

**A STRATEGIC BUSINESS ANALYSIS MODEL FOR ECOXERGY  
SOLUTIONS' ENERGY AND GREENHOUSE GAS CONSULTING SERVICES.**

By

Anderson Gwanyebit Kehbila

Ph.D in Environmental and Resource Management,  
Brandenburg University of Technology, Germany, 2010

PROJECT SUBMITTED IN PARTIAL FULFILMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF BUSINESS ADMINISTRATION

In the Faculty of Business Administration

© Anderson Gwanyebit Kehbila 2012

All rights reserved. However, in accordance with the *copyright Act of Canada*, this work may be reproduced, without authorization, under the conditions for *Fair Dealing*. Therefore, limited reproduction of this work for the purposes of private study, research, criticism, review and news reporting is likely to be in accordance with the law, particularly if cited appropriately.

## **Approval**

**Name:** **Anderson Gwanyebit Kehbila**

**Degree:** **Master of Business Administration**

**Title of project:** **A Strategic Business Analysis Model for EcoXergy Solutions Energy and Greenhouse Gas Consulting Services**

**Supervisory Committee:**

---

**Dr. Mark Selman**  
Senior Supervisor  
Special Advisor to the Dean

---

**Dr. Jan Kietzman**  
Second Reader  
Assistant Professor

**Date Approved:** \_\_\_\_\_

## **Abstract**

The goal of this study was to assess the viability of the Canadian energy and greenhouse gas (GHG) consulting industry to support the development of a business concept and a go-to-market strategy for EcoXergy's consulting services business. A review of the literature points to information barriers, energy-market distortions, and capital constraints as the major barriers to the uptake of GHG abatement/energy efficiency measures in the trucking, commercial and institutional sectors.

In order to strengthen EcoXergy's competitive position, this study examined these barriers through detailed market, industry and SWOT analyses. Based on these analyses, strategic options were formulated to overcome identified challenges and capture the opportunities that provide the best path for long-term growth of the company's consulting services business. Considering the anticipated growth potential, low barriers to entry, low threats of substitutes and a lack of entrenched competition, this industry holds great promise for EcoXergy to be successful in the current environment.

**Keywords:** Energy, Climate Change, Consulting, Competitive Analysis, Market Analysis, Cap and Trade, Business Model, Marketing Strategy.

## **Dedication**

This work is dedicated to my parents, Daniel Buma Gwanyebit and Florence Odlu Gwanyebit, my siblings, Gein Misida Gwanyebit, Finlay Fofung Gwanyebit, Eric Dinga Gwanyebit and Rita Kahdoh Gwanyebit, and above all my lovely wife and son, Atenkeng Kehbila and Kelsey Dohlabang Kehbila. Your encouragement, love and unconditional support were fundamental to the successful realization of this work.

## **Acknowledgement**

I would like to sincerely thank Dr. Mark Selman and Dr. Jan Kietzman for their worthy counsel and insightful comments. Your valuable inputs were fundamental to the successful realization of this work.

Many thanks to Thomas Manson and his family for keeping me going in the toughest of times.

## Table of Contents

<b>Approval</b> .....	<b>ii</b>
<b>Abstract</b> .....	<b>iii</b>
<b>Dedication</b> .....	<b>iv</b>
<b>Acknowledgement</b> .....	<b>v</b>
<b>Table of Contents</b> .....	<b>vi</b>
<b>List of Figures</b> .....	<b>ix</b>
<b>List of Tables</b> .....	<b>x</b>
<b>Glossary</b> .....	<b>xi</b>
<b>1: Introduction</b> .....	<b>1</b>
1.1 Company Overview .....	1
1.2 Project Rationale and Scope .....	1
1.3 Market Overview .....	2
1.4 Projected Revenue .....	5
1.5 Study Objectives.....	7
1.6 Methodology.....	8
1.7 Study Outline .....	8
<b>2: Background</b> .....	<b>9</b>
2.1 Overview of Cap and Trade Regulations .....	10
2.1.1 The Western Climate Initiative.....	11
<b>3: Market Potential Analysis</b> .....	<b>12</b>
3.1 Criteria for Analyzing Market Potential and Size for Buildings .....	14
3.1.1 Building’s Age.....	14
3.1.2 Energy Retrofit Activities by Region .....	16
3.1.3 Building Ownership.....	17
3.1.4 Primary Heating Sources .....	19
3.2 Market Potential and Size of the Transportation Sector.....	22

<b>4: Industry Potential Analysis .....</b>	<b>25</b>
4.1 Summary of Five Forces Analysis.....	26
4.2 Threat of New Entrants (High).....	28
4.3 Rivalry (Moderate) .....	29
4.4 Supplier Power (High).....	30
4.5 Customer Power (Moderate) .....	31
4.6 Substitutes (Low).....	32
4.7 Industry Key Success Factors.....	33
4.7.1 Specialized Skills.....	33
4.7.2 Upfront Capital Cost Leadership .....	34
4.7.3 Brand Recognition .....	34
4.7.4 Service Differentiation.....	34
4.8 Competitor Analysis .....	35
4.8.1 Industry Value Proposition Map.....	39
4.8.2 Opportunities Identified.....	41
<b>5: Internal Analysis .....</b>	<b>42</b>
5.1 Resources.....	42
5.1.1 Financial Resources .....	42
5.1.2 Intangible Resources.....	42
5.2 Management and Organizational Structure .....	43
5.3 Marketing and Sales Capabilities .....	44
5.4 SWOT Analysis .....	44
5.4.1 Threats .....	46
5.4.2 Opportunities .....	46
5.4.3 Strengths and Weaknesses.....	49
<b>6: Strategic Option Analysis .....</b>	<b>49</b>
6.1 Short term Adaptive Strategies.....	50
6.1.1 Exploit Inbound and Outbound Marketing.....	50
6.1.2 Foster Strategic Partnerships and Provide Initial Free Consultations .....	51
6.1.3 Exploit Smart Meters and Target Government and Older Private Buildings ...	51

6.1.4 Provide Initial Public Offerings to Prospective Customers and Leverage their Local Knowledge and Networks into the Company’s Business Strategy .....	53
6.2 Long term Game-changing Strategies for Market Expansion .....	55
6.3 Value Proposition of the Umbrella Holding Company .....	58
6.4 Strategic Options for the Umbrella Holding Company .....	60
6.4.1 Organizational Expertise .....	62
6.4.2 Customer Segment and Green Loans .....	63
6.4.3 Energized Lithium-Ion Battery .....	64
6.4.4 Centralized IT-based Energy and GHG Management Systems.....	65
<b>7: Conclusion.....</b>	<b>65</b>
<b>8: Appendices .....</b>	<b>67</b>
8.1 Data Analysis - Interviews and Corporate Surveys.....	67
8.2 Data Analysis – Interviews with Financial Institutions.....	69
8.3 Data Analysis – Corporate Questionnaire Interviews .....	72
<b>9: References .....</b>	<b>73</b>



## List of Figures

Figure 1 GHG emissions reduction Technologies.....	10
Figure 2 Commercial and Institutional Buildings by year of construction in Canada .....	15
Figure 3 Energy retrofit activities and number of commercial and institutional buildings by region in Canada, 2000.....	17
Figure 4 Commercial and Institutional buildings by ownership in Canada, 2000 .....	18
Figure 5 Principal Energy Sources for heating (rate use).....	20
Figure 6 Commercial and Institutional Buildings by energy retrofits activity in Canada,21	
Figure 7 Light vehicles in Canada, 2008 .....	22
Figure 8 Vehicles in Canada (in millions) by Region, 2008 .....	23
Figure 9 Medium and Heavy Duty Trucks in Canada, 2008.....	24
Figure 10 Vehicles in Canada by type and Fuel, 2008.....	25
Figure 11 Forces driving competition for Energy and Greenhouse Gas Consulting in the trucking, institutional, and commercial Sectors in Canada. ....	26
Figure 12 Factors affecting new entry .....	28
Figure 13 Forces driving competition .....	29
Figure 14 Drivers of supplier power.....	30
Figure 15 Drivers of Customer Power.....	31
Figure 16 Factors influencing the treat of substitutes.....	32
Figure 17 Industry Value Proposition Map .....	40
Figure 18 Proposed disruptive architecture for EcoXergy’s consulting services busines.	56
Figure 19 Value proposition of the Umbrella Holding Company .....	59
Figure 20 Strategic energy and GHG management plan for the Umbrella Holding .....	61

## **List of Tables**

Table 1 EcoXergy Competitors comparison .....	35
Table 2 SWOT Analysis .....	45
Table 3 Companies' characteristics .....	67

## **Glossary**

<b>GHG</b>	Greenhouse gas
<b>BCTA</b>	British Columbia trucking association
<b>CO<sub>2</sub>e</b>	Carbon dioxide equivalent
<b>MC</b>	Marginal costs
<b>WCI</b>	Western Climate Initiative
<b>IEDC</b>	International Economic Development Council
<b>RFP</b>	Request for Proposal
<b>IT</b>	Information Technology

## **1: Introduction**

### **1.1 Company Overview**

EcoXergy Solutions is a consulting company founded in late 2009, under the Canadian Corporate Law, and headquartered in Vancouver, British Columbia. The company provides carbon trading analysis, measuring/auditing, monitoring, tracking and the verification of energy conservation and Greenhouse gas (GHG) emission reductions to curb the carbon footprints and energy costs of businesses and improve their financial bottom line. The company's team currently comprises of four freelance consultants with expert knowledge in energy and greenhouse gas management, sustainability, carbon trading consulting, business development, and policy analysis and development (EcoXergy, 2009). A detailed analysis of the company's resources, management and organizational structure, marketing and sales capabilities are provided in Section five.

### **1.2 Project Rationale and Scope**

.Three central problems facing firms in the energy and GHG consulting industry are: (1) information barriers such as a lack of clear-cut financial case for energy efficiency investments, (2) energy-market distortions in terms of split incentives for energy efficiency investments between landlords and tenants, and (3) capital constraints deterring small and medium sized businesses from making capital investments for energy efficiency upgrades (Beinhocker et al. 2008; Farrell et al. 2008a). In order to strengthen EcoXergy's competitive position, this study examines these problems through detailed market, industry and SWOT analyses. Based on these analyses, strategic options are

formulated to overcome identified challenges and capture the opportunities that provide the best path for long-term growth of the company's consulting services business. Based on EcoXergy's strengths and weaknesses, alignment between the company's core capabilities and the strategic options are examined. It is hoped that the work described here will provide a foundation for developing a grounded business plan for the company.

### **1.3 Market Overview**

The Canadian market for energy and GHG consulting in the commercial, institutional and transportation sectors is still in its infancy, and has been stalled by an array of market distortions and information barriers.

For institutional organizations and commercial businesses, market distortions and structural difficulties such as split incentives between landlords (who pay for energy efficiency investments) and tenants (who enjoy lower electricity and gas bills) make investment in energy and greenhouse gas management problematic" (Hartman et al., 2008, pg 35). In addition, a lack of clear-cut financial case for energy efficiency investments by prospective customers with little information on efficiency alternatives and potential savings further exacerbates the problem (Watts, 2011, pg 3; Beinhocker et al. 2008, pg23). That together with capital constraints as well as small and fragmented energy costs, which are a small portion of a company's overhead costs further aggravate the problem. (Beinhocker et al. 2008, pg 23; Farrell et al. 2008(b) pg 23) Thus "standoff between landlords not enthusiastic about making capital investments that benefit their

tenants and tenants' high turnover rate and uncertainty about being able to capture future energy savings that require a payback period of two to five years of their investment presents a major setback for consulting firms in the energy and GHG industry” (Farrell et al. 2008 (a) pg 30).

For heavy duty trucking companies, high incremental cost of energy efficient trucks, information and knowledge gaps in the areas of carbon trading, energy and emissions auditing make the transition to low-carbon trucks problematic. That together with “limited marketing and a lack of a comprehensive education and outreach initiative that provides fleet owners with the economic, operational and technical information they need to calculate payback and reduce risks help explain the low uptake of low-carbon vehicles to date” (Natural Gas Use in Transportation Round Table, 2010 pg 30).

Despite these challenges, the market for energy and GHG consulting for trucking companies and for institutional organizations and commercial businesses is expected to experience rapid growth:

For trucking companies, that growth is attributed to the need for fleet operators to invest strategically in low-carbon vehicles and comply with upcoming GHG emissions regulations due to take effect in 2014. For heavy duty trucking companies, EcoXergy seeks to provide technical and management consulting services on emissions trading and

regulatory compliance, carbon certification audits as well as grant application and project management support.

For institutional organizations and commercial businesses, the growth potential is attributed to growing awareness of government rebates and utility incentives for energy efficiency upgrades and in part to current cap and trade regulations for public buildings. For instance, the underserved and dilapidated nature of First Nations buildings (First Nations National Building Officers Association, 2011) offers an attractive market potential for EcoXergy's consulting services business.

EcoXergy seeks to explore these two emerging business opportunities by carefully tailoring its core competencies in energy and GHG management to meet the ever-changing needs for GHG expertise of: a) trucking firms who need to invest in low-carbon vehicles, and b) organizations and businesses who desire to benefit from government incentives to upgrade their buildings. Initially, the company plans to focus and tailor its consulting services to better serve small and medium sized institutional organizations and commercial businesses, particularly First Nations businesses that are currently underserved, while targeting the trucking industry in the next three years when the proposed carbon regulations for heavy duty vehicles take effect in 2014. This strategy seeks to: (1) increase awareness of government incentives and rebates for energy efficiency upgrades, (2) provide a better service to this sector highly underserved by competitors, and (3) create buzz through a few success stories, which is essentially cheap

marketing, by means of early customers sharing their experiences with other businesses in their local network and beyond. EcoXergy's success is therefore going to lie in the business model (pay as you save) it has developed to compete in this industry.

However, regulatory and licensing barriers currently prohibit EcoXergy from providing its consulting services directly to residential clients. The company has sought to bridge this barrier through a subcontractor agreement with a government accredited service provider. Besides, other potential sectors like industrial operations, maritime and rail transports are not currently being aggressively pursued due in part to a lack of financial resources to bring on board professionals with expert knowledge in these sectors. These sectors are, however, potential areas of focus as the company develops. In light of these changes, this study provides an important review of the literature and a market survey to develop strategic alternatives for EcoXergy. With this goal, an analysis of the market potential and an assessment of the receptiveness of businesses to EcoXergy's energy and GHG consulting business model are conducted.

#### **1.4 Projected Revenue**

EcoXergy's current revenue is based on consulting fees for carbon trading analysis, measuring/auditing, monitoring, tracking and the verification of energy conservation and GHG emission reductions. Based on the market overview presented above, the company seeks to target: a) small and medium sized trucking companies who need to update their fleet and b) institutional organizations and commercial businesses who desire to



capitalize on government incentives (e.g., hotels, motels, resorts, retail stores, clinics, banks, offices, community centres and public libraries).

With approximately 23,000 registered trucking companies in British Columbia (BCTA, 2011) and an average consulting fee of \$15,000 to audit the energy consumption and calculate GHG emissions of a trucking company's fleets and buildings, the total revenue for energy and GHG consulting for this sector could reach  $(23,000 \times \$15,000) = \$345,000,000$ . Assuming that one quarter of these trucking companies eventually comply with upcoming GHG emissions regulations backed with government rebates/incentives, the actual revenue for this sector could reach  $(\$345,000,000 \text{ from the total market} \times 25\% \text{ uptake}) = \$86,250,000$ . A projected market share of 1% over the next five years backed with EcoXergy's pending pre-authorized green loans to cover upfront capital costs would generate a total revenue of  $(\$86,250,000 \text{ from actual market} \times 1\%) = \$862,500$  for EcoXergy. This is the projected revenue from energy and GHG consulting services in British Columbia. Other regions such as Ontario, Quebec and the Prairies equally hold great promise for scalability thanks to current upcoming cap and trade regulations as well as energy efficiency incentives and rebates for operators.

With approximately 16,681 institutional organizations and commercial businesses in British Columbia operating out of buildings over 20 years old (Statistics Canada, 2008) and an average consulting fee of \$10,000 to audit the energy consumption and calculate GHG emissions of a building, the total industry's revenue could reach  $(16,681 \times$

\$10,000) = \$166,810,000. Assuming that one quarter of these organizations and companies capitalize on government rebates and utility incentives for energy efficiency retrofit projects, the actual revenue for this sector could reach (\$166,810,000 for the total market X 25% uptake) = \$41,702,500. A projected market share of 2% over the next three years backed with EcoXergy's pending pre-authorized green loans for energy efficiency upgrades would generate a total revenue of (\$41,702,500 from actual market X 2%) = \$834,050 for EcoXergy. Just as with trucking companies institutional organizations and commercial businesses hold great promise for scalability in other regions like Ontario, Quebec and the Prairies Other regions such as Ontario, Quebec and the Prairies equally hold great promise for scalability due to current cap and trade regulations as well as energy efficiency incentives and rebates in these sectors.

Based on the above calculations, EcoXergy's total revenue for its energy and GHG consulting services business over the next 5 years could reach (\$862,500 + \$834,050) = \$1,696,550.

### **1.5 Study Objectives**

The main thrust of this project is to assess the viability of the Canadian energy and GHG consulting industry to support the development of a business concept and a go-to-market strategy for EcoXergy's consulting services business over the next 3 years. Specific objectives are: (1) to identify key success factors for EcoXergy's future growth strategy by conducting an industry potential analysis, (2) to propose a business model and

formulate strategic options that refine EcoXergy's services and offer better value to its customers.

## **1.6 Methodology**

This project applies a combination of research approaches, subdivided into 4 major phases. In phase 1, a secondary/desk research in the form of literature review and existing market data is employed to ascertain the market potential for energy and greenhouse gas consulting services in the commercial, institutional and transportation sectors. In phase 2, Porter's Five Forces Model is employed to assess the challenges and opportunities embedded within the energy and GHG consulting industry. Phase 3 focuses on developing a business model and go-to-market strategies that take into account EcoXergy's internal capabilities and its external environment. In phase 4 a primary research in the form of personal and/or telephone interviews with a representative sample of ecosystem players in these sectors is employed to explore and understand their attitudes and receptiveness to a variety of service options in the market. The information gathered in phase 4 is analyzed and synthesized to assess the feasibility of the proposed business model and strategic options proposed in phase 3.

## **1.7 Study Outline**

This introductory section presented EcoXergy and the services it provides. It provided a brief overview of the company's target market, followed by the project's rationale, purpose and methodology of the study. The following section, Section 2, provides an

overview of the industry and explores how offsets work within the Canadian context. Section 3 assesses the market potential and size of the commercial, institutional and transportation sectors. Section 4 provides an industry analysis of the energy and greenhouse gas management consulting industry. Section 5 focuses on the internal and SWOT analyses of EcoXergy. Section 6 proposes a business model and go-to-market strategies for EcoXergy. Section 7 includes a preliminary market survey to assess the receptiveness of businesses to energy and GHG consulting services. The section further provides insights from potential investors regarding their involvement and attitudes towards investing in low-carbon projects in the commercial, institutional and transportation sectors. In Section 8, the study concludes with strategic recommendations to enhance alignment between EcoXergy's internal capabilities (strengths and weaknesses) and its external environment (opportunities and threats).

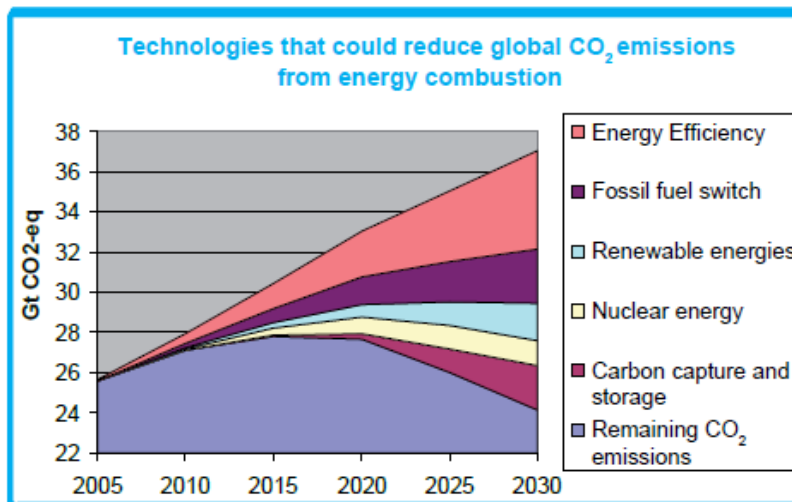
## **2: Background**

This section provides an analysis of the cap and trade regime as it sets the context for energy and GHG management in Canada and British Columbia in particular. Besides, an economic rationale for curbing pollution through emissions trading is provided. Further, key activities that are involved in the Canadian energy and GHG management consulting industry are defined.

## 2.1 Overview of Cap and Trade Regulations

Heightened concern about the deleterious impacts of climate change has prompted policy makers around the globe to propose an array of market based strategies aimed at curbing greenhouse gas emissions (Wheeler, 2007). Contrary to command and control regulations, market based strategies, such as cap and trade regimes, are designed to enable the market to assign a price tag to emissions while providing emitters with the flexibility to curb their emissions cost-effectively (Pew Center, 2008; WCI, 2009). From an economic standpoint, polluting facilities with lower marginal costs (MC) of pollution will seek to employ abatement technologies (Figure 1) to mitigate pollution, while facilities with higher MC of mitigation will seek to offset their emissions restrictions by purchasing pollution permits from other facilities (WCI, 2009; Horne, 2008; Ludwig, 2004), which may either sell unused allowances or bank them to offset higher emission levels in the future (Pew Center, 2008).

Figure 1 GHG emissions reduction Technologies



(Source: European Commission, 2009)

According to Horne (2008) and the Pew Center (2008), offsets derived from emission technologies are required to represent real emission reductions, be in possession by a single provider, be additional, quantifiable, verifiable, permanent, and counted once in order to ensure validity. Given that the prices of electricity, coal, gas and oil together with the state of the global economy shape the value of carbon credits (WCI, 2009a; Linacre et al. 2011; IEDC, 2009), complementary policies such as carbon taxes, renewable energy initiatives, energy efficiency and emission standards are crucial in enhancing the effectiveness of a cap and trade regime (Pew Center, 2008; WCI, 2009a).

### **2.1.1 The Western Climate Initiative**

This is a comprehensive carbon trading program proposed by six US states (California, Oregon, Washington, New Mexico, Utah and Montana) and five Canadian provinces (British Columbia, Alberta, Ontario, Manitoba, and Quebec) to address climate change (WCI, 2009b). With a mandate to curb regional greenhouse gas emissions by 15% of 2005 levels by 2020, the western Climate Initiative encompasses a broad range of sources comprising of industrial process emissions, electricity generation (including imported electricity consumed in the region), fossil fuel combustion from transportation, residential, commercial, and industrial facilities (WCI, 2009b). Under this mandate, facilities with annual emissions of over 25,000 metric tonnes of CO<sub>2</sub>e are compelled to abide by the regulation while amenities with annual emissions of over 10,000 metric tonnes of CO<sub>2</sub>e are obliged to monitor and report emission concentration starting in January 2010 (WCI, 2009b).

As a member of the Western Climate Initiative, the Government of British Columbia (BC) took the lead by enacting the BC's Greenhouse Gas Reduction (Cap and Trade) (Pacific Carbon Trust, 2010) after the Canadian senate voted, on November 2010, against the anticipated Climate Change Accountability Act previously approved by the House of Commons on May 2010 (Shelford, 2010). As Hamilton (2011) puts it, the Cap and Trade Act, complemented by the Carbon Tax Act, shape the BC carbon market currently valued at over \$1billion. With current carbon prices at \$20 per tonne and a projected increase to \$30 per tonne by 2012, the Pacific Carbon Trust, a government established Crown Corporation, is poised to regulate and broker carbon credits in the new low-carbon economy in British Columbia (Shelford, 2010). With 2007 representing the baseline year, the Cap and Trade Act mandates GHG emission reductions of 6, 18, 33 and 80 percentage points by 2012, 2016, 2020 and 2050 respectively (Pacific Carbon Trust, 2010).

### **3: Market Potential Analysis**

In this section, the market potential for energy and GHG Consulting has been analyzed based on a list of strategic criteria used to generate the strategic options in section 6.4.4. The market potential has been analyzed by energy retrofit activities by region, building's age, type of organization, whether private, non-profit or governmental, and principal energy source of heating to assess businesses with high economic potential for EcoXergy's energy and GHG consulting services.

First, the age of a building generally depicts the economic potential for energy cost savings vis-à-vis modern energy retrofit technologies. The older a building and its mechanical systems, the higher the economic potential in terms of energy cost savings. Second, the type of organization depicts the type of businesses that are mandated to offset their carbon emissions under the cap and trade regulations as the case with government organizations in Alberta, British Columbia, Ontario and Quebec. Third, principal energy source of heating such as natural gas and oil depicts the market potential for the generation of carbon credits through renewable energy technologies such as wind and/or solar boilers and heaters. Lastly, energy retrofit activities by region reveal regional energy efficiency and GHG management adoption rates and signal where EcoXergy should focus its short and long term marketing efforts. Thus regions with low energy retrofit adoption rates hold great promise for incremental market penetration as highlighted in section 6.

EcoXergy will specifically target regions, organizations and businesses that meet the above outlined criteria (i.e. building's age, energy retrofits activities by region, type of organization, whether private, non-profit or governmental, and principal energy source of heating). The company seeks to accomplish the first and fourth criteria through initial free walkthrough energy and GHG demonstration audits. By so doing, EcoXergy will be able to capitalize on the relationship between customers' productivity gains associated with GHG and energy efficiency investments and the company's profitability, which is



based on a portion of cash flows derived from energy cost savings and the monetization of carbon credits.

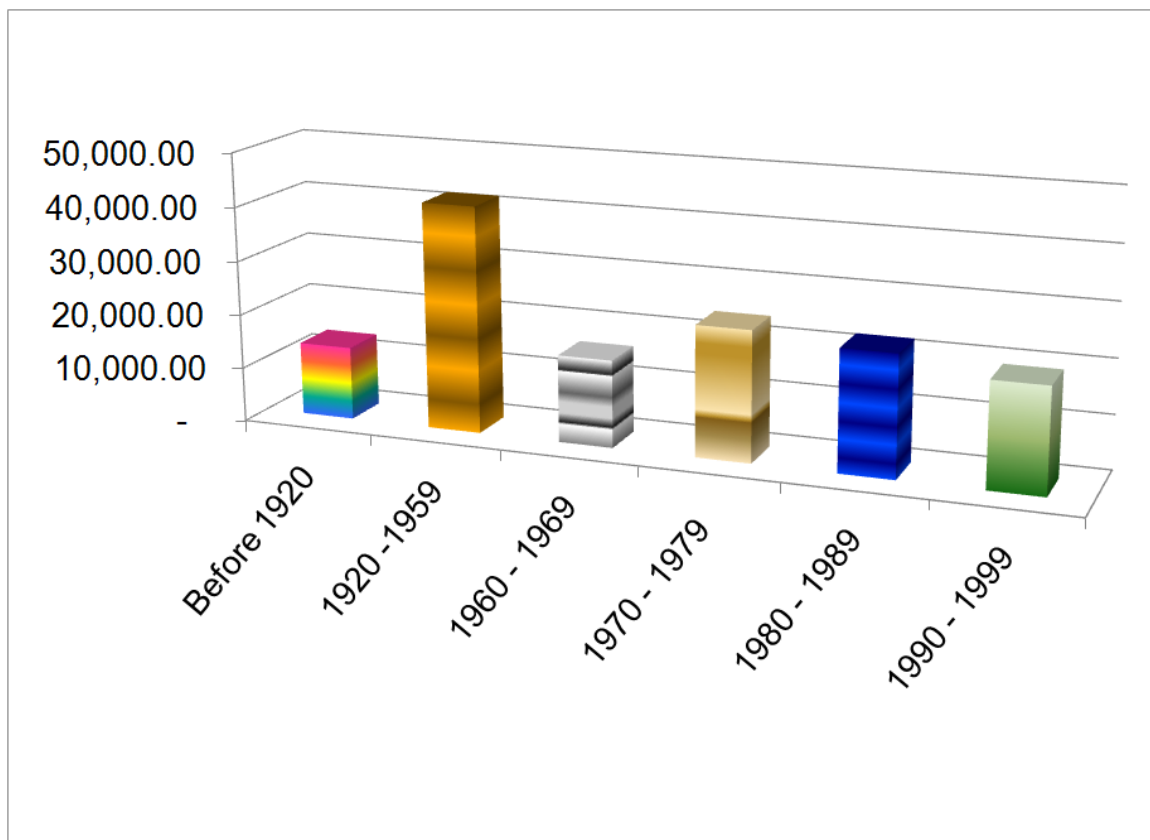
### **3.1 Criteria for Analyzing Market Potential and Size for Buildings**

#### **3.1.1 Building's Age**

In this analysis the year of construction of a commercial/institutional building is critical given the relation between a building's age and EcoXergy's profit margin. This is a core element of the company's business model given that a significant amount of the company's revenue will be derived from a portion of cash flow generated by prospective customers' energy cost savings. Thus the age of a building and its mechanical systems will play a critical role in EcoXergy's profit margin given that older buildings with outdated appliances hold tremendous potential for higher energy cost savings, thus higher economic rents for EcoXergy.

As depicted in figure 2, businesses operating out of buildings constructed between 1920 and 1999 dominate the Canadian energy and greenhouse gas consulting market comprising of 137,039 buildings; the largest segment being commercial properties constructed between 1920 and 1959 comprising of 41,828 buildings. These aging national commercial properties represent a strong potential market for energy efficiency and GHG consulting in terms of higher energy cost savings attributed to replacing outdated technologies with modern energy efficient appliances.

Figure 2 Commercial and Institutional Buildings by year of construction in Canada,2000



(Data obtained from Bilodeau et al. 2002)

Generally, buildings less than 20 years old (i.e. buildings constructed after 1991) present minimal likelihood for retrofit projects due to nominal energy cost savings while those greater than 20 years of age (i.e. buildings constructed before 1991 with outdated inefficient technologies) represent high prospects for EcoXergy consulting services business due to tremendous energy cost savings potential with modern highly efficient technologies. EcoXergy will seek to capitalize on this potential by providing initial free demonstration energy audits to establish clear-cut financial cases for energy efficiency

retrofit projects, in terms of potential energy cost savings, thereby gaining volume and share.

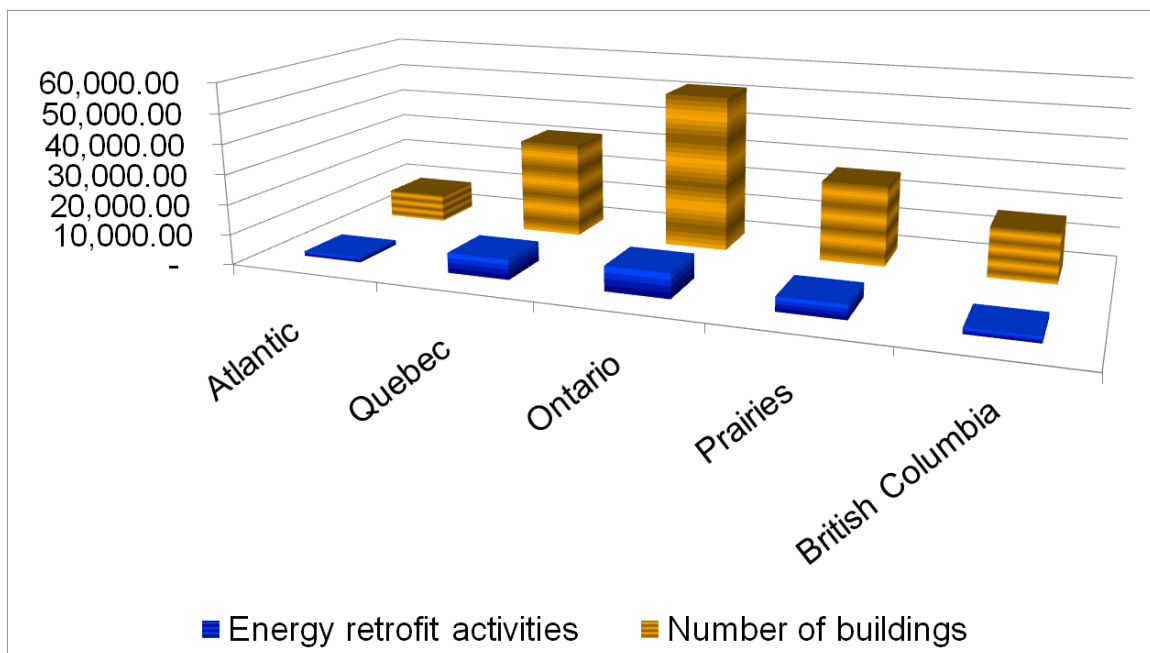
### **3.1.2 Energy Retrofit Activities by Region**

Focusing its initial marketing efforts in BC within the next 3 years, EcoXergy seeks to leverage its marketing know-how into other regions of the country over the next 4-to-10 years. From that premise, a regional market analysis is critical in identifying jurisdictions with the highest market potential (i.e. regions with low adoption rates for energy retrofit activities). With the exception of the Atlantic region, all the other four regions have a significant number of institutional and commercial properties with Ontario topping the list (Figure 3).

Despite the huge number of commercial properties, significantly low regional adoption rates for energy retrofit activities hold great promise for EcoXergy's energy and GHG consulting services. For instance, out of 52,182 commercial and institutional business premises that were constructed in Ontario between 1920 and 1999 as depicted in figure 3, just 8,213 had some form of energy retrofit activities representing an adoption rate of 16%. Similar low adoption rates in British Columbia (12%), Quebec (21%), the Prairies (18%) and the Atlantic (17%) present a strong stepwise market penetration potential for EcoXergy's energy and GHG consulting services.

As helpful as these data may be in making preliminary strategic decisions to expand into other regions, further studies on building concentration, marketing and sales costs as well as the competitive environment in these regions are crucial in making the ultimate strategic decision to expand in other regions.

Figure 3 Energy retrofit activities and number of commercial and institutional buildings by region in Canada, 2000.



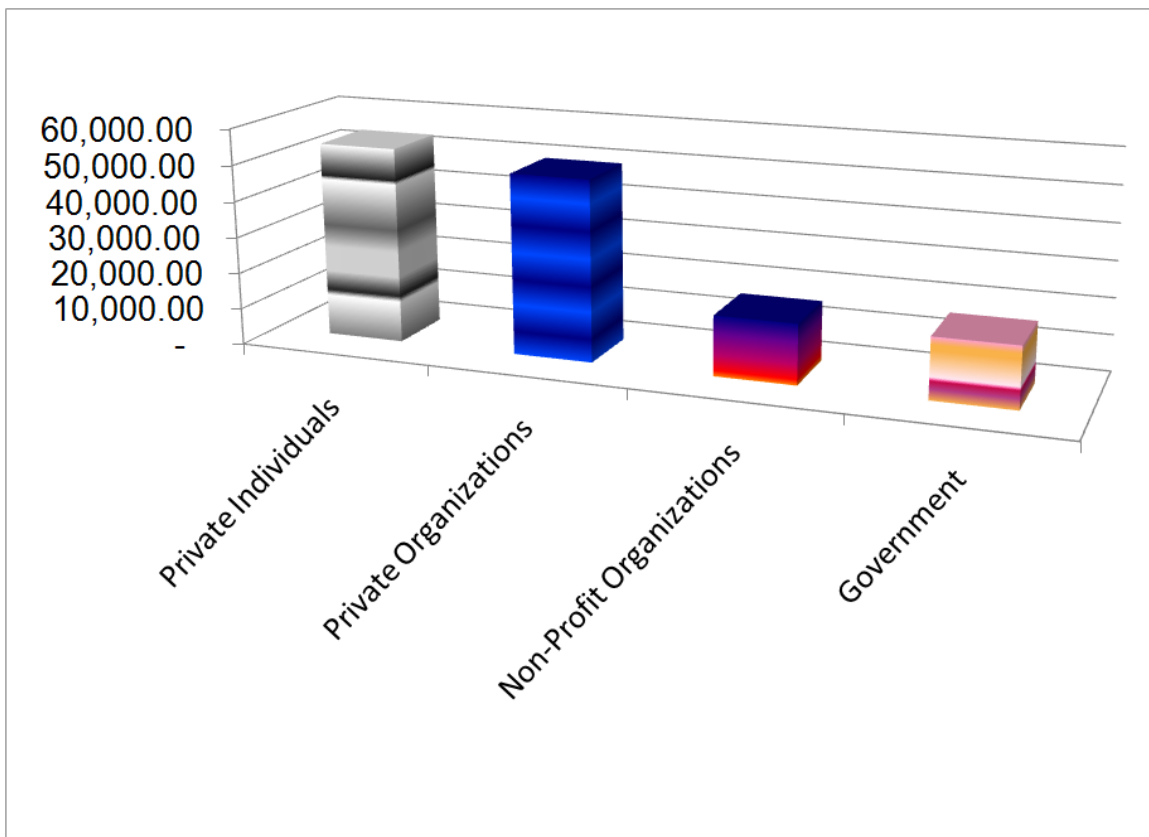
(Data obtained from Bilodeau et al. 2002)

### 3.1.3 Building Ownership

As mentioned earlier in section 3.0, building ownership depicts the type of businesses that are mandated to offset their carbon emissions under the cap and trade regulations as the case with government organizations in Alberta, British Columbia, Ontario and

Quebec. As depicted in figure 4, an overwhelming majority of building premises constructed between 1920 and 1999 were owned by private individuals and organizations representing 54,022 and 49,768 buildings respectively. That is followed by government and non-profit organizations with building ownerships totaling 16,745 and 16,505 respectively (Figure 4).

Figure 4 Commercial and Institutional buildings by ownership in Canada, 2000



(Data obtained from Bilodeau et al. 2002)

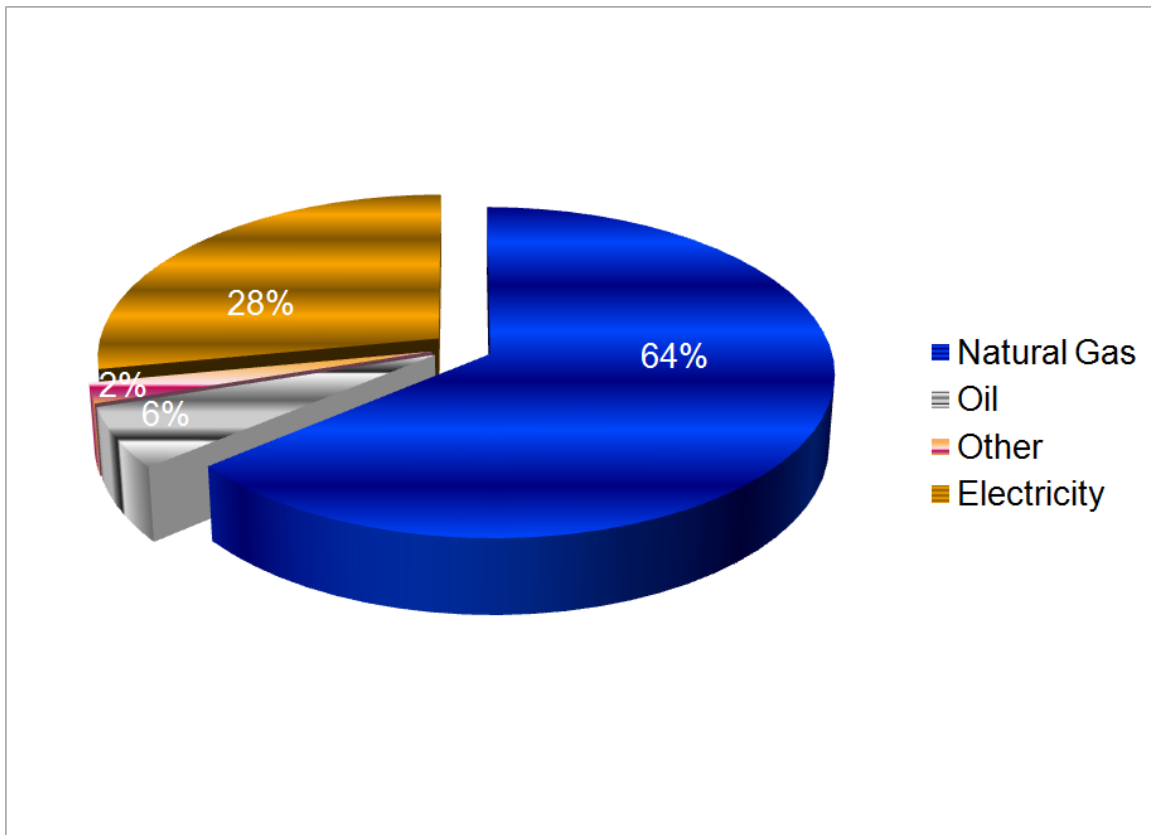
Although government organizations constitute 12% (about 16,745 buildings) of the market size, they hold great promise for EcoXergy's energy and GHG consulting services given that public sectors in British Columbia, Alberta, Ontario and Quebec are mandated to offset their GHG emissions under their provincial cap and trade regulations. With limited expertise in the areas of energy and emissions auditing as well as carbon trading, most government organizations have sought to comply with stringent cap and trade regulations by issuing request for proposals to qualified service providers, often through a bidding process. EcoXergy seeks to capitalize on this regulatory driver and grow its consulting business services in the commercial and institutional sectors while targeting the trucking industry in 2014 when the proposed carbon regulations come into effect that year.

#### **3.1.4 Primary Heating Sources**

An analysis of primary heating sources in the commercial and institutional sectors is critical in assessing the market potential for generating carbon credits through converting prospective customers' oil and natural gas furnaces and electrical heating appliances to renewable energy technologies such as underground heat pumps, and solar boilers and heaters. The relation between buildings' primary heating sources and EcoXergy's profit margin is a core element of the company's business model given that part of the company's revenue streams will be based on a portion of cash flows generated from carbon credits derived from the conversion of prospective customers' oil and natural gas furnaces and electric baseboards/heating appliances to renewable energy technologies.

Overall, natural gas and oil, with relatively high carbon contents of 1.9 and 2.8 kg CO<sub>2</sub>e/m<sup>3</sup> respectively (Environment Canada, 2010), constitute the primary heating sources for 64% and 6% of the 137,039 commercial and institutional buildings in Canada respectively, compared with 28% for hydro electricity (Bilodeau et al. 2002) with a low carbon content of 0.02 kg CO<sub>2</sub>e/kWh (Environment Canada, 2010) (Figure 5).

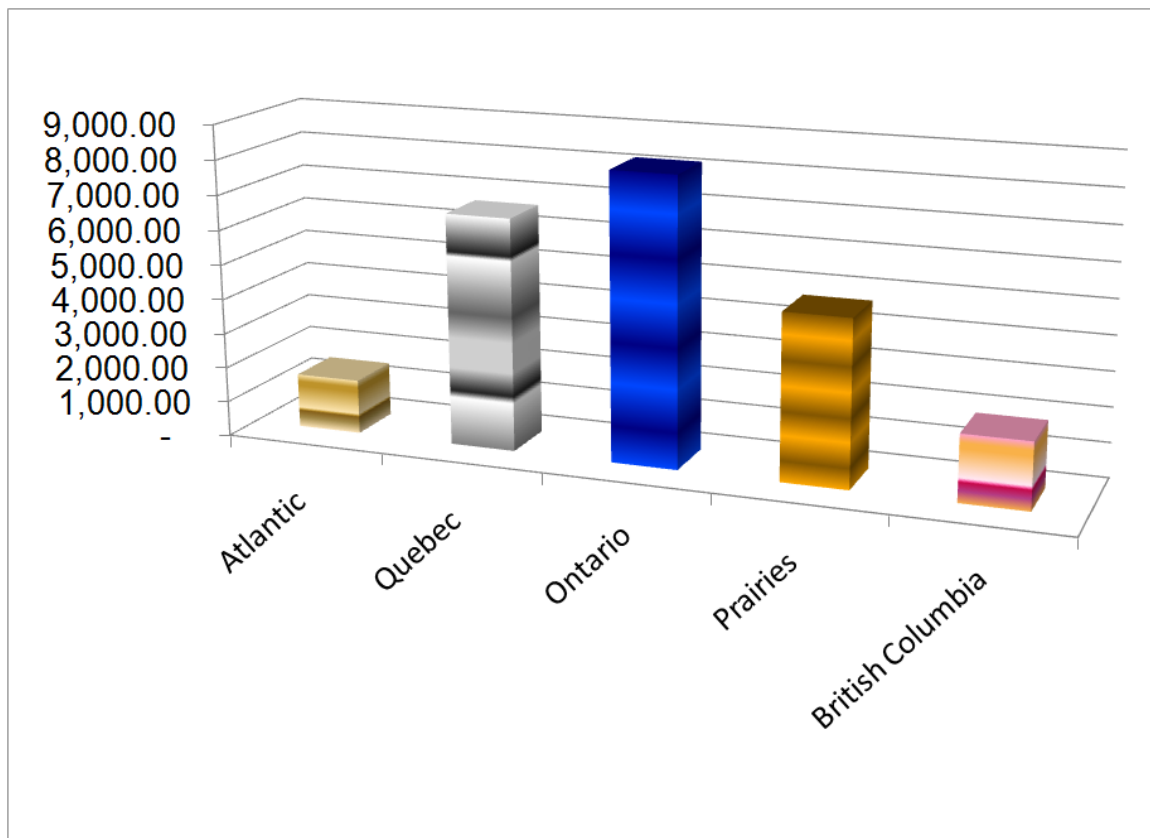
Figure 5 Principal Energy Sources for heating (rate use)



(Data obtained from Bilodeau et al. 2002)

Despite the relatively high carbon content of oil and natural gas compared to hydro electric heating, just about 23,087 of the 137,039 institutional and commercial buildings that were constructed between 1920 and 1999 had some form of energy retrofit activities as of December, 2000 (Figure 6). While this data depicts a strong market potential for generating carbon credits by converting prospective customers' high carbon oil and natural gas furnaces to renewable energy technologies, the value proposition for converting low carbon electric baseboards/heating appliances to renewable energy technologies lies in reducing the annual operating cost of such appliances.

Figure 6 Commercial and Institutional Buildings by energy retrofits activity in Canada, 2000.



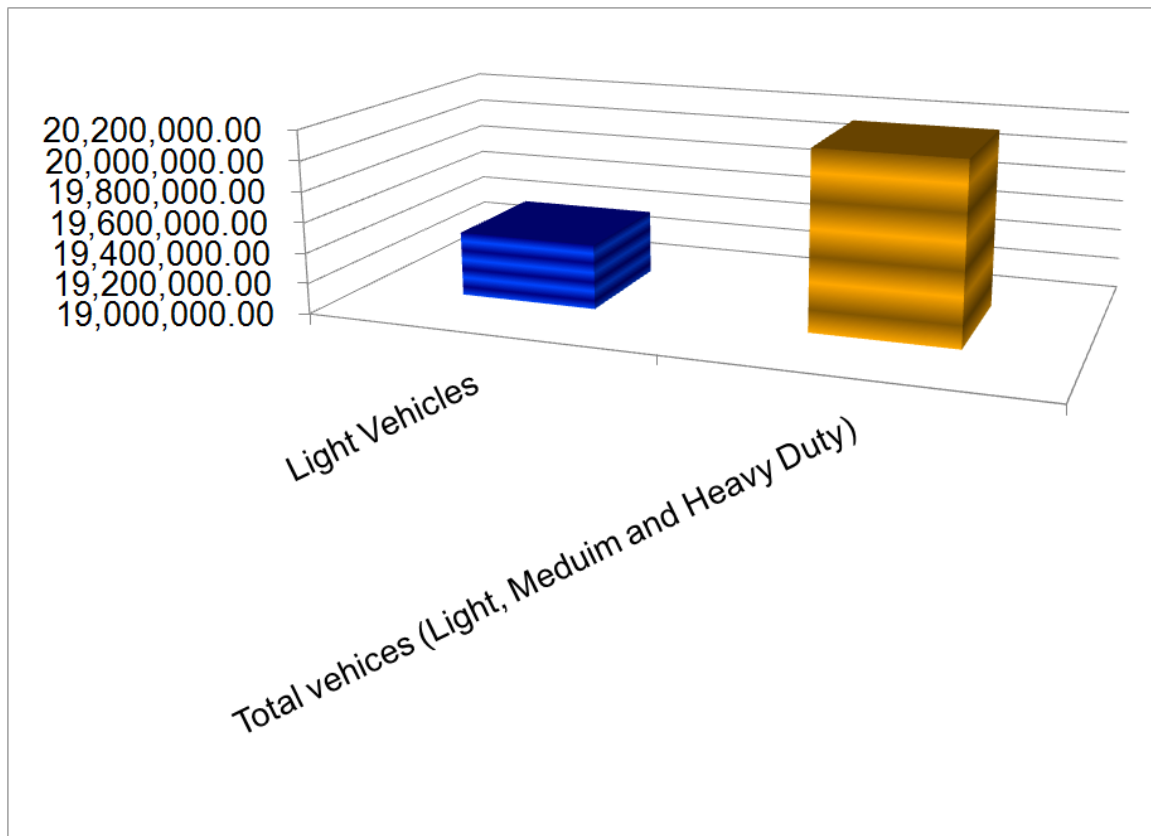
(Data obtained from Bilodeau et al. 2002)



### 3.2 Market Potential and Size of the Transportation Sector

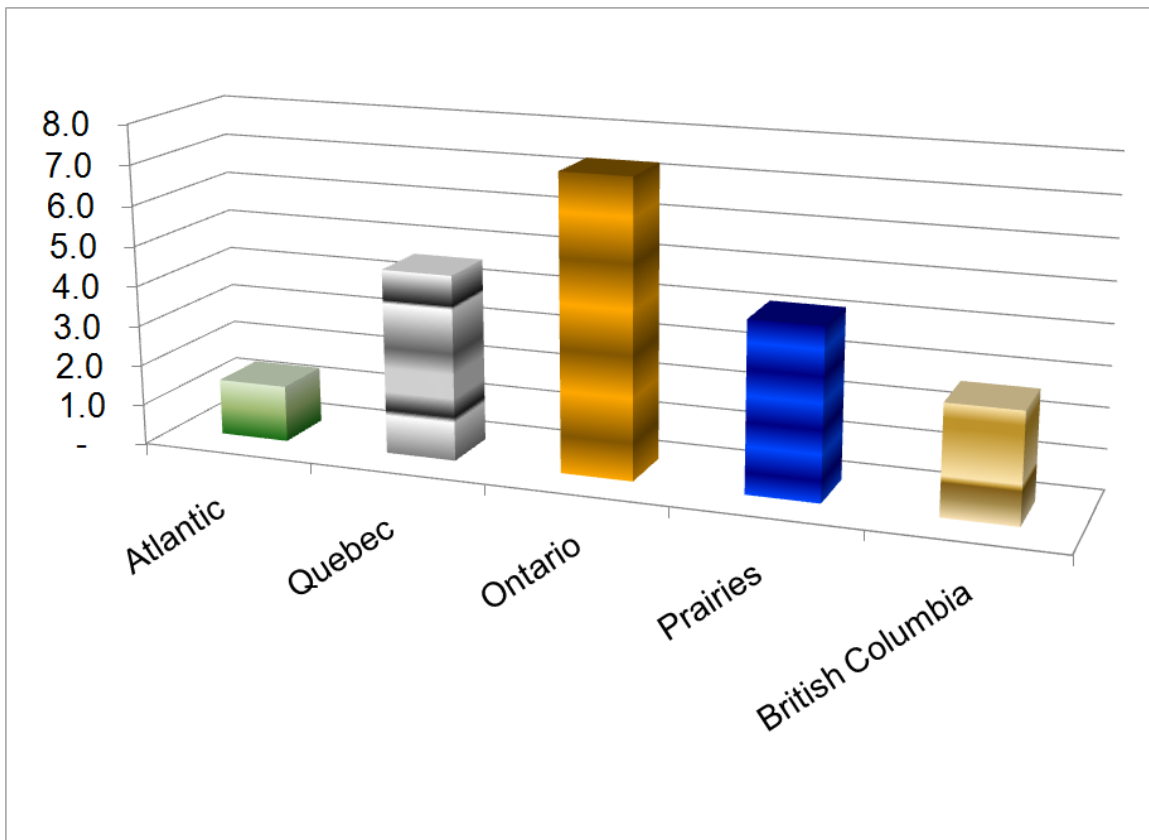
As of December 2008, there were more than 19 million automobiles in Canada with most of the vehicle use concentrated in Ontario, which accounts for 7.3 million vehicles closely followed by Quebec and the Prairies with 4.6 and 4.2 million respectively (Figures 7 and 8) (Natural Resources Canada, 2010).

Figure 7 Light vehicles in Canada, 2008



(Data obtained from Natural Resources Canada, 2010).

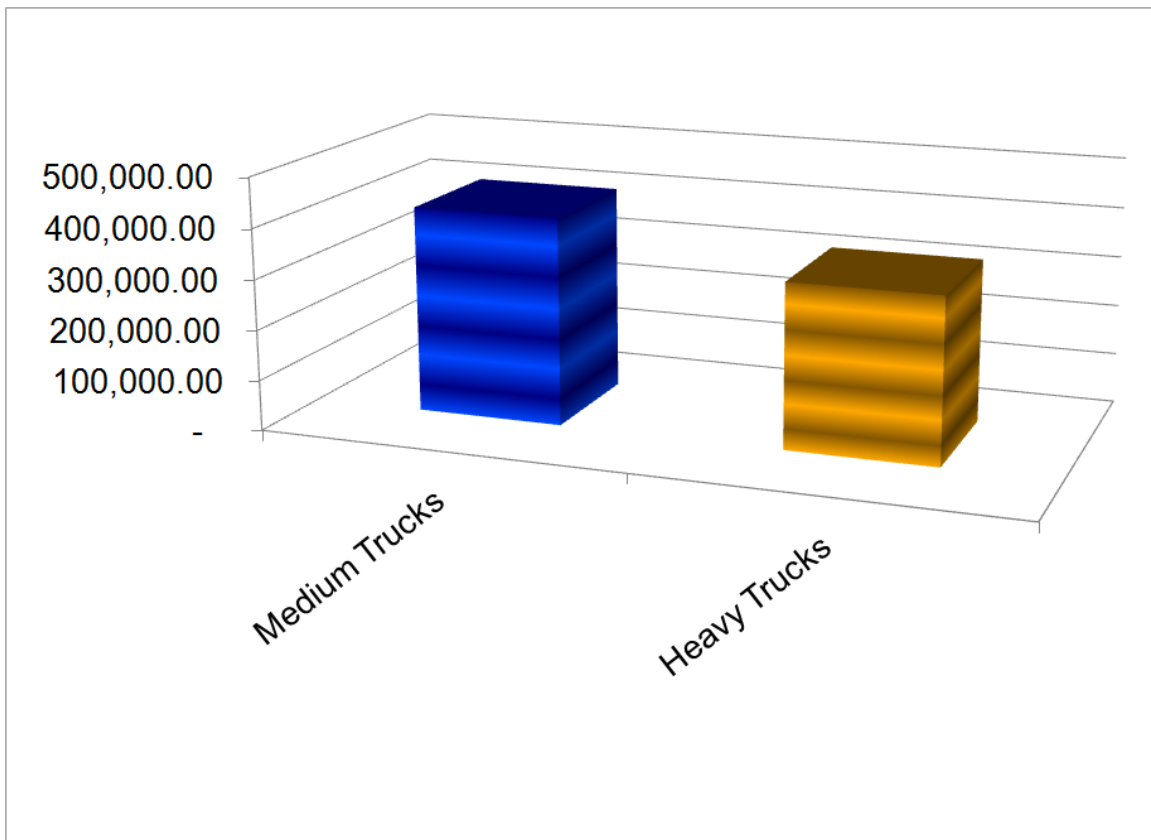
Figure 8 Vehicles in Canada (in millions) by Region, 2008



(Data obtained from Natural Resources Canada, 2010)

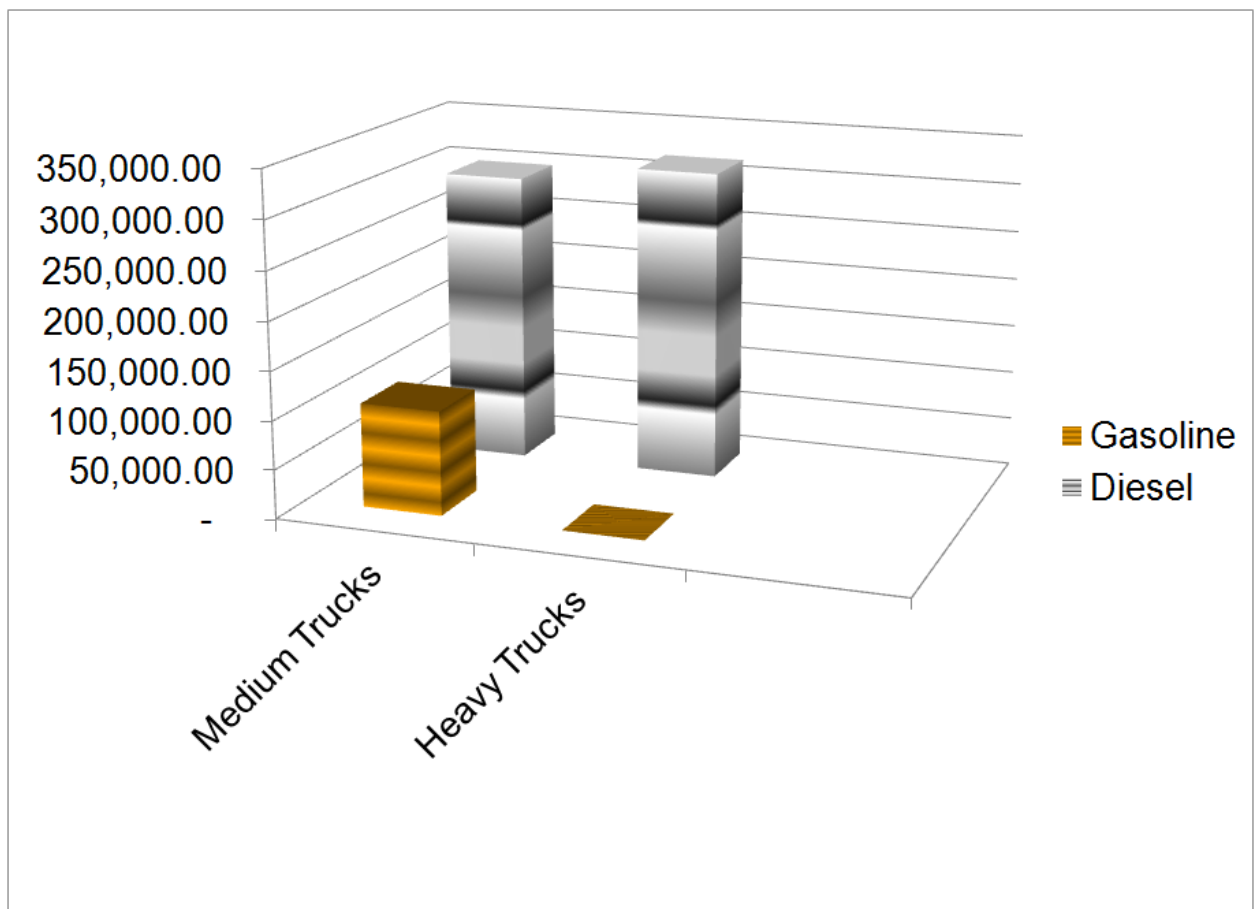
Medium and heavy trucks amounted to 412,811 and 327,106 (Natural Resources Canada, 2010) with barely 300 powered by natural gas - a low carbon alternative to diesel and gasoline (Marbek, 2010) (Figures 9 and 10).

Figure 9 Medium and Heavy Duty Trucks in Canada, 2008



(Data obtained from Natural Resources Canada, 2010).

Figure 10 Vehicles in Canada by type and Fuel, 2008



(Data obtained from Natural Resources Canada, 2010)

#### 4: Industry Potential Analysis

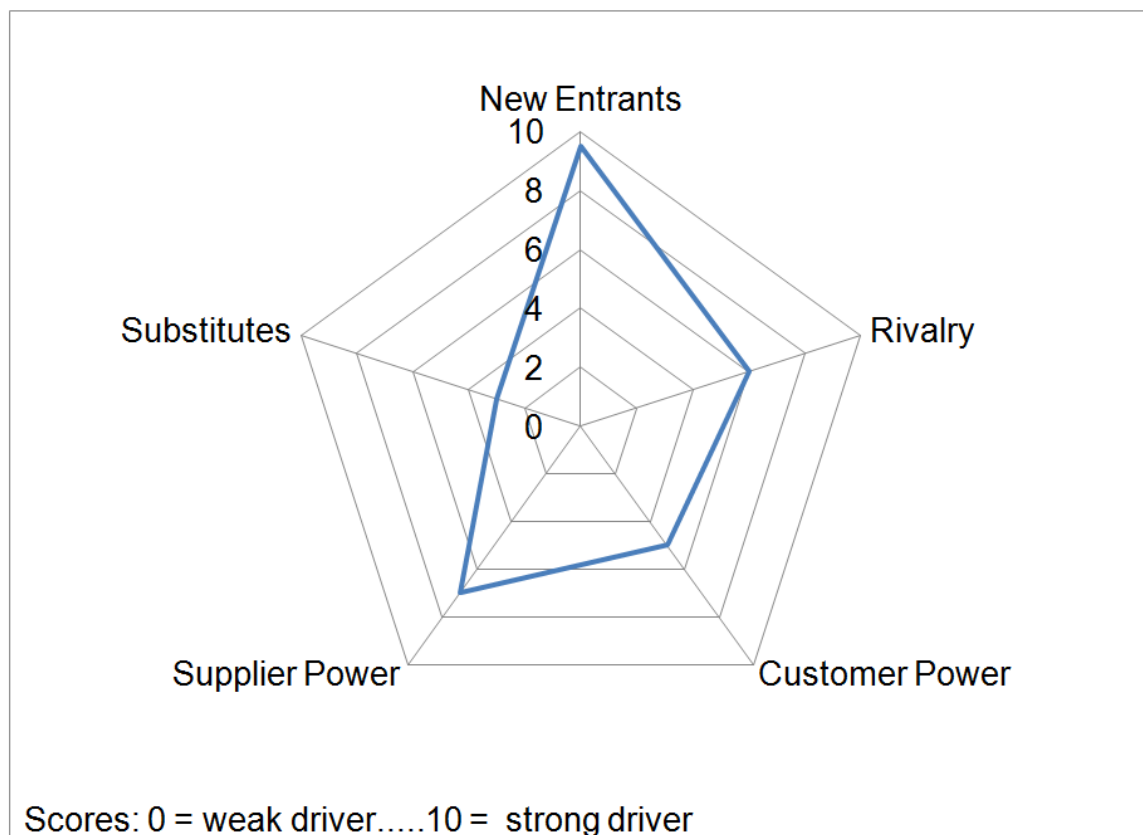
This section of the study employs Porter's five forces model to assess the challenges and opportunities embedded within the Canadian energy and GHG consulting industry by better understanding the barriers to entry, bargaining power of suppliers and customers, substitute services and the degree of rivalry. The section provides an analysis of the industry's performance and identifies key success factors that affect profitability in the

competitive environment. Based on these analyses, strategic options are formulated to grow EcoXergy's consulting services business over the next 3 years.

#### 4.1 Summary of Five Forces Analysis

Figure 11 depicts the five forces and the effects of their corresponding elements in the energy and GHG consulting industry. The blue lines and their corresponding numbers indicate the relative strength of each force.

Figure 11 Forces driving competition for Energy and Greenhouse Gas Consulting in the trucking, institutional, and commercial Sectors in Canada.



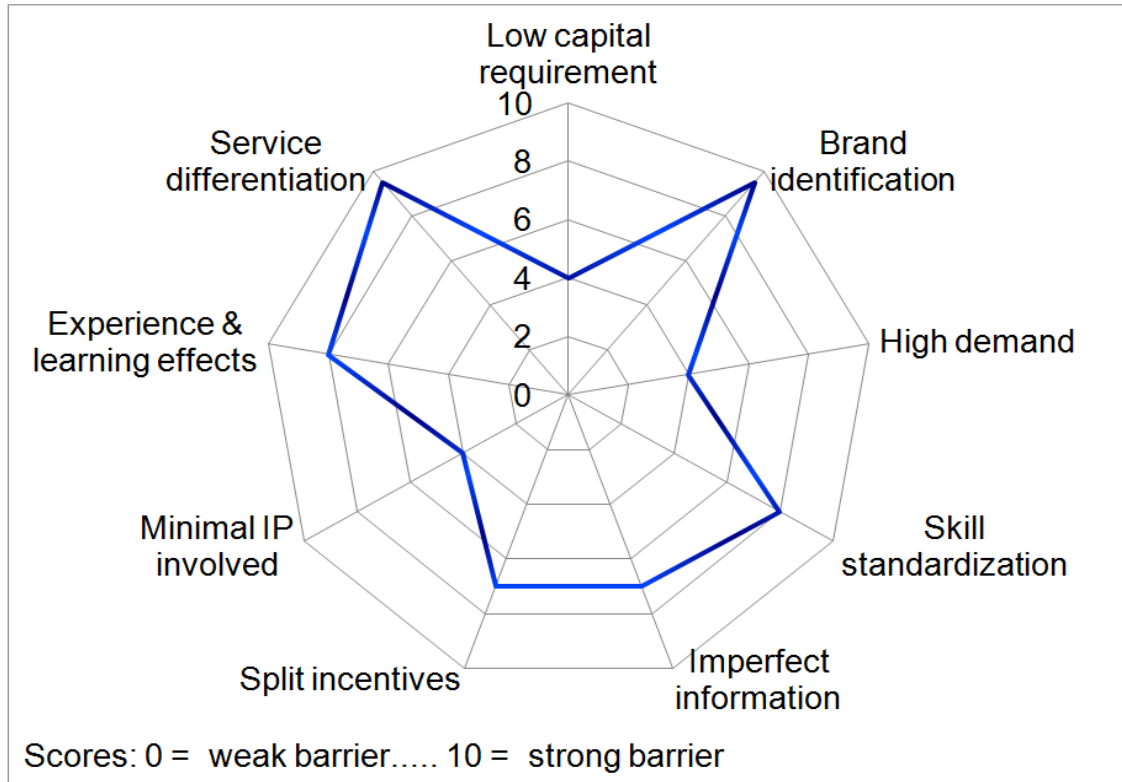
(Adapted from Porter, 1979)

Supplier power is boosted by the shortage of professionals with technical expertise in energy and greenhouse gas auditing as well as the specialized services offered by the software industry. Apart from demonstrating commitment to shareholders and customers that are environmentally friendly, customer power is weakened by their obligation to comply with evolving stringent provincial greenhouse gas emission regulations. Although low capital requirements and the experience of large consulting firms pose a significant threat to entry, the standardization of skills and qualifications of consultants tend to weaken the threat posed by new entrants.

Rivalry, on the other hand, is boosted by the contract bidding process, which is weakened by the growing market size that enables competing firms to have a share of the cake. Although performing energy and GHG management services in-house could act as a potential substitute, a dearth of specialized skills to identify fragmented energy/fuel costs and make clear-cut financial cases for fleet conversions to clean energy (Natural Gas Use in Transportation Round Table, 2010), buildings energy efficiency investments, and potential savings (Farrell et al. 2008a) weakens the threat posed in this sector. Despite high economic rents to service providers, very high threat of new entrants, high supplier power, and moderate rivalry and customer power are challenges that a small company like EcoXergy has to overcome in order to effectively compete in this industry.

## 4.2 Threat of New Entrants (High)

Figure 12 Factors affecting new entry



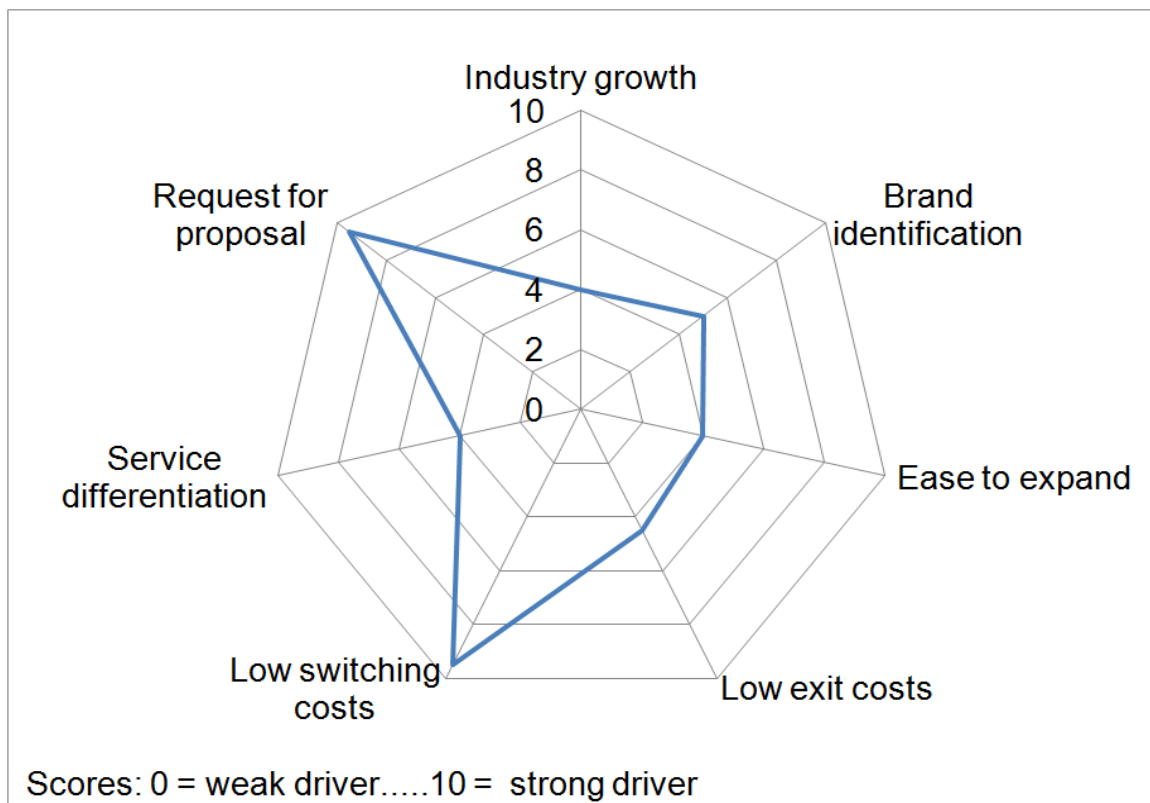
(Adapted from Porter, 1979 and Hartmann et al. 2008)

Imperfect information in terms fragmented energy cost, split incentives between landlords and tenants (Hartmann et al. 2008), the high importance associated with branding, product differentiation, experience and learning effects as well as the standardization of skills and qualifications (Porter, 1979), encompassing Master of Business Administration, Professional Engineer and Certified Energy Manager designations, minimize the threat of new firms establishing themselves in this industry. This threat is, however, significantly boosted by low capital requirements, growing

market size, minimal intellectual property involved as well as the experience, learning effects and brand of large conglomerate firms entering the market.

### 4.3 Rivalry (Moderate)

Figure 13 Forces driving competition



(Adapted from Porter, 1979)

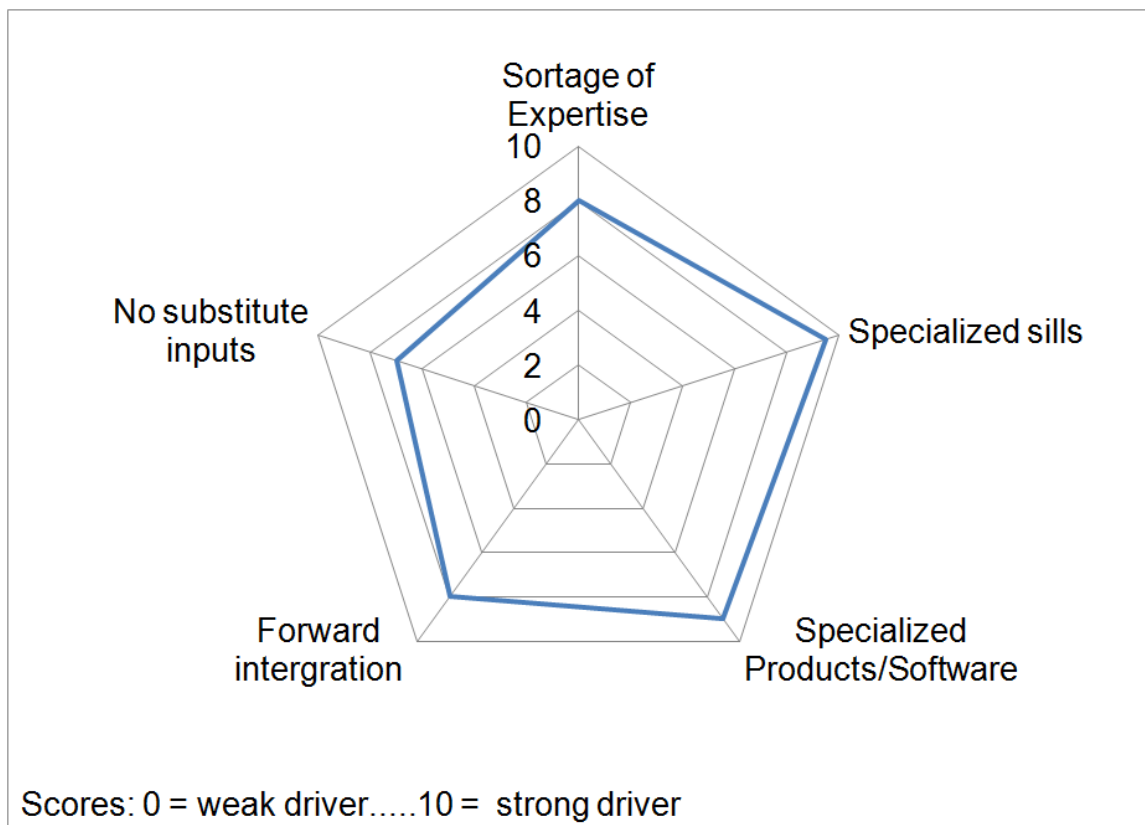
The high importance associated with branding, product differentiation, experience and learning effects, low exit costs (Porter, 1979), and the growing demand for energy and GHG management services combine to produce a low level of rivalry between industry



players. However, the rigorous contract bidding process and customers ability to easily switch from one service provider to the other intensify rivalry in the industry.

#### 4.4 Supplier Power (High)

Figure 14 Drivers of supplier power

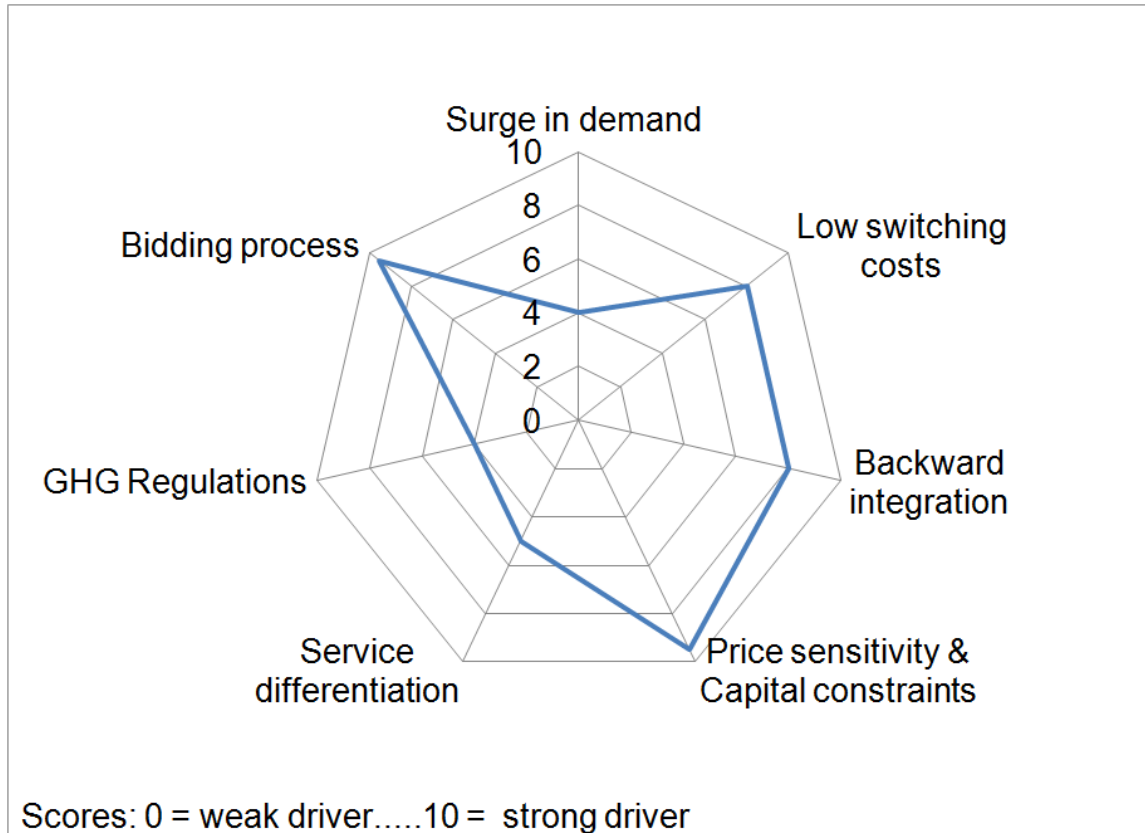


(Adapted from Porter, 1979)

Specialized skills, renewable energy and energy efficiency products and softwares boost the bargaining power of suppliers. These, combined with a lack of substitute inputs, a dearth of expertise, and the ability of individuals with the technical expertise to integrate forward enhances the power of suppliers. Overall, supplier power is assessed to be strong.

#### 4.5 Customer Power (Moderate)

Figure 15 Drivers of Customer Power



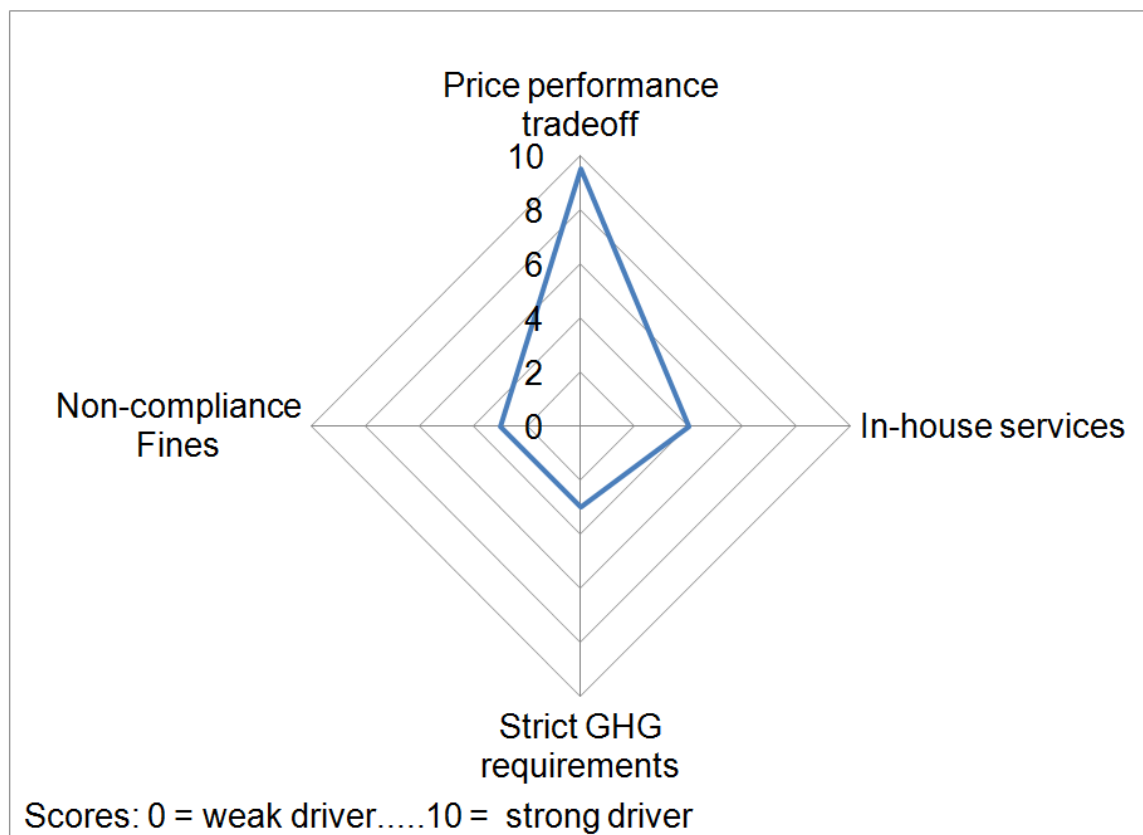
(Adapted from Porter, 1979)

Apart from a surge in demand as well as demonstrating commitment to shareholders and customers that are environmentally friendly, customer power is weakened by their obligation to comply with evolving stringent provincial greenhouse gas emission regulations (BC Ministry of Environment, 2011). Although the industry's services are differentiated, customers' power is enhanced by their ability to conduct the services in-house. This effect is, however, minimized by a dearth of specialized skills capable of identifying fragmented energy/fuel costs and make clear-cut financial case for fleet

conversions to clean energy (Natural Gas Use in Transport Round Table, 2010) as well as building's energy efficiency investments, and potential savings (Farrell et al. 2008). The RFP bidding process, customers' price sensitivity/capital constraints, principal-agent problems and the tendency to easily switch service providers enhance customers' power. Overall, customer power with respect to the Canadian energy and GHG management consulting industry is moderate due to the combined effects of GHG regulations, a surge in demand, price sensitivity and the bidding process for request for proposals.

#### 4.6 Substitutes (Low)

Figure 16 Factors influencing the treat of substitutes



(Adapted from Porter, 1979; BC Ministry of Environment, 2011)

The extent to which consulting and in-house services are substituted for each other partly depends on the value-price ratios of the two services. These services are real substitutes for each other as their applications satisfy the regulatory requirements of customers, thus boosting the threat of in-house energy and GHG management services. This threat is, however, weakened by a shortage of specialized labor and customer obligation to comply with evolving stringent provincial greenhouse gas emission regulations or face hefty fines for non-compliance. Overall, the threat of substitutes within the energy and GHG management consulting industry is low.

#### **4.7 Industry Key Success Factors**

Industry analysis performed earlier in section 8 identifies the following key success factors for a firm to effectively compete in the energy and GHG consulting industry:

##### **4.7.1 Specialized Skills**

Given that too much emphasis is placed on specialized skills to identify fragmented energy and fuel costs, and make clear-cut financial case for energy efficiency investments and potential savings, it is imperative that a firm differentiates itself by marketing the qualifications of its staff to prospective customers. Thus hiring and retaining professionals with specialized skills in carbon trading analysis, energy consumption and emissions auditing and tracking, through competitive compensation packages, is critical in sustaining a competitive advantage in the market place.

#### **4.7.2 Upfront Capital Cost Leadership**

In order to outperform competitors in the market place and minimize rivalry, in terms of customers' capital constraints and price-value sensitivity, EcoXergy will foster and facilitate strategic partnerships with financial institutions providing green mortgages and low-carbon vehicle loans to reduce the upfront capital costs of buildings' energy efficiency investments and fleet conversions from diesel/gasoline to clean energy.

#### **4.7.3 Brand Recognition**

In order to minimize customers' power and increase their switching costs, brand reputation, in terms of specialized skills and previous achievements, is critical given the intangible asset advantage the incumbent firm creates to its customers. Thus for a small firm like EcoXergy, employing professionals with specialized skills as well as facilitating strategic partnerships with reputable universities in order to leverage innovation into the delivery of the company's consulting services are crucial in strengthening its brand in the market place.

#### **4.7.4 Service Differentiation**

Service differentiation through technological innovation and experts with strong understanding of cap and trade regulations will be crucial in outperforming competitors and strengthening EcoXergy's presence in the industry.

## 4.8 Competitor Analysis

This section provides an analysis of EcoXergy’s major competitors in the energy and GHG consulting industry. A search of Natural Resources Canada’s database revealed relevant information of companies competing in this industry, many of which are larger firms that provide energy and GHG consulting services as well as other engineering and project management services. The industry is characterized by a large number of small and medium firms that compete either by bidding for contracts or rely on government incentives that partially cover upfront capital costs of buildings’ energy efficiency improvements. A summary of the services provided by EcoXergy’s competitors is provided in Table 1. This information will be used to develop a value position map of all the major competitors in the energy and GHG consulting industry.

Table 1 EcoXergy Competitors comparison

<b>Company Name</b>	<b>Size</b>	<b>Services/products’ offerings</b>
Stantec Consulting (SC)	Over 11000	Energy & GHG audits & energy & performance modeling, engineering services, project development and implementation, project management.
Enerficiency Consulting (EC)	Below 10	Energy & GHG Inventories, corporate and community energy planning, building energy audits, computer energy simulation, specialized energy engineering

ATN Energy (AE)	Below 10	Building energy management & simulation
Energitix (E)	Above 50	Gas and electric rate analysis, energy audits, accounting and benchmarking, and engineering services
Light House (LH)	Over 50	LEED consulting, energy and daylight modeling, energy audits, education and training
SES	Below 20	Energy audits, project management, measurement and verification
Willis & Energy (WE)	Below 50	Energy and emissions audit verification, monitoring, technology and equipment reviews, demand side management, renewable power development, training, regulatory and policy services.
ERM	Over 100	Carbon and water footprinting, sustainable cities and green buildings, energy and resource efficiency, sustainable business strategies.
Morrison (MH) Hershfeld	Below 100	Energy audits, carbon management, environmental assessment, demand side management, and sustainability planning

Delphi (DG) Group	Below 50	GHG inventory and reporting, policy analysis and corporate GHG strategy development, sustainability management services, portfolio life cycle analysis,
Deloitte (D)	Over 7000	Energy accounting, energy and carbon management, compliance management, risk assessment and strategy development, offset project verification and carbon accounting, sustainability strategy development and implementation
Dillon Consulting (DC)	Over 700	Energy and emissions auditing and monitoring, corporate environmental management, engineering services,

---

Although large and reputable firms like Deloitte, Stantec, Dillon, Delphi Group, Morrison Hershfeld, and ERM leverage their core capabilities in engineering and management to their energy and climate change departments, the rapid expanding market boosted by cap and trade regulations as well as BC Hydro's smart meter (for small consultancies without the financial capabilities to leverage IT in monitoring energy consumption) and rebates/incentive programs level the playing field for new entrants.



A closer look at previous competitors' projects indicate that most firms typically invest in large projects that generate tradable emissions credits that are verified to varying degrees and sold in the carbon market. Competitor analysis equally reveals that most projects are typically sourced by submitting bids to clients' request for proposals. In order to compete for these bids, the analysis reveals that firms in the industry have sought to differentiate themselves by marketing their expertise in energy and GHG management to potential customers and then charging a onetime upfront consulting fee for their services. This presents a unique opportunity for a firm to charge its consulting fees from energy cost savings.

Equally interesting to note from the analysis is that just a small number of firms have leveraged information communication technology to provide decentralized energy and GHG monitoring and tracking services exclusively to individual clients. This presents an opportunity for a firm to provide a centralized energy and GHG monitoring and tracking service as it is evident from Table 1 that not many competitors are targeting and servicing this segment. EcoXergy seeks to distinguish itself from the competition by capitalizing on the identified opportunities as well as embarking a business model that delivers energy and GHG services in new ways (pay as you save) while focusing on small and medium sized businesses, particularly First Nations' businesses, that are currently underserved and serving them better.

#### **4.8.1 Industry Value Proposition Map**

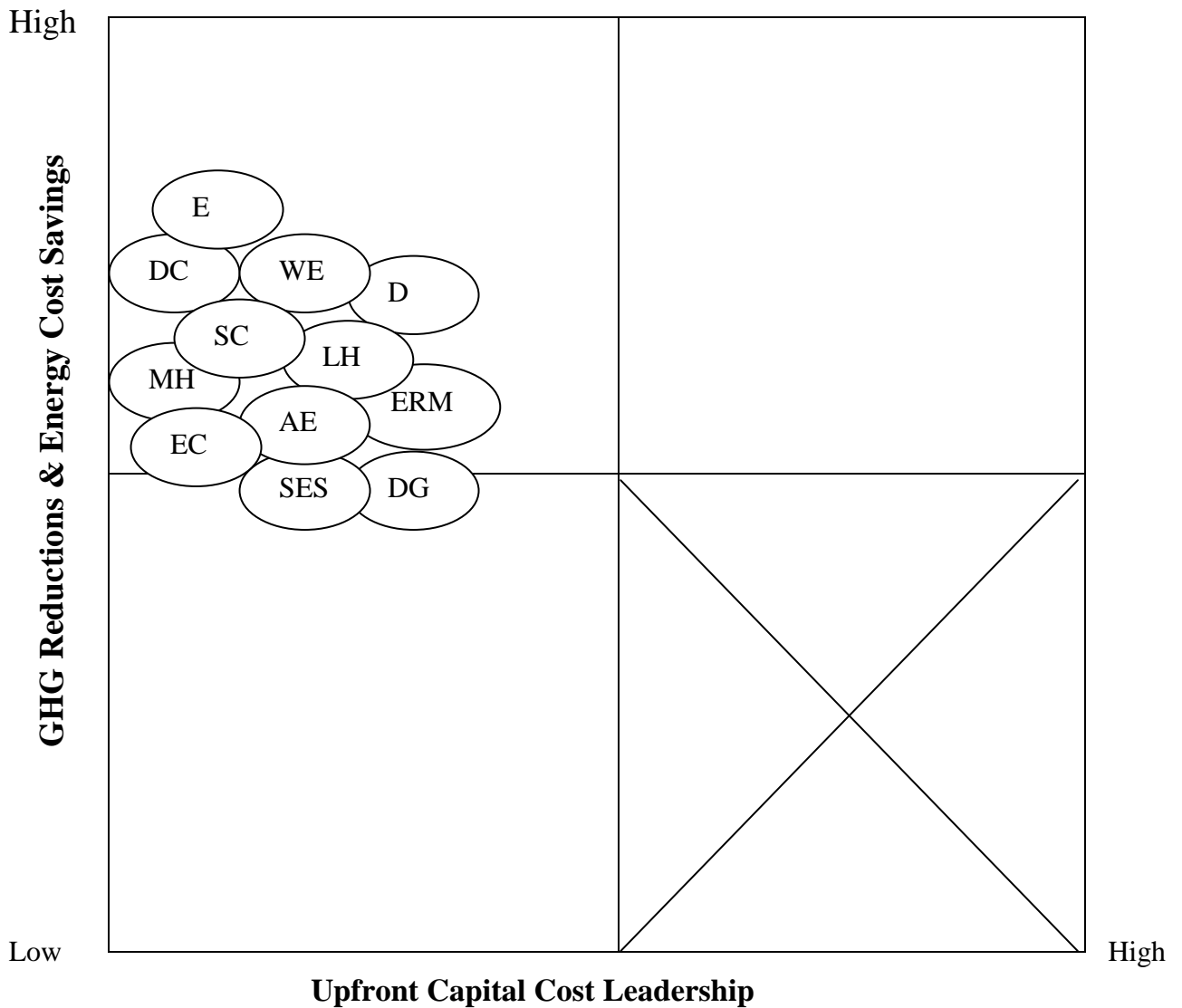
The two major dimensions typically used to assess the value proposition of a firm competing in the energy and GHG consulting industry are depicted in the value proposition map in figure 17. Competitor abbreviations are referenced in Table 1. In general the map (figure 17) portrays a lot of clustering around high GHG reductions and energy cost savings, which constitute the basis of customers' primary needs of either reducing operating costs and complying with GHG regulations or demonstrating commitment to stakeholders that are environmentally friendly.

By examining other sections of the map, it is apparent that of all the major competitors, there is none that currently addresses customers' upfront capital constraints; a significant market barrier to the adoption of low-carbon practices such as energy efficiency measures and GHG abatement technologies like solar boilers and heaters. That presents a great opportunity for a firm to provide a set of services that not only cater to high GHG reductions and energy cost savings but also to customers' capital constraints (top right hand quadrant of figure 17). As highlighted in the value proposition map de-risking upfront capital cost investment, through EcoXergy's pending partnership with a financial institution that provides green loans for retrofit projects, represents a value added service that none of the competitors currently provides.

A value proposition for low GHG reductions/energy cost savings and high upfront capital cost leadership (bottom right hand quadrant of figure 17) does not currently exist, and is

thus marked by an X. Interestingly, a closer look at competitors' former clients and previous projects reveals a growth potential in emerging markets - First Nation's businesses - that are currently underserved.

Figure 17 Industry Value Proposition Map



(Competitor abbreviations are referenced in Table 1)

## 4.8.2 Opportunities Identified

In retrospect, the competitor analysis and the value proposition map identified four potential opportunities:

1. There exists an opportunity to market a suite of services specifically targeted at de-risking upfront capital cost investment of prospective customers - upfront capital cost leadership strategy - given that the major competitors highlighted in figure 17 do not currently address this issue, which represent a significant market barrier to the adoption of energy efficiency measures. This would involve partnering with financial institutions providing green loans for retrofit projects.
2. A revenue model that capitalizes on ongoing revenue generation based on results in terms of energy cost savings and carbon credits presents a unique opportunity for a consulting firm in this industry given that major competitors currently charge a onetime upfront consulting fee for their energy and GHG consulting services. Thus, prospective customers will get energy efficient improvements with no upfront cost and pay later for the technologies and consulting fees through installments on savings from their energy bills
3. There exist an opportunity for a consulting firm to provide a centralized energy and GHG monitoring and tracking service as major competitors focus specifically on one time energy and GHG audits with a few providing decentralized monitoring and tracking services for their clients.

4. There exists an opportunity to better serve small and medium sized businesses, especially First Nations businesses, that are currently being underserved and serving them better.

## **5: Internal Analysis**

This section provides an analysis of EcoXergy's core capabilities and determines if they align with the external environment. First, the firm's management team, structure and key resources are examined. That is followed by a SWOT analysis to identify keys issues that are strategic to EcoXergy.

### **5.1 Resources**

#### **5.1.1 Financial Resources**

EcoXergy is a privately funded company with limited financial resources to effectively navigate its core business strategies. The company is not in possession of any significant fixed assets given the low overhead for performing consulting services.

#### **5.1.2 Intangible Resources**

EcoXergy's intangible resource consists of a strong team of consultants with expert knowledge in energy and greenhouse gas management, sustainability, carbon trading analysis, business development, and policy analysis and development.

## **5.2 Management and Organizational Structure**

EcoXergy is currently led by its founder, Anderson Gwanyebit Kehbila who holds a Ph.D and M.Sc in Environmental and Resource Management. Dr. Kehbila brings extensive project management, consulting, marketing and strategic experience to the company. He has a strong background in energy and GHG management and has played a key role in developing energy and carbon management strategies for businesses.

The company currently operates an ad-hoc structure comprising of a small number of freelance consultants that are selectively organized into project teams for major undertakings. Each consultant brings a unique set of skills and experience to the team.

Alemagi Dieudonne holds a Ph.D and M.Sc in Environmental and Resource Management. He has significant experience in research and policy analysis and has developed policy related research in themes relevant to climate change at the government, regional and local authority levels. Brighton Lubansa brings extensive project management experience to the company through his work at the Government of the North West Territories. Ms. Atenkeng Taku holds a M.Sc and a B.Sc in Forestry and Environmental Resource management respectively. She has a strong background in bioenergy analysis and brings a wealth of experience in research and analysis.

### **5.3 Marketing and Sales Capabilities**

EcoXergy currently lacks a formal sales and marketing department. Most of the sales (i.e. procurement of contracts and submission of tenders) and promotions (i.e. word-of-mouth and attending conferences) are currently executed by the company's founder, Dr. Anderson Gwanyebit Kehbila.

### **5.4 SWOT Analysis**

This section provides a detailed analysis of EcoXergy's strengths, weaknesses, opportunities and threats (Table 2) and then proposes strategies to align the company's internal capabilities with its external environment.

Table 2 SWOT Analysis

<p style="text-align: center;"><b>Environmental Factors</b></p> <p style="text-align: center;"><b>Internal Factors</b></p>	<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>• Service differentiation</li> <li>• Branding</li> <li>• Upfront capital cost leadership</li> <li>• Expanding market</li> <li>• New policies and programs level the playing field for new entrants</li> </ul>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Entrenched competitors</li> <li>• High threat of entry</li> <li>• Strong supplier power in terms of specialized skills and soft wares</li> <li>• Principal-agent split incentives</li> <li>• Capital constraints/price-value sensitivity</li> <li>• Imperfect market information</li> </ul>
<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>• Expertise in energy and GHG analysis/management</li> <li>• An array of specialized service offerings</li> <li>• Strong knowledge of cap and trade regulations</li> </ul>	<p><b>Strategies to exploit opportunities through company’s strengths:</b></p> <ul style="list-style-type: none"> <li>• Differentiate service by leveraging technological advances to offer better value to customers</li> <li>• Provide services at no upfront costs by fostering strategic partnerships with green financial institutions</li> </ul>	<p><b>Strategy to prevent threats through company’s strengths:</b></p> <ul style="list-style-type: none"> <li>• Market company’s cost leadership strategy and service differentiation</li> </ul>
<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>• Limited financial resources</li> <li>• Lack of brand and recognition</li> <li>• Lack of a marketing plan</li> <li>• High turnover of freelance consultants due to poaching from competitors</li> </ul>	<p><b>Strategies to exploit opportunities to minimize weaknesses:</b></p> <ul style="list-style-type: none"> <li>• Develop brand and recognition by marketing EcoXergy’s specialized skills and fostering strategic partnerships with reputable universities</li> <li>• Develop a marketing plan</li> </ul>	<p><b>Strategy to minimize potential dangers where company’s weaknesses meet threats:</b></p> <ul style="list-style-type: none"> <li>• Avoid competing against larger competitors by focusing on smaller businesses</li> </ul>



### **5.4.1 Threats**

The threats inhibiting EcoXergy's ability to strengthen its presence in the energy and GHG consulting industry are directly related to the threats from the Industry analysis performed earlier in section 8. Although all the threats listed on table 2 directly affects EcoXergy's ability to compete in the market place, the last three further prohibit prospective customers from reaping the economic benefits of energy cost savings.

Capital constraints and imperfect information, in terms of fragmented energy costs and a lack of clear-cut financial case for energy efficiency investments by prospective customers with little information on efficiency alternatives and potential savings, are major treats that EcoXergy has to address in order to compete in the energy and GHG consulting industry. In addition, the poaching of EcoXergy's freelance consultants by entrenched competitors, low barriers to entry and strong supplier power are major threats that EcoXergy has to address in order to be profitable in the industry.

### **5.4.2 Opportunities**

Opportunities for EcoXergy stem from the market potential analysis in section 3, the industry Key Success Factors identified earlier in section 4.7 and the Competitor Analysis in section 4.8. Each option will be explored in more detail in the following section.

### **5.4.2.1 Medium-term Opportunities**

The following medium-term strategic opportunities are intended for the next two-to-three years:

- 1) Marketing a suite of services specifically targeted at de-risking upfront capital cost investment of prospective customers - upfront capital cost leadership strategy- which represents a significant market barrier to the adoption of energy efficiency measures. A pending pre-authorized loan with a financial institution providing green loans for energy efficiency upgrades will bridge this barrier.
- 2) A pricing strategy, pay as you save, that forgoes industry's standard upfront consulting fees while capitalizing on getting paid for the company's services based on results in terms of energy cost savings. Thus prospective customers will get energy efficient improvements with no upfront cost and pay later through installments on savings from their energy bills.
- 3) Marketing EcoXergy's staff and its qualifications to prospective customers to improve brand and recognition.
- 4) Leveraging BC Hydro's smart meters to monitor and track energy consumption thereby guaranteeing energy and cost savings.

- 5) Tailoring the company's consulting services to small and medium sized businesses, particularly First Nations businesses, that are currently underserved and serving them better.

At launch, key marketing messages derived from the above opportunities will include: EcoXergy provides unique solutions not available through other consultants. Through partnerships with financial institutions, EcoXergy will deliver cost savings from day one without the need for large upfront capital investments. We make money because you make money by working with us.

#### **5.4.2.2 Long-term Opportunities**

The following long-term strategic opportunities are intended to optimize the company's consulting services for the next four-to-eight years as its working capital grows:

- 1) Off and online marketing campaigns in British Columbia before leveraging the company's marketing know-how to other regions of the country.
- 2) Leveraging a centralized energy and GHG monitoring and tracking system, from a software provider like Pulse Energy, to remotely monitor and guarantee energy savings and cost for all clients in the network (See section 6.3.4 for further details). The cost of this system will be addressed in a business plan that follows this project.

- 3) Further reducing energy cost that improves EcoXergy's margins by leveraging electric vehicles' highly energized lithium batteries to capture and store off peak electricity overnight at cheap rates to power clients' business activities during peak hours. EcoXergy will capitalize on its first mover advantage of leveraging electric vehicles' batteries into buildings by seeking exclusive rights to incorporate the technology into its consulting services thereby shielding itself from the competition.

#### **5.4.3 Strengths and Weaknesses**

EcoXergy's qualified staff, specialization in energy and GHG management, strong knowledge of the recently introduced cap and trade regulations as well as the company's suite of service offerings are some notable strategic strengths in its favor. These strengths are, however, drastically minimized by the company's limited financial resources, lack of brand recognition and a marketing plan. That together with the use of freelance consultants adversely affects the company's ability to strengthen its presence in the market place.

#### **6: Strategic Option Analysis**

To cope with the five competitive forces in section 4 this section of the study formulates short and long term strategic options for EcoXergy to successfully compete in the energy and GHG consulting industry taking into account the market potential and opportunities identified in sections 3 and 5.3.2 respectively. Moreover, alignment between the

company's core capabilities and the strategic options are examined while taking into account both the internal (strengths and weaknesses) and external (opportunities and threats) factors facing the company.

## **6.1 Short term Adaptive Strategies**

These short term adaptive strategies, anticipated for the next 3 years, are intended to better serve small and medium sized commercial and institutional businesses, including First Nations businesses that are currently underserved. They were derived from the opportunities outlined above and the SWOT analysis from section 5.2. As a small start-up company with limited financial resources and technical expertise in energy audits and GHG trading analysis, the following short term adaptive strategies are proposed.

### **6.1.1 Exploit Inbound and Outbound Marketing**

The primary focus of EcoXergy's marketing strategy will be to promote its services to small and medium sized commercial and institutional businesses, including First Nations businesses, more effectively than competitors who compete more broadly. While developing the business plan, additional market surveys will be conducted to distill the market potential of First Nations and assess their receptiveness to EcoXergy's energy and GHG consulting business model.

A secondary focus of the marketing strategy will be to boost the company's brand and recognition by leveraging video marketing, search engine optimization (i.e. organic search or Google's analytics and pay per click advertising model) and social media (i.e.

expert blog articles, facebook and twitter) to market the expertise and quality of the company's staff and services respectively. That will be complemented by attending industry trade shows and major conferences/events to strengthen the company's presence in the market place. All the above marketing efforts will be focused, within the next 3 years, specifically at EcoXergy's headquarter in British Columbia, a highly potential market with the lowest energy efficiency adoption rate, before leveraging that know-how to other potential regions like Ontario, Quebec and the Prairies.

### **6.1.2 Foster Strategic Partnerships and Provide Initial Free Consultations**

Given EcoXergy's current lack of brand and recognition, a strategy for the company is that of fostering and strengthening research partnerships with reputable universities, through the Mitacs-Accelerate internship program, in order to develop new knowledge and expertise and leverage the innovation into the delivery of the company's consulting services. Another strategy for EcoXergy is to leverage the market distortions and imperfect information identified earlier in section 1.2 into a profitable business for the company. This will include providing initial free consultations to optimize fleet owners' costs of carbon emissions compliance as well as establishing clear-cut financial cases for energy efficiency investments and potential savings for buildings retrofit projects.

### **6.1.3 Exploit Smart Meters and Target Government and Older Private Buildings**

Given that EcoXergy's revenue streams are dependent on a percentage of cash flows generated by energy cost savings and the monetization of carbon credits, an adaptive

strategy for EcoXergy is to focus on older institutional organizations and commercial businesses, including First Nations' businesses, in order to reap the economic potential of higher energy cost savings vis-à-vis modern energy efficient technologies. Further, marketing efforts geared towards the public sector is highly recommended given that government organizations are mandated to offset their GHG emissions under the current cap and trade regulations.

Last but not least, a strategy for EcoXergy is to scrap its current paper based monitoring and tracking system and capitalize on the recently introduced BC Hydro's smart meters. This strategy is aimed at monitoring and tracking clients' energy consumption with the fundamental objective of guaranteeing energy cost savings and the company's revenue. In order to achieve that goal EcoXergy will facilitate and forge a strategic partnership with Corix, a BC company contracted by BC Hydro to install smart meters, through a profit-sharing compensation model based on a percentage of dividends earned on referral projects. Such a partnership would require Corix to market and offer EcoXergy's energy and GHG consulting services, to complete a client's energy management package, with or without the client knowing EcoXergy was instrumental in developing and implementing its energy management plan. The client would enjoy the benefits of energy cost savings while EcoXergy and Corix get a share of the client's energy cost savings; a win-win situation for all.

#### **6.1.4 Provide Initial Public Offerings to Prospective Customers and Leverage their Local Knowledge and Networks into the Company's Business Strategy**

Given EcoXergy's lack of a strong market network, a strategy for the company is that of fostering and strengthening strategic partnerships with local small and medium sized business owners in order to leverage local market knowledge into the delivery of the company's consulting services. From that premise, EcoXergy will provide prospective customers with the opportunity to invest in the company.

Unlike traditional Initial Public Offerings (IPOs) whereby a company taps a wide pool of investors to provide itself with capital for future growth, EcoXergy will give prospective customers, predominantly First nations SMEs, the time and opportunity to build a green investment portfolio by reinvesting all or a portion of their energy cost savings in potential energy efficiency projects in return for a share of energy cost savings. In addition, prospective customers will be given the opportunity to reinvest all or part of their energy cost savings in green investment certificates that will be micro-managed by a subsidiary of EcoXergy - EcoXergy Capital. This will be done under the auspices of a partner financial institution such as Heritage Fincorp, which provides financial planning, assets management and estate planning services to prospective customers.

As with Corix, such a partnership with a financial institution like Heritage would entail EcoXergy marketing and offering Heritage tax reduction strategies and alternative investment opportunities, alongside EcoXergy's energy and GHG services, with or without the client knowing Heritage was instrumental in growing and maturing its energy



cost savings. At the end of the process, the client will enjoy the benefit of enhancing its green investment portfolio out of energy cost savings while EcoXergy and Heritage get paid from a portion of the client's cost savings investment portfolio; a win-win situation for all.

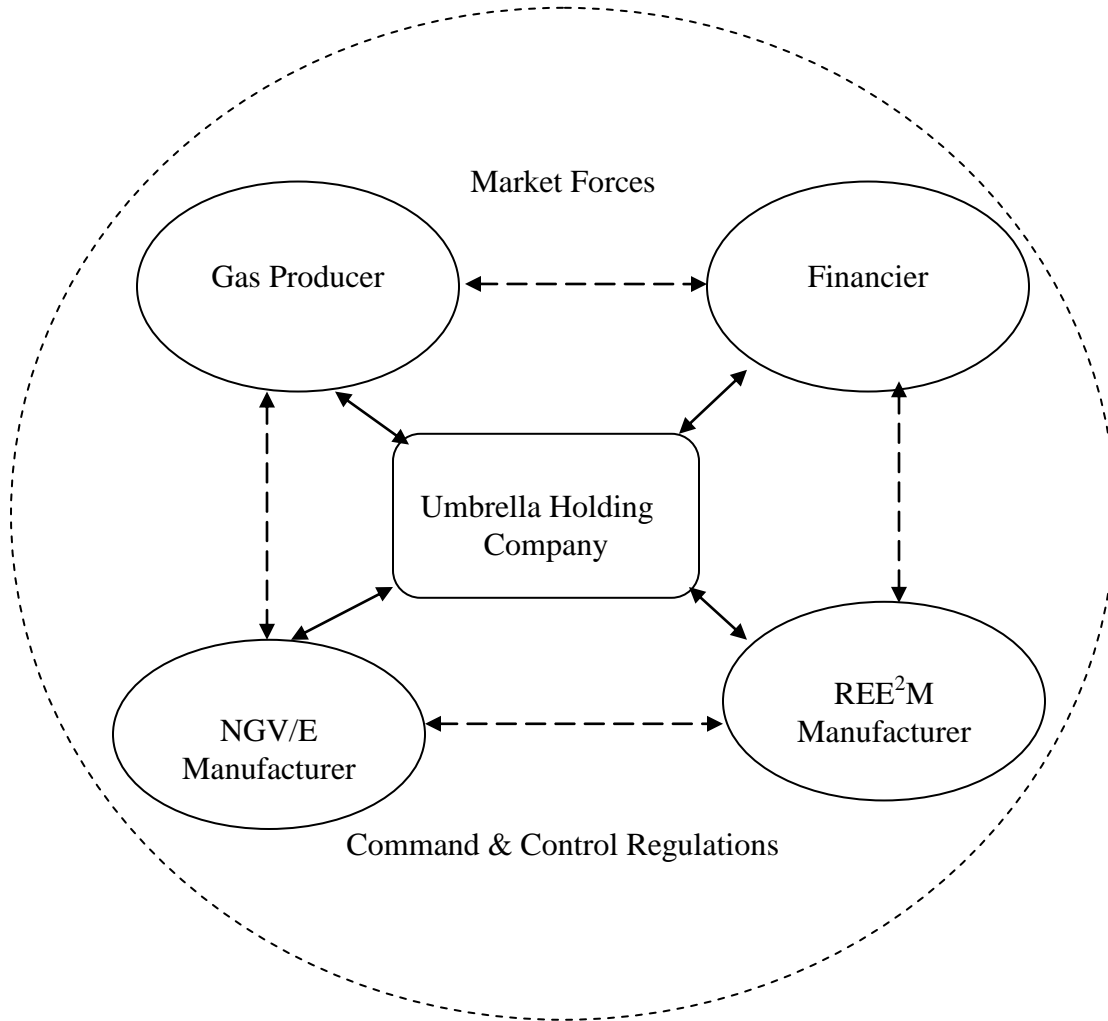
Providing prospective customers a stake in the EcoXergy's operations will enable early adopters have a sense of company ownership and create buzz, which is essentially cheap marketing. By so doing, customers will be able to share their experiences (i.e. growing an energy investment portfolio out of energy cost savings without investing a dime) with other businesses in their local networks and beyond. As earlier indicated in section 5.3.2.1, prospective clients' capital costs improvements would be paid for by pending pre-authorized loans from a financial institution providing green loans for energy efficiency upgrades. By capitalizing on customers' networks, EcoXergy would be able to leverage local market knowledge into the delivery of its energy and GHG consulting services thereby gaining share and volume while, at the same time, redefining the marketing and funding landscapes of the industry.

Once EcoXergy starts earning revenue, the company will seek to purchase interested customers' shares and keep future revenue internally. Revenue generated in the next 3-to-4 years will be reinvested in the company's long-term strategic plan as depicted in the next section.

## **6.2 Long term Game-changing Strategies for Market Expansion**

These long term disruptive strategies are intended for the next 4-to-8 years. The strategies, complemented by a business model, seek to minimize the five competing forces in the energy and greenhouse gas consulting industry by redefining how existing services are provided to customers. The business model focuses on leveraging clean/renewable energy and energy efficient technologies into the commercial, institutional and transportation sectors through a coordinated and holistic approach that redefines the relationship between ecosystem players towards organizational flexibility (Figure 18).

Figure 18 Proposed disruptive architecture for EcoXergy's consulting services business



REE2M = Renewable Energy and Energy Efficiency Measures for buildings

NGV/E = Natural Gas vehicle/Engine

Key:

←-----→ Partial relationship

←—————→ Direct relationship

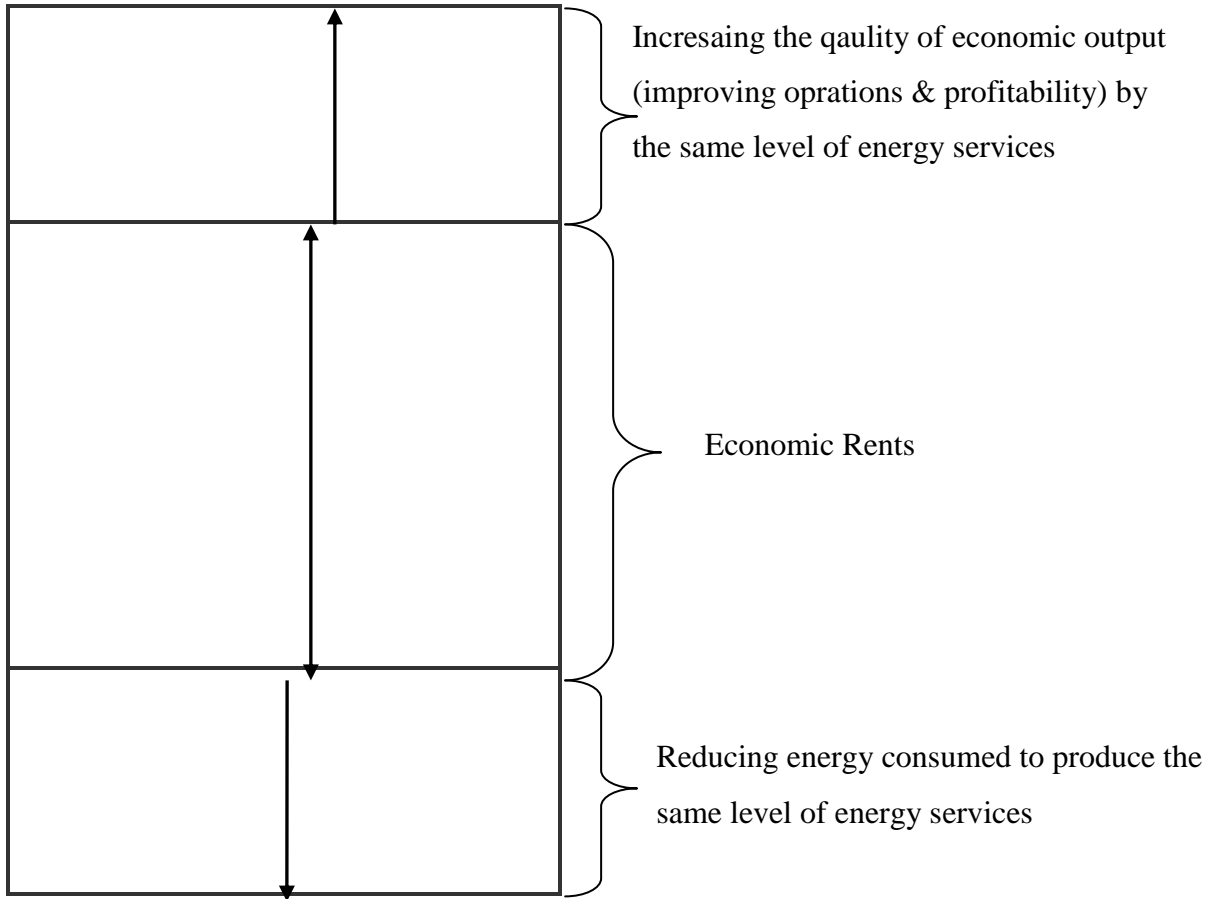
In this model, ecosystem players work together to enable a compelling and integrated solution by creating value through shared services. From that premise, existing organizational entities and the most famous brand names are brought together by a single virtual exploration brand name, an umbrella holding company, with the fundamental objective of optimizing overall performance of ecosystem players while rationalizing and exploiting synergies of common brand management activities such as marketing, advertising, promotions, distribution, energy audits, carbon trading analysis and speed to react to market and regulatory changes.

EcoXergy, the umbrella holding company, shapes the internal network and harnesses an array of shared core competencies while maintaining the autonomy and integrity of each entity/brand. This flexible and embedded network is steered by the virtual organizational pilot, the Umbrella Holding Company, which identifies business opportunities, making choices, and mapping the migration path of the network to align with upcoming heavy-duty carbon regulations and low-carbon buildings' market conditions while being in tune with customers' needs. Given its first mover advantage as a reformer of the energy and GHG consulting industry network players, under the brand of the Umbrella Holding Company, are able to define and control the market environment. Given the very high expectations of the Umbrella Holding Company, strategic options to exploit this opportunity are proposed in sections 6.3.

### **6.3 Value Proposition of the Umbrella Holding Company**

The Umbrella Holding Company, referred throughout this section as EcoXergy, is a one-stop shop providing energy and greenhouse gas consulting in the commercial, institutional and transportation sectors. Its value propositions include: (1) generating carbon credits and optimizing the cost of GHG compliance in order to let fleet owners remain competitive in the changing business landscape (2) energy cost savings, additional revenue streams from carbon credits, and management consulting services to enhance the profitability of institutional and commercial business (Figure 19). Key activities to effect this value proposition include providing technical and financial viability analyses of fleet conversion to clean energy and buildings' energy efficiency measures to prospective customers who lack relevant information to judge returns on their investments and meet stringent GHG emissions regulations in a changing business landscape (Farrell et al. 2008; Natural Gas Use in Transportation Round Table, 2010).

Figure 19 Value proposition of the Umbrella Holding Company

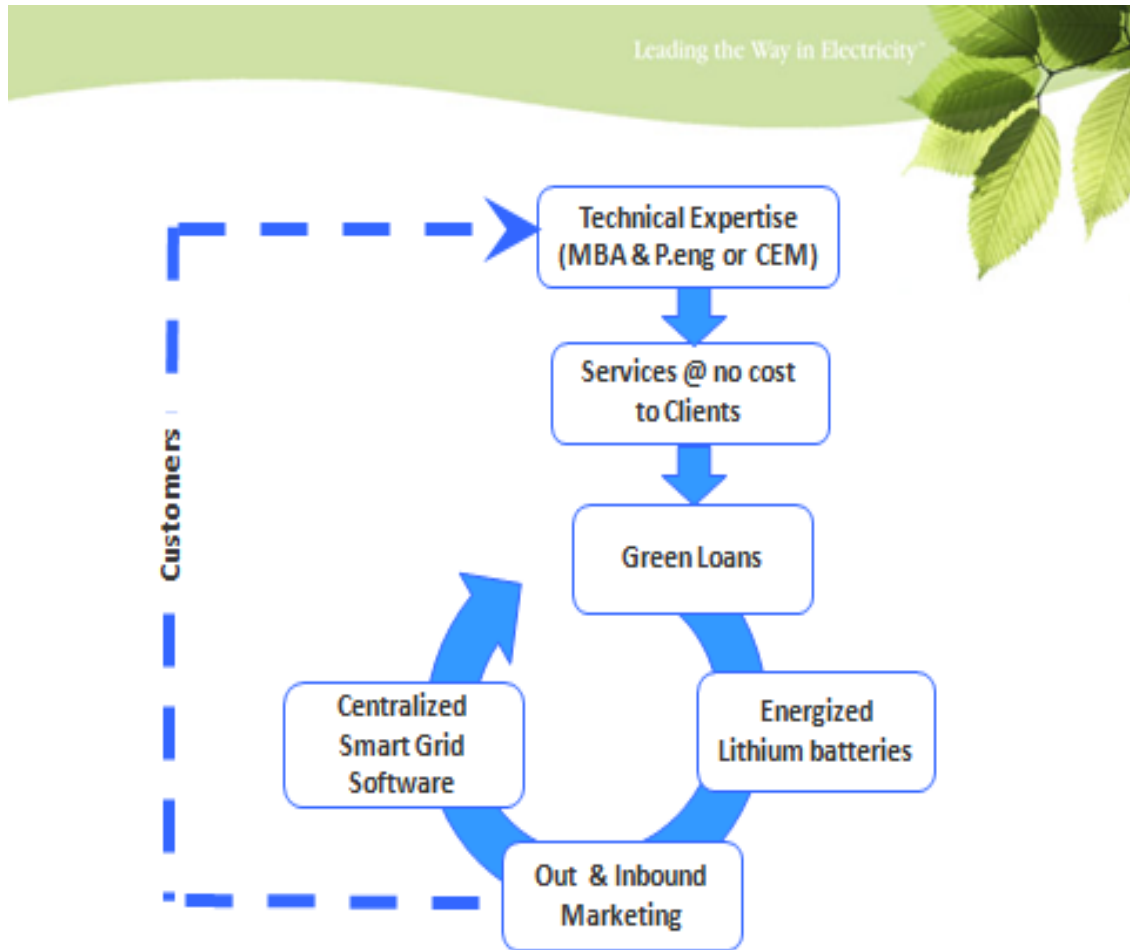


#### **6.4 Strategic Options for the Umbrella Holding Company**

To cope with the five competitive forces in section 4, these long term strategies take into account the internal (strengths and weaknesses) and external (opportunities and threats) factors facing the company. The strategies include: (1) recruiting professionals with strong business acumen and expert knowledge in energy and GHG management, (2) providing consulting services to prospective customers at no upfront cost, (3) exploiting state-of-the-art lithium batteries, (4) leveraging IT-based energy and GHG management systems (Figure 20). Details of these set of strategic options that EcoXergy intends to refine and test as it gets closer to implementing them, are provided in the subsequent sections below. They are intended to continuously add value to EcoXergy's consulting services business, which is instrumental in developing the company's brand and sustaining a competitive advantage in the market place.

Given EcoXergy's limited financial resources as highlighted in section 5.3, it is imperative that the company fosters and facilitates strategic partnerships with financial institutions providing green mortgages and low-carbon vehicle loans to cover the upfront capital cost of buildings' energy efficiency retrofit upgrades and fleet conversion from diesel/gasoline to clean energy. This strategic partnership is critical in successfully implementing these long term disruptive strategies and sustaining a competitive advantage in the market place.

Figure 20 Strategic energy and GHG management plan for the Umbrella Holding Company



Each of the above building blocks of the strategic management plan is described in detail below.



#### **6.4.1 Organizational Expertise**

Industry analysis in section 4.7 points to brand recognition as one of the key success factors for a company to differentiate itself and effectively compete in the energy and GHG consulting industry. Thus a strategy to avoid poaching of EcoXergy's freelance consultants is to bring on board full time professionals with expert knowledge in energy and GHG management, focusing on the most desired industry qualifications comprising of Master of Business Administration, Professional Engineer and Certified Energy Manager.

In order to retain the most skilled workers and effectively deliver on the value propositions of the Umbrella Holding Company (i.e. improving operations and profits with the same level of energy services and reducing the energy consumed to produce the same level of energy services), a disruptive strategy for the Umbrella holding Company is to hire MBA graduates with operations improvement experience as opposed to industry's best practices of hiring certified energy managers or professional engineers to provide energy and GHG consulting services.

For effective execution of this strategy, the Umbrella Holding Company will develop and implement a training and development department to enable operations improvement consultants take short energy and GHG auditing/compliance certification courses internally, through outside academies or at industry conferences. Thus, by enabling an employee take on both operations improvement and GHG/energy audits, EcoXergy will be able to combine two separate positions into a single role, thereby reducing the

company's human resource expenses while at the same time providing high quality value to its customers.

#### **6.4.2 Customer Segment and Green Loans**

As highlighted in section 4.7, upfront capital cost leadership emerged as a key success factor for a firm competing in the energy and GHG consulting industry to be profitable. Thus rather than targeting fleet, institutional and commercial businesses as prospective customers with upfront capital constraints – as is the case with current industry's bidding processes – a strategy for EcoXergy, as depicted in figure 18, is to focus its marketing efforts on: (1) resource-based companies investing in carbon reduction projects aimed at generating carbon credits to offset their greenhouse gas emissions mandated by current Cap and Trade Regulations, and (2) investors, such as the Pacific Carbon Trust, seeking to fund carbon reduction projects to generate carbon credits for sale in the carbon market. Thus rather than fleet, institutional and commercial business owners paying for EcoXergy's services upfront - as the case with current industry's practices – an adaptive strategy for EcoXergy is to continue fostering strategic partnerships with institutions providing green financing to cover the upfront capital cost of fleet conversion and buildings' energy efficiency upgrades as depicted in figure 18.

This strategy will entail amortizing prospective customers' upfront capital costs over a typical vehicle lifespan and mortgage term of 10 and 25 years respectively. From that premise, prospective customers will be required to pay their green loans and consulting

fees from a portion of cash flows generated by carbon credits and energy/fuel cost savings that will be incorporated into their monthly mortgage, lease or strata fees. Interviews with prospective financial institutions in section 7.1 throw more light on this.

### **6.4.3 Energized Lithium-Ion Battery**

Reshaping the way prospective customers buy and use energy is fundamental in sustaining EcoXergy's competitive advantage in the market place. From that premise a disruptive strategy for the Umbrella Holding Company is to leverage technological advances to further differentiate itself given the high importance to service differentiation by industry players as previously discussed in section 4.7. This strategy will entail leveraging electric vehicles' highly energized lithium-ion batteries into institutional and commercial buildings with the fundamental objective of capturing and storing off peak electricity overnight at cheap rates to power clients' business activities during peak hours. In addition, EcoXergy will leverage this battery technology together with onsite wind/solar cells and air/underground heat pumps for electricity and heat generation in remote areas where regular grid connections are difficult.

With the backing of potential financial institutions providing green loans for energy efficiency projects, EcoXergy will capitalize on its first mover advantage of leveraging highly energized Lithium-Ion electric vehicles' batteries into commercial and institutional buildings. This would entail paying battery manufacturers for exclusive rights to incorporate this technology into the company's consulting services business for

the next 10 years in order to shield itself from competition. The viability, costs and benefits, of this strategy will be explored in detail during the development of the business plan.

#### **6.4.4 Centralized IT-based Energy and GHG Management Systems**

Another strategy for EcoXergy is to scrap its current paper based monitoring and tracking system and exploit a centralized smart grid software, comprising of iPhone and iPad energy and GHG management applications, to complement BC Hydro's upcoming smart meters. This software will enable EcoXergy to remotely monitor and control clients' energy management systems for automatic diagnostics, work order issuance and tracking, automated fault detection and predictive maintenance, as well as automated minute-to-minute energy use and cost data collection and warehousing to ensure that clients' energy bills stay within a predefined limit; thereby guaranteeing energy cost savings and ongoing commissioning of all clients' facilities in the network.

As helpful as the above innovative strategies may be in refining EcoXergy's energy and GHG consulting services, further studies on their costs and benefits will be explored when crafting a grounded business plan for the company.

### **7: Conclusion**

The overarching goal of this project was to assess the viability of the Canadian energy and GHG consulting industry to support the development of a business concept and a go-to-market strategy for EcoXergy's consulting services business over the next 3 years. A

review of the literature points to information barriers, energy-market distortions, and capital constraints as the major barriers to the uptake of GHG abatement/energy efficiency measures in the trucking, commercial and institutional sectors.

In order to strengthen EcoXergy's competitive position, this study examined these barriers through detailed market, industry and SWOT analyses. Based on these analyses, strategic options were formulated to overcome identified challenges and capture the opportunities that provide the best path for long-term growth of the company's consulting services business.

By examining these strategic options, it is evident that EcoXergy would represent a unique product with some distinctive competitive advantages in the market. Considering the anticipated growth potential, low barriers to entry, low threats of substitutes and a lack of entrenched competition, this industry holds great promise for EcoXergy to be successful in the current environment.

## 8: Appendices

### 8.1 Data Analysis - Interviews and Corporate Surveys

The results presented in this section reflect information on a small sample of companies through interviews, press reviews and companies websites. The purpose of these interviews was to assess the feasibility of the proposed business model and strategic options discussed earlier in section 6. Feedback received during the interviews provided valuable information as they align with key elements of the proposed business model such as embarking on an upfront capital cost leadership strategy via green financing for energy efficient projects. Table 3 provides a summary description of the sample of selected companies.

Table 3 Companies' characteristics

<b>Company</b>	<b>Company's characteristics</b>
Forstrum Jackson	This is a small litigation firm with 4 lawyers providing ongoing legal counsel for private clients. With an office size of between 2000-3000 square feet, the firm is opened between 16-18 hours in a 24 hour period.
Finavera	This is a publicly traded wind energy development company with a building lease of between 2-3 years. With an office size of above 3000 square feet, the company is opened between 10-12 hours in a 24 hour period and employs between 10-20 employees.

AHBL	Alexander Holburn Beaudin & Lang (AHBL) is a litigation firm with over 50 employees providing legal counsel to businesses. With an office space of over 3000 square feet, the firm is opened between 10-12 hours in a 24 hour period.
Zincore Metals	This is a Zinc exploration company with 5 employees in its office based in Vancouver. With an office space of over 3000 square feet, the firm is opened between 10-12 hours in a 24 hour period.
School District 44	This is a school district based in North Vancouver with more than 50 employees. The school has a floor area of more than 3000 square feet and is open between 14 -16 hours in a 24 hour period.
Vancity Capital	This is a financial institution providing growth capital to small and medium-sized businesses in British Columbia. With over 50 employees, the organization occupies an office space of more than 3000 square feet and is open between 10 - 12 hours in a 24 hour period.
BDC	With over 50 employees, Business Development Bank of Canada (BDC) provides financing, consulting and venture capital solutions to businesses. The organization occupies an office space of more than 3000 square feet and is open between 10 – 12 hours in a 24 hour period.

---

## **8.2 Data Analysis – Interviews with Financial Institutions**

This section of the study presents the findings of in-depth interviews with employees from two major venture capital organizations in Vancouver. All quotations and references are from key informants who have delivered their ideas and experiences vis-à-vis investing in clean/renewable energy and energy efficiency projects in the commercial, institutional and transportation sectors. Key points raised are presented and discussed for each question in order to facilitate the understanding of the findings, which are discussed and reflected upon throughout this section.

The first question investigated respondent's involvement and attitudes towards investing in the Canadian carbon market with particular focus on clean/renewable energy and energy efficiency projects in the commercial, institutional and transportation sectors. Both informants pointed to the carbon industry as an attractive market with one informant stating that her organization invests between \$3 to \$6 million in capital efficient companies developing innovative emissions reduction, energy efficient and storage technologies. This submission differed with those of the second informant who remarked that her organization currently invests between \$50,000 to \$1.5 million in companies providing geothermal energy and energy efficiency measures in buildings.

When asked about the most important factors affecting investment in clean/renewable energy and energy efficiency in the commercial, institutional and transportation sectors, one informant pointed to payback periods between 5-10 years, an internal rate of return



greater than 20%, patents as well as a viable exit strategy. This view collided with those of the other respondent who pointed to shorter payback periods between 3-5 years, the level of energy efficient improvements and greenhouse gas reductions as important criteria affecting investment in clean/renewable energy and energy efficiency in the commercial, institutional and transportation sectors.

Looking specifically at previous investments, one informant pointed to compliance with certain regulations, more time to commercialize a product than anticipated as the major issues encountered. On the contrary, the second interviewee pointed to misunderstanding of actual energy efficient improvements, inability to customize solutions to specific projects, uncertainty in government incentives, a lack of software to enhance performance, and a lack of working capital as major issues encountered during previous investments in clean/renewable energy and energy efficiency projects in the commercial and institutional sectors.

Interestingly, both respondents pointed to excellent management team, scalable products and market size as key ingredients that would make an investment more attractive. Given that clean tech requires huge sum of capital, co-investment was highlighted by one informant as a prerequisite for investment to ensure that sufficient capital is provided to potential companies to reach exit. The other informant, on the other hand, remarked that co-investment is definitely not a prerequisite as the organization mostly embarks on investments less than \$1.5 million.

When asked about existing government support in boosting the uptake of clean/renewable energy and energy efficiency technologies, one respondent stressed that the government has done a great job in providing grants for clean technologies such as those provided by Sustainable Development Technology Canada (SDTC) and Industrial Research Assistant program (IRAP). The other interviewee, however, remarked that the system for government funding is not conducive to property owners given the extensive bureaucracy and paper work that are required. This informant further asserted that the government is not very interested in expanding the sector and should do more, in terms of subsidies and tax credits, to help building owners adopt energy efficiency measures.

In summary, feedback from these potential investors provided valuable information to assess the viability of the proposed model and strategic options discussed earlier in section 6. As one of the green financial institutions invests in companies providing renewable energy and energy efficiency measures for businesses in the commercial and institutional sectors, it is recommended that EcoXergy, given its limited financial resources, foster and facilitate a strategic partnership with this financial institution in order to effectively execute the proposed upfront capital cost leadership strategy highlighted in section 6. Achieving that will entail strengthening EcoXergy's brand by hiring and maintaining specialized skills as well as fostering and facilitating strategic partnerships with reputable universities with the fundamental objective of leveraging innovation into the delivery of the company's consulting services.

### **8.3 Data Analysis – Corporate Questionnaire Interviews**

In this section a closer look is given at the attitudes, dynamics and needs of commercial and institutional businesses with respect to energy and GHG management so that timely and relevant information and training can be provided.

Five companies agreed to participate in this study. In the first question, respondents were asked if their companies seek to be green leaders in their respective sectors. All five participants responded positively to this question, stating that their businesses are indeed interested in reducing energy and greenhouse gas emissions and improving the working environment of their employees. Moreover, all respondents were open to registering their interest to reduce their energy cost and GHG emissions.

Survey results revealed that 3 of the 5 respondents have completed a GHG management or an energy action plan before with barely 2 implementing any follow up action plans. It was intriguing to note that finance, time and expertise did not represent barriers to implementing energy and GHG management action plans for three of the reporting organizations. One informant, however, did not respond to these observations. Nonetheless, just two of the five respondents indicated they would like help recording and monitoring their greenhouse gas emissions as well as registering themselves for a free consultation on the latest energy cost reduction techniques and strategies. Feedback from businesses, though quite preliminary, provides early indications of the voluntary market in Vancouver.

## 9: References

Beinhocker, E., Oppenheim, J., Irons, B., Lahti, M., Farrell, D., Nyquist, S., Remes, J., Naucler, T., Enkvist, P. (2008). *The Carbon Productivity Challenge: Curbing Climate Change and sustaining economic growth*. McKinsey Global Institute: San Francisco.

BC Ministry of Environment. (2011). *British Columbia Climate action for the 21<sup>st</sup> century*. Retrieved July 2011 from [http://www.env.gov.bc.ca/cas/pdfs/climate\\_action\\_21st\\_century.pdf](http://www.env.gov.bc.ca/cas/pdfs/climate_action_21st_century.pdf)

Bilodeau, J-F., McNabb, D., Blais, M., Smits, J., Fecteau, V. (2002). *Commercial and institutional Building Energy Use Survey, 2000*. Office of Energy Efficiency, Natural Resources Canada: Ottawa

EcoXergy Solutions Inc. (2009). *Our Services*. Retrieved July 2011, from EcoXergy Solutions: <http://www.ecoxergysolutions.com>

Environment Canada. (2010). *National Inventory Report 1990-2008: Greenhouse gas sources and sinks in Canada*. Retrieved September 2011 from <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=492D914C-2EAB-47AB-A045-C62B2CDACC29>

European Commission. (2009). *EU action against climate change: Leading global action to 2020 and beyond*. European Communities: Luxemburg.

Farrell, D., Remes, J., Bressand, F., Laabs, M., Sundaram, A. (2008a). *The case for investing in energy productivity*. McKinsey Global Institute: San Francisco

Farrell, D., Remes, J., Charles, D. (2008b). *Fuelling sustainable development: the energy productivity solution*. McKinsey Global Institute: San Francisco

First Nations National Building Officers Association (2011). An exploratory study on the life cycle of first nation's homes. First Nations National Building Officers Association: Ontario.

Hamilton, G. (2011). Carbon credits could be a billion dollar industry. Vancouver Sun: British Columbia.

Hartmann, A., Farrell, D., Graubner, M., Remes, J. (2008). Capturing the European energy productivity opportunity. McKinsey Global Institute: San Francisco.

Horne, M. (2008). Cap and trade: Reducing pollution, inspiring innovation. The Pembina Institute: Alberta.

International Economic Development Council (IEDC) (2009). What is cap and trade? A primer for economic developers. Retrieved August 2011 from [http://www.iedconline.org/Downloads/IEDC\\_CCT\\_Primer.pdf](http://www.iedconline.org/Downloads/IEDC_CCT_Primer.pdf)

Linacre, N., Kossoy, A., Ambrosi, P. (2011). State and trends of the carbon market. World bank environment department: Washington D.C.

Ludwig, L.C. (2004). The US acid rain program and its effects on SO<sub>2</sub> emission levels. Issues in political Economy, Vol. 13.

Marbek. (2010). Study of opportunities for natural gas in the transportation sector. Marbek: Ontario

Natural Gas Use in Transportation Round Table (2010). Natural gas use in the Canadian transportation sector. Canadian natural gas vehicle alliance: Ottawa

Natural Resources Canada. (2010). 2008 Canadian vehicle update report. Energy publications, office of energy efficiency: Ottawa

Pacific Carbon Trust. (2010). Guidance document to the BC emissions offset regulations. Retrieved September 2011 from [http://www.pacificcarbontrust.com/assets/Uploads/Templates\\_and\\_Guidance/EOR-GuidanceDocumentv20.pdf](http://www.pacificcarbontrust.com/assets/Uploads/Templates_and_Guidance/EOR-GuidanceDocumentv20.pdf)

Pew centre on global climate change. (2008). Climate change 101: Cap and trade. Retrieved August 2011, from <http://www.pewclimate.org/docUploads/Cap-Trade-101-02-2008.pdf>

Porter, M. (1979). How Competitive Forces Shape Strategy. Harvard Business Review

Shelford, J. (2010). A hot topic - climate change law in BC. Retrieved August 2011 from <http://www.mcmillan.ca/A-Hot-Topic---Climate-Change-Law-in-BC>

Watts, C. (2011). Trends in global energy efficiency. The Economist Intelligence Unit: London.

Western Climate Initiative (WCI). (2009a). Market oversight white paper. Retrieved August 2011 from <http://www.westernclimateinitiative.org/document-archives/Markets-Committee-Documents/Market-Oversight-White-Paper/>

Western Climate Initiative (WCI). (2009b). Design recommendations for the WCI regional cap and trade program. Retrieved August 2011 from <http://www.westernclimateinitiative.org/component/remository/general/design-recommendations/Design-Recommendations-for-the-WCI-Regional-Cap-and-Trade-Program/>

Wheller, D. (2007). Moving toward a consensus on climate policy: The essential role of global public disclosure (Working paper No. 132). Washington, DC: Centre for global development.