A TARGET MARKET GROWTH STRATEGY FOR FORTISBC

by

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Abstract

FortisBC comprises two utilities, a gas utility and an electric utility. The gas division of FortisBC serves approximately 940,000 customers in 125 communities across the province of B.C. Although the company is a monopoly regulated by the British Columbia Utilities Commission, it is facing competitive pressures from its external environment. Additionally, showing the symptoms of a mature industry, the company is experiencing a decline in average gas usage by customers and an aging pipeline infrastructure.

The transportation sector is emerging as a promising growth market for the company. With an abundance of natural gas supply in B.C., a favourable cost differential over conventional fuels and lower greenhouse gas emissions, this market holds significant potential. However, the company must navigate various impediments to succeed in this market, including the misconceptions lingering due to the lacklustre acceptance of natural gas vehicles in the past.

Keywords: gas utility; natural gas vehicles;

Executive Summary

The gas division of FortisBC is approaching the mature stage of the gas distribution industry lifecycle, associated with declining average customer gas use rates, slow customer growth and an aging pipeline infrastructure. An emerging customer segment of the market, the transportation sector, looks promising. If FortisBC is successful in expanding natural gas distribution into this market, it has the potential to suppress the upward pressure on delivery rates.

The dynamics surrounding growing the natural gas vehicle markets holds significant prospects. An abundance of natural gas supply in the province and the new technologies available to access this gas economically facilitates a cost savings over using gasoline or diesel. Additionally, natural gas is the cleanest fossil fuel and therefore emits fewer greenhouse gas emissions than conventional fuels. Moreover, initiatives to expand the use of the province's domestic natural gas supply and the substitution of carbon heavy fuels with cleaner ones to reduce climate change are all strategies consistent with public policy initiatives.

As with any new strategic direction for the company, there will be some initial challenges that must be overcome. Servicing the natural gas vehicle market requires a more customized service offering and thereby some adjustments to the internal processes will be required. Additionally, customers may require financial incentives to encourage the transition and to offset the higher upfront capital cost of a natural gas vehicle.

Furthermore, expansion into the transportation market is an extension of the company's existing natural gas business, and therefore the company can continue to leverage and foster the key success factors that have given rise to the success of the business to its present day. The transportation sector encompasses the entire spectrum including light-duty vehicles, heavy-duty vehicles and marine vessels. The heavy-duty, return-to-base fleet vehicles exhibit the greatest prospective target market as early adopters for natural gas vehicles.

To my wonderful husband and children

Thank you for your patience and support

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Glossary of Abbreviations

AGA	American Gas Association
BSCA	British Columbia Safety Authority
BCUC	British Columbia Utilities Commission
CEA	Clean Energy Act
CNG	Compressed Natural Gas
COS	Cost of Service
DSM	Demand Side Management
EEC	Energy Efficiency and Conservation
ELT	Executive Leadership Team
FEI	FortisBC Energy Inc.
FEVI	FortisBC Energy Vancouver Island Inc.
FEW	FortisBC Energy Whistler Inc.
GHG	Greenhouse gas
GJ	Gigajoule (measure of gas)
HDV	Heavy-duty vehicles
HIM	High Involvement Management
IPC	Inland Pacific Connector
LDC	Local distribution companies
LDV	Light-duty vehicles
LNG	Liquefied natural gas
MDV	Medium-duty vehicles
NGV	Natural gas vehicles
NRCan	Natural Resources Canada
OEM	Original equipment manufacturer
PBR	Performance based ratemaking
RNG	Renewable natural gas
SCP	Southern crossing pipeline
WCSB	Western Canadian Sedimentary Basin

1: Overview of the Situation

1.1 Purpose and Scope

This paper will assess the feasibility of a new target market as a growth strategy for the gas division of FortisBC as it faces multi-faceted challenges in the environment in which it operates. Although a monopoly, FortisBC faces competitive challenges. Over the last few years, there have been changes in the company`s competitive energy environment instigated largely by a greater focus on energy efficiency, conservation and addressing climate change issues. As a result, the utility is facing declining market share. These competitive issues are further intensified as the utility approaches the mature stage of its industry lifecycle. An emerging market presents promise as a growth segment for FortisBC`s gas distribution business. This paper will serve to analyze this growth strategy in terms of strategic fit, in the context of the external environment and the internal capabilities required for successful penetration and growth into this emerging market.

1.2 Natural Gas Distribution Industry

The natural gas industry encompasses the entire process, from the exploration and extraction of natural gas from underground reservoirs or shale plays, the transportation and storage of natural gas, to the final delivery to customers in their homes and businesses. This paper will focus on the natural gas distribution industry sector, which comprises purchasing natural gas and transporting it to end users. These end-users are residential, commercial and industrial, together with electric utilities that require natural gas for the generation of electricity. Local distribution companies ("LDC") or gas utilities, like FortisBC, typically provide this natural gas service to customers in their homes, offices and businesses through a network of pipelines. In Canada, the natural gas distribution infrastructure spans 480,000 km of pipeline. Natural gas meets 30 per cent of Canada's energy needs and natural gas distribution companies service approximately 6.2 million customers, over half of Canadians in their homes and at work (Canadian Gas Association).

Natural gas utilities typically operate in a regulated environment and have exclusive rights to distribute gas in a specific service territory. As such, utilities are characteristically

natural monopolies as the significant cost of constructing a pipeline infrastructure creates high barriers to entry, seeing that it is uneconomical for multiple and redundant pipelines be installed in the same service area. In Canada, the provincial or the territorial authorities regulate LDC activities.

1.3 Recent Changes in the Industry

1.3.1 Deregulation in the form of Unbundling

The emergence of deregulation, through the unbundling of services, began in Canada in the 1980's and is offered in most provinces: with the exception of some of the Atlantic provinces and some regions including Vancouver Island and Medicine Hat. This service was facilitated by the separation of the cost of the natural gas commodity from the transportation and distribution service, hence the term unbundling. Unbundling allows customers to choose a supplier from whom to purchase the natural gas commodity and have the gas delivered through the utility's existing pipeline infrastructure. Gas marketers offer this service and focus on obtaining buyers for natural gas. Customers typically enter into fixed term and fixed price contracts for the purchase of the gas commodity from the marketer. The unbundling service was offered initially to industrial customers, residential and commercial customers were subsequently added. In B.C., unbundling services were made available to customers in mid-2000. Unbundling is seen as a means of introducing retail competition into what is typically a monopoly environment. While unbundling does facilitate competition, widespread acceptance has been slower than anticipated.

1.3.2 Natural Gas Prices

Natural gas prices have seen a downward trend in recent years. Gas prices averaged around $8 per gigajoule ("GJ") in 2008 compared to $4 per GJ in late 2011, a fifty per cent decline (Canadian Gas Association, 2011). Moreover, natural gas prices have now reached a ten-year low.

Lower prices are the result of lower consumption due to warmer than normal winter weather and an abundance of supply made possible by technological advancements facilitating the extraction of gas from shale plays. Combining horizontal drilling with hydraulic fracturing [1]

[1] Hydraulic fracturing is the process of creating cracks, through which the trapped gas rises to the well, using a mix of primarily water, sand and other chemicals. It is the combination of using both horizontal drilling and hydraulic fracturing processes that has enabled access to the "tight" shale gas deposits.

techniques has made possible the extraction of gas from shale plays previously thought uneconomical. Although, the forces of supply and demand determine the price of natural gas, it is important to note that policy makers have a significant influence on natural gas prices. This can be seen in their role in the management of existing resources and in decisions regarding infrastructure developments that address future supply options. Furthermore, environmental pressures not only influence infrastructure development but also natural gas use.

1.3.3 Provincial Energy Policies and Climate Change Concerns

Recent provincial government policies have shaped the way consumers in the province view natural gas use. With a greater focus on reducing greenhouse gas emissions ("GHG"), the provincial government has set forth policy initiatives that place natural gas use at a disadvantage. In July 2008, the provincial government introduced a carbon tax, which is a consumer end-use tax on fossil-based fuels, and served to place natural gas at a cost disadvantage relative to other energy sources such as electricity. With annual increases since 2008, on July 1, 2012, the carbon tax on natural gas will reach $1.4898 per GJ.

The Clean Energy Act ("CEA") (Bill 17, Clean Energy Act, 2010) introduced by the provincial government in April 2010, focuses on achieving provincial electricity self-sufficiency. The act identifies the objective to generate at least 93 per cent of the province's electricity supply from clean or renewable resources and achieve electricity self-sufficiency by 2016. These targets were specifically targeted at the crown owned electricity supplier in the province. Furthermore, the CEA outlines aggressive GHG emission reduction targets for the province[2]. In addition, both the CEA and the 2007 B.C Energy Plan (The B.C. Energy Plan, 2007) place an emphasis on demand-side measures to encourage energy efficiency and conservation. These mandates give consumers the impression that natural gas is a "dirty fuel" although it is the cleanest of all the fossil fuels. They also place the use of natural gas in the province at a significant disadvantage both from the perspective of pricing and fuel switching.

1.3.4 An Abundance of Natural Gas Supply

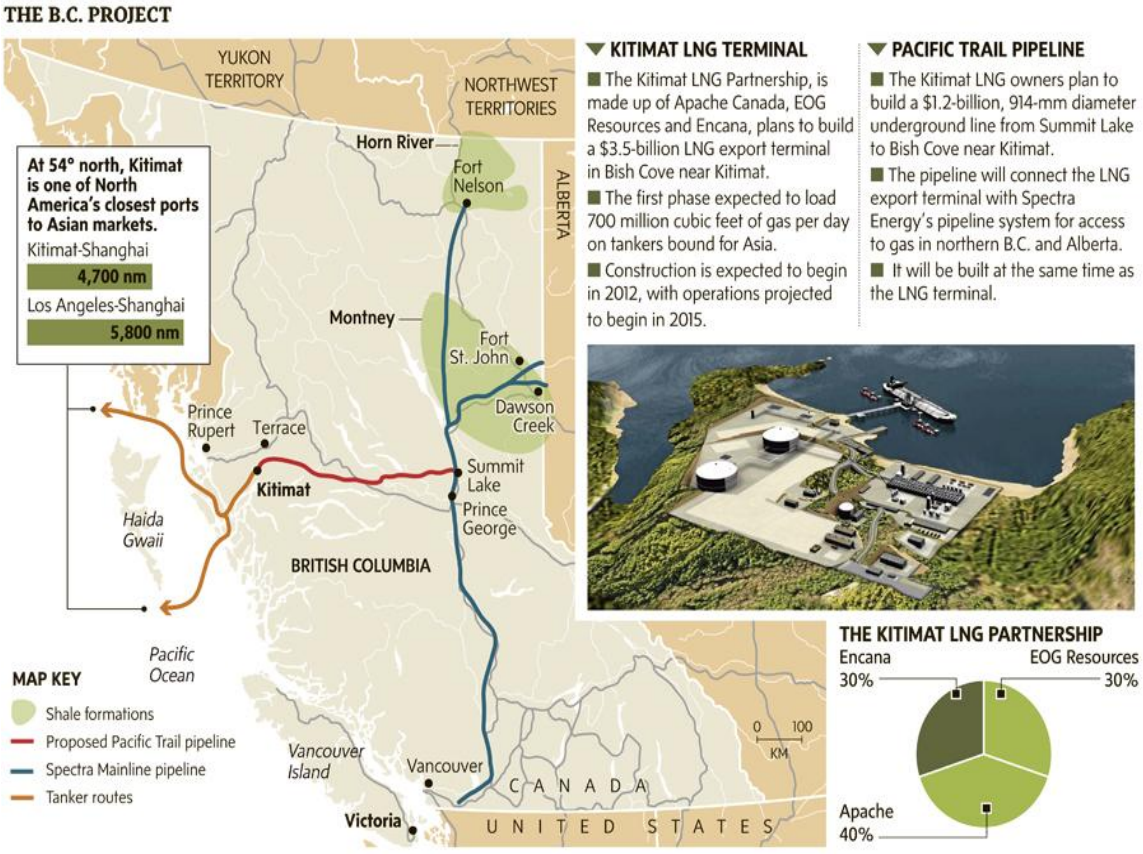
Shale gas discoveries in Canada, along with the advancement of drilling techniques such as the combination of horizontal drilling and hydraulic fracturing are set to change the natural gas

[2] A 33% reduction in GHG emissions below the 2007 levels by 2020 and an 80% reduction in GHG emissions below 2007 levels by 2050

industry landscape. Estimates indicate there is sufficient supply of gas for the next one hundred years.

Historically, the Western Canadian Sedimentary Basin ("WCSB") has been the largest source of natural gas for both B.C. and Alberta, but technological advancements has made access to gas shale plays, such as the Horn River Basin and Montney fields in B.C., now economically viable. The Horn River basin in Northeastern B.C. is the largest shale play in Canada. The developments in supply from the Horn River Basin have seen an increasing interest from abroad. With demand for natural gas growing in Asia and Europe primarily for electricity generation, space heating and transportation uses, the B.C. government is in full support of developing the capacity to export natural gas in its liquid state from the Horn River Basin shale plays. (Ministry of Energy, 2010). Construction is presently underway on a new Kitimat Liquefied Natural Gas ("LNG") project along the coast of B.C., designed to export LNG to Asia-Pacific LNG markets by 2015 (see Figure 1 below).

Figure 1: Kitimat LNG



Source: (Globe and Mail, 2011)

This increasing demand may place pressure on pricing and supply of natural gas at home, as suppliers seek to balance the demand of natural gas from home with that from abroad.

1.3.5 Technological Advancements in Metering

Advanced metering technology in recent years, has made possible the ability to harvest remote access to customers energy consumption data through wireless communication devices. These devices, when connected to gas meters at end user locations, transmit data that enable the reading of gas usage information through a central data-gathering infrastructure. This technology will serve to drive efficiencies in operating costs as manual meter reads will no longer be required, and utilities will experience improved and more accurate billing for customers. Improved billing will be the result of actual meter reads replacing estimated meter reads. Furthermore, real time or "near" real time access to consumption data will enable customers to manage their energy usage more effectively. In recent years, there has been an increase in the deployment of these automated meters for electricity metering, natural gas automated metering is likely to follow pursuit.

1.3.6 Evolution of the Natural Gas Industry to address Climate Change Issues

With a greater focus on clean energy, energy conservation and concerns about climate change, one must consider how the natural gas industry must evolve in order to deliver solutions to address these challenges. For example, one emerging area in recent years is the use of renewable resources such as renewable natural gas ("RNG") or biomethane. This is the use of organic waste, turning it into clean gas then distributing this gas through the existing gas pipeline for use in the home or business.

In the transportation sector, the use of Compressed Natural Gas ("CNG") or LNG in vehicles in place of conventional gasoline or diesel can play a large role in reducing GHG emissions, as natural gas is the cleanest fossil fuel. With an abundance of natural gas supply in B.C., advancements in vehicle engine technology and natural gas price advantage over crude oil based fuels, there is a growing interest in natural gas use in the transportation sector.

The industry is currently taking a hard look at these initiatives and many others to help steer a path in the evolution of natural gas distribution. In order to be successful, the industry must play a role in assisting policy makers recognize the imperative role of natural gas use in tackling the issues around climate change.

1.4 Overview of Fortis Inc. and FortisBC

FortisBC is an investor owned energy distribution company. FortisBC consists of two utilities, a gas utility and an electric utility. Fortis Inc., the parent company of FortisBC, is the largest investor owned distribution utility in Canada and serves more than 2 million gas and electric customers across Canada. Under the regulated arm of the company, there are five electric utilities in five Canadian provinces and two Caribbean countries and a natural gas utility in B.C. The non-regulated arm of Fortis Inc. comprises hydroelectric generation assets in Canada, Belize and upper New York State. Furthermore, Fortis Inc. owns hotels and commercial real estate in Canada. Please see Appendix A for the organizational structure of Fortis Inc. Fortis Inc.'s vision "is to be the world leader in those segments of the regulated utility industry in which it operates and the leading service provider within its service areas" (Fortis Inc., 2011, p.1).

In the province of B.C., Fortis Inc. both owns a natural gas utility and an electric utility. Both utilities operate under the common brand name of FortisBC, with the gas utility's most recent adoption of the FortisBC brand name in March 2011. The utilities have a common Executive Leadership Team ("ELT") and over the coming months there will be greater push for integration of the two companies as synergies and efficiencies are recognized with the two company's operations.

The FortisBC electric utility generates, transmits and distributes electricity to approximately 161,000 customers in the Southern Interior of B.C. The FortisBC gas utility delivers natural gas, piped propane and new energy solutions, such as geoexchange[3] and district energy solutions[4] to approximately 940,000 customers in 125 B.C. communities. See Appendix B for service area map of the FortisBC gas utility. The British Columbia Utilities Commission ("BCUC") regulates both the FortisBC gas and electric divisions.

1.4.1 FortisBC Gas Utility - The Back Story

The company has a history dating back to the 1950's, associated with significant growth and expansion through mergers and acquisitions, although, the company's core product and service offering has remained relatively unchanged.

The company was originally founded as Inland Gas in 1951 (later incorporated as Inland Natural Gas Co. Ltd.) to supply the B.C. interior communities with natural gas acquired from the

[3] geoexchange systems uses geothermal energy in the form of heat, that is stored in the earth's surface

[4] district energy systems – produce steam, hot water or cold water at central plants to serve a community with energy for space heating, water heating and air conditioning

Westcoast Transmission pipeline. Throughout the 1950s, Inland Gas purchased various subsidiaries including St. John Oil and Gas, Peace River Transmission, Canadian Northern Oil and Gas, and Grand Prairie Transmission. In 1977, it purchased Columbia Natural Gas. These acquisitions served to position the company as the largest distributor of natural gas in the B.C. interior. Then in 1988, Inland Gas purchased the Lower Mainland Gas Division of BC Hydro and Power Authority (BC Hydro). BC Gas Inc. was subsequently formed to supply gas and piped propane to customers throughout the province. In 2002, BC Gas Inc. acquired Centra Gas BC Inc. and Centra Gas Whistler, which served gas customers on the Sunshine Coast and Vancouver Island, and piped propane to customers in Whistler respectively. In 2003, the company underwent a name change from BC Gas Inc. to Terasen Inc. In 2005 the company was acquired by Kinder Morgan Inc, a Houston- based energy storage and transportation company, who subsequently sold Terasen Inc. to Fortis Inc in 2007.

In 2004, Fortis Inc. purchased West Kootenay Power and Light Company and renamed it FortisBC. In 2010, Terasen Inc. also began operating under the FortisBC brand name as both the gas and electric utilities began the transition to a common ELT. FortisBC's vision is to realize "one vision, one voice, one company' for both utilities as it seeks to align the resources, processes and technologies of both the electric and gas utilities. Currently, the gas and electric utilities operate as separate legal entities. The FortisBC gas and electric utilities deliver more energy than any other utility in B.C., approximately 21 per cent of the province's total energy consumption. FortisBC gas utility owns and operates 46,000 kilometres of natural gas pipelines and natural gas distribution facilities in B.C. and serves 95 per cent of the province's natural gas customers. It is also the largest utility of the Fortis Inc. family comprising approximately 70 per cent of the Fortis Inc. corporate asset base.

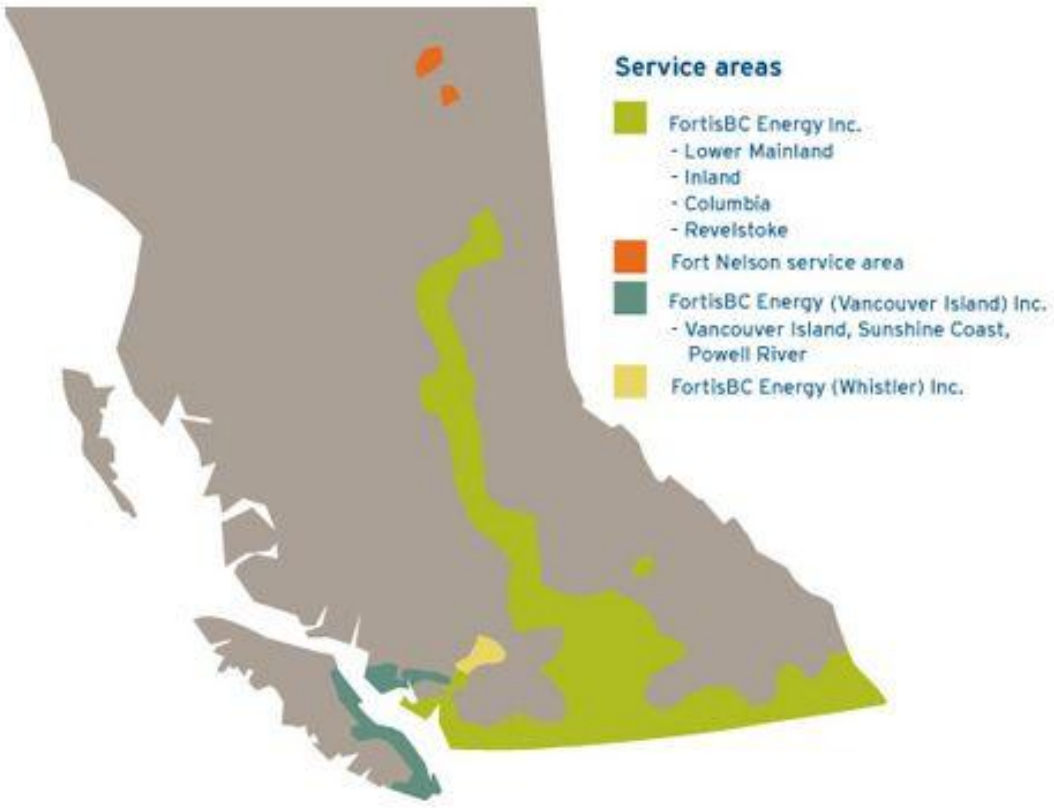
1.5 Pricing

Rates (or tariffs) charged to customers must be approved by the regulator. Gas service to end users comprises two main components, the price of the gas commodity and the price of delivery. The market forces of supply and demand determine the commodity price of natural gas and the gas cost is not marked up but simply passed on to the consumer. Delivery rates, on the other hand, are based on a cost of service ("COS") model wherein the total amount collected in rates is the sum of the recovery of all costs incurred and a reasonable rate of return. These costs include operating and maintenance costs, taxation, depreciation, amortization and financing expenses. The rate of return included in the COS model is based on invested capital and allows

the utility to compensate its debt holders and shareholders. It also ensures that the utility continues to update and renew its aging infrastructure. An alternative to the COS ratemaking, and one that has been used by regulators in recent years is a Performance Based Ratemaking ("PBR") model, which typically involves providing incentives that reward utilities to either meet or exceed benchmarks or targets in items such as efficiency, service and safety. Benchmarks are typically service metrics established in agreement with the regulator and the utility, and are often based on past performance as an indicator of how service levels can be improved or operational efficiency improvements can be achieved. Incentive based ratemaking provides a mechanism for shareholders and consumers to share in gains from efficiency improvements. FortisBC gas operated under the PBR model from 2002 through to 2009 and was able to garner cost efficiencies during this period.

Delivery charge rates are set annually and vary across the company's service areas shown in Figure 2. The gas division of FortisBC comprises three legal entities, FortisBC Energy Inc. ("FEI"), FortisBC Energy Vancouver Island Inc. ("FEVI") and FortisBC Energy Whistler Inc. ("FEW"). FEVI and FEW each represent a single service area, and FEI is further divided into four service areas: the Lower Mainland, Inland, Columbia and Fort Nelson, for a total of six distinct service areas. Furthermore, rates vary within each of the three customer groups, residential, commercial and industrial, contained within these services areas as they are based on the cost of servicing these various customer segments. Typically larger gas consumption customers (commercial and industrial) are less expensive to service and pay lower rates for each unit of gas consumed compared to residential customers.

Figure 2: FortisBC Gas Service Areas



Source: Company documents

The company employs a number of strategies to manage the price risk volatility of the natural gas commodity and has a comprehensive price risk management program. The program incorporates such measures as a diversified natural gas portfolio for natural gas including both short-term and long-term gas supply contracts, combined with commodity storage and transportation measures. The company purchases futures contracts to secure supply and pricing, and then supplements this supply with spot market purchases when natural prices are low. In addition, the company owns two LNG facilities for "peak-shaving" needs and rents underground gas storage facilities. These storage facilities enable the company to draw upon natural gas reserves during the winter periods to meet peaks in demand during the winter heating season and hence avoid pricey spot market purchasing. The gas commodity price charged by FortisBC to customers can change up to four times a year to allow adjustments for market fluctuations, but all changes are reviewed and approved by the BCUC.

1.6 Company Strategy

The utility primarily adopts a low cost strategy and the strategic fit grid (Buksar) analysis provided below (Table 1) illustrates this approach.

Table 1: FortisBC Gas Utility – Strategic Fit Grid

	Cost Base → Differentiation										
	Low Cost, Adequate Quality	1	2	3	4	5	6	7	8	9	10	High Quality, Adequate Cost
1. Product Strategy	Rapid Follower			❍								Innovative
2. R&D Expenses	Low			❍								High
3. Structure	Centralized		❍									Decentralized
4. Decision Making	Less Autonomy			❍								High Autonomy
5. Production/ Service	Economies of Scale			❍								Economies of Scope
6. Labour	Mass Production					❍						Highly Skilled
7. Marketing	Comparative, Push		❍									Pioneering, Pull
8. Risk Profile	Low Risk		❍									High Risk
9. Capital Structure	Leveraged			❍								Conservative

The purpose of this corporate strategy analysis is to determine how this low cost strategy aligns with that of a high corporate growth strategy and alignment with the recent changes in the industry environment.

The utility's centralized organizational structure, low risk profile, economies of scale propensity and leveraged capital structure all demonstrate a low cost and adequate quality corporate strategy. The company boasts a centralized, hierarchical organizational structure with major operational decisions driven from the top down. Either the Management Committee comprised largely of directors of the various departments of the company, or the ELT comprised the CEO and company Vice Presidents, maintain significant control of operational decisions. One

of the key factors in their decision making process is the desire to gain efficiencies by controlling costs. Over the years, the utility has focussed on increasing its customer base through organic growth and corporate acquisitions. This growth has enabled the company to achieve economies of scale as it can spread the high fixed costs of maintaining a capital-intensive pipeline infrastructure across a larger number of customers and thereby decrease its average operating cost.

The company`s capital structure is approved by the BCUC and was recently established at a 60/40 split of debt/equity[5]. A reasonable amount of debt is allowed in the utility business due to the stable nature of the operating environment and the predictable revenue stream, which enables the utility to cover its debt obligations. Higher debt leverage also enables the company to lower its cost of capital.

Due to the specialized nature of work required in the gas utility, a highly skilled trade's workforce is required, including engineers, operators and technicians who understand the complexity associated with the installation and maintenance of a gas pipeline infrastructure. Additionally, a large clerical and administrative workforce is required to handle customer service activities such as billing, service requests along with other more standardized and repetitive tasks.

While there has been some progress in the diversification of service offerings with the addition of biomethane, natural gas for vehicles, geothermal and district energy solutions in recent years, this progress has been slow. To date, the customer count for these new service offerings comprise only a relatively small number of customers compared to the large natural gas customer base. Research and development in this area has also been limited due to the utility's low appetite for risk. The "push" marketing approach adopted by the company for the new product offerings is also designed to contain costs.

This strategic analysis demonstrates how the company's capabilities are consistent with a low cost strategy, however, the external environment in which the company operates is evolving and therefore it is critical to understand how this strategy will evolve to adapt to the external changes.

[5] FEI received a decision from the Commission in December 2009 to increase the equity component of its capital structure allowed for ratemaking purposes from 35.01% to 40% and approved a rate of return on equity of 9.5%, up from 8.47%. FEVI's and FEW's equity component of their capital structure remains unchanged at 40%.

1.7 Issues with the Current Strategy at FortisBC

The existing cost-based strategy hinders the utility's ability to adapt effectively as the industry's external environment changes. The company faces challenges from social and political reaction to energy efficiency and energy conservation matters due to climate change concern. Moreover, new provincial policies and legislation have implications to energy production, consumption and infrastructure in the province. FortisBC needs to decide if a high growth plan is the route it wishes to pursue. Further development and pursuit into the diversification of service offerings will only increase costs. While operational efficiencies have played a large role in the company's success to date, the low cost, adequate quality strategy now requires anticipatory changes. The impetus for anticipatory change comes from a sense that strategic change is needed rather than from concrete evidence (Crossan, Rouse, Fry, & Killing, 2009, p. 248). Anticipatory change can be challenging to address as a lack of urgency makes it difficult to get management on side with the changes. Additionally, with an unclear problem due to the unknown or varying outcomes of future events there are many uncertainties to deal with (Crossan et al.).

A move towards a differentiated strategic direction will enable the company to support the development of a more customized approach to solving customers' energy solutions. Such a differentiated strategy will provide for customized services for which customers will be willing to pay. This differentiated strategy will have a focussed approach and thereby target key customer segments.

The company has taken a step in this direction with service offerings such as geothermal energy, district energy systems, renewable natural gas and more recently, natural gas for heavy-duty vehicles. The natural gas vehicle ("NGV") market is showing significant signs of promise for the company. However, it is uncertain whether the cost-based strategy adopted to-date can support such a chartered course and whether a focussed strategy should be adopted in its place.

1.8 Summary

This paper will focus on the growth strategy for FortisBC gas utility into the NGV market. Chapter two will provide an analysis of the company`s external environment, using Porter's Five Forces Framework analysis (Porter, 1979) and identify the company`s sources of competitive advantage. Chapter two will conclude with a comprehensive review of the NGV target market and evaluate its alignment with the company external competitive environment. Chapter three will focus on evaluating the proposed strategic alternatives of growth in the market

based on the internal capabilities of the organization and selecting one option to be implemented. Finally, in chapter four, an implementation plan for the recommended outcome will be discussed.

2: External Analysis

In order to perform an external analysis, this chapter will provide an overview of the industry and a description of the industry value chain with a focus on the role of the natural gas utility. In addition, an analysis of the attractiveness of the industry through a comprehensive review of Porter's Five Forces will be provided along with an identification of FortisBC`s key success factors. Furthermore, this section will provide a comprehensive competitive analysis of the company`s external operating environment along with a discussion of growth into the NGV market. A discussion of the opportunities and threats faced by the company pursuing an aggressive growth strategy in the NGV market will also be addressed. In conclusion, two strategic proposals into the NGV market will be offered for evaluation in chapter three.

The industry analysis will comprise of Porter`s Five Forces Framework in "understanding the competitive forces and underlying causes, reveals the roots of an industry`s current profitability while providing a framework for anticipating and influencing competition (and profitability) over time" (Porter M. E., 1979, p. 3). This analysis will be complemented with an industry "value chain" analysis. Porter explains that the value chain analysis describes how each of the activities performed in an organization add value and how they are linked to the organization's competitive position and thereby the competitive strength of the organization (Porter M. E., 1985).

2.1 Industry Analysis and the Value Chain

In order to understand the competitiveness of the natural gas distribution industry, it is important to review the natural gas industry as a whole and the areas in which the gas distribution industry has control. The all-encompassing value chain is often referred to as from "wellhead to burner tip", and comprises the entire natural gas industry value chain from exploration and extraction of natural gas from deep underground, to the delivery of natural gas to the end user as shown in Figure 3 and Table 3 below.

Figure 3: Natural Gas Industry Value Chain Overview

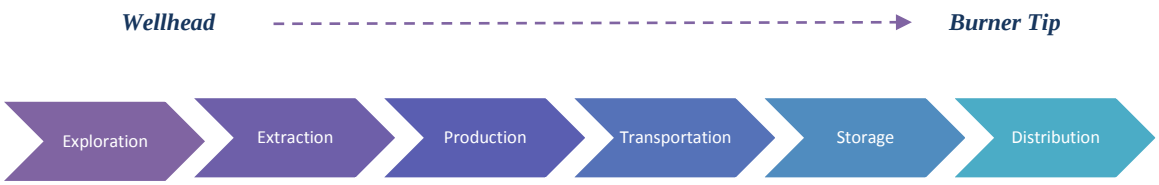


Table 2: Description of Natural Gas Industry Value Chain

Process	Description
Exploration	Natural gas is occurs naturally and consists primarily of methane, with lesser amounts of ethane, propane, butane, pentanes and heavier hydrocarbons. Therefore, the first step in the process is to locate the natural gas trapped under the earth's surface using technology.
Extraction	In this step of the process, once a potential natural gas deposit site has been located, drilling experts set up a new well after first gaining all the necessary permits and by following regulatory guidelines.
Production	Production is the process of bringing the natural gas to the surface. Natural gas is purified in order to remove water, impurities and heavier hydrocarbons. Natural gas delivered to end users for use in homes and businesses is almost entirely methane.
Transportation or Transmission	This process requires a network of transmission pipelines to transport the natural gas to regions where there is high demand or where storage facilities are available. That is, from production regions to consumption regions.

Process	Description
Storage	There are two main types of storage, underground storage and LNG storage. To store LNG, natural gas is cooled to a temperature of −162 °C (−260 °F) and stored in liquid form to meet increased demand in future periods. Typically, natural gas demand has been higher during the winter months and lower during the summer months due to its vital role in heating homes and offices. Natural gas in storage enables the ability to draw on supply to meet customer demands as they fluctuate.
Distribution	This is the process of transporting natural gas to end users. This is where local distribution companies or gas utilities have constructed a network of pipelines to households and businesses. The marketer also plays a role in this process by supplying natural gas to customers and in effect "competing" with the utility.

Source: (www.naturalgas.org)

The gas utility typically focuses on the distribution arm of the value chain where it delivers gas to end users in their homes and businesses, through a network of pipelines. Some gas utilities have successfully integrated vertically backwards with ownership of transmission pipelines in order to secure supply. The distribution process comprises the procurement and distribution of natural gas to end users. End users use natural gas for space and water heating, generating electricity, industrial processes, (such a generating heat and steam for use in combined heat and power systems) and for operating heavy duty vehicles such as garbage trucks and buses. As described in the previous chapter, the distribution process of the value chain is highly regulated. Throughout Canada, there are a number of gas utilities operating within their service territory with oversight from their respective regulating bodies.

Natural gas prices are driven by the market forces of demand and of both the current and the future supply of natural gas. As natural gas is both challenging to transport and to store the ability to react immediately to short-term increases in demand is limited. Although, natural gas in storage can help alleviate these demand and price fluctuations, natural gas storage by way of underground reserves can be increased when there is excess supply (during the summer months

when demand is low) and then withdrawn during the winter months when demand for heating increases. This enables utilities to supply gas to customers quickly when demand for natural gas peaks above the normal baseline load. Utilities need to be able to deliver gas into the distribution system quickly in order to meet these peaks in demand. The use of underground storage, LNG facilities or trucking LNG to satellite storage tanks can help better manage these fluctuations in demand. As the extraction of Northeastern B.C. shale deposits progresses, one would expect the construction of additional pipeline infrastructure and storage facilities to support this growth.

Each of the customer segments including residential home, commercial and industrial consumers typically drive demand for natural gas. Population growth, increased economic activity, natural gas pricing and prevailing weather conditions, all influence the demand for natural gas. Profitability of the utility, as described in the previous chapter, is largely controlled by the regulator through the COS model where the utility must seek approval from the regulator for any change in customer rates.

FortisBC operates in the transmission and distribution sectors of the industry value chain with pipelines spanning across the province. The transmission pipeline includes the Southern Crossing Pipeline ("SCP") a 312-kilometre pipeline that connects Yahk in the East Kootenays and Oliver in the South Okanagan, and the Inland Pacific Connector ("IPC") a 232-kilometre pipeline that extends the SCP from Oliver to Huntingdon in the Lower Fraser Valley. These pipelines enable the company to secure the transportation of its gas supply. Gas supply resources together with the SCP pipeline are shown in Figure 4. Additionally, a detailed FortisBC pipeline system map is shown in Appendix C.

Figure 4: Production Areas and Regional Gas Supply Resources Serving the Pacific Northwest

Source: Northwest Gas Association

The SCP is shown here as the Terasen Southern Crossing

Furthermore, the company owns two LNG plants, one in the Lower Mainland in Tilbury and the second completed and commissioned in 2011 located on Vancouver Island at Mount Hayes. The transmission pipelines along with the management of gas in storage facilities demonstrates the company`s two key success factors. The first key success factor is operational excellence in the ability to provide safe and reliable gas to meet customer demand by exercising greater control over supply options. Another key success factor is the ability to manage significant fluctuations in the price of the gas commodity through the company's ability to draw upon gas in underground storage to manage increased demand during the heating season when demand for natural gas is the highest, and draw upon LNG to meet peak-shaving needs during cold winter snaps.

2.2 Industry Analysis and the Five Forces Framework

This section will comprise a comprehensive industry analysis of the natural gas industry with a particular focus on the gas distribution process of the industry value chain. Porter's five competitive forces framework identifies five forces that shape competitiveness and thereby the profit potential in a given industry (Porter, 1979). These five forces comprise the threat of new entrants, bargaining power of suppliers, bargaining power of customers, the threat of substitutes and rivalry among competitors. Together, the strength of the five forces provides for an influence on pricing, cost and required investments and thereby a determination of the profit potential in the industry. Stronger forces will create a more competitive industry environment. In evaluating these five forces, the further development of the company`s key success factors will emerge and be reviewed at the end of this section.

2.2.1 Threat of New Entrants (Low)

Barriers to entry measure the significance of the threat of new entrants into an industry to existing firms. Since new entrants will bring with them the desire to gain market share and often-significant resources and increased capacity, this may place pressure on pricing and decrease profitability. The natural gas distribution industry enjoys high barriers to entry, largely due to high capital investment and government regulation giving it a monopoly status and thereby the threat of new entrants is low.

i. High Capital Investment (+)

The industry enjoys high barriers to entry due to the significant capital funding required to build a network of underground distribution pipelines, construct regulator and compressor stations and install meters. Firms in this industry not only have high capital requirements, but also high operational costs in order to maintain the complex infrastructure. For this reason, corporate size is a key success factor for a firm operating in this industry.

ii. Economies of Scale enjoyed by Incumbent Firms (+)

Incumbent firms enjoy economies of scale due to the ability to spread the high fixed costs across a greater number of customers. This forces new firms entering the industry to do so at the same scale as that of existing firms or to accept the cost disadvantage. Furthermore, firms need to reach a large minimum efficient scale due to the high ratio of fixed costs to variable costs in order to compete effectively with incumbent firms. The ability of firms in the industry to garner a large customer base to achieve economies of scale and operational efficiencies through growth is a key success factor. Furthermore, another success factor is a firm's ability to contain costs even during growth phases.

iii. Regulatory Restrictions are High (+)

The regional regulating body provides exclusive rights to utilities to operate in a specific service territory. Therefore, new firms must first register and seek approval from the regulator through a long, complicated and arduous process requiring a demonstration of compliance with all safety, security, health, service levels and environmental issues related to natural gas distribution. Furthermore, the utility must seek approval from the regulator for all pricing (or tariffs) it intends to charge the consumer. Effectively managing the relationship with the regulator is one of the key success factors for a firm operating in this industry. Since the regulator has significant influence and oversight over the utility operations, including pricing, service levels, approval of large capital infrastructure projects and approval of an adequate rate of return.

iv. High Brand Identification and Corporate Reputation (+)

As a utility operating in a monopoly environment, an existing firm has developed high brand identification and a positive corporate image over time, synonymous with safety and reliability of service. Additionally, the existing firm has established themselves in the minds of consumers as the gas service utility of choice. A new firm entering the industry must overcome this hurdle, educate consumers, and be in a position to offer customers service reassurance, with no history or record of accomplishments to demonstrate. Furthermore, new firms must entice customers to switch from their existing service provider to another. With a homogenous product offering, this is in the form of better pricing or superior service. With exclusive rights to operate in a service territory, the existing utility has developed a reputation over time and therefore its brand identification and corporate image are key success factors through its ability to maintain high customer satisfaction.

v. Deregulation through Unbundling (-)

In recent years, deregulation has facilitated competitive conditions in what historically has been a monopoly environment. This has primarily focussed on the trading and retailing elements of the value chain. In order to facilitate this retail competition, the gas commodity charge is separated from the service delivery charge. This enables gas marketers to offer programs, which "compete" with the utility. Gas marketers offer end users the ability to contract for the supply of the gas commodity and the delivery of the gas is executed through the existing utility's pipeline infrastructure at the regulated delivery charge. Like the utility, natural gas marketers must adhere to strict guidelines and policies directed by the regulator. Regulators have developed a code of conduct, fair market practice guidelines along with contract guidance for marketers, which ensures consumer protection.

While unbundling in Canada has been adopted by various provinces, there have been only modest adoption rates by consumers. FortisBC`s adoption rate is at 14 per cent of its customer base. It appears that the main reasons for the slow adoption are due to the company's key success factors including the customer's affiliation with the corporate brand, the reliability of service (operational excellence) together with overall customer satisfaction. Furthermore, price also plays a role in consumer decision-making process. The gas marketer offers fixed price and fixed term contracts, which are not adjusted for market fluctuations in the gas commodity price. Therefore, customer's recognition of stable pricing through a firm's price risk management

strategy is another key success factor in addressing this competitive environment, as has been demonstrated by FortisBC.

vi. Entry through Mergers and Acquisitions (-)

With natural gas distribution industry growth relatively modest to flat, due to the mature nature of the industry, mergers and acquisition of local distribution companies facilitates entry into the market. Most recent examples of Canadian utilities acquiring other utilities are that of AltaGas' acquisition of natural gas distribution and natural gas storage utilities in Alaska and Michigan, and Fortis Inc.'s acquisition of a utility in upper New York State, (CH Energy Group Inc. that owns Central Hudson Gas and Electric Corp.). Both acquisitions took place in February 2012. We continue to see mergers and acquisitions as a means of entry into the market. This again lends to the corporate size of firms as a key success factor.

vii. Economies of Scope and Learning (+)

With the convergence of multi utilities, firms can exploit economies of scope and save on operating costs. Given that gas, electricity and water utilities share similar sets of services, there can be the efficient integration of services in areas such as service operations, customer billing, call centre, safety and environmental programs and marketing. Additionally, the multi utilities can share the same set of labour resources particularly if there is reserve capacity to draw upon for emergency and maintenance repair work. Thereby, economies of scope provides for lower barriers to entry with the horizontal integration of multi utilities, particularly those operating in the same service territory.

Additionally, through economies of learning, employees in gas utilities become increasingly knowledgeable and efficient in installing pipe as they gain on the job experience in preparing pipeline drawings, installing pipe in the ground, connecting the pipelines to customer homes and installing gas meters. Additionally, an incumbent utility has developed relationships and formed alliances with the local municipality, city hall representatives, and government officials along with First Nation groups. These relationships serve to facilitate a smoother and more efficient process for developing initiatives that impact or benefit various stakeholders. This superior knowledge can only be acquired on the job and is very difficult for a new firm to replicate immediately. In this context, corporate size and operational excellence through

experience are key success factors firms operating in this industry and, as such are success factors cultivated by FortisBC.

viii. Homogeneous Product (+)

Given that very little product differentiation can be achieved with the gas commodity, differentiation can only take the form of value-added services be means of service offerings, service levels, reliability, safety, and trust. One emerging area is the differentiation of service through automated metering system. The customer can benefit from more accurate and timely gas consumption readings and ultimately provide for greater efficiencies in operating costs with the elimination of manual meter reads. While in the short term, automated meters may increase costs there are longer-term benefits through operational efficiencies (no manual meter reads required) and increased accuracy of billing.

Additionally, with the unbundling of services gas marketers are enabled the ability to compete with the utility on pricing with fixed pricing term contracts. Thereby operational excellence through service and reliability, high brand identification and high levels of customer satisfaction all serve as a key success factors for FortisBC, as it is able to differentiate itself through providing additional value add to customers.

In summary, superior relationships with the regulators through outstanding performance and adherence to regulatory guidelines, high brand identification, economies of scale resulting in operational efficiencies are all key success factors for firms operating in this industry to address the threat of new entrants. Furthermore, for horizontally integrated utilities, there can be greater efficiencies through economies of scope. Therefore, high barriers to entry in this industry are attained by the company through key success factors such as corporate size, cost containment, operational excellence, an effective price risk management strategy, high brand identification and high levels of customer satisfaction.

2.2.2 Bargaining Power of Customers (Low)

Consumers can have a significant influence on firms in an industry through their ability to drive down prices or to demand better quality of services. This may lead to increased costs at the expense of industry profitability. Thereby, for this force an assessment of buyer group

composition and buyer influence is presented below. The overall assessment for this force in the gas distribution industry is low.

i. Buyer Dominance is Limited (+)

While the utility serves three principal buyer groups, residential, commercial and industrial consumers, residential consumers typically make up the largest portion of the utility's revenue. However, residential customers are many and are spread geographically across the utility's service territory with very little power to influence pricing. The role of the regulator is to ensure consumers are not adversely affected in any way by the utility`s actions.

High volume users of natural gas, such as industrial users, are often provided with a separate pricing rate structure and have greater bargaining power than residential customers, although, they typically contribute a smaller percentage of a utility's gas revenues. Some industrial users have set up their production facilities to enable the ability to switch fuels as required, in order to contain their costs. In this context, FortisBC`s effective price risk management strategy and cost containment capabilities have served to limit buyer dominance.

ii. Deregulation increases Buyer Power (-)

With the emergence of deregulation in various provinces, consumers have the ability to choose an alternative supplier for the purchase of the natural gas commodity. Gas marketers provide consumers with a fixed pricing and fixed term contracts. The program began initially with availability to industrial and commercial customers, and has since grown to include residential customers. Adoption rates have slowed in recent years largely due to a forecasted decline in gas commodity costs as consumers "wait" to see where gas commodity prices level out before signing fixed term and fixed price contracts. Currently, 14 per cent of FortisBC's customers have signed up with gas marketers. This relatively low adoption rate is largely due to the company`s ability to successfully manage fluctuations in the price of the gas commodity.

iii. Buyer Switching Costs are High (+)

Once a particular fuel service infrastructure is in place, it is costly and uneconomical for most consumers to switch to an alternative fuel source. For consumers to switch effortlessly from gas to electricity for example, they will need to ensure the installation of appropriate wiring and

appliances together with an electricity metering system alongside their gas service infrastructure. Residential customers often make a one-time decision at the time of their home construction or renovation concerning their choice of fuel for heating, cooking and various home appliances and hold fast to this decision. Some industrial consumers and electric generation consumers do have the capacity to switch fuels while most residents and commercial customers rely solely on natural gas to meet their space heating needs. Electric generation is moving away from using coal to natural gas for electricity generation due to coal's higher contribution to carbon emissions.

In summary, the bargaining power of consumers is low, largely due to limited buyer dominance, slow unbundling adoption rates and high switching costs for consumers. FortisBC has been able to manage this competitive force through various key success factors such as its corporate size, cost containment, operational excellence, an effective price risk management, high brand identification and high levels of customer satisfaction.

2.2.3 Bargaining Power of Suppliers (Moderate)

Supplier bargaining power can also be a competitive force in the ability to control costs and pricing, or reduce the quality of the goods sold. This can lead to decreased profitability in the industry if firms are unable to pass these higher costs onto consumers. The overall assessment for this force is moderate as there are some influences, such as supplier dominance and limited throughput that are high, and others such as an abundance of gas supply that counteract these influences.

i. <u>Demand affected by influences beyond control of Suppliers (+)</u>

Weather and economic growth have a significant influence on the demand for natural gas, and these factors are beyond the control of suppliers and difficult to forecast. Natural gas demand typically increases during the cold winter months as demand for heating increases, and decreases in summer months. Additionally, as the economy expands fuelled by commercial and industrial growth, demand for energy (including natural gas) also increases. As demand increases for natural gas, suppliers have greater influence and control and thereby their bargaining power increases. Therefore, the bargaining power of suppliers is inherently linked to major influences of demand, weather and economic growth. Although suppliers are able to manage natural gas supply

through storage facilities, which can increase their bargaining power position, FortisBC has been successful in mitigating this external pressure through its` effective gas commodity price risk management strategy.

ii. Natural Gas playing an increasing Role in the Energy Solution (-)

With natural gas the cleanest fossil burning fuel, the role of natural gas in place of coal for electricity generation will continue to place pressure on the demand for natural gas and furthermore enable suppliers to have increased bargaining power.

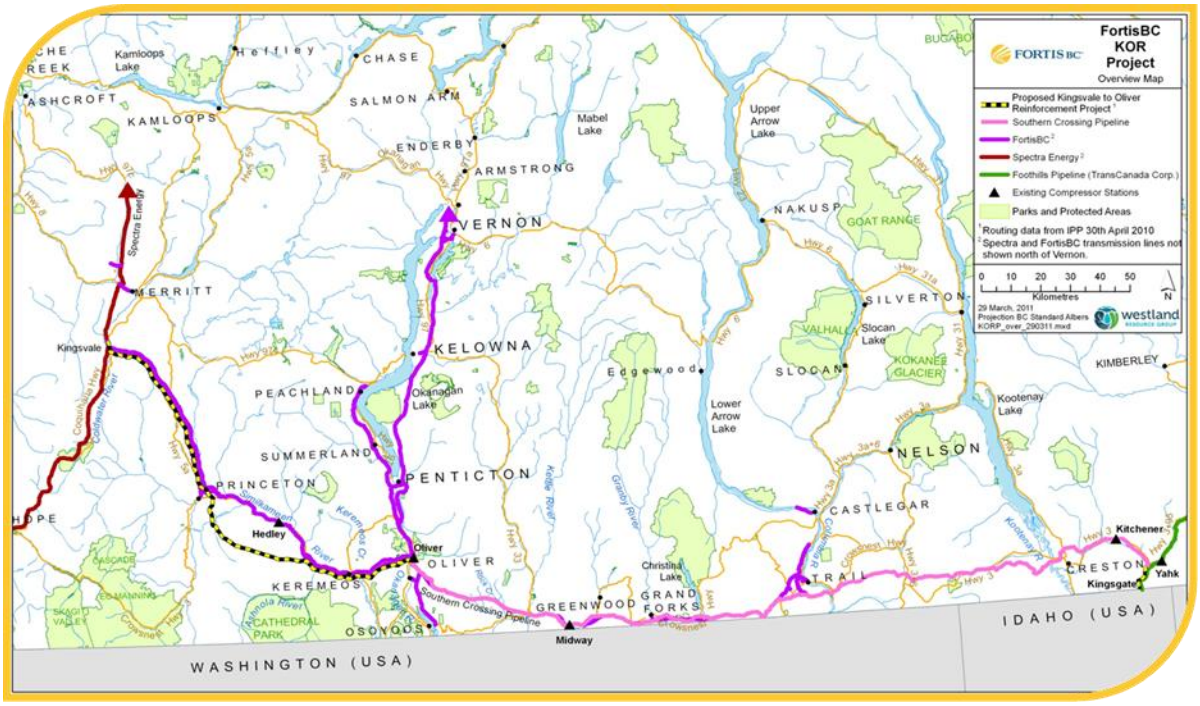
Long-term gas prices are driven by population and economic growth, and by factors such as environmental policies. For example, greater demand for gas as an environmentally preferred fuel for electricity generation could result in an increase in natural gas prices. Therefore, a key success factor for FortisBC in relieving this competitive pressure is the company's ability to manage price fluctuations with a comprehensive price risk management strategy.

iii. Natural Gas Transportation Throughput Limited (-)

While there are a large number of extraction and production companies, the first step in the industry`s value chain process, the number of natural gas transportation suppliers and pipelines are few and thereby there is limited natural gas throughput  pipeline capacity. This may become an increasing concern for utilities as demand from Asia and Europe for BC`s natural gas ramps up. Utilities can protect themselves against price fluctuations and guarantee supply by constructing storage facilities, which enable them to draw upon natural gas in storage during the heating season. Utilities need to have an effective price risk management program in place to ensure guaranteed supply of natural gas at favourable pricing as has been FortisBC`s success.

Moreover, FortisBC is in the process of evaluating an expansion to the existing pipeline infrastructure in Northeastern B.C. in order to take advantage of the shale gas supply developments. The new pipeline would benefit both FortisBC's customers and enable shippers to transport natural gas to new markets discussed above. The 161-kilometre pipeline proposed between Kingsvale and Oliver will include facilities at Yahk, and is an expansion of the company's SCP as shown in Figure 5. The company is currently in the initial planning stages and will be seeking the regulator's approval in the near term. This initiative demonstrates the company's commitment in effectively managing and securing supply of gas for its customers.

Figure 5: Map showing the proposed Transmission Pipeline from Kingsvale to Oliver



Source: *Company Documents*

iv. Land Access through Right of Ways (-)

As pipeline construction crosses through a vast territory of the province, landowners can exercise a significant amount of power in enabling utilities to access their existing pipelines or moving forward with new pipeline construction projects. In particular, First Nations landowners play a critical role in determining the outcome of various pipeline or storage facility construction projects and therefore garner significant bargaining power. The utility must nurture relationships with landowners, both in existing and potential future right of ways. FortisBC has been successful in developing authentic and virtuous relationships with various stakeholders, including landowners, over time.

v. Role of Governmental Policies influencing Supply of Natural Gas (+)

Government plays a key role in managing gas supply capacity through the approval of infrastructure developments due to the impact that such projects can have on the local economy and the environment. Recent developments, as outlined in the B.C. Government's Natural Gas Strategy paper (Ministry of Energy, 2010), will shape the development of the Northeastern B.C.

shale play in Horn River, the largest shale gas reserve in Canada. Such development activities will play a large role in influencing supply and pricing of natural gas to the utility. A key success factor in managing this issue has been FortisBC's relationships with key stakeholders, including policy makers.

The overall bargaining power of suppliers is moderate. High supplier influence is the result of limited transportation throughput and stakeholder control over land access to right of ways. These pressures are somewhat lessened with demand influenced by factors beyond the control of suppliers including weather in the short term and governmental energy policies in the long term.

This force have been regulated by FortisBC's key successes in the management of the gas commodity cost through a comprehensive portfolio management of future contracts, spot market purchases and gas held in storage. Furthermore, the nurturing of key relationships with transportation suppliers, landowners (including First Nation groups) and government has been paramount to the utility's success.

2.2.4 Threat of Substitutes (Moderate)

The existence of substitute products limits the profit potential of a particular industry as customers can choose to purchase the alternative product or service. The overall assessment for this force is moderate. While consumers can exercise their ability to choose either gas or another energy form, in the long-term demand for energy can be reduced through effective demand-side measures as consumers become increasingly energy conscious.

i. Alternative Energy Sources or Fuels (-)

There is no direct substitute for natural gas itself, and short-term demand for energy, and thereby natural gas, is relatively price inelastic. In the longer term, alternative energy sources can be used in the place of natural gas, such as electricity, propane, solar, geothermal, or district energy systems depending on the purpose of consumption. For example, residential customers can use electricity, propane or solar for home heating, if the appropriate infrastructure is in place. Electricity is the greatest source of threat as a substitute and thereby natural gas usage compared to that of electricity must remain price competitive in order for consumers to choose natural gas

particularly for space and water heating. FortisBC has been able to maintain price competitiveness with electricity through cost containment measures along with its gas commodity price risk management strategy.

ii. Demand Side Management ("DSM") Programs (-)

While not a substitute, demand side management programs seek to reduce the overall consumption of energy, including natural gas. These programs often include government incentives for the installation of energy efficient upgrades of appliances and home improvements. There has been increased growth of these programs in recent years. Utilities must find ways to incorporate DSM programs into their service offering but simultaneously ensure that demand management does not adversely affect the ability to reach economies of scale through a large customer base.

FortisBC has identified innovative ways to grow in the face of these challenges through new service offerings such as renewable natural gas offerings Additionally, the company services this need by employing wide-ranging DSM programs designed to assist customers with managing their energy usage and mitigate the need for future infrastructure requirements. Thereby, ensuring customers are satisfied with the utility's service offerings.

iii. Government Incentives and Climate Control (-)

Governments continue to address the issue of clean energy and climate control through various tax incentives and grants enticing consumers to choose renewable energy solutions such as hydroelectricity, renewable natural gas, solar, geothermal and district energy solutions. This places pressure on the role of natural gas as an energy solution. Additionally, taxes such as the carbon tax increases the cost of natural gas to the consumer, and provide customers with the perception of a dirty fuel, although natural gas is the cleanest of all the fossil fuels. Furthermore, government incentives for fuel-efficient upgrades for heating, insulation, windows, roofs, water heaters also affect the use of natural gas in the home. To combat these pressures FortisBC has been finding innovative ways to offer renewable energy service offerings for its customers.

In summary, the threat of substitutes is moderate. As, on the one hand various government incentives entice customers to choose renewable energy sources or to reduce their

overall demand for energy. On the contrary, natural gas demand is relatively price inelastic in the short term, as it is cost prohibitive to switch conveniently to alternative energy forms. The key success factors cultivated by FortisBC to combat these forces have been effective cost management practices designed to maintain the price competitiveness of natural gas, renewable energy service offerings and the efficient management of DSM programs. Customers must see the perceived value in DSM programs for utilities to be able to increase prices.

2.2.5 Intensity of Rivalry (Low)

Rivalry among competitors within the industry is the fifth competitive force. The use of price competition, advertising battles, and new product introductions are often used in order for a company to advance their competitiveness position. The intensity of rivalry in this industry is considered low.

i. Regulation limits Rivalry (+)

The regulated environment limits competition as the utility operates in a monopoly environment with no direct competition. FortisBC's key success factors in this regard have been its size, successful cost containment measures, high brand identification and operational excellence. Furthermore, a relationship with the regulator built on trust has been critical.

ii. Deregulation enables Competition at the Marketing Level (-)

Marketers offer consumers a choice in the purchase of the gas commodity but so far, we have seen only modest growth in adoption of these programs. Furthermore, these programs limit competition to only one transaction in the overall industry value chain. The key success factors for FortisBC in alleviating these competitive pressures have been through an effective gas commodity price risk management strategy, high brand identification and service reliability.

iii. Slow Growth Industry – Mature Industry (+)

With only modest growth in the industry, there is no incentive for new firms to enter and compete for a share of the growth. The key success factors achieved by FortisBC are size, cost containment, high brand identification and operational excellence.

iv. High Fixed Costs (+)

High fixed costs require that a firm reach its minimum efficient scale with the minimum customer base in order to cover its costs. With a high fixed cost structure, utilities are limited to compete aggressively on price. Therefore, corporate size is a key success factor for a firm operating in this industry.

v. Homogeneous Product (+)

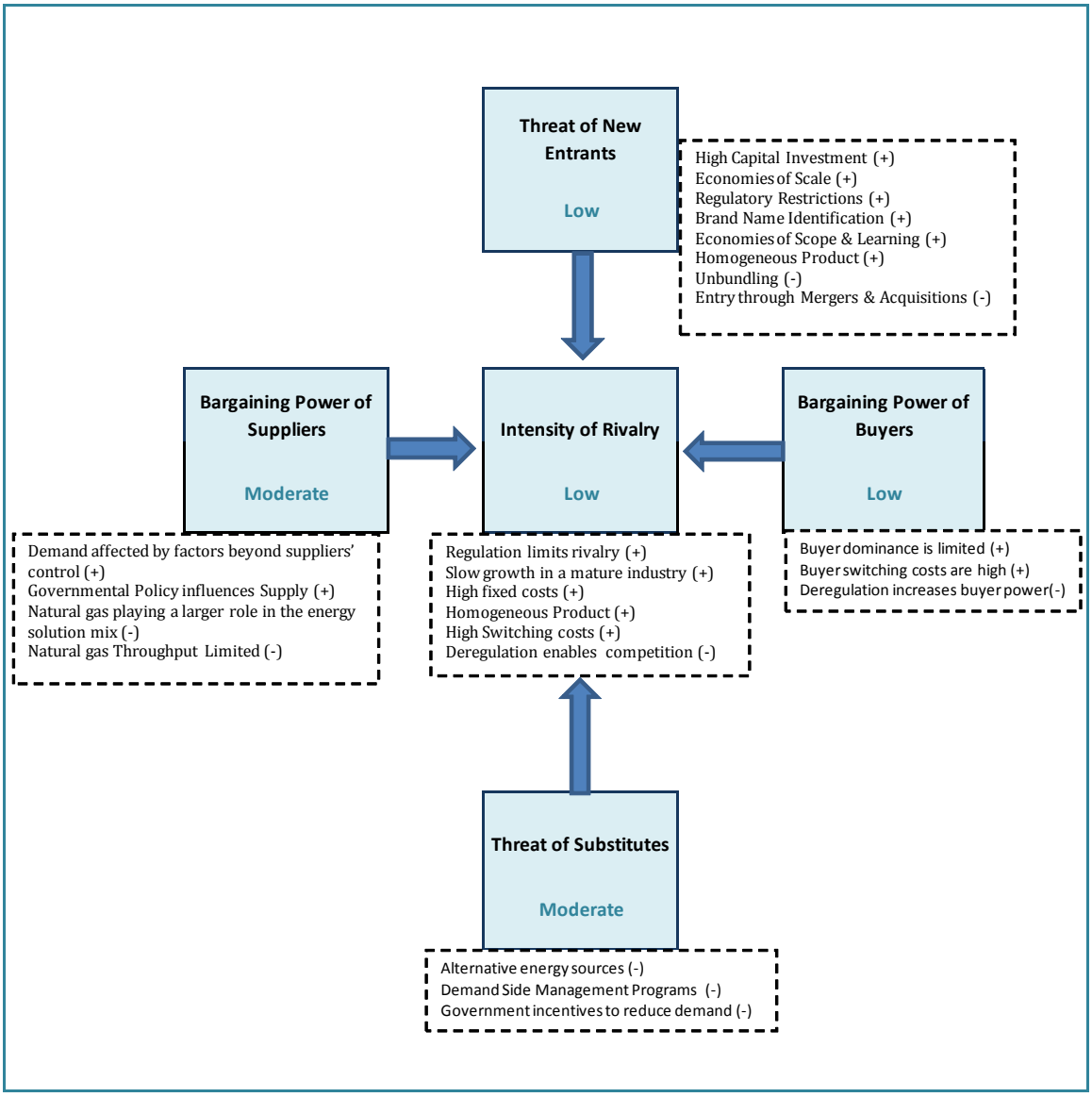
As discussed earlier, the natural gas commodity is a homogenous product and thereby competition must take the form of lower pricing or differentiated services. For this reason, operational excellence through service and reliability, high brand identification and high levels of customer satisfaction all serve as a key success factors for FortisBC, as it is able to differentiate itself through providing additional value to the consumer.

ix. High Switching Costs (+)

As discussed earlier, short-term demand for energy is inelastic due to the high cost of switching to alternative energy sources. FortisBC's key success factors in the deterrence of switching in the long-term have been in cost containment, high brand identification and operational excellence.

In summary, the intensity of rivalry in the industry is relatively low. While consumers are able to choose a supplier for their gas commodity, they are limited in the ability to switch energy forms due to high switching costs. Additionally, high fixed costs and a slow growth industry limit fierce price rivalry. A stable, modest growth and highly regulated environment does not provide for intensity in rivalry in this industry. Again, FortisBC has been able to address these influences through various key successes including its corporate size, cost containment measures, high brand identification, operational excellence and its price risk management strategy. Figure 6 provides a concise summary of the five forces framework analysis.

Figure 6: Porter's Five Forces Framework Summary

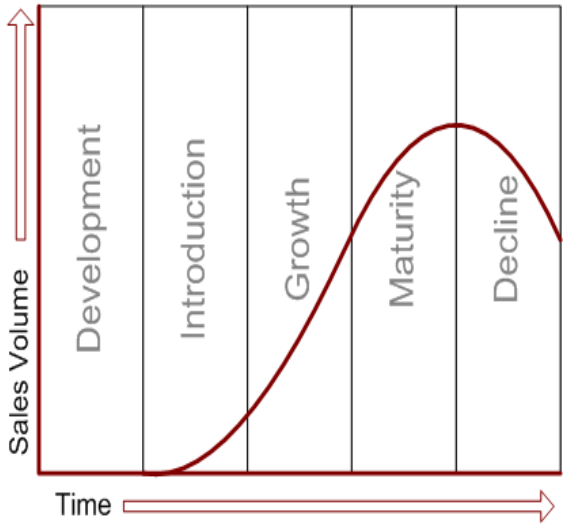


2.3 Industry Attractiveness

The overall attractiveness of the industry is that it is profitable and with high barriers to entry and exclusive service territory, companies are often in a monopoly position as the sole supplier in the region. Although natural gas has no direct substitute, alternative forms of energy can be used in the long term if an infrastructure for the alternative energy source is developed. Due to the mature nature of the industry, growth is modest or relatively flat and entry into the market is largely facilitated through mergers and acquisitions. Although, there are limitations to this approach as some LDCs are owned by local or provincial government bodies.

While the industry profitability has been relatively attractive to date as it advances towards the mature stage of its lifecycle (see Figure 7 below) the gas utility is faced with addressing concerns surrounding limited growth, a declining load and an aging infrastructure.

Figure 7: Stages in an Industry Lifecycle



2.4 Key Success Factors

Through the completion of the five forces framework in Section 2.2, the company`s various key success factors were identified. These have been instrumental in FortisBC`s achievements to date. Some of these success factors are developed though tacit knowledge and often taken for granted while others are more explicit, such as key relationships, that have been carefully nurtured over time. The ranking of these key success factors is provided in Table 3 (on a

scale of 1 to 5, with 5 being the highest) and is relative to the frequency with which they appeared in the five forces competitive analysis above.

Table 3: Summary and Ranking of Key Success Factors

Key Success Factors	Description	Ranking
Operational Excellence	Striving for service reliability, safety, integrity and service level excellence, along with compliance of codes and standards	5
Brand Identification and Image, customer satisfaction and loyalty	Customers view the organization as the energy provider of choice	4
An effective price risk management program for the gas commodity	Effectively managing price fluctuations in the gas commodity in order to maintain price competitiveness	4
Focus on cost containment	Through growth by achieving economies of scale and focussing on diligent cost management strategies	4
Corporate Size	Enables access to funds, a large customer base, economies of scale and scope	3
Effective management of external stakeholder relationships	Key stakeholders include the regulator, land owners, suppliers and energy policy makers	2

Key Success Factors	Description	Ranking
Finding innovative ways to take advantage of growth opportunities that focus on renewable energy sources or reduction in GHG emissions	Through new service offerings such as renewable natural gas, geothermal, district energy systems and natural gas for vehicles	1

It is imperative that FortisBC has a solid grasp of its key success factors as any change in strategic direction should revolve around the competitive advantage the company has cultivated through these key success factors.

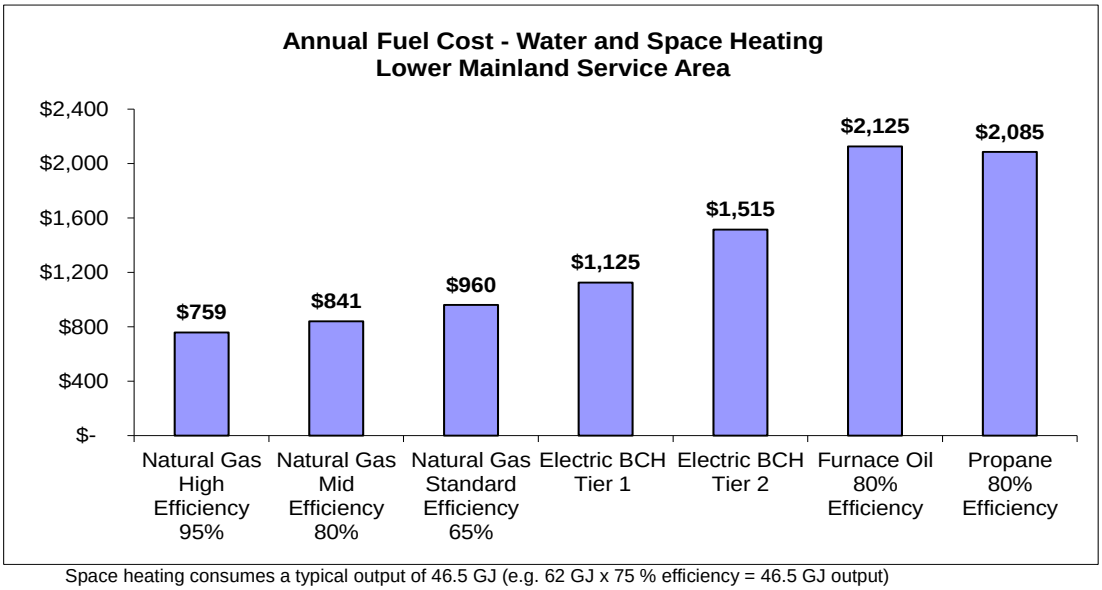
2.5 Competitive Analysis

One method of evaluating FortisBC's competitiveness it to benchmark the company's performance against it peers. A confidential benchmarking study prepared in 2009 indicated that FortisBC exhibited the lowest operating cost per customer amongst its peer group of gas utilities for the period 2003 to 2008. Lower operating costs are demonstrative of the company's ability to successfully contain costs and hence a key success factor. However, external factors largely attributable to provincial divergences significantly influence operational costs. This same study indicates that FortisBC's number of customers per km of pipe was above the peer group's weighted average, possibly because of higher customer density, which can give rise to lower operating cost per customer. The study also identified that the company's volume of gas usage per customer was the lowest in the peer group. This was most likely the result of the mix of customers (residential, commercial and industrial) and provincial differences in weather conditions, which influence gas throughput demand for heating. As external environmental differences across per group utilities influence their respective performance and subsequent competitiveness, such benchmarking is used with caution. This is because peer utilities vary in size, customer segment mix, customer density, prevailing weather conditions, and provincial government policy, among other factors. One would assume that the company would also not rely on such benchmarking studies as a sole criterion for competitive analysis. Instead, the following analysis provides for a more relevant competitive analysis for the company.

Although FortisBC is a monopoly, it operates in a somewhat quasi-competitive environment. This is because customers are making an energy choice. In the province, this choice is primarily between gas and electricity for their home and office heating needs. BC Hydro supplies electricity to homes and businesses in approximately 90 per cent of FortisBC's service territory. BC Hydro is a crown corporation, responsible to the Ministry of Energy, Mines and Petroleum Resources, and is regulated by the BCUC. It distributes electricity, the majority of which is generated by hydroelectric facilities, to 1.8 million customers in the province (Hydro).

A price comparison of a typical Lower Mainland residential customer's average fuel consumption in a year demonstrates the price competitiveness of natural gas over electricity. Natural gas, even at 65 per cent energy efficiency, is a more cost effective fuel for both space and water heating when compared to electricity. Indeed, it is more cost effective than electricity, furnace oil or propane, as shown in Table 4 below.

Table 4: A Comparison of Energy Costs for a "Typical" Residential Customer in the Lower Mainland



Space heating consumes a typical output of 46.5 GJ (e.g. 62 GJ x 75 % efficiency = 46.5 GJ output)

Water heaters are assumed to be standard efficiency for gas and electric

Electric amount does not include basic charge since a household already pays the basic electric charge for non-heating uses

1 GJ = 39.4 Litres of Propane

Typical water heating consumption of 20.4 GJ input (natural gas)

1 GJ = 25.8 Litres of Furnace Oil

FortisBC Energy rate includes the basic charge

1 GJ = 277.78 Kilowatt Hours

Gas Rates effective as at January 1, 2012, Alternative Fuel Rates as at January 2012

Source: Company documents

While natural gas continues to retain a price advantage over electricity, natural gas usage in residential homes when compared with electricity has actually declined. Table 5 below shows the proportion of natural gas and electricity end-use in B.C. over a five-year period. The use of natural gas for space heating in residential homes has decreased by 4 per cent over this period, while electricity use has increased by the same percentage. This trend is disconcerting for the company as residential customers comprise 90 per cent of the total customer base and contribute nearly 60 per cent of the total revenue.

Table 5: A Comparison of Energy end-use for Natural Gas and Electricity in B.C.

BRITISH COLUMBIA	2005	2006	2007	2008	2009	Change 2005-9
Space Heating						
Residential %						
Natural Gas	59%	59%	58%	55%	56%	**-4%**
Electricity	27%	27%	27%	31%	31%	**4%**
Commercial & Institutional %						
Natural Gas	77%	71%	76%	75%	80%	**3%**
Electricity	9%	9%	9%	9%	9%	**0%**
Water Heating						
Residential %						
Natural Gas	81%	82%	82%	80%	82%	**1%**
Electricity	17%	16%	16%	17%	16%	**0%**
Commercial & Institutional %						
Natural Gas	76%	77%	76%	81%	81%	**5%**
Electricity	71%	71%	71%	71%	71%	**0%**

Source: (Natural Resources Canada)

This decline in natural gas use is the result of a number of factors, including pricing signals along with overall consumer perceptions of energy usage. One of the pricing considerations is that customers are faced with higher upfront capital costs (a difference of $4,500) to install electric baseboard heating versus natural gas piping in their new home construction, as shown in Table 6 below. Moreover, the table shows that a price differential over electricity of $10 per GJ over 18 years is required in order to compensate a consumer for the higher cost of natural gas installation relative to electric baseboard heating.

Table 6: Payback on Incremental Capital Costs for a Natural Gas Heated Home[6]

Payback of Capital Costs (New Construction)

Space Heating Requirement Only New Construction of home in Lower Mainland (2500 square feet in size)	
Capital Costs for High Efficent Furnace (90%) and ducting/installations	$7,000.00
Capital Cost for Electric Baseboards	($2,500.00)
Difference in up front capital costs	$4,500.00
Interest Rate	0.06
Measureable Life of Furnace (years)	18
Amount that has to be recovered in operating cost annually to payoff difference in capital cost	$415.60
Add in furnace maintence costs per year	$100.00
Total ($)	**$515.60**
Energy consumptions for natural gas space heating (GJ's)	50
Difference in cost that needs to exist between natural gas heated home and electricity heated home in $/GJ over 18 years	**$10.31**

Source: Company Documents (FortisBC, 2009, p. 64)

There are additional reasons for the decline in the proportion of natural gas use in the province over this period. These include the replacement of low energy efficient appliances with those that are of high-energy efficiency, an increase in the construction of multifamily dwelling homes, which have lower average energy use rates, and demand side measures, which focus on energy conservation.

Furthermore, the company is approaching the mature stage of its lifecycle with new customer additions from the period of 2003 to 2011 showing an average growth of only 1.5 per cent per year. This rate of customer growth is not sufficient to offset the decline in average use rates the company has been experiencing, (see Appendix D).

The company`s cost based strategy has served well to maintain natural gas' price competiveness against electricity and other energy forms. It is important that "systematic considerations of both the economic and political environment are key components of strategic analysis frameworks" (Vining, 2011, p. 64) As such, analysis of the external environment shows a continuum of evolution and the role that natural gas will play in the province`s energy portfolio is still uncertain. Furthermore, the company is confronted with a downward spiral of increased

[6] The 50 GJ used in this calculation relates to a new (2500 square feet) residential home located in the Lower Mainland. This 50 GJ is for space heating only and does not include other uses of natural gas in the home such as water heating or natural gas stoves.

pressure on delivery costs as it faces decreased average use rates and a slow rate of customer additions, but must maintain the upkeep of the existing aging and capital-intensive infrastructure. The company must chart a course towards a more focussed growth strategy if it is to continue to reap benefits similar to those acquired in the past.

2.5.1 Addressing the Competitive Pressures

In order to address the company`s competitive pressures, and leverage the company`s existing key success factors, FortisBC is in need of a growth strategy that will facilitate an increase in gas load to the existing gas pipeline system. The traditional utility business model must evolve beyond the conventional gas service offering. The company has already taken steps toward such an evolution with the development of geoexchange, district energy systems and biomethane[7] service offerings. These "greener" or renewable service offerings are in recognition of public perceptions of natural gas and are in alignment with shifts in government energy policies. Additionally, the company has recently increased its' efforts to pursue an alternative market for natural gas, the transportation sector. Growth in this market has the potential to address the imminent competitive and environmental pressures the company faces. This target market will be explored further both in the context of the opportunities it offers and threats it poses for the company.

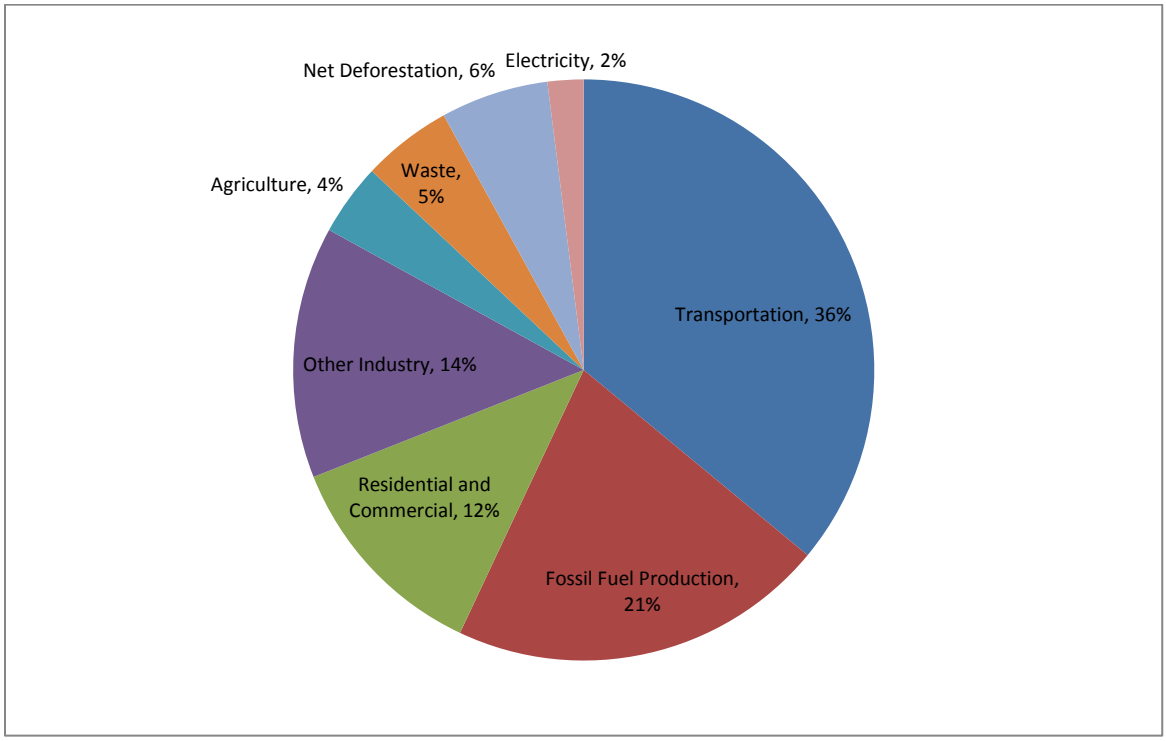
2.6 A Targeted Growth Strategy into the Transportation Sector

The key drivers influencing the growth of natural gas use in the transportation sector are the price advantage and the environmental benefits of GHG emission reduction that natural gas offers over gasoline or diesel fuel. These benefits coupled with the abundance of domestic (B.C.) natural gas supply suggest this market segment offers significant growth potential. The company currently has a few NGV customers and is poised for further growth in this target market segment, as the NGV market offers great potential for increasing gas load throughput with the company's existing pipeline infrastructure. In order for customers to utilize the gas for their NGV, pressure increasing and dispensing equipment is installed at the customer's premise. This allows customers to use CNG or LNG for their vehicles.

[7] Biomethane is a renewable fuel derived from organic waste

The transportation sector of the economy contributes the largest proportion of GHG emissions in the province at 36 per cent, as shown in the Figure 8. The use of natural gas as a transportation fuel, with 20 to 30 per cent fewer GHG emissions compared to conventional fuels such as diesel and gasoline, offers great potential for a cleaner environment (Ministry of Energy, 2010).

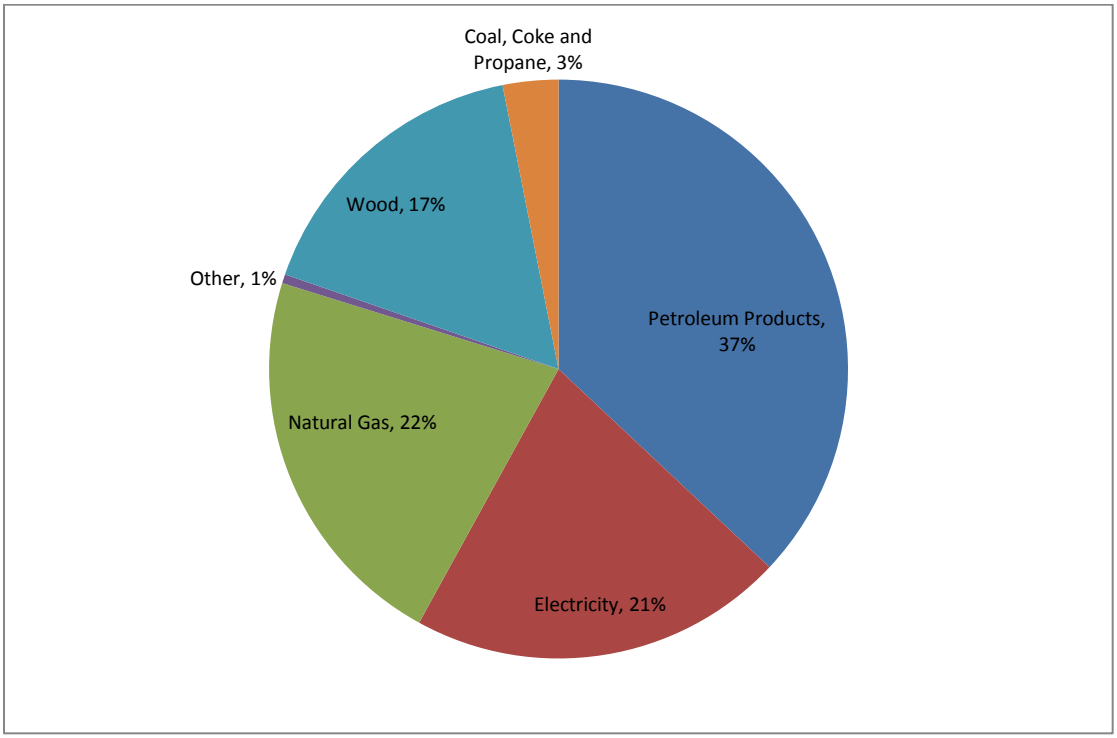
Figure 8: B.C.'s GHG emissions by sector



Source: Natural Resources Canada

Furthermore, petroleum products make up the largest portion of GHG emissions in the province at 37 per cent as shown in Figure 9. Since petroleum products are largely used in the transportation sector, there is great opportunity to reduce GHG emissions by replacing these with natural gas.

Figure 9: Greenhouse Gas Emissions in B.C.

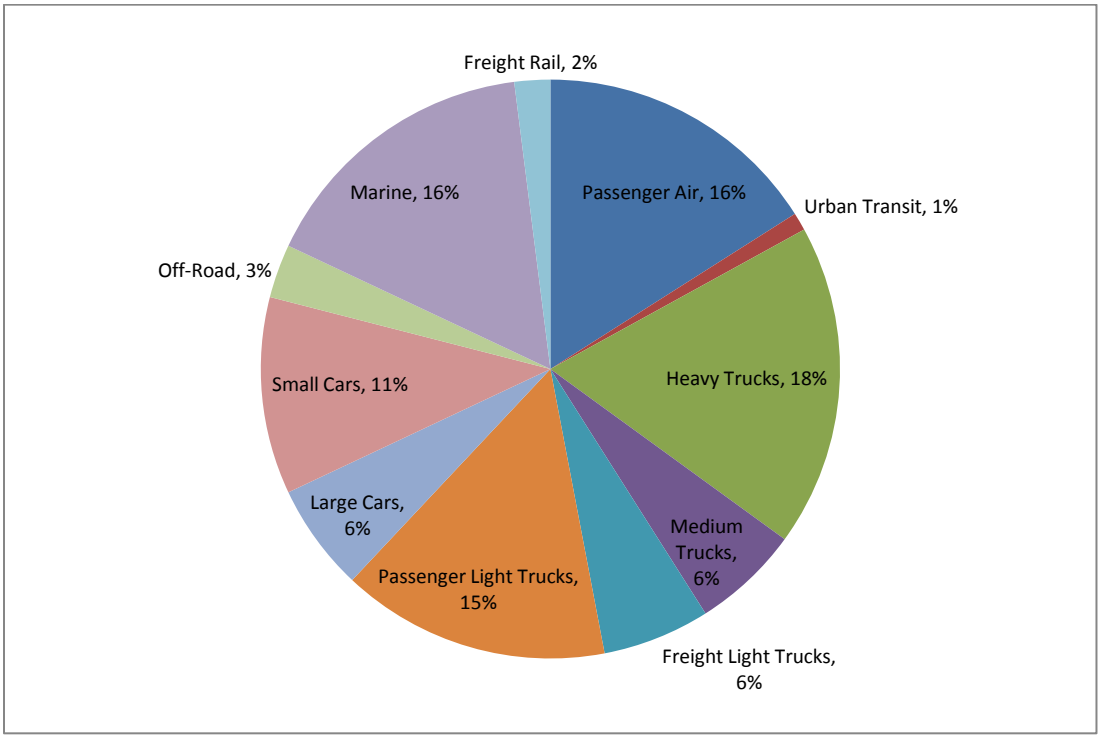


Source: Natural Resources Canada

Interestingly enough Figure 9 also shows that electricity and natural gas each provide an equal share of the end-use energy market in B.C. (approximately 21-22 per cent).

The pie chart in Figure 10 shows the transportation sector divided into the various modes of transport. The pie chart illustrates how heavy-duty vehicles, medium-duty vehicles, freight and passenger light trucks combined contribute approximately 45 per cent of the GHG emissions from B.C.'s transportation sector. This presents great opportunities for FortisBC, with a GHG reduction emission strategy in hand, the benefits to the province for a cleaner environment are significant.

Figure 10: GHG Emissions from B.C.'s Transportation Sector (percentage)



Source: Natural Resources Canada

Moreover, this target market growth strategy is consistent with the provincial government's recent announcement of its natural gas strategy as outlined in the Natural Gas Strategy paper, released on February 3, 2012. The paper describes how "the province is planning to continue to grow the (natural gas) industry over the next 10 years" (Ministry of Energy, 2010, p. 2). Furthermore, the paper discusses the need to "promote natural gas as a transportation fuel" in recognition that "natural gas is 25 to 40 per cent cheaper than gasoline and diesel. A natural gas vehicle produces 20 to 30 per cent fewer greenhouse gas emissions compared to gasoline or diesel vehicles". The paper goes on further to recognize how the "Clean Energy Act provides the framework for a "planned five year, $62 million program to reduce transportation emissions for heavy duty vehicles" (Bill 17, Clean Energy Act, 2010) (page 5). The details of which, the company is eagerly awaiting.

CNG is the preferred fuel for light and medium-duty vehicles and LNG is used primarily with heavy-duty vehicles. LNG enables heavy-duty vehicles to store more fuel on board with less gas tank weight. Natural gas fuelling stations can typically service both CNG and LNG vehicles.

The transportation market provides for significant alignment with the company's core competencies in the gas distribution business. Seeing that this market represents an extension of the existing natural gas distribution business, the company can continue to leverage the seven key success factors described in Section 2.4 as it evolves to adapt to the external pressures of the industry. Furthermore, I believe the effective management of stakeholder relationships, a key success factor, will play a more prominent role in navigating these external influences. Natural gas can play a pivotal role in the holistic energy portfolio for the province. In acknowledgement of such a role, the company must overcome social, environmental and public policy apprehension.

2.6.1 Opportunities

The opportunities for the company to serve the transportation market segment will be explored in this section. It is important to recognize, that the delivery of natural gas to customers for the end-use of their choice, such as for space heating or for their NGV, is no different from the value proposition the company offers today. The utility provides safe and reliable natural gas to customers, whether they choose to use natural gas for space heating, water heating or for their natural gas vehicles, is entirely their choice.

i. Market Segment Opportunities

The Marbek report commissioned by Natural Resources Canada, (NRCan) describes how the transportation market is divided into various categories, and the "more promising NGV market segments are likely to consist of the following" (Marbek, March 2010, p. i), see Table 7.

Table 7: Categories of Vehicles in the Transportation Sector

Category	Types of Vehicles
Heavy-duty and medium-duty vehicles	➢ Line haul Trucking (fleets) ➢ Return-to-base fleets ➢ Transit buses ➢ Refuse Trucks
Light-Duty Fleets	➢ Taxis, courier services
Marine Vessels	➢ Ferries
Rail	➢ Locomotives
Industrial	➢ Forklifts ➢ Ice re-surfacers

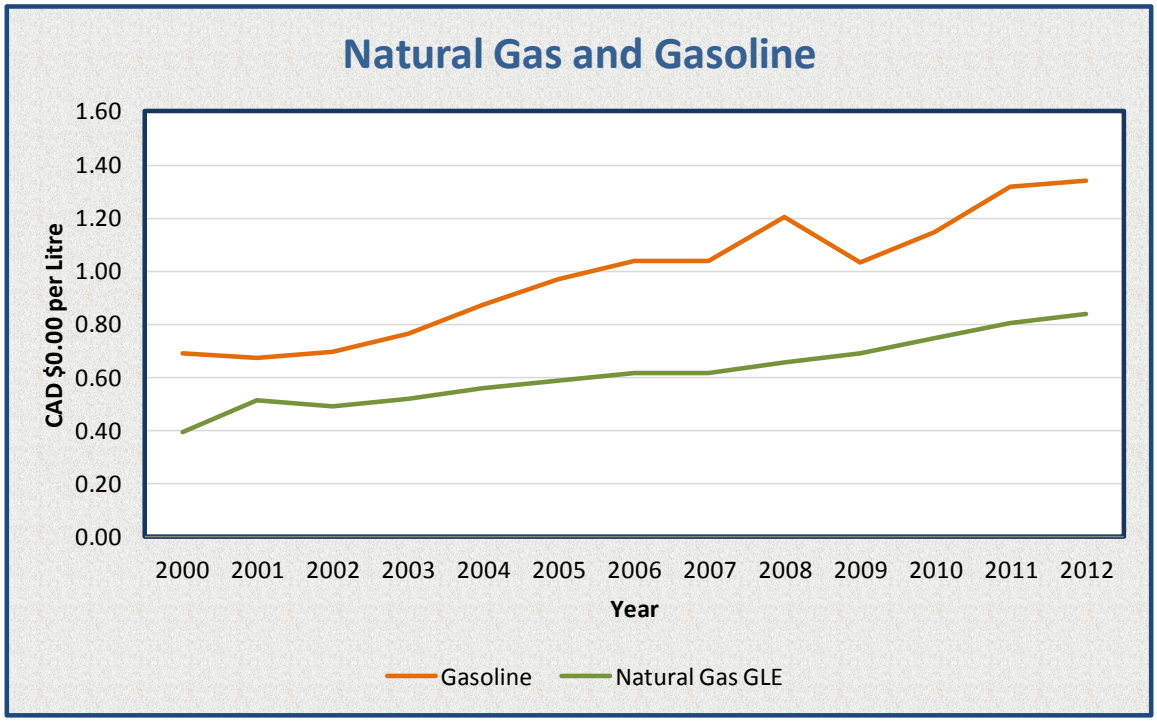
Source: Marbek, March 2010

The Marbek report identifies how in the world market Canada ranks 29, with about 12,000 NGVs. This number includes 300 heavy duty vehicles, 150 urban transit buses, 45 school buses, 9,540 light-duty cars and trucks and 2,400 forklift and ice re-surfacers" (Marbek, March 2010, p. 9).

ii. Natural Gas Price Advantage over Gasoline and Diesel

Advancements in natural gas drilling technology have made possible access to shale plays in Northeastern B.C. providing for an abundance of gas supply in the province. Furthermore, the plentiful supply of natural gives rise to a 25 to 40 per cent price advantage over gasoline. The charts, Figures 12 and 13, show how the price differential for both gasoline and diesel over natural gas has evolved over time, but the more recent years demonstrate a greater and sustained price disparity.

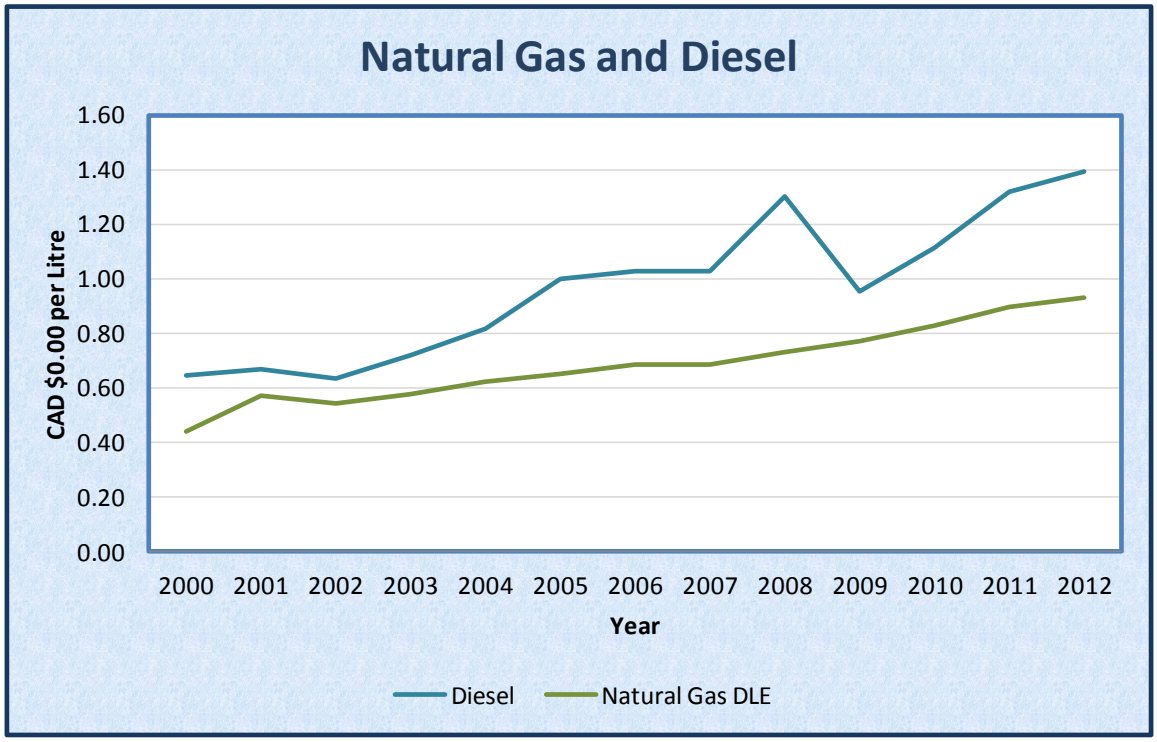
Figure 11: Price Differential of Natural Gas and Gasoline



Source: Petroleum Price Data, The Kent Group (Petroleum Price Data, 2012)

These are average Vancouver pump prices, including all applicable taxes for regular unleaded gasoline and GST for NGV. NGV pricing is shown as a gasoline litre equivalent (GLE).

Figure 12: Price Differential of Natural Gas and Diesel



Source: Petroleum Price Data, The Kent Group (Petroleum Price Data, 2012)

These are average Vancouver pump prices, including all applicable taxes for diesel and GST for NGV. NGV pricing is shown as a diesel litre equivalent (DLE).

The additional benefit that natural gas vehicles produce fewer GHG emissions compared to gasoline or diesel vehicles, provides for opportunities to meet provincial GHG reduction targets. Heavy-duty vehicles using LNG offer a 23 per cent reduction in GHG over diesel (see Table 8). Moreover, CNG can be mixed with renewable gases such as biomethane, which offers even greater promise for a cleaner environment.

Table 8: Greenhouse Gas Emissions Reduction Potential

Vehicle Category	Greenhouse Gas Emission Reduction
Heavy-Duty Vehicles	23% reduction with LNG when compared with diesel
Medium-Duty Vehicles	19% decrease with CNG, 23% reduction with LNG when compared with diesel
Light-Duty Vehicles	23% decrease with CNG when compared with diesel

Source: Marbek, March 2010

iii. Advancements in Vehicle Technology

The *Natural Gas Use in the Canadian Transportation Sector Deployment Roadmap,* which was the work of various industry stakeholders, outlines how the " technologies for medium-and heavy-duty natural gas vehicles have improved significantly in terms of reliability, power, fuel efficiency and availability for original equipment manufacturers ("OEM"). Canadian suppliers have developed leading engines, storage, compression, and dispensing technologies that are sold around the world" (Roundtable, March 2010, p. 31). One such manufacturer resides in Vancouver, B.C., Cummins Westport, and produces heavy-duty natural gas spark ignited engines that are sold around the world.

2.6.2 Threats

i. Lack of Market Confidence

Natural gas use in the transportation sector requires a significant amount of education and awareness of the benefits. Such awareness should be directed at industry stakeholders, fleet managers, public policy makers and the early adopters of the general public. Natural gas use in the transportation sector is even more promising today than it was in the 1990's, and various stakeholders, such as NGV alliances and the government, are needed to instil the confidence required to kick-start the natural gas substitution.

The market is faced with the classic "chicken and the egg" dilemma, with either the development of a comprehensive fuelling infrastructure or increased natural gas vehicle availability, or both. The market is in its infancy. In B.C., there are just twenty-two public

fuelling stations, located at regular gasoline stations, and available to the public. A network of fuelling stations across the province is required and options for refuelling vehicles at home. (Canadian Natural Gas Vehicle Alliance).

ii. Government Incentives lagging behind other Jurisdictions

While natural gas use in vehicles in place of conventional fuels is more cost effective, the higher upfront vehicle cost means that there is a longer-term payback. The Marbek report calculates that the payback could be as much as 6.5 years, as in the case of refuse trucks (Marbek, March 2010, p. 39). Temporary government incentives are required to kick-start the market, as once the market reaches a critical mass it can be sustained without incentives as vehicle prices should decrease. Steps have been taken in the right direction as the provincial government offers a point of sale incentive, which provides up to $2,500 off the sticker price for qualifying compressed natural gas vehicles.

In the U.S., T.Boone Pickens has been a resilient advocate for natural gas vehicles for the last 35 years. In July 2011, the Pickens Bill, which was set to provide up to" $64,000 towards the purchase of natural gas-long haul trucks" was defeated (Bloomberg, 2011). This has not deterred Pickens, as recent development in the US show promise. In March 2012, President Barack Obama announced a $1 billion proposal for tax credits and grants for alternative-energy cars and trucks including natural gas vehicles along an LNG corridor. (Earth Techling, 2012). Additionally, in California the California Energy Commission ("CEC") announced it "has approved funding to help bring as many as 357 natural gas-powered shuttle buses, cars and trucks to California's roadways. CEC is authorized to develop and deploy alternative and renewable fuels and advanced transportation technologies to help achieve the state's climate change policies and has issued funds under its Alternative and Renewable Fuel and Vehicle Technology Program" (NGV Global News, 2012).

These developments demonstrate potential as one looks towards Canada's federal and B.C.'s provincial governments to take the lead in Canada.

iii. Electric Vehicles receiving all the attention

While electric vehicles are getting all the attention, Honda Motor Co. ("Honda") is taking steps forward to jumpstart the natural gas OEM passenger vehicle market and is the only

automaker in the US with a CNG fuelled car. Although not available in Canada, a customer can purchase the vehicle in the US and import it into the country. The Honda Civic Natural Gas (previously known as the Civic GX) can be refuelled at home using a compressor that connects to the residential natural gas line. Additionally, earlier this year, the automaker, Chrysler Group LLC ("Chrysler") announced in the U.S., its intention to manufacture and sell CNG pickup trucks to fleet customers (Bloomberg Businessweek, 2012).

There are challenges with the growth of electric vehicles. While B.C. has enjoyed one of the lowest electricity rates in North America, there is emerging upward pressure (see Table 9 below). This is driven by BC Hydro's need to undertake various capital investments to meet increasing demand and self-sufficiency targets mandated by the provincial government.

Table 9: BC Hydro's Forecasted Rate Increases

2012	2013	2014
8.00%	3.91%	3.91%

Source: (BC Hydro's Service Plan 2012/13 - 2014/15, p. 16)

2.6.3 Strategic Alternatives

With market confidence still in its infancy, the company would be wise to adopt a strategy that initially targets a narrow segment of the transportation sector. The vehicle market is largely divided into two sectors, the light-duty vehicles and the heavy and medium-duty, return-to-base fleet vehicles. These two strategic alternatives are discussed below.

i. Light-Duty Vehicle Market

This strategy would focus on the commercial light-duty NGV vehicles used primarily by couriers and taxi services. The company has seen an expressed interest in this area by fleet managers. This approach would encompass a wider customer base and network-fuelling infrastructure to support this growth, as these vehicles tend to travel a wider geographical area and often-irregular routes.

Initially, target customers would include taxi fleets and courier companies. Growth in the customer segment could be further developed to include the personal use passenger car market as more light-duty NGV vehicles become available and gain wider acceptance in the market. The infrastructure to support this target segment could evolve in future years to include home refuelling appliances.

ii. Heavy-Duty and Medium- Duty, Return-to Base Fleet Vehicles

This strategy would focus primarily on providing a fuelling infrastructure for medium and heavy-duty fleet vehicles (including marine vessels) through an LNG solution and a CNG solution for return- to-base fleets. The fuelling station, infrastructure and metering service would be built on private property and therefore serve the commercial customer's fuelling needs only. These vehicles are typically used for a limited distance and therefore do not require an extensive fuelling infrastructure network.

The business model would focus on customers that own a fleet of commercial vehicles that travel a limited distance or return to their base each night. Examples include long haul trucks, refuse trucks, transit buses and school buses. FortisBC currently has contracts in place with the following fleet customers; Waste Management: 20 refuse trucks; Vedder Transport: 50 trucks, Kelowna School district: 11 school buses and the City of Surrey: 1 refuse truck.

The next section evaluates these two strategic alternatives in the context of the internal capabilities required of the organization to execute these strategies.

3: Internal Analysis

The previous chapter concluded with two viable strategic alternatives to pursue targeted growth in the NGV market. The first was to pursue the light-duty NGV market and the second, the medium to heavy-duty and return-to-base fleet NGVs (including marine vessels). In order to determine the feasibility and ultimate success of these strategy alternatives, an assessment of the internal capabilities will now follow. This internal analysis is based on a "Diamond–E Framework" and will address management preferences, the organization capabilities and resource availability in the context of these strategic alternatives (Crossan et al., 2009).

3.1 Management Preference

Management preferences provide for an evaluation of the proposed strategic alternatives based on the strategy aligning with the predilections of senior management through an assessment of their goals, visions and experience. Such an analysis will ensure alignment of the strategy with senior management's direction for the organization. The key decision makers for the strategic direction of the organization comprise the CEO and the Vice Presidents of the various business units who collectively make up the ELT. Therefore, it is important to assess these two proposed strategies against any inherent preferences this group may exhibit. Management will have inherent preferences in ensuring the chosen growth strategy pursued aligns with the key success factors of the organization in order to deliver the desired growth and sustained competitive advantage.

One of management's objectives is company growth through increased gas load, to address the emerging issues faced by the mature utility. However, there is an inherent desire that any chosen strategy exhibit a low risk profile. Therefore, the strategy must be a natural extension of the existing gas distribution business within the regulated environment. This is why the overall NGV market warrants as a good strategic fit for the company. It leverages the key success factors of the company, and furthermore it parallels environmental changes in the industry such as provincial mandates for GHG emission reductions. Therefore, on the surface, both strategies appear to meet with management's vision but we will further examine each in turn below.

3.1.1 Management Preference Evaluation of LDV

3.1.1.1 Management's Strategic Objectives

i. Gap in Management Objectives

As outlined in the parent company's quarterly report, "the key goals of the Corporation's regulated utilities are to operate sound gas and electricity distribution systems, deliver gas and electricity safely and reliably at the lowest reasonable cost and to conduct business in an environmentally responsible manner. The Corporation's main business, utility operations, is highly regulated and the earnings of the Corporation's regulated utilities are primarily determined under cost of service regulation" (FortisInc., 2011, p. 2).

Moreover, in a recent public announcement the company identified its focus on the heavy-duty transportation market, *"*FortisBC has been working with B.C.'s natural gas vehicle industry to advance the required refuelling infrastructure for the heavy-duty market. In future, once that base infrastructure is established, the foundation may be in place to expand use more broadly*"* (The Vancouver Sun, 2012). The company's immediate focus is the heavy-duty vehicle market, most likely due to the more favourable economics in pursuing this market over the light-duty vehicle market in the short-term.

Furthermore, some members of the senior management team have past experience in the NGV market, with endeavours undertaken in the past when the company offered a regulated NGV service, with NGV fuelling stations targeting the light-duty vehicle market. This endeavour, dates back almost 20 years from the mid-1980's to 1990's, when the company helped kick-start the NGV market by installing NGV compression fuelling stations. From 1999 to 2005, the company's NGV division was sold to a non-regulated arm of the company, and then subsequently sold to a company headquartered in California. FortisBC believes the anticipated growth in this market did not materialize due to a number of factors outside of the company's control. Such factors included a declining price differential between natural gas and gasoline, a lack of support from vehicle manufacturers who withdrew their natural gas vehicle offerings, an increasing cost of engine conversions, a discontinuation of government incentives and the introduction of hybrid electric vehicles (Terasen Gas, 2010).

ii. Suggested Gap-Bridging Solutions

While the environment for the light-duty NGV market has evolved over the last twenty years, this market is exhibiting slow progression. Shale gas exploration and the abundance of natural gas in

the province has only recently prompted policy makers to think differently about natural gas uses, particularly in vehicles. Therefore, widespread acceptance and the favourable economics for the light-duty market NGV market are yet to be achieved. Furthermore, since the company faces no real competitive threat in fuelling infrastructure market, management will want to take a "wait and see" approach with this market to assess how the light-duty vehicle market will evolve before engaging in a steadfast commitment. One would subsequently assume that senior management is not yet ready to embark down this path as this strategy is heavily reliant on widespread acceptance, and significant support from vehicle manufacturers and financial incentives. Crossan explains that in the process of the Diamond-E analysis, if a strategic proposal does not conform to management preferences, and any difference cannot be resolved, then the strategy should not be pursued (Crossan et al.). Therefore, the light-duty vehicle strategy will not be assessed any further in this internal framework analysis. Although, one must not lose sight of this strategic option since it is a viable complement to growth in the heavy-duty market, in the future.

3.1.2 Management Preference Evaluation of HDV and Return-to-Base Fleet Vehicles

3.1.2.1 Management's Strategic Objectives

i. Gap in Management Objectives

The heavy-duty NGV market presents great potential and a lower risk profile strategy than that of light-duty vehicles. Moreover, as we have seen in the analysis above, this strategy aligns with the corporate goals and objectives.

ii. Suggested Gap-Bridging Solutions

None to address

3.1.2.2 Management Experience

i. Gap in Management Experience

Although management's objectives are aligned, there must be recognition that the strategy requires a more customized service offering than the conventional gas service offering. The business model is sound and the transportation market has great potential, but there is a need for recognition that a customized service offering offers a different value proposition to the customer.

ii. Suggested Gap-Bridging Solutions

Management must drive the process to leverage the most of the existing processes inherent in the gas service standardized service offering. This process will involve management providing direction in evaluating the company's value chain to identify where customization is necessary and where standardization with the existing processes can be successfully accomplished.

3.1.3 Management Preference Summary

The analysis of management preferences reveals that the identified gaps of the light-duty NGV market cannot be bridged in the immediate future, and therefore this strategic alternative will not be analyzed any further. The identified management preference gaps and a summary of the suggested solutions are provided in Table 10.

Table 10: Summary of Gaps and Suggested Solutions for Management Preference

Strategy	Category	Gap	Suggested Solution
LDV	Management Objectives	The economics of this strategy have yet to see further improvement along with widespread acceptance of NGVs by the general public	Delay entry until increased support and wider acceptance can be achieved
HDV	Management Objectives	No gap observed	n/a
HDV	Management Experience	Recognition that the value proposition is a more customized service offering	Provide for greater awareness and recognition that some adjustments may need to be made to align with the existing value chain of the organization

The LDV will not be assessed any further. As recommended by Crossan, in the process of the Diamond-E framework analysis, if a strategic option does not conform to management's preferences, and the gaps cannot be bridged, then that option should not be pursued. (Crossan et al.). The heavy-duty market strategy is still a viable strategic option and will be next evaluated in the context of the organizational requirements for success.

3.2 Organization

Next, an examination of the organization in the context of its structure, systems and processes, culture and leadership follows for the heavy-duty NGV growth strategy. As any "strategy deployed in an organization involves a complex pattern of coordination between people and resources" (Barney, 1997).

3.2.1 Organizational Structure

FortisBC has a hierarchical organizational structure, with each main functional business unit led by a Vice President. While the Sales and Business Development groups within the Energy Solutions and External Relations business unit have to date been the driving force behind the NGV strategy, successful implementation requires significant collaboration across the functional units of the organization.

i. Gaps in Organizational Structure

The collaboration and sharing of key information with various subject matter experts across the organization is necessary. An "NGV Project Team" is required who should primarily comprise of proficient individuals with significant knowledge and experience from each of the Sales, Business Development, Project Management Office (engineers) and Operations groups. This project team should be "boundarylessness" as described by General Electric's former CEO Jack Welch, with the ability to work effectively across boundaries both inside and outside the organization. This can be accomplished by establishing "work routines that cut across the functional boundaries" (Crossan at al.).

Furthermore, while the centralized structure contributes to the organization's success in containing costs, in order to enable fast and effective decision-making, the project team tasked with moving the initiative forward, require a certain level of autonomy. Therefore, consideration needs to be given as to how to create an agile environment for this initiative to flourish.

ii. Suggested Gap-Bridging Solutions

The formation of a project team with key members has been initiated, however, various management processes, as it pertains to the 'decision making process, operating processes, performance assessments and reward processes" are yet to be defined (Crossan et al., p.178). Additionally, the existing project team must consider the best means of effectively sharing information. The group "needs to find formal and informal methods of horizontal communication between the functions" (Crossan et al.). Formally, this could be achieved through the existing system platform such as SharePoint. Moreover, consideration must be given in developing a process for sharing information with the supporting services such Finance, Procurement and Regulatory.

Furthermore, an alignment of the project team member goal's and objectives, through a performance measure can be achieved in order to facilitate faster and effective decision-making. Individuals from the various functional units of the organization often have varying and sometimes conflicting priorities, goals and objectives. Moreover, these team members have reporting relationships often to different managers. While this matrix structure facilitates the sharing of specialized resources and technologies across departments and the cross-pollination of ideas, it can also give rise to complexities and goal incongruence due to dual reporting structures. Therefore, clear communication channels are necessary together with knowledge of the processes for product and service development. Additionally, an alignment of performance measures is required to ensure consistency across the team with the established project goals. The performance measures for the team should also be "tailored to promote cross-unit cooperation" (Crossan et al., p.181).

As the initiative begins to flourish, faster and timely decisions, and the provision of an agile and efficient process for the project team, could be achieved through a steering committee. This group would be primarily responsible for key strategic decisions such as direction setting and allocating resources.

3.2.2 Systems and Processes

i. Gaps in Systems and Processes

Currently, the Sales and Business Development groups manage the entire process from customer contact to coordinating the completion of construction and commissioning of the

fuelling facility. This entire process is taking an average of twelve to eighteen months. If an increasing number of NGV customers are to be added each year, then this process must be streamlined in order to facilitate a faster growth rate of customer attachments. This timeline includes the additional period required for customers to order their new NGV fleet of vehicles from the vehicle manufacturer.

Additionally, each customer attachment currently requires the regulator's approval by means of a project application filed with the Commission. The existing process of seeking approval has been improved to approximately four months in duration, from the time of filing the application with the regulator to receiving a decision. Additionally, the Sales, Business Development and Regulatory groups all spend time in advance of the filing in preparing the application.

ii. Suggested Gap-Bridging Solutions

There are various means available to streamline the process that will "enhance the speed and responsiveness of the organization" (Crossan et al., p.171). These include removing the duplication of efforts and taking advantage of the existing systems and processes.

There appears to be a duplication of efforts, by the Business Development and Regulatory groups, in the development and review of the business model, which develops a COS rate offering for each customer, which can be eliminated.

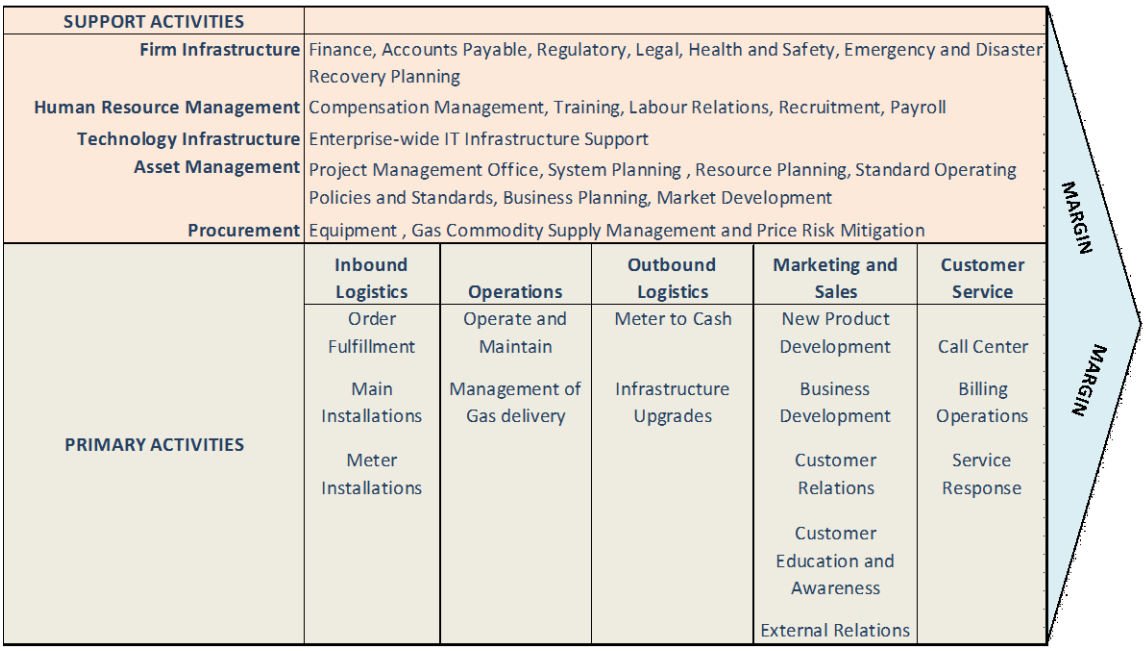
Secondly, the Business Development group must relinquish some of their duties to those capable within the organization to acquire them. While appreciating that the NGV service is a customized service offering, there are opportunities for process improvements. Recognition that the existing systems and processes to serve the approximately one million gas customers can be expended as the rate of customer additions grows.

The existing customer attachment process takes approximately up to four weeks for attaching a residential customer with no main extension and up to sixteen weeks for a customer with a main extension. For an industrial customer, who often requires a custom meter, the process takes longer with an additional two weeks for a non-inventory meter set and up to six months to order parts and build a custom meter set. These existing end-to-end processes, such as the customer attachment process, should be evaluated and adapted to the needs of an NGV customer who will require a meter set along with fuelling equipment. Furthermore, the process of

equipment installation downstream of the meter developed by the Business Development group, can be further streamlined once greater proficiency and experience is gained over time.

The company "value chain" identifies the series of activities in the organization that create and generate value (Porter, 1980). The value chain shows how the organization is split into primary and support activities as shown in Figure 13. Currently, all activities associated with adding and servicing a new NGV customer are managed by the Business Development group. As the number of customers increases, a handoff process must take place in recognition of the various activities performed by the various departments within the organization. For example, the Operations group should take on the responsibility of maintaining and servicing the fuelling station once it has been installed. The equipment manufacturer has a recommended schedule for the on-going maintenance and the Business Development group is currently managing this schedule manually. The group contract a competent and certified service provider to perform the servicing. These activities can be integrated into the existing asset maintenance and servicing programs managed by the Operations group.

Figure 13: Company Value Chain



Source: Adapted to fit FortisBC from Porter's "Value Chain" Analysis

The Finance department is currently managing invoicing for the new NGV customers, which in the future should transition to the newly in-sourced Billing Operations group. Furthermore, in the future the newly in-sourced Contact Centre service could manage all NGV service calls and process them through the SAP[8] enterprise wide system.

The regulatory review process could be improved. A means of creating a common NGV rate structure approved by the Commission may serve as the best approach. The company currently employs a Mains Extension Test (MX Test) for each customer attachment that requires an extension of the existing pipeline system. This test determines the amount a new customer must contribute towards their main extension by reviewing the forecasted volumes and costs. Ultimately, the test is designed to ensure that existing customers are not adversely affected by new customer additions. A similar test could be designed for NGV customers along with a common rate structure. The economic test and common rate structure would be designed as to not to adversely affect existing gas customers . Additionally, the company could propose to provide a

[8] SAP is an enterprise wide information system, produced by a German company SAP AG, and is used to coordinate information and activities throughout the organization

quarterly report update of all new NGV customers attached during the previous three-month period. This would serve to replace the existing process of filing a project application for the addition of each NGV customer. Furthermore, the company will adhere to the general terms and conditions set forth by the commission, and the quarterly report would outline how adherence has been achieved. I believe the combination of the proposed economic test along with a common rate structure will provide for process improvements.

Another area, where the process can be streamlined, is in the development of relationships with equipment and vehicle OEM of vehicles. This will provide the customer a means of easy access to their new NGVs, as currently the customer must wait for their new vehicles before the fuelling station and infrastructure can be installed.

3.2.3 Leadership

i. Gaps in Leadership

Currently the primarily role for executing the NGV growth strategy resides with the VP, Energy Solutions and External Relations and is supported by the ELT. Since the organization is not in a crisis, employees do not fully comprehend the requirement for change in strategic direction, and therefore why it is necessary to pursue the NGV market segment. In the "regulatory worldview" environment, such is that of FortisBC, Wexler describes that change must take place in "logical increments". He also describes how change is seen as positive when it is planned and suits the standard operating procedures of the system, and it is seen as negative when it creates problems which are difficult to resolve (Mark Wexler, SFU EMBA, Organizations: Structure and Change Class notes, 2012) .

ii. Suggested Gap-Bridging Solutions

The organization is not in a crisis, and therefore it will be necessary for the executive leadership to provide the "story" as to why change is necessary. Management will need to provide the leadership role and the "story" behind why the change is required. The immediate role of leadership will be to assist in providing for greater awareness of both the economic benefits and the environmental benefits of an NGV strategy for the organization. Anticipatory change is more difficult to achieve, as is the case in this instance, as there is not the same sense of urgency that exists in a crisis. Therefore, the leadership role, will need to be "participative and dominated by careful, purposeful, incremental steps" (Crossan et al., p. 248).

3.2.4 Culture

i. Gaps in Culture

While the strategy requires an “entrepreneurial worldview” focus, the organizational culture has been typically one of “built to last”. Therefore, a cultural shift is required to enable speed and agility. The organization currently operates in a “built-to-last” worldview environment where, since control is very high, decisions are slow and methodical and there is a greater focus on uncertainty reduction giving rise to a trade off with profit maximization.

Additionally, seeing as the organization is in the midst of integration efforts with the electric business, adds another layer of complexity in addressing the cultural change. The gas and electric utilities have operated independently with their separate leadership teams up until recently. Each group has their distinct processes and as expected, an identifiable culture. Over the coming months, we will witness the emergence of a new culture as the integration efforts take shape. What is important is that the emerging culture of the combined organization has a desire to further adapt and support the NGV strategy.

ii. Suggested Gap-Bridging Solutions

A possible cultural shift to an “entrepreneurial worldview” will be required, particularly for those directly involved in supporting the NGV plan. This group requires a temporary "entrepreneurial worldview” dominance versus the “built-to-last” worldview of the larger organization, in order to grow the transportation customer base. For this group to thrive, key processes should be streamlined and aligned more closely with the goals and objectives of the strategy. In order for this group to be effective and take advantage of opportunities in the market, they require speed and agility facilitated by decision-making moving closer to the customer. The employees within the group need to be empowered to move forward with potential opportunities that involve a higher appetite of risk taking than the “regulatory worldview” of the larger organization.

Lorsh and Morse highlight that employees often gravitate towards companies with whose cultures they are comfortable (Morse & Lorsch, 1974), and therefore one must address if there is a need to bring in new individuals who have experience within an organization that has an “entrepreneurial” culture. While there appears to be no immediate concern, as individuals within the Business Development group are adapting well to the “entrepreneurial focus” since they have previously held positions in such an environment, there will be a need for a re-evaluation of these

individuals' performance in twelve months. Since employees over time, often mould to the culture of the organization and in doing so become less effective in generating new ideas and questioning existing systems and processes. In the "entrepreneurial worldview" intelligence is seen as the ability to generate new ideas and then to act on these swiftly. If it appears that personnel are missing opportunities in the market then it is time to consider recruiting individuals from outside the organization.

This change management methodology will require a High Involvement Management ("HIM") approach in reviewing, work design, incentive practices, flexibility and the level of autonomy. The HIM focus will provide for sufficient authority and freedom for the project group to fulfill their job responsibilities, and providing encouragement to individuals in this group to participate in and make decisions that affect their day-to day activities. Performance evaluations should be developed so they have a strong link to how well these individuals perform in their role.

To implement change, this project group will need to examine the interactions of people, structure, systems and processes. There should be a defined boundary between this group and the rest of the organization, and one that is semi-permeable so that pertinent information can flow both ways. The project team should be provided a certain level of autonomy for a short time horizon, say no more than two years, after such time a re-evaluation should take place.

The project group must find a competitor with whom they must benchmark their best practices. Intelligence in the "entrepreneurial worldview" is that of being quick and fast to react. Therefore, success measures must be different for this group than those in the rest of the organization. Short-term goals of no more than 90 days must be developed versus the long-sighted vision of the larger organization.

Changes in business practices will be required. There will be a greater focus on teamwork. Employees must be challenged to adapt to the changing environment. The project group will need a clear direction shared by all group members and should enable them greater discretion over their work. Mechanisms must be in place that communicates the shared direction. As without this, the coordination and integration of tasks will breakdown and a sense of frustration amongst employees will emerge.

Re-organization can be instigated with a decision audit. This process involves an identification of the key decisions required given the group's goals and then a prioritization of those that are critical. Categorization of these critical decisions and where in the organization

these decisions should be made is the next step. Subsequently, an alignment of the elements of the organizational system, such as incentives, information flows and processes with those related to decision making is required. (Mankins & Roger, June 2010).

The group should revaluate the current time to market response and make comparison to key competitors. Identify ways to revamp the policies and guidelines in order to be more efficient. Initiate a performance improvement program in which each employee is asked to suggest items that lead directly to increase productivity, profitability, quality and improve speed and responsiveness. Employ competitor benchmarking in change efforts. Reinforce the concept of a profit center and look for ways to improve the speed and timeliness of output. Identify where the bottlenecks exist and where extra sign offs are required. Redesign the processes that slow the group down.

3.2.5 Organizational Capabilities Summary

The table below provides a summary of the organizational gaps and the suggested solutions to bridge the identified gaps.

Table 11: Summary of Gaps and Suggested Solutions for the Organization

Organizational Category	Gap	Suggested Solution
Structure	A representative Project Team is required with goal alignment for each of its members	Identify and implement an appropriate Project team structure with key representatives from across the organization Align goals, objectives, work design and performance incentives
Systems and Processes	Slow process due to some duplication of efforts	Eliminate the duplication of efforts though training and documentation
	Long customer attachment process as streamlining has not been fully addressed	Take advantage of the existing expertise and processes by analyzing the entire value chain of the organization

Organizational Category	Gap	Suggested Solution
	The regulatory review process is long and labour intensive	Seek approval from the Commission to develop an economic test and common rate structure
Leadership	Anticipatory change is more difficult to achieve	Provide the leadership role behind the change "story"
Culture	A cultural shift for the Project team is required as they move to "an entrepreneurial worldview" focus	This will involve a review of the decision making process, work designs and incentive practices A greater need for benchmarking is required In the near future, re-evaluate personnel needs, particularly senior management roles, to assess if there is a requirement to hire expertise from outside the organization

3.3 Resources

The third internal capability of the organization is that of organizational resources. These are categorized into three groups: operational, human and financial and each is discussed below.

3.3.1 Operational Resources

i. Gaps in Operational Resources

The operational resources are required to make the service offering available to customers and include such items as product/service design, construction of mains pipeline and fuelling station and after product servicing. The company owns a central corporate office from which all product/service offerings can be developed with the use of the existing technological systems and technical expertise. Since gas distribution is the company's core business, the company already owns or has easy access to the relevant equipment, through relationships with

suppliers. The NGV market is a logical extension of the company's existing operations and therefore the company will be able to leverage the existing operational resources.

From an implementation perspective, the operational requirement to deliver CNG is very similar to the compression system that the company uses throughout its gas distribution system. The company owns approximately 150-compressor stations and thousands of regulators, which enable the safe and reliable delivery of gas at a variety of different pressures. Additionally, the company has extensive experience with LNG production, and in dispensing and transporting LNG to end use customers. Furthermore, the company owns and operates two LNG facilities, one on Vancouver Island (Mt. Hayes) and one in the Lower Mainland (Tilbury). An assessment of future LNG requirement should be completed in order to determine future gas load requirements.

ii. Suggested Gap-Bridging Solutions

While, the recent addition of the Mt. Hayes LNG facility on Vancouver Island in 2011 has provided the additional flexibility of peak shaving to meet demand particularly during the heating season, the daily limit imposed at this facility may need to be reviewed as gas load increases. The advantage of the NGV load is that it does not place additional pressure during the heating season, as it is a more consistent gas load throughout the year. The company plans to use the Mt. Hayes facility to service Vancouver Island customers and to use the Tilbury plant to service Lower Mainland customers. If demand increases significantly beyond the capacity available, then the addition of an additional LNG tanker/truck loading facility at Mt. Hayes may be required. This LNG would then be transported to the Lower Mainland. An assessment of alternative potential future supply options for LNG must also be completed.

3.3.2 Human Resources

i. Gaps in Human Resources

The required strategy requires expertise from personnel across the organization. Currently, the primary activities for this strategy (including sales, product development, product design, construction and commissioning, and servicing of CNG/LNG fuelling stations), are being managed by one group, the Business Development group. While this is manageable with only a handful of customers, as the customer base grows, responsibilities and assignments to the various functional units will be required. In order to facilitate these handoffs, training will be required.

While it is critical that the Project Management Office works closely with the Business Development group to ensure all the customer needs and specifications are being met, this group must be provided with enough information to ensure that sole responsibility and ownership can be achieved.

ii. Suggested Gap-bridging Solutions

An effective handoff process with assigned and clear responsibilities along with additional training is required. Personnel in the Operations department have the required certification from a safety and legal perspective, the B.C. Safety Authority ("BCSA") contractor's licence, to service the fuelling station. However, there appears to be some reservations with acquiring responsibility for the servicing of the stations. Employees that hold the BCSA high pressure Special Purpose licence are permitted to construct, operate and maintain compressed natural gas station equipment. However, the Business Development group needs to work closely with the Operations group in order to transfer the servicing of fuelling stations from third party contractors to the Operations group. Furthermore, the Operations group should gain a greater understanding of the maintenance and operational activities from the equipment manufacturers in order to grow this expertise in-house.

In addition, to facilitate this assignment of responsibilities, the development of training documentation is required. These should include training materials for station and equipment repair along with comprehensive safety codes and standards documentation.

3.3.3 Financial Resources

i. Gaps in Financial Resources

In the short-term, the need for additional immediate financial resources is not required, as the business model is based on a full cost of service recovery and "take-or-pay" contracts for a minimum fixed term. However, potential customers do require financial incentives to assist with the conversion of their existing fleet to natural gas vehicles. In the past, FortisBC has been able to offer these financial incentives through its Energy Efficiency and Conservation ("EEC") programs, but the regulator has requested that this funding not be applied as incentives for natural gas vehicles at this time. For this reason, the company must seek alternative incentive funding to entice customers to convert their fleet to NGV vehicles.

ii. Suggested Gap-bridging Solutions

The greatest challenge from a resource perspective is the dependency of the initiative on customer incentives. The existing programs were initiated with funding from EEC Programs, but since this funding is on hold until further review with the regulator, the company must look for funding elsewhere.

The company is eagerly awaiting an announcement from the Ministry of Energy and Mines and Petroleum Resources, which is expected to announce a $62 million program that will provide for incentives over a five-year period for customers, towards the purchase of new heavy-duty NGVs. The current government program supports light-duty vehicles with a $2,500 savings from the sticker price of a light-duty NGV vehicle purchase (Ministry of Energy, 2010).

In order to entice customers to convert their fleet of vehicles to NGV the gap between the price of conventional gasoline or diesel vehicles and natural gas vehicles must be narrowed. The price disparity between the two types of vehicles is shown in Table 12 below, as per the Marbek report (Marbek, March 2010). This disparity presents the greatest hurdle to be overcome in order to persuade consumers to convert their vehicles.

Table 12: Incremental capital Cost for NGV

Category	Vehicle or Engine Type	Incremental Capital Cost over Gasoline Version
HDV and MDV	High Pressure Direct Engines	$70,000 additional engine cost over diesel $80,000 additional engine cost with LNG tanks over diesel
HDV and MDV	Spark Ignited Engine	$50,000 additional engine cost over diesel
LDV	Pick-up truck or panel van	$14,000 to $18,000
LDV	Passenger Cars	$6,500 additional cost over gasoline model

Source: Marbek report

The options available to the company include seeking approval from the regulator to utilize the EEC Program funding, lobbying the provincial government to release approve the

incentive funding and lobbying federal government to encourage tax breaks for NGV vehicle purchases. The company could work closely with NGV Associations in this endeavour.

These incentives will presumably be required in the short term in order to kick-start the market, as once customer adoption rates have reached a critical mass, one would expect the price of NGV vehicles to fall.

3.3.4 Resource Summary

Table 13 provides an overview of the gaps and suggested solutions for the resources required to support the strategy. The greatest area of concern is in securing funding for incentives.

Table 13: Summary of Resource Gaps and Suggested Solutions

No.	Category	Gap	Suggested Solution
1	Operational	Assess future LNG needs	Prepare a comprehensive assessment of future LNG requirements
2	Human	Staff Training is required	Prepare training documentation, policies and guidelines, with a greater focus on educating the Project Management Office and the Operations group
3	Financial	Financial Incentives for Customers	Work closely with external stakeholders to influence policy makers Work closely with the regulatory body to release funding through the EEC program

3.4 Internal Analysis Summary

The heavy-duty NGV strategy requires a shift from the standardized product offering to one that is more customized in nature, as each fleet manager's vehicle needs will vary. With a clear and deliberate focus, the organization can successfully adapt to service this market. Table 14

provides a summary of recommendations to improve the internal capabilities of the utility to enable this change.

Table 14: Summary of Recommendations from the Internal Analysis

Internal Characteristic	Recommendations
Management Preferences	➢ A greater focus on understanding the requirements of a more customized service offering for fleet managers with medium to heavy-duty NGVs
Organizational Capabilities	➢ A Project team empowered to lead the new NGV strategy is essential ➢ Streamline the customer attachment process by taking advantage of the existing core processes and the organization's value chain ➢ Improve the regulatory review process through the development of a common rate offering and an economic test ➢ Some organizational change is required as the company experiences a cultural shift to a more agile and adept operating environment to support this initiative
Resources	➢ Training and the development of documentation is required ➢ Customer incentives are required in the short term to offset the higher upfront NGV capital cost

The greatest hurdle for the company is overcoming the economics of a longer tern payback for customers that invest in NGV due to the higher upfront vehicle costs. Since, NGV OEMs and engine manufacturers have not yet reached the economies of scale required to reduce costs to be on par with conventional vehicles. As such, the availability of grants or tax incentives

for customers, is required. The American Gas Association (AGA) recognizes the importance of offering incentives in this market as it identifies **"***an important reason to increase incentives to build new NGVs, convert existing vehicles to NGVs, expand the delivery infrastructure and use (more natural gas) as a transportation fuel is that the technology is readily available to deliver the benefits. NGVs are here and now"* (Northwest Gas Association, p. 2)**.**

4: Final Recommendation

Through an assessment of the company's competitive environment and internal capabilities, it has been identified that gas distribution for the transportation sector is both a promising and viable strategy for the company. This chapter concludes with some challenges that that the company should address as it moves forward with targeting this market sector. These include; providing for greater awareness of both the technological advancements in NGV use and the environmental benefits, addressing potential concerns from the regulatory body and thirdly, identifying risk mitigation steps that the company can undertake.

4.1 Providing for Greater Awareness of the Benefits

One of the challenges the utility must overcome, is around increasing education and awareness of the benefits of using gas as a replacement fuel to diesel or gasoline. Recognizing that conquering the negative experiences of the past with natural gas use in the transportation sector may present as challenges.

This awareness should come from various stakeholders including government, natural gas vehicle alliances, natural gas engine and vehicle manufacturers, clean energy advocates, early adopter of NGVs, together with gas utilities. While the utility has access to a large customer base across the province, it cannot achieve widespread awareness on its own. The utility requires the support of all stakeholders to present a consistent message in order to change consumer behaviours to switch from using conventional carbon heavy fuels to the cleanest fossil fuel.

Educating customers of the benefits of natural gas use should include a greater awareness of the following:

- Lower operating costs with use of CNG / LNG and lower maintenance costs as natural gas burns cleaner and so some parts of the engine stay cleaner.
- Environmental benefits of a lower carbon footprint and reduced global warming.
- Natural gas supply will be provided by the local gas utility utilizing the existing natural gas distribution infrastructure.

- Greater reliance on domestic (B.C.) energy rather than on fuels imported from outside the province.
- Vehicle manufacturer support exists. With the wider availability of medium and heavy-duty NGVs, and with technological advancements in NGV engines, the previous technical issues have been resolved.

Working closely with both private and government organizations to promote natural gas will increase the awareness of its benefits over conventional fossil fuels. Furthermore, public awareness that even greater potential for GHG emission reductions can be harvested with the use of renewable natural gases, such as biomethane, as greater acceptance of natural gas use is achieved.

4.2 The Role of the Regulator

The regulator can have a profound influence on how widely NGVs are adopted in the province and therefore FortisBC should play a greater role in aiding the regulator understand the longer term implications of its decisions. As explained by the Northwest Gas Association, "regulatory structures affecting the natural gas industry can provide important incentives – or disincentives – to wider deployment of NGVs. Regulators need to examine whether existing ratemaking helps or hinders NGV development, the most effective actions to take to remove economic barriers to wider NGV use, and to what extent utilities should be allowed to pursue NGV development and charge ratepayers for that investment. Tools at their disposal include NGV-specific rates, rate subsidies, and cost recovery mechanisms" (Northwest Gas Association, p. 2).

There has been concern over the role a utility should play in delivering energy to the transportation sector. While there are concerns that the state regulated utility operating in this market may result in "market distortions" and "inefficiencies" these can be eliminated by ensuring the utility is recovering the full cost of service from the fleet operator (Massey, Fleishman, Earley, & Gallagher, 2011). FortisBC will adopt policies to ensure that it does not compete unfairly with non-utility enterprises. These will include adopting a robust code of conduct and fair cost allocation methodology for NGV customers, which will prevent any unfair advantage and cross subsidization.

The regulator is faced with a dilemma. While the benefits of NGV wider deployment for the province are overwhelming, it must be conscious of any decisions that it imposes on FortisBC

that restricts its ability to facilitate widespread acceptance in the transportation sector. The regulator has the ability to provide "financial incentives to reward utilities and their shareholders for superior performance in facilitating the NGV market development." One must consider if FortisBC should be approaching the regulator to develop NGV rate incentives. "Rate incentives should be targeted to increase the NGV system throughput and providing initial gas service to NGV customers in a timely way" (Massey et al., pp. 20-21). As widespread adoption will reduce GHG emissions and therefore achieve important government policy objectives. Furthermore, increased throughput will in the long run, keep all customer delivery rates from increasing sharply and not just those of NGV customers. Thus is of significance to FortisBC as it faces gas load erosion.

The regulator confronts a quandary, to either provide a barrier to NGV development or to foster its development. Any potential barriers to the utility to pursue an NGV growth plan will overwhelmingly shape the widespread adoption of NGV vehicles, as the utility, with its high brand identification and customer loyalty can play a key role in stimulating the market and achieving widespread acceptance.

The company should play a greater role in providing for greater awareness to the regulator, by demonstrating how the NGV market strategy benefits of all customers and does not adversely affect its existing gas customers. This new markets represent new territory for even the regulator, somewhat affected by past experiences, which gives rise to moving forward only with extreme caution.

4.3 Risk Mitigation

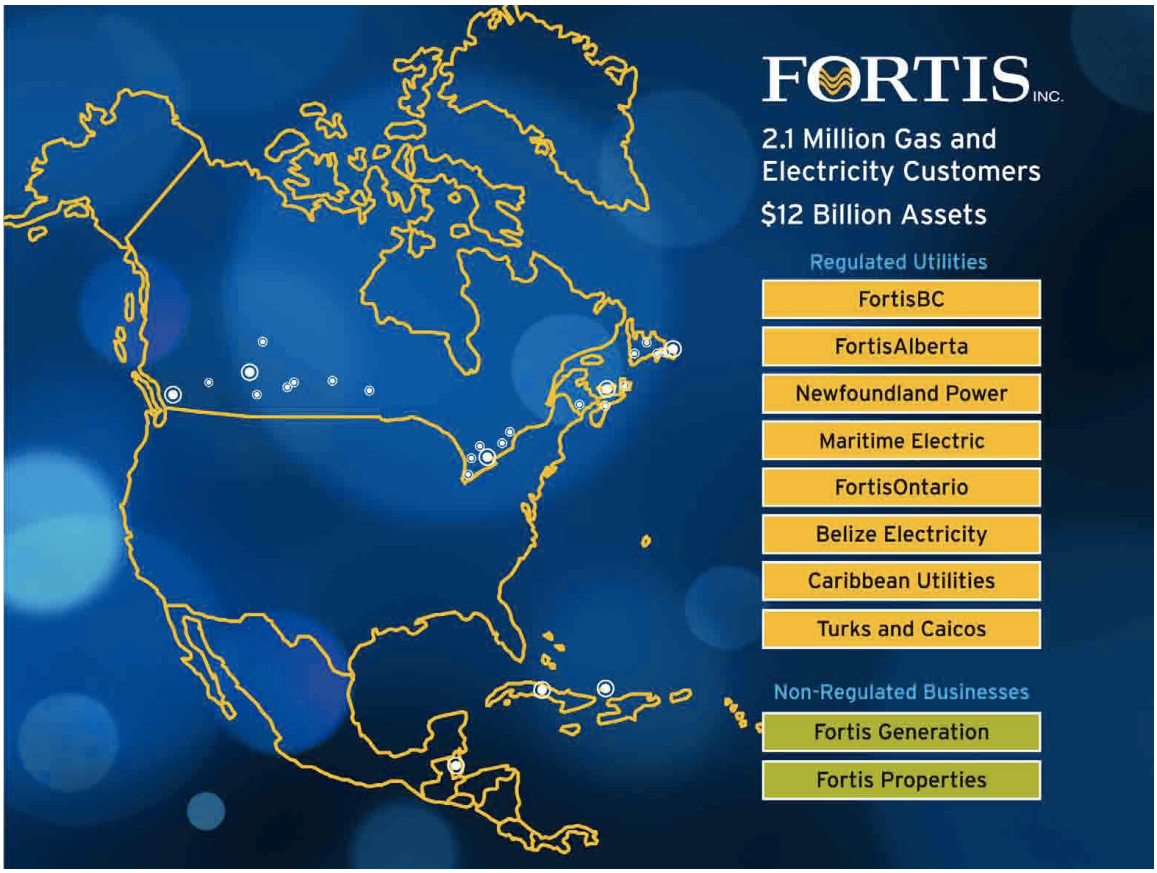
The company intends to provide for a low risk strategy by entering into "take-or-pay" and term contracts with its NGV customers that also provides for safeguarding the risk of "stranded assets".

Take-or-pay contracts will guarantee that the full cost of service is recovered by the utility through a minimum contracted amount, even if gas use falls below this level. Stranded assets are dealt with through the contractual agreements with the NGV customer guaranteeing reimbursement to the utility. Additionally, the risk of stranded assets is addressed through both contractual provisions with the customer, and through the construction of refuelling facilities so they can be easily relocated elsewhere if required. These measures will serve to mitigate risks associated with adding new NGV customers.

In conclusion, as the NGV customer base grows, FortisBC should consider an assessment of at what point in time NGV customers should be considered part of the larger base of existing customers, as the increased level gas throughput to the gas distribution system will benefit all utility customers. NGV customers provide for reduced upward cost pressure on delivery rates because of their increased gas load, and thereby will benefit all natural gas customers of the mature utility in the long term.

Appendices

Appendix A: Fortis Inc. Organizational Structure



Fortis currently owns the following regulated utilities:

- Newfoundland Power, serving 85% of the population of Newfoundland and Labrador
- Maritime Electric, serving 90% of the population of Prince Edward Island
- FortisOntario, a holding company for Canadian Niagara Power, Cornwall Electric, and Algoma Power
- FortisAlberta, a holding company for assets purchased from Aquila, Inc.
- FortisBC, an electric utility in British Columbia
- Belize Electricity Limited, a utility in Belize

- Caribbean Utilities, a utility in the Cayman Islands
- FortisBC, a gas utility supplying natural gas to 95% of gas users in British Columbia

Fortis also operates two non-regulated companies:

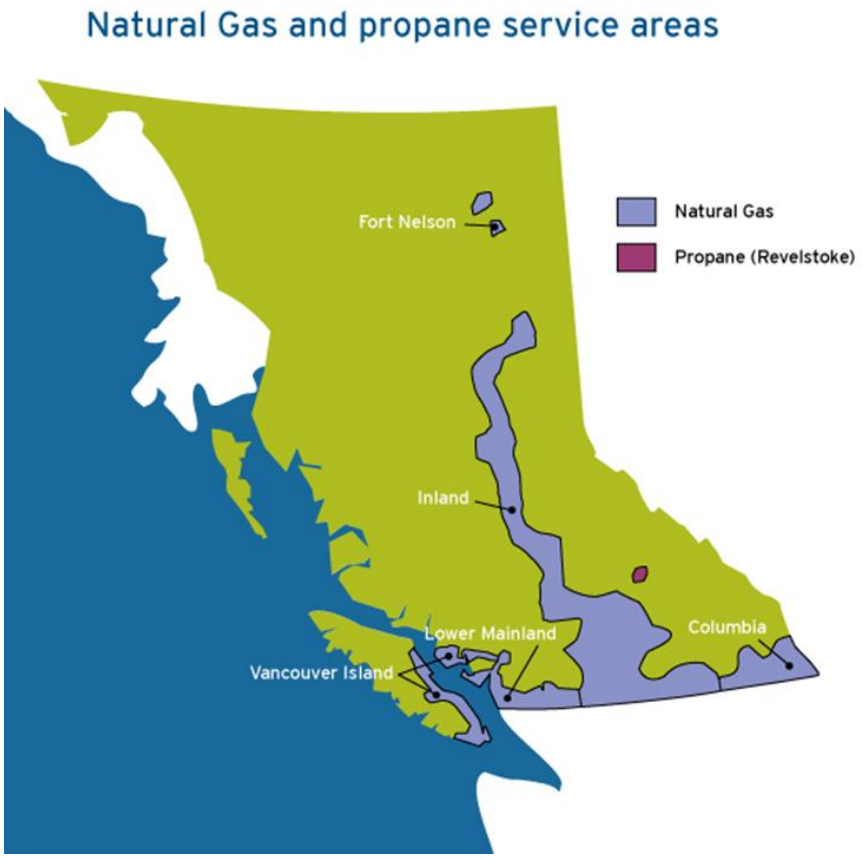
- Fortis Generation, hydro generation in New York state and central Newfoundland.
- Fortis Properties, a real estate company.

Appendix B: FortisBC Service Territory

FortisBC - Gas Division Service Territory

FortisBC delivers natural gas to homes and businesses across a vast area, including the Lower Mainland, Squamish, Whistler and the Sunshine Coast, extending north to Prince George and Fort Nelson, east to Fernie and the east Kootenay region. On Vancouver Island, FortisBC services customers from Victoria to Campbell River. The company also delivers piped propane gas to Revelstoke.

Figure 14: Map of FortisBC's (Gas Division) Service Territory



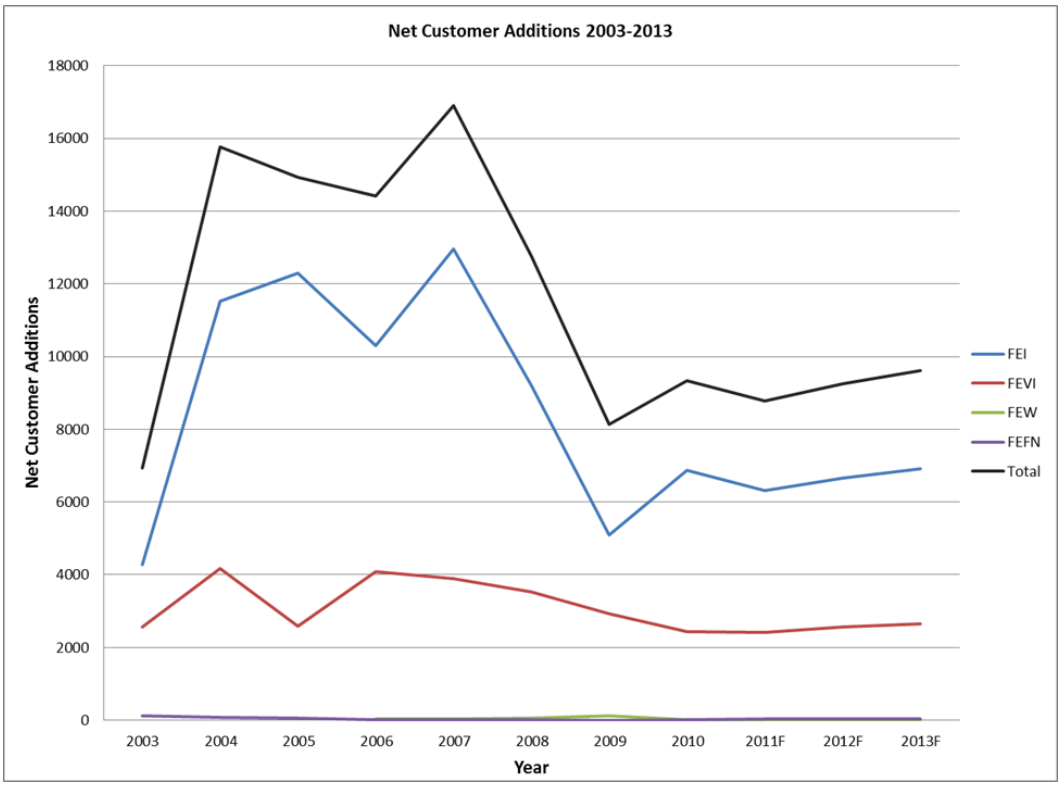
Source: http://www.fortisbc.com

Appendix C: FortisBC Pipeline System

Source: Company Documents

Appendix D: Customer Additions and Average Customer Use Rates

Table 15: Historical Net Customer Additions have experienced a decline in the past Decade



Source: Company documents

The rate of growth in the customer additions has been steadily declining over this period.

Legend

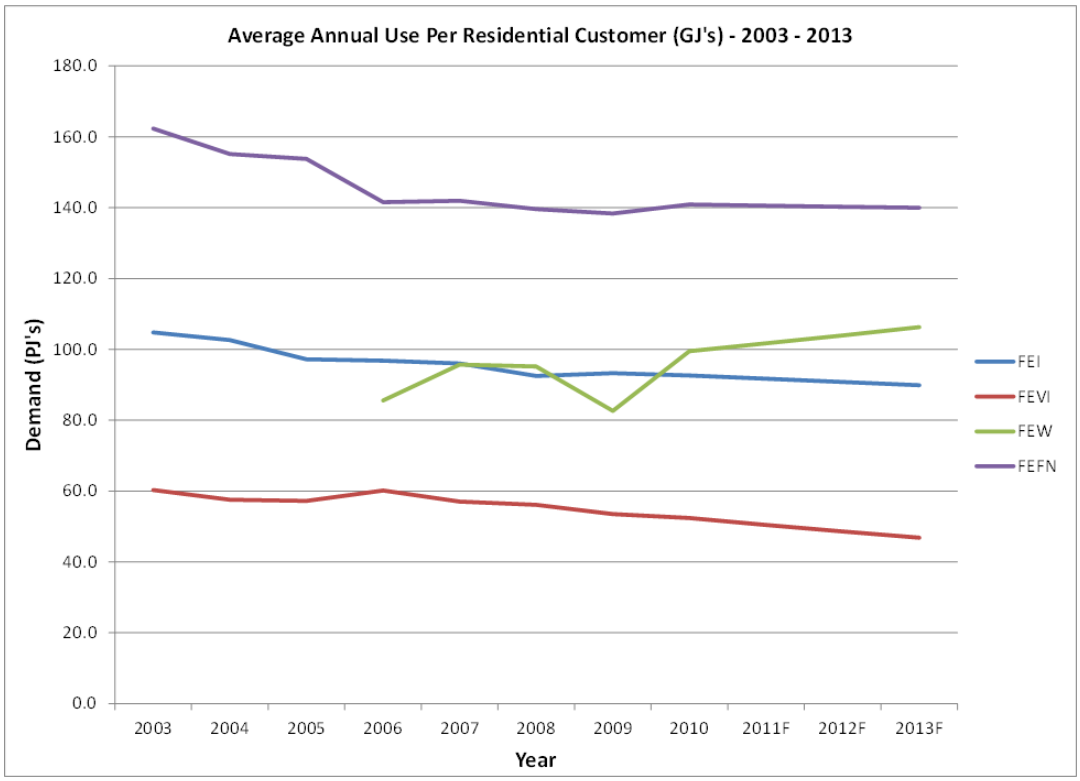
FEI = FortisBC Energy Inc.

FEVI = FortisBC Energy Vancouver Island Inc.

FEW = FortisBC Energy Whistler Inc.

FEFN = FortisBC Energy Fort Nelson

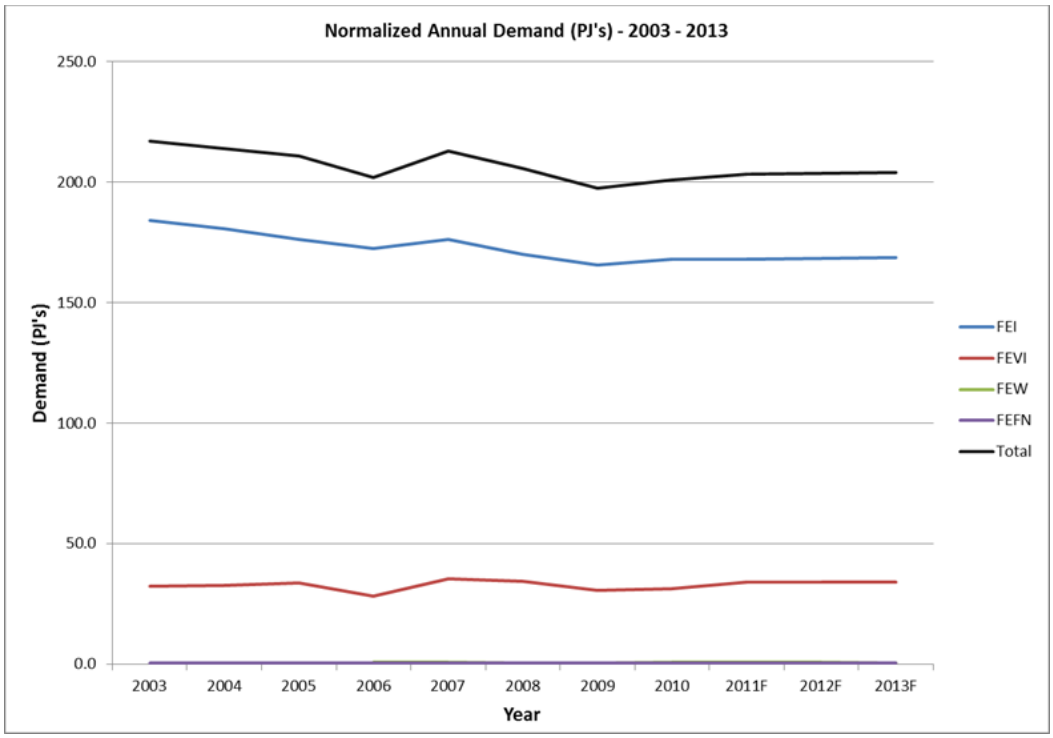
Table 16: Overall Normalized Actual Average Residential UPC (GJ/yr) Steadily Declining



Source: Company documents

Average use per customer has been steadily declining over this period largely due to the retrofit of higher efficiency appliances, the shift towards a higher number of multi-family dwellings in the housing mix, together with demand side management programs.

Table 17: Historic Total Demand Continues to Decline



Source – Company Documents

The chart illustrates the gradual decrease in demand volumes for the company.

Reference List

Barney, J. B. (1997). *Gaining and Sustaining Competitive Advantage.* Addison-Wesley Publishing Company.

BC Hydro's Service Plan 2012/13 - 2014/15. (n.d.). Retrieved from BC Hydro: http://www.bchydro.com/about/company_information/reports/service_plan.html

Bill 17, Clean Energy Act. (2010). Retrieved from 2010 Legislative Session: http://www.leg.bc.ca/39th2nd/1st_read/gov17-1.htm

Bloomberg. (2011, July 12). *Pickens Losing to Koch in Natural-Gas Feud*. Retrieved from Bloomberg: http://www.bloomberg.com/news/2011-07-12/pickens-losing-to-koch-in-billionaires-fight-over-natural-gas-subsidies.html

Bloomberg Businessweek. (2012, January 17). *Chrysler to Begin Natural-Gas Truck Sales to Fleets in 2012.* Retrieved from Bloomberg Businessweek: http://www.businessweek.com/news/2012-01-17/chrysler-to-begin-natural-gas-truck-sales-to-fleets-in-2012.html

Buksar, E. (n.d.). Strategic Fit Grid.

Canadian Gas Association. (n.d.). Retrieved February 2012, from http://www.cga.ca/about-cga/general-overview/

Canadian Gas Association. (2011, November). *Natural Gas Supply Update.* Retrieved from Canadian Gas Association: http://www.cga.ca/wp-content/uploads/2011/02/CGA_bulletin_SUPPLY-ENG.pdf

Canadian Natural Gas Vehicle Alliance. (n.d.). *Natural Gas Refuelling Stations.* Retrieved from Canadian Natural Gas Vehicle Alliance: http://www.cngva.org/media/4251/british_columbia_station_listing.pdf

Crossan, M. M., Rouse, M. J., Fry, J. N., & Killing, P. J. (2009). *Strategic Analyisis and Action.* Toronto: Pearson Prentice Hall.

Earth Techling. (2012, March 7). *Obama Embraces Natural Gas Vehicles In A Billion Dollar Way*. Retrieved March 2012, from Earth Techling: http://www.earthtechling.com/2012/03/obama-expands-alternative-vehicle-push/

Fortis Inc. (2011, p.1). *Annual Reports.* Retrieved March 2012, from Fortis Inc.: http://www.fortisinc.com/InvestorCentre/FinancialReports/AnnualReport/

FortisBC. (2009, June 15). *TGI 2010-2011 Revenue Requirements.* Retrieved from British Columbia Utilities Commission: http://www.bcuc.com/ApplicationView.aspx?ApplicationId=242

FortisInc. (2011, 3rd Quarter). *Quarterly Reports.* Retrieved from Fortis Inc.: http://www.fortisinc.com/investorcentre/financialreports/QuarterlyReport/Default.aspx

Globe and Mail. (2011, October 7). *A Lifeline for Energy Companies*. Retrieved from Globe and Mail: http://www.theglobeandmail.com/report-on-business/a-lifeline-for-energy-companies/article2195221/?from=2195213

Hydro, B. (n.d.). Retrieved from http://www.bchydro.com.

Kingsvale to Oliver Reinforcement Project. (n.d.). Retrieved from FortisBC: http://www.fortisbc.com/About/ProjectsPlanning/GasUtility/NewOngoingProjects/FortisBCKingsvale-OliverReinforcementProject/Documents/KORPFactSheet.pdf

Mankins, M. C., & Roger, P. (June 2010). The Decision Driven Organization. *Harvard Business Review*.

Marbek. (March 2010). *Study of Opportunities for Natural Gas in the Transportation Sector.* Submitted to Natural Resources Canada, Fuels Policy and Programs division.

Massey, W., Fleishman, R., Earley, W., & Gallagher, W. (2011). *What is the Appropriate Role of Natural Gas Utilities in the Natural Gas Vehicles Refuelling Market.* Convington and Burling LLP.

Ministry of Energy. (2010). *British Columbia's Natural Gas Strategy.* Ministry of Energy, Mines and Petroleum Resources.

Morse, J. J., & Lorsch, W. J. (1974). *Organizations and their Members: A Contingnecy Approach.* New York: Harper & Row.

Natural Resources Canada. (n.d.). *Energy Efficiency Trends Analysis*. Retrieved from Natural Resources Canada: http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/analysis_ca.cfm?attr=0

NGV Global News. (2012, March 16). *CEC Delivers Point-of-Sale Incentives for 357 Natural Gas Vehicles*. Retrieved March 2012, from NGV Global News: http://www.ngvglobal.com/cec-delivers-point-of-sale-incentives-for-357-natural-gas-vehicles-0316

Northwest Gas Association. (n.d.). *NGV Policies and Opportunities.* Retrieved from Northwest Gas Association: www.nwga.org

Petroleum Price Data. (2012, March). Retrieved from The Kent Group: http://www.kentmarketingservices.com/dnn/PetroleumPriceData.aspx

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

Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance* . New York: Free Press.

Roundtable, N. G. (March 2010). *Natural Gas use in the Canadian Transportation Sector Deployment Roadmap.*

Terasen Gas. (2010). *Application for Approval of a Service Agreement for CNG Service and for Approval of General Terms and Conditions for CNG and LNG Service.* Public Company Document.

The B.C. Energy Plan. (2007). Retrieved from http://www.energyplan.gov.bc.ca/PDF/BC_Energy_Plan_Conservation.pdf

The Vancouver Sun. (2012, February 15). *New Natural Gas Strategy drives benefits for B.C. Consumers*. Retrieved from The Vancouver Sun: http://www.vancouversun.com/business/natural+strategy+drives+benefits+consumers/6156336/story.html

Vining, A. R. (2011). Public Agency External Analysis using a Modified "Five Forces" Framework. *International Public Management*, 64.

www.naturalgas.org. (n.d.). *Natural Gas: From Wellhead to Burner Tip*. Retrieved February 2012, from Natural Gas.org: http://www.naturalgas.org/naturalgas/naturalgas.asp