

Sustainable development as freedom

How Alberta's energy sector can improve the quality of life for current and future generations

Michael Benson

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Abstract

Alberta's energy sector provides a reliable supply of energy and contributes to the economy of Alberta. In addition to these positive aspects, there are concerns about the environmental, economic and social performance of the energy sector. The purpose of this thesis is to critically examine the production side of Alberta's energy sector and offer constructive ideas about how the sector could be better organised to improve the quality of life for current and future generations of Albertans. It is a decidedly practical thesis that attempts to create a vision for a more sustainable energy sector as opposed to a perfectly sustainable energy sector.

Sustainable development (SD) provides a useful theoretical framework because it links economic, environmental and social considerations into one dynamic concept. Additional theories about modernity, communicative action, participation and justice and their relationship to SD are also discussed.

47 interviews were conducted in order to better understand the perspectives of different interest groups within the energy sector. The fieldwork identified significant common ground, making it possible to use communicative action (specifically, stakeholder dialogues as deliberation). Given this possibility, the thesis makes recommendations about processes and institutional arrangements that could be used to: establish SD principles and SD indicators for the energy sector; and guide the continual improvement of the energy sector towards sustainable development.

Key words: sustainable development, social choice, communicative action, continual improvement

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1 Introduction

If you pick up a newspaper in Alberta, you are not likely to find many stories linking the concept of sustainable development (SD) with Alberta's energy sector. In fact, SD is used more often to point out what the energy sector has not accomplished as opposed to where progress has been made. The concept of SD has the potential to solve many of the challenges in Alberta and around the world; however, its effectiveness to-date can be viewed as either a glass half empty or half full (Dale 2001).

The concept of SD has broad public appeal. One of the challenges associated with widely accepted concepts, like SD or justice or freedom, is that different people understand each concept in different ways (Clark 2010). Whether done intentionally or unintentionally, it is confusing and frustrating when people use the same words to mean very different things. It is important to overcome this challenge because the concept of SD can be a valuable framework that allows societies to better understand the implications of their decisions (Hopwood, Mellor et al. 2005).

People have been trying to understand the concept of SD for the past 25 years. In my opinion, the glass is half full because we are collectively starting to figure out the theoretical and practical considerations associated with such a complex concept. By applying the latest thinking about SD to Alberta's energy sector, I believe that we can improve the quality of life for current and future generations of Albertans. I talk about freedom because if the objective of development is to provide individuals with freedom, then we should concentrate on that overarching objective (Sen 1999). Therefore, development of Alberta's energy sector should consider individual freedoms.

This is a decidedly practical thesis. I could have attempted to design a perfectly sustainable energy sector, which would have been an interesting intellectual exercise, but would have been a challenge to implement. By focusing instead on how to create a more sustainable energy sector, I recognise the current realities of the energy sector, and attempt to get us headed in the right direction. I argue that Alberta should embrace a dynamic view of SD, *"emphasizing not some distant goal of achieving SD, but rather on contemporary progress along a transition toward sustainability"* (Clark 2010). I have put some ideas onto paper but it is really up to Albertans to decide how they want to arrange the energy sector.

1.1 Background and Purpose

We live in a modern society. Energy is an essential component of our modern society because it is the primary means for providing human beings with access to basic needs such as food and water and it facilitates various opportunities for the achievement of a decent quality of life. In other words, “energy is central to achieving the interrelated economic, social and environmental aims of sustainable human development” (United Nations Development Programme 2000).

Energy plays a critical role in Alberta, Canada. Albertans rely on energy to keep their homes warm during cold winter months, produce goods and services, and provide transportation across large geographic areas (NEB 2007). In addition, the energy sector is an important part of Alberta’s economy in terms of investment, trade, income generation and employment. The high quality of life that Albertans enjoy today was built around the energy sector. However, there are also concerns about the economic, environmental and social performance of the energy sector and how this affects the quality of life for Albertans.

A critical examination of the energy sector is a sensitive topic in Alberta. When I returned from Sweden to Alberta in early 2012 to conduct interviews, I was repeatedly asked by family, friends and colleagues if my research was going to be pro-energy or anti-energy. This was a very strange question. How could someone be against energy in principle when it is such an essential part of our society? The questions are symbolic of how polarized the debate about the energy sector in Alberta has become; it pits radical environmentalists against heartless capitalists with little space for reasoned and reflective discussions. I am hopeful that my research will demonstrate a constructive approach to addressing concerns associated with Alberta’s energy sector, while simultaneously recognizing its contribution to Alberta’s overall development. Economic growth is very important for the continued development of Alberta, but focusing solely on economic growth is an insufficient basis of human development (Anand and Sen 2000).

The purpose of this thesis is to critically examine Alberta’s energy sector and offer constructive ideas about how the sector could be better organised to improve the quality of life for current and future generations of Albertans. A better quality of life is something that all Albertans can agree upon. More specifically, my research aim is to develop recommendations that integrate the concept of SD into the production-side of Alberta’s energy sector. I will leave the consumption-side of the energy sector for further research. In order to accomplish this purpose, my research strategy was to conduct “use-inspired basic research” that incorporates elements from basic and applied research (Clark 2007).

This means that I was seeking practical solutions and, at the same time, seeking a theoretical understanding. Practical solutions sound good, but why do I need to worry about a theoretical understanding? The simple answer is consistency. The theoretical understanding provides deeper insights into the energy sector but more importantly provides a reference point to ensure all practical solutions are consistent with each other. Information about the methodology that I have followed for my thesis can be found in Appendix A.

I have developed two research questions in order to accomplish my research aim:

- RQ1: Given different interpretations of SD, is there sufficient common ground between arguments to move Alberta's energy sector towards SD?
- RQ2: If so, what are the appropriate processes and institutional arrangements that would move Alberta's energy sector towards SD?

The two main theories that I rely on are Amartya Sen's human development theory, and Jurgen Habermas' theory on communicative action. In addition to these theories, there are three main concepts at the core of my thesis: SD, modernity and Alberta's energy sector. These concepts are not necessarily equally understood by all readers so the next sections provide an overview and explain how they are relevant to my thesis.

1.2 Overview of Sustainable Development

The term SD appeared in 1972 at the United Nations Conference on Human Development and in 1980 in the World Conservation Strategy. It was popularized in 1987 with the release of the United Nations report *Our Common Future*, by the World Commission on Environment and Development, also known as the Brundtland Report. The Brundtland Report attempted to address the tensions between environment and development goals by joining environmental issues together with those of social and economic development. The definition of SD included in the Brundtland Report is:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland 1987).

The definition from the Brundtland Report also contained within it two key concepts: *"the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be*

give; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs" (Brundtland 1987).

SD has also resonated widely in Canada. During the late 1980s and the early 1990s, environmental non-governmental organizations (NGOs) established SD as the standard approach in Canada (Douglas 2010). By convincing government and business to accept this approach, many NGOs were optimistic that this would create space for dialogue and new opportunities to develop solutions.

Since the release of the Brundtland Report, there have been substantive deliberations aimed at interpreting and operationalizing the concept of SD. These deliberations have identified three essential components of SD:

- *"Economic – An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances that damage agricultural or industrial production.*
- *Environmental – An environmentally sustainable system must maintain a stable resource base, avoiding over exploitation of renewable resources systems or environmental sink functions and depleting non-renewable resources only to the extent that investment is made in adequate substitutes. This includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as economic resources.*
- *Social – A socially sustainable system must achieve fairness in distribution and opportunity, adequate provision of social services, including health and education, gender equity, and political accountability and participation."* (Harris and Goodwin 2001)

In addition to these three components, there is increasing acceptance that SD is dynamic. SD should be thought of as a process that moves us towards sustainability as opposed to specific goals that need to be achieved (Clark 2010). The process of SD can be guided and shaped by social goals, which will continuously change because of the evolving expectations and values of society. People need to talk with each other to facilitate understanding and reach agreement on the current and future vision for society (Robinson 2004).

Today the concept of SD is widely accepted by governments and corporations across the world. Despite this broad acceptance (or perhaps as a direct result of this broad acceptance), there remains uncertainty about the exact meaning of SD, and the appropriate policies and practices to move

towards SD (Faran 2010). It is not always clear what is to be developed and what is to be sustained. If this trend continues, then we could end up in the situation illustrated in the cartoon in Figure 1.

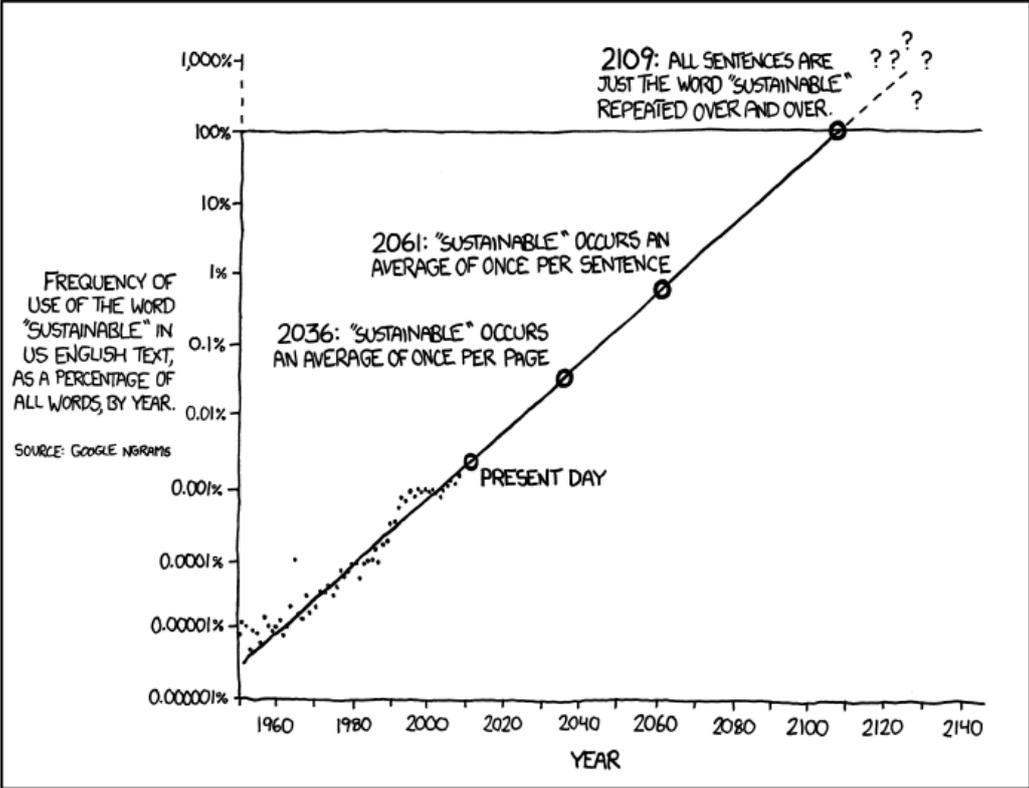


Figure 1: The Word "Sustainable" is Unsustainable
Source: XKCD (2012)

There are plenty of reasons to be optimistic about the future of SD. Its broad appeal has resulted in the development of many different conceptual paradigms and practical tools, which allows SD the flexibility to address a wide range of concerns. One explanation for the popularity of SD is that the concept resonates with people at a common-sense level (Harris and Goodwin 2001). SD has also been able to bring a "wide diversity of industrialists, environmentalists, public policy practitioners, and politicians to round tables in their attempts to define, deal with and actualize it" (Dale 2001). There have been significant efforts by the academic community to more clearly define the theoretical underpinnings of SD and thereby reduce its ambiguity. These efforts could be useful for clarifying the concept of SD, if better communicated outside the walls of academia.

Clarifying the concept of SD is important so that practitioners understand the implications associated with using different paradigms and tools. A better understanding ensures that paradigms and tools will be used appropriately and consistently. According to Faran (2010), the three main types of paradigms in SD are weak sustainability, strong sustainability, and the human development

paradigm. These paradigms are explained later in the thesis, and provide a better understanding of and guide us in choosing the appropriate tools to operationalize SD in Alberta's energy sector.

1.3 Overview of Modernity

Before the modern society, there were feudal societies, which were based on tradition where individuals accepted the arrangement of social institutions because it had always been done a certain way. The significance of the Enlightenment lies in part with the idea that the arrangement of social institutions no longer has to be based on principles derived from the past, but rather on principles that can be self-justified (Callinicos 2007). A modern society arranges its social institutions with the promise of making things better in the future. To achieve this promise, social institutions can be transformed. *"Modernity can and will no longer borrow the criteria by which it takes its orientation from the models supplied by another epoch: it has to create its own normativity out of itself"* (Habermas 1987).

Energy has played an important role in the development of modern societies. The industrial revolution transformed human society and it was largely dependent on significant advances in technology (Hannesson 2001: 4). These advances in technology increased our dependence on non-renewable resources. Coal was the primary fuel of the industrial revolution, and combustion of this non-renewable resource permanently released the stored solar energy (Hannesson 2001: 5).

There are two reasons why the concept of modernity is relevant to my thesis. First, shifting the energy sector towards more sustainable patterns of consumption and production is limited only by our imagination. Living in a modern society provides us with the potential to arrange our society how we want in order to make things better. Second, there are different perspectives on modernity that are useful to understand when contemplating making changes to our society. These different perspectives have the potential to influence the success or failure of our efforts so it is helpful to identify how different arguments are structured. The three perspectives are anti-modern, uncritically modern and critically modern. We will return to these perspectives later in the thesis.

1.4 Overview of Alberta's Energy Sector

Alberta is one of the western provinces of Canada and is considered by many to be a global energy leader. Alberta has an abundance of renewable and non-renewable energy sources. The energy sector in Alberta includes oil, natural gas, oil sands, petrochemicals, pipelines, oil field services, coal, electricity, and renewables (for example, wind, hydro, biofuels and solar). Appendix A includes additional background information on Alberta's energy sector.

The energy sector is undeniably the engine of Alberta's economy, with energy revenues accounting for almost a third of the revenue allocated under Alberta's provincial budget and just over half of the value of the province's total exports (Alberta 2012a). In 2010, an estimated \$10 billion was invested in Alberta's conventional oil and gas sector, and an estimated \$13 billion was invested in oil sands, and the energy sector employed either directly or indirectly nearly one in every six workers in Alberta (Alberta 2011a). There are many positive aspects associated with Alberta's energy sector, but there are also concerns about its economic, environmental and social performance. Due to space limitations, I have included the results of a culturomics analysis to substantiate the existence of such concerns (Appendix B includes additional analysis of Alberta's energy sector).

There is an emerging field, called culturomics, that attempts to identify cultural trends by studying and evaluating digital texts (Michel, Shen et al. 2011). There are many types of digital texts, including periodicals, so any analysis of cultural trends should not be restricted solely to the texts of books (Schwartz 2011). Periodicals can be particularly useful at gauging culture's changing pulse. In order to find digital records, I received help from the Calgary Public Library. Included in the \$12 annual fee is access to the E-Library and the potential to search Canadian Newsstand™ which has full text news from almost 200 Canadian newspapers including the Calgary Herald and Edmonton Journal. I was interested in learning if there are any trends in the coverage of Canadian newspapers on the energy sector in Alberta. In particular, I wanted to identify trends in economic, environmental and social concerns in Alberta's energy sector. In order to do this I searched for the number of media records that included all words, for example, Alberta, energy, environmental, and concern. Figure 2 illustrates the results.

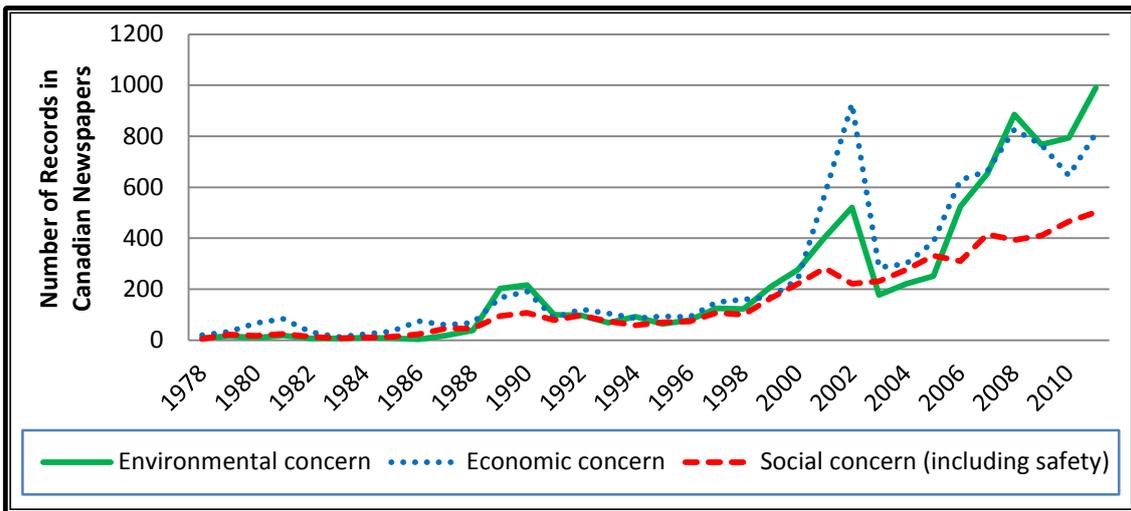


Figure 2: Cultural Trends towards Alberta’s Energy Sector
 Source: Compiled by author with data from Canadian Newsstand™, April 2012

An analysis of the media coverage suggests that environmental concerns, social concerns, and economic concerns associated with Alberta’s energy sector have been increasing over time. This trend is expected to continue in 2012 given the total number of records for the first quarter of the year. I want to be clear that I am not claiming that actual concerns with the energy sector are increasing at the same rate as the number of concerns in the media coverage. I am only looking at the trend as a qualitative indicator.

Figure 2 illustrates two notable increases in economic and environmental concerns during the late 1980s and the early 2000s. By reading the news stories in 1988-1990, it appears that the spike in concern was a result of heightened environmental awareness connected to the release of the Brundtland Report in 1987 and the Exxon Valdez oil spill in March 1989. By reading the news stories in 2001-2003, it appears that the spike in concern was connected with Canada’s formal ratification of the Kyoto Protocol in December 2002. Some additional information from the media coverage can be found in Table 1.

Table 1: Additional Information from Culturomics Analysis

	Environmental concern	Social concern	Economic concern
Total records	8426 total records	5496 total records	9301 total records
Top 5 subjects	oil sands (1338) pipelines (762) petroleum industry (723) energy policy (392) environmental protection (380)	oil sands (385) pipelines (339) petroleum industry (268) energy industry (173) politics (137)	oil sands (755) petroleum industry (596) pipelines (447) energy industry (299) recessions (289)
Top 5 company / organisation	BC Hydro (60) Imperial Oil Ltd (40) Enbridge Inc (39) Canadian Association of Petroleum Producers (37)	Suncor Energy Inc. (27) Canadian Press (25) Alberta Energy Co. (24) BC Hydro (23) Imperial Oil Ltd. (22)	Bank of Canada (99) Imperial Oil Ltd (30) BC Hydro (29) Toronto Stock Exchange (27) Petro-Canada Inc (25)
Top 5 people	Harper, Stephen (121) Klein, Ralph (114) Stelmach, Ed (83) Chretien, Jean (63) Anderson, David (48)	Klein, Ralph (75) Martin, Paul (63) Harper, Stephen (56) Bush, George W (50) Stelmach, Ed (42)	Klein, Ralph (224) Chretien, Jean (180) Harper, Stephen (120) Stelmach, Ed (108) Martin, Paul (88)
Top 5 Publications	Calgary Herald (1461) Edmonton Journal (1302) The Canadian Press (795) The Globe and Mail (676) National Post (409)	Calgary Herald (903) Edmonton Journal (855) The Canadian Press (626) The Globe and Mail (493) National Post (221)	Calgary Herald (1376) Edmonton Journal (1127) The Globe and Mail (992) The Canadian Press (984) National Post (528)
Top 5 Document types	News (7592) Article (807) Feature (765) Commentary (434) Editorial (241)	News (4918) Article (576) Feature (516) Commentary (238) Editorial (121)	News (8449) Article (956) Feature (899) Commentary (439) Editorial (233)

Source: Compiled by author with data from Canadian Newsstand™, April 2012

1.5 Overview of the Thesis

This thesis attempts to create a vision for a more sustainable energy sector in Alberta, as opposed to designing a perfectly sustainable energy sector. I have developed recommendations for processes and institutional arrangements that could move the production-side of Alberta's energy sector towards SD. These recommendations have the potential to work in Alberta, but I am not making any claims that this type of solution can be applied to different sectors in different countries. Some of the realities in Alberta's energy sector that play an important role in my thesis include:

- Albertans are the principal owners of non-renewable natural resources in Alberta;
 - agreement in principle within the energy sector about continual improvement;
 - agreement in principle among certain companies about corporate social responsibility (CSR);
- and

- the motto for the province of Alberta is “strong and free”.

Regarding ownership, the Provincial Energy Strategy makes it clear by stating that: “Albertans are the main players in their energy future. We are, after all, the principal owners of the resource” (Alberta 2008: 46). The Government of Alberta regularly mentions that Albertans own the province’s energy resources (Alberta 2012a), and more specifically, that Albertans own the non-renewable natural resources in Alberta through the provincial government (Alberta 2007; Alberta 2010a). Laws respecting non-renewable natural resources are in accordance with Section 92A of Canada’s Constitution Act (Canada 1867 - 1982).

Regarding continual improvement, the energy sector agrees in principle with the concept. For example, the Responsible Canadian Energy Program supports the energy industry’s ongoing commitment to continual improvement in areas that matter to Canadians (CAPP 2012). Despite agreement in principle, there are practical issues that arise without any clear and agreed upon long-term goals to guide continual improvement. For example, the majority of more than four thousand senior officials, experts and professionals polled in Canada give poor or terrible ratings to nearly all aspects of their own efforts to achieve sustainable energy (Pembina 2010).

Regarding CSR, companies that are listed on the Dow Jones Sustainability Index agree in principle with the concept. CSR encourages companies to consider the economic, social and environmental aspects associated with development, and publicly report on performance. Again there are practical issues that arise as individual companies make decisions regarding their own operations.

I have been working in the energy sector in Alberta for the past 20 years with companies, government departments, universities and NGOs, so I am able to rely on my personal experiences to deepen my understanding of the current realities. It is this depth of understanding that convinced me to adopt a practical and reformist approach for my thesis; anything different would end up collecting dust on a bookshelf. There is research being done, for example in transition management, which designs a perfectly sustainable energy sector and then focuses on how to promote a transition in the right direction. However, I am not sure that I would be able to get agreement from all the participants in the energy sector in Alberta about the vision of a perfectly sustainable energy system, let alone practical recommendations to transition in this direction.

Chapter 2 provides details about the concepts of SD and modernity building on academic literature.

Chapter 3 presents the results of my fieldwork in which I interviewed company representatives, government representatives, NGO representatives, landowners, and Aboriginal people on the topic of SD. The purpose of conducting interviews was to give me a better understanding of the values and expectations of individuals and their organisations, which in turn could be used to make a more convincing argument. My fieldwork results highlighted significant common values and simultaneously confirmed that government and industry have different expectations for the energy sector than landowners, NGOs and Aboriginal people. These divergent expectations partially explain why there are tensions in the energy sector. These common values open the door for further discussions and future progress.

Chapter 4 recommends processes and institutional arrangements with the potential to create common values and move Alberta's energy sector towards SD. The recommendations rely on continual improvement and communicative action to more directly incorporate expectations of landowners, Aboriginal people, and environmental NGOs into the energy sector. My thinking around continual improvement was informed by interviews with people knowledgeable in this field from the energy, mining and chemistry sector in Canada.

Chapter 5 offers some final thoughts.

2 Theoretical Frameworks (Part 1)

So far I have briefly introduced the concepts of SD and modernity, and I have demonstrated that the energy sector is the engine of Alberta’s economy and that there are concerns with Alberta’s energy sector (see Chapter 1). The purpose of highlighting the trend in economic, environmental and social concerns is not to get into a discussion about how serious these problems are or potential trade-offs, but rather to arrive at agreement that there is room for improvement in the energy sector. I will even go further and suggest that there will likely always be opportunities for improvement given the dynamic and constantly changing relationship between society, politics and the economy. People have expectations about what is acceptable and what is unacceptable, and these expectations change over time. As a result, the energy sector has to respond to these changing expectations and continually improve their economic, social and environmental performance.

I think the concept of SD can provide some constructive ideas about how the energy sector could be better organised to improve the quality of life for current and future generations of Albertans.

2.1 Different Paradigms of Sustainable Development

As was introduced in Chapter 1, according to Faran (2010), there are three main paradigms of SD: weak sustainability, strong sustainability, and human development. These different paradigms cover the important components of SD: what is to be sustained, what is to be developed, and the intergenerational component (Ness, Urbel-Piirsalu et al. 2007). Table 2 provides a summary of the different paradigms of SD, and more details are provided in the sections that follow.

Table 2: Different Paradigms of Sustainable Development

SD Paradigms	Components of SD Paradigms				
	Consider environmental, economic, and social aspects	Intergenerational equity	Intragenerational equity	Environmental limits	SD Strategy
Weak Sustainability	Yes	Yes	No	No	Economic Choice
Strong Sustainability	Yes	Yes	No	Yes	Political Choice
Human Development	Yes	Yes	Yes	Depends	Social Choice

Source: Adapted from “Sustainable Development: A Typology of Perspectives” (Faran 2010)

2.1.1 Weak Sustainability

Initially, the concept of sustainability posed a problem for economists, but in the 1990s a consensus emerged that *“sustainability implies that certain indicators of welfare or development are non-declining over the very long term”* (Stern 1997). A Nobel laureate economist, Robert Solow, combined the economists’ definition of sustainability with the Brundtland definition of SD to create the foundations of weak sustainability. Solow states (Solow 1993):

“If sustainability is anything more than a slogan or expression of emotion, it must amount to an injunction to preserve productive capacity for the indefinite future. That is compatible with the use of non-renewable resources only if society as a whole replaces used up resources with something else.”

When Solow describes preserving human well-being, he is referring to scenarios where future generations are able to enjoy a GDP per capita at least equal to ours. The focus is on intergenerational equity in terms of GDP per capita, which can be justified because Brundtland’s definition of SD did not include any discussion concerning the intra-generational distribution of income. Solow (1993) further states: *“the principle of sustaining the levels of GDP means that the using up of the non-renewable resources for creating present income is only allowed when a) production is carried out efficiently (no waste), and b) the lost welfare of the future generation (the used-up stock of non-renewable resources) is at least compensated by an increase in the total stock of capital that we accumulate for future use”*.

Solow assumes that capital exhibits substitutability: specifically, that manufactured capital (for example, plants, equipment and knowledge) can be substituted for natural capital (for example, renewable and non-renewable resources), or vice-versa. If this assumption is accepted, there is no particular need to conserve natural capital so long as manufactured capital is augmented by a value equal to or greater than the depletion of natural capital (Harris 2001). By substituting other factors for natural resources *“the world can, in effect, get along without natural resources, so exhaustion is just an event, not a catastrophe”* (Solow 1974). The well-known principle derived from the work by Solow and Hartwick (the Hartwick rule), states that *“consumption may remain constant, or increase, with declining non-renewable resources provided that the rents from these resources are reinvested in reproducible capital”* (Harris 2001). As a result, there is no explicit commitment to preserve the environment within the paradigm of weak sustainability.

The strategy to achieve SD within the weak sustainability paradigm is Economic Choice. Key decisions are made by the market, although there is an attempt to appropriately adjust market prices to include environmental issues (for example, environmental economics attempts to internalise the costs and benefits associated with environmental issues). Actors continue to make decisions based on self-interest (for example, profit maximization or utility maximization) and price signals (Faran 2010).

Corporate Social Responsibility (CSR) can be considered as a subcategory of the Weak Sustainability paradigm. The World Business Council for Sustainable Development (WBCSD) is a CEO-led organization of forward-thinking companies that galvanizes the global business community to create a sustainable future for business, society and the environment. The WBCSD has defined CSR as: *“the continuing commitment by business to contribute to economic development while improving the quality of life of the workforce and their families as well as of the community and society at large”* (WBCSD 1999). CSR addresses intergenerational equity by focusing on the long-term success of corporations, which in turn contributes to GDP per capita. The argument against its inclusion as a subcategory is that it does not explicitly incorporate the concept of intergenerational equity, which has emerged as the theoretical foundation of SD.

2.1.2 Strong Sustainability

Strong sustainability, just like weak sustainability, is interested in preserving human well-being and has been developed by economists. The fundamental difference between the two paradigms is that strong sustainability assumes there is no perfect substitutability between natural capital and manufactured capital. Instead, the strong sustainability paradigm believes that there is complementarity between the two types of capital. The idea of complementarity is illustrated with an example: if fish in the ocean are continually converted into manufactured capital (for example, more fishing boats), then there will be a point when the fish stocks are depleted and the fishing fleet becomes completely worthless (Faran 2010: 12). In other words, it is not possible to offset the depletion of natural capital with an addition of manufactured capital.

If the objective of SD is to sustain human well-being (for example, maintaining levels of GDP per capita), then the idea of complementarity requires that the present levels of natural capital are maintained (Costanza, Cumberland et al. 1997). It is insufficient to focus only on the total stock of capital.

The difference between substitutability and complementarity sounds like a minor technical adjustment that only economists need to worry about. Indeed, many practitioners of strong sustainability view the difference as a technical adjustment to the weak sustainability paradigm (Faran 2010). However, the logic of this technical adjustment brings us to the idea of a steady state economy or zero growth (Daly 2008). These ideas have been advocated by Herman Daly who is considered by many to be the founder of the strong sustainability paradigm. If we accept that manufactured capital cannot be substituted for natural capital, and we accept that the finite nature of non-renewable resources and our dependence on these resources, then we must acknowledge natural limits to growth (Faran 2010). Daly believes that our economic system is dependent on the finite ecosystem. Daly also believes that it is possible for development to occur within a steady state economy. Development can continue improve human well-being by focusing on the efficient production of more useful stuff as opposed to more useless stuff (Daly 2005).

The strategy to achieve strong sustainability is Political Choice. The idea of a zero-growth or steady state economy would be challenging to implement given the increasingly integrated global economy and the free flow of capital. To make this a political possibility, there would have to be a transformation of culture and basic values of a large majority of population (Daly 2005).

2.1.3 Human Development

The Human Development paradigm is associated with Amartya Sen, who elaborated his ideas in the context of development and later extended them to the SD debate. The aim of human development is to sustain human freedom while developing basic human capabilities and societal institutions (Anand and Sen 2000). Human development (for example, people being better educated, more healthy, less debilitated) not only improves the quality of life for each individual, but it also allows individuals to be productive members of society and make positive contributions to the collective well-being (Anand and Sen 2000). In other words, human development is about “*expanding the real freedoms that people enjoy*” (Sen 1999: 36).

Unlike weak sustainability that focuses on sustaining human well-being, the Human Development paradigm is interested in sustaining freedom. In order to sustain freedom, the recommended approach is to develop individual capabilities. A capabilities approach incorporates both the potential opportunities and the actual outcomes related to development. The role of the market is important

for the Human Development paradigm but people should have the appropriate capabilities to be involved with the market (for example, adequate education). In addition, equity considerations should be included in the Human Development paradigm, including the prioritization of expanding the capabilities of the poor and deprived (Faran 2010). *“There is no basic conflict between regarding economic growth to be very important, and taking it to be in itself an insufficient basis of human development”* (Anand and Sen 2000).

According to Faran (2010: 18):

“Sen's understanding of development as freedom (capability expansion) embraces easily the social aspect of SD. In a sense, a society of free human beings is Sen's vision of sustainability, and for Sen both economic and environmental aspects of SD should be seen through this lens. When it comes to economic sustainability, Sen accepts from Solow that sustainability is a question of intergenerational equity; although he hastens to add that if one accepts such commitment to future generations on ethical grounds one could not neglect intragenerational equity. Equitable distribution for the existing generation follows from the principle of sustainability, and as always with Sen, it is not just a matter of an ethical obligation, but it has instrumental desirability for sustainability, in that an equitable distribution now will leave a larger stock of capital for future generations; both by its usefulness for economic growth and by the accumulation of higher levels of human capital that follows from a more equitable distribution (Anand and Sen 2000). It must be stressed that although Sen shares with Solow the idea of sustainability as intergenerational equity, Sen's idea of what is to be sustained is quite different from Solow's and from the weak sustainability approach. Sen is not an advocate of maximizing growth; this is so because he does not see GDP per capita as the supreme criteria for human well-being. His idea of development as freedom implies that, even when accepting from Solow the importance of maintaining the level of total stock of capital for the future generation, economic growth is only justified while it serves the expansion of the capabilities of the future generation.”

Regarding the environmental aspect of SD, Sen believes that natural capital can be preserved on either moral or instrumental grounds. The moral argument is that future generations should be provided with the same opportunities as us to enjoy the natural environment. There are also instrumental arguments that focus on understanding how the natural environment contributes to the well-being of current and future generations.

The strategy to achieve human development is Social Choice. An essential component of Social Choice is stakeholder participation as deliberations, which is quite different from stakeholder participation as consensus building. Social choice is an attempt to identify pre-existing values in a society: it is about making the right decisions as opposed to the most agreeable decisions. These pre-existing values are different for different societies and might include, for example, gender equality, racial equality, universal health care, universal education and the removal of capability deprivation (Faran 2010). If we accept the goal of development as freedom, then we need to create processes and institutional arrangements that identify and promote alignment with pre-existing values.

2.2 Different Perspectives on Modernity

The reason why SD has been interpreted different ways by different people can be partially explained by looking at an individual’s philosophical and moral ideas on the relationship between nature and society (Robinson 2004). This means that what can and should be done to move towards SD in Alberta is not fundamentally a scientific or technical issue. In order to understand and help solve complex sustainability challenges, it is important to consider a larger set of issues including the role of science and knowledge in modern society (Robinson 2004). Table 3 highlights the links between SD and the different perspectives on modernity.

Table 3: Sustainable Development Paradigms and Perspectives on Modernity

SD Paradigms	Components of SD Paradigms			
	Perspective on Modernity	Consider environmental, economic, and social aspects	Development Indicators	Development Strategy
Weak Sustainability	Uncritically Modern	Yes	Economic	Economic Choice
Strong Sustainability	Critically Modern	Yes	Economic and Environmental	Political Choice
Human Development	Critically Modern	Yes	Economic, Environmental, and Social	Social Choice

Source: Adapted from “Sustainable Development: A Typology of Perspectives” (Faran 2010)

Jurgen Habermas suggests that different perspectives on modernity were established during the debates between German philosophers that followed Georg Wilhelm Friedrich Hegel’s death in 1831 (Callinicos 2007). In these debates, three basic perspectives on modernity were taken: Left Hegelian, Right Hegelian, and Nietzsche. *“The Left Hegelian critique turned toward the practical and aroused*

for revolution" (Habermas 1987). This critically modern perspective believes that there needs to be some fundamental changes to our society, either reformative or transformative, in order to make things better.

The Right Hegelians believed that *"the substance of state and religion would compensate for the restlessness of bourgeois society, as soon as the subjectivity of the revolutionary consciousness that incited restlessness yielded to objective insight into the rationality of the status quo"* (Habermas 1987). This uncritically modern perspective believes that there is no need to make any fundamental changes to our society because science and technology will be capable of addressing issues. This perspective has the flexibility to promote improvements and reforms, but these changes must be within existing structures. This perspective is connected with the ecological modernization movement and includes Amory Lovins, Paul Hawken, Al Gore and the World Business Council on Sustainable Development.

Nietzsche believed in the radical rejection of modernity. He argued that all forms of reason are *"simply particular expressions of the will to power that is the fundamental tendency in both the physical and the social worlds"* (Callinicos 2007).

This correlation between modernity and SD provided me with a deeper understanding during my fieldwork. These different perspectives on modernity will be discussed again.

3 Fieldwork related to Sustainable Development

The purpose of conducting fieldwork related to SD was to answer my first research question:

- RQ1: Given different interpretations of SD, is there sufficient common ground between arguments to move Alberta's energy sector towards SD?

3.1 Fieldwork Methodology

I conducted qualitative research, which signifies that the people interviewed are not meant to be representative of a population. *"It is the quality of the theoretical inferences that are made out of qualitative data that is crucial to the assessment of generalization"* (Bryman 2008). I followed the six main steps of qualitative research as identified by Bryman (2008):

1. general research questions,
2. selection of relevant subjects,
3. collection of relevant data,
4. interpretation of data,
5. conceptual and theoretical work, and
6. writing up findings and conclusions.

A comprehensive discussion of my fieldwork methodology is included in Appendix D. This section provides only a brief overview. My starting hypothesis, based on my experience in the energy sector in Alberta, was that industry and government representatives are uncritically modern and support the Weak Sustainability paradigm, whereas representatives from civil society are critically modern and support the Human Development paradigm. From this starting hypothesis I developed general research questions and selected different interest groups in the energy sector.

I used purposive sampling in order to identify specific people and organisations that were relevant to my research questions (Bryman 2008). Based on personal experience, I identified different interest groups to articulate different arguments in the energy sector. It is these arguments that are put into the broader public arena and used to shape the opinions of Albertans. This was not stakeholder dialogue to reach consensus amongst interest groups, but rather a search for intersubjective-truths (specifically, understanding different arguments to determine whether there is sufficient common ground to reconcile these divergent arguments). The different interest groups that I identified were industry, government, NGOs, academia, landowners, and Aboriginal people.

I conducted 47 interviews (refer to Appendix E for additional information about the participants, and Appendix F for the questionnaire) between December 2011 and April 2012 and then interpreted the data through coding and analytical induction. Then I had to use my data to develop theoretical connections. I wrote up my findings and conclusions, which are provided in the next sections.

3.2 Fieldwork Results

Although the purpose of conducting this fieldwork was to answer my first research question, the results are exploratory in nature and are not meant as statistically significant proof. There are three main results of my interviews:

- Result 1: there is significant common ground in the energy sector regarding continual improvement and CSR elements.
- Result 2: industry representatives, government representatives, market-based NGOs and academic representatives have a predominantly uncritically modern perspective and have expectations that the energy sector in Alberta be organised around the Weak Sustainability paradigm.
- Result 3: landowner representatives, Aboriginal representatives, and environmental NGOs have a predominantly critically modern perspective and have expectations that the energy sector in Alberta be organised around the Human Development Paradigm.

Aboriginal People

“Environmental limits are not an Aboriginal concept, but rather a colonial perspective based on scarcity. The Aboriginal concept of abundance means that the earth will provide plenty for everyone. Listening to and respecting the earth will ensure that it can continue to provide resources for generations to come.” (direct quote from an Aboriginal representative)

I interviewed seven Aboriginal representatives including both First Nation and Métis people. All representatives appear to view the energy sector from the Human Development paradigm and have a critically modern perspective. There is a wide range of concerns (social, environmental and economic) about the energy sector and suggestions to improve it include both reformative and transformative elements.

Environmental NGOs

“Sustainability is not part of the discourse in Alberta. We need to focus on developing in a responsible way, and not on limits to growth or a steady state economy, because this is what resonates with Albertans.” (direct quote from a NGO representative)

I interviewed six NGO representatives from organisations actively involved in Alberta’s energy sector. In order to explain my results, I had to reformulate the category of NGOs to include: environmental NGOs, law-based NGOs, and market-based NGOs (Appendix D includes a discussion about the law-based and market-based NGOs). The environmental NGOs appear to view the energy sector from the Human Development paradigm with a critically modern perspective. The environmental NGOs are concerned that environmental impacts on water, air and land and social impacts on individuals and communities are not being properly addressed under the current system; therefore, we need to make some fundamental changes. Interestingly, none of the environmental NGOs had an anti-modern perspective.

Government Representatives

“We have a dynamic system and we need to manage it using indicators and proper monitoring. I hope there are more discussions about the trade-offs, but I am not sure that the political process allows for these discussions. The public service needs to be more strategic and change the way we work. We need to focus on big picture.” (direct quote from a government representative)

I interviewed six government representatives including one elected official, provincial departments, the provincial regulator and the federal regulator. All six government representatives appear to view the energy sector from the CSR paradigm and have an uncritically modern perspective. There were different ideas on how to improve the system and a strong commitment amongst these public servants for improving the quality of life for Albertans.

Industry Representatives

“The Bruntland definition is a good starting point but difficult to operationalize. Corporate social responsibility takes this concept and translates it into more meaningful and measureable metrics.” (direct quote from an industry representative)

I interviewed fourteen industry representatives from energy companies, pipeline companies, consulting companies, service companies, investment companies and industry associations. All fourteen industry representatives appear to view the energy sector from the CSR paradigm and have an uncritically modern perspective. There was acknowledgement that there are legitimate concerns about the energy sector and a genuine desire to address all concerns related to their own operations.

Landowners

“The key to SD is to get people talking and listening to each other. This will develop a common understanding and common goals. Collectively, people know what the right thing to do is.” (direct quote from a landowner)

I interviewed ten landowners across the province. All representatives appear to view the energy sector from the Human Development paradigm and have a critically modern perspective. There are a wide range of concerns (social, environmental and economic) about the energy sector and uncertainty that these concerns can be addressed by minor adjustments to the current system. None of the people interviewed are against development on principle, although there are varying degrees of frustration about the perceived lack of progress towards more responsible development.

University / Academic Representatives

“The academic community has a role providing insights into short-term problems (for example, technical solutions to CCS, tailing ponds and energy efficiency), which we do very well, but also into the longer term problems of the energy sector (for example, the sustainability and transition of the overall energy system), which we do very poorly.” (direct quote from an academic representative)

I interviewed four academic representatives including graduate students, a research associate and one senior administrator all with an interest in sustainable energy. All four academic representatives appear to view the energy sector from the Weak Sustainability paradigm, although interestingly, they are aware this paradigm is useful to develop technical solutions but does little to address big picture challenges in the energy sector. People were interested in understanding the different tools from the different SD paradigms.

3.3 Discussion of Fieldwork Results

There appears to be both common ground and divergent expectations about how the energy sector in Alberta should be organized. Should we attempt to reconcile these divergent expectations? Some people would argue that the energy sector is too important economically to deliberately make any changes. However, the energy sector in Alberta has a lengthy history of change through leadership and innovation. As scientific knowledge expanded and society's expectations evolved, government and industry continually raised performance standards and attempted to address the effects of earlier activities, for example (Bott 2004):

- In 1938, the Petroleum and Natural Gas Conservation Board was created to promote orderly development of the resource;
- In 1961, Alberta established air quality standards that addressed H₂S and sulphur dioxide emissions; and
- In 1990, Canadian refiners stopped using lead as a gasoline additive.

Albertans had sufficient vision to make the right choice even if it wasn't the most popular choice. All 47 of the people that I interviewed believe there is room for improvement in the energy sector; the challenge is to agree on how this can be accomplished.

A more practical answer to whether we should reconcile these divergent expectations is connected to Alberta possessing the third-largest proven crude oil reserves in the world. This places Alberta under international scrutiny as an energy supplier. There are concerns from the United States and Europe about how Alberta is developing our natural resources, which have the potential to restrict access to markets for energy products from Alberta. To respond, Alberta must demonstrate responsible development of the energy sector in a manner that is consistent with the values and expectations of Albertans. I am not talking about improving the public relations campaign, but rather developing a comprehensive, transparent, dynamic approach that establishes clear expectations, monitors performance and improves performance: an approach based on the values on Albertans. Without such an approach, it is possible that Alberta will lose access to markets and/or have solutions imposed upon us by the international community or the federal government of Canada.

3.3.1 Consideration of Economic, Social and Environmental Aspects

Based on my interviews, there is a lot of common ground about the responsible development of Alberta's resources. No one suggested that Alberta should immediately stop extracting non-renewable resources but there were a lot of ideas on how to do a better job of it. Everyone that I interviewed agreed that it is important for the energy sector to consider the economic, social and environmental aspects associated with development. Everyone also agreed that there is room for continual improvement in the energy sector. These common values open the door for further discussions and future progress.

3.3.2 Intergenerational Equity

Based on my interviews, there was agreement that the energy sector has a role to play in improving the quality of life for future generations of Albertans. However, there were divergent expectations on how best to achieve this. Government and industry representatives frequently described how a robust energy sector would create jobs and investments, which would benefit both current and future generations of Albertans. I was a little surprised that none of the government or industry representatives discussed the long-term preservation of wealth from non-renewable resources, although they frequently described frustrations and limitations created by the short-term focus of business cycles and political cycles.

Landowners, Aboriginal people and environmental NGOs expressed concerns about the future after the non-renewable resources are gone. There were some common concerns, including:

- How can we convince government and industry to adopt a longer-term perspective?
- How will we support our social programs when the non-renewable resources are gone?
- Who will pay to clean-up aging infrastructure when the resources are gone?
- How will my grandchildren maintain a high quality of life in Alberta?

Based on these concerns, it appears that landowners, Aboriginal people and environmental NGOs would like the benefits from exploiting non-renewable resources, which are finite in nature, preserved for future generations. This brings us to a discussion about royalties.

The purpose of Alberta's royalty system is to collect the appropriate amount of mineral and energy resources for the benefit of Albertans, which attempts to balance a fair return for Albertans and

investment opportunities that are competitive with other petroleum development opportunities around the world (Alberta 2011b). Periodic efforts, perhaps every three or five years, should be made to determine if this balance should be adjusted to create a more just arrangement. The opinions of landowners, Aboriginal people and environmental NGOs should be considered in these reviews. Their opinions will likely change over time, shifting between higher returns for Albertans (for example, higher royalties and higher taxes) and a more attractive investment climate. The purpose of making regular adjustments is to avoid a situation where the expectations of Albertans are so far out of line with the reality in the energy sector that drastic changes are required. These periodic efforts need to be based on information provided from technical experts but should also include the opinions of the broader public (see Chapter 4).

More importantly from the perspective of intergenerational equity, is the consideration of what to do with the royalties once they are collected. All of the SD paradigms require that the temporary and unsustainable gains from non-renewable extraction are set aside for purposes that will make these gains permanent instead of transient (Hannesson 2001). This brings us to the Alberta Heritage Fund. Alberta has long since abandoned the vision of Premier Lougheed, when he asked in 1976:

“Are we prepared ... to put aside substantial sums of current revenues from the sale of non-replaceable crude oil production, put it aside for our grandchildren and not make it available for current revenue needs; to use it for that day ... when some of the wells may have gone dry?” (Mumey and Ostermann 1990)

Initially 30% of the province’s oil and gas revenues were deposited into the fund but no deposits have been made since the fall in oil prices in 1986. There does not appear to be any plans to begin additional contributions from the energy sector to the Heritage Fund, so *“its wealth transformation role is one that belongs to the past; its main role appears to be one of a budgetary reserve, a savings account for a rainy day”* (Hannesson 2001). Although landowners, Aboriginal people and environmental NGOs did not explicitly mention the Heritage Fund, many of their concerns about future generations are closely connected to the concept of such a fund.

A starting point for discussion would be to take 100% of the royalties generated by the oil sands and put them directly into the Heritage Fund. The dwindling royalties from conventional oil and gas would compel the Alberta Government to end their reliance on fluctuating energy revenues and establish a new fiscal framework. It is far easier to develop a new fiscal framework when there is a robust economy instead of trying to put it in place during an economic downturn. The 2012 Budget

Speech confirmed that there is a need to build a more predictable, sustainable revenue base to support ongoing social programs because the health and education of Albertans should not be dependent upon the fluctuating price of energy commodities (Alberta 2012b). Currently, energy revenues account for almost a third of the revenue allocated under Alberta's provincial budget (Alberta 2012a), so putting all of, or a portion of, these revenues into the Heritage Fund would require some substantial changes. The 2012 Budget Speech also acknowledges that a new fiscal framework must include a discussion about Alberta's tax regime.

A revised Heritage Fund should include several improvements, including: a clear objective for the long term preservation of wealth; clear rules that are not easily amended by a parliamentary majority; management of the fund by an institution at arm's length from the government and the legislature; and most importantly, a mechanism to anchor it in the minds of the general public. The long term objective could be to make oil and gas wealth permanent. For example, after production of the oil sands is finished, then the Alberta Government can use the interest earned from the Heritage Fund to cover the costs of important programs such as health, education and infrastructure. Albertans will only be interested in the success of a revised Heritage Fund if they perceive that there are potential benefits for either the individual or the household (Hannesson 2001: 98). The two primary mechanisms for anchoring the Heritage Fund in the minds of Albertans is a dividend program, similar to the Alaskan Permanent Fund, or a retirement fund. Additionally, given the current discussions in Canada around adjustments to Old Age Security and the Canadian Pension Plan, it might be an interesting and timely opportunity to establish a provincial retirement fund. Each generation of retirees would have an obvious interest in a fund on which their retirement payments depend.

Economists agree that SD is compatible with the use of non-renewable resources only if society as a whole replaces used up resources with something else. I would challenge the Alberta Government, progressive energy companies and interested Albertans to start discussions about revitalising the Alberta Heritage Fund in order to make oil and gas wealth permanent and benefit future generations of Albertans. The Heritage Fund is one alternative, but perhaps there are better solutions that can be developed through open discussions and deliberations.

Table 4: Sample SD Principles for Intergenerational Equity

SD Principles	Common Ground
Current generation of energy wealth is important	Concern about the well-being of current generations (for example, GDP, share price, investment, employment, royalties, taxes)
Permanent preservation of energy wealth is important	Concern about the well-being of future generations

Source: Based on fieldwork by the author

3.3.3 Intragenerational Equity

Based on my interviews, there was agreement that the energy sector has an important role to play in improving the quality of life for current generations of Albertans. However, interviewees tended to focus on either province-wide or local considerations. Government and industry representatives talked about province-wide considerations by frequently describing how a robust energy sector delivers direct benefits (for example, jobs and investment) and indirect benefits (for example, taxes and royalties to support government programs) to current Albertans. They did acknowledge that development creates local issues, which are best addressed by minimizing negative impacts and maximizing positive impacts. They believe that leaders in responsible development can improve and implement best practices, and are able to set a positive example for the energy sector.

Landowners and Aboriginal people tended to focus on local considerations by describing how the energy sector creates issues that affect them on a daily basis. Specific examples include disruptions to farming or ranching operations, erosion of property rights, the boom-bust cycle of development, increased traffic, disruption to lands used for traditional purposes, and a lack of meaningful consultation. In these negative examples, energy companies focused solely on meeting legal or contractual obligations. When landowners, Aboriginal people and environmental NGOs were dealing with these negative examples, they describe it as a constant struggle to communicate their concerns and make any progress. From their experiences, it sounds like there are energy companies only interested in dealing with pragmatic questions (for example, what is the most efficient means of extracting the resource?), and have no time for ethical questions (for example, what is good for me or us in the long run?) or moral questions (for example, what is right or just?). The challenge for the energy sector is that the reputation of the entire sector is largely determined by the companies with the worst performance on environmental, social and economic issues (refer to the Figure 12 in Appendix C).

Based on my interviews, the general concern from landowners and Aboriginal people is that the benefits from the energy sector are not being fairly distributed to those people that are exposed to the direct impacts. This general concern was often underlying many of the specific concerns. Some of the company representatives also shared this opinion, and talked about how their voluntary community investment programs were an attempt to address this concern. A discussion about fairness leads us to the concept of justice.

Justice is the act of being just and / or fair (Konow, 2003). There are two basic lines of thought about justice that have emerged in our modern society (Sen 2009). One approach concentrated on creating a perfectly just society. The other approach concentrated on creating a less unjust society. Both lines of reasoning about justice support the notion that those directly affected should have some input in how the energy sector is organized. It is easy for the general public to be supportive of resource extraction activities when they receive substantial benefits from these activities and remain far removed from any of the direct costs. There is more justice in an approach that incorporates input from people that directly experience both the benefits and the costs.

Table 5: Sample SD Principles for Intragenerational Equity

SD Principles	Common Ground
Neutral social footprint	Minimize negative impacts and enhance positive impacts
Equity principles are important to consider in the SD of the energy sector	Concern about impacts on directly affected and worst-off members of society

Source: Based on fieldwork by the author

3.3.4. Environmental Issues

Everyone that I interviewed agreed that it is important for the energy sector to consider the environmental aspects associated with development. One interviewee advocated limits to growth and the idea of a steady state economy in Alberta. Some interviewees talked about the possibility of Alberta being forced into a steady state economy in the future but didn’t necessarily present this as a solution. Given the low interest in the concept of environmental limits, I will use this section to talk about environmental issues in general. Landowners, Aboriginal people and environmental NGOs raised concerns about the impacts of the energy sector on water, air and land. I will briefly discuss each of these.

Regarding water, this was consistently identified as the most important environmental concern. There was some interest about water quality but by far the most interest was in water quantity. In particular, people were concerned about water being permanently removed from the water cycle. This can happen in different energy sector activities, including deep well disposal of industrial wastewaters, water used for washing salt caverns and water used for the enhanced recovery of oil through water and steam injection processes (Alberta 2004).

Regarding air, the majority of interest from landowners and Aboriginal people is connected with local air quality. There were complimentary comments about the work of the Clean Air Strategic Alliance, a multi-stakeholder alliance composed of representatives selected by industry, government and NGOs to provide strategies to assess and improve air quality for Albertans. It is always possible to do a better job and in this case there is a mechanism in place to promote continual improvement.

There is also interest in climate change and the greenhouse gas emissions associated with Alberta's energy sector. The interest ranged from passionate appeals for additional action on the most demanding environmental and economic challenge facing our planet, all the way to uncertainty that human activity is directly responsible for climate change. Despite this range, the vast majority of people agreed with the scientific consensus that global warming is happening as a result of human activity. There was, however, no agreement on the appropriate response from the energy sector. The government and industry representatives were convinced that climate change is a serious issue that needs to be addressed. The environmental NGOs were dissatisfied with the responses to date by the government and industry in moving forward on this issue, suggesting that Alberta's 2008 Climate Change Strategy was a good start but not nearly sufficient. It is possible that the values and priorities of Albertans will likely evolve, for example, if Alberta starts to lose access to international markets for its energy and suffers economically because of its policies on climate change. This is an example where open discussion, debate, criticism, and dissent, are central to the processes of generating informed and reflected choices (Sen 1999).

Regarding land, there were concerns about potential conflicts over land use between the energy sector, the agricultural sector and the residential sector. Alberta's population is projected to continue to grow, increasing to between 5.0 to 7.5 million Albertans by 2050 (Alberta 2011c). There are also projections for increased activity in the energy sector (for example, crude bitumen production is expected to more than double to 3.5 million bbl/d by 2020). The potential for conflicts highlights the importance of Alberta's Land-Use Framework, which manages the province's land and natural resources to achieve Alberta's long-term economic, environmental and social goals. It is too early to

judge the success of this initiative but there is a mechanism in place to promote continual improvement.

Overall, the interviewees are interested in protecting the environment while simultaneously recognising that there are environmental impacts associated with development. The balance between these two perspectives is captured with the concept of a neutral footprint. If there are environmental impacts associated with development then efforts should be made, not just to minimize the impacts, but to actually make the impacts neutral. For example, one company representatives described efforts to reduce their environmental impact, including:

- they will plant a tree for every tree they remove to build new facilities;
- they will conserve an acre of land for every acre of wilderness they permanently impact; and,
- they will generate a kilowatt of renewable energy for every kilowatt their operations consume.

These commitments are a great starting point for a discussion about a neutral environmental footprint. I would probably add a water commitment to the list for the energy sector because it is of such concern to Albertans. The water commitment could be to conserve one acre of wetlands for every 1,000 m³ of water that is permanently removed from the water cycle (approximately the volume of water that is found in one acre wetland that is 25 cm deep).

All of the landowners, Aboriginal people and environmental NGOs expressed interest in a transition towards renewables and a low energy future. Interestingly, the overwhelming majority of government and industry representatives also described a future with more renewables and lower carbon fuels. The substitution of renewable sources of energy for non-renewable resources will never happen, unless a society makes a conscious effort to allocate some of the wealth created by the exploitation of non-renewable resources towards acquiring the skills that will facilitate such a transition (Hannesson 2001). This is also illustrated in the Causal Loop Diagram in Appendix C where limited resources are allocated to non-renewable instead of renewables.

Table 6: Sample SD Principles for Environmental Issues

SD Principles	Common Ground
Neutral environmental footprint	Minimize negative impacts and enhance positive impacts
Promote the growth of renewable energy	Transition towards a low carbon energy system

Source: Based on fieldwork by the author

3.3.5 SD Strategy

The SD strategy under the Weak Sustainability paradigm is Economic Choice and under the Human Development paradigm is Social Choice. Based on my interviews, there was not a lot of agreement on what the current strategy should be to move towards SD.

On the one hand, industry and government representatives consistently expressed confidence in relying on market mechanisms to allow social development and to efficiently address any concerns associated with the energy sector. This approach is summed up nicely in Alberta's Provincial Energy Strategy (Alberta 2008: 19) where it reads: *"ultimately, the market will still decide"*. Some representatives thought Economic Choice could be complemented with regulations for challenging issues, such as environmental externalities, but care should be taken to avoid stifling innovation.

On the other hand, landowners, Aboriginal people and environmental NGOs expressed a lack of confidence in the ability of market mechanisms to address economic, environmental and social concerns. In fact, there were several interviewees that viewed the reliance on economic choice as the principle cause of many concerns. There were high levels of frustration about the lack of opportunities for individuals to have meaningful input on decisions about projects and policies, and also numerous comments about aligning the energy sector with the values and expectations of Albertans. These interviewees were interested in Social Choice but did not have many suggestions on how to best implement this strategy. *"Political and civil rights, especially those related to the guaranteeing of open discussion, debate, criticism, and dissent, are central to the processes of generating informed and reflected choices"* (Sen 1999: 153). The value of these political and civil rights can be connected to the basic rights of individuals, their instrumental contributions to human well-being, and their positive role in the creation of values and norms (Sen 1999: 157).

When I asked questions about the future, it appears that there might be more common ground on the strategy to move towards SD. Four out of six government representatives and six out of fourteen industry representatives talked about leadership on SD issues coming from a grassroots level. There was no agreement on the most appropriate mechanism to incorporate social choice into the energy sector but there was a belief that this will be increasingly important. This might be what is suggested in Alberta's Provincial Energy Strategy (Alberta 2008: 19) where it reads: *"the Sustainable Prosperity path will allow us to play a significant proactive role in our own future"*. It is important to consider that discussions concerning what may happen 50 years in the future are likely more reflective of

personal beliefs than organisational beliefs so take this optimism of common ground with a grain of salt.

Table 7: Sample SD Principles for Strategy

SD Principles	Common Ground
Open discussion, debate, criticism and dissent are important	Discussion and exchange are important to the processes of generating informed and reflected choices
People have a right to be involved in the decision-making that affects their lives	Participation is valuable in itself, as people have a democratic right to participate in decision-making, and it is valuable as a means to an end, to deliver higher quality decisions

Source: Based on fieldwork by the author

3.3 Conclusions of SD Fieldwork

The answer to my first research question is yes; there is sufficient common ground between arguments to move Alberta’s energy sector towards SD. There was common ground regarding the concepts of CSR and continual improvement.

My research shows that landowners and Aboriginal people directly affected by the energy sector would like to see it organised around the Human Development paradigm, and given the concept of justice, it could be argued that this would be the fairest arrangement to extract non-renewable natural resources. Appendix G provides a detailed overview of the Human Development paradigm and a description of how it could be applied to the energy sector in Alberta. This is an interesting vision for the energy sector of Alberta but it might not be immediately possible.

My research also shows that there is currently no consensus on the most appropriate SD strategy. Industry and government representatives have an uncritically modern perspective, which means they believe there is no need to make any fundamental changes to the energy sector because science and technology will be capable of addressing issues that arise. Making key decisions based on social choice instead of economic choice would be considered a fundamental change. It would be naïve to imagine that industry and government would enthusiastically embrace this type of change. So where does that leave us?

4 Continual Improvement towards SD

My second research question contemplates the appropriate processes and institutional arrangements that would move Alberta's energy sector towards SD. The results of my fieldwork indicate that, despite many common values, there is a lack of consensus on the appropriate SD strategy (see Chapter 3). Therefore, any processes and institutional arrangements must be dynamic and able to further build on existing common values.

In order to further develop common values and expectations, I will rely on the theory of communicative action. Jurgen Habermas described communicative action as *"a situation where actors in society seek to reach common understanding and coordinate actions by reasoned argument, consensus and cooperation rather than strategic action strictly in pursuit of their own goals"* (Habermas 1984: 86). Critics of communicative action, such as Michel Foucault, believe it is impractical in the real world because communicative action is oriented towards ideal situations that are independent of contextual information (Flyvbjerg 1998). In other words, vested interests and powerful stakeholders may undermine any processes based on communicative action in order to maintain the status quo. The results of my fieldwork suggest that, despite challenges during implementation, communicative action has the potential to work in Alberta because of the significant common ground between arguments in the energy sector.

Regarding processes and institutional arrangements, I think the key to moving forward lies in the concept of continual improvement. There is agreement in principle within Alberta's energy sector about continual improvement. Therefore, we can use SD principles, developed using communicative action, to guide the continual improvement of the energy sector over time. It is a compromise. It is an attempt to incorporate elements of Social Choice into the energy sector while largely relying on the tried and tested mechanisms of Economic Choice.

In this chapter, I present theoretical frameworks relating to communicative action and stakeholder dialogue. I describe the process and results of my fieldwork on the topic of continual improvement. I describe processes and institutional arrangements that could be used to develop policies for the energy sector. And finally, I describe a Continual Improvement Framework that could be used to move the energy sector towards SD.

4.1 Theoretical Frameworks (Part 2)

4.1.1 Communicative Action

Habermas has written extensively on a range of topics with the central theme of his work being the public use of reason. Habermas is convinced that both philosophy and society are better served by if they are guided by the forceless force of the better argument (Thomassen 2010). I think that there are some valuable insights from his work that are relevant to Alberta's energy sector. This section will cover the most relevant topics and is based on the book "Habermas: A Guide for the Perplexed".

For Habermas, language and communication are central to his work. He believes that our use of language is what distinguishes us as humans. According to Habermas, whenever we use language there is an assumption that, *"under idealized circumstances of the free exchange of reasons, it is possible to reach a universal, unconstrained consensus"* (Thomassen 2010: 10). The responsibility to defend the validity of your arguments in deliberations free from domination and to reach a consensus, is not a conscious decision but rather an inherent component of language itself (Thomassen 2010: 32).

Building on his view of language and communication, Habermas developed a theory of communicative action. This was described in "The Theory of Communicative Action" published in two volumes in 1984 and 1987. The basic components of communicative action are:

- *"First, social action is more than instrumental and strategic action where I try to manipulate the world and other people in order to achieve an end. There is another kind of action which is action oriented towards mutual understanding; this he calls communicative action.*
- *Second, and linked to this, there is a kind of rationality that is not a means-end rationality. This is communicative rationality, which is linked to achieving rational consensus through rational discourse. Rationality is linked to the public use of reason; it is the quality of that reason giving that determines the rationality of the outcome."* (Thomassen 2010: 10)

Habermas views modernity as an incomplete project because we have only realized a fraction of the potential available by fully adopting communicative action (Callinicos 2007). According to Habermas modernity presents a paradox: one perspective is that modernity results in increased rationality; the other perspective is that increased rationality reduces life to a matter of efficiency, so there appears to be no solution (Thomassen 2010: 72). One of the solutions recommended by Habermas is to *"build in sensors for the exchanges between lifeworld and system"* (Habermas 1987). The lifeworld is

reproduced through communicative action and language, whereas the system is reproduced through instrumental and strategic action.

Habermas developed a theory of discourse ethics. According to Habermas, decisions on practical matters should be arrived at through deliberations between real people, as opposed to through deliberations between philosophers (Thomassen 2010: 84). Real people should be given the opportunity for open discussion, debate, criticism, and dissent under circumstances that are free from inequality, manipulation and any other forms of domination. The result of these deliberations will be a rational consensus (Habermas 1990). His theory of discourse ethics focuses on the procedures to follow in order to arrive at rational consensus, and it does not focus on what the outcomes should be.

Habermas developed a theory of deliberative democracy, which was described in “Between Facts and Norms” published in 1996. According to Habermas, individuals who are subject to moral or legal norms should be able to see an alignment between these norms and their own values. (Thomassen 2010: 11). Habermas suggests adopting a more encompassing approach that relies on society to establish the moral and legal norms through communicative action as opposed to relying solely on the government to develop the legal norms (Thomassen 2010: 119). Deliberations within society allow individuals to understand different ideas and perspectives, combine these ideas and perspectives, and move towards a common identity. In this manner deliberations play an important role in establishing public opinion and a collective will (Thomassen 2010: 119). Habermas believes that *“under certain circumstances civil society can acquire influence in the public sphere, have an effect on the parliamentary complex (and the courts) through its own public opinions, and compel the political system to switch over to the official circulation of power”* (Habermas 1996). The challenges are to ensure adequate space for deliberations based on communicative action, and to incorporate public opinion into the political system.

4.1.2 Stakeholder Participation

Stakeholder participation is valuable in itself, as people have a democratic right to participate in decision-making, and it is valuable as a means to an end, to deliver higher quality decisions (Reed 2008). As more and more people become aware of the value of stakeholder participation, it has played a more prominent role in government and the scientific community. According to van de

Kerkhof (2006) there are many reasons for the rise in popularity of stakeholder participation, including:

- *“the result of disillusionment with the power of scientific knowledge to rationalize the decision-making process (Beck 1992);*
- *a more sober reassessment of the role of science in policy (Jasanoff 1990);*
- *greater appreciation of the role that stakeholder knowledge may play in improving decisions (Fischer 2000);*
- *contemporary society is characterized by a high level of education and citizens have become more critical and have their own knowledge and ideas about the issues that society has to deal with (Irwin 1995); and*
- *the call for more democracy in the political process in order to improve decision making in terms of its legitimacy (Dryzek 2000).”*

There are two separate and distinctive forms of stakeholder participation: stakeholder dialogues as consensus building and stakeholder dialogues as deliberation (van de Kerkhof 2006). The former is much more commonly used by practitioners and it tends to represent the main goal of stakeholder participation in policy development (Ozawa 1991). Consensus building is also the dominant approach in the fields of conflict resolution, negotiated rule making, and collaborative problem solving (Susskind and Field 1996). Consensus building can be defined as: *“a process of seeking unanimous agreement. It involves a good-faith effort to meet the interests of all stakeholders. Consensus has been reached when everyone agrees they can live with whatever is proposed after every effort has been made to meet the interests of all stakeholder parties”* (Susskind 1991).

Consensus building is a process of negotiation and compromise, whereas stakeholder participation as deliberation is concerned with dialogue and argumentation (van de Kerkhof 2006). This should sound familiar because the idea of deliberation is based on the theory of communicative action. The dialogue and argumentation occurs in an open process that allows stakeholders to share opinions and perspectives, weigh and balance arguments, and then reflect on what they have heard (Dryzek 2000; Renn 2004). Because of its reflexive nature, deliberations can take more time than consensus building. Efforts are made to create an open process so that all relevant stakeholder information can be included in the dialogue and argumentation. If any information is excluded from the deliberations, then there is potential for stakeholders to have an incomplete or incorrect understanding of the problem (van de Kerkhof 2006).

The International Association for Public Participation (IAP2) is an international organization advancing the practice of public participation. IAP2 has designed a Spectrum of Public Participation to assist with the selection of the level of participation that defines the public's role in any public participation process. It is a useful tool that illustrates different levels of participation are legitimate and depend on the goals, time frames, resources, and levels of concern in the decision to be made. The Spectrum of Public Participation includes the following categories (IAP2 2012):

- *“Inform, where the public participation goal is to provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions;*
- *Involve, where the public participation goal is to work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered; and*
- *Empower, where the public participation goal is to place final decision-making in the hands of the public.”*

4.2 Fieldwork related to Continual Improvement

Once again, I followed the six main steps of qualitative research (refer to section 3.1). The purpose of the interviews was to obtain a better understanding about continual improvement initiatives. I identified and contacted different organisations across Canada experienced with continual improvement: the Canadian Association of Petroleum Producers (CAPP), the Chemistry Industry Association of Canada, the Mining Association of Canada (MAC) and the National Energy Board of Canada (NEB). See Appendix H for additional information about these organisations. I conducted seven interviews with representatives from these organisations between January and March 2012. The majority were conducted in person although some were done by telephone in order to cover the different corners of the country. I must thank all of the interviewees for taking the time to participate in my research and making it such an informative and enjoyable process.

The interviews were semi-structured and I asked three basic questions: describe the history of your initiative, describe the current state of your initiative, and describe the effectiveness of your initiative at promoting continual improvement. Each interview lasted approximately one hour. In order to ensure that I understood what people were telling me, I took notes during our meetings and shared them with all participants. I incorporated any changes that were suggested and I relied on the updated versions for my analysis.

I again relied on analytical induction for the interpretation of my results. The coding was relatively straight-forward because I could rely directly on the words in my notes. The interviewees described the effectiveness of their initiatives, including strengths and weaknesses, and from this data I was able to identify similarities. All seven interviewees identified the following elements that need to be in place to effectively promote continual improvement:

- public commitment from the senior management of companies;
- a robust systems approach within companies (for example, adoption of the plan, do, measure, and improve cycle);
- key performance indicators that are transparently communicated; and
- efforts to align with the values and expectations of Canadians.

4.3 Discussion of Continual Improvement

4.3.1 Processes and Institutional Arrangements for Policy Development

There needs to be appropriate policies in place that establish desired outcomes and overall direction for the energy sector of Alberta. Albertans are the principal owners of non-renewable natural resources in Alberta (Alberta 2008) and should have a say in determining the desired outcomes and direction. Figure 3 is a logic model for developing policies centred on communicative action.

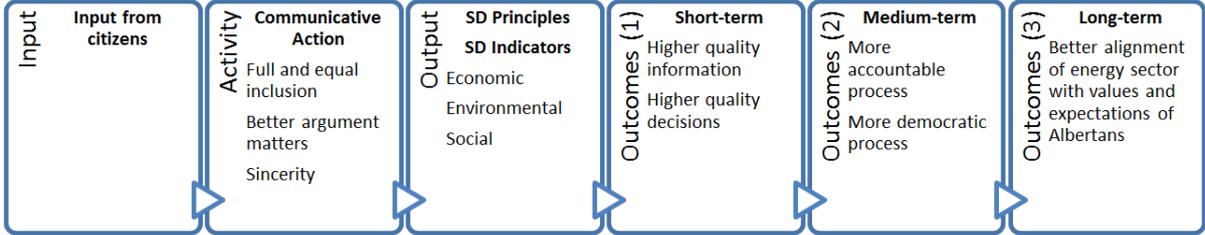


Figure 3: Logic Model for Developing Policies
Source: Created by the author

Input into the logic model must come from individuals behaving as citizens as opposed to interested parties. Citizens bring along their arguments and participate in open and deliberative dialogue; whereas, interested parties participate to protect their vested interests.

The main activity of the logic model is communicative action. Habermas’s criteria for rational deliberations include “*the full and equal inclusion of everybody affected, that only the forceless force*

of the better argument matters, and that the discourse participants are sincere” (Thomassen 2010: 70). If these criteria are followed during deliberations, then the outcome will be a rational agreement between all possibly affected people (Habermas 1996). This represents stakeholder dialogue as deliberation. The purpose of deliberation is to reach quality decisions as opposed to agreeable decisions. Figure 4 provides a visual representation of deliberations based on communicative action.

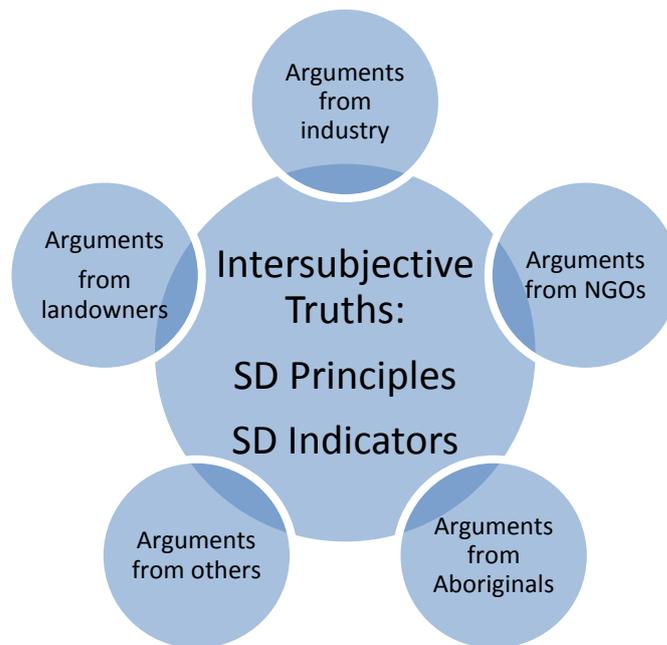


Figure 4: Deliberations based on Communicative Action

Source: Adapted from the “Theory of Communicative Action” (Habermas 1984)

My research identified areas where there is potential to find common values (specifically, the SD principles from section 3.3), which could be a starting point for discussions. In order to ensure that stakeholder participation occurs as deliberations, instead of as consensus building, there are different approaches that practitioners can use separately, in combination with each other, or in combination with more traditional stakeholder participation approaches. These approaches rely on open processes to identify the arguments from all relevant stakeholders and the assumptions underlying these arguments, and these approaches include (van de Kerkhof 2006):

- repertory grid;
- the dialectical approach;
- value-focused thinking;
- Q Methodology; and
- Semantic Differential.

The main output of the activity is a list of SD principles and SD indicators, which are based on ethical concerns (for example, what is good for me or us in the long run) and moral concerns (for example, what is right or just). When developing the SD principles and SD indicators, it is important to adopt a long-term perspective (for example, 50 year perspective). This long-term perspective helps get people away from getting hung-up on their immediate interests. If these indicators are considered long term goals that move the energy sector towards SD, then it might not be as hard as you think for people to agree. The process to develop these indicators could have many of the positive outcomes typically associated with public participation.

The logic model looks nice but how can we implement this in Alberta? Habermas recommends using representatives from civil society, such as grass-roots organisations, that demonstrate democratic values and promoting deliberations with these representatives, between these representatives, and between them and the government (Thomassen 2010: 47). These representatives would facilitate the flow of information for public reasoning and for demands from the grassroots level. One potential challenge for these representatives is that public reasoning is best accomplished at a local scale (Parkinson 2003). Therefore, we need some democratic organisations that are small scale and spread across the province, and ideally, are already familiar with issues in the energy sector. Hmm... that sounds like the Synergy Groups.

In 2006 the Government of Alberta established Synergy Alberta, a not-for-profit society to help support, coordinate and grow an emerging network of groups addressing the pressures of energy development. The mission of Synergy Alberta is to foster and support mutually satisfactory outcomes in Alberta communities by providing information, mutual learning, communication, skill development, facilitation and resources. By 2010, 25 Synergy Groups were established throughout Alberta. The principles of Synergy Alberta (respect, transparency, responsibility, ethics and free choice) look like a pretty good match compared with the criteria for communicative action.

From my interviews and experience, it appears that the public participation goal of most Synergy Groups is to work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered: “involve” on the IAP2 Spectrum of Public Participation. In order to successfully develop the desired outcomes and direction for the energy sector, the Synergy Groups have to shift to “empower” on the IAP2 Spectrum of Public Participation. This would place final decision-making in the hands of the Synergy Groups. For example, each Synergy Group could discuss the SD principles in Chapter 3 and develop their own SD principles and

SD indicators that align with their own values and expectations. The inclusiveness of Synergy Groups allows others to be involved in the decision-making process.

The 25 Synergy Groups across the province could come up with their own SD principles and SD indicators, and then it would probably makes sense to consolidate these into province-wide expectations, or possibly into expectations for the oil sands, conventional oil and gas, and coal sectors. Fortunately, Synergy Alberta has an annual conference that could be an ideal platform for the deliberations on province-wide expectations. In Habermasian tradition, these deliberations could be about moral and ethical questions where actors in society seek to reach common understanding and coordinate actions by reasoned argument. This could be an iterative process that is capable of addressing new technologies and new processes, for example hydraulic fracking. There could also be a formal review of the SD principles and SD indicators scheduled every three years to align with the evolving values and expectations of Albertans.

This section talked about the development of policies, specifically how Synergy Groups could be used to come up with SD principles and SD indicators. The next section will discuss what could be done with these indicators if they are developed.

4.3.2 Continual Improvement Framework

It is important to ensure activity or site-specific decisions are consistent with the energy sector policies (for example, SD principles and SD indicators). A framework is useful to connect the various processes and institutional arrangements. Figure 5 is a logic model for a Continual Improvement Framework, which is centred on the systematic approach (for example, plan, implement, measure and improve) typically used by companies in the energy sector.

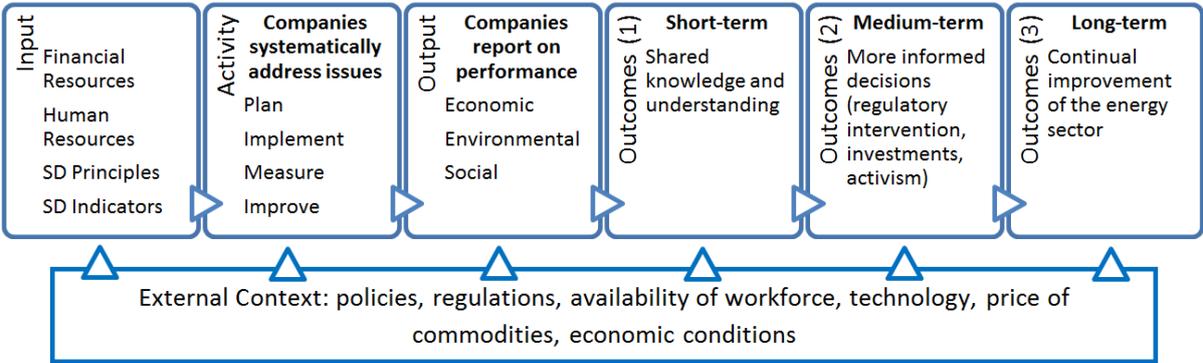


Figure 5: Continual Improvement Framework
Source: Created by the author

Inputs include financial and human resources as well as the SD principles and SD indicators that were developed in Figure 3.

The main activity in the Continual Improvement Framework is the approach of companies to systematically address issues. The first step is for companies to develop a plan that addresses economic, environmental and social issues, including a corporate policy supported by senior management. Companies then implement these systems which are supported with adequate training. Companies then measure the performance of the different systems, including measuring system adequacy with audits, system implementation with inspections, and system effectiveness with indicators. The final step is for companies to conduct a formal review of their systems with senior management in order to develop corrective action plans to improve their systems. This systematic approach is the driving force of continual improvement.

The main output of the activity is a report on economic, environmental and social indicators, which triggers a variety of outcomes. Companies could test the adequacy and implementation of their systems on 1-5 year intervals; whereas effectiveness results and corrective actions should be a more constant and repeated process occurring on 6-12 month intervals.

“What we measure shapes what we collectively strive to pursue, and we pursue what we measure” (Stiglitz, Sen et al. 2010), so it is important to carefully chose the right indicators. If we use the SD indicators from section 3.3 and combine them with some more conventional performance indicators then we could produce a dashboard of indicators like Table 8. This is just a sample dashboard because the real SD principles and SD indicators should be developed through communicative action with stakeholders. The leading and lagging indicators in the sample dashboard attempt to assess how the energy sector is contributing to the current well-being of Albertans (for example, jobs, investment, community investment, taxes and safety) and the well-being of future generations (for example, royalties supporting future social programs and protecting the natural environment).

Table 8: Sample Dashboard of SD Principles and SD Indicators

Category	Sample SD Principles	Sample SD Indicators
Economic Considerations	<ul style="list-style-type: none"> • Current generation of energy wealth is important • Permanent preservation of energy wealth is important 	<ul style="list-style-type: none"> • Investments • Jobs • No outstanding economic issues • 100% of employees trained on economic program • Community investment • Taxes paid (supporting current social programs) • Royalties paid into revitalised Heritage Fund (supporting future social programs)
Environmental Considerations	<ul style="list-style-type: none"> • Neutral environmental footprint • Promote the growth of renewable energy. 	<ul style="list-style-type: none"> • No spills, leaks or releases (by volume) • No spills, leaks or releases (by number) • No outstanding environment issues • 100% of employees trained on environment program • Plant one tree for every tree removed • Conserve one acre of land for every acre disturbed • Conserve one acre of wetland for every 1000m³ of water removed from the water cycle • Generate one kw of renewable energy for every kw of energy consumed • Reduce GHG emissions intensity by 12 percent
Social Considerations	<ul style="list-style-type: none"> • Equity principles are important • Neutral social footprint • Open discussion, debate, criticism and dissent are important. • People have a right to be involved in the decision making that affects their lives. 	<ul style="list-style-type: none"> • No complaints from people (landowners, Aboriginals) • No fatalities • No injuries • No outstanding social issues • No outstanding safety issues • 100% of employees trained on safety program • 100% of employees trained on social program • Reduction in the Gini coefficient • No contributions to political parties

Source: Based on fieldwork by the author

By making dashboard information for individual companies publicly available, then people could see how different companies are doing in different areas. Everyone could see the playing field and know the rules of the game. Companies could consider pressure from their peers and the public when allocating resources to improve their social, environmental and economic performance. Depending on the level of involvement from the government, the ERCB could base its interventions on the performance of companies in the above areas (for example, companies that demonstrate their competence will see less regulatory oversight), investors could look at this information when making

investment decisions, NGOs could use it to inform their positions, and policy-makers could use it when considering new policy.

This Continual Improvement Framework is constructed through an essentially social process that brings together expert, local and traditional knowledge with the values and expectations of affected stakeholders to establish a common understanding and co-produce the dynamic and evolving social goals of SD (Robinson 2004). The plan, implement, measure and improve cycle that is at the heart of the model could move the energy sector towards SD. It also could allow the flexibility to incorporate changing SD principles, which recognises that sustainability is a process, not an end-state.

4.4 Incorporating Social Choice into the Energy Sector

I have described processes and institutional arrangements with the potential to create common values and move Alberta's energy sector towards SD. Despite the existence of different arguments in the energy sector, I am hopeful these could work because my fieldwork showed significant common ground on the concepts of CSR and continual improvement. These processes and institutional arrangements have the potential to incorporate elements of Social Choice into the energy sector.

I present two scenarios for implementing these processes and institutional arrangements: a voluntary scenario and a regulatory scenario. This is necessary because the Government of Alberta is currently in the process of making improvements to Alberta's regulatory system for energy development. The Regulatory Enhancement Task Force made six recommendations to bring about the enhanced system, and these are starting to be implemented as further details are being worked out (Alberta 2011d).

4.4.1 Voluntary Scenario

Imagine that a particular Synergy Group is concerned about water, and more specifically, about the permanent removal of water from the water cycle. The Synergy Group could decide that an appropriate SD principle is a neutral environmental footprint. Part of this expectation could be for industry to conserve one acre of wetlands for every 1,000 m³ of water that is permanently removed from the water cycle. The Synergy Group could agree on an SD indicator that asks companies to publicly report two numbers on an annual basis: the total quantity of water that is permanently

removed from the water cycle, and the total number of acres of wetlands conserved. It is possible that some companies would not report anything, some companies would report the total quantity of water and zero acres of wetlands conserved, and some of the more progressive companies would decide to conserve some wetlands and report this number back to the Synergy Group. In this manner, the Synergy Group could start to get a good idea about company performance on issues that matter to them.

To be clear, there would be no legal requirement for companies to report or to conserve wetlands. This would be a voluntary agreement; similar to some existing voluntary agreements between companies and Synergy Groups (for example, agreements on incinerating gas releases).

4.4.2 Regulatory Scenario

Habermas talks about weak and strong publics (Thomassen 2010: 51):

“Weak publics are found in civil society and they are characterised by opinion and identity formation. That is, citizens debate issues of the day and form opinions and collective and individual identities. Strong publics consist of, for instance, the public in parliament. Here opinion formation and decision-making melt together. That is, the participants do not just debate and form opinions but also take decisions on the basis of those opinions.”

Habermas suggests that modern societies have to incorporate elements of communicative action in order to accomplish successful long-term social integration. One way to incorporate elements of communicative action is to use the results of stakeholder dialogues as deliberations to influence and shape legal expectations. *“The public sphere thus becomes the course of the legitimacy of the law; citizens must first have deliberated freely and equally and in this way have formed their opinions, and this is then fed into the political system via the strong publics in, for instance, the parliament”* (Habermas 1996). Legal expectations are enforced by the government and Habermas believes that they have greater influence than moral expectations in a modern society where many of us have impersonal relationships with other citizens (Thomassen 2010). The essence of the Continual Improvement Framework remains the same but there become some interesting twists if the government decided to get involved.

The simplest way for the Government of Alberta to get involved would be to endorse a logic model for developing SD principle and SD indicators similar to Figure 3. In this manner, the government could require all energy companies to report on the SD indicators that are developed by Synergy Groups. There would be no expectations for companies to achieve high levels of performance on these indicators but they must report on them.

Things become more interesting if the Government of Alberta incorporates a Continual Improvement Framework into their plans to develop a systemic and common risk assessment and management approach for the energy sector. My understanding is that the Government of Alberta is currently considering introducing legislation that would require companies to systematically address economic, environmental, and social issues. If this approach is followed by the Government of Alberta, then there are interesting possibilities to promote outcomes that are in the public interest. For example, the ERCB could base its interventions on the performance of companies on the SD indicators (companies that demonstrate their competence will see less regulatory oversight). I have prepared some considerations for policy-makers (see Appendix I) in case there is interest in moving forward with this type of regulatory model.

5 Final Thoughts

SD is a complex concept, but progress is being made to better understand the theoretical and practical considerations associated with it. To effectively discuss SD, it is important to explicitly identify which paradigm you are talking about (for example, Weak Sustainability, Strong Sustainability or Human Development) and consistently follow the paradigm. These paradigms are applicable to the energy sector of Alberta, including renewables, oil, gas, coal and oil sands.

My fieldwork indicates that the energy sector of Alberta is predominantly organised around the Weak Sustainability paradigm, and more specifically, the CSR sub-category. The main challenge when dealing with non-renewable resources in the Weak Sustainability paradigm is how to preserve wealth from non-renewable resources for future generations. Economists agree that SD is compatible with the use of non-renewable resources only if society as a whole replaces used up resources with something else. I challenge the Alberta Government, progressive energy companies and interested Albertans to start discussions about making oil and gas wealth permanent and benefiting future generations of Albertans (for example, revitalisation of the Alberta Heritage Fund).

My fieldwork also indicates that landowners, Aboriginal people and NGOs would like to see the energy sector organised around the Human Development paradigm. Appendix G describes what this could look like and some tools to support it (for example, sustainability assessments and public interest decisions that promote freedoms and remove “unfreedoms”). One difference between the Human Development paradigm and the Weak Sustainability paradigm is the former’s reliance on Social Choice and the latter’s reliance on Economic Choice. My fieldwork indicates there is no consensus on the most appropriate SD strategy for the energy sector.

Most importantly, my fieldwork identifies significant areas of common ground, which open the door for further discussions and future progress. Albertans need to focus more on areas of convergence, and less on areas of divergence. By basing these further discussions on communicative action, Albertans could establish SD principles and SD indicators for the energy sector, which could then be used to guide the continual improvement of the energy sector towards SD.

My argument is to integrate elements of Social Choice into the energy sector. In academic language, this represents a vision for the operationalization of Social Choice in Alberta’s energy sector through institutional imperatives. This approach should be pursued concurrently with efforts at improving the

other two strategies to achieve SD. Regarding Economic Choice, work needs to be done in Alberta at improving techniques to value public goods including clean air and fresh water. Regarding Political Choice, work needs to be done at improving representative democracy in Canada by addressing low voter turnout, dissatisfaction amongst voters regarding the current first-past-the-post electoral system, the under representation of women and minorities in parliament, and domination by one political party (MacIvor 1999). I have focused on Social Choice because of the findings from my fieldwork and the fact that an approach based on expanding individual freedoms will resonate with Albertans. Aligning the energy sector with the values and expectations of Albertans does not guarantee instantaneous harmony with the latest academic thinking on SD, but it moves the energy sector towards SD and its dynamic nature ensures development will correspond with the evolving values and expectations of Albertans.

Why should anything change? There are some instrumental reasons, including the potential to lose access to markets if the energy sector is not capable of demonstrating responsible development and the potential for the energy sector to lose its social license to operate if it cannot demonstrate that development aligns with the values and expectations of Albertans. There are also some value-based reasons including empowering individuals, creating a more democratic society, protecting the environment and improving the quality of life for current and future generations of Albertans.

Viewing development from the perspective of expanding individual freedoms (Sen 1999) requires us to go beyond the traditional view of the energy sector. Incorporating elements of Social Choice into the energy sector would ensure that individual freedoms are considered in the development process. It is a call to action for Albertans to take a more active role in ensuring the development of the energy sector is aligned with their values and expectations. Not a call to action in Marxian tradition for workers of the world to unite, but rather in typical Canadian tradition for better informed discussions over coffee at Tim Horton's. Public discussion is a powerful and indispensable component of social change and economic progress (Sen 1999: xiv). Hopefully some of my ideas will positively contribute to a better informed public discussion about the concept of SD and Alberta's energy sector.

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Appendix A: Thesis Methodology

In order to come up with constructive ideas to improve the performance for the production side of Alberta's energy sector, I have designed and followed a consistent methodological approach. I have adopted a perspective of philosophical anthropology (a theory of human nature). This is consistent with the approach of Jurgen Habermas, who combines very different interpretations of science and relates them to an overall human project of gaining understanding and knowledge in order to improve human life (Benton and Craib 2011). *"There are different types of and levels of scientific activity beyond the straightforward distinction between the human and the natural sciences, and these can coexist with each other"* (Benton and Craib 2011).

I have adopted the epistemology of Critical Theory. It is possible to differentiate between a 'Critical' Theory and a 'Traditional' Theory by examining its practical purpose: *"a theory is critical to the extent that it seeks human emancipation, to liberate human beings from the circumstances that enslave them"* (Horkheimer 1982). Critical Theory does not claim to be value neutral and it does not pursue the concept of value neutrality that is expected from traditional theory. Critical Theory adopts a practical interest in social change. Critical Theory can be summed up in six points (Thomassen 2010):

- *"It analyses contemporary society, which it characterizes as capitalist, even if not exclusively so;*
- *It takes the ambiguous nature of progress as a central point of inquiry;*
- *It takes society as a totality and examines all areas of society;*
- *It is interdisciplinary;*
- *It combines philosophy and empirical social science; and*
- *It is self-reflexive."*

I relied on interviews, observations, and documents. For the interviews, I conducted them in person and over the phone with key actors in Alberta's energy sector (for example, government departments, regulatory agencies, companies, industry associations, representatives from environmental and social NGOs, landowners, and Aboriginal people) and key actors with experience related to continual improvement. All interviews were semi-structured in order to ensure a similar starting point for the discussion while still allowing flexibility to delve into specific points of interest. In terms of observations, I looked at media coverage of the energy sector in Alberta. In terms of documents, I looked at a wide range of literature on the topics of energy and SD. Additional information about my methodology is included in the relevant portions of my thesis.

Appendix B: Background on Alberta's Energy Sector

Alberta is one of the western provinces of Canada and is considered by many to be a global energy leader. Alberta has an abundance of renewable and non-renewable energy sources. The energy sector in Alberta includes oil, natural gas, oil sands, petrochemicals, pipelines, oil field services, coal, electricity, and renewables (for example, wind, hydro, biofuels and solar). The following description of these sections of the energy sector is based on information found on the Alberta Energy Website (Alberta 2012a):

- There is conventional and non-conventional oil (for example, oil from tight sands and shale formations) in Alberta. In 2007, the conventional crude oil production in Alberta averaged 525 thousand barrels a day (bbl/d), the remaining established reserves were 1.5 billion barrels, and there were 1,769 successful oil wells drilled. There are four operating refineries in Alberta with a combined crude processing capacity of over 450,000 bbl/d.
- There is conventional and non-conventional natural gas (for example, shale gas, tight sands and coalbed methane) in Alberta. In 2010, there were 4,209 successful natural gas well connections, the remaining established reserves were 38.8 trillion cubic feet, and Alberta's total marketable natural gas production was 4.1 trillion cubic feet. Alberta consumed 38 per cent of its marketable natural gas with the remaining 62 per cent being delivered to other Canadian provinces and the United States. Natural gas in Alberta is used primarily for industrial use, electricity generation and residential and commercial space heating. Coalbed methane (natural gas found in coal seams) and shale gas (natural gas found in organic rich rocks such as shale, mudstone or laminated siltstones) are potential additional sources of natural gas and are still in the early stages of development in Alberta.
- Oil sand is a naturally occurring mixture of sand, clay or other minerals, water and bitumen, which is a heavy and extremely viscous oil that must be treated before it can be used by refineries to produce usable fuels such as gasoline and diesel. Alberta's total proven oil reserves from the oil sands are 169.3 billion barrels, or about 12% of total global oil reserves. In 2010, Alberta's production of crude bitumen reached over 1.6 million barrels per day (bbl/d), about 58% of crude bitumen production was sent for upgrading in the province, and Alberta exported about 1.4 million bbl/d of crude oil to the United States. There are five operating upgraders in Alberta with the capacity to handle approximately 1.2 million bbl/d of bitumen. As of November 2011, there were more than 100 active oil sands projects in Alberta including six mining projects and the remaining projects use various in-situ recovery

methods. By 2020, crude bitumen production is expected to more than double to 3.5 million bbl/d.

- Petrochemicals are products manufactured from crude oil and natural gas. Alberta is Canada's leading producer of petrochemicals with a production capacity of 8.6 billion pounds of ethylene per year. The petrochemical industry is located primarily in Joffre and Fort Saskatchewan and features four ethane-cracking plants, including two of the world's largest.
- Alberta's pipeline infrastructure has approximately 392,000 kilometres of crude oil, natural gas and other pipelines. The Alberta network of pipelines connects major production areas for oil and natural gas, with energy markets, and with export terminals throughout North America. Of the total inventory, 62 % carry natural gas, 5% carry sour gas, 5% carry crude oil, 6% carry water, 14% are multiphase and 8% are defined as other (EUB 2007). For the 15 years ending in 2005, the growth of pipeline infrastructure averaged 6.2% per year (EUB 2007). It is expected that a significant amount of additional pipeline capacity will be required to meet predicted growth in the oil sands.
- The petroleum-related service, supply and manufacturing sector consists of businesses that provide the specialized equipment and skills needed for: drilling, testing, producing, maintaining and reclaiming crude oil and natural gas wells (CED 2009).
- Alberta coal reserves have a current estimate of 33 billion tons remaining to be mined. Alberta's total coal production in 2011 was 36.9 million tonnes of marketable coal from its eleven mines. Most mining activity in the province is based on surface pit operations. Approximately four-fifths of the coal produced in Alberta is used as fuel for electricity generation in the province, to heat buildings in agricultural operations and as an important source of energy in cement manufacturing and other industrial processes. Most of the remainder is exported to international markets (Japan and South Korea, mainly) as a feedstock for the production of primary iron and steel. Coal in Alberta is generally low in sulphur and therefore burns relatively clean compared to many coals mined around the world.
- The electricity system in Alberta is owned and operated by a mix of investor-owned and municipally owned companies. Alberta has over 13,800 megawatts (MW) of electricity generation capacity as well as 21,000 kilometres of transmission lines. In 2010, Alberta generated 70,586 Gigawatt hours (GWh) of electricity from the following sources: 58% coal, 34% natural gas, 3% biomass, 2% hydro, 2% wind and a small amount of other.
- Alternative and renewable energy sources are part of Alberta's energy portfolio. As of February 2012, Alberta had an installed generation capacity in hydro of 900 MW, in wind of

893 MW and in biomass of 379 MW. In addition, there were 47 proposed renewable projects with an estimated total capacity of 5,829 MW. Alberta's Renewable Fuels Standard will require an average of two per cent renewable diesel in diesel fuel and five per cent renewable alcohol in gasoline sold in Alberta. In 2011, Alberta has one ethanol and one biodiesel producing facilities that use waste products from food manufacturing to make fuel.

- The Alberta Heritage Fund was established in 1976 following the energy crisis in the mid-1970s. The initial objectives of the fund were: *“act as a future source of revenue, either through income from the fund or from the fund itself; reduce the debt load that might develop at some future and perhaps not very distant point in time; improve the quality of life in the province; and strengthen and diversify the economy of the province”* (Hannesson 2001). The Fund initially collected 30% of the province's oil and gas revenues, but this number was reduced to 15% in the early 1980s, and contributions to the fund ceased completely in 1986.

Appendix C: Additional Analysis of Alberta's Energy Sector

A sustainable energy future seeks a balance between energy production and energy consumption, while simultaneously protecting the natural environment and allowing a society to develop its social and economic activities (Hofman, 2008). There are many different strategies that can be used to move towards a sustainable energy future, including (Tukker, 2010):

- *“greening production by reducing the impact intensity of mining and manufacturing activities through the implementation of end-of-pipe measures or structural technical changes in production methods,*
- *greening products and services by decreasing material and energy use per functional unit,*
- *intensifying use by encouraging more efficient deployment of products and services (for example, by promoting activities such as carpooling),*
- *greening consumption patterns by shifting expenditures to lower impact product and service alternatives, and*
- *reducing consumption volumes while maintaining quality of life.”*

All of these interventions have potential to be considered and applied in Alberta; however, as previously mentioned, I have chosen to focus on the production-side of Alberta's energy sector.

C.1 Document Analysis

The energy sector is undeniably the engine of Alberta's economy, with energy revenues accounting for almost a third of the revenue allocated under Alberta's provincial budget and just over half of the value of the province's total exports (Alberta 2012a). In 2010, an estimated \$10 billion was invested in Alberta's conventional oil and gas sector, and an estimated \$13 billion was invested in oil sands (Alberta 2011a). The energy sector employs either directly or indirectly nearly one in every six workers in Alberta.

There are many positive aspects associated with Alberta's strong economy, but there are some signs that not everyone is benefiting. The issue of inequality is one area that has recently been highlighted. The standard indicator of inequality is the Gini coefficient, which measures the inequality among values of a frequency distribution (for example levels of income). A Gini coefficient of zero expresses perfect equality where all values are the same (for example, where everyone has an exactly equal income). A Gini coefficient of one expresses maximal inequality among values (for example, where

only one person has all the income). Alberta has the highest Gini coefficient of all the provinces across Canada based on after-tax household income (Canada 2011).

In 2001, the Pembina Institute developed the Alberta Genuine Progress Indicator (GPI) to provide a new system for measuring the total wellbeing and sustainability of Alberta. The GPI considers not just economic factors, but environmental and social factors as well. Figure 6 illustrates that the Alberta’s GPI has leveled off (a decrease 19% from 1961 to 2003) even though Alberta's GDP continues to rise (an increase of 483% from 1961 to 2003) (Taylor 2005).

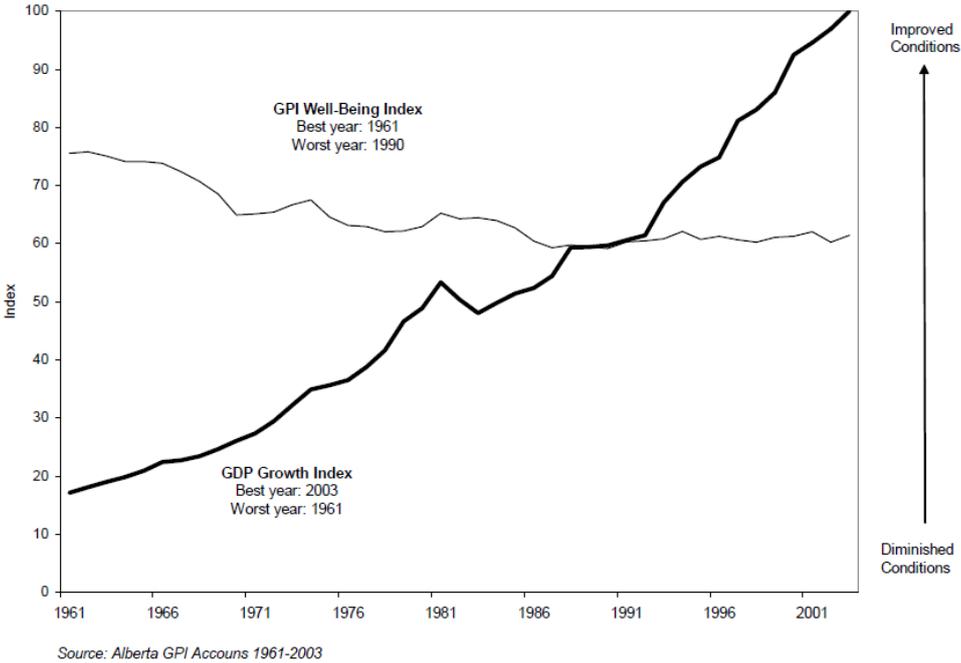


Figure 6: Genuine Progress Indicator in Alberta, 1961 to 2003
Source: (Taylor 2005)

The city of Fort McMurray is a good illustration of how strong economic growth does not always improve the quality of life for everyone. This city of 76,797 people is located in the heart of the oil sands area and underwent a tremendous boom during the mid-2000s. The rapid economic growth, which was driven by oil sands projects, put pressure on the city to adequately provide its residents with social services (for example, health care and education), housing and infrastructure. In 2006, the mayor of Fort McMurray urged a slowdown in oil sands development so that other sectors could keep pace (Bott 2010). In 2008 and 2009, the pace of development did slow due to economic conditions. A new period of economic growth is predicted because crude bitumen production is expected to more than double to 3.5 million bbl/d. by 2020 (Alberta 2012a). There is optimism that the city has learned from the past and will be better prepared to deal with another boom; however,

“whether the efforts of the various levels of government and the oil sands sector will be enough to avoid a repeat of Fort McMurray’s infrastructure struggles from the previous decade remains to be seen” (Christian 2011).

There are a variety of environmental concerns associated with the production side of Alberta’s energy sector including, impacts on water quality and quantity, greenhouse gas emissions, impacts on local air quality, land reclamation, tailing ponds, biodiversity, and cumulative effects. There are also a variety of social concerns associated with the production side of Alberta’s energy sector including, impacts on human health, land use, traditional land use, social services, infrastructure, and property rights. The nature of the concerns can range from local, to regional, to international. These concerns are expressed in a variety of ways, including: letters to the editor; petitions against and opposition to energy projects; publicity campaigns by non-government organizations to address social and environmental issues; blockades and demonstrations by Aboriginal people; sabotage of energy infrastructure; legal challenges to energy projects under environmental legislation; shareholder resolutions; and public concerns that trigger government inquiries.

The emergence of social and environmental concerns about Alberta’s energy sector, and in particular the management of the oil sands, in the past decade has created tensions with foreign governments. There are discussions about restrictions on importing unconventional crude by US cities (for example, a US Conference of Mayors resolution passed on high-carbon fuels), US states (for example, the 2007 California low-carbon fuel standard that reduces carbon intensity in transportation fuel), and the US federal government (for example, the Energy Independence and Security Act of 2007 that precludes US federal agencies from purchasing vehicle fuel derived from non-conventional sources unless its carbon footprint is less than that of conventional petroleum). There is also a debate ongoing within Europe about importing unconventional crude (for example, the European Union’s Fuel Quality Directive). These tensions have the potential to limit access to markets for Alberta’s energy.

What about the broader public opinion in Alberta? One source of timely information is the recent provincial elections (Albertans went to the polls on April 23, 2012). Vote Compass is an online electoral literacy application in which users are invited to respond to a series of questions on political issues in a given election (VC 2012). The Alberta edition of Vote Compass drew nearly 115,000 respondents by the close of election night and perhaps their views can help illuminate the larger dynamics of public opinion in the province. There is no statistical information available about the validity of these results so it is important not to read too much into them, but at the very least they offer an interesting cross-section into how respondents’ opinions vary on 30 important political

issues. Figures 7 – 11 present the specific questions related to the energy sector and overall results from the survey.

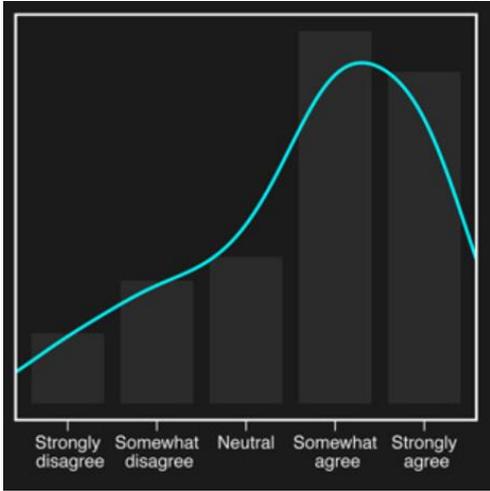


Figure 7: The Alberta government should take a bigger share of royalties from oil and gas companies
Source: VC (2012)

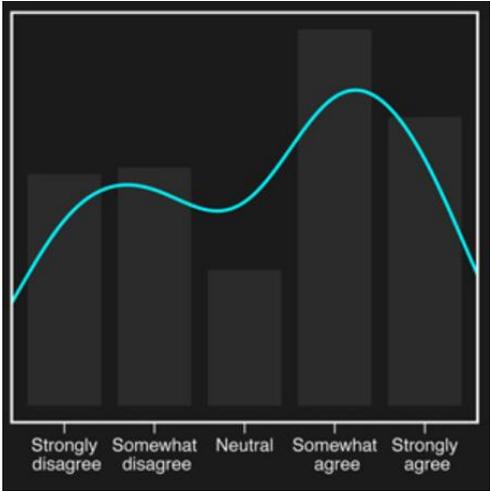


Figure 8: The environmental damage caused by the oil sands industry is exaggerated.
Source: VC (2012)

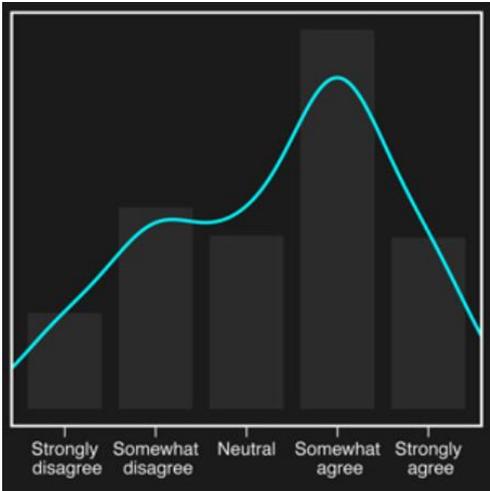


Figure 9: Environmental regulation should be stricter, even if it means consumers pay higher prices
Source: VC (2012)

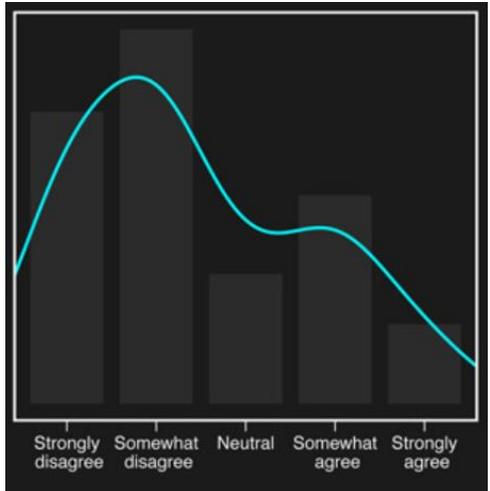


Figure 10: Environmental issues should be solved by industry, not government
Source: VC (2012)

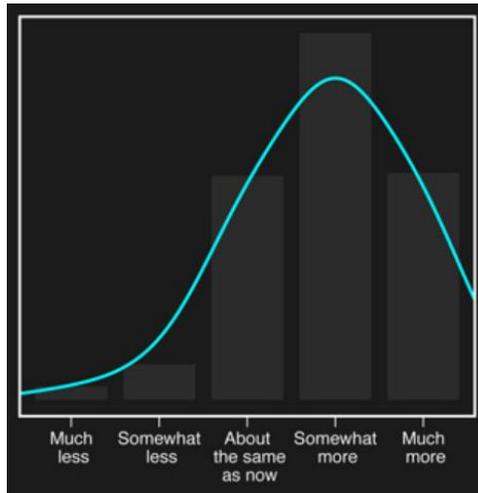


Figure 11: How much tax should corporations pay?
Source: VC (2012)

While the views of the public on sustainable energy are relatively well-documented, there is less understanding about the perspectives of leading government officials, experts and professionals who work in this area. To this end, the Pembina Institute undertook the 2010 Global Thought Leader Survey, one of the largest surveys of sustainability thought leaders ever completed. The survey focused primarily on Canada, and more than 5,000 thought leaders holding positions in government, academia, industry, institutions and non-profit organizations completed the survey. The final observations from the survey include (Pembina 2010):

- *“The majority of more than 5,000 senior officials, experts and professionals polled in Canada, the United States and Europe rate progress on climate and sustainable energy issues as unequivocally poor or terrible.*
- *Thought leaders are also critical of the progress made to date toward greening the economy and managing the impacts of the Canadian oil sands.*
- *There is strong interest in advancing economic policies like incentives for low-carbon technologies, infrastructure investments and eliminating subsidies for dirty energy. A carbon tax, either alone or in combination with cap-and-trade, is seen as an effective tool, whereas very few endorse cap-and-trade alone.*
- *Thought leaders across all regions point to national and international leadership, in addition to lack of public pressure for action, as the most significant barrier to progress on sustainable energy issues.”*

C.2 Systems Analysis

Systems Analysis is the interdisciplinary branch of science, dealing with analysis of systems and the interactions within those systems by creating mental model structures with the help of Causal Loop Diagrams (CLD). Steps of system analysis include: problem definition, definition of system boundaries, identification of important components within the system, identification of cause-effect relationships and feedbacks between these components, and analysis of system behaviour. These steps have been followed in order to produce Figure 12.

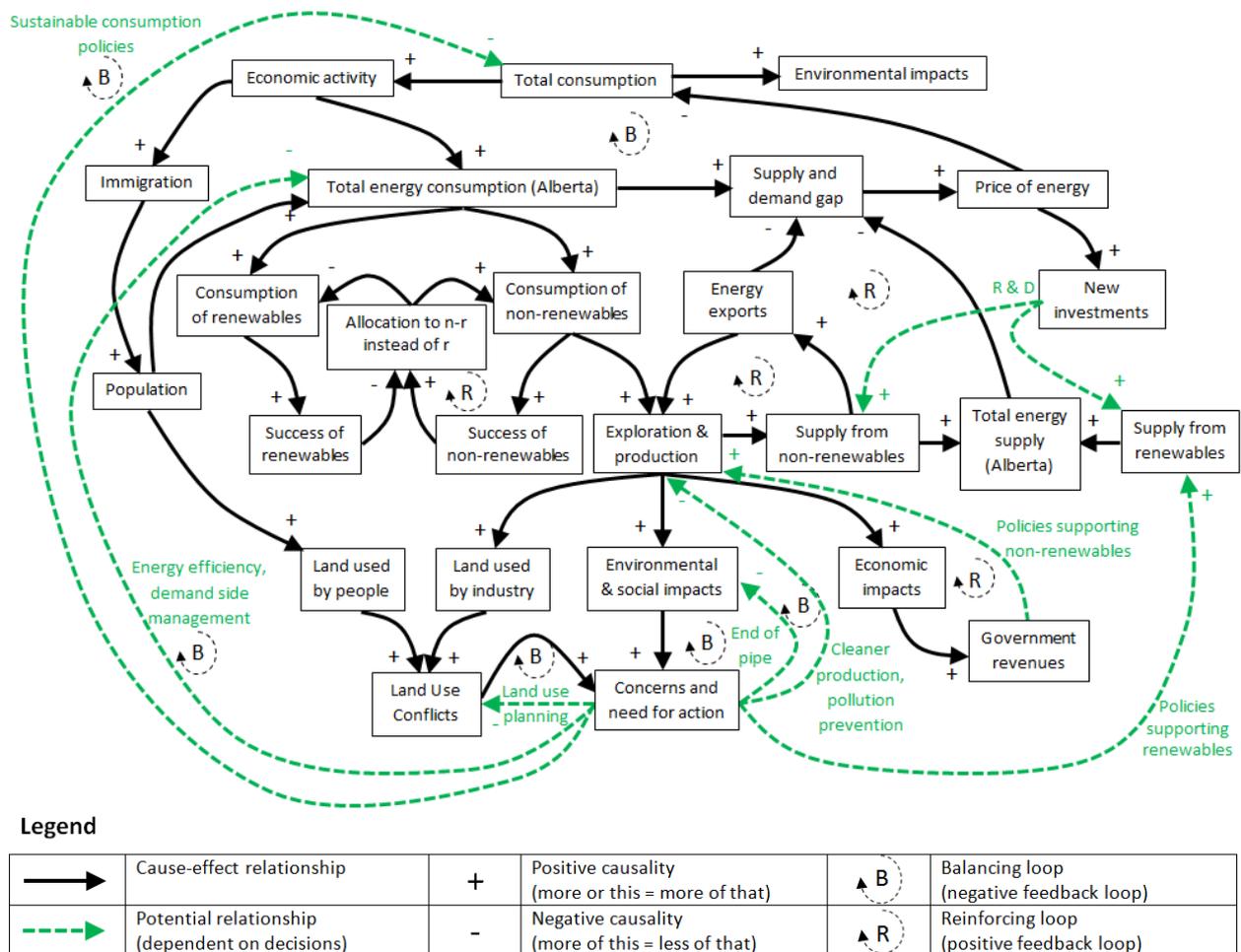


Figure 12: Causal Loop Diagram for Alberta's Energy Sector
Source: Created by the author

In the CLD, the black arrows linking each variable indicate a cause and effect relationship. The green arrows indicate a potential relationship, which may exist depending on the outcome of decisions (for example, policy, planning or R&D decisions). The plus or minus sign at the head of each arrow indicates the direction of causality between the variables when all the other variables (conceptually) remain constant. For example, the plus sign between population and total energy demand means

that more population causes more total energy demand, or alternatively, less population causes less total energy demand. The opposite is true for a minus sign, for example, a higher price of energy causes less consumption, and a lower price of energy causes more consumption.

Typically, this type of CLD would be produced over a period of facilitated sessions with input from key stakeholders in order to build a shared understanding; however, this was problematic because I was in Sweden writing my thesis. As a result, I relied on media coverage, a literature review, and my 20 years of experience working in the Alberta energy sector. This approach, while not ideal, is sufficient for my thesis because it provides us with a mental model. The CLD illustrates the important components as opposed to all components. For example, the consumption of renewables is connected with the production of renewable energy, which has negative environmental and social impacts; however, these are not included in the CLD because renewable energy from hydro, wind and biomass combined only accounted for 7% of Alberta's electricity generation in 2010 (Alberta 2012a). The CLD also illustrates that the energy sector is closely connected with broader issues of economic activity, consumption, immigration and population.

The dominant reinforcing loop for the energy sector occurs when economic activity leads to total energy consumption, which leads to exploration and production, which leads to total energy supply, which leads to the price of energy, which leads to consumption, which in turn leads back to economic activity. This loop demonstrates how our modern society (for example, a consumption-based society) is dependent on cheap and reliable sources of energy. Another reinforcing loop is connected with energy exports driving exploration and production in Alberta. Given that world primary energy demand is expected to increase by 36% between 2008 and 2035 with non-OECD countries accounting for 93% of the projected increase (IEA 2010) this will continue to influence the energy sector in Alberta. Another reinforcing loop connects economic impacts, to government revenues, to policies supporting non-renewables, to exploration and production. The final reinforcing loop on the CLD is between the consumption of non-renewables, the success of non-renewables, and allocation to non-renewables instead of renewables. This is an example of a "success to the successful" archetype where the limited resources (for example, investment capital, skilled labour and technology) are largely consumed by non-renewables at the expense of renewables.

The dominant balancing loop occurs when total energy consumption leads to a supply and demand gap, which leads to the price of energy, which leads to consumption, which leads to economic activity, which in turn leads back to total energy consumption. This explains why energy exporting countries (for example, OPEC) are interested in avoiding oil shortages by increasing production when

necessary. If oil becomes too expensive then there will be new investments in other sources of energy, which have the potential to shift the total energy supply away from oil. This might explain why many of the large energy companies in Canada are actively pursuing renewable energy projects. Investment in renewables is currently only a small percentage of their total portfolio but it supports an important risk mitigation strategy in case there is a quicker than expected shift away from oil. The reluctance for energy companies to get more involved in renewables is multifaceted, including current profitability margins, and requirements for new technical and managerial competencies.

Figure 12 also illustrates that many of the potential balancing loops are generated when there are concerns and need for action. The CLD illustrates that concerns and need for action are driven primarily by land use conflicts or negative social and environmental impacts. This explains why the energy industry has taken on voluntary initiatives to improve its overall performance. Typically the general public will judge the entire industry based on the performance of the poorest performing companies. If the need for action crosses a threshold level, then interventions will occur (for example, sustainable consumption policies, energy efficiency initiatives, pollution prevention, end of pipe solutions, policies supporting renewables), which depending on how they are designed have the potential to positively or negatively affect the energy sector. This uncertainty has led the energy industry to mitigate the negative impacts of their activities and to invest in public relation campaigns.

Given the complexity of the energy sector in Alberta, complementary strategies will be needed to shift Alberta towards a more sustainable energy future. As my thesis is focusing on the production side of Alberta's energy sector, there are three key points to highlight from the CLD:

- energy exports play an important role depending on the commodity, for example, over 87% of Alberta's crude bitumen production is exported (Alberta 2012a);
- renewables and non-renewables are competing for the same limited resources, and currently the allocation of these resources is to non-renewables at the expense of renewables; and
- changes to the energy sector, whether incremental or transformative, are often connected with the performance of the energy industry in addressing land use conflicts, environmental and social impacts.

Appendix D: Fieldwork Methodology related to SD

As introduced in Section 4.1, this Appendix provides a comprehensive discussion of my fieldwork methodology. I conducted qualitative research, which signifies that the people interviewed are not meant to be representative of a population. *“It is the quality of the theoretical inferences that are made out of qualitative data that is crucial to the assessment of generalization”* (Bryman 2008). I followed the six main steps of qualitative research (Bryman 2008):

1. general research questions,
2. selection of relevant subjects,
3. collection of relevant data,
4. interpretation of data,
5. conceptual and theoretical work, and
6. writing up findings and conclusions.

My starting hypothesis, based on my experience in the energy sector in Alberta, was that industry and government representatives are uncritically modern and support the Weak Sustainability Paradigm, whereas representatives from civil society are critically modern and support the Human Development Paradigm. In order to test this hypothesis, I had to understand how people felt about the components of SD paradigms that are identified in Table 2. Here are my fieldwork research questions:

- RQ1 – what is your perspective on intragenerational equity?
- RQ2 – what is your perspective on intergenerational equity?
- RQ3 – what is your perspective on environmental limits?
- RQ4 – what is your perspective on SD strategies?
- RQ5 – what is your perspective on modernity?

The next step was to select relevant subjects. I used purposive sampling in order to identify people and organisations with direct reference to the research questions being asked (Bryman 2008). Based on personal experience, I identified different interest groups to articulate different arguments in the energy sector. It is these arguments that are put into the broader public arena and used to shape the opinions of Albertans. This was not stakeholder dialogue to reach consensus amongst interest groups, but rather a search for intersubjective-truths (specifically, understanding different arguments to determine whether there is sufficient common ground to reconcile these divergent arguments). The interest groups that I identified were industry (energy companies, pipeline companies, consulting

companies, service companies, investment companies and industry associations), government (elected officials, provincial departments, the provincial regulator and the federal regulator), NGOs (environmental NGOs and market-based NGOs), academia, landowners, and Aboriginal people (First Nations and Metis).

Within these interest groups, I used the following approach to identify individuals. I relied on the Dow Jones Sustainability Index to identify progressive members of industry, and then I contacted their sustainability departments. I identified the government departments and agencies that played a direct role in the energy sector, and then I followed up with them. I identified NGO representatives from organisations actively involved in Alberta's energy sector, and then I followed up with them. I was interested in speaking with landowners that had experience with the energy sector so I contacted Synergy Groups, which have a vision of achieving a principled, balanced and sustained approach to resource development for Albertans. The Synergy Groups then forwarded my research proposal to landowners and asked for volunteers. I was interested in speaking with Aboriginal people that had experience with the energy sector so I contacted Aboriginal organisations and used personal contacts. Refer to Appendix E for additional information about the participants.

The next step was to collect relevant data. I decided to conduct semi-structured interviews that would allow consistency across the different interest groups while still allowing flexibility to delve into specific points of interest. I knew that most people are not familiar with the different sustainability paradigms (for example, strong and weak sustainability) nor with the academic terminology (for example, inter and intra-generational equity); however, they have strong opinions on these issues. In order to get people talking about the issues I developed a questionnaire (see Appendix F). Here the links between my general research questions and the questions in the questionnaire:

- Supporting RQ1 – Describe how you would make trade-offs when dealing with current issues.
- Supporting RQ2 – Describe how you would make trade-offs between current and future issues.
- Supporting RQ3 – Describe how you would address environmental issues in the energy sector.
- Supporting RQ4 – Describe who should provide leadership in addressing current and future issues.
- Supporting RQ4 – Describe what the mechanism should be for addressing these issues.
- Supporting RQ5 – Describe the current and future performance of the energy sector.

I also included a final general question about SD that allowed flexibility to focus on any unknowns or uncertainties.

I conducted 47 interviews between December 2011 and April 2012. Each interview lasted approximately one hour. Informed consent was obtained at the beginning and care was taken to ensure confidentiality. The vast majority were conducted in person although some were done by telephone in order to cover the different corners of the province. I must thank all of the interviewees for taking the time to participate in my research and making it such an informative and enjoyable process.

I decided not to audiotape the interviews because I felt that this might make people nervous or limit the openness of people's answers. As a result, in order to ensure that I understood what people were telling me, I took notes during our meetings and shared them with all participants. I incorporated any changes that were suggested and I relied on the updated versions for my analysis.

The next step was to interpret the data. For this step I used analytical induction, which is a research strategy that requires researchers to focus on evidence that challenges and contradicts the ideas they are developing (Ragin 1994). As I conducted my interviews, I compared the results of individuals from the same interest group with each other in order to establish similarities and differences. When I came across evidence that challenged or refuted my hypothesis, then this provided important clues on how to reformulate my hypothesis. Classification of the interviews into SD paradigms and modernity perspectives was based on my impressions immediately after the interview and coding of the written interview notes. Coding is an iterative process that reviews transcripts (for example, meeting summaries) in order to identify key words or concepts that appear to be of potential theoretical significance and/or that appear to be particularly relevant to the research questions (Bryman 2008). The coding process identified key words and concepts, whether spoken or by reading between the lines, for each interview.

I used coding to interpret the result of my interviews on SD. The technical aspects of my coding process are important in order to demonstrate how I made theoretical inferences out of the qualitative data. Table 9 illustrates the main codes that I used to categorize the transcripts.

Table 9: Fieldwork Research Questions and the Coding Process

<p>RQ1 – what is your perspective on intragenerational equity? Supporting RQ1 – Describe how you would make trade-offs when dealing with current issues.</p>	
<p>Codes supporting intra-generational equity</p> <ul style="list-style-type: none"> • Distributional considerations (we have to look out for the worst off members of society) • Priority to ethical and moral questions • Fairness, justice • Corresponding benefits with burdens 	<p>Codes against intra-generational equity</p> <ul style="list-style-type: none"> • Aggregative considerations (jobs, investment and a strong economy will benefit everyone) • Priority to pragmatic questions • The costs of doing business (social and environmental effects)
<p>RQ2 – what is your perspective on intergenerational equity? Supporting RQ2 – Describe how you would make trade-offs between current and future issues.</p>	
<p>Codes supporting intergenerational equity</p> <ul style="list-style-type: none"> • Sustainable development • Preservation of mineral wealth • Long-term thinking • Proactive • Visionary • Concerns about future generations and grandchildren 	<p>Codes against intergenerational equity</p> <ul style="list-style-type: none"> • Responsible development • Short-term thinking • Reactive • Priority to achieve immediate results
<p>RQ3 – what is your perspective on environmental limits? Supporting RQ3 – Describe how you would address environmental issues in the energy sector.</p>	
<p>Codes supporting environmental limits</p> <ul style="list-style-type: none"> • Steady state economy • Limits to growth • Thresholds 	<p>Codes against environmental limits</p> <ul style="list-style-type: none"> • Continuous growth • Ecological modernization - technology can deal with environmental issues • Progress depends on converting natural capital into manufactured capital
<p>RQ4 – what is your perspective on SD strategies? Supporting RQ4 – Describe who should provide leadership in addressing current and future issues. Supporting RQ4 – Describe what the mechanism should be for addressing these issues.</p>	
<p>Codes supporting social choice</p> <ul style="list-style-type: none"> • Grassroots movements • Public input into key decisions • More conversations to align the energy sector with the values and expectations of Albertans • Industry and business are too focused on short-term results to solve big picture issues 	<p>Codes supporting economic choice</p> <ul style="list-style-type: none"> • Market mechanisms are fundamental to development (the ends and means) • The market will decide • Industry will provide leadership (for example, R&D) • Regulations inhibit innovation • Deregulation, remove market interventions • Stakeholder dialogue (public input restricted to limited topics)
<p>RQ5 – what is your perspective on modernity? Supporting RQ5 – Describe the current and future performance of the energy sector.</p>	
<p>Codes supporting critically modern perspective</p> <ul style="list-style-type: none"> • Need for fundamental change • Our current system is broken • We can't expect the same thinking that created these problems to solve them 	<p>Codes supporting uncritically modern perspective</p> <ul style="list-style-type: none"> • No need for a fundamental change • Our current system is working well • Ecological modernization - technology can deal with environmental issues

Source: Created by the author

Immediately after each interview, I wrote down my impressions for each of the research questions. After getting back the validated version of the meeting notes, I coded the notes for each of the

research questions. I followed an 80-20 rule for coding because I found that individuals were not always 100% consistent. For example, if 4 out of 5 (80%) of someone's codes corresponded to a certain position, say critically modern, and only 1 out of 5 (20%) of someone's codes corresponded to another position, say uncritically modern, then this was sufficient for me to classify them as having a critically modern perspective. *"Rather than seeing analytical induction as a search for universals, a search that is likely to fail, it is better to see it as a research strategy that directs investigators to pay close attention to evidence that challenges or disconfirms whatever images they are developing"* (Ragin 1994). Applying this 80-20 rule allowed me to successfully code all of my research questions for each individual. There was 100% agreement between my initial impressions and the results of the coding for all individuals.

My coding process was an iterative process, where I was continuously comparing the results for each individual against my original hypothesis. If you recall, my starting hypothesis was that industry and government representatives are uncritically modern and support the Weak Sustainability Paradigm, whereas representatives from civil society are critically modern and support the Human Development Paradigm. All representatives from industry and government supported my original hypothesis. All representatives from landowners and Aboriginal people also supported my original hypothesis. The representatives from NGOs produced deviant cases (specifically one representative supporting weak sustainability and the other representative supporting strong sustainability), which according to the steps in analytical induction required me to reformulate my hypothesis or hypothetical explanation redefined to exclude deviant case (Bryman 2008).

I interviewed six NGO representatives from organisations actively involved in Alberta's energy sector. In order to help understand my results, I had to reformulate the category of NGOs to: environmental NGOs, law-based NGOs, and market-based NGOs. The environmental NGOs appear to view the energy sector from the human development paradigm with a critically modern perspective. The law-based NGO appears to view it from the strong sustainability paradigm with a critically modern perspective. And the market-based NGO appears to view it from the weak sustainability paradigm with an uncritically modern perspective. The environmental and law-based NGOs are concerned that environmental impacts on water, air and land and social impacts on individuals and communities are not being properly addressed under the current system; therefore, we need to make some fundamental changes. The market-based NGO also identified environmental and social concerns, in addition to economic concerns relating to the role of competitive markets. The market-based NGO did not believe that fundamental changes are necessary, but rather that market-based solutions are the most efficient way to address concerns in the energy sector and to improve the quality of life for

people of all ages and income levels. The discussion in the main text of my thesis focuses on the environmental NGOs.

By following this coding process I was able to identify answers for my research questions for each individual, which in turn allowed me to infer the theoretical perspective regarding SD and modernity for each individual. These theoretical inferences from my qualitative data support my original hypothesis and are crucial to the assessment of generalization (Bryman 2008).

After interpreting my data with the help of coding and analytical induction, the next step was to develop theoretical connections. This was relatively straightforward because I relied on theory to construct my research questions. The final step was to write up my findings and conclusions, which are provided sections 4.2 and 4.3.

Reliability and validity are key criteria when assessing the quality of any research; however, the relevance of these criteria for qualitative research has been a point of discussion amongst qualitative researchers (Bryman 2008). Some qualitative researchers use these terms with a somewhat different meaning from the quantitative researcher, for example (LeCompte and Goetz 1982):

- *“External reliability, by which they mean the degree to which a study can be replicated.*
- *Internal reliability, by which they mean whether, when there is more than one observer, members of the research team agree about what they see and hear.*
- *Internal validity, by which they mean there is a good match between researchers’ observations and the theoretical ideas they develop.*
- *External validity, which refers to the degree to which findings can be generalized across social settings.”*

When conducting my research, I kept in mind the concepts of reliability and validity. It is impossible to recreate the exact circumstance of my research, but by being transparent with my methodology, hopefully other researchers will be able to obtain comparable results. I tried to address internal reliability by sharing my meeting notes with all interviewees so they could ensure that I accurately understood what they were trying to tell me. Internal validity appeared strong because there was a high level of alignment between theoretical concepts and my interview results. Regarding external validity, it is the quality of the theoretical inferences that are made out of qualitative data that is crucial to the assessment of generalization (Bryman 2008), which depends on my coding process.

Appendix E: Additional Information on Interviewees

Government Representatives

- Alberta Energy Resources Conservation Board
- Alberta Government, Executive Branch
- Alberta Ministry of Energy
- Alberta Ministry of Environment and Water
- Member of the Legislative Assembly of Alberta
- National Energy Board

Industry Representatives

- AMEC (consulting company)
- Canadian Association of Petroleum Producers, CAPP (industry association)
- Canadian Energy Pipeline Association, CEPA (industry association)
- Cenovus Energy Inc. (energy company)
- Enbridge Inc. (pipeline company)
- EnCana Corporation (energy company)
- Halliburton (integrated service company)
- Investment Banker
- Moving Forward (consulting company)
- Nexen Inc. (energy company)
- Stat Oil Canada Ltd. (energy company)
- Talisman Energy Inc. (energy company)
- TransCanada Corporation (pipeline company)

NGO Representatives

- Canadian Parks and Wilderness Association, Alberta Northern Chapter
- Eco Justice
- Fraser Institute
- Pembina Institute
- Sierra Club of Canada
- Toxics Watch Society of Alberta

University / Academic Representatives

- University of Calgary, Institute for Sustainable Energy, Environment and Economy
- University of Calgary, Haskayne School of Business
- University of Calgary Graduate Student, Renewable Energy
- University of Calgary Graduate Student, Sustainable Energy

Appendix F: Sustainable Development Questionnaire



Interview Questions Regarding Sustainable Development

1. I am interested in your opinions about the current issues facing Alberta's energy sector. What do you believe are the most important:
 - a. Economic issues
 - b. Environmental issues
 - c. Social issues
 - d. On a scale of 1-5, how well do you think the energy sector (including industry, government and communities) is addressing these issues?
 - e. Ideally, all of these issues would be addressed quickly and simultaneously, but often this is tough to accomplish in reality. Any thoughts about the trade-offs or prioritisation of these current issues?

2. I am also interested in your opinions about the future issues facing Alberta's energy sector. In 50 years, what do you believe will be the most important:
 - a. Economic issues
 - b. Environmental issues
 - c. Social issues
 - d. If there is a difference between the current issues and the future issues, do you have any comments about the tradeoffs or prioritisation of current issues versus future issues?

3. It is one thing to identify current and future issues, but it is another to address them. What is your opinion about:
 - a. Who should provide leadership in addressing these current and future issues (e.g., companies, provincial or federal government, NGOs, academia, the public)
 - b. How should these issues be addressed (e.g., social, economic or political choice)
 - c. What should be the mechanism for addressing these issues (e.g., regulations, corporate social responsibility, consumer behaviour)
 - d. What are the main barriers in addressing these issues?

4. We have discussed the individual components of sustainable development, specifically the economic, social and environmental components. My final questions are about sustainable development as a whole, including:
 - a. How do you define sustainable development?
 - b. How does this concept get integrated into day to day activities?
 - c. Are you familiar with some of the definitions of sustainable development (e.g., weak and strong sustainability)

5. That is all of my questions; do you have any comments related to sustainable development and Alberta's energy sector that you would like to share with me?

Appendix G: Human Development Paradigm & the Alberta Energy Sector

My research shows that landowners and Aboriginal people directly affected by the energy sector would like to see it organised around the Human Development Paradigm, and given the concept of justice, it can be argued that this would be the fairest arrangement to extract non-renewable natural resources (Chapter 3). If we are going to organise Alberta's energy sector around the Human Development paradigm, then we first need to understand the paradigm that was briefly introduced in Chapter 2. This Appendix will start with an overview of the paradigm and then describe how the Human Development Paradigm could be applied to the energy sector in Alberta.

G.1 Overview of the HD Paradigm

If you consider development from the anthropocentric perspective, then the Human Development Paradigm has the most comprehensive vision because economic growth serves to enhance the well-being of the majority (Haq 2001). The foundations of the human development paradigm are described in Amartya Sen's book "Development as Freedom". The paradigm is applicable to both developed countries and to developing countries.

The paradigm is built on the foundation of individual responsibility, something that should resonate well with Albertans.

"There is no substitute for individual responsibility. However, the substantive freedoms that we respectively enjoy to exercise our responsibilities are extremely contingent on personal, social, and environmental circumstances. For example, a child who is denied the opportunity of elementary schooling is not only deprived as a youngster, but also handicapped all through life (as a person unable to do certain basic things that rely on reading, writing and arithmetic). The argument for social support in expanding people's freedom can, therefore, be seen as an argument for individual responsibility, not against it." (Sen 1999: 283)

Development can be viewed as a process of expanding the real freedoms of real people (Sen 1999: 1). If the objective of development is to provide individuals with freedom, then Sen argues for concentrating on that overarching objective, rather than only concentrating on some particular means (for example, growth of GDP or individual income). Sen focuses primarily on the roles and interconnections between certain crucial freedoms, including economic opportunities (aggregative

and distributional considerations), social facilities (safety, health and education), and political freedoms (opportunities of political dialogue, critique and dissent). So if we are interested in improving the quality of life for current and future generations of Albertans, then we have to focus on expanding the freedoms that we have reason to value. When talking about freedoms, this *“involves both the processes that allow freedom of actions and decisions, and the actual opportunities that people have, give their personal and social circumstances”* (Sen 1999: 17). Both of these aspects are important because *“unfreedom can arise either through inadequate processes (such as the violation of voting privileges or other political or civil rights) or through inadequate opportunities that some people have for achieving what they minimally would like to achieve (including the absence of such elementary opportunities as the capability to escape premature mortality or preventable morbidity)”* (Sen 1999: 17).

Freedom is both the primary end of development and the principle means of development. In other words, the goal of development is to give people more freedom (not just a higher GDP for the province) and the best way to do this is by focusing on the expansion of individual capabilities. The focus on freedom *“can give a very different view of development from the usual concentration on GDP or technical progress or industrialisation”* (Sen 1999: 285); it is simply not adequate to take as our basic objective only the maximisation of wealth. *“The usefulness of wealth lies in the things that it allows us to do – the substantive freedoms it helps us to achieve”* (Sen 1999: 14). Without ignoring the importance of economic growth, Sen argues that we must look well beyond it. *“Such freedoms as participation in political decisions and social choice cannot be seen as being, at best, among the means to development (through, say, their contribution to economic growth), but have to be understood as constitutive parts of the ends of development in themselves”* (Sen 1999: 291). So when we are looking at the situation in Alberta, we have to consider how the production side of the energy sector is removing unfreedoms and extending the substantive freedoms of different types that people have reason to value.

G.2 Applying the HD Paradigm to Policy Development

At the end of the day, development of the energy sector could be viewed as a process of expanding freedoms that Albertans enjoy. This fits nicely with the motto of the province of Alberta being “strong and free”. The Human Development paradigm takes a broader view than the traditional view of development (for example, where the energy sector is expected to contribute short-term economic benefits). There is no doubt that the growth of individual incomes can facilitate the

expansion of freedoms enjoyed by real people in a society (for example, sufficient money to buy and exchange goods and services); however, freedoms also depend on other factors, such as social and economic arrangements (for example, the quality of health and education services) as well as political and civil rights (for example, the ability to freely participate in public discussions) (Sen 1999: 3). *“Freedoms of different kinds can strengthen one another”* (Sen 1999: 11). The Government of Alberta could make this clear by declaring the following energy strategy:

Alberta promotes the sustainable development of its energy sector to expand individual freedoms and improve the quality of life for current and future generations of Albertans.

This type of energy strategy could build on the ‘sustainable prosperity’ path, identified in the 2008 Energy Strategy, that allows Albertans to play a significant proactive role in our own future, and to demonstrate leadership and exert our fullest influence on the world stage (Alberta 2008: 19). The Human Development paradigm could build on this concept and push it to its logical conclusion. The fundamental difference between the two energy strategies is that currently we allow the market to decide, whereas, the Human Development paradigm could allow Albertans to decide. We could replace economic choice with social choice. If this happened, there would continue to be a central and essential role for the market in the energy sector but it would no longer be relied upon to make all key decisions. We could align the development of the energy sector with the values and beliefs of Albertans, which makes sense given that the non-renewable resources belong to the people of the province.

“The politics of social consensus calls not only for acting on the basis of given individual preferences, but also for sensitivity of social decisions to the development of individual preferences and norms. In this context, particular importance has to be attached to the role of public discussion and interactions in the emergence of shared values and commitments. Our ideas of what is just and what is not may respond to the arguments that are presented for public discussion, and we tend to react to one another’s views sometimes with a compromise or even a deal, and at other times with relentless inflexibility and stubbornness.”
(Sen 1999: 253)

The concept of social choice fits very nicely with recent commitments by the Alberta Government to allow additional public input on policy development. By adopting the Human Development paradigm, the Alberta Government could engage Albertans in a true public discussion about freedoms and the extent to which people have the opportunity to achieve outcomes that they value.

G.3 Applying the HD Paradigm to Policy Assurance

It is important to ensure activity or site-specific decisions are consistent with the energy sector policies. The Energy Resources Conservation Board (ERCB) already has clearly defined criteria for making decisions: consideration of public interest. It is described in section 3 of the Energy Resources Conservation Act:

“Where by any other enactment the Board is charged with the conduct of a hearing, inquiry or other investigation in respect of a proposed energy resource project or carbon capture and storage project, it shall, in addition to any other matters it may or must consider in conducting the hearing, inquiry or investigation, give consideration to whether the project is in the public interest, having regard to the social and economic effects of the project and the effects of the project on the environment.” (Alberta 2010b)

This definition of public interest provides enough flexibility to for the Policy Assurance Component to be aligned with the Human Development Paradigm. Having regard to the social and economic effects of the project and the effects of the project on the environment could be viewed from the perspective of freedoms. As we have already seen, the distinct types of freedoms include: political freedoms (opportunities of political dialogue, critique and dissent), economic freedoms (aggregative and distributional considerations), social freedoms (safety, health, education) and environmental protection (air, water and land). So if we need to structure these freedoms within the structure of the public interest definition we end up with: social effects (safety, health, education, open discussion), economic effects (generation of wealth, preservation of wealth), and effects of the project on the environment (air, water and land).

The public interest refers to a balance of economic, environmental and social considerations that changes as society’s values and preferences evolve over time. I think it is safe to say that the public interest considerations of the Alberta Petroleum and Natural Gas Conservation Board (the initial regulatory body for the Alberta energy sector) in 1938 looked very different from the public interest considerations of the ERCB in 2012. This evolution of the public interest is necessary to keep pace with the changing values and preferences of Albertans.

In addition to the decision-making criteria for public interest, it is also important to have some tools. Sustainability assessment is one tool that could be very useful in applying the Human Development Paradigm to Policy Assurance. Sustainability assessment is *“an integrative concept that combines*

attention to the multiplicity of intertwined factors in complex socio-ecological systems, accepts uncertainty, favours participative openness and extends concern from the immediate to the long term” (Gibson 2006). The essence of sustainability assessment is the establishment of net gains as the basic objective; although it is acknowledged that there will almost inevitably be trade-offs, which raises concerns about the equitable distribution of costs and benefits. Inequitable distribution of costs and benefits is even more troublesome if the costs are primarily borne by people that are already disadvantaged, which is a common occurrence of many previous development projects (Kemp, Parto et al. 2005). It is very important that any trade-off decisions must not compromise the fundamental objective of net sustainability gain. If there are substantial compromises within the sustainability assessment, then trade-offs should be clearly identified, openly discussed and explicitly justified, in order to make the most transparent and best possible decision (Gibson 2006).

Sustainability assessments under the Human Development Paradigm could evaluate how any development would remove “unfreedoms” and extend the substantive freedoms of different types that people have reason to value. By encouraging the energy sector to obtain a fuller understanding of the role of human capabilities, each decision would have to take note of: *“their direct relevance to the well-being and freedom of people; their indirect role through influencing social change; and their indirect role through influencing economic production”* (Sen 1999: 296). This type of discussion could provide a general overview for the SD of the energy sector based on societal values.

Sustainability assessments could shift from focusing on the significance of adverse impacts to the balance of net impacts. This approach would not require any changes to existing legislation. No net impacts could simply be a criterion for no significant adverse effects under environmental legislation (for example, the Canadian Environmental Assessment Act). If, and only if, a project has a net positive impact on both social and environmental freedoms then the decision maker could find the project in the public interest. The idea of evaluating how projects contribute to the removal of unfreedoms has the potential to internalize the societal costs of development and move towards a more just society. The Human Development Paradigm could promote a better understanding of how individual projects align with our collective social choices and result in decisions that are compatible with our universal values.

Appendix H: Organisations Experienced Promoting Continual Improvement

H.1 Canadian Association of Petroleum Producers (CAPP)

CAPP represents member companies that produce about 90 per cent of Canada's natural gas and crude oil. CAPP's Responsible Canadian Energy program highlights the strategic environmental, health, safety and social performance of the Canadian oil and gas sector in the areas of greatest relevance to its industry and to its stakeholders. The program is a requirement for all member companies. The program is a collective recognition that there are concerns about the impact of operations and reflects the oil and gas industry's ongoing commitment to continual improvement in areas that matter to Canadians.

H.2 Chemistry Industry Association of Canada

Responsible Care was launched by the Chemistry Industry Association of Canada and it is a requirement for all member companies. It is the chemistry industry's commitment to sustainability - the betterment of society, the environment and the economy. Its ethic and principles compel companies to innovate for safer and more environmentally friendly products and processes, and to work cooperatively to identify and eliminate harm throughout the entire life cycle of their products. Responsible Care is a commitment to continual improvement of all aspects of the chemistry industry's environmental, health and safety performance and to ensuring openness about its activities and its achievements.

H.3 Mining Association of Canada (MAC)

Towards Sustainable Mining (TSM) was developed by The Mining Association of Canada to improve the industry's performance by aligning its actions with the priorities and values of Canadians. It is a requirement for all member companies. The members of the Mining Association of Canada believe that opportunities to contribute to and thrive in the economies in which they operate must be earned through a demonstrated commitment to SD. In the guiding principles of TSM (MAC 2004) there is a commitment to demonstrate leadership worldwide by practicing continual improvement through the application of new technology, innovation and best practices in all facets of operations.

H.4 National Energy Board of Canada (NEB)

The NEB regulates pipelines, energy development and trade in the Canadian public interest. In order to deliver on its mandate, the NEB has a regulatory framework that consists of the following: setting

expectations for industry; monitoring compliance; enforcing rules; measuring performance; and focusing on continual improvement. The NEB has formal expectations for continual improvement with regard to safety, security and environmental protection, and the promotion of a safety culture (NEB 2011). The NEB also has draft expectations for the continual improvement of public involvement programs (NEB 2009). The advantage of focusing on continual improvement versus prescriptive regulations is to provide direction when necessary and allow freedom of choice where appropriate so each company is able to develop innovative and cost-effective programs under different circumstances so that the greatest protection is provided for the public, employees, property and the environment.

Appendix I: Considerations for Policy-Makers

A Continual Improvement Framework represents a shift from traditional prescriptive laws, where industry is told exactly what to do, to a more innovative compliance regime, where industry is required to have adequate, implemented and effective systems in place. There might continue to be some prescriptive elements but the overall philosophy would be focused on systems. These systems could cover the environmental, social and economic performance of the company. A Continual Improvement Framework could require companies to:

- design their own system, test the design and correct deficiencies they find in the design;
- implement their system, test the implementation and correct deficiencies with implementation; and
- test the effectiveness of their system and correct effectiveness deficiencies.

In order for a Continual Improvement Framework to function properly, companies could be required to submit the following information to the ERCB:

- Harm Analysis, proposed performance measures, Corrective Action Plan (CAP) process;
- Findings and CAPs related to system adequacy;
- Findings and CAPs related to system implementation; and
- Results and CAPs related to system effectiveness.

This might sound like a substantial burden on companies but it is important to realize that companies in the energy sector have already adopted a systems approach. For example, CAPP's Responsible Canadian Energy program includes guidelines to help member companies develop a management system approach. Another example, is the formal expectations of the NEB for all of its regulated companies to have systems in place for continual improvement with regard to safety, security and environmental protection, and the promotion of a safety culture (NEB 2011). The sophistication of a company's system can range from one page for a company whose Harm Analysis illustrates a very low potential consequence, to full binders for companies whose Harm Analysis illustrate very high potential consequences. The companies get to do the Harm Analysis and design the system they believe is appropriate to their unique operating context.

A Continual Improvement Framework could require companies submit their documentation of deficiencies and corrective action plans. This information could be only sent in as the companies test their adequacy and implementation (1-5 year intervals). Effectiveness results and corrective actions

could be a more constant and repeated process within a company management system and as such, this information could be submitted to the ERCB on a more frequent basis (6-12 month intervals). This reporting could be done exactly as the company would be reporting to its own executive regarding its systems.

The legislation, regulatory framework and supporting guidance driving this type of Continual Improvement Framework would have to clearly describe the requirements of a full management system along with a more discipline reporting structure. Further, there would be clear requirements that companies have adequate, implemented and effective management systems with the typical elements required within a management system framework.

System Adequacy

Companies could be required to have all key elements of a management system and confirm to the ERCB that the systems are in place. The systems could be tailored to the potential effect (harm or threat) the company's facilities may pose to receptors. The ERCB could provide guidance on Harm Analysis for companies. Every company could submit their Harm Analysis, performance measures (including the SD goals), and corrective action process to the ERCB.

Benefits of a Continual Improvement Framework include:

- The company has the accountability and the freedom to employ experts to design their system according to their unique operation.
- The company is given the accountability to carry out the risk assessment for their operation.
- The simplicity of adequate management systems is directly related to the degree of potential consequence determined through the company's Harm Analysis.
- This approach can be communicated easily and could therefore be transparent.
- ERCB tests the most critical elements of every company management system.
- The ERCB guidance on Harm Analysis could ensure that company systems are focused properly on interest areas of the ERCB and Albertans.
- ERCB could ensure that every company has appropriate lead and lag performance measures suitable for their unique operation.

System Implementation

Every company could conduct implementation assessments and submit (not for approval) their deficiencies and associated corrective action plans. This could be used for ERCB analysis and

trending. ERCB could conduct implementation assessments to 'truth' the information being submitted by industry. ERCB inspections could provide good visibility regarding how well companies have implemented their systems.

Benefits of a Continual Improvement Framework include:

- ERCB could receive information from every company regarding how well they are implementing their systems.
- Company created CAPs could demonstrate that the company is utilizing their corrective action process.
- ERCB implementation assessments could be used to 'truth' the company reported information and the ERCB can do as many or as few as are deemed necessary.
- This approach could be communicated easily and could therefore be transparent.

System Effectiveness

Every company will submit results on their lead and lag performance measures (the same measures potentially approved by the ERCB in the adequacy test, including the SD goals). Every company will also submit their CAPs for identified gaps in performance. The ERCB monitors leading and lagging effectiveness measures and analyzes the information for trends. This includes monitoring the implementation and effectiveness of corrective actions. ERCB incident management provides good intelligence into the root causes behind the failure of a company's management system.

Benefits of a Continual Improvement Framework include:

- ERCB could receive performance results from every company, creating a good base of information to do analysis and look for trends within companies and across industry.
- Performance measures from each company could address each of the interest areas that the ERCB and Albertans have identified, while still being as simple or complex as required for the company operation.