry of Power
- Ministry of Petroleum and Natural Gas
- Reserve Bank of India
- Security and Exchange Board of India
- Telephone Regulatory Authority of India

### 14.5 Tax Structure

In India, taxes are levied and collected by both the State as well as the Central Government. Given below is a brief description of the various taxes levied in India.

#### 14.5.1 Corporate Tax

*Income tax in India is levied under the Income Tax Act, 1961. Domestic companies in India are taxed at 33.99 per cent while foreign companies are taxed at 42.23 per cent, both with a disallowance of expenses.*
14.5.1.1 Dividends Distribution Tax

Dividends distributed by Indian companies are taxed at 16.995 per cent, payable by the company. However, no further taxes are payable in India on such dividend income once dividend distribution tax ("DDT") is paid.

14.5.1.2 Capital Gains Tax

When exiting or restructuring, capital gains tax is payable up to 42.23 per cent contingent on whether the capital gains are long term or short term.

14.5.1.3 Withholding Tax and Minimum Alternate Tax

Certain types of payments in India require the payer to withhold tax as ‘tax deducted at source’. Minimum alternate tax (payable if a company’s book profits are less than 15 per cent of the company’s income due to exemptions etc.) is payable at 16.995 per cent for domestic companies and 15.836 per cent for foreign companies.

14.5.1.4 Indirect Taxes

Indirect taxes in India levied by the Union Government include Central Sales Tax, Central Excise, customs duty and service tax. States levy indirect taxes such as state level value added tax and stamp duty. Certain other taxes such as ‘entertainment tax’ and ‘luxury tax’ are also levied by certain states.

14.5.1.5 Wealth Tax

Wealth tax is applicable in India in a restricted manner and levied only on specified assets. However, the worldwide assets of a resident are subject to wealth tax in India. A company is liable to pay wealth tax at the rate of 1 percent on the amount of its net wealth that exceeds INR 1,500,000 ($30,000). Net wealth represents the total of prescribed assets minus any corresponding debts and obligations. Assets have been defined to include inter alia, motor cars, yachts, boats, aircrafts, urban land etc. The definition of the term ‘assets’, however, excludes
shares and certain other securities. Commercial and business assets are also exempt from wealth tax.

14.5.1.6 New Tax Code

A new Direct Taxes Code is in the offing. The Direct Taxes Code should be considered while structuring investments into India.

14.5.2 Payroll Tax

The employer does not have to pay payroll tax in India. However the employer is responsible to deduct tax at source (TDS). Also employers have to contribute 12 percent of earnings up to INR 6,500 a month, which includes contributions to the Employees’ Pension Scheme (EPS), the Employees’ Provident Fund Scheme (EPFS). Also for low salaried employee, the employer contributes 4.75 percent towards Employees' State Insurance Corporation scheme (ESI). Additionally, the employer has to pay superannuation and long term gratuity to employees.

14.5.3 Individual Tax

In India, individual tax is not based on citizenship, but on the residential status of the person. Foreign nationals working in India becomes liable to income tax, as salary income is subject to income tax if services are rendered in India and it does not matter if the salary is received in India or not. Expatriates are taxed on their worldwide income when residing in India. However, where an individual is treated as a tax resident of Canada, that individual qualifies for relief from Indian tax under a double taxation agreement between India and Canada.

Further, Canadian nationals may become liable to capital gains tax levied on disposal of assets. Also, a Canadian employed in India has to compulsorily contribute to Employees Provident Fund (PF). Under PF, the employee is required to contribute 12 percent of the employee’s salary every month and the employer has to match the contribution. Part of the employer’s contribution (8.33 percent) is allocated to the Employee Pension Fund. As per law, pension contributions are treated on the principles of reciprocity with the home country of foreign
nationals. Table 13: Individual Income Tax Rates gives the individual income tax rates with various income levels.

### Table 13: Individual Income Tax Rates

<table>
<thead>
<tr>
<th>Taxable Income Over INR (CAD)</th>
<th>Not Over INR (CAD)</th>
<th>Tax on Column 1 INR (CAD)</th>
<th>Percentage on excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>180,000 ($3,600)</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>180,000 ($3,600)</td>
<td>500,000 ($10,000)</td>
<td>0</td>
<td>10%</td>
</tr>
<tr>
<td>500,000 ($10,000)</td>
<td>800,000 ($16,000)</td>
<td>32,000 ($640)</td>
<td>20%</td>
</tr>
<tr>
<td>800,000 ($16,000)</td>
<td>And above</td>
<td>92,000 ($1,840)</td>
<td>30%</td>
</tr>
</tbody>
</table>

Foreign national women (below 60 years of age) and seniors (above 60 but below 80 years), with income up to INR 190,000 and INR 250,000 respectively do not have to pay any tax. Older senior citizens (80 years and above) do not have to pay tax up to income of INR 500,000.

*Besides the taxes mentioned above, an education cess (local tax) of three percent of tax is levied on all.*

### 14.6 Import Regulations and Logistics

With the growing potential in India, international trade is also gathering momentum. However, to successfully explore the potential of India it is imperative to gain an understanding of its regulations and requirements. Some critical information on imports is provided below:

#### 14.6.1 Import Regulations

All imports to India are governed by the Foreign Trade (Development and Regulation) Act 1992, also known as the Foreign Trade Policy or Export Import Policy. “This policy is announced once every five years with annual supplements coming out every year.” It is a pre-requisite for an importer to register with a regional licensing authority and obtain an Import Export Code (IEC) number before importing goods into the country. Failure to do so will result in Customs officials not permitting clearance of the imported goods.
Some important documents required for export to India:\(^{550}\):

- **Import Declaration**: This is to be provided in the prescribed bill of entry format, giving information as per requirements.
- **Import Licenses (if applicable)**: When required the import documents should accompany the import licenses.
- **Ex-factory invoice, freight and insurance certificates**: These documents help customs to verify the price and classify the goods.
- **Letter of Credit (L/C)**: All imports must have a copy of the L/C, as this document is verified with the issuing bank and outflow of foreign exchange is kept in check.

14.6.2 Import Goods Classification\(^{551}\)

India’s government has been steadily simplifying the import procedures over the last ten years. All imported items fall under one of the four categories:

- **Open General License (OGL)**: Most import items are freely importable and do not require a license, as they fall under OGL of India’s EXIM policy.
- **Banned items**
- **Items requiring an import license**
- **Items importable only by government monopolies after obtaining approval from the Cabinet (Canalized items)**

14.6.3 Import Tariffs\(^{552}\)

Customs duties are levied whenever goods go through Indian customs, whether it is export or import of goods. Over the last two decades Indian economic reforms have made the trade regime substantially more transparent. These reforms were accompanied by reduction in import tariff rates from “peak rates of 350 percent in June 1991 to an average of 10 percent today.”\(^{553}\) Customs duty can be classified into the following:
Basic Customs Duty: This is levied on all goods imported into the country and the rates of duty for different classes of goods are as per Customs Tariff Act, 1975. The customs tariff system is based on the Harmonized System of Nomenclature (HSN).  

Additional Customs Duty or the Countervailing Duty (CVD): This duty is imposed to balance the price increased due to levying of excise duty on similar goods produced in India. CVD is at the same rate as excise duty on domestically produced goods.  

Additional Duties in lieu of State and local taxes (ACD): ACD is similar to CVD, however this duty balances the sales tax and value added tax imposed by States in indigenously produced goods. The present rate of ACD is 4 percent.  

Safeguard Duty: This tax is imposed to protect the interests of an industry where there is a sudden increase in the import of goods. This is usually a temporary tax and would ease as the surge has subsided.  

Antidumping Duty: Also under Section 9A the Government can impose an Antidumping Duty on imported articles that are exported to India at a lower price than it is sold to other places. This duty will not exceed the difference in the two pricing. The anti-dumping law is based on the ‘Agreement on Anti-Dumping’ in conformant to Article VI of the General Agreement on Tariffs and Trade, 1994.  

Handling fees: This is in addition to all the above mentioned duties and would be about 1 percent.  

Besides the above duty there is also the Customs Education Cess, which is levied at three percent of Basic Customs Duty and Additional Duty of Customs. However goods bound under international commitments have been exempted from this tax.  

14.6.4 Categories of importers  

There are three categories of user, namely Actual Users, Registered Exporters and Others. The importer falls in one of the category depending on the purpose of obtaining an import license.  

Actual Users: The importer is an actual user when they apply for a license for items for personal and not for business or trade.
Registered exporters: Importers who are valid registration certificate holders from an export promotion council, commodity board or a registered authority designated for export-promotion.

Others: Those that do not fall in the previous two categories.

Further, there are two types of actual user licenses and they are General Licenses (can import goods from all countries, except prohibited countries) or Specific Licenses (can import from a specific country).

14.6.5 Import Licensing

Import licensing for consumer goods have been removed in most cases, however certain specific products require an import license. For instance a special license is required for motorcycles and restrictive vehicles. To obtain an import license for motorcycles, the importer should be a foreign national permanently residing in India and working in a foreign company that holds greater than 30 percent equity or working at an embassy or foreign mission. Some Indian nationals can also import these vehicles without a license only if imports are offset by exports.

14.6.6 Import licensing Requirements

To obtain an import certificate the importer would need to contact the following designated certificate issuing authorities:

- The Department of Electronics for import of computer and computer related systems
- The Department of Industrial Policy and Promotion for organized sector firms except for import of computers and computer based systems
- The Ministry of Defense for defense related items
- The Director General of Foreign Trade for small-scale industries
14.6.7 Special Import and License Programs

Export Promotion Capital Goods plan (EPCG):

To import capital goods at reduced rates the importer can obtain a license under the EPG. To qualify the importer has to commit and fulfill a time-bound export obligation. The EPGC plan requires the importer to pay 5 percent customs duty and is also applicable all capital goods without any threshold limit.

Duty exemption on material used for export products:

An exporter can import raw materials, intermediates, components, consumables, parts, accessories and packing materials that are used in products to be exported. The importer can get a non-transferable advance or can obtain a post-export duty-free replenishment certificate.

Advance License

An Advance License can be obtained for “addition, fuel, oil, energy, catalysts etc. that are consumed in the course of their use to obtain the export product, may also be allowed under the plan. Duty free import of mandatory spares up to 10 percent of the CIF value of the license, which are required to be exported/ supplied with the resultant product, may also be allowed under Advance License.”

Advance license can be issued for:

- Physical exports: License can be obtained to allow duty free imports to a manufacturer that needs to import inputs required for the export product.
- Intermediate supplies: An advance license for goods can be obtained by a manufacture, which would provide intermediate inputs required in manufacture export goods.
- Deemed exports: An advance license can be obtained for deemed exports. An advance license can also be availed by the sub-contractor to a project (provided name appears in the main contract). The license can also be obtained if a deemed export is made to an
United Nations Organizations or under the Aid Program of the United Nations, etc. and paid for in foreign exchange.

**Special Government Schemes:**

To promote foreign trade the Indian Government has introduced special programs that provide additional benefit to companies in certain locations and in certain industries. The major programs are:

- For companies registered under the Software Technology Parks Scheme ("STP Scheme" - a scheme directed towards 100 percent export-oriented IT & ITES units), 100 percent of Customs Duty is exempted on imports. Also they are allotted a Green Card, which provides priority treatment for Government clearances and other services.
- Any import of goods or services into the Special Economic Zone (SEZ), there is a 100 percent customs duty exemption. However, if any of the goods are removed from the SEZ into a domestic tariff area it will be subject to customs duty.

**The Accredited Clients Programme (ACP):**

The ACP has been introduced by the government to give assured facilitation to importers who have complied willingly with the laws administered by Indian Customs. Accredited Clients are allowed clearance on the basis of self-assessment without examination of goods.

### 14.7 Electronic Commerce

Electronic commerce in India is growing at a fairly brisk pace. India now has an internet user base of about 121 million (third largest user base in the World) and is expected to grow to 700 million by 2014 as per the India government. Also, broadband users continue to grow (175 million by 2014) in India. As broadband users grow the e-commerce market also continues to grow.

“A well-known global technology research firm is upbeat on the potential for online shopping in India. Similarly, industry experts believe that online business-to-business (B2B) commerce will
increase substantially in India because it meets a genuine need and portals offering such services are built on strong revenue models.”

Also, the Income Tax Act, 2000 legalizes the acceptance of electronic records and digital signatures providing a legal framework to e-commerce in India. Also the foreign Direct Investment limit in Business to Business e-commerce is now at 100 percent.

14.8  Industrial Property

Industrial property right is a subset of Intellectual Property Rights (IPR). Given below is a brief understanding of IPR and Industrial property rights in India and the extent of its enforcement in the country.

14.8.1 Intellectual Property Rights

India is a signatory of Trade Related Aspects of Intellectual Property Rights (TRIPS), negotiated by World Trade Organization (WTO). Since then, India has implemented a framework for protection of intellectual property in the country. This framework provides for both administrative as well as legislative aspects.

The categories of intellectual property covered by the TRIPS Agreement are Copyrights and related rights; Trade Marks; Geographical Indications; Patents; Industrial Designs; Lay out Designs of Integrated Circuits; Protection of Undisclosed Information (Trade Secrets); and Plant varieties.

14.8.2 India and IPR

India understands the strategic significance of setting up the IPR regime. India’s regime is as per the WTO norms and is implemented at the statutory, administrative and judicial levels. The critical initiatives taken by the GOI to administer IPR in the country are:

- Set up office of the 'Controller General of Patents, Designs and Trade Marks (CGPDTM)'. It is responsible for administration of matters relating to patents, designs, trademarks
and geographical indications and also supervises the functioning of the Patent Office; the Patent Information System; the Trade Marks Registry; and the Geographical Indications Registry.

- Copy Right office has been set up in the Department of Education to make it convenient to register copyrights
- The Department of Information Technology has been appointed the nodal organization for issues relating to layout design of integrated circuits
- Introduced the 'Protection of Plant Varieties and Farmers' Rights Authority' to create and implement policies relating to plant varieties. It is managed by Ministry of Agriculture
- Further, the administrative bodies were given authority through legislative initiatives like:
  - Trade Marks Act, 1999
  - Geographical Indications of Goods (Registration and Protection) Act 1999
  - Indian Copyright Act, 1957 and its amendment Copyright (Amendment) Act, 1999
  - Semiconductor Integrated Circuit Layout Design Act, 2000
  - Protection of Plant varieties and Farmer's Rights Act, 2001

14.8.3 Enforcement of IPR

Although the GOI has taken steps to enforce IPR in India, it has been a slow process. Obstruction of raids, leaks of confidential information, delays in criminal case preparation and the lack of adequately trained officials have further hindered the enforcement process. Its criminal justice system also does not effectively support the protection of intellectual property and settlements of IPR cases are slow.

On the positive side, since 2003, police action has improved against pirates of motion pictures. Also with the passage of the Drugs and Cosmetics (Amendment) Act, 2008, penalties for any
adulterated and spurious drugs have been enhanced and further it will also allow specialized courts to hear cases under the Act.

Further, Indian Customs Authorities, armed with the Intellectual Property Rights (Imported Goods) Enforcement Rules, 2007 have improved the IPR enforcement at the borders of India. This law empowers Customs Officials to seize goods infringing intellectual property rights at the border without having to obtain an order from the court. The Customs authorities have also created a system that will record patent, trademark, copyright, design or GI registrations. It also allows Intellectual property rights’ holders to request the suspension of clearance of potentially infringing goods. The electronic record system contains over 400 records and is now available at all ports of entry to India.

14.9 Dispute Resolution

Indian legal system is based on English Common Law and has a lot of similarities with the Canadian legal system. The Supreme Court of India is the highest court of the land. The second tier is occupied by 21 High Courts. Below the High Courts are the civil and criminal courts whose domain is determined by their location (rural or urban) and the disputes each court is allowed to judge. India also uses alternate dispute resolution means in the form of arbitration.

14.9.1 India - Member of New York Convention 1958

“India is a signatory to the New York Convention on The Recognition and Enforcement of Foreign Arbitral Awards, 1958 (“NYC”) as well as the Convention on the Execution of Foreign Awards, 1923 (“Geneva Convention”). Therefore, if a party receives a binding award from another country which is a signatory to the NYC or the Geneva Convention and is notified as a reciprocating country by India, the award would be automatically enforceable in India. The condition of reciprocity applies only to the country where the award is made.” However there are certain conditions where the enforcement can be contested.
14.9.2 Dispute Settlement

According to the World Bank, India continues to be the sixth slowest country in the world for the number of days it takes to resolve a dispute. Indian courts have a huge backlog of unsettled cases, as they are understaffed and lack technology.

*India has yet to become a member of the International Center for the Settlement of Investment Disputes. The Permanent Court of Arbitration (PCA, The Hague) and the Indian Law Ministry agreed, in 2007, to establish a regional PCA office in New Delhi to provide an arbitration forum to match the facilities offered at The Hague at a far lower cost. Since then, no further progress has been made in establishing such an office.*

However, the government, to speed up dispute resolution, has set up the International Center for Alternative Dispute Resolution (ICADR), an autonomous organization to settle domestic and international disputes through alternate dispute resolution. The ICADR, funded by the World Bank, conducted training for mediators in commercial disputes settlement. Further, eight dispute resolution panels (DRPs) were set up by Central Board of Direct Taxes to settle transfer-pricing tax disputes across the country.

14.10 Common Transport Modes

The various transport modes in India cater to 1.1 billion people and comprise of the roads, railways, air transport, shipping and ports.

14.10.1 Road Transportation

Roads in India play a critical role in transportation in the country. Most of country’s passenger traffic (90 percent) and a large part of freight (65 percent) are transported via road. India’s highway network is extensive and has a density of 0.66 km of highway per square kilometer of land, which is slightly higher than that of the United States density of .65 km. and much higher than China or Brazil. However, India continues to struggle with road transportation because most highways are narrow and congested and have poor surface quality. Also, rural areas and
Indian villages have, either poor access, or do not have all weather roads and transportation to these areas is severely affected during monsoon. The government of India has planned several initiatives to overcome the problems that currently exist in the road transportation.569

14.10.2 Railways and Railroad Transportation

“Indian Railways, the premier transport organization of the country is the largest rail network in Asia and the world’s second largest under one management”. It is owned and operated by the Government. On a daily basis the Indian Railways runs around 11,000 trains, of which 7,000 are passenger trains570.

As per World Bank, “(the Indian Railways carried) some 17 million passengers and 2 million tonnes of freight a day in 2007 and is one of the world’s largest employers. The railways play a leading role in carrying passengers and cargo across India's vast territory”.571 However, severe capacity constraints exist due to the large population and increased growth of the economy.

The Indian government has taken cognizance of the fact and planned initiatives that will provide relief to the capacity constraints. Also, Indian Railways have computerized the freight operations by implementing the Rake Management System (RMS). Freight Operations Information System (FOIS) terminals are available at 235 locations572.

14.10.3 Air Transport

India has a rapidly expanding aviation industry that has 125 airports, including 11 international airports. In the year 2006-2007, Indian airports handled 96 million passengers and 1.5 million metric tons (MT) of cargo, an increase of 31.4% for passenger and 10.6% for cargo traffic over previous year. Passenger traffic was projected to cross 100 million and cargo to cross 3.3 million MT by year 2010. The southern and southwestern parts of the country have better developed transport infrastructure as compared to the rest of India. As is true in the other transport areas, the dramatic increase in recent years in air traffic for both passengers and cargo has put a strain on the major airports of the country.573
Environmental Protection and Sustainable Development of Air Transport

India is one of the founder members of the International Civil Aviation Organization (ICAO). India has maintained a permanent delegation at the headquarters of ICAO in Montreal; is fully committed to the aims and objectives of the ICAO; and has participated in ICAO’s organizational and governance activities. The objectives of the ICAO being

- Safety - Enhance global civil aviation safety
- Security - Enhance global civil aviation security
- Environmental Protection and Sustainable Development of Air Transport - Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment.

14.10.4 Shipping and Ports

The ports in India serve the country’s growing foreign trade and the increasing traffic of containers. India has 13 major and 200 minor and intermediate ports along its more than 7,500 km long coastline. The major ports are governed by the central government whereas the other ports are governed by the respective state governments. The ports account for 70 percent of India’s trade by value and 95 percent by volume. Indian ports operate at 90 percent of their capacity.

14.11 Shipment Accounting, Reporting & Storage

For Customs clearance formalities importers have to obtain an Importer-Export Code (IEC) number; present a Bill of Entry containing details such as description of goods, value, quantity, exemption notification, etc.; and Customs Tariff Heading.

14.11.1 Documents requirements

For goods that are cleared through the Electronic Data Interchange (EDI) system the Bill of Entry is generated in the computer system. The importer is, however, required to file a cargo declaration with particulars required to process the Bill of Entry for Customs clearance.
For non-EDI ports/airports the importer has to file the Bill of Entry in four copies; the original and second copy are for Customs, third copy is for the importer and the fourth copy is for the bank making remittance of the money. Besides the Bill of Entry, the importer has to provide the following:

a. Signed invoice  
b. Packing list  
c. Bill of Lading or Delivery Order/Airway Bill  
d. GATT valuation declaration form  
e. Importers/CHA’s declaration  
f. Import license, where required  
g. Letter of Credit, where required  
h. Insurance document  
i. Import license, where required  
j. Industrial License, where required  
k. Test report, where required  
l. DEEC Book/DEPB in original, where required  
m. Catalogue, technical write up, literature, where required  
n. Separate value of spares, components, machineries  
o. Certificate of Origin, if preferential rate of duty is claimed

14.11.2 Carrier Programs

As per Customs Act, 1962 there are certain obligation on carriers bringing imports into the country:

- The carriers have to bring the imported cargo only to notified ports/airports/Land Customs Stations  
- Provide detailed information to Customs about goods being unloaded as well as those which would be carried further to other ports/airports
• Declaration of the cargo is to be made in the form of an ‘Import General Manifest’ (IGM) before their arrival at the Customs station

• For imports through Land Custom Stations, the person responsible has to give a similar import report within 12 hours of its arrival. There are provisions made to fill the IGM before the vessel arrives (where all details of cargo is available beforehand). The final IGM can be filed after arrival of the vessel

• Any goods not mentioned in the IGM/import report cannot be unloaded

• For transshipment of goods a bank guarantee is to be furnished depending on the categories of carriers as given below:
  a. All carriers of a public sector undertaking are exempt
  b. All containerized cargo carriers handling more than 1,000 twenty-foot equivalent unit (TEUs) import containers in a financial year, are also exempt
  c. Also carriers having annual transshipment volume below 1,000 TEUs, but having a good track record may be considered for exemption by the jurisdictional Commissioners of Customs
  d. For the custodians of ICDs/CFSs operating as carriers of transshipment cargo between gateway ports, the details of such bank guarantee shall be informed to the Commissioner of Customs having jurisdiction over the gateway port. They will be allowed to transship the cargo against the bank guarantee provided and will not require a separate bank guarantee for transshipment
  e. All others are required to furnish bank guarantee @ 15% of the bond amount

“To avoid multiplicity of bonds, the carriers are allowed to execute a running mother bond instead of individual bonds. The value of mother bond can be arrived on the basis of the average number of containers carried per trip, the average time taken for submission of proof of safe landing of containers at the destination ICDs/CFSs, frequency of such transshipment as well as notional value of cargo per container. As mother bond is a running bond, its amount may be high. If a running bank guarantee @ 15% of total bond amount is taken, it may block huge sum of money. To avoid blockage of money of carriers, an option has been given to
furnish either a running bank guarantee or individual bank guarantee for each trans-shipment, the latter being released as soon as the landing certificates from destination Customs are produced.”

14.11.3 Bonded Warehouses

Bonded warehouses are located near a port of entry and can store imported goods before it enters the country. These warehouses can be operated by the Government or are licensed by the government. The operator of the warehouse assures the custom authorities that goods will not be removed without the payment of customs duty and provides a 'Bond' for its assurance. Bonded Warehouses are useful for importers, as it provides them time to pay customs duty by being able to store the goods in a bonded warehouse until the custom duties are paid. Also the importer can withdraw the goods in installments by paying proportionate amounts of customs duty. Further bonded warehouse gives the importer the facility to package, grade and brand the goods as per statutory and market requirements. “Central Warehousing Corporation operates 75 Custom Bonded Warehouses with a total operated capacity of nearly 0.5 million Mts.”

14.12 Licensed Custom Brokers

There are several India freight forwarders, customs brokers and shipping companies that are interested in conducting business with Canada. Some of the large companies are:

- BDG International (India) Pvt Ltd. – Website: http://www.bdginternational.com
- Falcon Freightlink Pvt Ltd - Website: http://www.falconfreight.com
- GS Impex – Website: http://www.gsimpex.net
- K-Star Shipping Agency Pvt. Ltd. – Website: http://www.kstarship.com
- Pan Liner Clearing & Forwarding Agency – Website: http://www.panliner.com

There are several other companies in India that specialize in freight forwarding and customs brokering and their services can be availed when exporting to India
14.13 Government Incentives

There are various government incentives available for investors in the country. India offers a number of tax and non-tax benefits and incentives in specific industrial sectors, such as power, ports, highways, electronics and software; investing in undeveloped areas; building the much required export oriented units and Special Economic Zones (SEZ). However, export and foreign exchange promoting incentives are being phased out except for export oriented units in the Special Economic Zones (SEZs).\textsuperscript{580}

The tax incentives include tax holidays (for specific regions and industries); In-house research and development expenses including capital outlay but not land expenses (weighted deduction at 200 percent); also companies can deduct expenses for three years prior to commencement of business; and can avail the provision of accelerated depreciation on certain category equipment used for energy saving, pollution control and environment protection.\textsuperscript{581}

A brief understanding of the SEZ schemes promoted by the Indian government is as below:

Special Economic Zone (SEZ) Scheme\textsuperscript{582}

\textit{The SEZ Policy was introduced with a view to provide an internationally-competitive and unproblematic environment for exports. SEZs are duty-free enclaves considered to be outside the customs territory of India for the purposes of carrying out their authorised activities.}

\textit{SEZ developers are entitled to 100\% tax holidays (of profits and gains derived from the business of developing the SEZ) for ten consecutive years out of 15 years beginning from the year in which the government is notified of the SEZ. SEZ developers also enjoy exemption from MAT as well as DDT. Expenditure undertaken by a developer on account of the development of SEZ is also exempt from duties of customs, excise and central sales tax.}
A unit set up in an approved SEZ enjoys a 100% tax holiday for five years and 50% for the next ten years (during the last five years subject to certain additional conditions) out of profits derived from actual exports of goods and services. The tax holiday period commences from the year in which the SEZ unit begins to manufacture or produce or provide services.

**Industrial Parks**

*Taxes, the industrial park developers are eligible for 100% tax deduction to be provided for ten consecutive assessment years out of 15 years after the commencement of operations of such units.*

**Enterprises in Industrial Parks in Specified States**

To promote certain regions in India, the GOI has special considerations in industrial parks of Uttarakhand, Himachal Pradesh and the North East states. Units set up and operating in these industrial parks have an “income tax holidays and exemptions from CENVAT.” The tax holidays and exemptions are however subject to certain applicable conditions.

**Organizations in Infrastructure/Power/ Natural Gas projects**

Companies engaged in infrastructure projects are eligible for tax deduction. These are subject to conditions prescribed by the authorities.

**Tax holiday in respect of other facilities**

Companies in the Food Processing; Scientific Research and Development; Hotels; Hospitals; etc. are eligible for tax deduction; however they are subject to certain conditions as laid down by the government.

As discussed in the preceding paragraphs, the Indian Government is promoting investment for specific industries and regions that require development and this offers a great opportunity and future prospects for the investors who are capable and willing.
14.14 Foreign Operation Costs Evaluation

Foreign operating costs cover the major cost incurred while doing business in the country. To get a better understand of the business operations costs in India, this section contains information on the various costs associated with resources required to do business/manufacturing. The cost includes the cost of working capital (interest rates), land tax, commercial rent, utilities, transportation, wages and other costs to employ skilled, unskilled labor and professionals in India.

14.14.1 Interest Rates

The interest rate in the country dictates the cost of working capital, a key cost of doing business in a foreign country. As of August 2012 the benchmark interest rate in India is 8 percent and the Average Prime Lending Rate of the State Bank of India (a large public sector bank) is 14.75 percent.

14.14.2 Working Capital

Indian banks can be a potential source of working capital. Banks provide credit in the form of loans, advances, discounting bills, project financing, term loans, etc. However since the interest rate is high in India, companies should provision for a high cost of working capital, if it is planning to source working capital locally.

14.14.3 Land and Building Tax

Taxes are levied on Land and Building (property) in India, as a source of income. The amount of tax is calculated on the value of the property. Also property tax has to be paid to the local municipal authority for maintenance of basic civic services in the area. It is the responsibility of the property owner (not of the occupier) to pay the property tax to their respective municipality. Tax on property is calculated on the ‘Annual Value’ on the premise of fair rent. The fair rent can be actual rent (if found to be reasonable) or value as determined by the municipality.
14.14.4 Premise - Commercial Rent

The cost of rent has been steadily increasing in all regions of India especially in the National Capital Region (NCR). Table 14: Monthly Commercial Rent shows the lease rates in the top Metro cities and other areas, including the properties in the Export Processing Zones.

Table 14: Monthly Commercial Rent

<table>
<thead>
<tr>
<th>SN</th>
<th>Area/ Cities</th>
<th>High (Per square foot)</th>
<th>Low (Per square foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Delhi</td>
<td>US$ 4.5</td>
<td>US$ 1.7</td>
</tr>
<tr>
<td>2</td>
<td>Mumbai</td>
<td>US$ 10.0</td>
<td>US$ 2.8</td>
</tr>
<tr>
<td>3</td>
<td>Bangalore</td>
<td>US$ 3.7</td>
<td>US$ 1.3</td>
</tr>
<tr>
<td>4</td>
<td>Chennai</td>
<td>US$ 2.2</td>
<td>US$ 1.1</td>
</tr>
<tr>
<td>5</td>
<td>Non Metro Areas</td>
<td>US$ 2.2</td>
<td>US$ 0.7</td>
</tr>
<tr>
<td>6</td>
<td>Export Processing Zones</td>
<td>US$ 1.7</td>
<td>US$ 0.5</td>
</tr>
</tbody>
</table>

Source: Corporate Catalyst India Pvt. Ltd. - Cost of doing business in India

14.14.5 Cost of Utilities

Every organization incurs a substantial cost for utilities, such as electricity, water, phones etc. Rates prevalent in India are provided below and should be only used as a general guide.

**Electricity**

Installation cost for commercial and office premises depends on projected consumption and costs US$ 65 for service line charges plus US$33 per Kilo Watt (KW) of projected consumption. Additionally, organizations in industrial or commercial complex have to pay 12 cents per 10 KW.

**Water**

The water installation costs depend on the area of the premise and can range from US$ 110 to US$ 2,225. The cost for different ranges of monthly consumption is given in Table 15: Monthly Consumption Cost of Water in US$ per month
Table 15: Monthly Consumption Cost of Water

<table>
<thead>
<tr>
<th>Monthly Consumption (kilolitre)</th>
<th>Service charge</th>
<th>Volumetric Charges (per kilolitre)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 0-10</td>
<td>9</td>
<td>0.2</td>
</tr>
<tr>
<td>2 10-25</td>
<td>13.3</td>
<td>0.5</td>
</tr>
<tr>
<td>3 25-50</td>
<td>15.5</td>
<td>1.1</td>
</tr>
<tr>
<td>4 50-100</td>
<td>17.8</td>
<td>1.8</td>
</tr>
<tr>
<td>5 &gt;100</td>
<td>20.0</td>
<td>2.2</td>
</tr>
</tbody>
</table>

* Add 50 per cent Sewage Maintenance charges

Telephone (Landline):

See Table 16: Landline Telephone Charges for various costs for fixed line phone.

Table 16: Landline Telephone Charges

<table>
<thead>
<tr>
<th>1 Installation cost</th>
<th>US$ 11 to 33</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Monthly billing</td>
<td>US$ 45 to 555 (depending upon the plan and the number of calls)</td>
</tr>
<tr>
<td>3 National direct dialing calls</td>
<td>US$ 110 to 222 (depending upon the plan and the number of calls)</td>
</tr>
<tr>
<td>4 International direct dialing calls</td>
<td>US$ 222 to 555 (depending upon the plan and the number of calls)</td>
</tr>
</tbody>
</table>

Internet Connection

See Table 17: Internet Connection Charges for details on the cost of the Internet.

Table 17: Internet Connection Charges

<table>
<thead>
<tr>
<th>1 Installation fee</th>
<th>US$ 22 to 1,110 (depending on connectivity, data transmission plans)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Internet subscription</td>
<td>US$ 11-1,100 pm (rates vary depending on connectivity, data transmission plans)</td>
</tr>
</tbody>
</table>
14.14.6 Salary and wages

Given below is a range of estimated annual salaries in 2011 for different positions and levels. The estimated range is for the country and is not sector specific. Besides salary there are other related labour costs such as social security, holiday pay, leave pay, maternity and paternity leaves etc. Multiply by 1.2 to get a more accurate annual human resource cost estimate and to allow for inflation. To learn more, see Table 18: Annual Salary Levels for Various Responsibility Levels

Table 18: Annual Salary Levels for Various Responsibility Levels

<table>
<thead>
<tr>
<th>Responsibility/ Level</th>
<th>High US$</th>
<th>Low US$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Managerial Salary</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior level</td>
<td>225,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Middle level</td>
<td>55,500</td>
<td>13,500</td>
</tr>
<tr>
<td>Junior level</td>
<td>22,500</td>
<td>5,500</td>
</tr>
<tr>
<td><strong>Factory Workers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervisor</td>
<td>6,700</td>
<td>1,800</td>
</tr>
<tr>
<td>Skilled workers</td>
<td>2,200</td>
<td>1,300</td>
</tr>
<tr>
<td>Non skilled workers (minimum wages are decided by Government of different states)</td>
<td>1,065</td>
<td>800</td>
</tr>
<tr>
<td><strong>Marketing and Sales</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior level</td>
<td>110,000</td>
<td>78,000</td>
</tr>
<tr>
<td>Middle level</td>
<td>33,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Junior level</td>
<td>11,000</td>
<td>2,200</td>
</tr>
<tr>
<td><strong>Office and Administrative</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Executive secretary</td>
<td>10,000</td>
<td>2,700</td>
</tr>
<tr>
<td>Clerk</td>
<td>8,900</td>
<td>2,700</td>
</tr>
<tr>
<td>Accountant</td>
<td>11,000</td>
<td>2,700</td>
</tr>
<tr>
<td>Driver</td>
<td>2,700</td>
<td>1,300</td>
</tr>
<tr>
<td>Service technician (engineering experience)</td>
<td>5,500</td>
<td>1,900</td>
</tr>
</tbody>
</table>

*Source: Corporate Catalyst India Pvt. Ltd. - Cost of doing business in India*
14.14.7 Monthly Professional Retainer

The professional retainer range is estimated in US$. The high and low values are provided in Table 19: Professional Charges

Table 19: Professional Charges

<table>
<thead>
<tr>
<th>Professional</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chartered Accountant</td>
<td>2,775</td>
<td>555</td>
</tr>
<tr>
<td>Lawyer</td>
<td>2,225</td>
<td>445</td>
</tr>
<tr>
<td>Customs broker</td>
<td>Less than 1%</td>
<td></td>
</tr>
</tbody>
</table>

14.14.8 Transport cost

Approximate freight costs for ocean transport from Atlantic Canada to Mumbai, India is US$2400 per container load (20 feet) and includes a transit time of about 19 days. Approximate freight costs for air transport from Atlantic Canada to Mumbai, India is US$6.99 per kilogram and includes a transit time of about 16 hours.

Transportation costs for manufacturing operations within the country are low. The following estimates below are based on specific distribution patterns for each operation. Operations with different product distribution patterns may have different average transportation costs.

For a surface freight load of 40 feet containers for Global distribution, the average cost in India is US$1,142 as compared to US$2,190 in Canada. Similarly, air freight for Global distribution in India is US$1.27 per kilogram as compared to US$2.42 per kilogram in Canada. The low rates in transport cost are reflective of both the growing importance of the Indian markets plus a very competitive logistics market.
14.15 Insurance\textsuperscript{594}

Corporate insurance in India is regulated by the Insurance Regulatory and Development Authority (IRDA). Insurance can be purchased to cover liabilities, employees and assets of the organization. The insurance policies available in India can be grouped under the following:

- **Liability Policies:** These policies include Public Liability Policy, Products Liability Policy, Professional Indemnity Policy, Directors and Officers Liability Policy, Errors & Omissions Liability Policy, Lift (Third Party) Insurance, Employers’ Liability Policy, Carrier’s Liability Insurance, Liability Insurance Act Policy and Workmen’s Compensation Insurance

- **Group Policies:** These policies cover employees and is sometimes used as a retention tool by the organization, they include Group Life Insurance, Group Medical/ Health Insurance, Group Critical Illness, Group Accident Insurance, Group Travel Insurance, and Group Gratuity Insurance

- **Commercial and Industrial:** These policies mostly cover other assets and some of the policies are industry specific. A few examples of these policies are Fire Policy, Burglary Policy, Marine Cargo Policy, Marine Hull Insurance, Office Umbrella Policy, Shopkeeper’s Insurance Policy, Plate Glass Insurance, Special Contingency Policy, Aviation Insurance, Project Insurance, Money Insurance, Bankers Indemnity Policy etc.

14.16 Depreciation

Depreciation is deducted at cost and each category of asset has a different percentage, which is listed below. Depreciation is allowed at higher rates for certain items like energy-saving devices and pollution control equipment. Also, business in generation and/ or distribution of power can claim tax depreciation at the below rates or on a straight-line basis, as prescribed.\textsuperscript{595} See Table 20: Depreciation Percentages for more details.
### Table 20: Depreciation Percentages

<table>
<thead>
<tr>
<th>Assets</th>
<th>Depreciation Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory Building</td>
<td>10%</td>
</tr>
<tr>
<td>Furniture and fittings</td>
<td>10%</td>
</tr>
<tr>
<td>Plant and machinery (general)</td>
<td>15%</td>
</tr>
<tr>
<td>Computers (including software)</td>
<td>60%</td>
</tr>
<tr>
<td>Motorcars (Not if the business is running them on hire)</td>
<td>15%</td>
</tr>
<tr>
<td>Intangible assets (know-how, patents, copyrights, trademarks, licences, etc.)</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: (PWC and HSBC, 2010)

### 14.17 Advertising\(^{596}\)

With the liberalization of the Indian economy, the number of companies competing in the Indian market has exponentially increased.

*Over the years, the Indian economy has moved from being a controlled sellers’ market to a buyers’ market. With the opening of the economy came increased competition, and the need for increased advertising. Media availability has increased exponentially with unlimited competition. In the year 2011, the Indian advertising industry stood at $5.1 billion, recording a growth of 8 percent. The growth projections for the ad industry by industry experts for 2012 are 8-9 percent, with a total advertising sector of $5.6 billion.*

*Practically every aspect of media is available for advertising, from print to outdoor advertising to satellite channels to movie theaters. Advertising in print continues to hold (a large) share. Television advertising dominates the market with a share of 44.8 percent, followed by print with a share of 42.2 percent. Radio saw no growth in 2011 at 3.1 percent share, and outdoor advertising has a 5.1 percent share of the advertising market. The Internet share claims the third largest share of the market at 3.8 percent. A well-known industry consulting group predicts that Internet would become a 5 percent media.*
14.17.1 Print Media

India has a diverse and growing number of daily newspapers. Print media reaches 70 percent of urban adults. Further, the number of readers in rural India is now roughly equal to that in urban India. The print media, almost completely controlled by the private sector, is well developed and advertising and promotional opportunities are available in a large number of newspapers including daily, weekly or monthly business publications, news magazines and industry-specific magazines.

According to the Indian Readership Survey 2011 data The Times of India is the leading English newspaper daily in India, with a readership of 7.4 million, followed by Hindustan Times with 3.6 million. The Economic Times and Business World are the predominant business publications. The top Hindi daily is Dainik Jagran with readership 16 million. The leading magazines include India Today, Business India, Business Today, and Outlook.

14.17.2 Television and Cable

Advertising opportunities are also available on satellite and cable television channels. Doordarshan, the government-owned television network, reaches almost 90 percent of the population. In addition, more than 100 satellite and cable television channels, including many U.S. and international channels such as STAR TV, CNN, NBC, Discovery, National Geographic and BBC, are available for advertising. New distribution platforms like Direct-to-Home (DTH) are increasing the subscriber base and raising subscription revenues.

14.17.3 Radio

Radio, by far the least expensive and most traditional form of mass entertainment in the country, is staging a comeback in the lifestyles of Indians. Presently this medium is dominated by the government-owned All India Radio (AIR) and reaches over 99 percent of the people in India. Today privately-owned FM radio stations are present in 90 cities operating on 280 operating frequencies and reach 60 million people. According to an
industry body report, FM radio is expected to grow at a CAGR of 16 percent annually and reach a size of $328 million by 2014. New formats such as satellite, internet and community radio have also begun to hit the market.

Canadian companies interested in promotion of their products in India have many alternate advertising agencies to choose from, including an array of local agencies as well as agencies collaborating with reputable international firms. Also, Canadian companies can display and promote their products and services in international trade fairs held in India, which are both industry-specific and general.

14.18 Budgeting

While budgeting, it is important to consider how other organizations are doing in the same sector/ subsector in India. To better understand the performance of organizations in a particular sector it may be useful to study the ratios and indicators that measure performance of different aspects of business.

14.18.1 Business Ratios and Indicators

Some of the ratios and indicators that reflect the performance of an organization are:

- Current Price/Earnings (current PE): Current PE is estimated from latest reported earnings and current market price
- Enterprise Value/Sales (EV/ Sales)
- Pre-tax Operating Margin
- Return on Equity (ROE): Net income/ shareholders’ equity
- Enterprise Value/ Invested Capital (EV/ Invested Capital)
- Return on Invested Capital (ROIC): Net Income – Dividends/ Total Capital
- Enterprise Value/Earnings before interest, taxes, depreciation and amortization (EV/EBITDA)
- Enterprise Value/ Earnings before interest and taxes (EV/ EBIT)
• Market Debt to Capital
• Market Debt/Equity (Market (D/E)
• Effective tax rate

14.18.2 Sector Specific Financial Ratios

The above mentioned ratios of pertinent sector or subsector have been tabulated for quick reference in Table 21: Financial Ratios - Specific Sectors and Subsectors from Prof. Aswath Damodaran’s (Professor of Finance at the Stern School of Business at New York University) database of financial information ratios for Indian companies across sectors. For detailed information (company wise) the Excel sheet can be downloaded from Prof. Damodaran’s website. (http://pages.stern.nyu.edu/~adamodar/)
Table 21: Financial Ratios - Specific Sectors and Subsectors

<table>
<thead>
<tr>
<th>Sector / Subsector</th>
<th>Current PE</th>
<th>EV/Sales</th>
<th>Pre-tax Operating Margin</th>
<th>ROE</th>
<th>EV/Invested Capital</th>
<th>ROIC</th>
<th>EV/EBITDA</th>
<th>EV/EBIT</th>
<th>Market Debt to Capital</th>
<th>Market D/E</th>
<th>Effective tax rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace/Defense</td>
<td>17.44</td>
<td>1.59</td>
<td>15.73%</td>
<td>5639.32%</td>
<td>241.00</td>
<td>1834.12%</td>
<td>8.86</td>
<td>10.11</td>
<td>0.27%</td>
<td>0.27%</td>
<td>9.13%</td>
</tr>
<tr>
<td>Air Transport</td>
<td>6.18</td>
<td>0.42</td>
<td>-0.98%</td>
<td>-43.11%</td>
<td>0.96</td>
<td>-1.42%</td>
<td>11.64</td>
<td>NA</td>
<td>73.26%</td>
<td>273.96%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Beverage</td>
<td>152.15</td>
<td>3.75</td>
<td>-2.53%</td>
<td>-12.11%</td>
<td>7.13</td>
<td>-22.16%</td>
<td>NA</td>
<td>NA</td>
<td>0.83%</td>
<td>0.84%</td>
<td>13.71%</td>
</tr>
<tr>
<td>Beverage (Alcoholic)</td>
<td>14.86</td>
<td>0.81</td>
<td>8.53%</td>
<td>5.99%</td>
<td>5.19</td>
<td>48.59%</td>
<td>7.26</td>
<td>9.45</td>
<td>8.77%</td>
<td>9.61%</td>
<td>19.58%</td>
</tr>
<tr>
<td>Farming/Agriculture</td>
<td>10.18</td>
<td>0.56</td>
<td>6.94%</td>
<td>0.72%</td>
<td>1.02</td>
<td>10.11%</td>
<td>5.78</td>
<td>8.10</td>
<td>68.35%</td>
<td>215.92%</td>
<td>9.94%</td>
</tr>
<tr>
<td>Food Processing</td>
<td>33.56</td>
<td>0.81</td>
<td>7.24%</td>
<td>20.10%</td>
<td>2.69</td>
<td>17.50%</td>
<td>8.82</td>
<td>11.21</td>
<td>19.22%</td>
<td>23.79%</td>
<td>17.43%</td>
</tr>
<tr>
<td>Food Wholesalers</td>
<td>203.31</td>
<td>0.74</td>
<td>2.02%</td>
<td>9.17%</td>
<td>2.96</td>
<td>8.69%</td>
<td>49.18</td>
<td>36.78</td>
<td>11.88%</td>
<td>13.49%</td>
<td>11.86%</td>
</tr>
<tr>
<td>Sector / Subsector</td>
<td>Current PE</td>
<td>EV/Sales</td>
<td>Pre-tax Operating Margin</td>
<td>ROE</td>
<td>EV/ Invested Capital</td>
<td>ROIC</td>
<td>EV/ EBITDA</td>
<td>EV/ EBIT</td>
<td>Market Debt to Capital</td>
<td>Market D/E</td>
<td>Effective tax rate</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------</td>
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<td>------------</td>
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<td>------------------------</td>
<td>------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Retail (Grocery and Food)</td>
<td>11.60</td>
<td>0.28</td>
<td>4.18%</td>
<td>20.74%</td>
<td>1.50</td>
<td>17.42%</td>
<td>5.52</td>
<td>6.78</td>
<td>0.15%</td>
<td>0.15%</td>
<td>36.28%</td>
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<td>Biotechnology</td>
<td>104.50</td>
<td>1.30</td>
<td>12.30%</td>
<td>19.38%</td>
<td>1.76</td>
<td>17.42%</td>
<td>7.46</td>
<td>10.60</td>
<td>18.36%</td>
<td>22.50%</td>
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<td>Healthcare Products</td>
<td>20.59</td>
<td>0.66</td>
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<td>47.45%</td>
<td>5.38</td>
<td>55.83%</td>
<td>4.97</td>
<td>4.94</td>
<td>3.82%</td>
<td>3.97%</td>
<td>21.32%</td>
</tr>
<tr>
<td>Healthcare Equipment</td>
<td>5.04</td>
<td>2.03</td>
<td>23.23%</td>
<td>33.70%</td>
<td>2.21</td>
<td>33.33%</td>
<td>7.42</td>
<td>8.75</td>
<td>24.26%</td>
<td>32.03%</td>
<td>7.47%</td>
</tr>
<tr>
<td>Pharma &amp; Drugs</td>
<td>38.09</td>
<td>2.45</td>
<td>16.05%</td>
<td>18.29%</td>
<td>2.69</td>
<td>16.76%</td>
<td>12.25</td>
<td>15.25</td>
<td>13.78%</td>
<td>15.98%</td>
<td>18.42%</td>
</tr>
<tr>
<td>Coal &amp; Related Energy</td>
<td>99.56</td>
<td>2.09</td>
<td>27.24%</td>
<td>45.18%</td>
<td>NA</td>
<td>-134.62%</td>
<td>6.87</td>
<td>7.66</td>
<td>0.78%</td>
<td>0.79%</td>
<td>14.18%</td>
</tr>
<tr>
<td>Power</td>
<td>52.24</td>
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<td>9.42%</td>
<td>7.85</td>
<td>10.09</td>
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<td>25.63%</td>
<td>18.98%</td>
</tr>
<tr>
<td>Sector / Subsector</td>
<td>Current PE</td>
<td>EV/Sales</td>
<td>Pre-tax Operating Margin</td>
<td>ROE</td>
<td>EV/Invested Capital</td>
<td>ROIC</td>
<td>EV/EBITDA</td>
<td>EV/EBIT</td>
<td>Market Debt to Capital</td>
<td>Market D/E</td>
<td>Effective tax rate</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>------------</td>
<td>----------</td>
<td>--------------------------</td>
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<td>-----------</td>
<td>---------</td>
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<td>---------------------</td>
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<tr>
<td>Computer Services</td>
<td>152.59</td>
<td>2.39</td>
<td>16.76%</td>
<td>31.34%</td>
<td>5.48</td>
<td>33.97%</td>
<td>12.56</td>
<td>14.23</td>
<td>3.13%</td>
<td>3.23%</td>
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</tr>
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<td>2.51</td>
<td>25.46%</td>
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<td>8.05</td>
<td>17.05%</td>
<td>20.55%</td>
<td>12.48%</td>
</tr>
<tr>
<td>Computers/Peripherals</td>
<td>21.97</td>
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<td>-232.23%</td>
<td>1.06</td>
<td>-81.96%</td>
<td>10.63</td>
<td>NA</td>
<td>39.60%</td>
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</tr>
<tr>
<td>Healthcare Information &amp; Technology</td>
<td>5.70</td>
<td>1.73</td>
<td>15.87%</td>
<td>22.87%</td>
<td>2.78</td>
<td>18.84%</td>
<td>4.86</td>
<td>10.90</td>
<td>18.16%</td>
<td>22.19%</td>
<td>11.19%</td>
</tr>
<tr>
<td>Internet software and services</td>
<td>66.95</td>
<td>2.17</td>
<td>12.32%</td>
<td>18.14%</td>
<td>2.77</td>
<td>15.80%</td>
<td>13.68</td>
<td>17.58</td>
<td>8.98%</td>
<td>9.87%</td>
<td>11.66%</td>
</tr>
<tr>
<td>Telecom (Wireless)</td>
<td>15.56</td>
<td>2.67</td>
<td>12.40%</td>
<td>5.17%</td>
<td>1.27</td>
<td>4.22%</td>
<td>8.15</td>
<td>21.54</td>
<td>42.44%</td>
<td>73.74%</td>
<td>10.17%</td>
</tr>
<tr>
<td>Telecom. Equipment</td>
<td>14.59</td>
<td>0.67</td>
<td>-0.89%</td>
<td>0.02%</td>
<td>0.71</td>
<td>-0.01%</td>
<td>47.00</td>
<td>NA</td>
<td>13.69%</td>
<td>15.86%</td>
<td>11.03%</td>
</tr>
<tr>
<td>Telecom. Services</td>
<td>9.58</td>
<td>0.92</td>
<td>-13.56%</td>
<td>-75.35%</td>
<td>1.30</td>
<td>-19.54%</td>
<td>24.09</td>
<td>NA</td>
<td>54.36%</td>
<td>119.10%</td>
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</tr>
<tr>
<td>Sector / Subsector</td>
<td>Current PE</td>
<td>EV/Sales</td>
<td>Pre-tax Operating Margin</td>
<td>ROE</td>
<td>EV/Invested Capital</td>
<td>ROIC</td>
<td>EV/EBITDA</td>
<td>EV/EBIT</td>
<td>Market Debt to Capital</td>
<td>Market D/E</td>
<td>Effective tax rate</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------</td>
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<td>-----------</td>
<td>---------</td>
<td>------------------------</td>
<td>------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Educational Services</td>
<td>30.78</td>
<td>2.74</td>
<td>28.11%</td>
<td>18.48%</td>
<td>1.19</td>
<td>11.57%</td>
<td>7.82</td>
<td>9.76</td>
<td>38.66%</td>
<td>63.02%</td>
<td>17.52%</td>
</tr>
<tr>
<td>Railroad</td>
<td>10.33</td>
<td>2.33</td>
<td>22.86%</td>
<td>NA</td>
<td>8128.08</td>
<td>NA</td>
<td>8.76</td>
<td>10.18</td>
<td>0.00%</td>
<td>0.00%</td>
<td>8.61%</td>
</tr>
<tr>
<td>Transportation</td>
<td>9.94</td>
<td>1.22</td>
<td>20.71%</td>
<td>25.13%</td>
<td>2.16</td>
<td>16.91%</td>
<td>5.53</td>
<td>5.90</td>
<td>33.84%</td>
<td>51.14%</td>
<td>24.17%</td>
</tr>
<tr>
<td>Shipbuilding &amp; Marine</td>
<td>10.08</td>
<td>2.74</td>
<td>11.08%</td>
<td>8.92%</td>
<td>1.58</td>
<td>6.58%</td>
<td>12.99</td>
<td>24.71</td>
<td>31.32%</td>
<td>45.61%</td>
<td>15.74%</td>
</tr>
</tbody>
</table>
## 15. Contact Information of Professional Service Providers

<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Contact person</th>
<th>Services</th>
<th>Fees</th>
<th>Contact information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>R. Subramanian &amp; Co</strong></td>
<td>R. Subramanian</td>
<td>1. Audit and Assurance services</td>
<td>Depends on the assignment size and the complexities. Minimum Fees Rs 25,000 ($ 500) + taxes</td>
<td>Email: <a href="mailto:rs@rscompany.co.in">rs@rscompany.co.in</a>&lt;br&gt;<a href="mailto:ag@rscompany.co.in">ag@rscompany.co.in</a>&lt;br&gt;<a href="mailto:pb@rscompany.co.in">pb@rscompany.co.in</a>&lt;br&gt;Phone: 91-98409 22614&lt;br&gt;91-98400 33336&lt;br&gt;91-98407 20504&lt;br&gt;Website: <a href="http://www.rscompany.co.in">www.rscompany.co.in</a>&lt;br&gt;City: Chennai</td>
</tr>
<tr>
<td></td>
<td>A. Ganesan</td>
<td>2. Taxation including International Taxation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>P. Bhaskaran</td>
<td>3. Consultancy services - namely Mergers and Acquisitions, Financial and Tax Due Diligence, JV structuring, Project report preparation , SOP preparation etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Company law matters including setting up companies in India</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Business process outsourcing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

City: Chennai
<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Contact person</th>
<th>Services</th>
<th>Fees</th>
<th>Contact information</th>
</tr>
</thead>
</table>
| Manian & Rao           | Paresh Daga    | 1. India Entry Strategy  
2. Financial & Corporate Advisory  
3. International Tax Planning  
4. Management Consultancy  
5. Tax Advisory & Compliance  
6. Assurance Services | Fee is charged on a case to case basis. General hourly quote is given below:  
Senior Partner - INR 6,000 ($ 120)  
Junior Partner - INR 4,000 ($ 80)  
Chartered Accountant - INR 2,500 ($ 50)  
Audit executive - INR 500 ($ 10) | Email: paresh@manian-rao.com  
Phone: 91-9902015240  
91-80-26569500/501  
Website: www.manian-rao.com  
City: Bangalore |
| Khimji Kunverji & Co   | Gautam Shah    | 1. Legal Services: Registering and setting up business in India (subsidiary, JV, representative office or other options), Company Law  
2. Merger & Acquisition expertise  
3. Accounting: Audits, Tax and Financial Management | Would be on a case to case basis | Email: gautam@kkc.in  
Phone: 91-9833444468  
91-22-24214330/31/32  
Website: www.kkc.in  
City: Mumbai |
<table>
<thead>
<tr>
<th>Firm Name</th>
<th>Contact person</th>
<th>Services</th>
<th>Fees</th>
<th>Contact information</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA &amp; Associates</td>
<td>Sateesh Kulkarni</td>
<td>1. India Outbound 2. Finance Outsourcing 3. Tax Advisory 4. Tax Representations 5. Partner Search 6. India Entry Strategy 7. Set-up Approvals 8. Mergers &amp; Acquisitions 9. Market Research</td>
<td>Due Diligence: USD 25000 - 35000 Valuation: USD 12500 - 20000 Transaction Advisory: 2-5% is charged depending of deal size Setting up (Would vary from State to State as per regulations) Wholly owned subsidiary: USD 4,000 - 6,000 Representative Office: USD 4,000 - 6,000 Branch Office: USD 4,000 - 6,000 Project Office: USD 1,500 - 3,000 Assistance in land acquisition: USD 20,000 - 50,000 Assistance in Factory approval: USD 10,000 - 12,500</td>
<td>Email: <a href="mailto:sateesh.kulkarni@cci.in">sateesh.kulkarni@cci.in</a> Phone: 91-11-4613 6609 91-9810021042 91-9999947844 Website: <a href="http://www.asa.in">www.asa.in</a> City: Delhi</td>
</tr>
<tr>
<td>Firm Name</td>
<td>Contact person</td>
<td>Services</td>
<td>Fees</td>
<td>Contact information</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>--------------------------------------------------------</td>
<td>------------------------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>PK Chopra &amp; Company</td>
<td>Samir Chopra</td>
<td>Auditing, Accounting, Consultancy, Corporate Law, International Taxation, Merger &amp; Acquisition etc</td>
<td>As per Institute of Chartered Accountants of India Fees Structure</td>
<td>Email: <a href="mailto:sam@pkchopra.com">sam@pkchopra.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Phone: 91-9811063063</td>
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<tr>
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<td></td>
<td></td>
<td>91-11-23312341-44</td>
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<tr>
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<td></td>
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<td></td>
<td>Website: <a href="http://www.pkchopra.com">www.pkchopra.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>City: Delhi</td>
</tr>
<tr>
<td>Firm Name</td>
<td>Contact person</td>
<td>Services</td>
<td>Fees</td>
<td>Contact information</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
<td>----------------------------------------------------</td>
<td>-------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>S K Patodia &amp;</td>
<td>Arun Poddar</td>
<td>1. Business Set up Services</td>
<td>Depends upon Nature of assignment</td>
<td>Email: <a href="mailto:arun@skpatodia.in">arun@skpatodia.in</a></td>
</tr>
<tr>
<td>Associates</td>
<td>Monesh Jain</td>
<td>2. Mergers &amp; Acquisition Consultancy</td>
<td></td>
<td><a href="mailto:monesh@skpatodia.in">monesh@skpatodia.in</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Audit &amp; Attestation Services</td>
<td></td>
<td>Phone: 91-9820257312</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Tax Consultancy</td>
<td></td>
<td>91-9819839152</td>
</tr>
<tr>
<td></td>
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<td>5. Accounting &amp; Finance Services</td>
<td></td>
<td>Website: <a href="http://www.skpatodia.in">www.skpatodia.in</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. Foreign Exchange &amp; International Financial</td>
<td></td>
<td>City: Mumbai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advisory</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Audit &amp; Assurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Direct &amp; Indirect Tax</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Regulatory Services</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>10. Cross Border Transaction</td>
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</tr>
</tbody>
</table>

City: Mumbai
Appendices
Appendix “A” - Top 25 Industry exports from Atlantic Canada to India

Listing of Export in Top 25 Industries in Millions

<table>
<thead>
<tr>
<th>Industries</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>32212 - Paper Mills</td>
<td>$59.64</td>
<td>$67.89</td>
<td>$13.38</td>
<td>$52.74</td>
<td>$52.24</td>
</tr>
<tr>
<td>32211 - Pulp Mills</td>
<td>$56.90</td>
<td>$45.43</td>
<td>$111.18</td>
<td>$93.24</td>
<td>$42.58</td>
</tr>
<tr>
<td>33661 - Ship and Boat Building</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ 7.68</td>
</tr>
<tr>
<td>41811 - Recyclable Metal Wholesaler-Distributors</td>
<td>$2.12</td>
<td>$1.62</td>
<td>$0.62</td>
<td>$1.79</td>
<td>$3.50</td>
</tr>
<tr>
<td>11212 - Dairy Cattle and Milk Production</td>
<td>$0.42</td>
<td>$1.39</td>
<td>$1.82</td>
<td>$1.13</td>
<td>$1.22</td>
</tr>
<tr>
<td>33451 - Navigational, Measuring, Medical and Control Instruments Manufacturing</td>
<td>$0.37</td>
<td>$0.74</td>
<td>$1.21</td>
<td>$1.02</td>
<td>$1.20</td>
</tr>
<tr>
<td>41819 - Other Recyclable Material Wholesaler-Distributors</td>
<td>$1.31</td>
<td>$1.26</td>
<td>$1.43</td>
<td>$1.13</td>
<td>$1.15</td>
</tr>
<tr>
<td>33392 - Material Handling Equipment Manufacturing</td>
<td>$0.12</td>
<td>$0.03</td>
<td>$0.19</td>
<td>$0.19</td>
<td>$0.73</td>
</tr>
<tr>
<td>33999 - All Other Miscellaneous Manufacturing</td>
<td>$0.03</td>
<td>$0.07</td>
<td>$0.06</td>
<td>$0.10</td>
<td>$0.57</td>
</tr>
<tr>
<td>33361 - Engine, Turbine and Power Transmission Equipment Manufacturing</td>
<td>$0.04</td>
<td>$ -</td>
<td>$0.01</td>
<td>$0.03</td>
<td>$0.46</td>
</tr>
<tr>
<td>33111 - Iron and Steel Mills and Ferro-Alloy Manufacturing</td>
<td>$ -</td>
<td>$0.01</td>
<td>$ -</td>
<td>$0.00</td>
<td>$0.44</td>
</tr>
<tr>
<td>33313 - Mining and Oil and Gas Field Machinery Manufacturing</td>
<td>$0.20</td>
<td>$0.11</td>
<td>$1.50</td>
<td>$1.60</td>
<td>$0.40</td>
</tr>
<tr>
<td>33341 - Ventilation, Heating, Air-Conditioning and Commercial Refrigeration Equipment Manufacturing</td>
<td>$ -</td>
<td>$ -</td>
<td>$0.00</td>
<td>$0.06</td>
<td>$0.34</td>
</tr>
<tr>
<td>33641 - Aerospace Product and Parts Manufacturing</td>
<td>$0.00</td>
<td>$ -</td>
<td>$0.00</td>
<td>$0.00</td>
<td>$0.28</td>
</tr>
<tr>
<td>33299 - All Other Fabricated Metal Product Manufacturing</td>
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<td>$ -</td>
<td>$0.01</td>
<td>$0.01</td>
<td>$0.27</td>
</tr>
<tr>
<td>Industries</td>
<td>2007</td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
<td>2011</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------</td>
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<td>------</td>
<td>------</td>
</tr>
<tr>
<td>32791 - Abrasive Product Manufacturing</td>
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<td>$0.00</td>
<td>$0.04</td>
<td>$0.23</td>
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<tr>
<td>31151 - Dairy Product (except Frozen) Manufacturing</td>
<td>$0.01</td>
<td>$0.00</td>
<td>$0.00</td>
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<td>$0.16</td>
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<tr>
<td>33312 - Construction Machinery Manufacturing</td>
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<td>$0.31</td>
<td>$0.06</td>
<td>$0.05</td>
<td>$0.16</td>
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<tr>
<td>32561 - Soap and Cleaning Compound Manufacturing</td>
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<td>$0.15</td>
<td>$0.20</td>
<td>$0.15</td>
<td>$0.15</td>
</tr>
<tr>
<td>33351 - Metalworking Machinery Manufacturing</td>
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</tr>
<tr>
<td>33512 - Lighting Fixture Manufacturing</td>
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<td>$0.09</td>
<td>$0.03</td>
<td>$0.11</td>
</tr>
<tr>
<td>32541 - Pharmaceutical and Medicine Manufacturing</td>
<td>$0.04</td>
<td>$0.15</td>
<td>$0.02</td>
<td>$0.05</td>
<td>$0.10</td>
</tr>
<tr>
<td>32621 - Tire Manufacturing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$0.09</td>
</tr>
<tr>
<td>41812 - Recyclable Paper and Paperboard Wholesaler-Distributors</td>
<td></td>
<td>$0.09</td>
<td>$0.09</td>
<td>$0.15</td>
<td>$0.09</td>
</tr>
<tr>
<td>32629 - Other Rubber Product Manufacturing</td>
<td></td>
<td></td>
<td>$0.00</td>
<td>$0.08</td>
<td>$0.08</td>
</tr>
<tr>
<td>SUB-TOTAL</td>
<td>$121.63</td>
<td>$119.60</td>
<td>$131.88</td>
<td>$153.59</td>
<td>$114.38</td>
</tr>
<tr>
<td>OTHERS</td>
<td>$28.77</td>
<td>$1.45</td>
<td>$4.74</td>
<td>$3.30</td>
<td>$2.24</td>
</tr>
<tr>
<td>TOTAL (ALL INDUSTRIES)</td>
<td>$150.40</td>
<td>$121.04</td>
<td>$136.62</td>
<td>$156.88</td>
<td>$116.61</td>
</tr>
</tbody>
</table>
### Appendix “B” – Indian States For or Against FDI in Multi-Brand Retail

<table>
<thead>
<tr>
<th>For</th>
<th>Against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delhi</td>
<td>Tamil Nadu</td>
</tr>
<tr>
<td>Assam</td>
<td>Uttar Pradesh</td>
</tr>
<tr>
<td>Maharashtra</td>
<td>Chhattisgarh</td>
</tr>
<tr>
<td>Andhra Pradesh</td>
<td>Gujarat</td>
</tr>
<tr>
<td>Rajasthan</td>
<td>West Bengal</td>
</tr>
<tr>
<td>Uttarakhand</td>
<td>Bihar</td>
</tr>
<tr>
<td>Haryana</td>
<td>Karnataka</td>
</tr>
<tr>
<td>Manipur</td>
<td>Kerala</td>
</tr>
<tr>
<td>Daman &amp; Diu</td>
<td>Madhya Pradesh</td>
</tr>
<tr>
<td>Dadra &amp; Nagar Haveli</td>
<td>Tripura</td>
</tr>
<tr>
<td>Jammu &amp; Kashmir*</td>
<td>Odisha</td>
</tr>
</tbody>
</table>

*The state endorses the policy but has not provided assent in writing.*
### Appendix “C” – Regulated & Unregulated Sectors

<table>
<thead>
<tr>
<th>Regulated Sector</th>
<th></th>
<th></th>
</tr>
</thead>
</table>
| University Grants Commission (UGC) - Governs Universities | • Coordination, determination and maintenance of standards in Universities  
• Prescribes conditions that Universities/Colleges must fulfill  
• Provide funds to institutions of higher education | |
| All India Council for Technical Education (Governs Technical Education) | Responsible for maintenance of standards of technical education which currently includes education research and training in: | |
| | • Engineering  
• Technology including MCA  
• Architecture  
• Town Planning  
• Management  
• Pharmacy  
• Hotel Management & Catering Technology  
• Applied Arts and Crafts | |
| Specialized Professional Bodies: | Grant approval for establishment of institutes and determine standards | |
| | • Medical Council of India  
• Dental Council of India  
• India Nursing Council  
• Council of Architecture  
• Bar Council of India  
• Pharmacy Council of India  
• Indian Council for Architecture Research  
• Rehabilitation Council of India  
• Central Council of Homeopathy  
• Central Council of Indian Medicine  
• Veterinary Council of India | |
<table>
<thead>
<tr>
<th><strong>Unregulated Sector</strong></th>
</tr>
</thead>
</table>
| • Growing area of opportunity: Provision of innovative services to educational Institutions (school, higher and vocational) as well as students and corporation.  
• There are a number of private companies operating in this sector, some of which are listed.  
• Provided that such institutions do not provide education leading to the award of a degree or certificate, they can be incorporated as a company, are beyond the regulatory regime described earlier and can distribute profits, Examples of such institutions include:  
  o Language Training, Tutorials/Coaching, Education services companies, Content providers, Corporate Training |
## Appendix “D” – Canada’s Ocean Technology Sector

### Aquaculture
- Equipment
- Operations
- Other
- Site Development

### Marine Transportation
- Communications
- Equipment
- Industry Promotion
- Information
- Instrumentation
- Modeling and Forecasting
- Naval Architecture
- Navigation
- Other
- Performance Evaluation
- Port Design
- Port Management
- Port Security
- Safety/Evacuation
- Search & Rescue
- Seismic Survey
- Sovereignty
- Surveillance
- System Integration

### Education & Training
- Safety/Evacuation
- Underwater intervention

### Offshore Energy
- Coastal Zone Management
- Emergency Response
- Equipment
- Exploration
- Industry Promotion
- Modeling and Forecasting
- Other
- Production and Processing
- Renewables
- Safety/Evacuation

### Defence and Security
- Communications
- Equipment
- Industry Promotion
- Marine Acoustics
- Military
- Modeling and Forecasting
- Port Security
- Safety/Evacuation
- Search & Rescue
- Seismic Survey
- Sovereignty
- Surveillance
- System Integration

### Ocean Observation and Science
- Coastal Zone Management
- Communications
- Data Fusion
- Equipment
- Hydrography
- Industry promotion
- Instrumentation
- Marine Acoustics
- Modeling and Forecasting
- Monitoring
- Ocean Mapping & Survey
- Oceanography/Meteorology
- Other
- Seismic Survey
- Surveillance
- Underwater Intervention
- Underwater Vehicles

### Fisheries
- Harvesting
- Modeling and Forecasting
- Monitoring
- Other
- Processing
- Vessel Monitoring
- Equipment
- Navigation
- Underwater Vehicles

Source: [http://ocean.cinmaps.ca/asset_map](http://ocean.cinmaps.ca/asset_map)
Appendix “E” – Clean Technology Opportunities by Sector and Geography

<table>
<thead>
<tr>
<th>Sector</th>
<th>Geographic Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small hydropower</td>
<td>Himachal Pradesh, Uttarakhand, Jammu and Kashmir, and Arunachal Pradesh</td>
</tr>
<tr>
<td>Wind energy</td>
<td>Maharashtra, Andhra Pradesh, Tamil Nadu, and Gujarat</td>
</tr>
<tr>
<td>Solar</td>
<td>All over India</td>
</tr>
<tr>
<td>Bioenergy</td>
<td>Rajasthan, Punjab, Uttar Pradesh, Maharashtra, Madhya Pradesh, Haryana, and Gujarat</td>
</tr>
<tr>
<td>Waste-to-energy</td>
<td>Maharashtra, Uttar Pradesh, Karnataka, Tamil Nadu, and West Bengal</td>
</tr>
<tr>
<td>Geothermal</td>
<td>Jammu and Kashmir, Himachal Pradesh, Uttarakhand, and Chhattisgarh</td>
</tr>
<tr>
<td>Tidal</td>
<td>Gulf of Kutch and Gulf of Cambay in Gujarat and the Delta of the Ganga in the Sunderbans region in West Bengal.</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>All over India</td>
</tr>
</tbody>
</table>
## Appendix “F” Specific Technology Opportunities in the Renewable Sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Geographic Opportunity</th>
</tr>
</thead>
</table>
| Small hydropower     | • Technology for adaptation of high-pole permanent magnet excitation generators to SHP.  
                        • Technology for low-speed generators (direct-drive low-speed generators for low heads).  
                        • Technology for submersible turbo-generators.  
                        • Technology for appropriate turbine designs suitable to electrical output below 1 MW.  
                        • Technology for variable-speed operation (optimal use of low- and variable-head sites).  
                        • Technology/projects for flexible small hydro turbines for very low head (<2.5 m).                                                                 |
| Wind energy          | • Latest technologies with higher capacities are needed. These technologies may include wind power systems greater than 1–2 MW.  
                        • Wind machines for low-wind regimes and better designed rotor blades, gear boxes, and control systems.                                                                 |
| Solar                | • Technology for polysilicon and other materials.  
                        • Technology for device fabrication processes and improvements in crystalline silicon solar cell/module technology.  
                        • Thin-film solar cell technology (based on amorphous silicon films; cadmium telluride films and copper indium diselenide thin films; organic, dye-sensitized, and carbon nano tubes).  
                        • Technology for megawatt-scale solar photovoltaic power-generating systems.  
                        • Technology for solar thermal (high-temperature) power generation systems and energy efficient buildings utilizing solar energy concepts. |
### Bioenergy

- Development of megawatt-scale fluidized bed biomass gasifiers, hot-gas clean-up system, and optimum integration of the system following the principles of IGCC.
- Development of poly-generation facilities for the production of liquid fuels, variety of chemicals and hydrogen in addition to power production through the IGCC route, and establishing the concept of a biorefinery.
- Raising efficiency of atmospheric gasification to 25–30% along with cooling systems, complete tar decomposition, and safe disposal of wastes in commercial production.
- Raising system efficiency of small (up to 1 MW) combustion and turbine technologies to 20% plus.
- Design and development of high-rate anaerobic co-digestion systems for biogas/synthetic gas production.
- Development of gasifier systems based on charcoal/pyrolyzed biomass.
- Development of efficient kilns/systems for charcoal production/pyrolyzation of biomass.
- Design and development of engines, Stirling engines, and micro-turbines for biogas/producer gas/biosyngas.
- Design and development of direct gas-fired absorptive chillers, driers, stoves, etc., and improvement in biomass furnaces, boilers, etc.
- Engine modifications for using more than 20% biodiesel as a blend with diesel.
- Development of second-generation bioliquid fuels and related applications.
- Diversification of feed stocks to utilize alternate biomass wastes along with cattle dung for setting up household biogas plants. Methods for sustaining biogas production during winter months.
<table>
<thead>
<tr>
<th>Waste-to-energy</th>
<th>Technology and successful demonstration of biomethanation, combustion/incineration, pyrolysis/gasification, landfill gas recovery, densification, and pelletization.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geothermal</td>
<td>Technology supplier/equipment manufacturer/project developer for geothermal energy harnessing.</td>
</tr>
<tr>
<td>Tidal</td>
<td>Technology supplier/equipment manufacturer/project developer for harnessing tidal energy.</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>Energy service companies (ESCOs), energy efficiency equipment for buildings/industries.</td>
</tr>
</tbody>
</table>
## Appendix “G” – Overseas Investment Policy in India (2004 onwards)

### Overseas Investment Policy in India

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enhancement in the Monetary Ceiling for Overseas Investment by Eligible Indian Entities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>January 2004</strong></td>
<td>Allowed to invest up to 100 per cent of their net worth in overseas JV/WOS without any separate monetary ceiling</td>
</tr>
<tr>
<td><strong>May 2005</strong></td>
<td>Allowed to invest up to 200 per cent of their net worth. The ceiling is not applicable to investments made out of balance held in EEFC accounts and proceeds of ADR/GDR</td>
</tr>
<tr>
<td><strong>June 2007</strong></td>
<td>The limit under the Automatic route enhanced from 200 per cent to 300 per cent of the net worth</td>
</tr>
<tr>
<td><strong>Sept 2007</strong></td>
<td>The limit under the Automatic route enhanced from 300 per cent to 400 per cent of the net worth</td>
</tr>
<tr>
<td><strong>General permission for disinvestment</strong></td>
<td></td>
</tr>
<tr>
<td><strong>March 2006</strong></td>
<td>Under the Automatic Route, Indian entities are allowed to disinvest without prior approval of RBI subject to certain conditions</td>
</tr>
<tr>
<td><strong>Proprietorship/partnership concern</strong></td>
<td></td>
</tr>
<tr>
<td><strong>March 2006</strong></td>
<td>To enable recognised star exporters with a proven track record and a consistently high export performance, the proprietary/unregistered partnership firms allowed to set-up JV/WOS outside India with prior approval of RBI</td>
</tr>
<tr>
<td><strong>Investment by Mutual Funds registered with SEBI</strong></td>
<td></td>
</tr>
<tr>
<td><strong>July 2006 To June 2008</strong></td>
<td>Aggregate ceiling for overseas investments by MFs increased from US$ 1 to 2 billion, which has gradually increased to the present level of US$ 7 billion. A limited number of qualified Indian mutual funds are allowed to invest cumulatively up to US$ 1 billion in the overseas ETFs permitted by SEBI</td>
</tr>
<tr>
<td><strong>Overseas Investment by Indian Venture Capital Funds (VCFs) registered with SEBI</strong></td>
<td></td>
</tr>
<tr>
<td><strong>April 2007</strong></td>
<td>VCFs permitted to invest in equity and equity-linked instruments of off-shore venture capital undertakings subject to an overall limit of US$ 500 million</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>June 2007</td>
<td>The limit for portfolio investments enhanced from 25 per cent to 35 per cent of the net worth of investing company as on the date of its last audited balance sheet. The limit of portfolio investments enhanced from 35 per cent to 50 per cent of net worth of the investing company as on the date of last audited balance sheet.</td>
</tr>
<tr>
<td>Sep 2007</td>
<td></td>
</tr>
<tr>
<td>June 2008</td>
<td>Indian companies allowed to invest in excess of 400 per cent of their net worth as on the date of last audited balance sheet in the energy and natural resources sectors.</td>
</tr>
</tbody>
</table>
**Appendix “H” – Comparison of the Various Options for Investors to Enter India**

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Liaison Office</th>
<th>Project office</th>
<th>Branch office</th>
<th>Subsidiary company</th>
<th>Limited Liability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Setting up requirements</strong></td>
<td>Require prior approval from Reserve Bank of India (RBI)</td>
<td>Require prior approval from RBI</td>
<td>Do not require prior approval from RBI if certain conditions are fulfilled</td>
<td>No prior approval required, if activities fall under the ambit of automatic route, only post facto filing with RBI required. Otherwise Foreign Investment Promotion Board (FIPB) approval required and then compliance with post facto filing required</td>
<td>This option is allowed in sectors that have a 100% automatic route with prior approval of the government</td>
</tr>
<tr>
<td><strong>Permitted Activities</strong></td>
<td>Only liaison, representation &amp; communication. No business or commercial activities</td>
<td>Activities permitted by RBI. No manufacturing except in SEZ units</td>
<td>Activities permitted by RBI. No manufacturing except in SEZ units</td>
<td>Any activity specified in the memorandum of association of the company. All activities subjected to FDI guideline</td>
<td>It can be engaged in sector / activities for which 100% of FDI is allowed without approval</td>
</tr>
<tr>
<td>Procedures</td>
<td>Liaison Office</td>
<td>Project office</td>
<td>Branch office</td>
<td>Subsidiary company</td>
<td>Limited Liability</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------------------------------</td>
<td>----------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>-------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Funding of Local Operations</strong></td>
<td>Only inward remittances received from Head Office from normal banking channels</td>
<td>Through inward remittances or earnings from permitted operations</td>
<td>Through inward remittances or earnings from permitted operations</td>
<td>Through equity or other permitted capital infusion or borrowings (as per norm) or internal accruals</td>
<td>Contribution in the capital should be through inward remittance or by debit to NRE or FCNR account</td>
</tr>
<tr>
<td><strong>Limitation of Liability</strong></td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
<td>Limited to the extent of equity participation in the Indian company</td>
<td>Liability of the partners is limited to the agreed contribution to the LLP except in the case of fraud or wrongful acts</td>
</tr>
<tr>
<td><strong>Compliance Requirements under Companies Act</strong></td>
<td>Registration and periodic filing of accounts</td>
<td>Registration and periodic filing of accounts and other documents</td>
<td>Registration and periodic filing of accounts and other documents</td>
<td>High statutory compliance and filing requirements</td>
<td>Registration with ROC required. File annual accounts and submit annual statement on solvency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Procedures</th>
<th>Liaison Office</th>
<th>Project office</th>
<th>Branch office</th>
<th>Subsidiary company</th>
<th>Limited Liability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliance Requirements under FEMA</td>
<td>Annual Compliance certificate (from auditors in India) to be filed with RBI</td>
<td>Annual activity / compliance certificate (from auditors in India) to be filed with RBI</td>
<td>Annual activity / compliance certificate (from auditors in India) to be filed with RBI</td>
<td>Periodic and annual filings relating to receipt of capital and issue of shares to foreign investors</td>
<td>No filing requirement</td>
</tr>
<tr>
<td>Compliance Requirements under IT Act</td>
<td>No tax liability since no commercial activities are carried out. However it you have to file annual information in prescribed form</td>
<td>Obliged to pay tax on income earned and required to file returns of income in India. No further tax on repatriation of profits</td>
<td>Obliged to pay tax on income earned and required to file returns of income in India. No further tax on repatriation of profits</td>
<td>Tax liability on global income on a net basis. Dividends declared freely remittable but subject to distribution tax of 16.2225% of dividends declared, distributed or paid.</td>
<td>Liable to be taxed 30.9 % on net income basis. No DDT levied on profit distribution</td>
</tr>
<tr>
<td>Permanent Establishments (PE)</td>
<td>Generally do not have PE due to limited activity scope</td>
<td>Usually constitute a PE and taxable presence under DTAA and domestic IT provisions</td>
<td>Usually constitute a PE and taxable presence under DTAA and domestic IT provisions</td>
<td>An independent taxable entity and not a PE of the foreign company unless subject to the provisions of DTAA</td>
<td>An independent taxable entity.</td>
</tr>
</tbody>
</table>
Appendix “I” – List of Companies Interviewed for Primary Research

Canadian Firms Interviewed

<table>
<thead>
<tr>
<th>Firm</th>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. PEI Aerospace</td>
<td>Lisa Clory</td>
<td>Executive Director</td>
</tr>
<tr>
<td>2. CarteNav Solutions Inc.</td>
<td>Paul Evans</td>
<td>COO</td>
</tr>
<tr>
<td>3. BIONova</td>
<td>Martin Greenwood</td>
<td>Director of Stakeholder Relations</td>
</tr>
<tr>
<td>4. BIOAtlantech</td>
<td>Meaghan Seagrave</td>
<td>Commercialization Officer</td>
</tr>
<tr>
<td>5. St. Mary’s University</td>
<td>Maureen Woodhouse</td>
<td>Director/Program Manager of International Activities</td>
</tr>
<tr>
<td>6. Independent/Saint Mary’s University/CMC Canada</td>
<td>Kevin Schwenker</td>
<td>Professor/Management Consultant</td>
</tr>
<tr>
<td>7. Edunova</td>
<td>Michael Rosson</td>
<td>Director of Mktg &amp; Recruitment</td>
</tr>
<tr>
<td>8. Ganong Bros., Limited</td>
<td>Terry Arthurs</td>
<td>Vice President – Export sales and Marketing</td>
</tr>
<tr>
<td>9. McCain Foods Limited</td>
<td>Calla Farn</td>
<td>VP Gov’t &amp; Public Relations</td>
</tr>
<tr>
<td>10. McCain Foods Limited</td>
<td>Elspeth M. Williams</td>
<td>General Counsel, APMEA</td>
</tr>
<tr>
<td>11. Atlantic Canadian Food and Beverage Processors</td>
<td>Don Newman</td>
<td>Executive Director</td>
</tr>
<tr>
<td>Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Ambir Solutions</td>
<td>Ian Cavanaugh</td>
<td>CEO</td>
</tr>
<tr>
<td>14. Interview Rocket</td>
<td>Craig Brown</td>
<td>Owner</td>
</tr>
<tr>
<td>15. Urban Vision Group</td>
<td>Mike Kilfoil</td>
<td>Owner</td>
</tr>
<tr>
<td>16. Atlantica Logistics</td>
<td>Greg Sheaves</td>
<td>Owner</td>
</tr>
<tr>
<td>17. NICOM IT Solutions</td>
<td>Pat d’Entremont</td>
<td>Owner</td>
</tr>
<tr>
<td>18. Marine Institute Newfoundland</td>
<td>Chelsey Laird</td>
<td>International Program Office</td>
</tr>
<tr>
<td>19. Virtual Marine Technologies</td>
<td>Patrick Linehan</td>
<td>Project Manager</td>
</tr>
<tr>
<td>20. Nova Scotia Power</td>
<td>Edward Townsend</td>
<td>Project Manager</td>
</tr>
<tr>
<td></td>
<td>Company</td>
<td>Name</td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>21.</td>
<td>Carbon Cure Technologies</td>
<td>Robert Niven</td>
</tr>
<tr>
<td>22.</td>
<td>Independent/Helwig Hydrotechnique</td>
<td>Philip Helwig</td>
</tr>
<tr>
<td>23.</td>
<td>Engineering Services Inc.</td>
<td>Andrew Goldenberg</td>
</tr>
<tr>
<td>24.</td>
<td>Hatch Ltd.</td>
<td>Mick Camilleri</td>
</tr>
<tr>
<td>25.</td>
<td>BLES Biochem</td>
<td>David Bjarneson</td>
</tr>
<tr>
<td>26.</td>
<td>Gudgeon Thermfire International</td>
<td>William (Bill) Gudgeon</td>
</tr>
<tr>
<td>27.</td>
<td>Levitt Safety Limited</td>
<td>Robert Fiset</td>
</tr>
</tbody>
</table>
## Indian Firms Interviewed

<table>
<thead>
<tr>
<th>Firm</th>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Poabs Organic Estates</td>
<td>Abraham Jacob</td>
<td>Director</td>
</tr>
<tr>
<td>2. Capital Foods Limited</td>
<td>Ajaay Gupta</td>
<td>MD &amp; CEO</td>
</tr>
<tr>
<td>3. Radhakrishna Foodland Pvt. Ltd.</td>
<td>Purvin Patel</td>
<td>COO</td>
</tr>
<tr>
<td>4. Kommlabs Dezign Pvt. Ltd</td>
<td>Karanvir Singh</td>
<td>CEO</td>
</tr>
<tr>
<td>5. Arrow Aircraft Sales &amp; Charters Pvt. Ltd</td>
<td>Rohit Kapur</td>
<td>MD</td>
</tr>
<tr>
<td>6. SRK Aviacom (I) Pvt. Ltd</td>
<td>Sanjay Kumar</td>
<td>Chairman &amp; MD</td>
</tr>
<tr>
<td>7. NMIMS University</td>
<td>Rajan Saxena</td>
<td>Vice Chancellor</td>
</tr>
<tr>
<td>8. Mahatma Gandhi International School</td>
<td>Meenakshi Ganeriwala</td>
<td>Strategic Analyst and BTEC Coordinator</td>
</tr>
<tr>
<td>9. IIT, Powai</td>
<td>Nina Sabnani</td>
<td>Associate Professor, Industrial Design Centre</td>
</tr>
<tr>
<td>10. VMC Systems</td>
<td>B. Venkataramana</td>
<td>Executive Director</td>
</tr>
<tr>
<td>11. PHDCOMM</td>
<td>Prerak H. Mehta</td>
<td>Founder &amp; MD</td>
</tr>
<tr>
<td>12. Lepton Software Export and Research (P) Ltd</td>
<td>Rajeev Saraf</td>
<td>Co-Founder</td>
</tr>
<tr>
<td>13. Telemax Links India Pvt. Ltd</td>
<td>Vijay Singh</td>
<td>CEO</td>
</tr>
<tr>
<td>14. GeoMarine Biotechnologies (P) Ltd</td>
<td>Dr. T. Charles John Bhaskar</td>
<td>MD</td>
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<td>15. EGS Survey Private Limited</td>
<td>Cdr. P.K. Tyagi</td>
<td>MD</td>
</tr>
<tr>
<td>16. The Seafood Exporters Association of India</td>
<td>Sandu Joseph</td>
<td>Secretary</td>
</tr>
<tr>
<td>17. Orient Green Power Co. Ltd</td>
<td>P. Krishnakumar</td>
<td>MD</td>
</tr>
<tr>
<td>18. IVRCL Infrastructure</td>
<td>S. Rajagopalan</td>
<td>Head – Power Projects</td>
</tr>
<tr>
<td>19. IL&amp;FS Transportation Networks Ltd</td>
<td>Manish Arora</td>
<td>Manager – Business Development</td>
</tr>
<tr>
<td>20. IRB Infrastructure</td>
<td>Vinod Kumar Menon</td>
<td>V.P. – Business Development</td>
</tr>
<tr>
<td>21. Adani Ports &amp; SEZ</td>
<td>Vipul Shah</td>
<td>AVP – Chairman’s Office</td>
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