

MUNICIPAL PERSPECTIVES ON GREENHOUSE
GAS REDUCTIONS: EXPLORING STRATHCONA COUNTY

By

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Abstract

This thesis considers perspectives on municipal greenhouse gas emission reductions. It is timely study as it is one point of entry to analyzing emissions and contemplates the degree of local responsibility, as well as the barriers and possible solutions to creating action. By using a case study approach, Strathcona County was examined in its real-life context to determine the outlook at the local scale. Attention to varying government action plans, as well as scientific research was examined to verify relevance of municipal action. Using survey and interview methods, perspectives from key decision makers were compared and contrasted. The results indicated that there is a concentration at the municipal level on actions that will directly or indirectly benefit climate change. A multi-governance angle, as well as institutionalizing the concept into the organization and community will create progress. Solutions focusing on land use planning, transportation and community energy are emerging. This study demonstrates the value of municipal action as an essential element to achieving long term, cost effective and successful reductions, and recognizes that it is a supplement rather than an alternative to provincial and national plans.

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Chapter 1: Research Introduction

Introduction

The worldwide scientific consensus is that the planet has become warmer over the past century, and this is considered a vital issue to modern and future societies (IPCC, 2007; Stern, 2007). The main cause of global warming and climate change is simple – the excessive emission of greenhouse gases (GHG) due to the extraction of fossil fuels (coal, oil and natural gas) to meet the energy demands of an increasingly industrialized world (Environment Canada, 2005). Global surface temperatures are rising, impacting the quality and quantity of water, increases in diseases and insect pests, and the intensification of extreme weather events that cause natural catastrophes and damages cities, infrastructure and populations worldwide (Environment Canada, 2002; Jaccard & Rivers, 2007a). These changes impact the world's economy, health and quality of life.

As human activity is causing global warming it is therefore within our power to address. At the global scale, organizations such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) are acting from the top down and from the bottom up there are commitments from local governments to the Cities for Climate Protection (CCP) campaign and the C40 Climate Leadership Group. This research will concentrate on the local level and their prospects of taking action to reduce GHGs. As suggested by Kates and Wilbanks (2003), localized opportunities may be an encouraging means to addressing the global issue of climate change.

Political Context

From International to National

In the mid-1980s. Initially, as climate change was seen to have high costs that would be borne by whatever country undertook action, most benefits of abatement would not be realized in the short term, but in decades or centuries away and spread throughout the entire world (Jaccard & Rivers, 2007a). The relative responsibilities of different countries and the means through which action could or should be taken has been the subject of fierce debate (Betsill & Bulkeley, 2006). In 1992, a strategy was launched by 155 countries that signed the UNFCCC and initiated the Kyoto Protocol.

This Protocol required signatories to tackle human induced climate change by reducing national emissions to 5.2% below 1990 levels by the period of 2008-2012. To be legally binding, the Kyoto Protocol needed to be signed and ratified by at least 55 member countries and those that ratified had to represent at least 55% of the collective emissions in 1990 (Environment Canada, 2002). As of February 2005, both criteria were met and the Protocol came into effect.

Canada's Climate Change History

Canada produces over 2 per cent of global GHG emissions, more than all but six other countries in the world and it produces more emissions per capita than virtually any other country (Jaccard & Rivers, 2007b). There has been a 25 per cent increase since 1990, more than any other industrialized country, due to an expanding population, economic growth and intensifying fossil fuel production (Jaccard, Rivers, Bataille, Murphy, Nyboer et al., 2006). In 1992, the Canadian government signed the UNFCC and set a target to reduce Canada's GHG emissions back to their 1990 levels by the year 2000 (Jaccard & Bataille, 2002). In 1997, Canada

negotiated a target of reducing national emissions by 2010 to 6 per cent below the 1990 levels in Kyoto, and in December 2002 Canada ratified the Protocol.

Over the last 17 years Canadian governments have enacted – the 1990 Green Plan, the 1995 National Action Program on Climate Change, Action Plan 2000 on Climate Change, the 2002 Climate Change Plan for Canada and Project Green in 2005. After that, in 2006, Canada launched a series of initiatives under its ‘ecoAction’ banner which led to a new strategy announced in March of 2008 called Turning the Corner – Taking Action to Fight Climate Change. The concluding document is the release of the Regulatory Framework for Air Emissions, which is currently under consultative review and set to be launched early in 2010. The documents and government parties leading them may have changed, but the policy approaches have not significantly varied, resulting in increased emissions.

Although they have brought national attention to climate change and future required action, it is midway through the Kyoto time requirement and Canada’s intent has yet to be achieved. Environment Canada (2007) reported that Canada’s total GHG emissions in 2007 were 747 megatonnes (Mt), which indicates that Canada’s emissions at that time were about 26 per cent above the 1990 total of 592 Mt, and shows a trend towards a level of 33.8 per cent by the Kyoto 2012 target. The federal government’s climate change policy over the last decade has focused on noncompulsory policies that put emphasis on voluntary initiatives by businesses, consumers and municipalities supported by modest government subsidies and hindered by information provisions (Rivers & Jaccard, 2005). Consequently, Jaccard, Rivers, and Horne (2004) indicate that this approach is environmentally ineffective and economically inefficient. Moreover, Canada has had to deal with the U.S. government’s decision to not participate in the Protocol. With Canada’s energy sector being approximately 7 per cent of the country’s gross

domestic product, there is fear that there would be impact on the energy intensive industries that compete for business with U.S. companies (Smith, 2002).

Most recently during the Copenhagen climate summit in December 2009, Canada was perceived to have played a negative role throughout these talks and was singled out for international criticism, winning a satirical prize as the “Fossil of the Year” for hindering progress on the combat against climate change (Climate Action Network Canada, 2009). Canada had entered into these negotiations in a unique position of being the only country to have accepted the legally binding Kyoto target and then opting not to try to meet it (Demerse & Bramley, 2009). In addition, the head of the United Nations, General Ban Ki-moon, signalled that Canada is not doing enough to curb emissions and slow the effect of climate change around the world, and needs produce some bold targets (Smith, 2009). Canadian emissions actually rose faster during the 1990 to 2006 period of policy initiatives, than during the previous decade from 1980 to 1990, which had no GHG reduction policies (Jaccard & Rivers, 2007b). Federal approaches in Canada are not being successful or aggressive to reduce emissions. The current Conservative government has claimed that it faces the stark choice of either admitting defeat in terms of international agreements, or pretending Canada can meet the targets and face embarrassment in the future (Stoett, 2006).

Alberta's Direction

Alberta is the largest provincial emitter of GHGs in Canada, with 223 Mt emitted per year; due to its reliance on coal fired electricity and the province's role as the leading energy producer in Canada (Alberta Environment, 2008b). Alberta's emissions are predicted to increase by another third in the next 5 to 10 years (Alberta Environment, 2007). Prior to 2007, the Province of Alberta made it very clear it had no intention of enforcing Kyoto provisions in its

jurisdiction (Stoett, 2006); however, in 2007 it announced its strategy to develop climate policies and develop solutions in the province.

At the beginning of 2008, Alberta released its new climate change strategy and has been working on the compliance of the plan in its second year. Alberta was the first jurisdiction in North America to set a requirement on industries to reduce their emissions. Their goal is to reduce emissions by 50 per cent of business as usual scenarios by 2050 or 14 per cent below the 2005 levels (Alberta Environment, 2008b). Alberta's strategy targets facilities that emit more than 100,000 tonnes of GHGs a year. These facilities are required to reduce their emissions yearly by 12 per cent under the province's Climate Change and Emissions Act. Industries have three options to meet this reduction: (a) facilities can make operating improvements that will reduce their emissions onsite; (b) they can buy Alberta based credits; or, (c) they can contribute to the Climate Change and Emissions Management Fund. In addition to this specified gas emitters regulation, Alberta's approach focuses on three broad themes (Alberta Environment, 2008b). The first focus is on greening energy production. Second, implementing carbon capture and storage technologies will allow the depositing of mass quantities of CO₂ into geological formations instead of releasing them into the atmosphere. Lastly, is the focus on the conservation and energy efficiency supporting capacity building at the local level (municipal governments and private sector) to identify emissions reduction strategies.

Critics of Alberta's approach insinuate that not only are these actions long overdue, but the province is prioritizing the out-of-control tar sands sector over the expectations of Albertans and the global community (CBC News, 2008). Alberta is relying too heavily on carbon capture and storage as being the silver bullet to help the province achieve its targets (Richard, 2006). A technological strategy that allows emitters to bury their CO₂ does not in actuality reduce the

amount of emissions produced; it still requires research and testing in order to solve some outstanding problems (Flannery, 2005).

The Municipal Movement

At the global scale and in the case of Canada at the federal and some provincial levels, strategies are in place, but are they enough to ensure change for a sustainable future? A new direction of late, and the focal point of this research, is action that is occurring on the local front; looking at localizing policies and strategies for emission reductions could improve Canada's compliance with Kyoto's targets. With 80 per cent of Canadians living in cities, municipalities have a vital role to play in tackling climate change. Municipalities have direct or indirect control or influence over approximately 52 per cent of GHG emissions (Robinson & Gore, 2005).

In Canada municipal governments are encouraging alternative forms of transportation, curbing urban sprawl, protecting and enhancing urban green space, using renewable forms of energy and performing energy efficiency retrofits on buildings (Environment Canada, 2002). By facilitating local level engagement, communities can secure buy-in from their industry, institutions and residents on the kind of community in which they want to live, invest, and grow (Environment Canada, 2005). There are also non-profit organizations, such as the Federation of Canadian Municipalities (FCM) and the International Council of Local Environmental Initiatives (ICLEI), which have created programs that provide support to local actions on climate change.

Research Questions and Objectives

Cities, rather than nations, may be the most important arena in which to pursue policies to address GHG abatement (Bulkeley & Betsill, 2005). Decision makers at the local levels are being faced with some of the responsibility to deal with climate change. Using Strathcona

County as a case study, this research will investigate the role of municipalities in GHG emission reductions from the perspectives of those that have influence over local action.

Objective and Research Questions

The objective for this study is to determine the perspectives of local level decision makers that have influence over policies and programs that could drive the successful reduction of GHG emissions. The research questions being:

1. What are the viewpoints of decision makers that have influence over local climate change action?
2. What is a municipality's role in terms of GHG reductions in relation to other governance levels in Canada?
3. What approaches would be most desired, realistic, accepted and effective at reducing GHG emissions at the local level?
4. What are the perceived barriers for a municipality to take action, and how can a municipality overcome these in order to create a successful plan?
5. What type of support is available or would be required for a municipality to successfully implement approaches?

Research Objectives

Based on the investigative questions, the objectives for this project are:

1. To identify the current perceptions concerning municipal action.
2. To determine the best climate positive goals for a municipality.
3. To identify major factors that enable success and major barriers that hinder success of GHG emission reductions at the local level.
4. To develop recommendations for local governments on how they can take action.

Significance of Research

The local arena is only one point of entry to analyzing GHGs, and until recently has largely been overlooked. Few studies have explored the topic of local level climate change from the perspectives of various decision makers. Those that have focused on municipal action, such as Betsill (2001a, 2001b), Bulkeley and Betsill (2005), DeAngelo and Harvey (1998) and Harvey (1995), are limited by an elevated observation and analysis, as opposed to the perspectives that drive the action at the ground level. Robinson and Gore (2005) did examine viewpoints at the municipal level; however, their focus was solely on revealing barriers to action and not creating formative solutions.

Many opportunities to reduce GHG emissions and the associated costs and benefits are highly site specific; therefore, localized action may be the most promising path toward addressing a global challenge if its potential can be realized (Kates & Wilbanks, 2003). Given that this research project is specifically focused on Strathcona County, it is anticipated that the research findings will contribute to furthering discussions amongst all stakeholders at the local level on how to best address GHG minimization.

Chapter 2: Research Methodology

Research Conduct

The following section will provide specifics on the detailed methods utilized to conduct research on how relevant decision makers perceive the role of municipalities in the global climate change agenda. The reliability of the data and the effectiveness of the research it supports depend on the careful attention to detail throughout the research process, from initial planning to final product. Recruitment of participants and collection and storage of data was conducted in accordance with the Research Ethics Policy of Royal Roads University (2007). As the researcher has a close association with Strathcona County, it was important to keep the two roles distinct, in particular during the interview process

Research Methodology

This thesis uses a case study method that utilizes a triangulation strategy so as to enable a determination of the validity of the potential questions being investigated in relation to a municipality's role in reducing GHG emissions. As Yin (1981) suggested, a case study should represent a research strategy that will simulate a contemporary trend in its real-life context. In addition, case studies are best undertaken when dealing with how or why questions, where behavioural events are not controlled (Yin, 2003). In this study, the intervention is municipal perspectives on climate change and the potential approaches to support GHG emission reductions in the real setting of Strathcona County.

Case Study Selection

Strathcona County (Figure 1) is located in east central Alberta, adjacent to the City of Edmonton. The county is bordered by the North Saskatchewan River to the north, Lamont County and Elk Island National Park to the east and Leduc County and Beaver County to the

south. Strathcona County encompasses 1265 square kilometers. It is the fourth largest municipality in Alberta in terms of population and is classified as a “Specialized Municipality” under provincial legislation due to its authority over both urban and rural communities. This status means that the Province of Alberta allows urban and rural communities to coexist in a single municipal government. In Strathcona County, the province recognizes Sherwood Park and its Urban Service Area as equivalent to a city, and Rural Strathcona County, which includes country residential development, farmland, agricultural land and industry as equivalent to a municipal district; this is mainly for program and grant purposes.



Figure 1. Map of Strathcona County.¹

¹ From Tames, J. (2010). *Map of Strathcona County*. Used with permission.

The municipality is home to Alberta's Industrial Heartland, which is the largest hydrocarbon processing region in Alberta and fulfills a key role in the province's hydrocarbon industry. Many of the industrial businesses that are found in this region are also among the top emitters of carbon dioxide in the province (Alberta Environment, 2008a), and thus obligated to comply with Alberta's climate change strategy. The Alberta Industrial Heartland Association (AIHA) has identified this area as one of several Canadian locations with excellent potential for additional eco-industrial development. Using Strathcona County as a case study is unique in that it has a high concentration of heavy industry, as well as rural agricultural and suburban requirements.

Case Study Design

As described by Yin (2003) the following methodological procedure was followed - design the case study, conduct the case study, analyze the evidence and develop the conclusions, recommendations and implications. Three steps were used to conduct this study and data was collected from multiple sources of evidence. Data source triangulation, identified by Denzin (1984, as cited in Tellis, 1997), was utilized as it looks for similar data by using more than one method of collection in order to reduce researcher and subject bias. The choices of data collection methods were used to complement each other and ensure dependability of the process, which serves to confirm credibility of the research. In this study the investigator identified relevant documents and scientific literature, observed directly, conducted opinion surveys and carried out interviews.

This document review examined current municipal, provincial and national policy approaches and action plans for emission reductions, as well scientific analysis and a comparison of different approaches. A cross-case examination of action plans and documents along with

literature review helps ensure external validity. An review of municipal capabilities and approaches for climate change action was conducted. The information attained from the scientific work was utilized to describe the significance of local strategies, and the necessary course of action. The examination of the literature was also used in the data analysis to support conclusions or to identify divergent research findings. Monitoring of climate change policies and actions through media coverage took place at all scales over the course of the research.

The second step in conducting the study was the development and distribution of a structured online questionnaire (Appendix A). The survey was conducted through SurveyMonkey.com. This survey invited various decision makers in Strathcona County to discuss a municipality's role in climate change, as well as the current and future approaches for emission reductions. The majority of questions were open ended in format to encourage a rounded, meaningful answer using the participant's knowledge and expertise. This also allowed for more objective answers. Based on these responses, inferences were made and interview candidates were selected for the next phase of the methodology.

In the last step, primary data was collected via qualitative personal interviews, which were conducted with relevant stakeholders, organizations and levels of government that would have an interest in a municipality's GHG emissions. The purpose of the interviews was to gain more in-depth viewpoints from relevant players whose area of expertise were noted, through the survey responses, as being particularly important to municipal action. Techniques from Robert Weiss (1994) were used. A draft of the interview protocol and consent form can be found in Appendix B, and the selection of participants will be discussed later in this chapter.

The interview approach was an unstructured discussion and open answer in format to allow respondents to freely explain their opinions on the research topic. Weiss (1994), as well as

Yin (1984, as cited in Tellis, 1997) both support open-ended interviews to expand the depth and quality of data gathering, in addition to achieving a fuller development of information. Face to face personal interviews, and where necessary telephone interviews, gave the interviewer an opportunity to probe for additional information or clarification. One-on-one discussions were also beneficial for the participants as it allowed them to have additional opportunities to consider and talk about their perspectives because their attention was solely focused on the conversation at hand. Of the 10 interviews conducted with stakeholders, 8 were conducted in person and 2 took place over the telephone. The length of the interviews ranged from 45 minutes to 90 minutes.

Tellis (1997) suggests that case studies are multi-perspective analyses, in which the researcher considers not only the perspectives of the relevant players in the study, but also of the relevant groups of players and the interaction between them. Looking at the interactions between these groups, for example the different levels of government was critical to evaluate, as it is part of the real-life context. Considering the details from the viewpoint of these participants by using multiple sources of data strengthened the legitimacy of the study and its outcomes.

After the survey and interviews were conducted, an analytical strategy was carried out to examine, categorize and combine the results, which will be discussed further in this chapter. Lastly, the concluding step for the case study methodology was to develop conclusions based on the participants' perspectives and provide recommendations for the development and implementation of municipal approaches to address emission reductions. Findings of this study serve as a reference point from which to consider the role that a municipality, such as Strathcona County, could be taking to address global climate change.

Description & Selection of Participants

Both the online questionnaire and the interview process were directed towards representatives that in some form play a role in influencing municipal perspectives and policies on GHG emissions. The online questionnaire was distributed to all high level decision makers within Strathcona County's organization. Thirty-three decision makers, consisting of all department managers, associate commissioners, the chief administrative officer, and elected officials, were invited to participate in the survey. Administrators were selected based on their contributions to the municipal policy and program development process, while the politicians were invited to partake in the project because they approve these programs and their respective budgets. The results and responses from the survey revealed various areas of focus and support that a municipality could rely on to assist with the reduction of GHG emissions at the local level. Table 1 presents the common themes that reappeared in subjects' responses and provides details as to who was selected, why they were selected based on the themes from the survey and the importance of their role to the thesis questions.

Data Handling, Analysis and Presentation

As described in Tellis' (1997) review of case study methodologies, steps were taken to ensure that the handling and analysis of data collected was of high quality. Interviews were audio-taped and then transcribed. A content analysis was conducted on these transcribed texts to identify meaningful patterns. The identification of response categories was completed by looking through the data for emergent findings that naturally surfaced. Next the data was classified into similar themes and subthemes within each topic. The main themes derived were *Roles and Responsibilities; Benefits, Barriers and Band Aids; Emerging Solutions; and, Industry*.

Table 1. *Survey Themes and Justification for the Selection of Interview Participants.*

Theme	Participant	Perspective in Relation to Research Questions
Land Use Planning	Representative from Strathcona County's Planning & Development Services	What approaches would be most effective and realistic in terms of planning and development?
Green Building		
Water Conservation	Representative from Strathcona County's Utilities Department	What approaches would be most effective and realistic in terms of Utilities' services?
Waste Management		
Energy		
Transit/Transportation	Representative from Strathcona County's Transit Department	What approaches would be most effective and realistic in terms of transit and transportation planning?
Industry	Representative from Strathcona County's Economic Development & Tourism Department	What are the perceived barriers concerning industry? What approaches would be accepted by industry?
Municipal Jurisdiction	Representative from Strathcona County's Elected Official - Urban	What is a municipality's role in terms of GHG reductions in relation to other governance levels?
	Representative from Strathcona County's Elected Official - Rural	What approaches would be most desired, realistic and accepted?
County Governance & Sustainability	Representative from Strathcona County's Executive Team, Sustainability Portfolio	What are internal barriers exist and what support and solutions are available? What is the role of sustainability in climate change?
Provincial Role	Representative from Alberta Environment, Climate Change Secretariat	What is a municipality's role in terms of GHG reductions in relation to other governance levels?
Federal Role	Representative from Natural Resources Canada, Office of Energy Efficiency	What is a municipality's role in terms of GHG reductions in relation to other governance levels?
Support/Partnerships	Representative from a transnational network – FCM's Partners for Climate Protection	What is a municipality's role in terms of GHG reductions, and what type of support and guidance is available?
Residential Education	All participants	What is desired and accepted at the public level? What are the barriers? How can we educate and communicate?
Benefits and Barriers	All participants	What are the perceived barriers and how can a municipality overcome? What are the benefits?

Chapter 3: Literature Review

To provide context for this research project, an overview was conducted on the authoritative powers that each level of government has within Canada, as well as the complexities that develop with this divisional structure. In addition, the development of transnational networks and the interactions of multi-scale governance all have significant bearing on this research. The chapter concludes with an in-depth look at the relevant literature related to municipal action on climate change. There is a growing body of work, dealing with theory, case study analysis, evaluation and the evolving nature of the subject. The review not only provides supporting data for the discussion of the results, but also reveals the significance of this research.

Jurisdictional Complexities

In regards to environmental protection, and therefore climate change, Adler (2005) stated that the division of authority and responsibility between federal, provincial and municipal governments lack rationale or justification, and consequently compromises the effectiveness of measures intended to safeguard the environment. He suggested that the problem with current environmental protection efforts, which leads to policy failure, is the mismatch between the nature and scope of environmental problems and the nature and scope of those institutions charged with solving them. That is, when a federal authority intervenes to solve a problem that could be more effectively handled at a regional or local level, and vice versa. What may be most economically efficient or effective in realizing environmental benefits may pose difficulties from a standpoint of administrative feasibility or political acceptability (Jaccard & Rivers, 2007b). A forecast based on the continuation of this approach and divisional complexities suggests that Canadian emissions will increase by 50% within 35 years and cost Canadians \$80 billion (Jaccard et al., 2006).

Federal Authoritative Role

The flexibility of the federal government to develop GHG abatement policies is limited by the division of power between provincial and federal authorities under the Canadian Constitution. Canada is decentralized to the extent that the federal government has few regulatory tools at its disposal to induce climate initiatives at either the provincial or municipal level. DeAngelo and Harvey (1998) offer some examples: (a) federal energy efficiency standards for the building sector are meant merely as a model; (b) the provinces issue regional and local planning guidelines; (c) utility regulation falls primarily under provincial jurisdiction; (d) funds for regional and local transit flow from the provincial governments; and, (e) there are certainly no equivalents under Canadian regulation to the US Clean Air Act. Despite this perceived federal weakness to achieve successful reductions, the Canadian Constitution does provide several avenues for the federal government to implement policies and could be effective if they are aimed at being consistent with other jurisdictions within this country (Rivers & Jaccard, 2005).

Jaccard et al. (2004) suggest that by focusing on GHG reduction policies from a federal government perspective, analysis and policy suggestions are broadly applicable to GHG policies by any level of government. A few actions that they propose include: (a) improving energy efficiency in buildings, production processes, vehicles and appliances; (b) increasing the use of renewables, municipal waste and natural gas in electricity generation; (c) develop urban form and transportation infrastructure that reduces vehicle reliance; (d) increase the market penetration of low GHG emitting equipment and production processes throughout industry; (e) promote carbon capture and storage technologies; and, (f) change forestry and agricultural technologies and management practices. Many of these methods are attainable and implementable at the regional and local scales. These policy suggestions are intended to ensure that strong incentives

exist for Canadian innovators, private investors, corporations, municipalities and individual consumers to pursue opportunities within Canada to develop and adopt technological innovations that over the long run will move the country toward a low emission path (Jaccard et al., 2006).

Provincial Authoritative Role

Provincial disharmony has been a constant factor in Canadian climate change policy since several sources of GHG reductions fall largely under provincial jurisdiction, including sectors like transportation and electricity generation (Rivers & Jaccard, 2005). Most others are at least partly under provincial jurisdiction, as the provinces have constitutional authority over development, conservation and management of nonrenewable and renewable natural resources, such as oil and gas, energy, mining, forestry and agriculture (Jaccard & Rivers, 2007a). In addition to this jurisdictional struggle, which will be discussed further in this chapter, provinces have exclusive rights over the municipalities within their borders (Dewing, Young, & Tolley, 2006). In Alberta, municipalities get their power from the province's Municipal Government Act (MGA). The province can alter municipalities' boundaries or powers as well as their financial resources. In addition, any insertion of the municipal plan into national constitutional discussions had, in the past, provoked a reaction that has jeopardized relationships at all levels of government (Dewing et al., 2006). The provinces have consistently resisted any direct and formal federal involvement with their subordinate level of government, even though the federal government—through joint federal-provincial programs and funding—has been putting up money for services ultimately delivered by the municipalities (Rivers & Jaccard, 2005).

Multi-Scale Governance

Typically the examination of global, national and local environmental politics tends to occur in isolation. As demonstrated by the above-mentioned literature, this independent decision

making has made it increasingly clear that nations will be unable to meet their international commitments for addressing climate change. More explicit engagement with sub-national action is required. Numerous studies recognize this need for collaboration of national, regional and local level responses (Adler, 2005; Angel, Attoh, Kromm, Dehart, Slocum et al., 1998; Betsill, 2001b; DeAngelo and Harvey, 1998; Harvey, 1995; Lutsey & Sperling, 2008). All levels of government and society must be actively involved in efforts to control GHG emissions so that complementarily and mutually reinforcing measures are concurrently implemented. The concept of multilevel governance with its emphasis on the connections between vertical tiers and horizontally organized forms of governance provides a useful starting point for understanding the ways in which environmental problems are governed within and across scales (Betsill & Bulkeley, 2006). They contend that it is only by taking a multilevel perspective that we can fully capture the social, political and economic processes that shape global environmental governance. An effective climate strategy must therefore simultaneously address the individual to the global scales comprehensively and find the right balance, because how we regulate something is almost as important as what we regulate (Sovacool & Brown, 2009).

Benefits and Barriers of Taking Action at Multiple Scales

Case study reports from ICLEI's CCP campaign stated that the key to success at local levels had been the development of partnerships with provincial and national governments, as well as with private financial institutions. Table 2 demonstrates that the involvement at the local to global scales brings different sets of costs and benefits. It is more efficient and effective to address environmental problems through institutions with the problem in question. Adler (2005) suggests that where the scope of the problem does not match the responsible institution's

Table 2. *Costs and Benefits From Local and Federal Climate Policy*²

	Criteria	Local/Regional	Federal/Global
Supports local/regional policy	Diversity	Encourages innovation and experimentation in policy and enables more rapid response to changing needs.	Stifles innovation and experimentation, and is prone to diseconomies of scale.
	Flexibility	Can easily and more rapidly adapt to local conditions; promotes administrative efficiency.	Uniform, rigid and changes slowly; tends to fail to account for local conditions.
	Accountability	Allows for closer fit between policies and preferences and affords option to sort between jurisdictions.	Promotes “rent seeking” behavior, which wastes resources trying to garner local advantages.
Supports federal/global policy	Stability	Building national markets for technology solutions is difficult when policies vary; local controls over major carbon emitters are often limited.	Standardization minimizes transaction costs and policy uncertainties; uniform policy captures all emitters.
	Economies of Scale	Inefficient due to redundancies of R&D efforts and data collection systems.	Better matched to promote R&D.
	Spillovers	Vulnerable to free ridership and emissions leakage.	Minimizes free ridership and emissions leakage.

jurisdiction often either too much or too little environmental protection is done. Environmental protection efforts are most likely to be optimal where those who bear the costs and reap the benefits of a given policy determine how best, and even whether, to address a given environmental concern.

² From Sovacool, B. K. & Brown, M. A. (2009). Scaling the policy response to climate change. *Policy and Society*, 25, 317-328. Adapted with permission.

Local or regional action fosters diversity, which encourages innovation and experimentation. This ensures flexible policy mechanisms that can adapt to local conditions and needs, creating “ecologies of scale” that can maximize social wellbeing and minimize costs (Lutsey & Sperling, 2008; Sovacool & Brown, 2009). Localism also tends to be more representative; this creates variability in policy that better compliments local interests and preferences. In addition, there is benefit in gaining local expertise and experience in enforcing climate change programs and policies. Assessing the political responses to regulatory and policy actions at the local level could strongly influence the negotiating stance of the federal government when they are at the international table (DeAngelo & Harvey, 1998).

Lutsey and Sperling (2008) investigated varying levels of policy interactions and discovered the drawbacks of a decentralized approach. Performance of federal, regional and local environmental policy initiatives may overlap and interact with one another in negative ways. They suggested that this includes: (a) a patchwork of regulatory programs could pose additional administrative burden on industry, (b) duplicate enforcement could result in a waste of resources, (c) there would be a cross boundary mismatch between pollution sources and impacts, (d) an uneven performance amongst jurisdictions can have unintended consequences such as industry shuffling (i.e., redirect their lower carbon products to jurisdictions with stringent rules and high carbon products to areas with weaker rules); and (e) there would undoubtedly be jurisdictional confusion over which level of government is responsible for a given environmental issue.

National to international action has its own unique set of advantages. Sovacool and Brown (2009) feel it is the best way to provide uniformity and minimize transaction costs among actors. Centralization creates better economies of scale in data collection, and research and development. Global action is the only way to ensure that all states bear the burdens of

addressing climate change and to minimize free riding and significant emissions leakage. The ideal climate policy would mesh all scales together in a polycentric approach to a scale that creates multi level governance. We have little choice but to begin properly discussing scale as a vital aspect of policy intervention alongside the substance of climate policy.

Transnational Networks

While legally, the federal government may be committed to alleviating climate risks, this is a task it cannot complete without addressing the source of these risks (energy use) and without the involvement of the agents responsible for that use (industries and communities). In turn, non-governmental actors, which operate at different scales across traditionally discrete policy sectors, share responsibility for defining problems and implementing solutions (Betsill & Bulkeley, 2006). Due to this shift in acknowledgement, there has been a growth in transnational networks at the subnational level. This includes ICLEI's Cities for Climate Protection (CCP) network that initiates local mitigation and adaptation actions, and provides key input in global climate action efforts of local level governments. The Partner's for Climate Protection (PCP) program is the Canadian component of this global network, and is administered by the FCM.

Municipalities are asked to pass resolutions to join their respective national ICLEI campaign, which would allow local governments to develop policies and programs to control GHG emissions (Betsill, 2001b). The network has created its own arena of governance through the development of norms and rules for compliance that strive to achieve goals and targets. In addition, it serves to heighten public awareness about the threat of global climate change and shift public opinion in favor of national and international regulations. A number of studies have shown that one of the critical influences on the take up of a response to climate change is the existence of networks which can provide the information, the understanding and the shared

experience to both professionals and politicians at the local level to push the issue within their authority (Betsill, 2001b; Betsill & Bulkeley, 2006; Wilson, 2006).

To date, Betsill's (2001b) research has largely been focused on transnational networks and whether they can facilitate action at the local level in order to create reductions in emissions. Although the history of her research outlines many benefits of transnational networks, Betsill (2001) concluded in her earlier work that local action at that time had seen limited success. In agreement is Lindseth (2004), who suggested that the network has little to show for its work, as reductions from policies and programs existed prior to its adoption in a municipality. He contends that this type of network has not explicitly shown how climate change is an overarching responsibility rather than just a number of more or less loosely connected projects. He argues strongly that prioritizing climate change is also about saying no to unsustainable development, and about restricting practices and policies in other sectors of society. It simply might be that these networks fail to use all their potential to drive concrete local action.

The transnational movement is based on the belief that local efforts to mitigate climate change will have cumulative effects contributing to global efforts to control GHG emissions. In this way these networks bypass national levels and give local authorities the opportunity to take a position that may go against that of their national government, thus illustrating that the nature of climate change governance cannot be read hierarchically (Betsill & Bulkeley, 2006). It is apparent that there is a need for multiple perspectives to engage more fully with the concept of governance and to account for the changing nature of the nation and the links between different levels and spheres of authority.

Looking Local and Out

Sustainability in cities is the new driving environmental goal within a variety of policy contexts. Climate protection is a result of sustainable efforts. By looking at the role of GHG reductions, boundaries begin to blend by meshing the global and local. Bulkeley and Betsill (2006) contend that multilevel governance perspectives can start to open up these divisions. They propose that this scale of framing means that suggested measures to improve urban sustainability are frequently bounded by the idea of being local solutions, and the role and influence of policy and politics taking place outside the urban arena are largely ignored. There needs to be a shift away from an analysis which is explicitly concerned with the urban as a separate and discrete scale of political authority, and include those processes which form the local position for sustainability at multiple locales and levels of governance.

Municipal Action

The literature related to municipal action on climate change is growing. Researchers have focused on local case studies as an analytical approach to climate change, seeing that these examinations at the municipal level arguably improve the willingness to recognize GHG emissions (Angel et al., 1998). Through these examinations, researchers have attempted to establish a basis for which municipalities can look at addressing climate change.

Most municipalities still perceive global warming as falling under the jurisdiction of higher levels of governance, but there is growing recognition that local action is essential. Many cities around the world, despite their lack of mandate and legal capacity to protect the global climate, are now actively pursuing measures to reduce their own GHG emissions, often taking the lead in front of their national governments who do have an international mandate to act (Betsill, 2001a; Bulkeley & Betsill, 2005; DeAngelo & Harvey, 1998). They demonstrate

through their own, often informal, initiatives that they can reinforce and compliment the more formal, regulatory actions by senior level governments, thereby paving the way for them to deliver meaningful domestic emission reductions. Lambright, Changnon, and Harvey (1996) determined that typically the development of a municipal response evolves through the following stages: (a) awareness of need, (b) trigger for action, (c) planning, (d) adoption, (e) implementation, and (f) institutionalization. This has led to the formation of a number of municipal global warming networks and the development of municipal action plans in some cities. Harvey (1995) recognizes that little attention has been devoted to local actions and thinks there are a number of important roles to play that would complement national measures and international instruments. Betsill (2001a) acknowledges that countries will not be able to meet the commitments contained in these agreements without the assistance of municipal governments.

The Local Focus

Currently, around 50% of the world's population lives in cities and by 2030 this number should reach well over 60 per cent. Canada is one of the most urbanized nations in the world with nearly 80 per cent of its population living in urban centres (Bradford, 2002). Cities and urban areas consume some 75 per cent of the world's energy and are responsible for up to 75 per cent of the GHG emissions (Lindseth, 2004). In total, municipalities have direct and indirect control over many activities that are sources and sinks of GHG, and contribute to over 50 per cent of the national inventory (Jaccard et al., 2004; Robinson & Gore, 2005). They have direct influence over such things as waste management, water treatment, municipal fleets, street lighting, transportation systems and land use practices. Municipalities also have indirect influence over other elements such as private transportation and residential, commercial and

industrial practices (FCM, 2006). Cities bear a large responsibility for emitting emissions and are the level closest to the people; and consequently, could be the keys to alleviating climate change.

Betsill and Bulkeley (2006) argue that because GHG emissions originate from processes that are embedded in specific places, that it is often the local level that is the most appropriate political jurisdiction for bringing about necessary reductions in these emissions. Municipal governments, because they are more directly involved in local activities and more aware of local conditions and opportunities, are therefore well positioned to be able to capitalize on emission reduction opportunities within their own jurisdiction (Harvey, 1995). Lutsey and Sperling (2008) agree in that lower level engagement is fundamental to real, long term progress. They suggest that there must be a local commitment from government to business and industry down to the individual in order to accomplish the type of economic and societal transformations that will be necessary to achieve very large reductions. Again Betsill and Bulkeley (2006) support these examinations by proposing that municipal governments can facilitate action by others by fostering partnerships with relevant stakeholders, encouraging public participation and lobbying national governments.

Although some studies focus on a municipality's obligation being closest to the people or their responsibility in contributing to emissions, Wilson (2006) speaks mostly to adaptation as a driver for creating municipal action. This is mainly due to the likely impacts that climate change will have at the local level. His research states that there will be huge implications for land uses, activities and policy areas over which municipal planning intervene. Building climate change considerations and mitigation strategies into planning processes and systems allows early action, which should be more cost effective than responding to changes as they happen or in hindsight. He argues that these costs would be considerably less than the 'do nothing' option.

Societal forces such as population, affluence or technology drive the varied human activities that produce GHG emissions (Kates & Wilbanks, 2003). Angel et al. (1998) concurs with these drivers and uses the IPAT theory to investigate local level emissions. This research points out that most driving forces of global change are fashioned around this model that relates environmental impacts (I) to population growth (P), affluence (A), and technology (T). Figure 2 shows the scale of climate change action and consequences using four scale ranges. This representation demonstrates that while climate change is truly a global phenomenon, most of the specific actions that lead to climate change and its impacts on nature and society take place at smaller scales. Sovacool and Brown (2009) indicated that the matching principle in environmental law suggests that to be successful, the level of jurisdictional authority should match the scale at which these impacts occur.

Local Solutions

Harvey (1995) investigates the City of Toronto's role in assisting the national action plan in limiting GHG emissions and discovers that municipalities can play important roles in realizing significant emission reductions by: facilitating comprehensive, city wide building retrofit activities that could include private partnerships; by implementing community integrated energy solutions involving district heating and cooling, and cogeneration of electricity can significantly reduce emissions; and by promoting urban intensification and land use planning which will minimize the generation of automobile trips and, for those trips generated, minimize distances involved.

For a municipality to engage in these actions in the context of large scale government policies, Kates and Wilbanks (2003) suggest that local governments require the following: (a) greater control for local communities over a significant portion of their emissions, (b) local

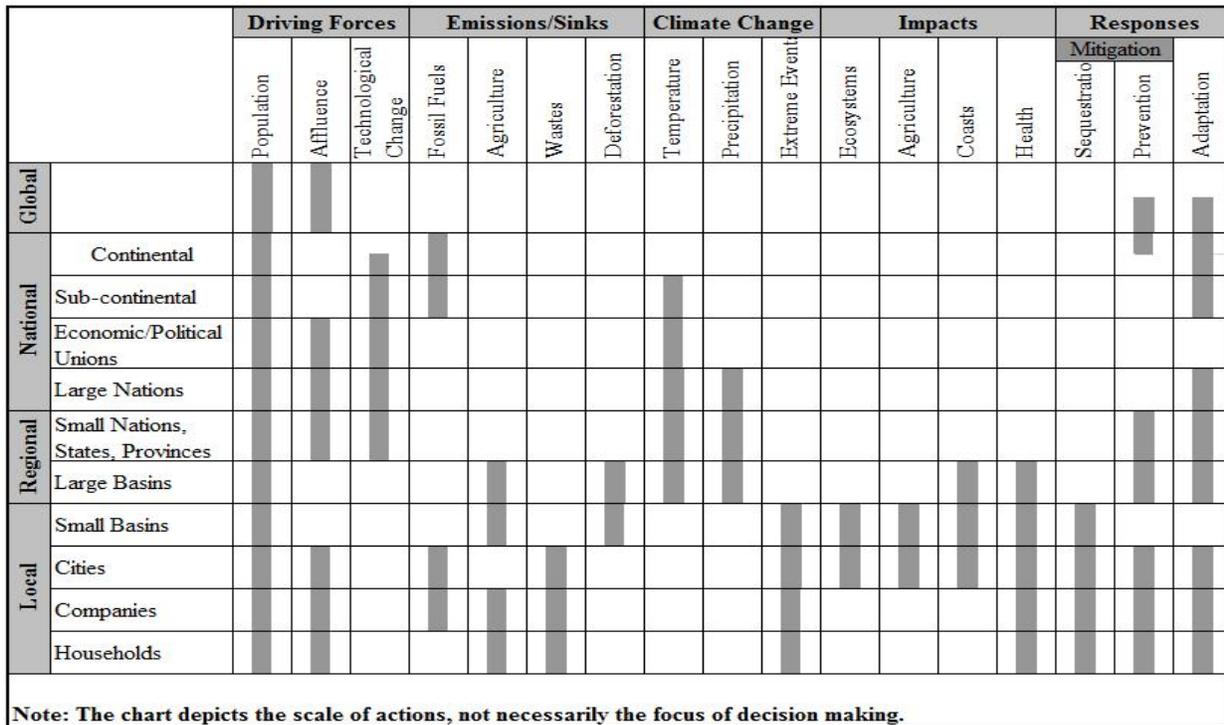


Figure 2. Scale domains of climate change.³

understanding and will derived from a shared belief that emission reductions is in the interest of the area. To appreciate the driving forces beyond the local level, there must be an understanding of how and why a community creates GHGs, and (c) access for the community to technological and institutional means that are not currently available. Fleming and Webber (2004) found that where authorities have made progress in fighting climate change there has been a combination of strong political and administrative support, strong expertise and technical knowledge of the issues amongst professionals, and a heightened awareness amongst the general public. In addition, they suggest that targets could be achieved through partnerships with key stakeholders

³ From Kates, R., & Wilbanks, T. (2003). Making the global local (cover story). *Environment*, 45(3), 12. Retrieved from Environment Complete database. Adapted with permission.

and a more effective exchange of experience between the successful and less successful of local authorities.

By embarking upon GHG reduction initiatives, municipalities realize a number of benefits, including better air quality, improvements in public health, reductions in traffic congestion and greater urban livability (Betsill, 2001b; Lindseth, 2004). In addition, there can be considerable economic advantages, such as lower costs of municipal operations and local job creation. Incorporating environmental objectives can improve the competitive position of cities in their challenge to attract investments, business and high skilled workers. Local action fosters diversity, which encourages innovation and experimentation. Localism also tends to be more representative, which creates variability in policy that better matches local interests and preferences (Sovacool & Brown, 2009).

Function Specific Route and Reframing for Local Governance

Various studies demonstrated a common theme amongst drivers for local action. A fundamental problem is that climate change is generally framed in global terms. In most communities, concern for climate change is based on the recognition that it has these links to other local issues, such as air quality, economic savings, or growth. Lambright et al. (1996) refer to this as a function specific route, where local officials focus on the fact that controlling GHG emissions helps them address other issues on their agendas. In Betsill's (2000, 2001a) work, she suggests that cities realize the co-benefits of climate action and reframe as a local issue when the preferred policy response (controlling GHG emissions) can be linked to issues already on the local agenda. A frame is an idea through which political debate unfolds and political alignment and collective actions take place. In the context of climate change, Lindseth (2004) suggests that it must enable actors to work with the problem in a local context, and that successful framing

requires establishing a coherent method of describing social reality. Framing would translate this issue into understandable categories, which provides an explanation for why climate change is important, and shows how cities can work with this issue.

Obstacles for Successful Local Reductions

By surveying numerous municipalities, Robinson and Gore (2005) uncovered barriers to Canadian local response. Some of these obstacles included information gaps, lack of capacity, willingness and resources, and a division of authority amongst other levels of government. In addition, Betsill (2001b) suggests that controlling GHG emissions require collaboration between officials working in the areas of waste management, transportation, public works, utilities, health, land use planning and air quality management. She also claims that without financial or jurisdictional support from higher levels of government, taking action can be difficult for many municipalities. This division of responsibility across three levels of government in Canada presents a formidable challenge to overcoming capacity barriers. DeAngelo and Harvey (1998) are in agreement and state that these institutional barriers just add to the difficulties that cities face when trying to move from political rhetoric to policy action.

Further to these above mentioned impediments for successful local action, some of the initiatives that are being considered successful are upon closer examination realized reductions from policies and programs that were previously in existence (Betsill, 2001b). In other words, she is revealing that cities are merely repackaging existing efforts as climate initiatives and are not going beyond the business as usual. Lutsey and Sperling (2008) point out that the adoption and pursuit of targets, goals and potential reductions are confused with actual mitigation performance. They state that what has been accomplished still falls far short of the much deeper long term cuts that will be needed for global stabilization.

In Summary

Municipal action on climate change has many influencing factors that can aid in the reduction of GHGs, but can also create stumbling blocks that inhibit advancement of action. Local strategies require a multi-layered governance perspective, whilst maintain a framing of local issues. With the Country currently striving for unattainable emission reductions, municipalities have an opportunity to assist in mitigating climate change for the nation, which will also address the needs of a community that is aiming for a more sustainable future. It is clear that various stakeholders have influence over what action is taken at the local level. This research investigates those perspectives in order to gauge the readiness and willingness at the ground level, and how this can be transferred into successful action that can supplement other governance structures.

Chapter 4: Results

Evaluation of Alberta Municipal Strategies

A review of Alberta based climate change strategies was completed in order to bring strength to the examination of local level actions. In order to provide similar context to the Strathcona County case study, five municipalities in Alberta were selected for review. Each municipal government has either adopted specific climate change oriented plans or is well known for their sustainability efforts and strategies. The two large urban centres, Calgary and Edmonton, were both selected for the influence they hold in the province, as well as the sizeable population (65 per cent) that they represent within Alberta (Government of Alberta, 2009). Medicine Hat was selected based on its comparable size to Strathcona County, in addition to the provincial recognition it has received for their Hat Smart sustainability initiative (Alberta Emerald Foundation, 2009). Another community that has received a great deal of recognition for their sustainability movement and claimed to be the ‘greenest community in Canada’ by Prime Minister Harper is the small Town of Okotoks (Gray, 2009). The Town of Stony Plain, which is similar to Strathcona County in that it is a suburb of Edmonton, has recently adopted a climate protection plan for their corporation and the community.

As summarized in Table 3, the municipal initiatives were reviewed based on their corporate and community strategies, targets and measures. The evaluation considered the advantages and limitations of each approach, and the ability to achieve results to date. In addition, consideration was given to each municipality’s involvement with transnational organizations, such as FCM’s Partner for Climate Protection program, and other partnerships external to the organizations.

Table 3. Evaluation of Municipal Strategies

Municipality	Climate Change Strategy	Partnerships	Evaluation	Results
City of Calgary (2006)	2006 Climate Change Action Plan Target of -50: City of Calgary Corporate and Community Outlook on Climate and Air Quality Protection	Member PCP in 1994 and have completed 5 milestones at the corporate level and 4 for the community strategy	<p>Corporate</p> <ul style="list-style-type: none"> reduction of 50% below 1990 levels by 2012 (revised from 6%) green power commitment of 75% (bulk of reductions) identify sources, forecasting and requirement of regular reporting very detailed strategies, partners and status documented completed or ongoing initiatives no specific targets or estimates on reductions for action areas <p>Community</p> <ul style="list-style-type: none"> reduction of 20% below 2005 by 2020 and 50% by 2050 to create a dialogue with community and private sectors identified partners and performance targets for specific action areas short, mid and long term strategies did not identify mechanisms for implementation did not identify communication or public consultation strategy 	<p>As of January 2009, Calgary reduced GHG emissions from municipal operations by more than 34% over 1990 levels, and are on track to exceed previous targets. The City expects to achieve a 63% reduction of total municipal GHG emissions by 2012, and to reduce emissions from electricity to zero.</p> <p>The City's new goal is to reduce its corporate GHG emissions by 20% by 2020 and 80% by 2050, based on 2005 levels, and to pursue parallel strategies within the community.</p>
City of Edmonton (1999, 2006, 2007)	1999 City Operations GHG Emissions Reduction Strategy Plan	Member of PCP in 1995 and have completed 5 milestones for both the corporate and community levels	<ul style="list-style-type: none"> targets a reduction of 16% of GHG emissions from 1990 levels by 2008 GHG emissions plan outlines four strategies for reduction but they are very broad with no direction or guiding documents (ie. how?); no details on specific actions outlines levels of reduction strategies by planning and implementing stages, and expenditure costs and savings strategic plan is more detailed and ties to GHG plan 	The GHG emissions plan is currently under review and is scheduled to be updated by the summer of 2010.
	2006 Environmental Strategic Plan		<ul style="list-style-type: none"> targets a reduction of 6% of community GHGs below the 1990 levels by 2010 and a 20% reduction by 2020. Initial plan started in 2002, but was reviewed in 2007 targets residential and corporate sectors focus on public recruitment, awareness and education inform on partnership with provincial and federal programs supporting GHG monitoring, verification and reporting procedures 	In 2006, the City recognized that, despite the efforts of the CO ₂ RE program from 2002, GHG emissions will not meet the goal of a 6% reduction from 1990 levels by 2010 and 20% by 2020. Because of this, a Strategic Review of CO ₂ RE was conducted in early 2007.
City of Medicine Hat (2008)	2008 Hat Smart - Community Environmental Roadmap	No memberships noted.	<ul style="list-style-type: none"> no specific GHG targets or action plan holistic approach that outlines environmental priorities for community, three (renewable energy, energy conservation and air quality) speak to the importance of GHG reductions indicators and targets for each priority focus on "what has been done" and quiet attention to action opportunities 	No reporting completed to date. The City's Environment Department has set out in its 2009-2011 Business Plan to include reporting on compliance of the Community Environmental Roadmap.
Town of Okotoks (2009)	No direct strategy. Guiding documents: The Legacy: MDP, Resource Recovery Plan	Member PCP in 2000, but has formally not achieved any milestones	<ul style="list-style-type: none"> holistic approach in pursuit of sustainable development and planned community growth secondary benefits of GHG reductions, but not primary driver key targets have been set for 2030 population, density, water use, waste generation, open space and commuting. 	Okotoks reports bi-annually on progress toward achievement of key sustainability targets. Targets were updated in 2008 recognizing some achievements and some areas needing work.
Town of Stony Plain (2007, 2008, 2009).	2007 Partners for Climate Protection Milestone 1-4 In addition, the Town launched a Community Sustainability Plan in 2007.	Member of PCP in 2006 and has completed 4 milestones at both the corporate and community levels	<p>Corporate</p> <ul style="list-style-type: none"> targets a reduction of 20% below 2000 by 2016 very detailed inventory, forecasting, actions & performance measures tied actions to fiscal and energy estimates <p>Community</p> <ul style="list-style-type: none"> targets a reduction of 6% below 2000 by 2016 tactics, implications and performance measures timeframe communication strategies 	Milestone 5 has not yet been completed for reporting and monitoring of progress.

Strathcona County Guiding Documents

The MGA is Alberta's provincial document that provides a legislative framework under which Strathcona County can govern. The MGA outlines the purposes, powers, capacity and jurisdiction that a municipality holds within its borders. The legislation states that the purposes of a municipality is to provide good government, services, facilities or other things that, in the opinion of council, are necessary or desirable for all or a part of the municipality and to develop and maintain safe and viable communities (MGA, 1995). As opposed to a municipality referring to the legislation to see whether it is permitted to do a specific act, the MGA guides municipalities to interpret whether there is a specific prohibition to taking actions.

Strathcona County (2009a), in consultation with the public, established a Strategic Plan in 2003, which identifies the values held by stakeholders within the community. The community consultation process included residential and business telephone surveys and online questionnaires; in addition, public written submissions were encouraged, and focus groups were conducted (KPMG Consulting, 2002). The Plan provides two elements that make an attempt to attain a desirable future for the county and its residents. First, is a framework as outlined in Figure 3 that aims to ensure a sound process is in place for decision making. This foundation is used to provide guidance for governance, community development and service delivery. It identifies the need to consider three things: (a) how the decision aligns with the needs and wants of the community, (b) how the decision will affect the well being of residents and the sustainability and economic viability of the community, and (c) how the decision will affect the county's ability to serve its residents. The county notes that two critical inputs for this process to work are good communication with stakeholders, and the responsible management of resources. Second, the Plan outlines a strategic direction that describes the county's vision for the future

and, their goals and strategies for achieving that vision. In 2009, county council revisited the Strategic Plan to update it and develop specific measurements to assess the county's progress towards its goals. Where the county did not previously have any specific evaluation tools, the addition of these key performance indicators are proposed to weigh implementation results. The Plan is intended to emphasize a triple bottom line approach that strives to balance social, environmental and economic positions. In 2007, Strathcona County Council adopted the Social Sustainability Framework that outlines a comprehensive guide to building a healthy and compassionate community. The next steps include completing an environmental equivalency, followed with the preparation of an economic guiding document.

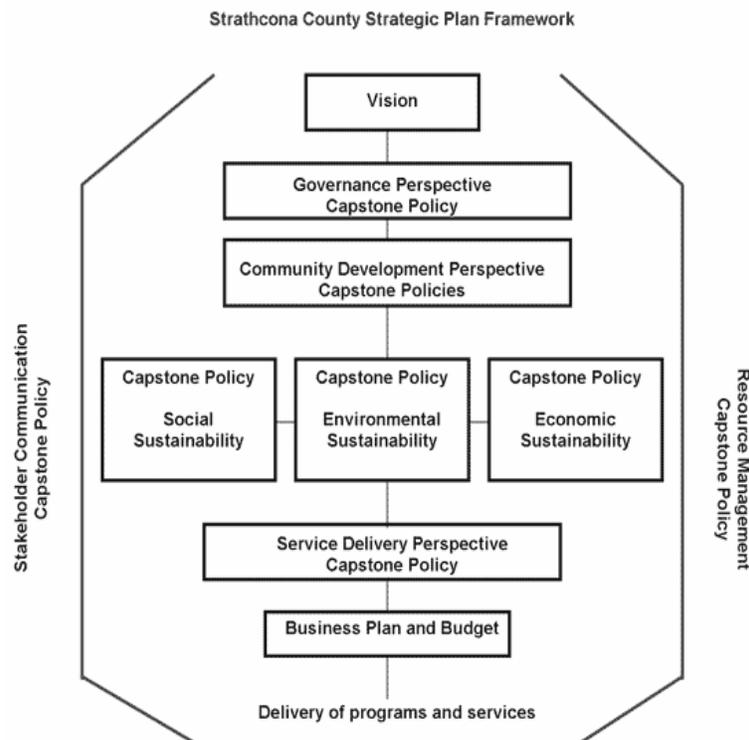


Figure 3. Strathcona County's Strategic Framework.⁴

⁴ From Strathcona County. (2009a). *Strategic plan*. Reproduced with permission.

In relation to this research topic, one of the guiding principles of the Strategic Plan falls under the environmental sustainability capstone policy. The goal sets out to achieve community sustainability by preserving the county's unique natural environment by directing and managing growth through proactive plans and sustainable development policies that display a strong sense of stewardship. In addition, one of the strategies outlines the importance of working with federal and provincial bodies, as well as industry and other partners to ensure that air and water quality meets or exceeds approved standards.

The key performance indicator for this environmental strategy is the Environmental Sustainability Framework (ESF), which was adopted in 2009. The framework is intended to assess the impact of changes to municipal operations on the environment, residents and the community. It is designed as a tool to guide new policies, and to help strengthen the county's commitment to integrated planning of environmental, social and economic factors. This framework is designed to help prioritize and plan for future environmental concerns. It establishes five environmentally specific themes, two of which, air emissions and energy, have direct connections to climate change. Although neither theme specifically sets targets for GHGs, a recommended strategy outlines the need to develop an inventory and plan to manage the County's emissions. In effect, this document was written without mentioning climate change as a concern or a focus for the municipality, and does not link the recommended emissions strategy to a specific goal. The other remaining themes, land, water and material use, have indirect benefits for GHGs. The ESF is mainly a tool that recommends strategies for corporate processes, but suggests that it can be applied to relevant policies that could be implemented community wide. However, this statement is lacking focus and direction for future strategies.

In addition to these high level steering documents, Strathcona County has invested resources to the establishment of a balanced development and growth plan for the community over the next 20 years and beyond. Through its Municipal Development Plan, Strathcona County (2007a) has stated a commitment to sustainable development, growth and environmental management, and improved transportation systems. The four principles they use to guide sustainable development are outlined in Figure 4. An example of Strathcona County's response to the pledges they have made is through a recent development initiative, the Emerald Hills Urban Village (EHUV). The EHUV is a pilot project that was chosen to implement the Sustainable Urban Neighborhood (SuN) Living application, which was initially developed through Natural Resources Canada (NRCan) according to Mayhew and Campbell (2008). The EHUV contemplates the One Planet Living concept for the project which attempts to provide a high quality of life while minimizing their ecological impact, and living within their fair share of the Earth's resources. The purpose of the SuN Living approach is to try to incorporate multiple contexts and various players in an attempt to generate new thinking, visioning and doing development. The approach strives to achieve a neighborhood that enables and fosters sustainable lifestyles both during design and once the infrastructure and buildings are in place. The SuN Living is a different approach to addressing challenges that Strathcona County as an urban centre faces in terms of development and growth. Even though the SuN Living concept recognizes the need to foster sustainable behavior once the neighborhood is occupied, only time will tell on whether the county can achieve this target and truly attain sustainability.

It was found that Strathcona County's guiding documents do not specifically tackle GHG emission reductions. Their focus is founded on a sustainability lens that applies a more consolidated approach to areas of municipal influence. The county has stated that its strategic

plan and other guiding documents will evolve with the community, its changing profile and the needs that emerge from those changes.

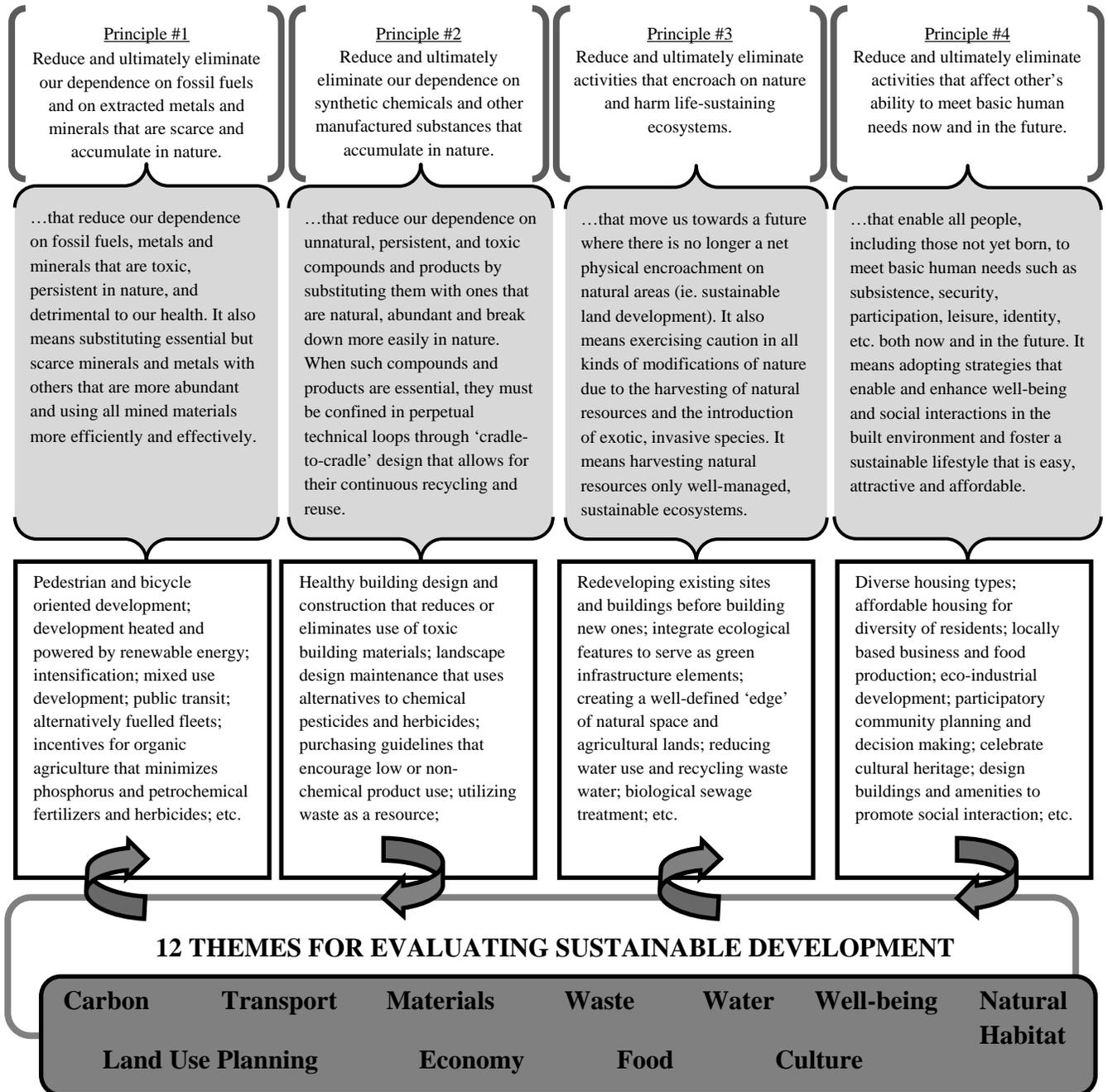


Figure 4. Strathcona County's 4 principles for guiding sustainable development.⁵

⁵ From Strathcona County. (2007a). *Municipal development plan Bylaw 1-200*. Reproduced with permission.

Survey Responses

Of the 33 decision makers invited to participate in the online survey, 16 people responded. Figure 5 breaks down the 48 per cent participation rate by role within the organization, and compares it to the potential participation; an analysis was also conducted on the participation rate within each level of decision making. Appendix C provides a full summary of the responses for each of the survey questions. The responses from the survey were categorized into noteworthy and recurring viewpoints and formed the basis for the interviewee selection. Of particular importance to the choice for interview candidates was the question that asked respondents to rank what they viewed as important in terms of where a municipality could place its focus for GHG reductions. The significant areas were analyzed based on total points (Ranking 1 = 5 points; Ranking 2 = 4 points; Ranking 3 = 3 points; Ranking 4 = 2 points; Ranking 5 = 1 point) and proportion of each ranking level. Figure 6 displays this evaluation and classified each focal point that Strathcona County decision makers ranked.

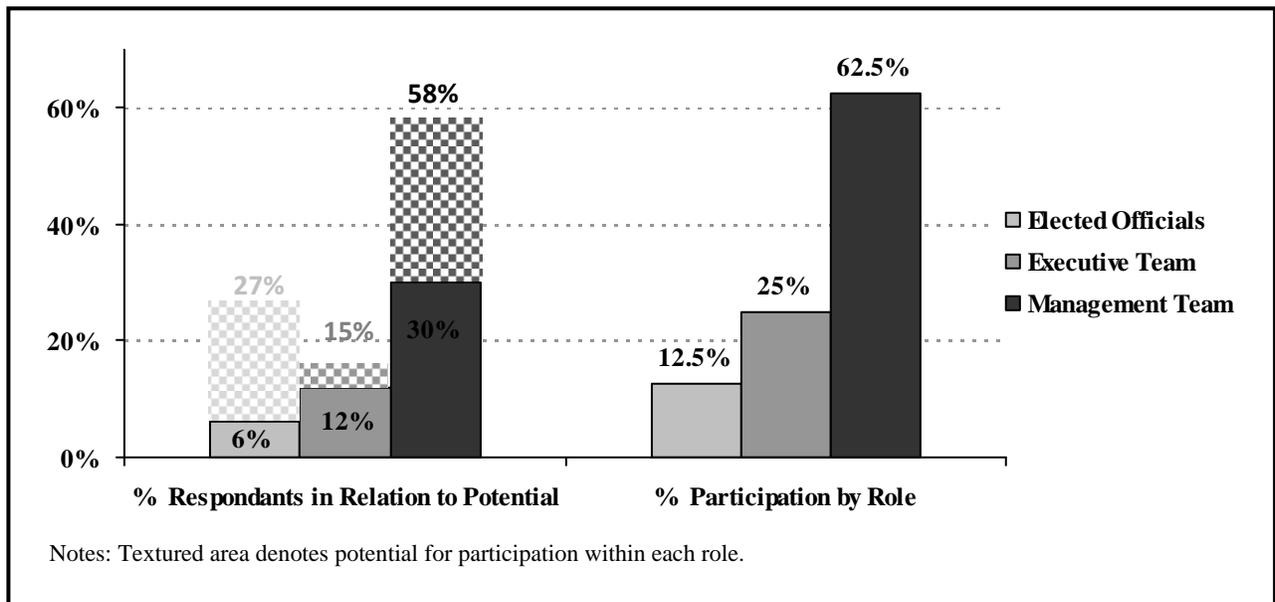


Figure 5. Survey participation.

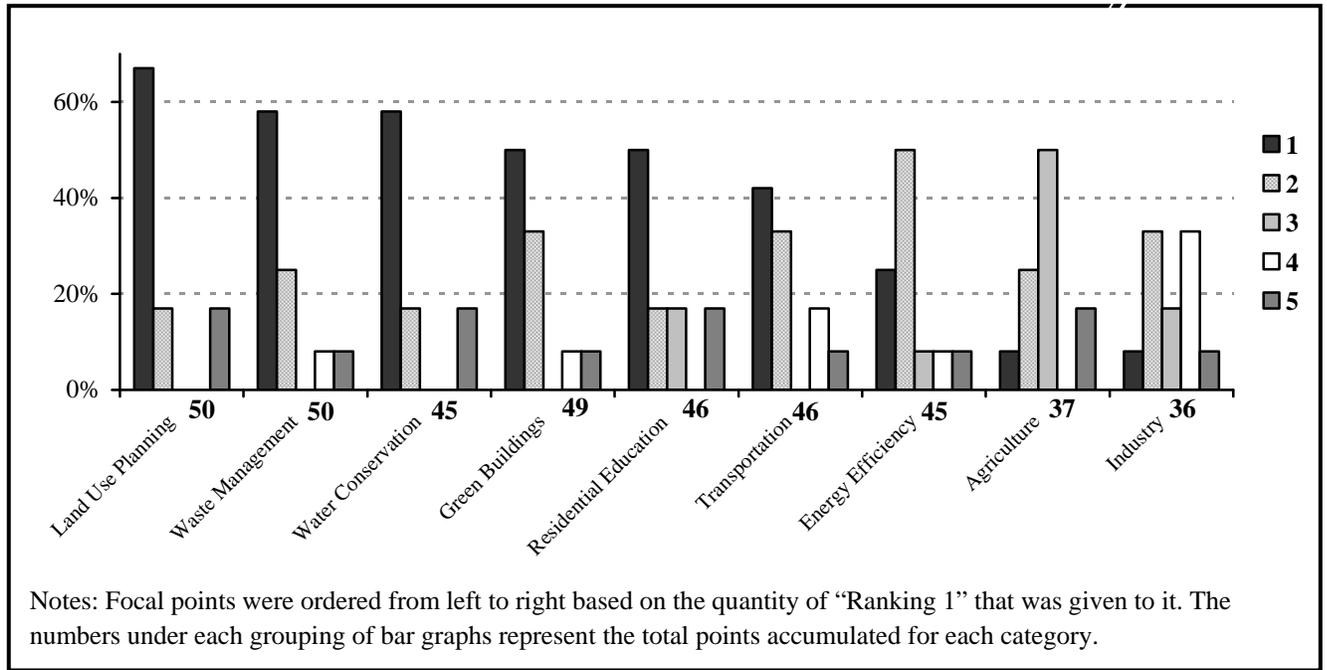


Figure 6. Rankings of municipal focal points for climate change action.

Interview Results

Detailed responses were received through the interview stage from a variety of decision makers that have a stake in municipal climate change action. These perspectives that offer diverse viewpoints are summarized for each interviewee in Appendix D. Table 4 provides a summary of the common perspectives, with the following sections offering a more inclusive view of the evaluated and categorized results supported by key quotes from participants.

Table 4. Summary of Common Perspectives From the Interview Results

Category	Consensus Positions
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Roles and Responsibilities

- All governments have a role to play in addressing climate change.
- Federal action needs to drive change downward.
- Provincial authority over municipalities creates jurisdictional barriers.
- Hierarchy of governments must be respected.
- It should be a priority at the local scale where there is a connection to business community and residents.

- A municipality needs to focus on where it can have the most impact.

Benefits

- Economic efficiencies, as well as impacting positively the health and well being of the community.
- The county has a reputation for leading, which provides the ability to move forward on climate change at a quicker pace.

Barriers

- Authoritative complexities create a misapprehension around who has the appropriate jurisdiction.
- Challenges exist in having to manage additional funding responsibilities, which creates the reliance on external funding opportunities.
- Capacity does not allow for long term planning.
- Financial process does not address all true costs.
- The flow of information through the organization can be challenging.
- Lack of awareness of barriers prevents plausible solutions.

Band Aids

- Addressing communication needs by focusing on leadership within the organization.

Land Use Planning

- Need to rethink the way neighborhoods are built to provide a range of opportunities for employment and liveability.
- Movement towards protecting core areas that have significant environmental and social value.

Transit Planning

- The county (and Alberta) is very vehicle dependant with over 15 per cent of the province's emissions produced by the transportation sector.
- Municipalities can directly affect via supply and demand mechanisms.
- Hybrids were stated as a solution, but tradeoffs need to be analyzed.

Integrated Community Energy

- There is growing interest for community energy strategies as a system that focuses on renewable sources, as well as reducing the demand.
- The county is positioning itself to alternate fuel sources and focus on district energy.

Connect to community

- Attributing the reduction of GHGs to mainstream issues in the community will create beneficial outcomes.

Rooted holistic approach

- Create a culture of sustainability in the corporation and community.
- An approach must envelop and intertwine all elements of sustainability into policies.

Support and partnerships

- Collaborative efforts will achieve successful action not regulations.
- Builds capacity and trust between partners to address GHGs, because working cooperatively will achieve common benefits.

Foster learning and communication

- Require education of county staff and politicians, as well as external stakeholders, such as developers and businesses.
- Focus on a variety of motives that will drive action.

Industry

- The County is attractive to industry; focuses on building relationships.
 - There is consensus on industrial emissions being a barrier, as it is a difficult provincial boundary to cross.
 - Shifting to economic incentives to influence eco-industrial principles; this implies the recognition of sustainable development benefits.
 - Encourage industry to reinvest in the community.
 - Overall, the industrial sector needs limits and regulations.
-

Recognition of Roles and Responsibilities

All interview participants agreed that every level of government needs to have a role in the reduction of GHGs. It was stated by four participants that because the federal government has a global view, they have an overarching responsibility to be a leader that would resonate down to the lower levels. Some interview participants acknowledged the provincial efforts being made to abate GHGs (mostly targeting industry), but most candidates focused on the barriers that the province creates for a municipality to achieve reductions. Participant E specifically stated that “we are limited under Alberta’s MGA and that hamstrings us on a lot of environmental issues.” Another participant empathized with this, suggesting that the province has a variety of interests

that it needs to represent, and that the province is in a difficult position to address its carbon footprint and the fact that it heavily relates to the economic standing of the province.

When questioned about the local level role, every interviewee acknowledged that municipalities play a role in climate change action. The provincial perspective acknowledged that municipalities “are on the front lines of climate change. You’re seeing it and interacting with the consumers. We know there is a gap... let’s figure out what the ability of municipalities is to do something.” It was indicated that it is the County’s responsibility to their current and future residents to ensure that environmental aspects of the community are safeguarded, which includes the reduction of its carbon footprint. Participant G suggested that because Strathcona County is an affluent community, with additional taxes from industry, they “have enough money to patch roads and then take on some altruistic tasks... we have that discretionary income that allows us to think about environmental initiatives.” In terms of accountability and liability, participant E stated that one responsibility of political leadership in the community is “to represent the public, but the other is to be ahead of issues so that you are not getting yourself cornered.”

Benefits, Barriers, and Band Aids

There appears to be an implied understanding that with an environmental focus the county is acknowledging the residents’ support for a sustainable future, and that many benefits can be realized in tackling GHG reductions, such as the improvement of the health and well being of the community, as well as the creation of efficiencies, which produces economic benefits. It was evident through all of the interviews, that there are high expectations for the county being a leader; one individual stated that “we have already lead and are leading the way in so many areas.” In addition to respecting its reputation, one viewpoint suggested that focusing

on GHG reductions, sustainability and eco-industrial principles, is “important as it’s going to make us competitive,” and thus attractive for economic development.

All participants agreed that these benefits do not come without barriers. In regards to the County being a leader, one participant indicated that pushing forward usually resulted in going past the boundaries and mandate of a municipality, which resulted in jurisdictional complexities. This corresponds with another consideration made, which stated that “most GHG emissions are a result of economic behaviours that are outside the ability of a municipality to affect.” It was suggested that the jurisdictional disparity causes a gap and disagreement in action. One high level decision maker stated that municipalities tend to skirt around the jurisdictional argument, as it can lead to taking on additional initiatives that require additional financial responsibilities. It was implied by many that funding is in most cases the reason for seeking partnerships with other parties and levels of government. The provincial representative believed that municipalities need to get more creative in search of financial opportunities. He stated the following:

There is a bigger appetite for the provincial government to be involved where there is some form of multi-lateral partnership in place, but if it’s solely money that municipalities are after then the pots that we have to work with on the climate change side are different than perhaps what the transportation or infrastructure has as a department... municipalities need to tap into the business planning decisions of these other departments rather than asking just to tap into the climate change fund.

Like any other organization, the county faces its own struggles internally. One perspective claimed that day to day matters took priority, in particular in operational departments, opposed to the long term road mapping that was required for climate change action. In regards to the fiscal process, three decision makers claimed that the County does not address all costs, such as the

long term social and environmental costs. Moreover, it was suggested that not all true costs, for such things as energy, are evident to each department as they are hidden in the budget process, which makes it difficult to see the benefits of efficiency and improvement. One participant recognized that communication within the organization was a struggle, as communication upward seemed to be more effective than across and down levels. When questioned further, it was suggested that there are formal reporting mechanisms in place to share information upwards. In communicating down or across the organization, this has typically been casual and unreliable, leaving individual decision makers for departments and projects to share information through their own methods. Interviewee C suggested that a remedy is in the works and that there is an attempt to improve communication channels; through Strathcona County's leadership workshops and department reviews, slowly communication is opening up and the county was starting to "move forward in a concerted effort that really will get us excited about where we can be and how the various departments can work together to realize the possibilities that exist."

In addition to all interviewees agreeing that barriers exist, one particularly interesting point that surfaced from an external participant suggested that these local level administrators and politicians are "often not even fully aware what their obstacles are yet, but are at a much coarser level." This implied that to achieve action, it is equally important for municipalities to be aware of the barriers they face as it is for them to actually be able to overcome them.

Emerging Solutions

Through the interview process, participants advocated for solutions to the reduction of GHGs, which are emerging in order to assist local level action. This next section will elaborate on those perspectives.

Land use planning. There appeared to be consensus by many participants that municipalities have authority over land use planning and indicated that reductions at the local level will be significantly increased if the county focuses on smart urban design, building for the environment and creating a balance of work, live and play. Interviewee G stated “that the silver bullet for municipalities is to redesign communities, so that you can work, have your schools and your stores close by... actually giving you a fighting chance of walking in your community.” By giving many examples, such as increasing energy efficiency, augmenting density, supporting transit use, encouraging walkable communities, and fostering environmental behaviours, participants pointed out that this will result in positive climate actions.

In addition, one perspective on the county’s land use planning suggested that there has been a shift to protecting core areas of land within the community. In fact Interviewee E indicated “that at the time of Alberta’s economic boom, we were the only municipality that actually down zoned land, which was absolutely unheard of.” This meant that restrictions for land use were placed on core areas due to their environmental and conservation value. This participant suggested that the natural capital concept is critical for a sustainable Strathcona County; he identified land use as being about more than the money it can generate for the county, but for other aspects that are equally important, such as clean air and water.

Transit planning. Some interview participants indicated that transit and transportation planning was an important focus for a municipality to concentrate efforts in order to reduce GHGs. Interviewee D pointed out that “land use orientation has a massive impact on whether or not the transit is an attractive alternative for the car.” This individual declared that mechanisms need to be put in place that make transit attractive and encourage people to get out of their car, such as road pricing, parking fees and vehicle/driving taxes. In terms of switching to a hybrid

fleet, it was declared that the county has invested in some (15 of 86) hybrid buses, but suggested that the tradeoffs have to be analyzed. The expert on the subject stated the following:

the real promise of a hybrid is that you are going to be more fuel efficient... for the price of hybrids, I can put three regular buses and get more people using transit and more cars off the roads... I would suggest getting more cars off the road would save more GHGs.

Integrated community energy. Some perspectives outlined the importance of a community investigating integrated energy solutions, both the supply and demand. Five of the participants indicated that reducing our reliance on non-renewable energy was pivotal for changing a community's footprint. One participant stated that "we need to be boosting our reliance of fossil fuels onto something else and to other areas such as alternate fuels... really the alternate fuel needs to become oil and gas." Another pointed out that the County is well positioned for this through its operational district energy system, which has the ability to use renewable sources and energy from wastes. It was also outlined that the county is strategizing on how to expand its district energy into other areas of the community. In relation to demand, a few participants indicated that this could be achieved through sustainable developments that focused on built for the environment concepts (building materials, solar orientation, grey water use, etc.) that reduces the need to draw energy. It was indicated by participant H that this new interest in developing a road map for community integrated energy is opening up discussions between different levels of government, which is providing the foundation for the new program under the federal ecoAction banner. She enthusiastically stated "it's an exciting time because at the political level, the provincial and federal governments are collaborating and bringing together people from industry and energy associations in a really constructive way."

Connect to the community. In order to be relevant at the municipal level, it was thought to be necessary to connect climate change to the everyday discourse. For example, Interviewee B discussed at length the local concerns over air quality and health related issues being within close proximity to heavy industry in the area; this decision maker suggested that by correlating GHGs to a health perspective started to make climate change “transferable from the tree hugger to the measurable person.” Several of the participants related the beneficial outcomes of reducing GHG emissions to appeasing residents’ anxieties about health, safety, social wellbeing and financial conditions. One participant was quite candid and suggested that any course of action, regardless of the motive, that results in a reduction of GHGs should be seen as a success.

Rooted holistic approach. Four of the participants suggested that the key to long term sustainability and successful climate change action at the local level is to create an overarching policy that is holistic in nature. In addition, another participant was in agreement that to successfully achieve this vision, guiding policies need to be so intertwined and layered into the organizational focus that it is not easily disconnected. He suggested that this is particularly important in creating this stability as there is a constant rotation of elected officials, and on a smaller scale staff. In addition, one participant was quite passionate in stating that “it’s got to be the respective departments that have the respective budgets that need to have climate change incorporated into their decisions and business cases.”

Support and partnerships. Through conversations with all of the participants, it was evident that partnerships and memberships play an important role in Strathcona County’s decision making process. All interviewees suggested that it was through relationships that the county gained knowledge and expertise on topics such as climate change and the reduction of GHG emissions. Many of the interviewees suggested that Strathcona County is well known for

creating partnerships with the private sector, neighboring municipalities, and other levels of government, transnational networks, institutional and professional organizations and individual residents in the community. In speaking about developers, one participant also believed that “development was not simply about building structures and roads, but it was about building relationships and trust that ensured a successful sustainable community.” Participant I indicated that the connections that municipalities can make will “lead to linking concepts, ideas and technology to their objectives.” In addition a network organization can assist in connecting a municipality to funding, as well as the development of a business case. This particular participant offered the example of the FCM’s recent launch of the *Act Locally* campaign that relates GHG reductions to costs in hopes that municipalities will see the benefit of taking action.

Foster learning and communication. There was clear identification of the importance of education as a fundamental requirement of achieving successful GHG goals. Although some interviewees suggested basic concepts, such as focusing on school curriculums and children, there was definitely an acknowledgement that a degree of learning needed to be accomplished within the county’s corporate and community organizations. One decision maker stated “we want to work with them and understand what they are trying to accomplish and to educate them on what we are trying to accomplish.” In regards to community education on climate change issues, one decision maker suggested this education piece might be over. He felt that climate change is a well known issue, and “that we just need to focus on the fix not the problem.” In addition, this particular perspective also signalled that there is a need to educate residents on many potential benefits to a solution. His logic was that in an attempt to change behaviours, people have varying reasons for getting on board or partaking in a solution; therefore, it is necessary to build a platform of motives to assist in the education process.

Industry

Being that survey participants' ranked industry as a low priority of focus for the County, it was important to identify the reasoning behind this position, as industry produces the largest portion of Alberta's emissions. There was some consensus among candidates that heavy industry is the major component of the county's and region's emissions; however, it was quickly acknowledged that this is also the biggest barrier to tackle in terms of creating effective change. Interviewee F suggested that because industry is Strathcona County's largest source of revenue (taxes), it causes a short sightedness within the county. He stated, "I think our biggest barrier is probably big industry and the fact that we have no control over it and even though it's the biggest source of revenue... we truly live in a false economy, which puts us at the mercy of industry."

When asked why Strathcona County is an attractive location for industry, one participant offered two explanations: one, the county has heavy industrial zoning that is not common in many municipalities and two, the County "understands what it takes to work with heavy industry". He suggested that the county creates partnerships and often supports industry through regulatory matters with the province; this is often achieved through their membership with the Alberta Industrial Heartland Association. Another participant confirmed from a municipal perspective that "tackling the industry side of emissions seems to work well when you get a group of municipalities involved together." During the recent downturn in the economy, one interviewee suggested that in trying to attract new eco-industrial type of developments, Strathcona County has taken a proactive approach by waiving levy systems and encumbrances on land to encourage and entice this type of growth. In addition to supporting eco-industrial principles, a couple of interviewees suggested that Strathcona County would benefit from being proponents of carbon capture and storage, as an interim solution and to support a thriving

economy that positions the community well for balancing economic and environmental views. In contrast, another decision maker within the county thought perhaps that carbon capture and storage did not actually address the reduction of emissions and was just a quick fix solution.

In addition, a participant thought that municipal efforts could be directed towards encouraging the industrial sector to become social entrepreneurs of the community; recommendations proposed that the industrial sector should be required to reinvest and fund specific projects within the community that either assisted with GHG reductions or other environmental initiatives. Another participant added that if industry “wants to stay in business in the long run, they are going to have to change the way they do business... I think we can play on that.” Although municipalities are making some inroads, it is believed that to make substantial movement forward on tackling industrial emissions they will require a shift in regulation and market mechanisms. One participant suggested that large emitters in the county will not change their technology or make advances in their operations without knowing what limit they will be tied to. Until this time, he indicated that they will continue to comply with the provincial regulation by paying into the technology fund as opposed to actually improving their emissions.

In Summary

Based on reviewing various action plans and discussing viewpoints with relevant decision makers and other external stakeholders, it is evident that municipalities are recognizing the potential for climate change success at the local level. This acknowledgement suggests that the need to take a multi-scale approach is vital. Additionally, there is more of a movement now towards focusing on the solutions, as opposed to concentrating on the problem and its restrictions. Based on Strathcona County as a case study, municipalities are finding opportunities to create change and implement action. There is an emerging trend that reflects the local

connection to climate change and values a holistic position. It is evident that land use planning will be vital to the success of local action and will greatly impact other areas of importance such as transportation and energy. Although there are barriers to overcome, it is evident that municipalities, such as Strathcona County, are recognizing the need to institutionalize these overarching concepts of sustainability that benefit the reductions of GHGs.

Chapter 5: Discussion

This chapter interprets the results in Chapter 4, and builds a case for the recommendations in Chapter 6. It opens by linking the viewpoints on jurisdictional complexities and the necessity of partnerships to the importance of looking at climate change from a multi-scale perspective. With this lens in mind, it is evident that there is respect for the intensification of action at the local level. Conclusively, the local level surge has propelled solutions to emerge that will assist in the reduction of GHGs. The results are supported by the literature and although it is recognized that barriers and challenges still exist, it is unmistakable that the municipal role in climate change is coming to fruition.

Multi-Level Collaboration

Support for a collaborative approach amongst all levels of government and relevant players, was a noticeable observation when examining the results and literature. Jurisdictional challenges create a blockade at the local level, and at the federal and provincial scales these apprehensions restrict the reductions necessary to achieve their commitments. Although the shared perspective is that there are still numerous struggles that take place within, across and between spheres and tiers of governance, movement is starting to occur. In studying the county, it is apparent that the perception of climate change solely falling under the responsibility of higher levels of government is quickly vanishing. The fact that there has been acknowledgement is in itself a significant stage, as it starts to allow the redefinition of roles of these various actors and their relationships in the governance processes (Betsill & Bulkeley, 2006).

It was identified that decision making competencies are increasingly shared between actors operating at the different levels of governance. In terms of the case study, it was indicated that through partnerships and collaborative efforts that aimed to balance and benefit all positions,

sustainable action was starting to emerge and success realized. Adler (2005) makes a case for this by indicating that when creating action, those who bear the costs of that action must also reap the benefits in order to achieve success. Furthermore, Fleming and Weber's (2004) research suggests that there must be an understanding of targets between partners, and that the more effective exchange of experiences between authorities will result in progress.

In addition, it was particularly interesting to discover that the transfer of information and planning has started to amplify between the provincial and federal levels, which suggests that perhaps climate change action within Canada is finally reaching a pivotal point where actors are aligning their interests with solutions in a beneficial way. Moreover, it has been acknowledged that the province values the cooperation between municipalities and private sectors; a future focal point will be placed on how municipalities can support the policy gaps. ICLEI Energy Services (2003) has advocated the partnership approach as a successful tactic to achieve GHG reductions. Although it was clear that industrial emissions are not yet on the municipal agenda to regulate, there was awareness that some inroads could be achieved through collaboration.

Angel et al. (1998) suggests that governments are gaining much experience about what works, how to leverage each other's efforts and how to link across jurisdictions and sectors. It is therefore important to step beyond the local, and to engage with the processes which shape local capacity and political will for sustainable development at multiple sites and scales of governance. In the Canadian context, this is critical because multiple jurisdictions must be involved in enacting climate change policy; policies will be more effective if they are consistent with those of other jurisdictions within the country (Jaccard & Rivers, 2007b).

Municipal Recognition and Institutionalization

As an outcome of this research, it is obvious that there is agreement that municipalities need to engage in climate change action. The plans and strategies adopted by Alberta municipalities indicate that the focus of GHG reduction is occurring at the local level. This indicates that communities are recognizing how and why they create GHGs, which Kates and Wilbanks (2003) suggest is an essential requirement to start taking action. Although Strathcona County has initiated a strong strategic direction for their community with a sustainability focus, the evidence suggests that they have not yet quantified emissions or specifically targeted GHG reductions at the time of this writing. Several decision makers indicated that their approach was more holistic that would result in benefits to climate change. In evaluating the various approaches from other municipalities within the province, it could be suggested that neither a targeted nor a comprehensive approach guarantees successful action.

Lambright et al. (1996) determined that successful municipal response to climate change evolves through stages. Their research reinforces a case for Strathcona County's action to date. The county is aware of the issues, and although their direction is not solely targeted to GHG reductions, they have triggered strategies to plan for a sustainable future. They have adopted specific policies and principles, as well as created frameworks to guide them. Through examples provided by interview participants, Strathcona County is also beginning to execute some of their vision and balancing their capstone policies when it comes to the implementation phase. Time will tell if the county is true to its stated Plan. Lambright et al. (1996) recognize that the last phase to any successful strategy needs to incorporate the institutionalization of the policies and approaches that drive action. This is a vital step, if not the most important one, as it creates a culture of sustainability. Several Strathcona County decision makers acknowledged this

importance of integrating and rooting the municipality's position on sustainability, and consequently climate change, into every facet of operations and decision making. Lindseth (2004) recognizes the importance of integrating climate concerns in to other sectors of local policy, such as traffic, economic development, urban and land use planning, housing, tax policy, etc. He implies that this entails recognizing that the environmental sector alone will not be able to secure climate objectives, and that each sector must therefore take on GHG goals.

While this is acknowledged by some, there is still recognition amongst decision makers that challenges do still exist. In Strathcona County's case, the uncertainty may still be present among some decision makers of how to best apply GHG reductions to their strategic plan and how to work within their municipal context. The research findings make a case for the need to connect the benefits of taking action to the community. Decision makers, and all stakeholders of a community, need to have an appreciation for the advantages of climate change action. By reframing global climate change as local problems that can garner local benefits, these matters can serve as hooks on which to hang the issue of climate change and prompt municipal officials to take action (Betsill, 2001a). Based on the participation rate of elected officials in the online survey, it could be deduced that the willingness to specifically target climate change is not yet on the political agenda, yet local problems and constituents' concerns typically garner attention from politicians. Public perceptions of climate change are important to consider as a potential obstacle to politicians; it is important that the priorities of council members and residents are mirrored (Robinson & Gore, 2005). By linking local concerns to several different motives for action, it is reasonable to think that action will grow. This indirect strategy focuses on the ways that emissions-producing activities are embedded in broader community concerns (Betsill, 2000). Betsill recognizes that the primary benefit of an indirect approach is that it avoids many of the

political debates about climate change science that have plagued international efforts to address this issue. Moreover, the reframing of climate change issues for the local level may also weaken any disagreements over jurisdictional authority, as creating local context for these issues will create relevancy and appropriateness for municipalities to take action.

Lindseth (2004) concurs and suggests that reframing the issue for the local context makes it more noticeable, meaningful and memorable, which contributes to community and capacity building. He points out that framing is a continuous task that must be carried out and must be adopted throughout the organization, and continuously endorsed, communicated and expanded. This position is relevant to the apparent barriers that were acknowledged through the interview process. Decision makers made it evident that willingness, information gaps, and capacity is still a shortcoming at the municipal level; however, there appears to be a shift within the county to strengthen communication channels, which will increase knowledge and appreciation for undertaking sustainable actions and creating climate change solutions.

Rising Trends

Through discussions and the literature review, it was discovered that at the local level emerging solutions are being investigated and implemented. In terms of opportunities for municipalities to reduce emissions, the results from the interview process confirmed much of Harvey's (1995) research. It was discovered that a municipality can generate the most reductions by focusing on: (a) the intensification of urban planning, land use, and transportation; (b) integrating energy solutions; and, (c) the creation of a building retrofit program. Betsill and Bulkeley (2006) confirm that local governments have considerable experience addressing environmental impacts within the fields of planning, energy management and transport; they have accredited many for taking innovative measures and strategies that can serve as

demonstration projects. In addition to these solutions, it is evident that municipalities need to take a non-traditional approach to fiscal management that will support climate change activities.

Land Use Planning

Based on the perspectives from Strathcona County decision makers and the other municipal stakeholders, it was clearly stated that sustainable land use planning is the overarching solution to climate change action at the local level. It is within the jurisdiction of municipal government to control planning and development processes within their boundaries. Decision makers recognize the need to create communities that are increasingly diverse and complex, with greater functional integration at all scales, from the building and site, to the neighborhood and county. This trend is becoming more common, as neighborhoods are evolving into ecological forms that are more effective at looping resources and cascading energy flows through multiple end uses (Sheltair Group, 2001). The adoption of the SuN Living application to guide Strathcona County through developments signals that the municipality is taking sustainability, and thus climate change action, sincerely. Furthermore the extent to which the county is being inclusive relays that it is the way of the future for the municipality. This is demonstrated through their fostering of relationships with the private sector, such as developers and industry. The county recognizes the need to understand these players and their intentions, in order to gain support for the municipality's strategic direction and goals. Stoett (2006) identifies the necessity to involve the business community, as it can improve the odds of climate change mitigation by pursuing a sustainable development agenda that is both broad and multilaterally oriented.

Transportation

In direct relation to land use form is transportation planning, as it is clear that land use is part and parcel with transportation emissions. Jaccard et al. (2004) recognizes the need to

develop urban form and transportation infrastructure that reduces vehicle reliance. Strathcona County appears to understand that land use orientation has a massive impact on the emissions from transportation. It was suggested that land use can drive the market for transit; intensifying density, integrating uses and creating opportunities for work, live and play within one neighbourhood will create attractive alternatives to the car. In addition, economic disincentives can drive people out of their cars, yet these types of tools are just starting to emerge and typically on a broader scale. Given that Strathcona County is a bedroom community to the City of Edmonton, and part of the Capital Region, it seems unlikely to be adopted at the county level without the participation of other regional efforts.

Alternatively, Randal O`Toole (2008), a policy analyst for the CATO Institute, has completed research specific to rail and bus transit and concludes that these forms of transport actually use more energy per passenger mile, and generate more GHGs than the average modern passenger vehicle. However, he does acknowledge that alternatives can do far more to reduce energy use and GHG outputs than rail and bus transit, at a far lower cost. Such alternatives include the following: (a) powering buses with hybrid-electric motors and biofuels; (b) concentrating bus service on heavily used routes and using smaller buses during off-peak periods and in areas with low demand for transit service; (c) building new roads, using variable toll systems, and coordinating traffic signals to relieve highway congestion; and (d) encouraging people to purchase more fuel efficient cars. He suggests that getting 1 per cent of commuters to switch to hybrid-electric cars will cost less and do more to save energy than getting 1 per cent to switch to public transit. One disparity exists between O`Toole`s research and a county perspective, and that is in regards to the use of hybrid buses as an alternative. It was suggested that tradeoffs must be analyzed, and a business case proven in order to support certain

environmental opportunities. Regardless of this opposition, as a rule, generating barriers to the car will encourage other forms of transportation, such as walking, bicycling, and transit use.

Energy Solutions

It was confirmed that integrated energy solutions can significantly improve a community's performance for emission reductions. Decision makers within Strathcona County acknowledge that energy efficiency for buildings should be a priority. In the case of new developments, there is a focus placed on the supply and demand for energy, in particular integrating it at the community level. Nevertheless, little focus at this point has been given to aggressive retrofitting programs for municipal facilities or external buildings. It was suggested though that when the county upgrades or modernizes buildings, they do ensure that energy efficiency is strengthened; an example of this was the introduction of a district energy system that provides heat to existing county facilities, as well as future residential buildings.

This direction is supported by the latest federal efforts under the ecoAction banner, which focuses on Integrated Community Energy Solutions (ICES). These solutions capitalize on the cross cutting opportunities for energy performance amongst local key players, as well as exploit opportunities that come from treating the built community environment as a system (Council of Energy Ministers, 2009). These solutions focus on greening the supply and reducing the demand for energy, which has positive consequences for GHGs, and other relevant local benefits.

Fiscal Management

Funding was stated by several survey and interview participants, as well as pointed out in the literature, as one of the biggest barriers to initiating local climate change action. Many cities may not be willing to invest in the financial resources for controlling GHG emissions since doing so often requires significant upfront costs (Betsill, 2001a). In addition, municipalities are

providing much more than their traditional responsibilities of basic services to property. Because they are largely dependent on user fees and the property tax (municipal governments receive 8 cents of every tax dollar), a regressive and unresponsive revenue source, they are often caught between a growing range of responsibilities and demands, and inadequate financial resources (EnviroEconomics, 2009). Municipalities often rely on external funding opportunities from the provincial or federal government; however, they must compete for these dollars. Municipalities should explore other government funding options that may be relevant to the project or program.

Without financial support, it is recognized that a strong business case must be built, as sound fiscal management is high on the list of priorities for a municipal government. In 2003, ICLEI Energy Services prepared a document for FCM, which introduced to member municipalities the necessity of having a business case for achieving climate protection. These road maps use full cost accounting practices that consider all of the economic, environmental and social factors, recognizing that what affects one area often has financial repercussions in others. It traces direct costs and allocates indirect costs, and outlines the need to eliminate split investment incentives in order to directly reward those that take the action. Strathcona County's framework system is intended to guide decision makers through a true cost accounting process, however the stages are not yet complete and it is not clear how all three tools will be merged and enforced in their governance process.

The basis for encouraging municipalities to build a case for climate protection activities is that there are potentially greater costs to inaction. The local level will bear the most significant costs of climate change impacts in the future (Wilson, 2006). To support municipal business cases, FCM launched a campaign in 2009 called *Act Locally*. FCM determined the potential magnitude of different options for municipal GHG emission reductions and their relative cost.

The document explains that a major advantage of investing in local community emission reductions is that they can be achieved at a low cost, or even in some cases can provide a neutral or even positive return on investment. The business case for cutting GHG emissions is more than just figures, it reflects a community's values, principles and needs.

Chapter 6: Conclusion and Recommendations

In Summary

The Earth's climate is changing and it is increasingly apparent that the governance of climate change is a complex issue. To achieve a sustainable future, governance at all its levels must act boldly and quickly to deal with the causes of global warming. Steps are being taken at the global scale to ensure that direction is flowing from the top down and solutions and strategies are starting to emerge from the bottom up. The local level is only one possible point of entry to analyze the opportunities for GHG emissions. In the context of Strathcona County, this research thesis set out to determine climate change perspectives of decision makers who have influence over municipal direction, policies and programs, as well as to demonstrate the value of municipal action as a supplement rather than an alternative to national and international studies.

By uncovering the various points of view, it was the intention of this research to determine the appropriate role a municipality could take in order to achieve successful GHG reductions. To answer the research problem and related investigative questions of the thesis, a case study approach was undertaken that combined numerous methods to strengthen the legitimacy of the research. There were three designed steps for conducting this study and in collecting data from multiple sources of evidence. First, an examination of the significant literature, as well as cross-case examination of relevant government action plans took place. Next, an online survey was sent to high level decision makers within Strathcona County to assess the broader scale perspectives on the GHG mitigation at the local level. The resulting information was used to support the last phase, which was the interview process. The survey findings revealed relevant themes which needed further investigation. Interview participants

were selected and principal perspectives were collected to gain more in depth viewpoints on the thesis questions.

The results provided applicable information that connects to the literature research, and is also relevant and timely in terms of the real-life context. The outcome of the research advocates for the participation of municipalities in the climate change agenda, as they have a fundamental function in generating action. The objective of analyzing Strathcona County as a case study was to determine realistic and accepted strategies that would result in positive GHG actions. The study investigated benefits and barriers to municipal climate change action, with the purpose of guiding municipalities to appropriately refocus and reanalyze their efforts to date. In addition, support mechanisms were considered with the intention of presenting municipalities with opportunities to connect their action in relation to other layers of governance.

The findings from this research establish a base for which municipalities can institute climate change action and sustainable strategies. It is argued that municipalities must have a multilevel governance lens that is inclusive of other perspectives, objectives and intentions of other relevant stakeholders in the community. In regards to mitigating climate change, municipalities have traditionally relied upon higher levels of government to direct or authorize action. It is clear that municipalities are no longer relying on higher management for GHG abatement support, but understand that they have an essential responsibility in sustaining all scales of action. Local level governance ought to stop looking for support from higher levels, but recognize that they need to provide support and fill gaps. This can be accomplished through relationships and partnerships, which are critical to successful collaboration; and, while collaboration can be challenging, it is leadership, innovative thinking, institutionalization of vision, ongoing communication and support mechanisms that help ensure success.

In addition, it is the reframing of climate change to adjust to local level issues that will assist in the adoption and acceptance of various initiatives that result in mitigating emissions. It is a suggestion of this research that municipalities would perhaps find greater success if they attached climate positive goals to relevant day to day concerns of the community. Although it may appear that climate objectives take secondary priority over other concerns, as long as there is institutionalization of these goals into every municipal function, there will always be indirect benefits to GHG reductions. This angle may allow a municipality to develop capacity and actually achieve higher reductions than solely focusing on climate change goals. Future research should examine this concept to determine the effectiveness of this strategy.

Municipalities are responsive to the climate change problem, which signals that there is a transfer of efforts towards productive solutions for GHG reductions. Local level governments are unearthing actions that are fundamental to achieving local, community based emission reductions. They have significant influence on development and land use decisions that shape the pattern of transportation and energy use within communities. These solutions can be attained if municipalities evolve their fiscal management approaches by looking at projects and programs from a unique financial perspective. It is vital to the success of sustainable initiatives, and thus GHG mitigation, that a solid business case is built on a platform of true cost accounting that manages economic, environmental and social aspects, as well as contemplates the appropriate allocation of costs and benefits. A municipal government requires a road map that drives it in the right financial direction, while addressing community concerns and values.

Overall, based on the literature review and information gathered from the survey and interviews, this research concluded that perspectives that have significant influence over decision making processes at the local level are in fact focused on actions that will directly or indirectly

benefit climate change. Ultimately, municipalities have a role and a responsibility to facilitate GHG emission reductions that should assist Canada in achieving its climate change commitment. Municipal contributions must be considered an essential element to achieving long term, cost effective and successful emission reductions.

Organizational Recommendations

This final section explores how Strathcona County and other municipalities could best implement their own climate change strategies in light of the research results. The findings of this research indicate that there is an acknowledgement and willingness for municipalities to play a significant role in reducing GHG emissions. Moreover, actions are emerging and developing at the ground level that municipalities can foster and expand in order to assist in challenging GHG reductions. The following recommendations for decision makers in Strathcona County are therefore based on local level solutions, with the goal of ensuring long term sustainability for the community, whilst supporting provincial and federal actions for climate change. The recommendations have the potential of creating constructive change for GHG emissions. The objective of these recommendations (R) and their associated actions (A) is to contribute towards continuing change in perspective towards climate positive goals.

R1. To fully capture the social, political and economic processes that shape climate change governance, a multilevel outlook is required for effective climate strategies.

A1.1 Municipal programs and projects need to be viewed from the perspective of supplementing other government action plans, as opposed to creating new and varying layers of rules and regulations. Although jurisdictional boundaries require respect, the county should focus on how they can strengthen current provincial and federal directions at the local level.

- A1.2 Establish open ended policy practices that include various perspectives, private sector, non-government organizations, scientists and residents, in the decision making process, which lead to partnerships. This input is essential to ensuring that present day decisions are sustainable over the long term.
- R2. Connect climate change to the everyday discourse. Reframing global climate change as local problems can garner benefits and serve as hooks on which to hang the issue of GHG reductions, and could reduce issues of capacity and funding. Decision makers, and all stakeholders of a community, need to have an appreciation for the advantages of climate change action.
- A2.1 Conduct a thorough public consultation process that explores the community's needs, desires and core issues. In addition, it should look to understand the barriers people perceive to engaging in an activity, as this can form the basis for targeting specific motives that promote the preferred behaviour (McKenzie-Mohr & Smith, 1999).
- R3. Create a culture of sustainability in the organization and throughout the community. A successful strategy needs to incorporate the institutionalization of the policies and holistic approaches that drive municipal action.
- A.3.1 Adopt a solid holistic planning foundation that will integrate climate positive goals into the organization's strategic plan. Every program and service should be linked to creating efficiencies that have positive GHG reductions. An element of this plan should include defined GHG targets and indicators, as well as an inventory and forecasting to construct the foundation.

- A.3.2 Create a knowledge and information management system within the corporation that will disseminate the culture of sustainability. Communication mechanisms need to focus on having information flow upwards, downwards and across the organization, so that sustainability is intertwined into all programs, policy and services.
- R4. Land use planning needs to be recognized as a vital tool to achieve GHG reductions at the local level.
- A.4.1 Create communities that are increasingly diverse and complex, with greater functional integration at all scales. A municipality needs to focus on smart urban design that balances work, life and play.
 - A.4.2 Development and building permits should require a sustainability plan that includes evidence of GHG reductions. Create a formal evaluation tool or checklist for approving the development of new buildings and communities.
 - A.4.3 Offer incentive packages for projects that demonstrate eco-industrial and “design for the environment” principles.
- R5. Create an integrated energy strategy for the municipality incorporating the principles outlined in NRCan’s Integrated Community Energy Solutions (ICES) roadmap.
- A5.1 Capitalize on the opportunities to create synergies in energy performance, and treat the built community environment as a system. Focus on greening the supply and reducing the demand for energy in the community.
 - A5.2 Explore options for initiating a building retrofit program for municipal facilities as well as community buildings.

R6. Create transportation networks that facilitate the efficient movement of people and goods by enabling residents and businesses to choose the best modes of travel for each trip, including walking, biking, and transit.

A6.1 Explore economic disincentives that reduce the attractiveness of the car and would be appropriate and tailored specifically to the community. Look for opportunities to encourage people to purchase more fuel efficient cars.

R7. Refocus fiscal practices that incorporate a balanced approach to managing economic, social and environmental factors. This needs to include outline climate protection activities that are tailored to a municipal government's unique needs and available resources.

A7.1 Require effective business cases that use a full cost accounting framework, and are tailored to a municipal government's unique needs and available resources. Create a corporate tool that will interconnect the social, environmental and economic guidelines in order to lead decision making. To support these business cases and where possible, use the estimated cost reduction values that were developed by FCM in their *Act Locally* campaign.

A7.2 Look for opportunities to eliminate split investments, so that budget managers directly are rewarded for realizing sustainable efforts, such as energy efficiency savings in their own operational area.

A7.3 Seek funding opportunities through partnerships, and explore options for tapping into the business planning decisions of other provincial and federal departments rather than the obvious climate change funds.

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Appendix A: Survey Consent and Questions

LETTER OF INVITATION
(Electronic Survey)

Date

Re: Research Project for Municipal Policies for Greenhouse Gas Emissions Reduction in Strathcona County

I would like to invite you to be part of a research project that I am conducting in Strathcona County to explore initiatives and opportunities for greenhouse gas (GHG) emission reductions. This project is part of the requirement for a Master's Degree in Environment and Management, at Royal Roads University. My credentials with Royal Roads University can be established by contacting Dr. Lenore Newman at [REDACTED], School of Environment and Sustainability or my thesis supervisor Dr. Chris Ling at [REDACTED].

The objective of my research project is to determine what policies and approaches would be most accepted and effective at reducing GHG emissions at the municipal level and in particular Strathcona County. Furthermore, this project will look at whether policies applied by a municipality can enable action to reduce Canada's overall GHG emissions, and to understand how local level policies and approaches will work in accordance with other governance systems in Canada.

My research project will consist of an initial electronic survey. The intent of the survey is to get an understanding of current GHG reduction initiatives in Strathcona County, as well as opinion and recommendations on future opportunities. The survey will consist of a number of open-ended questions and is foreseen to take approximately 20 to 30 minutes. Decision makers within Strathcona County (members of management team, executive team and elected officials) have been chosen to participate in the survey. Even though participation in the survey is anonymous, it is possible that some answers may be attributable to an individual. However, in the final report, no comments will be used that can be traced back to an individual.

In addition to the survey, and as a second phase to the research project, you may also volunteer to participate in the interview stage of the project. The interviews will explore further the plausibility of particular initiatives and recommendations that were found through the survey. Questions will be sent to you in advance to help you prepare. This letter also acts as a Research Consent Form requesting your agreement to participate in the interview process.

Information will be recorded in an electronic survey format, and where appropriate summarized, in anonymous format, in the body of the final report. At no time will any specific comments be attributed to any individual unless specific agreement has been obtained beforehand. All documentation will be kept strictly confidential and secure.

A copy of the final report and research findings will be published. A copy will be housed at Royal Roads University, available online through UMI/Proquest and the Theses Canada portal and will be publicly accessible. Access and distribution will be unrestricted. In addition to submitting my final report to Royal Roads University in partial fulfillment for a Master's Degree, I will also be sharing my research findings with Strathcona County's management team.

My position as Coordinator is distinct and separate to my role as Researcher (a component of obtaining my MA in Environment and Management) and no influence will be placed on participants at any stage of this research process. My role as Researcher is not connected to my role in the organization and the research has no influence on roles each of us maintains in the organization. You are not compelled to participate in this research project. If you do choose to participate, you are free to withdraw at any time without prejudice. Similarly, if you choose not to participate in this research project, this information is maintained in confidence.

Please feel free to contact me at any time should you have additional questions regarding the project and its outcomes. My Project Sponsor can also be contacted for questions, Jeff Hutton at

Name: Leah Seabrook

Email: [REDACTED]

Telephone: [REDACTED]

Sincerely,
Leah Seabrook

Survey Preamble & Questions (Electronic - Survey Monkey)

Preamble

The objective of this survey is to determine what policies and approaches would be most accepted and effective at reducing GHG emissions at the municipal level and in particular Strathcona County.

The information that will be recorded in this electronic survey format will be appropriately summarized in anonymous format in the body of the final report. At no time will any specific comments be attributed to any individual unless specific agreement has been obtained beforehand. All documentation will be kept strictly confidential.

You are not compelled to participate in this research project. If you do choose to participate, you are free to withdraw at any time without prejudice. Similarly, if you choose not to participate in this research project, this information is maintained in confidence.

By completing this survey, you are giving free and informed consent to participate in this project. To continue, please click the "Accept" button.

Questions

1. What level(s) of government should play a role in the reduction of greenhouse gas emissions and why?
2. Do you think that a municipality has a role to play in addressing Canada's climate change targets? Yes, why? No, why not?
3. Describe the responsibilities you think a municipality could take to address GHG reductions?
4. Do you think that the provincial government should mandate municipalities to create an action plan to reduce GHG emissions under some form of regulation? Yes, why? No, why not?
5. Should municipalities only focus on reducing greenhouse gas emissions within their own internal operations? Yes, why? No, why not?
6. At the local level, where could a municipal government place focus for GHG reductions? Please rank the following in terms of the level of importance from 1(most) to 5 (least).

i. Industry	vi. Waste management
ii. Transportation	vii. Green buildings
iii. Energy efficiency	viii. Water conservation
iv. Land use planning	ix. Residential education
v. Agriculture	x. Other: _____
7. How could municipalities influence/encourage the private sector to reduce their GHG emissions?
8. How could municipalities influence/encourage the public to reduce their GHG emissions?
9. Do you think a GHG reduction plan fits into Strathcona County's strategic plan, municipal development plan and the environmental sustainability framework? Yes, how? No, why not?
10. What initiatives or policies are you aware of that Strathcona County currently has in place that might address the reduction of GHG emissions?
11. What areas do you think Strathcona County could focus on to get the greatest impact of GHG emission reductions?
12. Should Strathcona County implement voluntary guidelines or strict policies in order to achieve GHG reductions? Why?

13. What external support should a municipality receive in order to address GHG targets?
14. What resources do you think Strathcona County would require to create and implement an action plan?
15. How can Strathcona County increase its adaptive capacity for climate change?
16. What are the barriers to a municipality for implementing a GHG action plan?
17. What benefits do you think there would be if Strathcona County adopted a climate change strategy?
18. Do you have any further comments on GHG reductions in Strathcona County and/or a municipality's role in Canada's climate change targets?
19. Please check which of the following role you have with Strathcona County?
 - Elected Officials
 - Executive Team
 - Management Team

Appendix B: Interview Consent Form and Protocol

LETTER OF INVITATION & RESEARCH CONSENT FORM
Interviews

Date

Re: Research Project for Municipal Policies for Greenhouse Gas Emissions Reduction in Strathcona County

Dear [Prospective Participant],

My name is Leah Seabrook and this research project is part of the requirement for a Master's of Arts degree in Environment and Management at Royal Roads University. My credentials with Royal Roads University can be established by contacting Dr. Lenore Newman at [REDACTED], Program Head – School of Environment and Sustainability or my thesis supervisor Dr. Chris Ling at [REDACTED].

This document constitutes an agreement to participate in my research project, the objective of which is to determine what policies and approaches would be most accepted and effective at reducing GHG emissions at the municipal level and in particular Strathcona County.

The portion of the research phase will consist of an interview and is foreseen to last approximately 60 minutes. The questions will refer to current and future approaches and initiatives to reduce greenhouse gas emission at the municipal level.

Information will be recorded in hand-written format or on an audio recorder and, where appropriate, summarized, in anonymous format, in the body of the final report. Participants will be given an identification number or code so that specific individuals can be identified when transcripts are written up, however the need to follow one participant's contributions may not be necessary. At no time will any specific comments be attributed to any individual unless specific agreement has been obtained beforehand. All documentation will be kept strictly confidential and secure. As a participant, you may also decline the use of an audio recorder and participate in interview through discussion format only.

A copy of the final report and research findings will be published. A copy will be housed at Royal Roads University, available online through UMI/Proquest and the Theses Canada portal and will be publicly accessible. Access and distribution will be unrestricted. In addition to

submitting my final report to Royal Roads University in partial fulfillment for a Master's Degree, I will also be sharing my research findings with my sponsor, Strathcona County.

As the Researcher, I will endeavour to ensure no harm will come to you through participation in this project. You understand that benefits to participating in this study may include deeper understanding of initiatives and policies for GHG reductions in a municipality. You also understand that, other than the cost of your time in participating, there may be few, if any, potential liabilities in participating in this study, given my attention to making participation as anonymous as you choose.

My position as Coordinator for Strathcona County is distinct and separate to my role as a Researcher (a component of obtaining my MA in Environment and Management) and no influence will be placed on participants at any stage of this research process. My role as Researcher is not connected to my role in the organization and the research has no influence on roles each of us maintains in the organization. You are not compelled to participate in this research project. If you do choose to participate, you are free to withdraw at any time without prejudice. Similarly, if you choose not to participate in this research project, this information is maintained in confidence.

This letter also acts as a Research Consent Form requesting your agreement to participate in the interview process. By signing this letter below or responding to it via email, you give free and informed consent to participate in this project.

Name: (Please Print): _____

Signed: _____

Date: _____

Please feel free to contact me at any time should you have additional questions regarding the project and its outcomes. My Project Sponsor can also be contacted for questions, Jeff Hutton at

Name: Leah Seabrook

Email: _____

Telephone: _____

Sincerely,
Leah Seabrook

Interview Protocol

Pre Interview

1. Identify interviewee and contact to arrange a date and time of interview, as well as aim of project. Plan for 45-60 minutes for the interview.
2. Determine essential background information about the interviewee.
3. Draft a set of interview questions tailored to the interviewee's area of expertise that will guide the conversation.

Interview

1. Start each interview with a statement of confidentiality and have participant sign consent form.
2. Provide background information to the project
3. Request permission to record the interview. Check tape recorder and conduct voice test.
4. Collect contact information, role in their respective organization and provide information on why they were selected as an interviewee for this project.
5. Use open ended questions to keep the interviews flowing. Use probing questions where necessary.
6. Throughout interview take notes.
7. Request permission to follow up issues by telephone/face to face/e-mail
8. Thank interviewee for participating in this research and provide them with contact information and copy of consent form should they have future questions about the project.

Post Interview

1. Send email of thanks to participant.
2. Write up interview notes and identify any action points or follow up questions. Contact interviewee where necessary.
3. Transcribe, check and edit recordings.
4. Classify data into themes and subthemes for analysis.
5. Save recordings, transcripts and notes in a password protected file on personal computer.

Appendix C: Summary of Responses to Online Survey Questions

No.	Question	Summary of responses
1	What level(s) of government should play a role in the reduction of greenhouse gas emissions and why?	<p>100% of all participants responded confirming “all three levels” have a role</p> <ul style="list-style-type: none"> • Federal/Provincial hold mandate on higher level issues (car emission standards, industrial air quality, policy direction, funding, planning resources) • Municipal (land development controls, transportation network, fleet) • Municipal have localization of same roles as province/feds and work on implementation • Likelihood of success will diminish if all three do not collaborate • Local level should mirror the provincial • The problem has no jurisdictional boundary • All have different means to change behavior • Policy set at the higher levels, yet real change occurs at the lower level • Payment should be according to level of contribution of GHG emissions on sliding scale (whoever has statutory authority to govern the emitter should bear the burden)
2	<p>Do you think that a municipality has a role to play in addressing Canada’s climate change targets?</p> <p>Yes, why? No , why not?</p>	<p>100% of all participants responded yes</p> <ul style="list-style-type: none"> • Municipal level has connection with public • Contributor to emissions, should model the way • Internal emissions • Work with corporate tax payers
3	Describe the responsibilities you think a municipality could take to address GHG reductions?	<ul style="list-style-type: none"> • Transit • Encourage greener industry through economic and land development • Educate residents, staff and municipal stakeholders • Green procurement • Sustainability through all municipal operations • Land use planning (increase walkability, carpooling) • Preservation of carbon sinks • Climate friendly water, wastewater, waste and heat services • Leadership in legislative and bylaw approval • Follow guidelines as emitter

<p>4 Do you think that the provincial government should mandate municipalities to create an action plan to reduce GHG emissions under some form of regulation?</p>	<p>50% of participants said yes:</p> <ul style="list-style-type: none"> • Through a comprehensive sustainability plan, not solely on GHGs • Should require municipalities to develop sustainability plans that include adaptation • Need direction otherwise they won't do • Need guidance and funding <p>42% of participants said no:</p> <ul style="list-style-type: none"> • Provincial and federal can make more of a difference • Municipalities can be motivated through grants, incentives, financial contributions and expertise • Would stifle innovation and flexibility at municipal level • Why reinvent the wheel • Would weaken our actions, not enhance them
<p>Yes, why? No, why not?</p>	
<p>5 Should municipalities only focus on reducing greenhouse gas emissions within their own internal operations?</p>	<p>Yes:</p> <ul style="list-style-type: none"> • That's going to be hard enough to complete • As this is all they are responsible for • Apply internally and only externally if Province applies a regulation <p>Fence sitters:</p> <ul style="list-style-type: none"> • No but would require some method of policing and could become quite onerous and costly <p>No:</p> <ul style="list-style-type: none"> • Our responsibility could extend to all activity within our boundaries • Public input through educating community, assist stakeholders • Partnerships with neighbors could be beneficial
<p>Yes, why? No, why not?</p>	
<p>6 At the local level, where could a municipal government place focus for GHG reductions? Please rank the following in terms of the level of importance from 1 (most) to 5 (least).</p>	<p>Rank in order of focus:</p> <p>1: Land Use Planning, 2: Waste Management, 3: Green Building, 4: Water conservation, 5: Transportation, 6: Residential education, 7: Energy efficiency, 8: Agriculture, 9: Industry</p>
<p>7 How could municipalities</p>	<ul style="list-style-type: none"> • Be an example/leader – demonstrate our own sustainability plan and make connection with other

influence/encourage the private sector to reduce their GHG emissions?	<p>sectors (demonstrate bottom line)</p> <ul style="list-style-type: none"> • Externals need to apply to County for expansion of their operations will require a sustainability plan • Larger plan by other levels of government • Influence or encourage only, but do not have the ability to direct • Price as a driving factor for private sector and municipalities don't control this • Community design – who is part of the community and need to comply with our requirements (delicate balance as we need to collect taxes and create livability) • Incentives, partnerships, acknowledgements, penalties for non-compliance
8 How could municipalities influence/encourage the public to reduce their GHG emissions?	<ul style="list-style-type: none"> • Public awareness, education, recognition and subsidization/incentive programs • Work along the inform-educate-enforce continuum • Lead by intelligent example • Information on carpooling, transit and energy use • Consider smart retrofit programs, multi tiered water billing, free transit • Use regulatory requirements, such as permits, for development and building stages (would need to be linked with federal/provincial)
9 Do you think a GHG reduction plan fits into Strathcona County's strategic plan, municipal development plan and the environmental sustainability framework? Yes, How? No, Why not?	<p>100% of participants responded yes.</p> <ul style="list-style-type: none"> • In a supportive role to the federal and provincial governments • Aligns with our capstone policy on the environment • Specific strategies and actions under the sustainability framework • Assists all three pillars (social, environmental and economic) of sustainability (frameworks within the County) • Small incrementally stages both internally and externally • Fits with the health of our residents
10 What initiatives or policies are you aware of that Strathcona County currently has in place that might address the reduction of GHG emissions?	<ul style="list-style-type: none"> • Encouraging use of transit and alternative transport like walking/biking (good trail system) • Internal fleet (buses, operational vehicles) are hybrid and clean diesel engines • Community Energy Centre • LEED standards on new buildings • Subsidies for low flow toilets • Rebates for efficient homes built new

		<ul style="list-style-type: none"> • Life cycle replacement programs • Numerous guiding frameworks, plans, etc. • Beaver Hills Initiative (Land Use) • Waste management program
11	What areas do you think Strathcona County could focus on to get the greatest impact of GHG emissions reduction?	<ul style="list-style-type: none"> • Internal fleet • Transit efficiencies • Building efficiencies • Not a focus specifically but rather use the sustainability consideration across the board • Programs that emit GHGs should be first focus • Integrated transportation master plan • Opportunity to be the centre of carbon capture and storage implementation – policy strategies that put s in position to take advantage • Additional district energy systems • Industry • Cost benefit analysis to evaluate
12	Should Strathcona County implement voluntary guidelines or strict policies in order to achieve GHG reductions? Why?	<p>Voluntary Guidelines</p> <ul style="list-style-type: none"> • For externals as we lack the full regulatory clout • Requires flexibility • Requires a change of attitude • Need to mirror available funding • Believe them to be more effective if they are not being imposed • Keep our economic appeal <p>Strict policies</p> <ul style="list-style-type: none"> • For internal only • Where appropriate • Potentially long term policy with provincial support <p>Those that suggested stricter policies also said in combination with other voluntary initiatives.</p>
13	What external support should a municipality receive in order to address GHG targets?	<ul style="list-style-type: none"> • Federal and provincial grants (Municipalities do not have the same ability to collect tax revenues) • Funding for trial projects • Contributions from industry • Provinces should give funding for green transportation instead of funding for roads. • Spend some proactive capital (to mitigate for adaptation). • Expertise, research and development, best practice information • Regulatory direction from the provincial and federal

		government
14	What resources do you think Strathcona County would require to create and implement an action plan?	<ul style="list-style-type: none"> • Redeployment and refocus priorities • Federal and provincial governments need to step up • Training, staff resources • GHG task force that includes input from across divisions • Specialized and professional expertise (stronger link to academic and technical centres) • Public involvement • Willingness to consider new services and new ways • Partnerships with other levels • Money, time and effort
15	How can Strathcona County increase its adaptive capacity for climate change?	<ul style="list-style-type: none"> • Decision making processes that seeks to minimize GHG creation in operations and consideration of impacts • Review operations with GHG lens • Small well thought steps, with trials of all initiatives before we go to full scale operations • Education and communication, social marketing programs • Share successes • Diligent in using ESF tool • Drive services into local nodes • Open and willingness to change • Regulatory approach and development and permitting stage
16	What are the barriers to a municipality for implementing a GHG action plan?	<p>Top 3</p> <ul style="list-style-type: none"> • Money • Time # • Jurisdiction (inability to affect change outside our mandate) <p>Other:</p> <ul style="list-style-type: none"> • Human resources • Public attitudes and resistance to change • Industrial development • Political will
17	What benefits do you think there would be if Strathcona County adopted a climate change strategy?	<ul style="list-style-type: none"> • Good optics • Work towards sustainable community • Marketability of the municipality • More eligible for green grants • We are fortunate enough to get to meddle and engage in some experiments • Healthier environment, community (health = better quality of life) • Friendlier, less congested roads

		<ul style="list-style-type: none"> • Leading the way and setting an example
18	Do you have any further comments on GHG reductions in Strathcona County and/or a municipality's role in Canada's climate change targets?	<ul style="list-style-type: none"> • Baby steps • Need to turn it up a notch, but we have limitations • Opportunity to be a leader in green industrial development (ie. Carbon capture and storage) • Move towards a knowledge based community • Collective benefits (ie. Shared costs, consistency, support, impact) by doing this on a regional basis
19	<p>Please check which of the following role you have with Strathcona County?</p> <p>Elected Official Executive Team Management Team</p>	<ul style="list-style-type: none"> • 2/9 - Elected Officials (22% of potential, 12% of respondents) • 4/5 - Executive Team (80% of potential, 25% of respondents) • 10/19 - Management Team (53% of potential, 63% of respondents)

Appendix D: Interview Summaries of Individuals Perspectives

Interviewee A

Context

- Strathcona County (SC) is committed to the heartland servicing project.
- SC is attractive to industry due to the heavy industrial zoning it has within its boundaries.
- The County has a partnership with neighbouring municipalities (Sturgeon County, Lamont County and the City of Fort Saskatchewan), as well as has membership with the Alberta Industrial Heartland Association (AIHA)
- 3-5 potential oil upgraders are planned for the region, with three being targeted within SC.

Role/Jurisdiction

- In regards to industry, the Federal and Provincial make the decisions, whereas SC can only be an intervener in terms of regulatory matters.
- SC works with Alberta Environment on concerns about regulatory approvals that may be a barrier for industry and/or the municipality.

Emerging trends

- Small steps are being taken in terms of technology change, but the bulk of change is dependent on an emissions cap therefore industry is waiting.
- Industries will figure out the regulation but if and when limits come in, we know what to work with for the area and base current and future development on those limits.
- Eco-industrial synergies are emerging
- SC is taking a partnership approach with developers (ie. Cambrian Lands)
- Realization that GHG reductions and eco-industrial focus will make SC competitive.
- SC uses the permitting process as a hammer or driver for sustainability. There is a shift to economic drivers and incentives during the downturn to make them more competitive.
- SC is a huge proponent of carbon capture and storage as it could be a game changer
- SC has gotten funding for a carbon balance and emissions trading system for the Beaver Hills Initiative (BHI)

Barriers

- From a heartland perspective (AIHA) they are waiting for Alberta Environment to set the cap/limit on GHGs for the area. Need the province to step up.
- Barriers exist with encouraging eco-industrial principles due to transition zones that are required under the industrial regulatory approvals
- SC does not believe in being owners or developers of the land, which gives industry free reign to do what they want.

Interviewee B

Context

- Strathcona County is a member of Alberta Urban Municipalities Association (AUMA), which provides a valuable perspective for SC on climate change. The AUMA's focus on climate change is to help municipalities help themselves with policy changes.

Role/Jurisdiction

- Being at the world stage, the feds needs have the overarching responsibility of GHGs
- Alberta's carbon footprint relates to economics and has always been a challenge
- The question is when it comes to municipalities, "who has the jurisdiction?", but a municipality does have a responsibility to ensure we have clean air and carbon footprint
- Municipality should do a review for blatant areas of environmental disaster and lead the way in reducing emissions internally for the community.

Support

- The province should initiate a specific ministry that identifies and develops climate change policy. They should use municipalities as stakeholders.
- Require experts in the field that can provide information and direction on climate change, as well as use other municipalities as examples.

Emerging trends

- Municipalities have a choice to start looking at the mandate of climate change and how it affects the health, safety and wellbeing of its residents. I think that's where we will decide where we have to interface with the province and feds.
- Climate change could be a correlation with the health perspective (MS, asthma or different conditions). It starts to be transferrable from the tree hugger to the measurable person
- SC should focus its attention on encouraging walkable communities and land use planning.
- Industry should be focused on last, but could direct them to be social entrepreneurs and buy into the community. (ie. give back to community and schools perhaps).

Education/Communication

- Education should be done in relation to our schools that is curriculum based.
- Need to get a temperature reading of the community to see whether it's a relevant issue

Barriers

- We have tried to skirt around the jurisdictional argument because anything that we take on (additionally) has to be funded.
- Funding and staff commitment to make it a forefront of our discussions... it's considered fluffy, nebulous and it needs to be transferred to a more tangible matter.

Interviewee C

Context

- PDS can influence through the permitting process.
- PDS is responsible for reviewing land use bylaws and whether they are in conformance with the MDP, which is a policy document that plans where and what happens in SC.
- An area concept plan provides what will happen and then the area structure plan is more detailed and becomes the basis for determining the zoning and range of use and activity.
- SC may have more opportunities to do things more so than some of our counterparts due to the range of uses and dollars we have within the County.
- SC is pretty traditional in terms of green programs for buildings, but could go further take

Role/Jurisdiction

- If you really want to make substantial inroads into reducing GHGs, municipal level will not be making the major ones, it really needs to be senior government and industry.

Support

- Need to look for partners, provincial level and private sectors, as we do sustainability initiatives. The regulatory approach is not the preferred direction, but a partnership.
- Tap into universities research expertise.
- FCM is a good driver of sustainability throughout the Country.
- We need to do a lot more cooperative ventures to get us to where we need to be at.

Emerging trends

- SC is moving a direction of working with developers and incorporating sustainability into urban developments. We are working cooperatively for common benefits.
- Work with developers to understand what they are trying to accomplish and educate them on what we are trying to accomplish, however we must identify where we are going.
- Through the Capital Region Board (CRB), higher density in urban areas is being encouraged to reduce the urban footprint.
- Transit will be looking at changing our transit patterns and encouraging more use.
- Incorporating practices that improves sustainability in terms of both community layout as well as building design infrastructure (ie. grey water use for irrigation, solar orientation).
- Numerous technological applications that we can incorporate into these areas... don't need to reinvent the wheel just adapt to SC.
- Need to look at synergies in areas like the industrial heartland (ie. agriculture land).
- The Cambrian Lands is an example of a new trend emerging where we are rethinking the way we do things and integrate a combination of land uses.
- We are seeing a greater appreciation for being more environmentally friendly and being better stewards of the land... publically demanding and politically needed.

- Leadership workshops and reviews of department are allowing SC to move forward together in a concerted effort to determine the possibilities out there. Shift to getting departments to work together and knowing what it is they can contribute to.
- We have been leaders in sustainability (MDP) but now how do we push the boundaries
- Taking the MDP to the next level of a growth strategy.

Education/Communication

- Educate the parents through their kids. The kids are being educated and they will be tuned in as they come along... focus needs to be on our youth.

Barriers

- I don't think we are all on the same page, but I think we are realizing it and trying to get our act together.
- Need to articulate the barriers more and may realize that they are not actually barriers but just comes down to effective communication.
- If everyone is a stakeholder, then they all need to have and realize their stake in it.

Interviewee D

Context

- Municipalities can directly influence supply and demand side
- Transit needs to be attractive and convenient for people to use. Travel time needs to be relatively fast in comparison to their regular commute in a car. Convenience versus the car plays a huge role (psychological barrier for routes running longer than 10mins).
- Broad category of drivers called "quality of service" which relate to the experience
- We have 15 hybrid buses out of 86.

Role/Jurisdiction

- Individual decisions are what we are dealing with and we live in a democratic society and where is the line at any level of government's ability to influence or should we be allowed to influence.
- The idea of road pricing is emerging as a way to affect a mode shift to get people to choose to walk away from their car and get on the train or bus.
- These types of user fees are starting to come more and more appropriate, mostly because the economic pressure that government's face in terms of infrastructure costs.
- The province is attempting to look at long term benefits of an integrated transit or transportation system. The CRB is a new perspective in Canada.
- Most GHGs are created by economic behaviours outside the ability of a municipality to affect.

Emerging Trends

- Municipalities are empowered to charge for parking in their community, which states that cars are a big part of GHGs and we can influence how many cars are in the community. Making cars inconvenient or costly will drive people to the bus.
- Land use orientation has a massive impact on whether or not transit is an attractive alternative for the car...density has a huge affect on ridership of transit.
- CITP is a very conscious and determined effort to move to a different lifestyle which is manifested in parking maximum restrictions.
- Implementing a double-decker bus to take twice as many people for the same amount of operating budget, this is an efficiency increase.
- An option to look at is taxing people who drive and dedicate those dollars to transit.
- Developing our own internal anti idling policy to conserve fuel and visual perspective.

Barriers

- Pricing can influence people's decisions, and since the price of using the roads is extremely untransparent people choose cars over transit.
- Neighbourhood designed with parking spaces puts not restrictions on the car.
- There is no physical barrier from stopping sprawling around us. The only thing that stops us is the cost of doing so and the infrastructure... we won't be able to keep it up forever.
- In the face of high energy prices, the demand for certain vehicles collapses, but the issue is that prices fluctuate giving the illusion that things aren't so bad so people buy.
- It is a challenge to get people to voluntarily get out of their cars. Transit services needs to be competitive on travel time and convenience.
- The challenge with hybrid buses is that the gas engines kick in at higher speeds, which is what we use the majority of the commuter buses for.
- Hybrid buses cost twice as much as regular buses, therefore there's a trade off (more buses and more cars off the road, or hybrid efficiency).

Interviewee E

Context

- The Beaver Hills Initiative (BHI) is part of our land use responsibilities under the MGA.
- The MDP gives a menu of land use options that have been laid out within SC.

Role/Jurisdiction

- Federal government has to take the lead as they work in the global climate. We need direction at the top and to flow policies down so we can implement at the municipal level.
- We are seeing the opposite effect which is the bubble up effect from the municipal level.
- As an elected person you have two responsibilities... one is to represent the public, but the other is to lead and to be ahead of issues so that you are not getting cornered.

- We need to lobby, communicate and work with our sitting MLAs and MPs to drive action.
- MGA is very specific on our jurisdiction, but we push it where we can.

Support

- It starts at home with each of us and then we work from there and hope that the elected people are putting in policies to make those changes.
- We need support from the Province to move forward on certain aspects of the MGA, as well as be in synch with other members of the region.

Emerging trends

- We need to have the idea of sustainability (and climate change) so entrenched into our policies and our system. You need to get policy so intertwined and layered so it's not simple to pull apart. It needs to be entrenched in the whole vision of the County.
- In terms of land use, the value is that the land has to be left whole and the larger it is the more functional it is.
- The Beaver Hills moraine is about 2/3 of the County, but the County is protecting the core area and there are stringent set of rules in bylaws before any development can occur. There has been a shift of identifying a land use for beyond the money that could be made, but for the other things that are important to life like clean air, water, biodiversity, etc.
- Natural capital is critical to surviving as a species.

Barriers

- It's frustrating because we have a federal level that's not acting and even at the senior level (within that government) that doesn't believe in climate change and are only starting to refocus because of US having a change in leadership which is dragging them in.
- We need leaders that are thinking down the road and not just thinking day to day which causes to fall into traps that we continue to fall into.
- We can influence industry to a degree, but are limited under the MDP, which hampers us on a lot of environmental issues (ie. emissions, water policy).
- We play around with green technology, but for the most part its business as usual on the oil and gas side and what we really need to be doing is weaning ourselves off of fossil fuels. We are just talking a green talk, as we are still on this addiction to oil and gas.
- We are working the BHI's carbon trading opportunity, but need assistance with legislation.
- Transfer of development credits is area of legislation that we are working on changing under the MGA. We need changes to reward people for their conserving their land.
- Setting aside land under the conservation reserve means that residents will be punished for doing so as taxes will fall under the recreational land use and be 6-8 times greater than agricultural. The MGA needs to recognize a 'conservation easements' as a 5th assessment category for land. The province's land use framework is looking at these changes.

Context

- Council has a vision and a strategy and from that we have built our three frameworks. The ESF is where you'd end up setting targets for GHGs and base measurements.
- Executive Team is on the same page for supporting sustainability, but how we demonstrate that is a different story.
- Role of the executive team is to take new elected officials through an orientation of the County and guiding documents.
- SC has its own green building rebate program for developers

Role/Jurisdiction

- There is always this belief that SC is trying to be a leader, therefore you end up trying to keep up with yourself.
- Industry is provincially regulated and almost stands alone within our boundaries, but SC truly gets it when working with industry.
- On provincial level, the Land Use Framework is being driven which affects municipalities.
- The province has implemented the CRB which is driving higher densities to curb sprawl.
- We are a microcosm of the province and we can't live off the veils of that forever.

Emerging trends

- A new sustainability advisor for the County has been hired to help departments learn and apply sustainable practices to their operations. She will look at GHGs for a division.
- A framework specific to GHGs might be too narrow of focus. The Sun Living approach that we are taking to our development process is more holistic, One Planet Living feel.
- There are marginal things we might be able to do with industry, such as carbon trading (but this encourages the continuation of bad habits ie. emitting GHGs).
- Land Use Bylaw speaks to sustainability and is driving change.
- SC would like to move towards a sustainability checklist for developments. Businesses that just want to make a quick buck won't flourish in this new emerging system.
- Industry (development) will respond to changes in regulation or legislation and come up with their own standards (ie. built green program).
- Opportunities like the BHI will help us in working with industry as we can play one off the other and leverage that... it's more like stewardship than trading.

Education/Communication

- There is a level of communication with a new council to get them on the same page about sustainability and an education piece on the strategic plan. Every council likes to put their own stamp on something because it gives them a sense of purpose.
- With our developers we build partnerships and try to educate them and build capacity. If they feel that you are in it with them, then you build trust and relationships.

Barriers

- Carbon capture is the same idea as trading in that it's just burying the issue and doesn't prevent the generation of the carbon in the first place. It's a quick fix.
- Big industry is our biggest barrier and the fact that we have no jurisdiction over it, even though it's our biggest source of revenue. It creates a false economy.
- It's a behavioural and cultural piece that needs to change with industry.

Interviewee G

Context

- In terms of waste, SC does not operate a landfill; therefore it would be through the minimization of transportation distances to local processing and disposal facilities.
- Waste management was at a stage where it required monumental change (ie. introduction of Green Routine), where as our water management is very effective and efficient system already therefore is more in a stage where incremental improvements can be made.
- SC has some additional tax dollars (industrial) or discretionary income to allow us to think about more sustainable practices. The make up of SC also drives community support.

Role/Jurisdiction

- In terms of water, the province is pursuing a strategy of centralized water treatment facilities with a public health and water quality objective.
- Need to have regulations (at provincial levels) that can be implemented
- Believes that partnering with other municipalities might drive the province to take action (ie. collective water distribution system lead to provincial water policy)
- Community Energy is an example of pushing our boundaries, but the price is that we end up taking on the financial responsibility.
- I empathize with the province as they have to represent a variety of interests from the tiny towns to the big cities, industry, business, etc.

Emerging Trends

- Need to work with our planning and design folks who are building our communities to try and get more energy efficiency built into our building permits and bylaws.
- The Utilities department is well positioned to make a big impact through centralized heating facility, which has option of switching to alternate fuel source.
- Although we are not in the offset game, we can use our procurement process to ensure that emissions are a priority in contracts (ie. Priority given to landfills that capture gas).
- One of the silver bullets will be to redesign communities for live, work and play balance.

- We need to look at where we could have the most impact in terms of emissions and then get serious about it and set some goals and redirect some funding. (ie. reduce capital funding from roads and put to transit).
- Carbon capture and storage might be the interim solution and allows us to start planning for the adaptive capacity of climate change. It well positions our community.
- Two big areas of opportunity for energy efficiency is through our buildings and to be more aggressive on the residential permitting side.

Education/Communication

- We do a better job of communicating upwards than we do downwards.
- I think the education piece is over, I think that everyone knows and understands. We needs to focus on the fix not the problem and we need to give people some solutions.
- You need at least three things (ie Green Routine's diversion, convenience and costs) that will convince people to change their behaviours.

Barriers

- We need to have a better understanding around life cycle analysis of recycling to understand the broader environmental impacts and gain an emissions perspective.
- Sometimes we trust and rely too much on the provincial government to give us a holistic review of things and set targets based on analysis they have done.
- The dilemma is that you can't just apply an emissions lens to this, we've also got to look at angles and perspectives
- We are not yet attacking water from a conservation lens (ie. fee structure based on conservation), but this is more of a resource scarcity than a climate change perspective. I don't know how big of a deal pumping and treatment is in terms of emissions, but sense it is a smaller piece of pie than the scarcity issue.
- We spend a lot of time talking about trade offs between the economics, environmental and social aspects of a decision and we are lacking tools and data to fully understand.
- Communication downward needs to be better and being an operational department makes it difficult to find the time or make it a priority.
- As an organization, I think we are more general than we are holistic.
- You can only do the right things when you have enough money to do it.
- Time and money are our biggest barriers.

Interviewee H

Context

- Works within National Energy Research and Development Centre within NRCan

- To situate it with other work that NRCan is doing, OEE is running the home retrofit program under the ecoAction banner.
- The new term for eco-energy programs will be part of the 2011 budget and begin in 2012.
- Community energy approach provides new opportunities to reduce energy use and achieve climate change objectives and so far has been largely untapped.

Role/Jurisdiction

- The federal community road map is of course subject to government support and budget.
- Consultation for the program has been done at the Federal and provincial levels. It's been released by the Council of Energy Ministers.
- We recognize a huge value in getting input from municipalities and organizations like the FCM, but haven't quite gotten started on that end.
- Part of the problem with a Federal program such as this, is that municipalities are technically provincial jurisdiction and we need to respect that, so there has even been hesitation on directly engaging communities. It has gotten support from provinces.

Emerging Trends

- Interest in developing a road map for integrated community energy solutions, which is the next step for the Office of Energy Efficiency's programs at the federal level.
- This includes capacity building, policy and regulations as an important step for change.
- The integrated road map is looking at the entire community energy profile including the demand and supply side at all sectors - residential, commercial and industry.
- This program would be voluntary as it is not OEE's mandate to force, but to provide an incentive based approach through program support and potential funding.
- Through this initiative there has been acknowledgement that there is a role for all levels of government and that the dialogue needs to continue.
- Community energy planning at the municipal level is growing which is an indication that there is value in targeting these initiatives.
- The Sun Living takes community energy to the next level that fosters behavior changes.
- Alternative energies is important on the efficiency side and the supply side, so using renewable sources and waste energy. (eg. district energy on natural gas might increase the efficiency of a system, but it also provides a platform for alternative fuel sources).
- This is an exciting time because it seems as though the stars are aligning... there is provincial and federal collaboration and there is interest from industry and municipalities.

Education/Communication

- It is important to understand where communities are at, so when we put programs together it meets the current needs of those types of municipalities.

Barriers

- Our experience is that municipalities are not even fully aware their barriers are yet.
- It's going to be part of the challenge to find that balance for all municipalities.
- There is a finite envelope of money that we have to work with.
- There are financial barriers and capacity barriers, knowledge and access to expertise.

Interviewee I

Context

- Partners for Climate Protection program and network which is a program that assists municipalities looking at climate change, including emission reductions and energy efficiency. It's a gateway for sustainable planning.
- Act as a network hub to connect communities, provide data and funding.
- FCM initiated the PCP in 1994, but the latest version and partnership with ICLEI is 1998.
- An integrated sustainability plan can be a higher level policy direction and the PCP model gives you a more quantifiable component that you can measure against.

Role/Jurisdiction

- Municipalities are the most directly connected to the business community and their residents, whether its through the planning process, building permits, land use zones, these are all functions that municipalities have that the federal and provincial levels do not.
- With varying regulations and policies in provinces, the PCP is certainly trying to work with each province to align the milestones around the provincial regulations
- We work with provinces and organizations such as AUMA.
- The federal government has no authority over municipalities; therefore municipalities would have to mandate some strict regulations.
- PCP does works with NRCan, Environment Canada and Transport Canada.

Emerging trends

- Some communities choose to focus on an integrated plan and have an emissions and energy component to that plan.
- Municipalities already are looking at GHGs and climate change before even the Federal government, but were explained more as energy efficiency from a cost perspective.
- The environment has been a high priority nationally, but more so locally, because that's where the people live.
- The Act Locally document has put a cost to GHG reductions is setting the stage for municipalities to participate in the carbon trading market. The FCM is of the position that municipalities should be able to access the sale of offsets from their projects.

- The FCM is looking at how it can facilitate verifying GHGs for smaller communities and perhaps be an aggregator of GHGs for municipalities. This would include assisting with the development of protocols.
- Via demonstration projects, municipalities can influence upwards and share knowledge.
- Need to determine the hot topics that are concerning people in the community and tie climate change to them.

Barriers

- It's more of an issue of the capacity and funding at the municipal level.
- There is a barrier for municipalities to access the carbon market as there is a cost and expertise required to verify GHGs.
- Industry is a barrier for municipalities, but by grouping together they can drive action.
- Community reductions at the rural level will be a struggle because alternatives for driving won't be feasible. For some things like transportation, it is going to take the Federal to get involved as they regulate vehicle emissions. It is going to be hard to get to 80% reduction by 2050 without regulating the transportation industry or issues around oil.

Interviewee J

Context

- Department of Environment manages climate change within the Alberta Government, which has climate change secretariat that focuses on the large industrial emitters regulation, the management reporting program, national and international climate change policies and working with municipalities to support their own action plans.
- Heading into the third year of compliance for the regulatory system.
- Improvements companies could be making to their technology has been made already because of energy costs so until the price of carbon drives further technology changes, right now emitters will pay into the technology fund.
- The technology fund is where the bulk of the compliance falls and that was by design. It will always be the primary compliance piece unless carbon prices increase. The fund will be used towards technology that will benefit or have applications in Alberta.
- The carbon market and technology fund is essentially capping the price at \$15/tonne.

Role/Jurisdiction

- We need the federal government and US to provide some direction.
- Industry is the biggest bang for the provincial buck and the easiest place to start.

Support

- We have relationships in some form or another with different associations and groups in the province to create that connection within the province.

- The province has always experienced the request of financial support from municipalities, but there is a bigger appetite to have partnership and be collaborative not only with the province but other municipalities.
- Working with the large municipalities in the province (ie. Calgary and Edmonton), as they acknowledge that municipalities are on the front lines of climate change and there is a gap.

Emerging trends

- Alberta's system is like no other in the world... with an offset program, a regulatory system and the technology fund and Alberta Environment is going to be an open door and very organics in trying to get things moving.
- Reductions at the local level is about land use planning and smart urban design and the province might assist by saying here's the limits and the space to work within.
- The province has released the Land Use Framework and the Energy Strategy which are less about air emissions, but have secondary benefits of GHG reductions.
- Municipalities need to start looking at how to tap into other areas of government funding, not just climate change funding. (ie. If it's road related, how can you tap into Alberta Transportation funding and still have GHG benefits).

Barriers

- As our program grows, so does the expectations and it's a challenge to make sure we are managing those timelines, resources and relationships.
- There are companies and sectors that are waiting for things to happen, but then there are those that are making it happen; an organic system allows us to work through it with them.
- Nationally we have a challenge on how to get the consumer side of emissions and provincially we have not yet had an honest conversation of how to target consumers.
- Alberta has room to grow and we are still seeing relatively good air quality on the majority of days, therefore it's difficult to push action in the face of that. Industry has suggested that an emissions limit would be problematic.
- There is still a need to figure out the ability of municipalities and identify the role that the province has versus the role of the local level.
- Need to raise the awareness and understanding at the local level of climate change impacts and that takes time and money.
- Transportation is 15% of Alberta's emissions, when in other jurisdictions its more like 25-30%, therefore more difficult to focus on that when we have a larger piece of the pie.
- The provincial government also works in silos and we are trying to make sure that other departments have a focus and appreciation for climate change.
- A provincial barrier is growth and until we do so, the efforts that are being made are going to be reduced by the growth and make the province appear that no steps are being taken. Climate change needs to be made mainstream and brought into every day discourse.