



Energy Management Plan and Greenhouse Gas Emissions Reduction Strategy



Partners for Climate Protection

Local Action Plan

2004—2006

Submitted by:
The City of Spruce
Grove
315 Jespersen Avenue
Spruce Grove, Alberta
T7X 3E8
www.sprucegrove.org



Energy Management Plan - Greenhouse Gas Emissions Reduction Strategy -

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Executive Summary

The City of Spruce Grove is committed to sustainable development and to becoming a leader in environmental stewardship. By recognizing the ever-present link between the social, economic and environmental factors of our society, we will be in a position to reconcile these facets and move forward with a holistic, systems approach to community planning.

Comprehensive energy planning is a key way to move towards our goals of being a sustainable, vibrant and healthy community for future generations. Thus, in 2003, Spruce Grove City Council voted unanimously to join Partners for Climate Protection, a voluntary greenhouse gas emissions reduction program offered by the Federation of Canadian Municipalities (FCM) and the International Council for Local Environmental Initiatives (ICLEI). Committing to a 20% reduction of corporate greenhouse gas (GHG) emissions and a 6% community reduction by 2013, the Energy Management Plan will serve as guide to realizing these reductions.

Key components of the Energy Management Plan include:

- A detailed background of the city, its emissions indicators and its participation in national climate change mitigation efforts through Partners for Climate Protection;
- A series of guiding principles that voice our philosophy towards energy management and will act as an overall guide to project development, the Energy Management Team, and the organization as a whole;
- A past, present and future profile of each our corporate and community energy use and emissions output for 1996, 2003 and 2013 to measure where we are now and where we need to go; and
- Two action plans, corporate and community focused, containing project ideas and objectives that will work to meet reduction targets.

Emissions Summary Baseline Year (1996)

Sector	Emissions (tCO ₂ e)	Emissions (%)
Corporate	6,594	2.4
Community	264,755	97.6
Total	271,349	100.0



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Energy Management Objectives

Working with the City's strategic plan

- Key initiatives and associated priority areas – Clean and Green (Environmental Responsibility) and Service Excellence (Service Delivery, Fiscal Plan)
- Ensure that all action items and outcomes correspond with the City's key initiatives
- Align goals with community vision established at 2000 Community Caucus

Sustainable Development Principles

- Represent the concept of "Natural Capital" by attaching a value to the environment
- Integrated/systems approach to decision-making
- Strive to achieve a balance between cost and environmental impact by incorporating environmental and community considerations into our bottom line

Demonstrated Leadership

- Demonstrate individual and organizational commitment to environmental management – lead by example
- Encourage staff to change behaviours and take ownership of their impact
- Provide a working, practical example of the Sustainable Development Charter and its function

Environmental Stewardship

- Take every opportunity to achieve the highest possible standard of environmental stewardship
- Challenge traditional thinking by incorporating a fresh approach with an emphasis on innovation

Improving Quality of Life

- Understand the affects of climate change on air quality and human health
- Air quality as a community asset to be sustained and protected
- Recognize that a clean physical environment promotes a healthy lifestyle



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Background

The Energy Management Plan (EMP) views the community over the long-term, using as its theme a future vision developed by the residents of Spruce Grove. For a community to have lasting viability, from a social, economic and environmental perspective its long-term vision must include an effort to optimize its energy use. The City has made a commitment to sustainable development, and environmental stewardship, in the way of responsible energy use, is a large component of that. The EMP will therefore define the energy goals of the organization and will outline the commitment that the organization will make to support this vision.

The City of Spruce Grove is facing significant challenges to service delivery through the rising costs of electricity, natural gas and fuel. Changes to energy costs directly impact the City's operating budget and ability to deliver services to residents. While we cannot control the cost of utilities, we can control the amount we use.

By making an effort to minimize our energy use, we are in turn reducing greenhouse gas emissions and greening our community. To optimize our efforts in this regard, the City has joined a national energy reduction endeavor headed by FCM and ICLEI. The Partners for Climate Protection program offers its members a supported framework for establishing and achieving the reduction target. A key piece of the framework is the development of a local action plan to guide activities that will fulfill the City's aim of identifying and implementing initiatives to achieve energy efficiencies for the purposes of incurring cost savings and reducing GHG emissions.

Not only a best practice, producing an EMP will serve several purposes:

1. Provide strategic direction regarding energy use within the organization and the community as a whole.
2. Having an inventory of emissions reduction initiatives will easily facilitate reporting
3. As Milestone Three of the Partners for Climate Protection program, our commitment includes the submission of a local action plan.
4. Most funding programs require a documented strategy be included as part of the application process.

This plan is a living document and will be updated on an annual basis to report progress and continued development of initiatives.



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Local Context and Demographics

Spruce Grove is located approximately 11 kilometers west of the City of Edmonton. The City is surrounded by County farmland, leaving few restrictions on growth and development. Currently, there is approximately 53.4% of undeveloped land within the City's corporate limits. Of the developed land, the majority is zoned residential, however we have a substantial amount of green space and urban forest. Appendix A contains a map depicting the City's land use plan, as well as a map of the corporate limits which illustrates the total area of developed and undeveloped land.

Since our base line year of 1996, the population has grown by 19.7%. The 2003 municipal census revealed a population of just over 17,000 residents. All projections for the emissions inventory are based on an average annual growth rate of 3.5%.

Emissions Indicators

Emissions data is only useful when explained within the context in which it was produced. The following factors have been collected to compliment the emissions data and the information contained in this report.

Total area of City	2,617 ha
Municipal buildings	11 (14,036.188 m ²)
Municipal fleet vehicles	65
Residential dwellings	6,936
Commercial units	937
Industrial units	422
Institutional units	130

Nature of the Community

Through community consultation sessions held in 2001, a vision of a "clean and green" community was clearly expressed by residents. Issues of air quality, waste management, efficient use of resources, and environmental stewardship were identified as priority areas and subsequently were highlighted in the organization's strategic plan, the Key Initiatives.

The residents of Spruce Grove are active and community-oriented. We have a vibrant cultural and recreational scene with opportunities for all ages. Much of our recreational culture is related to the numerous parks and extensive trail system. Resident surveys have identified the City's parks as an integral feature of the community that adds to the quality of life and attraction of Spruce Grove.

Having our identity tied to our natural surroundings adds extra incentive to protect and enhance our environment.



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Partners for Climate Protection

In June 2003, City Council voted to join the Partners for Climate Protection program and became the 106th member. PCP is the Canadian counterpart of ICLEI's Cities for Climate Protection, a successful voluntary reduction program running in the United States and Australia. To support this growing network of municipalities, PCP offers a five-milestone framework through a performance-based model to guide the emissions reduction project. The milestones are as follows:

- Milestone One – Create a greenhouse gas emissions inventory and forecast
- Milestone Two – Set an emissions reduction target
- Milestone Three – Develop a local action plan
- Milestone Four – Implement the local action plan
- Milestone Five – Monitor progress and report results

The development of two separate inventories, corporate and community, is encouraged as municipalities can develop and implement plans on an organizational level in order to demonstrate leadership and provide a positive example for the community.

Municipal governments have an important contribution to make to the reduction of emissions. Up to half of Canada's GHG emissions (350 million tonnes) are under the direct or indirect control or influence of municipal governments. The federal government has acknowledged that the involvement of municipalities is crucial to achieving Kyoto targets, thus funding for the program is provided by Environment Canada's Climate Change Action Fund.

Greenhouse Gas Emissions and Climate Change

Climate is the average weather pattern experienced by a specific location. It is a summary of past weather events and is influenced by many factors such as latitude, altitude, topography and large bodies of water. Basically, climate is the result of the way the earth's atmosphere redirects the sun's energy. The atmosphere is made of a gaseous layer of water vapour and naturally occurring gases such as nitrogen and oxygen. Also present are trace amounts of carbon dioxide, methane and nitrous oxide, which create the greenhouse effect by trapping the reflected energy and preventing it from escaping immediately into space, hence the term "greenhouse gases." This is what maintains the earth's surface temperature and makes the planet habitable for humans.

As greenhouse gases are also regularly emitted into the atmosphere by human activity, we are responsible for enhancing the greenhouse effect. It is estimated that human activity directly adds five billion tonnes of carbon dioxide (CO₂) to the atmosphere each year. In Canada, individuals are responsible for at least 25 per cent of emissions primarily due to transportation, fossil fuel use, and waste disposal. In Spruce Grove, the foremost greenhouse gas emitted is CO₂ and the majority of emissions are due to vehicle transportation and residential use of electricity.

The enhanced greenhouse effect leads to an unnatural increase in temperatures and irregular weather patterns such as extreme hot and cold, floods, drought, and storms. Weather irregularities will have negative effects on agriculture, forestry, fisheries, and the world's fresh-water supply. Warmer temperatures, together with reduced precipitation and higher evaporation, may reduce water levels and compromise the quality of drinking water. While not only endangering the health of



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ecosystems and nature, climate change may have serious impacts on human health by way of air quality, especially in urban and industrialized areas. Moreover, natural disasters will become more common and may bring serious economic consequences.

It is critical that the gases in the atmosphere be stabilized. The Kyoto Protocol is an international treaty created to secure the commitment of United Nations members to annually reduce greenhouse gas emissions in a bid to ease the impacts of climate change and secure the releases of greenhouse gases. By encouraging more environmentally responsible ways of producing and using energy, the Protocol hopes to reach emission targets of below 1990 levels. For Canada, this will require an 18 per cent reduction from current emissions. Because climate change is a natural occurrence, this initiative will not stop its progression; what the Kyoto Protocol does is make an effort to slow down the rate of climate change and facilitate adequate adaptation measures. The savings realized through the reduction of fossil fuel use will buy time for the global climate system while alternative energy technologies can be developed and made cost-effective. It is hoped that emissions-free sources ultimately will replace fossil fuels as the main category of energy supply.

Along with reduced fossil fuel use, the proliferation of forests is an effective tool in mitigating climate change. Trees use only sunlight for energy and act as carbon sinks by removing CO₂ from the atmosphere and replacing it with oxygen. This biological occurrence represents a net withdrawal of atmospheric CO₂, a "carbon credit", which can logically be considered to offset emissions due to fossil fuel use.

Responding to climate change requires an approach that involves the above mentioned mitigation efforts, as well as adjusting activities and practices to reduce our vulnerability to potential impacts, referred to as adaptation. The nature of the earth's climate systems means that temperatures would continue to rise, even after stabilization of CO₂ and other greenhouse gases is achieved. Adaptation is therefore necessary to complement reduction strategies. A sector or region with a high adaptive capacity would generally be able to cope with, and perhaps even benefit from, changes in the climate, whereas one with a low adaptive capacity would be more likely to suffer as a result of the same change. In addition to reducing vulnerability to future climate change, enhancing adaptive capacity would also increase our ability to deal with present-day climate variability.



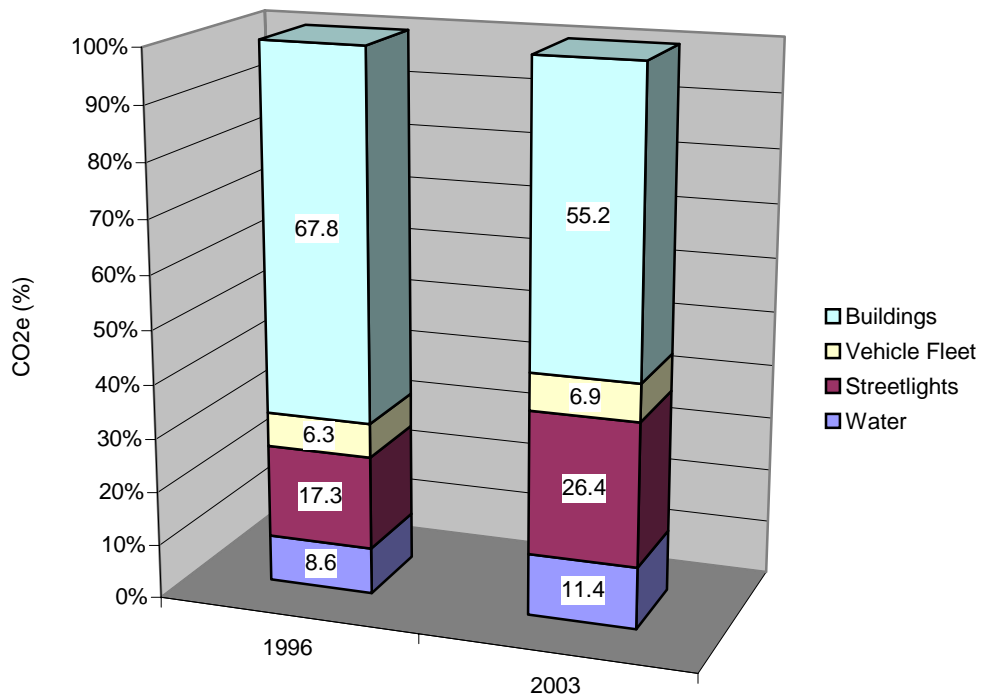
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Emissions Inventory, Forecast and Reduction Targets

Corporate Energy Profile

The Corporate greenhouse gas emissions inventory incorporates electricity and natural gas usage of all City buildings, fleet, streetlights, as well as the water distribution system. The City's inventory was created using a baseline year of 1996, as that was our earliest complete set of records. All data is taken directly from 1996 utility bills.

Percentage by Sector of Overall Corporate GHG Emissions



Actual Corporate Emissions (tonnes CO ₂ equivalent)			
Sector	1996 (tCO ₂ e)	2003 (tCO ₂ e)	Change
Buildings	4,471	2,924	-35 %
Fleet	416	367	-12 %
Streetlights	1,142	1,398	+22 %
Water	565	605	+7 %
TOTAL	6,594	5,295	-19.7 %

As of 2003, corporate GHG emissions have reduced by 19.7%. Reasons for the decrease are as follows:



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Buildings – 35% reduction in emissions

- City Hall retrofit to green building standards
- Closing the indoor swimming pool
- Energy efficiency upgrades made in several buildings affecting lighting and heating; significant upgrades to Agrena
- Only building with increased consumption is Fire/RCMP; increase will likely continue as more emergency services staff are added and building is used at all hours

Vehicle Fleet – 12% reduction in emissions

- Fleet size has remained relatively the same from 1996 to 2003
- Retirement of older vehicles
- “Right-sizing” – more appropriate vehicle choices based on use
- Fuel efficiency as a more prominent buying feature

Streetlights – 22% increase in emissions

- Population has increased by almost 20% since 1996
- 50% increase in number of signalized intersections (incandescent lights)
- 35 subdivision phases have been completed since 1996

Water Distribution – 7% increase in emissions

- Second pump house used much more in recent years, as its zone encompasses the residential community

Community Energy Profile

The community greenhouse gas emissions inventory was created using a baseline year of 1996. Community sectors include residential, commercial and industrial buildings; transportation-related fuel use and landfill waste.

Residential, commercial, and industrial data is based on actual consumption figures provided by Atco Gas and Fortis, Inc., the two companies that provide Spruce Grove with natural gas and electricity, respectively. Electricity consumption data was estimated for 1996 based on the number of households and area of commercial development due to unavailability of data for that year. Fortis’s local records go back as far as 1998.

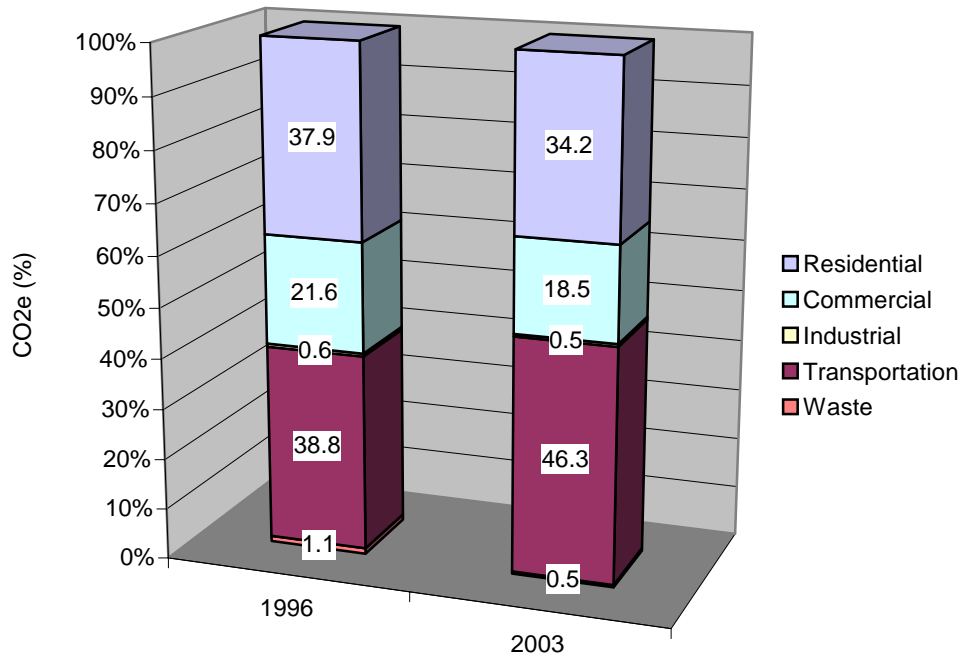
Transportation data was estimated using traffic count information and projections from the 2000 Spruce Grove Transportation Study in conjunction with the PCP software’s VKT (vehicle kilometers traveled) calculator.

Waste data was collected from the City’s contractor, Canadian Waste Management, although complete records only went back as far as 2001, consequently baseline estimates were determined based on the number of households in 1996.



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Percentage by Sector of Overall Community GHG Emissions



Actual Community Emissions (tonnes CO₂ equivalent)			
Sector	1996 (tCO₂e)	2003 (tCO₂e)	Change
Residential	100,303	110,877	+9%
Commercial	57,177	60,054	+5%
Industrial	1,616	1,531	-5%
Transportation	102,744	150,318	+32%
Waste	2,915	1,765	-39%
TOTAL	264,755	324,545	+22.6%

As of 2003, community GHG emissions have risen by 22.6 %. Reasons for the increase are as follows:

Residential – 9% increase in emissions

- Spruce Grove is primarily a residential community that has seen significant growth in recent years
- 19.7% population growth since 1996

Commercial – 5% increase in emissions

- Increased presence of big box stores
- Commercial boom to correlate with population increase



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Industrial – 5% decrease in emissions

- Light industrial industry has not seen much growth

Transportation – 32% increase in emissions

- Provincial highway running through the City
- Town of Stony Plain (pop. 10,544) able to access Edmonton through Spruce Grove (38% of their population work in Edmonton, 15% work in Spruce Grove)
- 65% of transportation emissions released by Spruce Grove residents

Waste – 39% decrease in emissions

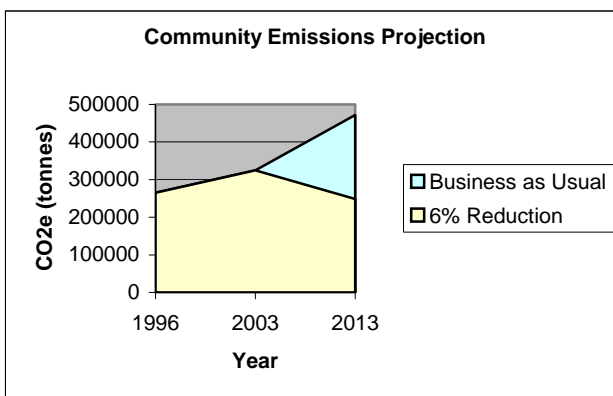
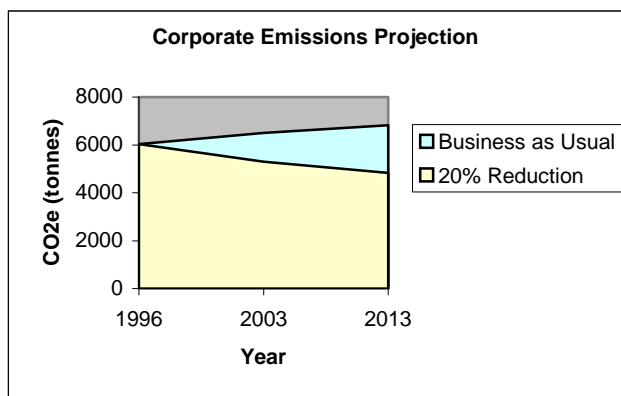
- Organic waste collection program introduced in 2001
- Recycling Centre collects mixed paper, metal, glass, cardboard, plastic milk jugs and electronic waste
- 34% waste diversion in 2003 – Organics 29%; Recycling Centre 4%

Reduction Targets

By way of formal Council resolution (please see Appendix B), the City of Spruce Grove has committed to reducing greenhouse gas emissions by 2013. The following targets have been set:

- Reduction of emissions due to municipal operations by 20% below 1996 levels (5,275 tonnes CO₂e)
- Reduction of community-wide emissions by 6% below 1996 levels (248,870 tonnes CO₂e)

The following graphs reflect the baseline, current, and target years' emissions with a clear distinction between our future emissions as an active participant in the PCP program and future emissions with no action taken.



These reduction targets are not only realistic and achievable but as is apparent by the “business as usual” projections, very necessary for the sustainability of Spruce Grove as a clean and green community.



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Reduction Strategy

The City’s reduction strategy has several components. The prioritization grid and funding sources are the tools necessary to meet our targets in a timely and efficient manner. Keeping in line with the City’s budgetary process, the action items will be reviewed and new opportunities will be outlined on an annual basis.

Prioritization Grid

In order to work through numerous available projects in a conscientious and effective manner, a mechanism has been developed to establish priority. The grid below rates projects according to a variety of elements that have been determined to directly impact a project’s ability to affect overall CO₂ reduction, as well as funnel savings back into the energy management fund. There are 12 available points for “core criteria” which includes energy savings per unit, impact on total CO₂ reduction, and a timely payback period. As well as three additional points for “value-added elements” such as the availability of funding opportunities, co-benefits, and public visibility.

The information required for the grid will not only simplify the decision-making process, but when used in conjunction with the City’s project charter process, will result in a well-thought out opportunity. As well, the data collected for the grid will enable easy tracking of energy savings upon completion of projects.

		High (4)	Substantial (3)	Moderate (2)	Minimal (1)
Core Criteria	Energy Savings	>20%	11 - 19%	6 – 10%	<5%
	Impact on total CO₂ Reduction	>3%	1.5 - 3%	0.25 – 1.4%	<0.24%
	Payback Period	<3 yrs	3 – 10 yrs	11 – 20 yrs	>21 yrs
Value- Added Elements	Funding Opportunities	Yes (1)		No (0)	
	Co-benefits	Yes (1)		No (0)	
	Public Visibility	Yes (1)		No (0)	



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Funding Sources

There are three sources for financing energy management projects. The first is grant funding. Due to the Kyoto Protocol and an emergence of environmentalism as a component of comprehensive strategic planning, there are several funding sources available for projects related to energy management.

The second is an internal reserve that will provide an opportunity to capture the savings generated from energy efficiency projects and finance further initiatives. As a result of the Viking/Kinsella gas field sale rebate and the ENMAX billing error rebate, the City has an available sum to launch this fund. Access to this fund must be in accordance with the City's Energy Management Reserve Policy.

Thirdly, financial support for energy projects may also occur through general operating funds for smaller efficiency upgrades, usually in conjunction with other work. As well, capital funding may be used to improve energy efficiency in combination with other capital improvements.

Action Plans

The action plans below detail a number of projects that will serve as a starting point for the energy management program, both corporate and community focused. The corporate action plan primarily deals with the development and organization of policies and plans that will establish a strong foundation for further action.

As for the community action plan, the focus is strongly centered on raising awareness and dialoguing with residents regarding individual action and determining what role the City can play in facilitating those individual efforts.

As action items are completed and opportunities are realized, those items will become part of the "measures taken to date" inventory. As well, with every update, we will show the progress being made towards our reduction target.



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Corporate Action Plan, 2004 – 2006				
Sector	Action	Timeline	Lead Role	Outcome
General	<ul style="list-style-type: none"> - Develop and implement an energy awareness program for City staff - Ensure energy focus is reflected in City plans - Develop corporate water efficiency strategy - Investigate opportunities for alternate energy sources 	2005	P & I (SDC)	Individual contribution key to overall success; ensure consistent message throughout City documents
		2006		
Buildings	<ul style="list-style-type: none"> - Develop and launch BOSS software as main energy analysis tool for buildings - Continue implementing 2003 Enmax audit recommendations - 410 King Street retrofit feasibility study 	2004/05	P & I (SDC)	Central location established to track energy data, opportunities and measures; more energy savings achieved
		2005/06		
		2006	(Corporate Services)	
Fleet	<ul style="list-style-type: none"> - Develop comprehensive Fuel Management Plan (anti-idling policy, education campaign, alternative fuels, “right-sizing”) 	2005	P & I (SDC)	Efficient use of resources; fleet emissions reduced
Streetlights	<ul style="list-style-type: none"> - Develop LED Retrofit program strategy for traffic signals - Investigate efficiency opportunities for streetlights; update development standards 	2004 (develop)	P & I (PW)	Efficient use of resources, lower operating costs, savings will kick start Energy Mgmt Fund
		2005 (implement)	(Eng)	

Corporate Measures Taken to Date			
Sector	Action	Outcome	Impact
Buildings	- Audit of City facilities (2003)	- Opportunities identified; BOSS data compiled	35% reduction in emissions from 1996 to 2003
	- Green Buildings Policy (2003)	- All major renovations and new construction of City buildings will be done to the LEED™ certified standard	
	- Energy efficiency upgrades	- Various maintenance upgrades related to lighting, overhead doors, furnaces, boilers, and air conditioners	

Emissions Target (2013) 5275 tonnes CO₂e
 Current Emissions (2003) 5295 tonnes CO₂e



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Community Action Plan, 2004 – 2006				
Sector	Action	Timeline	Lead Role	Outcome
General	<ul style="list-style-type: none"> - Enhance website as information clearinghouse for public - Community Caucus – dialogue with residents as to their role in meeting reduction target - Council as community champions of emissions reduction 	2005	P & I (SDC)	Building profile for reduction program; Gather input from the community
Residential	<ul style="list-style-type: none"> - Produce residential GHG reduction handbook 	2004/05	P & I (SDC)	Tools available for community involvement
Commercial Industrial Institutional	<ul style="list-style-type: none"> - Present business case for reducing energy use - Encourage eco-industrial development 	2005	P & I (SDC) Business Affairs	Introduce concept to local business
Transportation	<ul style="list-style-type: none"> - Develop transportation demand management plan - Community dialogue 	2005/06	P & I (Engineering)	Increased use of alternative transportation
Waste	<ul style="list-style-type: none"> - Develop long-term waste management strategy - Increase promotion of Organicart and recycling program 	2005 2005	P & I (Engineering)	Increased diversion

Community Measures Taken to Date			
Sector	Action	Outcome	Impact
Waste	<ul style="list-style-type: none"> - Waste diversion programs launched (2001) 	<ul style="list-style-type: none"> - Residential curbside organics collection (29% diversion in 2003) - Recycling Centre accepts mixed paper, cardboard, plastic milk jugs, metal, glass and electronic waste (4% diversion in 2003) 	39% decrease in emissions related to waste

Emissions Target (2013) 248,870 tonnes CO₂e
 Current Emissions (2003) 324,545 tonnes CO₂e

APPENDIX A:

MAPS

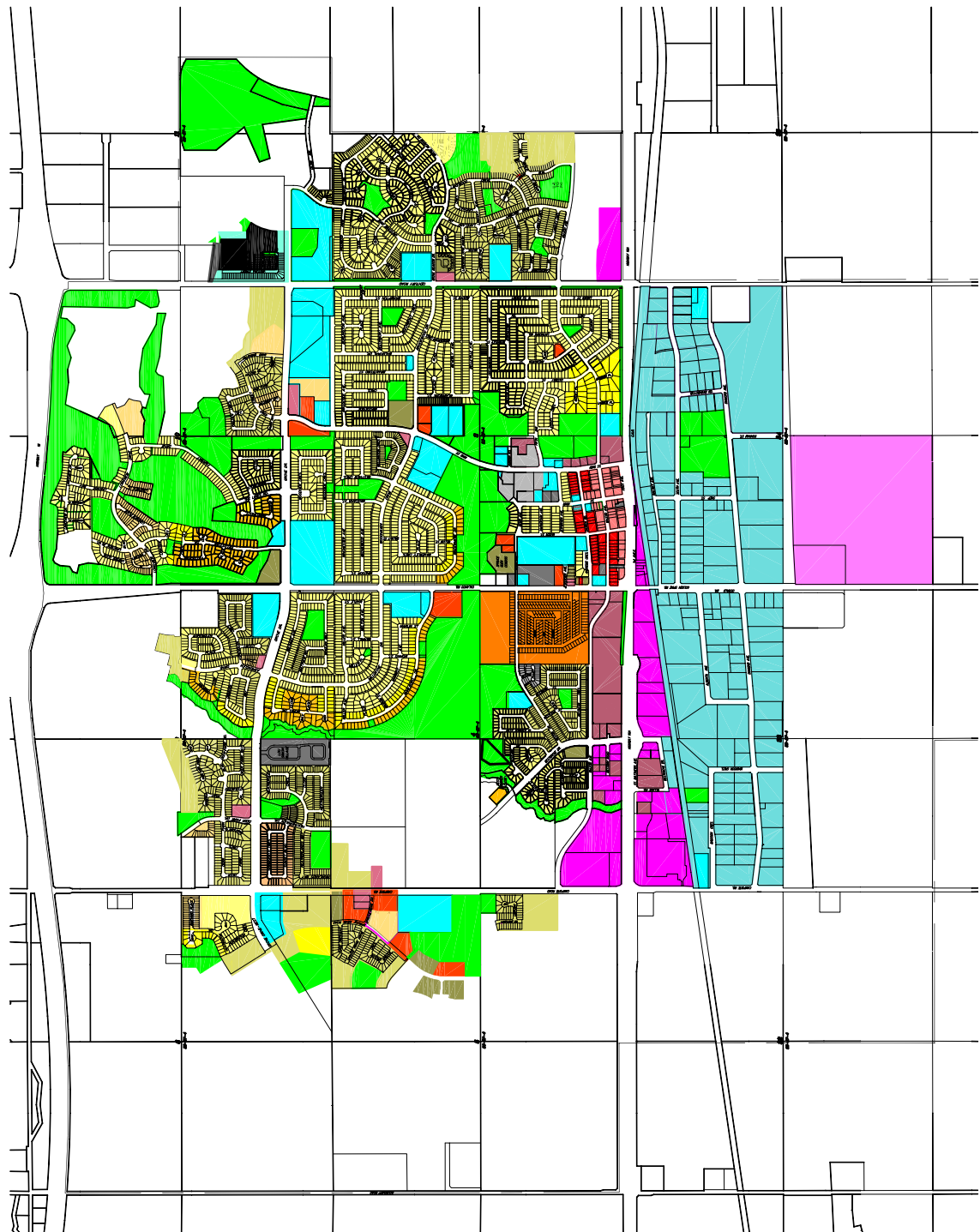
- **Land Use Map**
- **Area Map –
Developed and Undeveloped Land**

CITY OF SPRUCE GROVE
 PLANNING AND DEVELOPMENT DEPARTMENT
 LAND USE PLAN

OCTOBER 2004

LEGEND

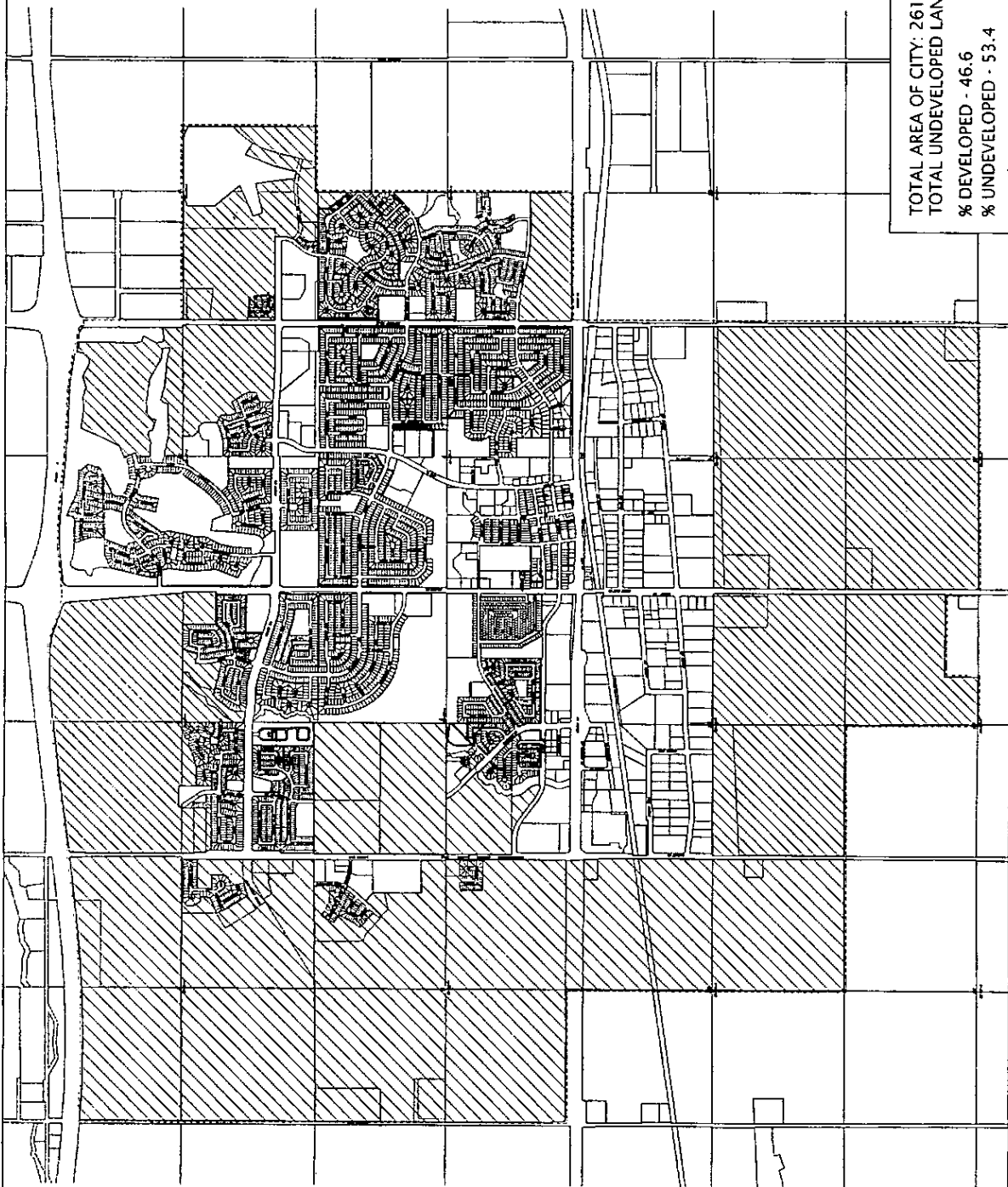
- | | | | |
|---|-------|------------------|-------------------------------------|
|  | R-1A | RESIDENTIAL | Single Detached (Class A) |
|  | R-1B | RESIDENTIAL | Single Detached (Class B) |
|  | R-1C | RESIDENTIAL | Single Detached (Class C) |
|  | R-1D | RESIDENTIAL | Single Detached (Class D) |
|  | R-2 | RESIDENTIAL | Two Dwelling Units |
|  | R-2M | RESIDENTIAL | Medium Density |
|  | R-2MS | RESIDENTIAL | Medium Density Small Site |
|  | R-3 | RESIDENTIAL | High Density |
|  | R-MHC | RESIDENTIAL | Mobile Home Court |
|  | R-MHS | RESIDENTIAL | Mobile Home Subdivision |
|  | C-1 | COMMERCIAL | City Center |
|  | C-2 | COMMERCIAL | Mixed Use |
|  | C-3 | COMMERCIAL | Neighbourhood Retail & Service |
|  | C-4 | COMMERCIAL | Shopping Center |
|  | C-5 | COMMERCIAL | General Industrial |
|  | M-1 | INDUSTRIAL | Light Industrial/Commercial |
|  | BP-1 | BUSINESS PARK | Semi Public (Institutional) |
|  | S-P | SEMI PUBLIC | General Recreation |
|  | P-1 | RECREATION | Holding District |
|  | U-R | URBAN RESERVE | Comprehensive |
|  | DC-1 | DIRECT CONTROL 1 | Development Specific |
|  | DC-2 | DIRECT CONTROL 2 | Semi-Detached or Duplex Residential |
|  | SVR-2 | SPRUCE VILLAGE | Small Lot Residential |
|  | SVRLR | SPRUCE VILLAGE | Planned Lot Residential |
|  | SVRPL | SPRUCE VILLAGE | |





TOTAL AREA OF CITY: 2617 ha
TOTAL UNDEVELOPED LAND: 1398 ha
% DEVELOPED - 46.6
% UNDEVELOPED - 53.4

SCALE 1 : 25000



APPENDIX B:

PARTNERS FOR CLIMATE PROTECTION RESOLUTION

Proclamation

WHEREAS a global reduction in emissions of greenhouse gases is necessary to protect against climate change and possible adverse effects on human health, the physical environment, economy and quality of life;

WHEREAS Canada ratified the Kyoto Protocol in 2002 thereby committing to reduce its greenhouse gas emissions six per cent below 1990 levels between 2008 - 2012;

WHEREAS Federation of Canadian Municipalities and the International Council for Local Environmental Initiatives have established the Partners for Climate Protection program to provide a forum for municipal governments to demonstrate their leadership on climate change issues and share their knowledge and experience with other municipal governments;

WHEREAS Partners for Climate Protection participants commit to working towards reducing greenhouse gas emissions in municipal operations by 20 per cent below 1996 levels, and at least six per cent reductions below 1996 levels throughout their municipal area within ten years of joining the PCP initiative;

WHEREAS greenhouse gas emissions reductions contribute to sustainable community development and generate important economic, social and environmental benefits.

BE IT RESOLVED THAT the City of Spruce Grove communicate to FCM its support for the Partners for Climate Protection initiative and its interest in participating in PCP;

BE IT RESOLVED THAT the City Spruce Grove appoint the following corporate staff person to oversee implementation of PCP milestones: Sustainable Development Coordinator.



Mayor Ken Scott



Date



The Community of Choice!

APPENDIX C:

GREENHOUSE GAS EMISSIONS INVENTORY DATA – CORPORATE AND COMMUNITY

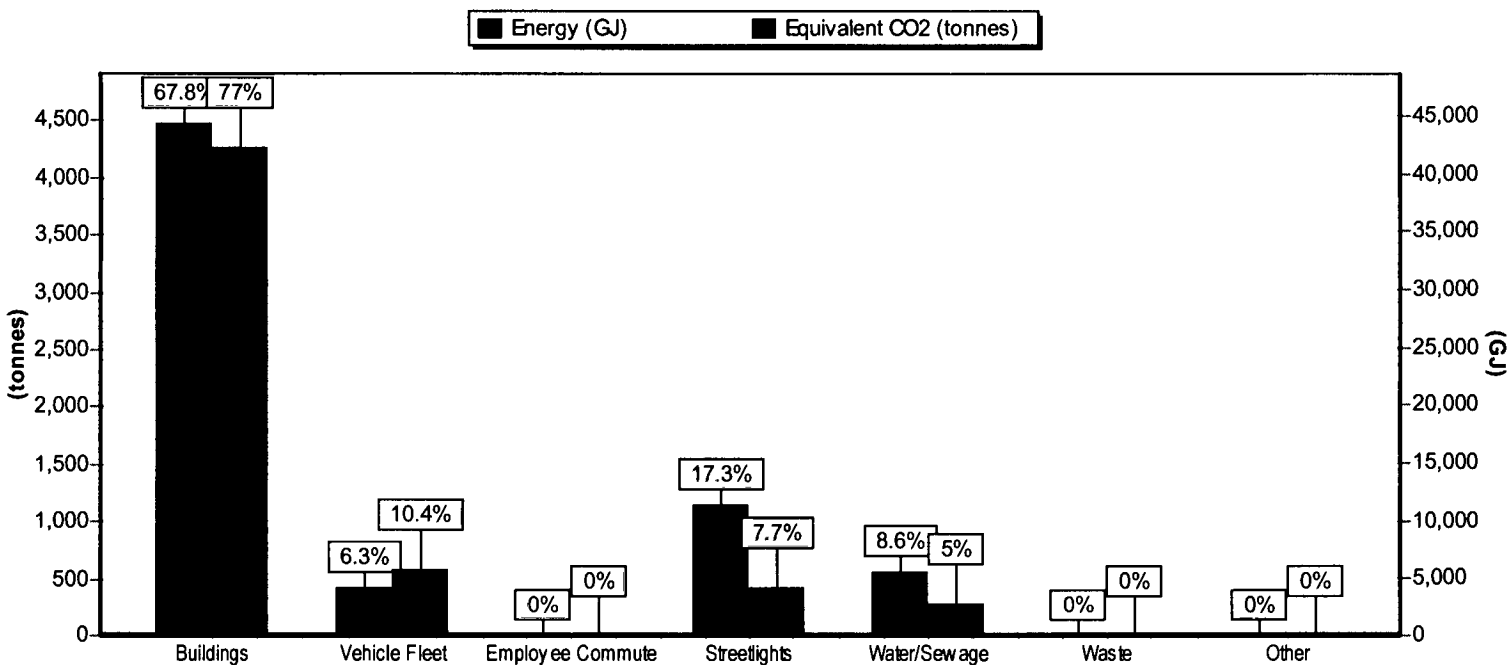
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City of Spruce Grove

Corporate Greenhouse Gas Emissions in 1996

Base Year Sector Summary

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Buildings	4,471	67.8	42,208	312,479
Vehicle Fleet	416	6.3	5,706	69,422
Streetlights	1,142	17.3	4,196	350,214
Water/Sewage	565	8.6	2,737	50,208
Total	6,594	100.0	54,847	782,323



Corporate Greenhouse Gas Emissions in 1996 Base Year Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Buildings				
<i>Arena</i>				
Electricity	1,540	23.4	5,659	112,702
Natural Gas	649	9.8	12,998	32,582
Subtotal Arena	2,189	33.2	18,658	145,285
<i>Brookwood Rink</i>				
Electricity	7	0.1	26	900
Natural Gas	13	0.2	254	890
Subtotal Brookwood Rink	20	0.3	280	1,790
<i>City Hall</i>				
Electricity	336	5.1	1,234	37,009
Natural Gas	160	2.4	3,206	8,976
Subtotal City Hall	496	7.5	4,440	45,984
<i>Fire/RCMP/Council Chambers</i>				
Electricity	261	4.0	961	17,530
Natural Gas	113	1.7	2,266	6,421
Subtotal Fire/RCMP/Council Chambers	375	5.7	3,227	23,951
<i>Henry Singer Park</i>				
Electricity	0	0.0	2	241
Natural Gas	5	0.1	95	457
Subtotal Henry Singer Park	5	0.1	96	698
<i>Library</i>				
Electricity	157	2.4	577	15,988
Natural Gas	57	0.9	1,139	3,361
Subtotal Library	214	3.2	1,717	19,349

Corporate Greenhouse Gas Emissions in 1996 Base Year Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
<i>Log Cabin</i>				
Electricity	7	0.1	24	2,000
Natural Gas	11	0.2	223	802
Subtotal Log Cabin	18	0.3	247	2,802
<i>Parks Shop</i>				
Electricity	12	0.2	43	1,924
Natural Gas	54	0.8	1,077	3,092
Subtotal Parks Shop	66	1.0	1,121	5,016
<i>Pool</i>				
Electricity	370	5.6	1,358	20,383
Natural Gas	376	5.7	7,533	20,756
Subtotal Pool	746	11.3	8,891	41,139
<i>Public Works Shop</i>				
Electricity	205	3.1	753	18,619
Natural Gas	139	2.1	2,778	7,847
Subtotal Public Works Shop	344	5.2	3,531	26,466
Subtotal Buildings	4,471	67.8	42,208	312,479
Vehicle Fleet				
<i>Cars</i>				
Gasoline	1	0.0	15	223
Subtotal Cars	1	0.0	15	223
<i>SGFS</i>				
Gasoline	18	0.3	246	3,637
Diesel	2	0.0	27	327
Subtotal SGFS	20	0.3	273	3,964

Corporate Greenhouse Gas Emissions in 1996 Base Year Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
<i>Tractors</i>				
Diesel	138	2.1	1,897	17,757
Subtotal Tractors	138	2.1	1,897	17,757
<i>Trucks</i>				
Gasoline	136	2.1	1,865	27,249
Diesel	93	1.4	1,272	14,566
Subtotal Trucks	228	3.5	3,137	41,815
<i>Vans</i>				
Gasoline	28	0.4	384	5,664
Subtotal Vans	28	0.4	384	5,664
Subtotal Vehicle Fleet	416	6.3	5,706	69,422
Streetlights				
<i>Crosswalks</i>				
Electricity	50	0.8	184	2,215
Subtotal Crosswalks	50	0.8	184	2,215
<i>Signs</i>				
Electricity	28	0.4	104	3,283
Subtotal Signs	28	0.4	104	3,283
<i>Streetlights</i>				
Electricity	992	15.0	3,647	336,531
Subtotal Streetlights	992	15.0	3,647	336,531
<i>Traffic Signals</i>				
Electricity	71	1.1	263	8,186
Subtotal Traffic Signals	71	1.1	263	8,186
Subtotal Streetlights	1,142	17.3	4,196	350,214

Corporate Greenhouse Gas Emissions in 1996 Base Year Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Water/Sewage				
<i>Zone 1 Pump House</i>				
Electricity	309	4.7	1,136	26,320
Natural Gas	25	0.4	508	1,561
Subtotal Zone 1 Pump House	334	5.1	1,644	27,880
<i>Zone 2 Pump House</i>				
Electricity	216	3.3	793	21,322
Natural Gas	15	0.2	300	1,005
Subtotal Zone 2 Pump House	231	3.5	1,092	22,327
Subtotal Water/Sewage	565	8.6	2,737	50,208
Total	6,594	100.0	54,847	782,323

City of Spruce Grove

Corporate Greenhouse Gas Emissions in 1996

Base Year Report by Source

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Electricity	4,561	69.2	16,763	625,151
Natural Gas	1,617	24.5	32,378	87,750
Gasoline	183	2.8	2,510	36,772
Diesel	233	3.5	3,196	32,650
Total	6,594	100.0	54,847	782,323

Fuel costs include Buildings, Vehicle Fleet, Streetlights and Water/Sewage sectors only.
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City of Spruce Grove

Corporate Greenhouse Gas Emissions in 1996

Base Year Indicators Report

	Equiv CO ₂ (tonnes)	Energy (GJ)	Cost (\$)
Buildings			
City Hall			
<i>Per floor area (1000 sq. m)</i>	0.5	4.6	48.0
Fire/RCMP/Council Chambers			
<i>Per floor area (1000 sq. m)</i>	0.3	2.4	17.8
Arena			
<i>Per floor area (1000 sq. m)</i>	0.3	2.9	22.9
Public Works Shop			
<i>Per floor area (1000 sq. m)</i>	0.2	1.6	12.3
Log Cabin			
<i>Per floor area (1000 sq. m)</i>	0.0	0.7	7.4
Pool			
<i>Per floor area (1000 sq. m)</i>	0.9	11.0	50.7
Parks Shop			
<i>Per floor area (1000 sq. m)</i>	0.2	2.6	11.6
Sector Average			
<i>Per floor area (1000 sq. m)</i>	0.3	3.2	23.4
Vehicle Fleet			
Vans			
<i>Per vehicle</i>	4.7	64.0	943.9
<i>Per vehicle kilometre</i>	0.0	0.0	0.1
Cars			
<i>Per vehicle</i>	1.1	15.2	222.8
<i>Per vehicle kilometre</i>	0.0	0.0	0.1
Trucks			
<i>Per vehicle</i>	8.2	112.0	1,493.4
<i>Per vehicle kilometre</i>	0.0	0.0	0.2
Tractors			
<i>Per vehicle</i>	13.8	189.7	1,775.7
<i>Per vehicle kilometre</i>	0.0	0.4	3.3
SGFS			
<i>Per vehicle</i>	2.8	38.9	566.3
<i>Per vehicle kilometre</i>	0.0	0.0	0.2

City of Spruce Grove

Corporate Greenhouse Gas Emissions in 1996

Base Year Indicators Report

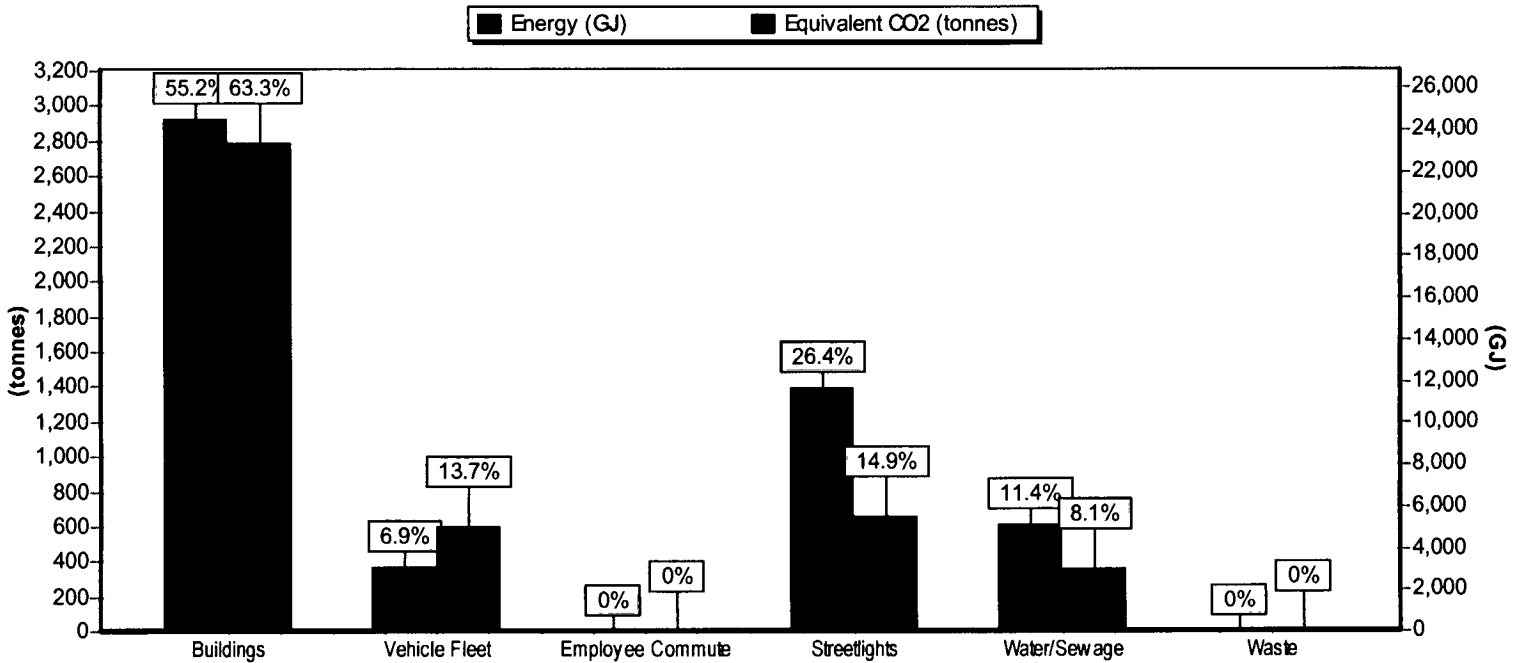
	Equiv CO ₂ (tonnes)	Energy (GJ)	Cost (\$)
Sector Average			
<i>Per vehicle</i>	8.0	109.7	1,335.0
<i>Per vehicle kilometre</i>	0.0	0.0	0.2
Streetlights			
Streetlights			
<i>Per streetlight</i>	0.7	2.5	234.8
Traffic Signals			
<i>Per streetlight</i>	7.1	26.3	818.6
Crosswalks			
<i>Per streetlight</i>	4.5	16.7	201.3
Signs			
<i>Per streetlight</i>	5.6	20.7	656.6
Sector Average			
<i>Per streetlight</i>	0.8	2.9	240.0
Water/Sewage			
Zone 1 Pump House			
<i>Per 1000 litres Per unit of output</i>	0.0	0.0	0.0
Zone 2 Pump House			
<i>Per 1000 litres Per unit of output</i>	0.0	0.0	0.0
Sector Average			
<i>Per 1000 litres Per unit of output</i>	0.0	0.0	0.0

City of Spruce Grove

Corporate Greenhouse Gas Emissions in 2003

Sector Summary

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Buildings	2,924	55.2	23,327	431,081
Vehicle Fleet	367	6.9	5,040	76,213
Streetlights	1,398	26.4	5,493	305,786
Water/Sewage	605	11.4	2,965	82,829
Total	5,295	100.0	36,824	895,908



Corporate Greenhouse Gas Emissions in 2003 Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Buildings				
<i>Arena</i>				
Electricity	1,203	22.7	4,728	157,763
Natural Gas	263	5.0	5,266	45,884
Subtotal Arena	1,466	27.7	9,995	203,647
<i>Aspenglen Rink</i>				
Electricity	7	0.1	27	1,024
Subtotal Aspenglen Rink	7	0.1	27	1,024
<i>Brookwood Rink</i>				
Electricity	10	0.2	38	1,417
Natural Gas	8	0.2	168	1,590
Subtotal Brookwood Rink	18	0.3	206	3,007
<i>City Hall</i>				
Electricity	264	5.0	1,039	36,315
Natural Gas	97	1.8	1,933	17,371
Subtotal City Hall	361	6.8	2,972	53,686
<i>Fire/RCMP/Council Chambers</i>				
Electricity	283	5.3	1,110	35,778
Natural Gas	85	1.6	1,694	14,988
Subtotal Fire/RCMP/Council Chambers	367	6.9	2,805	50,765
<i>Henry Singer Park</i>				
Electricity	2	0.0	8	368
Natural Gas	2	0.0	44	552
Subtotal Henry Singer Park	4	0.1	52	920
<i>Kinsmen Arts Centre</i>				
Electricity	10	0.2	38	1,819

Corporate Greenhouse Gas Emissions in 2003 Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Natural Gas	16	0.3	320	3,063
Subtotal Kinsmen Arts Centre	26	0.5	358	4,881
<i>Library</i>				
Electricity	173	3.3	678	23,633
Natural Gas	60	1.1	1,200	10,850
Subtotal Library	232	4.4	1,878	34,483
<i>Log Cabin</i>				
Electricity	21	0.4	83	4,240
Natural Gas	24	0.5	482	4,458
Subtotal Log Cabin	45	0.9	566	8,698
<i>Parks Shop</i>				
Electricity	7	0.1	29	1,268
Natural Gas	32	0.6	645	5,961
Subtotal Parks Shop	39	0.7	673	7,229
<i>Pool</i>				
Electricity	51	1.0	199	13,326
Natural Gas	33	0.6	665	5,703
Subtotal Pool	84	1.6	864	19,029
<i>Public Works Shop</i>				
Electricity	159	3.0	624	22,884
Natural Gas	115	2.2	2,308	20,827
Subtotal Public Works Shop	274	5.2	2,932	43,711
Subtotal Buildings	2,924	55.2	23,327	431,081

Corporate Greenhouse Gas Emissions in 2003 Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Vehicle Fleet				
<i>Cars</i>				
Gasoline	10	0.2	144	2,531
Subtotal Cars	10	0.2	144	2,531
<i>SGFS</i>				
Gasoline	11	0.2	147	2,600
Diesel	10	0.2	136	1,784
Subtotal SGFS	21	0.4	283	4,384
<i>Tractors</i>				
Gasoline	0	0.0	2	27
Diesel	112	2.1	1,536	18,319
Subtotal Tractors	112	2.1	1,537	18,346
<i>Trucks</i>				
Gasoline	138	2.6	1,891	32,766
Diesel	55	1.0	759	10,639
Subtotal Trucks	193	3.6	2,650	43,405
<i>Vans</i>				
Gasoline	31	0.6	425	7,547
Subtotal Vans	31	0.6	425	7,547
Subtotal Vehicle Fleet	367	6.9	5,040	76,213
Streetlights				
<i>Crosswalks</i>				
Electricity	51	1.0	200	7,474
Subtotal Crosswalks	51	1.0	200	7,474

Corporate Greenhouse Gas Emissions in 2003 Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
<i>Signs</i>				
Electricity	31	0.6	120	4,427
Subtotal Signs	31	0.6	120	4,427
<i>Streetlights</i>				
Electricity	1,215	22.9	4,775	279,743
Subtotal Streetlights	1,215	22.9	4,775	279,743
<i>Traffic Signals</i>				
Electricity	101	1.9	398	14,141
Subtotal Traffic Signals	101	1.9	398	14,141
Subtotal Streetlights	1,398	26.4	5,493	305,786
Water/Sewage				
<i>Zone 1 Pump House</i>				
Electricity	317	6.0	1,246	40,372
Natural Gas	25	0.5	503	4,497
Subtotal Zone 1 Pump House	342	6.5	1,748	44,869
<i>Zone 2 Pump House</i>				
Electricity	252	4.8	990	35,782
Natural Gas	11	0.2	226	2,178
Subtotal Zone 2 Pump House	263	5.0	1,216	37,960
Subtotal Water/Sewage	605	11.4	2,965	82,829
Total	5,295	100.0	36,824	895,908

City of Spruce Grove

Corporate Greenhouse Gas Emissions in 2003

Report by Source

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)	Cost (\$)
Electricity	4,156	78.5	16,329	681,775
Natural Gas	772	14.6	15,455	137,921
Gasoline	190	3.6	2,609	45,470
Diesel	177	3.3	2,430	30,743
Total	5,295	100.0	36,824	895,908

Fuel costs include Buildings, Vehicle Fleet, Streetlights and Water/Sewage sectors only.

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City of Spruce Grove

Corporate Greenhouse Gas Emissions in 2003

Indicators Report

	Equiv CO ₂ (tonnes)	Energy (GJ)	Cost (\$)
Buildings			
Arena			
<i>Per floor area (1000 sq. m)</i>	0.2	1.6	32.0
City Hall			
<i>Per floor area (1000 sq. m)</i>	0.4	3.1	56.0
Fire/RCMP/Council Chambers			
<i>Per floor area (1000 sq. m)</i>	0.3	2.1	37.6
Log Cabin			
<i>Per floor area (1000 sq. m)</i>	0.1	1.5	22.9
Pool			
<i>Per floor area (1000 sq. m)</i>	0.1	1.1	23.5
Public Works Shop			
<i>Per floor area (1000 sq. m)</i>	0.1	1.4	20.3
Parks Shop			
<i>Per floor area (1000 sq. m)</i>	0.1	1.6	16.7
Sector Average			
<i>Per floor area (1000 sq. m)</i>	0.2	1.7	31.1
Vehicle Fleet			
Cars			
<i>Per vehicle</i>	5.2	71.8	1,265.5
<i>Per vehicle kilometre</i>	0.0	0.0	0.4
Vans			
<i>Per vehicle</i>	6.2	85.0	1,509.3
<i>Per vehicle kilometre</i>	0.0	0.0	0.1
Trucks			
<i>Per vehicle</i>	6.7	91.4	1,496.7
<i>Per vehicle kilometre</i>	0.0	0.0	0.1
Tractors			
<i>Per vehicle</i>	8.0	109.8	1,310.4
<i>Per vehicle kilometre</i>	0.0	0.1	1.2
SGFS			
<i>Per vehicle</i>	2.6	35.4	548.0
<i>Per vehicle kilometre</i>	0.0	0.0	0.1

City of Spruce Grove

Corporate Greenhouse Gas Emissions in 2003

Indicators Report

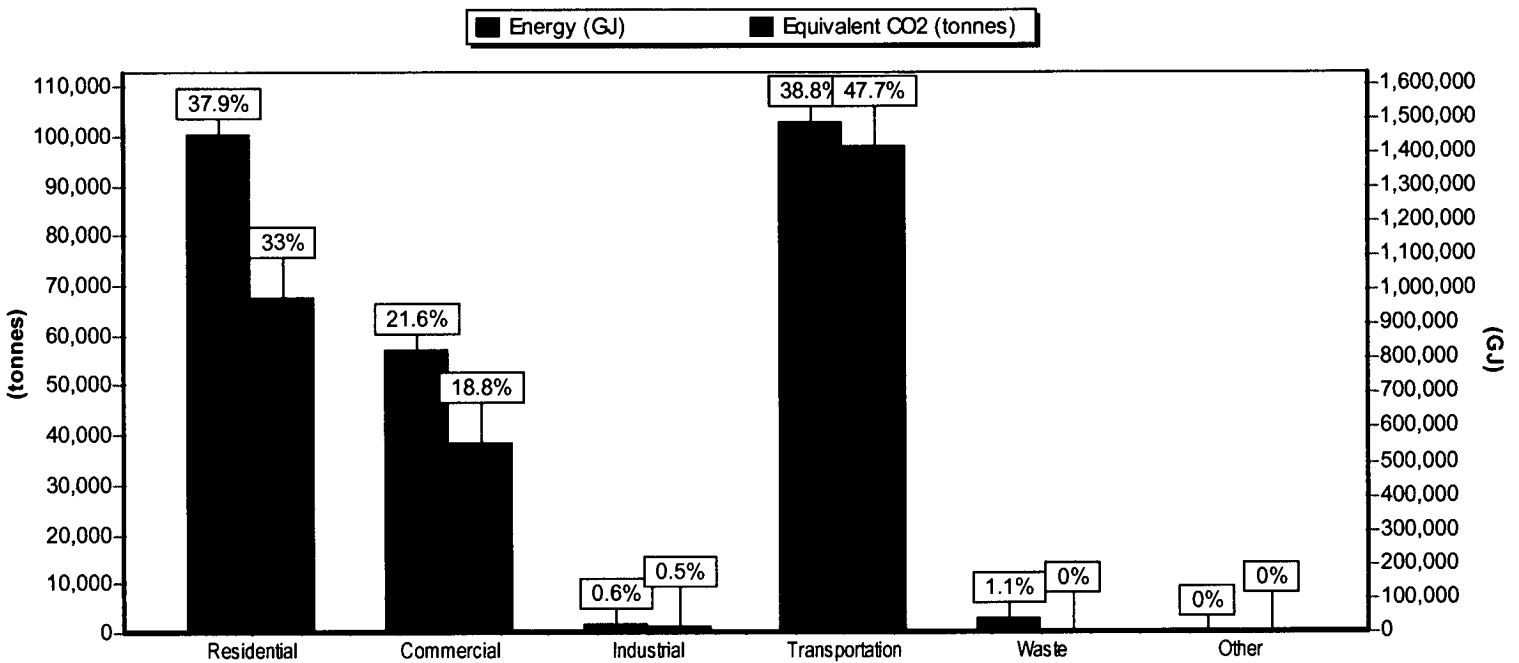
	Equiv CO ₂ (tonnes)	Energy (GJ)	Cost (\$)
Sector Average			
<i>Per vehicle</i>	6.3	86.9	1,314.0
<i>Per vehicle kilometre</i>	0.0	0.0	0.2
Streetlights			
Streetlights			
<i>Per streetlight</i>	0.7	2.9	167.0
Traffic Signals			
<i>Per streetlight</i>	6.3	24.9	883.8
Crosswalks			
<i>Per streetlight</i>	4.2	16.7	622.9
Signs			
<i>Per streetlight</i>	4.4	17.2	632.5
Sector Average			
<i>Per streetlight</i>	0.8	3.2	178.8
Water/Sewage			
Zone 1 Pump House			
<i>Per 1000 litres Per unit of output</i>	0.0	0.0	0.1
Zone 2 Pump House			
<i>Per 1000 litres Per unit of output</i>	0.0	0.0	0.0
Sector Average			
<i>Per 1000 litres Per unit of output</i>	0.0	0.0	0.0

City of Spruce Grove

Community Greenhouse Gas Emissions in 1996

Base Year Sector Summary

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Residential	100,303	37.9	979,233
Commercial	57,177	21.6	556,772
Industrial	1,616	0.6	16,017
Transportation	102,744	38.8	1,416,158
Waste	2,915	1.1	
Total	264,755	100.0	2,968,180



Community Greenhouse Gas Emissions in 1996 Base Year Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Residential			
<i>Residential</i>			
Electricity	62,943	23.8	231,352
Natural Gas	37,361	14.1	747,880
Subtotal Residential	100,303	37.9	979,233
Subtotal Residential	100,303	37.9	979,233
Commercial			
<i>Commercial</i>			
Electricity	35,967	13.6	132,201
Natural Gas	21,210	8.0	424,571
Subtotal Commercial	57,177	21.6	556,772
Subtotal Commercial	57,177	21.6	556,772
Industrial			
<i>Industrial</i>			
Electricity	999	0.4	3,672
Natural Gas	617	0.2	12,345
Subtotal Industrial	1,616	0.6	16,017
Subtotal Industrial	1,616	0.6	16,017
Transportation			
<i>Road Transportation</i>			
Gasoline	71,552	27.0	983,406
Diesel	29,646	11.2	406,468
Propane	1,220	0.5	20,134
CNG	326	0.1	6,151
Subtotal Road Transportation	102,744	38.8	1,416,158
Subtotal Transportation	102,744	38.8	1,416,158

Community Greenhouse Gas Emissions in 1996 Base Year Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Waste			
<i>Untitled</i>			
Paper Products	1,641	0.6	
Food Waste	1,422	0.5	
Plant Debris	-125	0.0	
Wood/Textiles	-23	0.0	
Subtotal Untitled	2,915	1.1	
Subtotal Waste	2,915	1.1	
Total	264,755	100.0	2,968,180

City of Spruce Grove

Community Greenhouse Gas Emissions in 1996 Base Year Report by Source

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Electricity	99,909	37.7	367,226
Natural Gas	59,187	22.4	1,184,796
CNG	326	0.1	6,151
Gasoline	71,552	27.0	983,406
Diesel	29,646	11.2	406,468
Propane	1,220	0.5	20,134
Paper Products	1,641	0.6	
Food Waste	1,422	0.5	
Plant Debris	-125	0.0	
Wood/Textiles	-23	0.0	
Total	264,755	100.0	2,968,180

Fuel costs include Buildings, Vehicle Fleet, Streetlights and Water/Sewage sectors only.

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City of Spruce Grove

Community Greenhouse Gas Emissions in 1996

Base Year Indicators Report

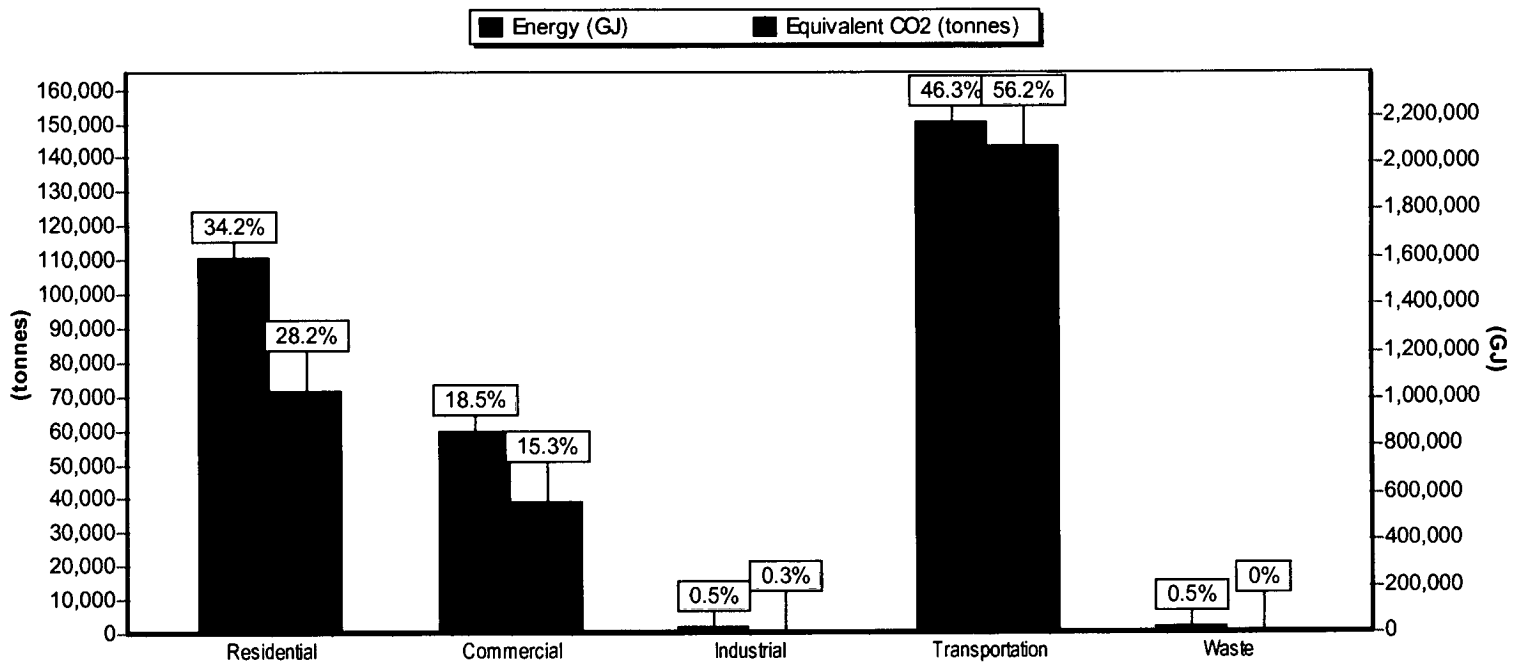
	Equiv CO ₂ (tonnes)	Energy (GJ)
Residential		
Residential		
<i>Per household</i>	20.2	197.3
Sector Average		
<i>Per capita</i>	7.0	68.6
<i>Per household</i>	20.2	197.3
Commercial		
Sector Average		
<i>Per capita</i>	4.0	39.0
Industrial		
Sector Average		
<i>Per capita</i>	0.1	1.1
Transportation		
Sector Average		
<i>Per capita</i>	7.2	99.2
Waste		
Sector Average		
<i>Per capita</i>	0.2	

City of Spruce Grove

Community Greenhouse Gas Emissions in 2003

Sector Summary

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Residential	110,877	34.2	1,036,836
Commercial	60,054	18.5	563,884
Industrial	1,531	0.5	11,878
Transportation	150,318	46.3	2,067,653
Waste	1,765	0.5	
Total	324,545	100.0	3,680,250



Community Greenhouse Gas Emissions in 2003 Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Residential			
<i>Residential</i>			
Electricity	73,511	22.7	288,843
Natural Gas	37,366	11.5	747,993
Subtotal Residential	110,877	34.2	1,036,836
Subtotal Residential	110,877	34.2	1,036,836
Commercial			
<i>Commercial</i>			
Electricity	39,672	12.2	155,884
Natural Gas	20,382	6.3	408,000
Subtotal Commercial	60,054	18.5	563,884
Subtotal Commercial	60,054	18.5	563,884
Industrial			
<i>Industrial</i>			
Electricity	1,167	0.4	4,585
Natural Gas	364	0.1	7,293
Subtotal Industrial	1,531	0.5	11,878
Subtotal Industrial	1,531	0.5	11,878
Transportation			
<i>Road Transportation</i>			
Gasoline	111,644	34.4	1,534,435
Diesel	37,684	11.6	516,666
Propane	897	0.3	14,794
CNG	93	0.0	1,758
Subtotal Road Transportation	150,318	46.3	2,067,653
Subtotal Transportation	150,318	46.3	2,067,653

Community Greenhouse Gas Emissions in 2003 Detailed Report

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Waste			
<i>Residential Waste</i>			
Paper Products	1,103	0.3	
Food Waste	749	0.2	
Plant Debris	-67	0.0	
Wood/Textiles	-20	0.0	
Subtotal Residential Waste	1,765	0.5	
Subtotal Waste	1,765	0.5	
Total	324,545	100.0	3,680,250

City of Spruce Grove

Community Greenhouse Gas Emissions in 2003

Report by Source

	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (GJ)
Electricity	114,350	35.2	449,311
Natural Gas	58,112	17.9	1,163,286
CNG	93	0.0	1,758
Gasoline	111,644	34.4	1,534,435
Diesel	37,684	11.6	516,666
Propane	897	0.3	14,794
Paper Products	1,103	0.3	
Food Waste	749	0.2	
Plant Debris	-67	0.0	
Wood/Textiles	-20	0.0	
Total	324,545	100.0	3,680,250

Fuel costs include Buildings, Vehicle Fleet, Streetlights and Water/Sewage sectors only.

This report has been generated for City of Spruce Grove, AB with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.

City of Spruce Grove

Community Greenhouse Gas Emissions in 2003

Indicators Report

	Equiv CO ₂ (tonnes)	Energy (GJ)
Residential		
Residential		
<i>Per household</i>	17.3	161.4
Sector Average		
<i>Per capita</i>	6.5	60.7
<i>Per household</i>	17.3	161.4
Commercial		
Sector Average		
<i>Per capita</i>	3.5	33.0
Industrial		
Sector Average		
<i>Per capita</i>	0.1	0.7
Transportation		
Sector Average		
<i>Per capita</i>	8.8	121.0
Waste		
Sector Average		
<i>Per capita</i>	0.1	