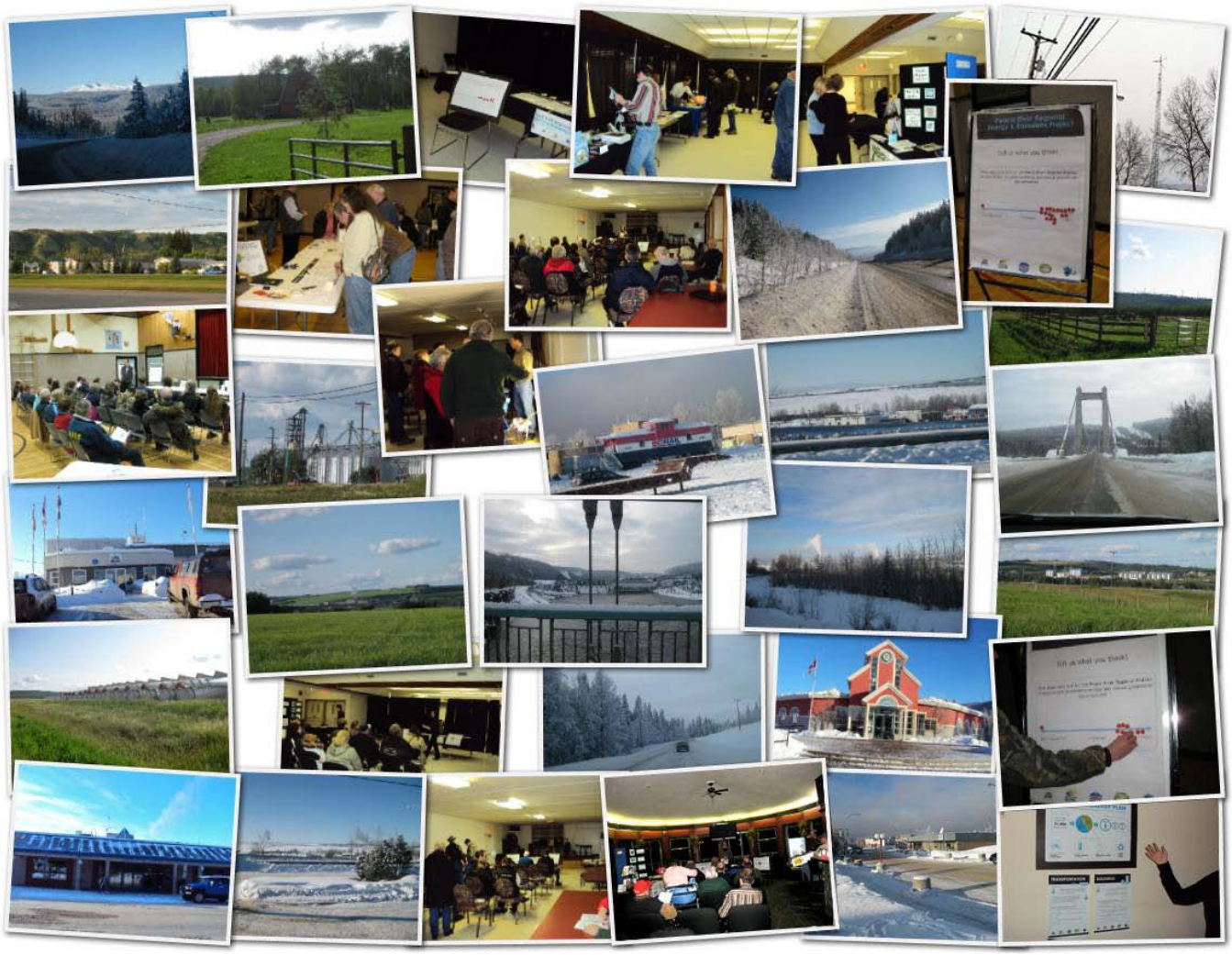

District of Chetwynd

Community Energy Plan

Prepared for
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Date: October 19, 2010

The Peace River Regional Energy and Emissions Project is a collaborative effort between the Peace River Regional District and the municipalities of Chetwynd, Pouce Coupe, Taylor and Tumbler Ridge to develop both corporate and community energy plans for each community and the rural areas in order to meet their voluntary commitments under the Climate Action Charter and the regulatory commitments under the "Green Communities" amendment to the Local Government Act (Bill 27, 2008). This report represents the District of Chetwynd's community energy plan.

Peace River Regional Energy and Emissions Project Partners:

- Peace River Regional District
- District of Chetwynd
- Village of Pouce Coupe
- District of Taylor
- District of Tumbler Ridge

The preparation of this sustainable community plan was carried out with assistance from the Green Municipal Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Notwithstanding this support, the views expressed are the personal views of the authors, and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

Summary

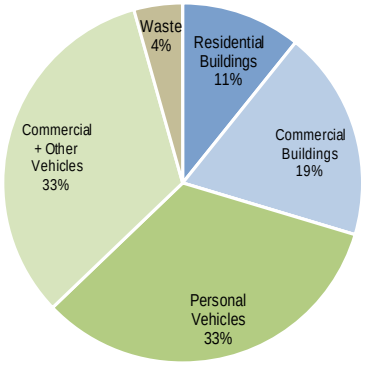
Across the globe people have become dependent on fossil fuels (e.g. oil, gasoline, natural gas, coal) to power our way of life: to get around, to grow our food, to heat our buildings. Due to the finite nature of fossil fuel resources, we are starting to experience more volatility and uncertainty around their price and availability. Reducing our dependence on these energy sources helps to decrease our vulnerability to fluctuating energy supply and pricing and is a key strategy for ensuring long-term sustainability in the Peace River region.

The District of Chetwynd in collaboration with the Peace River Regional District (PRRD) and the municipalities of Taylor, Pouce Coupe and Tumbler Ridge, has undertaken this project to create both corporate and community energy plans. This document represents the Community Energy Plan for the District and has the following objectives:

- Address legislated requirements to establish greenhouse gas reduction targets, policies and actions for incorporation into Official Community Plans (OCPs) by May 2010.
- Define the District's role in working towards the overall provincial goal of a 33% reduction in GHG emissions by 2020.
- Support community level commitments under the B.C. Climate Action Charter.
- Define actions for the District to implement that will improve energy efficiency, reduce GHG emissions, and diversify the supply of energy for the community as a whole.
- Comply with the Federation of Canadian Municipalities Partners for Climate Protection (PCP) program requirements (Milestones 1-3, "community" stream).

Community Energy and GHG Emissions in 2007

In 2007, buildings and transportation in Chetwynd consumed approximately 844,500 gigajoules (GJ) of energy. This energy consumption, combined with emissions from solid waste, translates into total GHG emissions in 2007 for the community of **47,500 tonnes of CO_2 equivalents** (excluding industrial and agricultural emissions), broken down by sector as shown in the pie chart (right). Transportation (personal and commercial vehicles) contributes the largest amount to annual GHG emissions.



Goals for Community Energy and GHG Emissions

1. Our community has a variety of accessible, energy efficient and comfortable **buildings** to live and work in.
2. Our residents live in compact **rural communities** with access to local amenities where agricultural and natural land is preserved.
3. Our residents use a variety of efficient and active **transportation** choices to live, work and play in our communities.
4. Our community is resilient and uses a diversity of reliable, renewable **energy sources**.
5. Our residents and businesses minimize **waste**.

Overarching GHG Emissions Reduction Targets

GHG emissions reduction targets were developed for the community of Chetwynd using a combination of community input and technical analysis. The following reduction targets are proposed for incorporation into the District of Chetwynd's Official Community Plan (OCP):

Target Type	**Reduce GHG emissions by 2020** (from 2007 levels)	**Reduce GHG emissions by 2030** (from 2007 levels)	**Reduce GHG emissions by 2050** (from 2007 levels)
Total Community	**10%**	**25%**	**80%**
Per Capita Reduction	*25%*	*45%*	--

Strategies and Actions for Achieving the Goals and Targets

The plan is structured into five **Themes**: Buildings, Transportation, Land Use, Alternative Energy, and Solid Waste. Several strategies and actions have been identified for each Theme area to assist the District in achieving the reduction targets and goals identified. These are summarized here:

	Strategy	Action
Buildings	Education & Leadership	**B-1**: Develop an education campaign to encourage energy efficient renovations and new buildings.
		B-2: Provide an "Energy Efficiency Checklist" with building permits.
		B-3: Build / retrofit District facilities to LEED equivalent standards and promote this to the public.
	Financing & Incentives	**B-4**: Encourage the Regional District to develop a regional financial incentive program to improve energy efficiency in buildings.
	Partnership	**B-5:** Work with education institutions to encourage projects that demonstrate energy efficiency and alternative energy technologies and promote these in the community.
Land Use	Policies & Regulation	**LU-1**: Accommodate new growth through re-development, increased density and infill of existing lots.
		LU-2: Encourage a variety of housing types, including multi-family units, secondary suites and cottages.
Transportation	Education & Leadership	**T-1**: Support development of a region-wide social marketing campaign to reduce fuel consumption from driving.
	Partnership	**T-2**: Work with major employers to encourage ride-sharing and investigate the potential for daily shuttle buses for commuting.
		T-3: Engage local businesses in the Climate Smart Program by becoming a Climate Smart Host.
	Financing & Incentives	**T-4**: Continue to install and maintain pedestrian and cycling infrastructure to encourage non-motorized transportation.
	Policies & Regulation	**T-5**: Work with the Regional District and neighbouring municipalities to reduce idling.
Alternative Energy	Research	**AE-1**: Conduct an opportunity assessment for potential use of waste industrial resources.
	Education & Leadership	**AE-2**: Coordinate with neighbouring municipalities to train building inspectors and operational staff in alternative energy technologies.
		AE-3: Promote the District's alternative energy projects to the public and share lessons learned.
	Policies & Regulation	**AE-4**: Update bylaws (zoning/building) to define allowances for alternative energy systems, based on a model bylaw developed regionally.
Solid Waste	Policies & Regulation	**SW-1:** Work with the Regional District to implement the Regional Solid Waste Management Plan.

Plan Implementation

The District will need to dedicate staff time and annual funding to support the implementation of this plan and help the community reach the identified goals and targets. It will also be important to continually monitor, report and review progress on plan activities so that they can be adjusted as necessary to improve the outcomes.

Ten Indicators and associated targets were selected to monitor progress towards achieving the targets and goals:

Indicator	Target
1. Total GHG emissions from buildings (residential, commercial and small/medium industrial).	Reduce by 15% from 2007 levels by 2020
	Reduce by 30% from 2007 levels by 2030
2. Percent of new District (corporate) buildings built to LEED equivalent standards.	100% by 2020
3. Percent of existing homes renovated to high efficiency standards exceeding EnerGuide for Houses (EGH) 80.	25% by 2020
	75% by 2030
4. Percent of new developments occurring in the Town Centre.	No target
5. Housing starts by structural type (Single-family, Duplex, Multi-family, Modular).	No target
6. Total transportation emissions (from personal and commercial vehicles).	Reduce by 10% from 2007 by 2020
	Reduce by 25% from 2007 by 2030
7. Percent of residents using alternative transportation to get to work (shuttle bus, walking, cycling).	25% by 2020
8. Percent of energy consumed in buildings derived from alternative energy sources.	10% by 2030
9. Number of alternative energy systems installed (e.g. solar roofs, geo-exchange, small wind).	75 systems by 2020
10. Tonnes of CO_2 equivalent GHG emissions from solid waste disposed regionally.	35,000 tonnes less GHG emissions by end of RSWMP Phase 2

Contents

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Tables

1. Introduction

The District of Chetwynd, in collaboration with the Peace River Regional District (PRRD), the District of Taylor, the Village of Pouce Coupe and the District of Tumbler Ridge, has undertaken a project to develop a Community Energy Plan for each community. This document represents the Community Energy Plan for Chetwynd. A separate document, released in December 2009, addresses the District's energy and emissions footprint from its corporate operations, including a target to reduce GHG emissions from operations over the next 10 years by approximately 10%.

1.1 What is a Community Energy Plan (CEP)?

A Community Energy Plan (CEP) is a strategic document to assist a community in reducing its energy consumption and greenhouse gas (GHG) emissions, and in planning for its energy future. The purpose of creating a plan for the District of Chetwynd is to provide guidance for future decision-making for the communities in the Peace region. The CEP defines long term targets for energy use and GHG emissions, outlines strategies for meeting those targets and recommends actions to move the strategies forward.

1.2 Why create a CEP?

Across the globe people have become dependent on fossil fuels (e.g. oil, gasoline, natural gas, coal) to power our way of life: to get around, to grow our food, to heat our buildings. Due to the finite nature of fossil fuel resources, we are starting to experience more volatility and uncertainty around their price and availability. Although the Peace region is a source for these conventional energy sources, businesses and residents purchase these fuels from the global market and are subject to global energy prices and fluctuations. Reducing our dependence on these energy sources helps to decrease our vulnerability to fluctuating energy supply and pricing and is a key strategy for ensuring long-term sustainability in the region.

There is also a growing consensus of scientific opinion[1] that:

- Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea levels;
- Global GHG emissions due to human activities increased 70% between 1970 and 2004;
- Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in human-caused GHG concentrations.

Our impact on the climate system is real and we must go beyond what we are currently doing, both individually and collectively, if we are to avoid the significant and potentially dangerous consequences of global climate change.

1.3 Objectives of this plan

The CEP objectives are to:

- Address legislated requirements to establish GHG reduction targets, policies and actions for incorporation into Official Community Plans (OCPs) by May 2010, as set out in the Green Communities amendment to the Local Government Act (Bill 27, 2008).
- Define the District's role in working towards the overall provincial goal of a 33% reduction in GHG emissions by 2020.
- Support community level commitments under the B.C. Climate Action Charter.
- Define actions for the District to implement (alone, or in partnership with others) that will improve energy efficiency, reduce GHG emissions, and diversify the supply of energy for the community as a whole.
- Comply with the Federation of Canadian Municipalities Partners for Climate Protection (PCP) program requirements (Milestones 1-3, "community" stream).

[1] Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report (2007). http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf

1.4 Guiding principles

The development of this CEP incorporates the following guiding principles for energy planning[2]:

1. **Increase Efficiency by Avoiding and Reducing Energy Demand**. Reducing the amount of energy we need to undertake our daily activities involves changing our personal habits and using more efficient technologies.

2. **Find Efficiency by Reusing, Recycling and Recovering**. Finding efficiencies involves planning our communities to encourage reuse / recovery of wasted resources, particularly heat.

3. **Find Alternatives**. Renewable energy sources need to be developed in order to provide alternatives to burning fossil fuels for our energy. These sources also increase our self-sufficiency because they are locally-based.

1.5 How was this plan developed?

The CEP was developed through a community-based process that included:

- **Developing a community-wide baseline** inventory of energy consumption and GHG emissions, based on the Community Energy and Emissions Inventory (CEEI) developed by the provincial government.

- **Aligning with community vision and policy** by reviewing existing community vision, strategy, and policy documents to ensure documents to ensure CEP alignment with these processes.

- **Consulting with local government staff** at the District to identify potential targets and strategies. This included a workshop with representatives from each participating local government, and individual meetings and phone communication.

- **Gathering input from community members through a survey** and information brochure. These were developed, printed and distributed to residents throughout the region in the participating municipalities and unincorporated areas. Seventy-seven surveys were completed over the course of the project, and input from these was incorporated into the development of the plans. Refer to Appendix A for a summary of the survey results. Key findings from the survey are that community members desire:
    - More public education to increase awareness and knowledge about technologies, tools and programs.
    - More access to incentives to improve efficiency and install alternative energies.

[2] Based on BC Hydro's 4Rs of Sustainable Community Energy Planning

- More public transit or shuttle bus options.
- Increased access to recycling facilities.
- Reduced oil flaring (note this is being addressed by the provincial government).

- **Conducting meetings with community members**.

In February and March 2010, the Regional District, together with Northern Environmental Action Team (NEAT), organized public meetings in six communities and invited residents and stakeholders to learn about community energy and emissions, talk to practitioners in the region about alternative energy and energy-efficiency technologies, and to provide input into the development of the CEP. One meeting was held in Chetwynd, with approximately 30 community members in attendance. The input obtained is incorporated into Section 5, Goals and Targets.

- **Gathering input from stakeholders** through phone interviews and through discussions at the community meetings. Representatives from from 21 organizations in the region were contacted to provide input into the CEP, and 14 interviews were conducted. Stakeholder groups contacted include:
  - Real estate boards and realtors
  - Builders and developers
  - Education institutions and school districts
  - Chambers of commerce
  - Non-profit organizations
  - Agricultural associations
  - Alternative energy suppliers / installers

The objectives of these one-on-one phone interviews were to:

- Bring awareness about the CEP project to various stakeholders
- Identify opportunities and challenges for reducing energy use and GHG emissions in the region
- Identify potential strategies for the CEPs

- Identify potential partners for implementation
- Clarify the local government role

The responses are summarized in Appendix B. Key findings from the interviews include:

- Opportunities to build more compact communities with more amenities to reduce travel
- Homeowners need help – incentives, demonstration projects, education campaigns – to move forward with energy retrofits and alternative energy systems
- Local governments need to take a leadership role by building demonstration projects
- Opportunities to build partnerships with education institutions, realtors, utilities to help with public education and implementation of programs
- Opportunities to work with industry and commercial businesses to reduce emissions from transportation

- **Incorporating technical expertise and experience** on renewable and alternative energy practices in other areas, and identifying opportunities specific to the Peace region. Expertise and experience from energy planning in other municipalities, particularly in British Columbia and the north, was also incorporated.

- **Integrating the elements** to define targets, goals and strategies appropriate for this plan.

2. Context

In the past, municipalities in BC have not been responsible for considering energy consumption or GHG emissions in their communities. Traditional municipal service areas (water, sewers, infrastructure, planning and land use) are generally within the municipality's authority to address. In contrast, GHG management is only under the general 'influence' of local governments. For example, many standards, including industrial emissions, building codes and vehicle fuel economy are set by other levels of government. This section provides context about the legislation and initiatives that are being undertaken by senior levels of government. This plan focuses on the initiatives that can be undertaken by the District to reduce energy consumption and GHG emissions in the community, where the District has some level of influence or control, and where senior levels of government do not exercise as much influence.

2.1 Federal legislation and initiatives

Federally, the ***Canadian Environmental Protection Act*** **(CEPA)** regulates environmental contaminants and includes specific provisions that control the fuels and engine emissions of vehicles and equipment. Furthermore, *CEPA* includes requirements for reporting GHGs emitted from all facilities emitting 50,000 tonnes or greater.

In April 2010, the federal government announced proposed Passenger Vehicle and Light Truck Greenhouse Gas Emission Regulations under CEPA to create national vehicle efficiency standards that will harmonize with US standards by 2011. If implemented, new vehicles sold in 2016 will be on average 40% more efficient than vehicles sold in 2008.

In May 2010, the federal government announced upcoming Heavy Duty Vehicle regulations. These are not yet defined, but the initial announcement anticipates approximately 20% improvement in efficiency by 2018 model years.

The **Copenhagen Accord** was developed during the United Nations Framework Convention on Climate Change Conference on the Parties (COP 15) held in Copenhagen, Denmark in December 2009. The Accord required industrialized countries to set greenhouse gas emission reduction targets for 2020 by January 31, 2010. The Canadian federal government has announced a nation-wide GHG emission reduction target of 17% below 2005 levels by 2020[3].

[3] http://www.climatechange.gc.ca/cdp-cop/default.asp?lang=En&n=C4BD2547-1

2.2 Provincial legislation and initiatives

The Province has been moving forward with a series of ambitious measures to advance energy efficiency and reduce community consumption. These include:

- **GHG Emissions Reduction Target Act (Bill 44, 2007)**: The Province of BC has set a province-wide GHG emissions reduction target of 33% below 2007 levels by 2020. The Act also sets requirements for Public Sector Organizations (PSOs) to be carbon neutral by 2010.
- **Greenhouse Gas Reduction (Cap and Trade) Act (Bill 18, 2008):** The Province introduced legislation to authorize hard limits "caps" on GHG emissions for facilities emitting greater than 25,000 tonnes of CO_2 equivalents per year.
- **BC Climate Action Plan:** After setting the reduction target, the province created a plan that outlines strategies and initiatives that will take the province 73% of the way to reaching its target. These initiatives include LiveSmart BC (rebates for energy efficiency upgrades) and a carbon tax on fuels, among others.
- **BC Energy Plan**: This plan sets out a *Vision for Clean Energy Leadership* and aims to include more green and alternative energies feeding into the grid. Furthermore, it includes new policies for oil and gas, such as the goal to eliminate all routine flaring at oil and gas producing wells and production facilities by 2016 with an interim goal to reduce flaring by 50 per cent by 2011.
- **"Greening" the BC Building Code (Bill 10, 2008)**: Building Code requirements to increase energy and water efficiency are in effect. Further requirements for efficiency in housing are expected in 2011, including achievement of the equivalent of EnerGuide for Homes (EGH) 80.
- **Green Communities Act (Bill 27, 2008):** Bill 27 requires local governments to include GHG emissions reduction targets, policies, and actions in their OCPs. To achieve this objective, the legislation provides a range of potential new powers for local governments.
- **BC Climate Action Charter:** A provincial initiative introduced in September 2007 to encourage local governments to become carbon neutral in their local government operations by 2012. The District of Chetwynd has signed this charter.
- **Landfill Gas Management Regulation (2008):** The Ministry of Environment requires all landfills with 100,000 tonnes or more waste in place, or with more than 10,000 tonnes of annual waste disposed to install a gas capture system by 2016.

2.3 Peace River Regional District initiatives

In February 2009, the Board adopted Terms of Reference for a **Peace Region Climate Action Task Group**. The Task Group has representatives from each municipality and the Regional District and is the basis for a strong collaborative and integrated approach to sustainable energy planning. Upon completion of these community energy plans, the Task Group will continue to move forward with implementation of the plans in order to meet longer term goals.

In June 2009, the Board adopted a motion to become a member of the Federation of Canadian Municipalities' **Partners for Climate Protection Program**,[4] making a commitment to achieve a series of five milestones, the first three of which are being addressed through this plan.

The Regional District revised its **Regional Solid Waste Management Plan** in 2008 to support Zero Waste as a long-term, overarching vision.

2.4 District of Chetwynd initiatives

As a signatory to the **Climate Action Charter**, the District is committed to taking voluntary action to reduce its energy consumption and GHG emissions, and to achieve 'carbon neutrality' in its operations beginning in 2012. This is addressed in the District's **Corporate Energy Plan**, completed during the first phase of this project. Furthermore, the Charter is a commitment to create "complete, compact, more energy efficient rural and urban communities."

The District has also undertaken a number of initiatives that reduce energy consumption and GHG emissions in the community. These include:

- **Water conservation:** Installed water meters in 2006/07, in addition to an aggressive water conservation education program. Result has been a 15% reduction in per capita water use.
- **New airport terminal:** Built with geo-exchange system to heat and cool buildings.
- **Solar power and LED lighting**: Installed solar-powered crosswalk lights, LED welcome sign.
- **District fleet:** Signed on to E-3 Fleet Management program, purchasing smaller vehicles, anti-idling policy.
- **Wind towers:** Installed wind generators to supply power to decorative LED lighting along the boulevard trees.
- **Parks, Trails and Green Space Plan:** Completed a comprehensive plan to guide development of new trails, parks and green spaces in 2007, and are undertaking development to fulfill the plan.
- **Tree program**: Trees for Tomorrow and BC Hydro/Trees Canada funding to plant approximately 340 trees in the community.

2.5 Other local government initiatives in the region

Three other municipalities in the region are working collaboratively with the Regional District on this project: the District of Taylor, the Village of Pouce Coupe and the District of Tumbler Ridge. Upon completion of this project, each of these municipalities will have completed Corporate and Community Energy Plans.

[4] The Federation of Canadian Municipalities' Partners for Climate Protection Program is a five-milestone framework that guides municipalities to reduce greenhouse gas emissions (http://www.sustainablecommunities.fcm.ca/Partners-for-Climate-Protection/)

The three remaining municipalities in the region have already initiated climate action independently. The District of Hudson's Hope completed a corporate plan and is planning to develop a community plan in 2010.

The City of Dawson Creek and the City of Fort St. John have set community-wide reduction targets as follows:

City	2020	2030	2050
Dawson Creek	**33%** below 2006 levels	--	**85%** below 2006 levels
Fort St. John	**1%** below 2007 levels	**12%** below 2007 levels	--

3. Community Profile

In order to develop a Community Energy Plan, it is important to understand some of the challenges and opportunities that are presented by the location, climate, population, economy, housing, transportation, and projected growth for the region. This chapter outlines the key factors that influence energy consumption and GHG emissions with respect to the community of Chetwynd.

3.1 Location and boundaries

The District of Chetwynd is located in north-eastern British Columbia in the eastern foothills of the Rocky Mountains (see Figure 1). The District of Chetwynd is characterized by cool, short summers and long, cold winters. The municipality covers approximately 64 square kilometres.

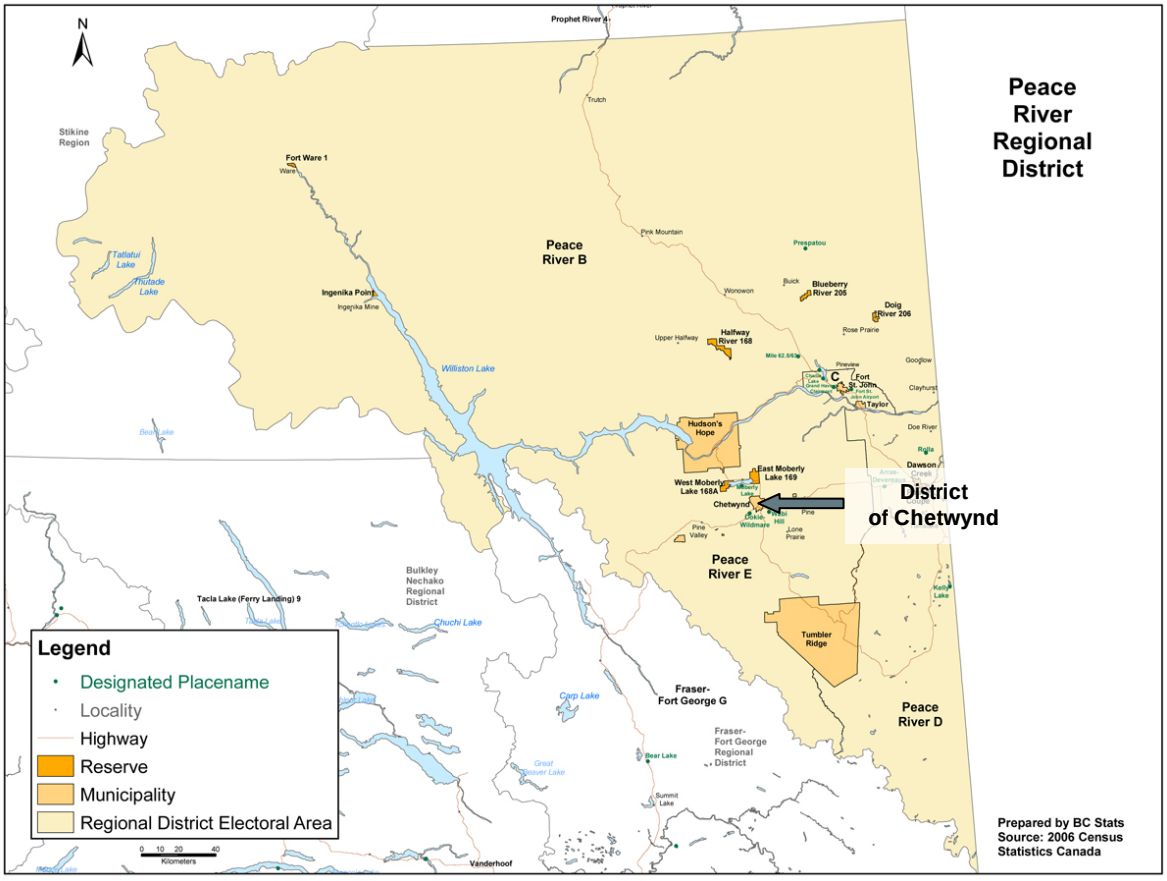


Figure 1. Chetwynd location map

3.2 Population and development

The population of Chetwynd is 2,633 people[5]. Over the last decade, the population has decreased over 10%, as shown in Table 1. The demographics of the community indicate a young population, with a very high percentage of people between 0 and 45 years of age (approximately 70%), compared to the BC average for these age groups (approximately 55%).

Table 1. District of Chetwynd population 1996-2006

Census Year	Population	Population change by Census year
2006	2,633	2%
2001	2,591	-13%
1996	2,980	5%

Source: Statistics Canada, 2006

Building permit data indicates the level of activity in new development over time. This data is shown for 2008 and 2009 in Table 2.

Table 2. Building permits Issued in Chetwynd 2008-2009

Year	Residential		Commercial	
	Number	Value	Number	Value
2008	21	$810,050	7	$7,413,000
2009	10	$2,391,900	3	$180,000

Source: District of Chetwynd, 2010 Annual Report

3.3 Climate

Considerable energy is required for heating in the Peace region, as indicated by the high heating degree days[6] in Table 3 (approximately twice as many as Vancouver). There is limited energy required for cooling, as temperatures remain moderate in the summer. Despite the cold temperatures, the Peace region has approximately 2,200 sunshine hours throughout the year – one of the highest in BC, which has an average of 2,000 hours per year[7].

[5] Statistics Canada, 2006.

[6] A heating degree day is the number of days that the temperature is below 18°C, multiplied by the temperature below 18. For example 5 days at 12°C is 5*(18-12) = 30 degree days. The use of 18°C as the defining temperature for heating degree days is a common benchmark in heating and air conditioning analysis.

[7] http://www.solarbc.ca

Table 3. Annual heating and cooling degree days

Location	Heating Degree Days[1] (Annual)	Cooling Degree Days (Annual)
Chetwynd	**5,490**	**14**
Fort St. John	5,847	27
Dawson Creek	5,981	13
Vancouver	2,926	44
Prince George	4,728	40
Whitehorse, YK	6,811	8
Edmonton, AB	5,708	28
Toronto, ON	4,066	252

Source: Climate Normals 1971-2000; http://climate.weatheroffice.ec.gc.ca

Table notes:

1) *Heating Degree Days are the number of days that the temperature is below 18°C, multiplied by the temperature below 18. The measure is intended to give an indication of the level of heating required in a community as a comparison to other communities.*

3.4 Dwellings

The predominant dwellings in the District of Chetwynd are single-detached residences, representing 62% of dwellings. Approximately 18% of residents live in low-rise apartments, 16% in row and semi-detached houses, and 4% in movable dwellings.[8]

Approximately 40% of homes in the District of Chetwynd are less than 30 years old. There was a housing boom between 1970 and 1980, which resulted in 37% of the current housing stock being built in this era. The remaining dwellings (22%) are over 40 to 50 years old. [9]

In Chetwynd, 62% of homes are owned and 38% are rented. The rental population is higher than the BC average (30% rented).

3.5 Transportation

Residents in Chetwynd primarily use private vehicles to commute to work (over 85% of trips, with 17% of those trips as passengers). Up to 12% of commutes are done by walking and cycling[10].

[8] Source: Statistics Canada, 2006: Community Profiles: http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E. '

[9] Source: Statistics Canada, 2006: Community Profiles: http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E.

[10] Source: Statistics Canada, 2006: Community Profiles: http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-591/index.cfm?Lang=E.

Approximately 95% of vehicles registered in Chetwynd are personal vehicles and 5% are for commercial purposes, as shown in Figure 2. About 67% of passenger vehicles are light trucks, vans and SUVs.

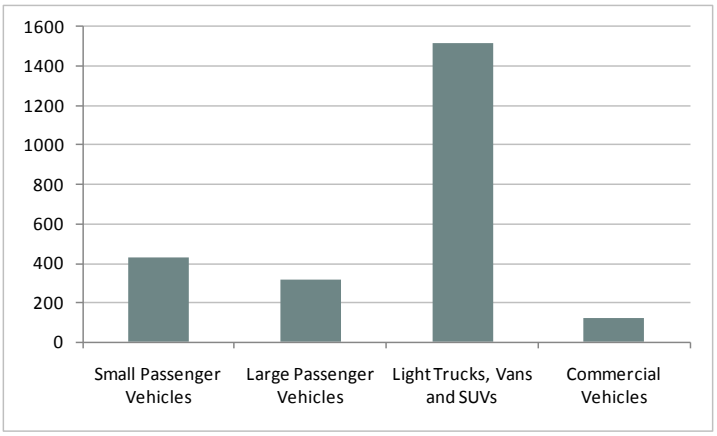


Figure 2. Vehicles by type in Chetwynd

Source: CEEI Initiative, Ministry of Environment, Province of BC, 2010.

3.6 Economy

Chetwynd is the commercial centre for several surrounding rural communities, including the Pine River Valley, Moberly Lake, Jackfish Lake and Lone Prairie. The rural economy is dominated by ranching (cattle, sheep, and bison), and Chetwynd serves as the transportation and service centre for these areas.

Within the community, economic activity is focused around a number of primary industries, including lumber mills, gas plants, a coal processing plant and a sulfur processing plant. Due to the volatile nature of primary industries, Chetwynd has experienced economic downturns and rebounds with closing plants, followed by increases in activity. Currently the community seems to be in a period of higher activity with gas and mineral exploration and development, and tourism in outdoor recreational activities.

Recently, there has been significant activity around a new industry – wind farming. The Dokie Ridge wind farm was the first wind farm to start development in BC, though it is not expected to begin generating electricity until 2011. When complete it is expected to be 300 megawatts in size.

Figure 3. Dokie Ridge wind farm construction

Source: http://www.plutonic.ca/s/Dokie.asp

3.7 Future growth

The total population of the PRRD is expected to grow from approximately 60,000 people to 80,000 people over the next 30 years (approximately 30%).[11] The population of Chetwynd is expected to grow moderately with continued activity in gas exploration and extraction, wind farm development, and coal mine activity.

3.8 Renewable energy

There is increasing interest in the development of renewable energy resources to reduce GHG emissions and improve energy security. The cost of renewable energy technologies has been dropping, making these systems more attractive, but they still tend to be considerably more expensive than conventional energy sources. In BC, low energy prices (particularly in northern BC where natural gas prices are lower), large transportation distances, and cold climates can make renewable energy a challenge. However, there are some promising opportunities for renewable energy in the Peace region. These are summarized in the following table, with more details available in Appendix C.

Renewable energy source	Opportunity in PRRD
Solar thermal and photovoltaics	• Very good solar resource, one of the best in BC • Passive solar is something that local governments have control over through the use of development permit guidelines.
Wind	• Peace region has proven to be viable for wind power with the opening of the Bear Mountain wind project • Area between Dawson Creek and the Rocky Mountains has the best wind potential • Opportunities likely limited to large turbines feeding power into the grid
Micro-hydro	• Peace region does not generally have good micro-hydro potential, although areas in the Rocky Mountains are identified as moderate potential • No potential sites over 2 MW have been identified by BC Hydro
Biomass	• Most common form of renewable energy, used mostly in fireplaces and wood stoves in homes • Can be used at a much larger scale, for heating buildings, supplying district energy systems, or generating power • Several mills in the Peace region may provide sources of wood waste • Another possibility for biomass in the Peace region is the use of agricultural waste
Landfill gas	• Collected landfill gas can be used to generate electricity or it can be cleaned and injected into the PNG gas system • If there are nearby buildings the landfill gas can be used for heating, or in a cogeneration system
Geothermal	• High potential geothermal areas around Hudsons Hope and Chetwynd

[11] BC Stats, 2009, PEOPLE 34 Projections from 2008 to 2036.

Renewable energy source	Opportunity in PRRD
Geo-exchange	• Most areas are likely good candidates for geo-exchange • Commercial/institutional buildings are generally more cost effective than homes due to larger size, but economics will vary from project to project
Industrial waste heat	• Many industries in the Peace, and some may have waste heat available • To justify the cost of piping, the industry must be located reasonably close to where the heat will be used
Cogenerations	• To be cost effective, cogeneration plants need to be located where there is a use for the heat • Facilities with large year round heating loads (such as hospitals, recreation centres, or industry) are preferred. • BC Hydro's new firm purchase rates for plants under 5MW has made it easier to plan cogeneration plants, while low gas rates would increase potential viability in the Peace. • Cogeneration can also be used with a district heating system
District heating	• Municipal planning should support a district heating system by focusing development around the system distribution • Civic facilities or other institutional buildings can be core customers • Facilities that may be sources of waste heat (e.g. sewage treatment plants or ice rinks) should be located nearby

3.9 Opportunities and challenges

There are a variety of challenges and opportunities for improving energy efficiency and reducing greenhouse gases based on the context of the Peace River region. These are summarized here:

Factor	Opportunities	Challenges
Population and Development	• Potential for more infill development with new growth – leading to a more compact rural community.	• Population declined, then began to grow slowly – limited opportunities for compact growth and addition of new amenities.
Climate	• Potential for faster payback periods for retrofitting or building new homes to high energy-efficiency standards. • High solar potential in the region.	• Large energy demand for heating and powering homes due to northern climate.
Dwellings	• Many older homes may provide opportunity for conservation through retrofit program.	• Financial barriers to retrofits for lower income homeowners. • Single-family homes typically require more energy than multi-family units.
Transportation	• New vehicle technologies becoming more available, and operate in northern climates. • New Federal regulations will require improvements in vehicle efficiency for personal and commercial	• Winter driving conditions, leads to a high percentage of large vehicles that consume more fuel. • Tendency to idle vehicles for long periods of time due to climate – though some idling likely occurs

Factor	Opportunities	Challenges
	vehicles.	due to driver habit when not necessary.
Economy	• Economy is diversifying with new wind exploration, in addition to gas exploration, coal and forestry.	• Reliance on resource extraction which can be volatile.
Future Growth	• OCPs can promote the development of energy-efficient rural communities, with a focus on compact, nodal development.	• Planning for growth is dependent on attracting business and industry to the area and may happen in "clumps".
Renewable Energy	• Several opportunities identified above.	• Cost effectiveness of building the systems and potential impact of the systems need to be evaluated on case-by-case basis.

4. Energy and GHG Emissions Inventory

This chapter describes the 2007 levels of energy consumption and sources of GHG emissions in the District of Chetwynd. Energy consumption and GHG emissions in the community derive from several sources.

4.1 What is a community energy and GHG emissions inventory?

A community energy and GHG emissions inventory calculates the total amount of energy consumed in one year to do our daily activities in the community (heating our buildings, driving our vehicles, etc.) and the amount of GHGs that are emitted into the atmosphere as a result of this energy use. Inventory reports are provided for most local governments by the Community Energy & Emissions Inventory (CEEI), a provincial government initiative. CEEI reports are available for Chetwynd, Pouce Coupe, Taylor, Tumbler Ridge, and the PRRD (total including municipalities). They are not available for Electoral Areas.

The following sectors are included in this community energy and GHG emissions inventory:

- **Buildings** – The energy to heat and power residential, commercial and small/medium industrial buildings.
- **Transportation** – Vehicular consumption and emissions is based on a count of the vehicles registered in the community, an estimate of fuel consumption based on type of vehicle, and an estimate of the number of kilometres driven that is specific to average travel distances in the Peace River Regional District.
- **Waste** – Waste does not directly consume energy but when deposited into landfills it decomposes and releases methane gas which is a greenhouse gas that has approximately 20 times more impact on global warming than carbon dioxide. Solid waste emission estimates are obtained through the CEEI initiative at the regional and municipal levels.

The following sectors also lead to GHG emissions and are typically regulated by higher levels of government. These sectors are not included in this community energy and GHG emissions inventory:

- **Agriculture** – Fertilizer application and manure management practices can lead to emissions of methane or nitrous oxide (N_2O) – both potent greenhouse gases.
- **Industrial activity** – Energy consumed in large industrial facilities is reported at the regional level for information only. Industrial processes and activities can also emit GHGs in various forms (e.g. flaring of gas wells).
- **Rail and Off-Road sources** – Rail transportation and off-road mobile equipment (including lawn and garden equipment, off-road recreation vehicles etc.) can emit greenhouse gases from use of diesel, gasoline and other fossil fuels.

4.2 Energy consumption and GHG emissions inventory for 2007

In 2007, buildings and transportation in the District of Chetwynd consumed approximately 844,000 gigajoules of energy. This energy consumption, combined with emissions from solid waste, translates into **total GHG emissions in 2007** for the community of Chetwynd of **47,500 tonnes of CO_2 equivalents**, or 18 tonnes per capita (excluding emissions from large industrial facilities, agricultural activities, rail and off-road sources)[12]. The transportation sector is the major source of greenhouse gas emissions in the community, accounting for 66% of all emissions. Buildings account for 30% and solid waste accounts for 4%, as shown in Figure 4.

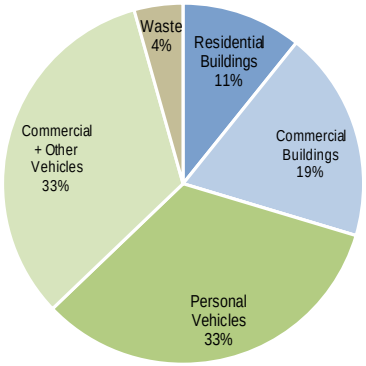


Figure 4. GHG emissions by sector in the District of Chetwynd (2007)

Table 4 provides a summary of the community's energy consumption and associated GHG emissions. Transportation accounts for the largest source of GHG emissions.

[12] The Provincial Ministry of Environment, as part of the Community Energy and Emissions Inventory (CEEI) initiative has provided an inventory of community energy consumption and greenhouse gas (GHG) emissions. Revised inventories were provided as of June 2010.

Table 4. Community energy consumption and GHG emissions in Chetwynd (2007)

Use	Energy (as GJs)	GHG Emissions (tonnes of CO_2e)[2]	GHG Emissions %
Residential	151,000	5,100	11%
Commercial	239,400	9,000	19%
Transportation[1]	454,100	31,400	66%
Solid Waste	-	2,100	4%
Total	844,500	47,500	--
Total per capita	321	18	--

Table notes:

1) *Transportation emissions are estimated from vehicle counts and assumed annual average travel distances.*

2) *Energy and GHG emissions from large industrial and agricultural sources are not included in the community inventory.*

For information only, agricultural GHG emissions have been estimated for the entire PRRD (including municipalities) to be 219,000 tonnes of CO_2 equivalents for 2007. This includes GHG emissions from enteric fermentation only (data for manure management and agricultural soils is not sufficient enough to provide a reasonable estimate). GHG emissions resulting from energy consumed in large industrial buildings are approximately 150,000 tonnes of CO_2 equivalents for the entire PRRD in 2007.

4.3 Inventory methodology

The Community Energy and Emissions Inventory (CEEI) initiative provided reports to most BC local governments that contain community-wide energy and emissions data for the buildings, on-road transportation, and solid waste sectors[13]. Although CEEI provides a consistent methodology for developing inventories across the province, there are errors with the CEEI reports with respect to communities in the PRRD, including:

- Energy consumption data from large industrial buildings is withheld.
- Data is not broken down by electoral area or OCP area (for unincorporated areas).

[13] For details on data sources, emissions factors, and methodologies employed by CEEI, see the 2007 CEEI Reports User Guide: http://www.env.gov.bc.ca/epd/climate/ceei/resources.htm. Note that the Ministry updated methodologies and released revised inventories for 2007 on May 31st, 2010. A revised User Guide is expected to be released to reflect the updated methodologies, but is not available at this time.

For this project, the CEEI inventories were adjusted according to the following steps:

Buildings

- Regional and municipal level data was obtained through the CEEI initiative from utility records and includes electricity and natural gas consumption[14].
- For electoral areas and OCP areas, residential electricity was split based on dwellings. Commercial electricity was split based on commercial property assessed values. Natural gas was already identifiable by electoral area but was adjusted by number of connections between the North Peace Fringe and Rural OCP areas.
- Other energy sources such as wood, fuel oil, or propane tank heat were estimated based on number and type of dwellings and average consumption estimates from the BC Hydro Conservation Potential Review. This information was refined to the level of OCP areas by splitting: residential electricity based on dwellings; commercial electricity based on assessed property values; and natural gas based on number of connections[15].

Transportation

- This data was obtained at the regional and municipal levels through the CEEI initiative and includes data sources from ICBC and Natural Resources Canada.
- For electoral areas and OCP areas, vehicle consumption data was split based on population.

Solid Waste

- For electoral areas and OCP areas, solid waste consumption was split based on population.

Agriculture

- Agricultural emissions were estimated for the PRRD using the methodology employed by the National Inventory Report and are included for information only. The estimate includes GHG emissions from enteric fermentation only, as data for manure management and agricultural soils are not sufficient enough to include.

4.4 Energy and GHG emissions business-as-usual forecast

A business-as-usual (BAU) forecast was developed for each OCP Area to 2050. The forecasts are driven by population growth, but take into consideration expected improvements in efficiency that will result from senior government regulations that will occur regardless of action taken by the local government. The assumed efficiency improvements include:

[14] Industrial energy consumption is available only for electricity as confidentiality concerns prevent the release of the natural gas data at present. The industrial electricity consumption amounts to approximately 53% of the total reported building energy consumption.

[15] Refer to the CEEI Technical Methods and Guidance Document for 2007 CEEI Reports for more information about the data collection:
http://www.env.gov.bc.ca/cas/mitigation/ceei/CEEI_TechMethods_Guidance_final.pdf

- Reduce residential building energy demand by 20% by 2020[16] (e.g. building code improvements, appliance / equipment improvements, etc.)
- Reduce commercial building energy demand by 9% by 2020 (e.g. building code improvements, appliance / equipment improvements, etc.)
- Reduce passenger vehicle energy use by 40% by 2030[17] (e.g. general fleet turnover and improved efficiencies in vehicle design from existing policy initiatives)
- Reduce commercial vehicle energy use by 15% by 2030

The assumed growth used for Chetwynd is 1% annual population growth, applied each year through to 2030. The resulting business-as-usual forecast for Chetwynd is outlined in Table 5 and Figure 5.

Note that no further efficiency improvements are calculated beyond 2030, as these are yet to be defined, so emissions from 2030 to 2050 grow with population growth.

Table 5. Business-as-usual forecast of GHG emissions to 2050

OCP Area	Population Growth assumed (annual)	2007 GHG Emissions (tonnes of CO_2e)	2020 GHG Emissions (tonnes of CO_2e)	2050 GHG Emissions (tonnes of CO_2e)
Community Total	1.0%	47,500	46,700	56,900
Change from 2007	--	--	**-2%**	**20%**

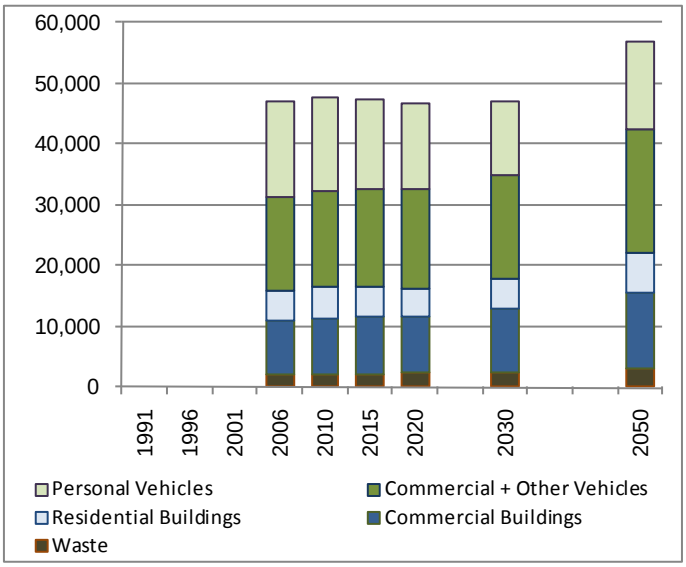


Figure 5. Business-as-usual forecast of GHG emissions to 2050

[16] Residential and commercial building targets from the BC Energy Efficient Buildings strategy

[17] Passenger and commercial vehicle efficiency improvements expected based on the federal government announcements to increase fuel efficiency requirements by 2016 (light duty) and 2018 (heavy duty).

4.5 Benchmarks for community GHG emissions

Benchmarks can provide a context for the current state of GHG emissions from community activities, and provide a sense of the level of emissions per capita relative to other communities. The challenge with benchmarks for GHG emissions is that there are significant variations in climate, population, density and energy sources, as well as variations in methodology for measuring and reporting community GHG emission making it difficult to draw meaningful comparisons. However, they can provide an indication of the level of emissions between different areas. Table 6 provides a list of select Canadian cities for interest.

Table 6. Community GHG emissions from select Canadian cities

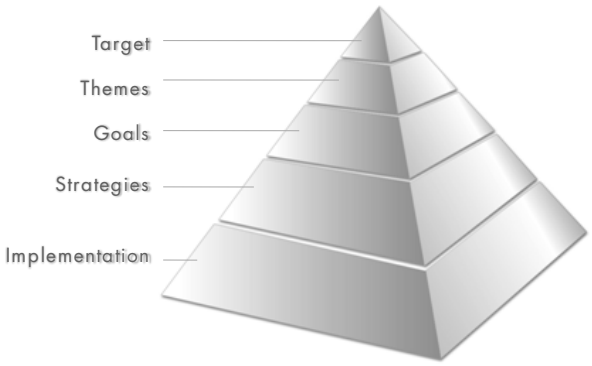
Community	Year	GHG emissions (per capita) [18]
Peace River Regional District	2007	14.4
Toronto (metropolitan area)	2005	11.6
Calgary	2003	17.7
Vancouver	2006	4.9

[18] PRRD data is based on the CEEI data for the whole regional district; Toronto, Calgary and Vancouver data are from the UNEP report of "Representative GHG Baselines for Cities and their Respective Countries" at http://www.unep.org/urban_environment/PDFs/Representative-GHGBaselines.pdf .

5. Goals and Targets

5.1 Adaptive management approach

The CEP adopts an adaptive management approach that ensures alignment between all the plan elements in reaching a defined target. This framework also allows incorporation of new information, approaches and policies that continue to align with the targets and goals defined in the plan.



A **Target** is a measurable value that defines "Where we want to be" in a specified time period regarding energy consumption, greenhouse gas emissions, or related activities. This provides a measurable goal that the community can collectively work towards achieving.

The plan is structured into five **Themes**: Buildings and Development, Transportation, Land Use, Alternative Energy, and Solid Waste. These are the key areas of activity that will lead the community towards its target.

Within each theme areas, one **Goal** is identified that states "What we want to achieve" for that theme.

Strategies include one or more types of approaches that define "How we are going to achieve our goals". There are four types of strategies: Research, Education, Financing and Incentives, and Regulation.

Implementation of the plan will involve undertaking activities in each of the theme areas, monitoring progress toward the targets over time, and adjusting strategies and activities to ensure success.

5.2 Community GHG Reduction Targets

The provincial government has set a reduction target of 33% from 2007 levels by 2020 for the province overall, and 80% from 2007 levels by 2050. Each local government in BC has been legislated to develop GHG emissions reduction targets, policies and actions for inclusion in its OCP.

Target-setting is a challenging process that requires values tradeoffs, local knowledge, and technical analysis. Staff, stakeholders and the general public were engaged, through surveys, discussions and community meetings, in the development of GHG emissions reduction targets for the four participating municipalities, including Chetwynd, and each of the fringe and rural OCP areas in the Regional District.

Input from Community Members

During the development of the Community Energy Plan, input was gathered from residents and stakeholders to understand the desire for having the District take action to reduce energy use and GHG emissions in the community, and to increase the use of alternative energy. The results of the input obtained at the community meeting held in Chetwynd are shown in Figure 6. This indicates a moderate level of support for action by the District to undertake initiatives regarding energy efficiency and alternative energy in the community.

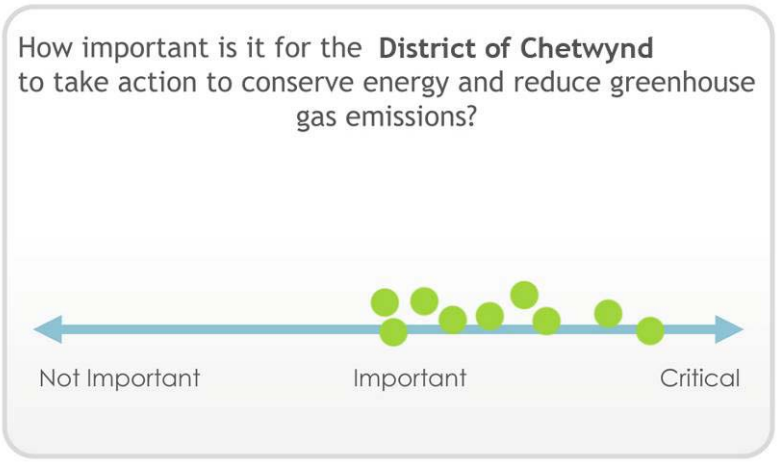


Figure 6. Input from community members attending meeting

Scenario Analysis

This section describes a scoping-level analysis of the possible results and GHG reductions from the actions defined in the plan relative to the Business As Usual forecast (described in Section 4). One reduction scenario was developed to scope the general impact of the measures described in this action plan. This is not intended as a precise forecast, but rather an attempt to quantify "what could the future look like if these initiatives are pursued?" and "what is the impact on GHG emissions?"

The scenarios are developed in three steps:

STEP 1: Performing **scoping-level technical research and analysis** of the proposed measure. This involves identifying research and benchmarks of the direct impact assuming the measure is fully implemented.

For example, if a new commercial building meets LEED Gold standards, it is expected that the building will consume 40% less energy than a new commercial building that meets current building code.

STEP 2: Determining the **expected proportion of the population** or activity area ("level of uptake") that will be impacted by implementing the measure. For the scenarios developed, we combined expected level of uptake for implementing different program types[19], with knowledge of the local situation in the Peace Region, and input from the community about how aggressively they would be willing to pursue the activities to determine the expected level of uptake for each measure.

Continuing with the LEED Gold example from above, if the District embarks on an education campaign with a financial incentive to encourage building to LEED Gold standards, it is assumed approximately 30% of new buildings will participate.

STEP 3: Combining the first two steps to determine the **total expected impact of the measure** and calculate an expected reduction in GHG emissions for the affected sector.

For the above example, the total expected impact would be a 12% reduction in GHG emissions from the new commercial building sector, relative to the BAU forecast.

These three steps are applied to each measure defined in this plan, resulting in a cumulative impact assessment of undertaking the proposed measures. The result of the scenario analysis is summarized as follows:

- A series of short, medium and long term GHG emission reduction targets (for 2020, 2030 and 2050), as outlined in Table 7, and
- An estimate of anticipated reductions by sector (Buildings, Transportation, and Waste) if the proposed measures are implemented, as graphically displayed in Figure 7. Note that an additional 10% reduction is included for measures that are yet to be defined but are likely to present themselves in the next 5 to 20 years (2015 to 2030).

[19] Research indicates that different levels of uptake are expected for the different strategies. For example, Information & Education campaigns may result in 5-10%uptake; Financing & Incentive programs may result in 20 - 50% uptake (depends on level of incentive); and Regulation is likely to lead to 90% or more uptake.

- Note that the long-term (2050) target of 80% reduction is chosen as a "visionary" target for two reasons: first, to align with the provincial 2050 target, and second, to strive for the level of GHG emissions reduction necessary to avoid potentially serious consequences of global climate change, according to current science.

Table 7. Summary of proposed GHG reduction targets for Chetwynd

Target Type	Reduce GHG emissions by 2020 (from 2007 levels)	Reduce GHG emissions by 2030 (from 2007 levels)	Reduce GHG emissions by 2050 (from 2007 levels)
Total Community	**10%**	**25%**	**80%**
Per Capita Reduction	*25%*	*45%*	--

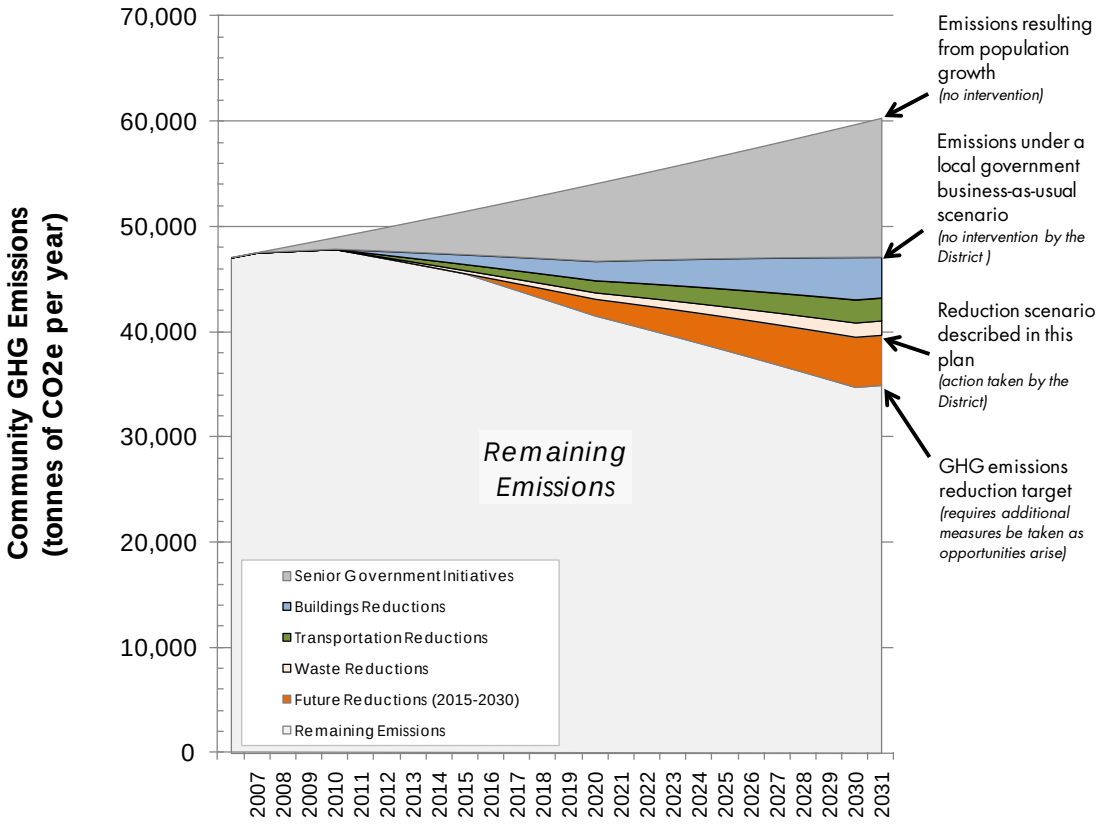


Figure 7. Reduction scenarios and resulting targets for Chetwynd

5.3 Goals for energy and GHG emissions

One goal was defined for each theme area as follows:

Buildings:
Our community has a variety of accessible, energy efficient and comfortable buildings to live and work in.

Land Use:
Our residents live in a compact rural community with access to local amenities where agricultural and natural land is preserved.

Transportation:
Our residents use a variety of efficient and active transportation choices to live, work and play in our community.

Alternative Energy:
Our community is resilient and uses a diversity of reliable, renewable energy sources.

Solid Waste:
Our residents and businesses minimize waste.

6. Strategies and Actions

The area of local government management of community GHG emissions is a new activity. Traditional local government service areas (water, sewers, infrastructure, planning and land use) are generally within the local government's authority to address. In contrast, GHG management is only under the general 'influence' of local governments. Additionally, local governments need to understand how to bring about desired behavioural changes in community members and stakeholders (developers, homebuyers, residents, etc). Which combination of strategies (education, incentive and/or regulation) will affect change in the community, and obtain the desired GHG reduction outcomes?

A series of 17 actions that use a combination of strategies are identified to help the District understand how to reach the targets and goals defined in Section 5. Actions range from one-time activities to longer-term program development activities or planning requirements which require bylaws to be enacted. These represent an excellent starting point for implementing the CEP; however, it is not an exhaustive list of opportunities. Over time, new opportunities will arise that may move the community towards its goals and targets more effectively, and may add to or even replace actions defined below.

The strategies and actions are presented according to five theme areas:

Theme 1: Buildings

Theme 2: Land use

Theme 3: Transportation

Theme 4: Alternative energy

Theme 5: Solid Waste

Each theme presents a goal, a description of the current state, a list of indicators that will help with monitoring progress towards the goals, suggested targets for each of the indicators and a series of strategies and actions to help reach the goals and targets. The GHG emission reduction targets within each sector are based on the technical scenario analysis described in Section **Error! Reference source not found.**.

Communities throughout BC are beginning to take action to reduce energy consumption and mitigate climate change. Several toolkits and resources have been developed by the provincial government, non-profit organizations, and utilities to support local governments in taking action. A list of these resources, along with some potential funding sources, is compiled in Appendix D to support the District in implementing the identified actions.

Theme 1: Buildings

Goal: Our community has a variety of accessible, energy efficient and comfortable buildings to live and work in.

State: Buildings (including residential, commercial and small-medium industrial) account for 30% of GHG emissions from community activities.

Indicators & Targets:

Indicator-1: Total GHG emissions from buildings (residential, commercial and small-medium industrial).
Target-1A: Reduce by 15% from 2007 levels by 2020.
Target-1B: Reduce by 30% from 2007 levels by 2030.

Indicator-2: Percent of new District (corporate) buildings built to LEED equivalent standards.
Target-2: 100% by 2020.

Indicator-3: Percent of existing homes renovated to high efficiency standards[20] (exceeding EGH 80).
Target-3A: 25% by 2020.
Target-3B: 75% by 2030.

Actions:

Strategy: Education & Leadership

Action B-1: *Develop an education campaign to encourage energy efficient renovations and new buildings.*

Throughout consultation in the Peace region, residents continually identified the need for more education about the types of actions and technologies that are most suitable for buildings in this region, and furthermore, the need for finding local contractors that can support these technologies (installation and maintenance).

The District of Chetwynd and the PRRD will partner with a community organization to develop a directory of technologies and/or local contractors that can provide services for improving building efficiency and installing alternative energy systems in the Peace region. This directory may also include guidelines for new buildings to aspire to in order to minimize GHG emissions. As part of the education campaign, the District will work with the local real estate industry to increase knowledge of energy efficiency and alternative energy technologies among agents.

[20] EGH refers to the EnerGuide for Homes energy rating system.

***Action B-2**: Provide an "Energy Efficiency Checklist" with building permits.*

The District will develop an energy efficiency renovation checklist and distribute a copy with each permit application. Checklists that have been developed by other municipalities can be used as a starting point[21]. The District may also consider:

- Requiring completion of the checklist in order to obtain the permit (although action would not be mandatory), or
- Linking the completion of items on the checklist to a permit rebate system.

Building inspectors with the District may also benefit from additional training about energy efficiency technologies and opportunities as these are continually evolving.

***Action B-3:** Build / retrofit District facilities to LEED equivalent standards[22] and promote this to the public.*

The District will demonstrate leadership by building all municipal facilities to LEED equivalent standards and encouraging other community facilities to use the same standards. After building or retrofitting municipal facilities, the District will promote the efficiency / alternative energy improvements with prominent information signs in the facility, on the District's website, and in local media.

Strategy: Financing & Incentives

***Action B-4:** Encourage the Regional District to develop a regional financial incentive program to improve energy efficiency in buildings.*

Undertaking energy efficiency and renewable energy upgrades can be difficult for some homeowners, particularly if they are on fixed or lower incomes, as they often require significant expenditures upfront, with payback gradually occurring over several years. Incentive programs can support these homeowners in achieving energy efficiency and comfort in homes, and local governments in BC are beginning to look at this option to increase the energy efficiency of buildings in their communities. The idea of incentives was generally supported by community member responses during plan development.

[21] Municipalities in BC that have developed checklists include: Town of Smithers, City of Kelowna, District of 100 Mile House, District of Central Saanich, District of Vanderhoof, and several more.

[22] There are several building rating systems with different approaches to measuring energy efficiency, including LEED, ASHRAE 90.1 and the NMECB. The LEED rating system evaluates the design and construction of buildings in a number of categories – one of which is energy consumption. Beyond a minimum requirement it does not mandate a number of 'points' to be attained in the energy category. Some policies require "LEED with a minimum number of points in the energy and atmosphere category. " The NMECB was developed by the Federal Government. ASHRAE is the American Society for Heating, Refrigeration, and Air Conditioning and they define performance standards. The 90.1 standard is for energy efficiency.

Local governments have the authority to provide assistance in the form of a grant, benefit, or tax exemption to residents under the *Local Government Act* and the *Community Charter*. Depending on the approach employed, the program may be available to residential buildings only, or more broadly to commercial buildings as well. The incentive program would require a stable source of funding for a set number of years to ensure objectives of improving energy efficiency and encouraging alternative energies are achieved. Funding options that can be investigated include:

- Levying an energy or climate property tax;
- Securing grant funding from senior governments or utilities; and
- Setting up the program as a "carbon offset project" where measurable reductions in community carbon emissions are sold as offsets. In this case there may be potential for local governments to purchase offsets from the program in order to meet their carbon neutrality commitments under the Climate Action Charter.

Local governments have provided financial incentives to residents and businesses in BC for various purposes, including energy efficiency, water conservation, heritage conservation, and revitalization purposes. By implementing the program on a regional scale, smaller communities can have access to the program that would not individually have sufficient resources. Some examples include:

- Capital Regional District Water Efficient Rebate Program: Over 15 years, the CRD provided rebates to residents for the purchase of appliances and fixtures that reduce water use.
- District of Saanich Green Home Building Rebate Program where building permit fees are rebated for attaining various energy efficiency standards, or for installing solar hot water systems[23].

The District will encourage the Regional District to investigate the potential for implementing a regional incentive program to increase the energy efficiency of existing buildings.

Strategy: Partnerships

Action B-5: *Work with education institutions to encourage projects that demonstrate energy efficiency and alternative energy technologies and promote these in the community.*

Northern Lights College ("BC's Energy College") is continually expanding its programs and training around energy efficient building and alternative energy systems. For example, NLC offers the province's only thermal solar hot water installation and wind turbine maintenance technician programs. In Dawson Creek, NLC is engaged in building "Energy House" as a demonstration of some of these technologies and an ongoing learning centre for the community. NLC has a campus located in Chetwynd and there may be

[23] http://www.saanich.ca/living/natural/greenrebate.html

opportunities to work with the college to pilot some alternative energy projects for showcasing to the community.

Additionally, the School District has undertaken a program with high school students to build very energy efficient homes, some using geo-exchange systems, for sale on the market. This may be an opportunity to produce a showcase home, while training local students in energy efficient building techniques and installation of alternative energy technologies.

The District will explore opportunities for building a demonstration of energy efficiency and/or alternative energy technology in the community in collaboration with Northern Lights College and/or the School District.

Theme 2: Land use

Goal: Our residents live in a compact rural community with access to local amenities where agricultural and natural land is preserved.

State: Chetwynd is a rural community with a range of recreational amenities and commercial services in town. Sixty-two percent of homes are single-family dwellings.

Indicators:

Indicator-4: Percent of new developments occurring in Town Centre[24].
(Describes how compactly the community is developing)

Indicator-5: Housing starts by structural type (Single-family, Duplex, Multi-family, Modular).
(Describes the diversity of new housing types)

Actions:

Strategy: Policies & Regulation

Action LU-1: *Accommodate new growth through re-development, increased density and infill of existing lots.*

By encouraging new development and re-development near the Town Centre, the District can promote a centre that attracts and maintains core businesses and services, improves accessibility for seniors, and preserves natural and agricultural lands surrounding the centre. The existing OCP (2004) includes the following objectives for encouraging infill development:

- *4.2: It is the objective of the municipality to encourage the development of a strong Town Centre.*
- *4.2.1.1 (e): Mixed commercial and residential development shall be provided for within the Town Centre area, to encourage a broadening and diversification of activities in the area and to stimulate the development of the Town Centre as a "people place" rather than simply a centre of commerce.*
- *4.2.1.1 (f): Redevelopment and increased density in the existing Town Centre will be encouraged.*

The District will continue to encourage new development as infill in existing lots by:

- Encouraging mixed commercial and multi-family developments in the Town Centre,

[24] "Town Centre" refers to the terminology in the District of Chetwynd OCP (2004).

- Implementing higher Development Cost Charges for development occurring outside the current service area (new lots),
- Requiring an evaluation of alternative energy options for development occurring on new lots[25], and/or
- Requiring overall GHG emissions reductions be achieved in the area. This is a non-prescriptive method of achieving a combination of efficiency and alternative energy (e.g. may employ several techniques to achieve the objective, including building orientation, landscaping, solar hot water, geothermal, water conservation measures). This requires defining a Development Permit Area and associated guidelines.

Action LU-2: *Encourage a variety of housing types, including multi-family units, secondary suites and cottages.*

Availability of a variety of housing options in a community ensures that there are opportunities for everyone to find affordable accommodation that meets their needs. Chetwynd currently has a predominance of single family homes, however, the District is actively encouraging the development of multi-unit housing with a particular focus on housing that meets the needs of seniors and encourages "ageing in place", meaning that people continue to have access to necessary services and amenities to comfortably stay in the same community as they age. The District currently allows secondary suites, but they are limited to "owner-occupied".

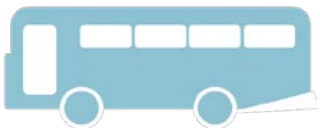
The District will modify the existing policy to allow and encourage secondary suites, infill cottages, and multi-family units in the Town Centre, and adjacent medium-density residential areas as capacity of water and sewer infrastructure allows.

This is supported in the existing OCP (2004):

- *4.1: There is a recognized need for affordable housing, including senior's housing, secondary suites and additional manufactured home subdivisions. Secondary suites within single family homes may be considered under a Housing Agreement to provide independent living quarters for members of the immediate family. Secondary suite development will be controlled through conditions in the Zoning Bylaw.*

[25] New powers were given to local governments in BC with the "Green Communities" amendment to the *Local Government Act* (Bill 27, 2008); including the ability to designate a development permit area (DPA) for the purpose of reducing greenhouse gas emissions. For example, the City of Dawson Creek OCP (2009) includes a development permit system with sustainability guidelines for energy conservation and renewable energy. A range of criteria is to be applied including, but not limited to, guidelines for passive solar design, green roofs, orientation, landscaping, renewable energy generation, solar hot water readiness, and district energy readiness. For a description of this new opportunity, refer to http://www.toolkit.bc.ca/resource/bill-27-opportunities-and-strategies-green-action, p.7.

Theme 3: Transportation



Goal: Our residents use a variety of efficient and active transportation choices to live, work and play in our community.

State: Transportation accounts for 66% of GHG emissions from community activities (including commercial and personal vehicles). Approximately 12% of commutes are done by walking and cycling.

Indicators & Targets:

Indicator-6: Total transportation emissions (from personal and commercial vehicles).
Target-6A: Reduce by 10% from 2007 by 2020.
Target-6B: Reduce by 25% from 2007 by 2030.

Indicator-7: Percent of residents using alternative transportation to get to work (shuttle bus, walking, cycling).
Target-7: 25% by 2020.

Actions:

Strategy: Education & Leadership

Action T-1: *Support development of a region-wide social marketing campaign to reduce fuel consumption from driving.*

Fostering a culture of efficient driving will involve leadership from all local governments in the region, and appropriately designed programs and awareness campaigns. The District can demonstrate visible leadership by employing energy-efficient fleet management (including adherence to the District's anti-idling policy and vehicle right-sizing) and promoting these activities to the public through notice boards at community facilities and stickers on fleet vehicles. These activities will begin to raise awareness about fuel saving behaviours, particularly if the District reports the fuel savings that result from these activities.

The District will support the development of a region-wide social marketing campaign that identifies and addresses barriers to behaviour change. Programs to support idle free zones, local shopping trends, and combined trip planning can be developed. Working with local non-profit organizations and schools can help with campaign implementation. Idle Free BC and Idle Free Zone are two examples of tools that help communities initiate an idle-free campaign. The provincial Ministry of Environment also has run an Idle Free Ambassador program in the past that supports local governments in hiring youth to implement idle reduction campaigns in communities throughout BC.

Strategy: Partnerships

Action T-2: *Work with major employers to encourage ride-sharing and investigate the potential for daily shuttle buses for commuting.*

Commuting to work each day often constitutes the majority of personal vehicle trips. Currently over 85% of these trips are by vehicle, with almost 70% as single-occupancy vehicles. Infill development helps to reduce the need to take vehicle trips to get to work; however, many people work at the large industrial plants that are located outside the Town Centre. Access to a daily shuttle, or well-used ride-share system can reduce these vehicle trips.

The District will engage in discussions with the major employers in Chetwynd to identify opportunities for developing internal ride-sharing programs, or providing shuttle buses for the start and end of shifts.

Action T-3: *Engage local businesses in the Climate Smart Program by becoming a Climate Smart Host.*

Local businesses are often interested in taking on climate change initiatives when it is easy and means saving money. Climate Smart is a BC based enterprising non-profit organization that helps companies, governments and organizations lead the change to a local, conservation-based economy.

The District will join Climate Smart as a Host Partner to help market, recruit and deliver training to the business community, suppliers, clients and franchises. This will provide an opportunity to local businesses to learn how to measure, reduce, and leverage energy savings in the marketplace.

Strategy: Financing & Incentives

Action T-4: *Continue to install and maintain pedestrian and cycling infrastructure to encourage non-motorized transportation.*

Safety and accessibility are key considerations when deciding whether to use active transportation. The District will encourage residents to choose non-motorized transportation options (walking, cycling, using electric scooters, etc) by installing infrastructure that improves safety and accessibility for these modes where feasible. Infrastructure improvements may include: sidewalks and safe crossings, separated paths and cycling lanes, and enhanced cycling signage. Year-round maintenance of recreational and commuter trails, including snow removal of sidewalks, will help encourage their use. Installing appropriate amenities (way-finding, benches, and bike racks) will also create an attractive environment for non-motorized transportation.

The District will install and maintain a year-round network of walking and cycling paths that are accessible and provide links between residents and commercial and recreational

services. This is supported by the Chetwynd Parks, Trails & Green Space Plan developed in 2007.

Strategy: Policies & Regulation

Action T-5: *Work with the Regional District and neighbouring municipalities to reduce idling.*

After a region-wide campaign to reduce vehicle emissions is well established (see T-1), the PRRD will work with member municipalities to develop a model bylaw that prohibits idling (with appropriate allowances for safety in cold weather). This would be most effective if implemented across the region (i.e. in every member municipality), and after rolling out the public education campaign and developing partnerships with businesses. Each local government will need to dedicate some bylaw enforcement time to ensure the bylaw is upheld. Several communities in BC have developed bylaws for anti-idling.[26]

[26] See http://www.idlefreebc.ca for a list of communities with bylaws.

Theme 4: Alternative energy

Goal: Our community is resilient and uses a diversity of reliable, renewable energy sources.

State: Our community currently relies on electricity from BC Hydro (primarily hydro-electric), and heating primarily from natural gas, supplemented by propane, heating oil and wood.

Indicators & Targets:

Indicator-8: Percent of energy consumed in buildings derived from alternative energy sources.
Target-8: 10% by 2030.

Indicator-9: Number of alternative energy systems installed (e.g. solar roofs, geo-exchange, and micro wind turbines).
Target-9: 50 systems installed by 2020.

Actions:

Strategy: Research

Action AE-1: *Conduct an opportunity assessment for potential use of waste industrial resources.*

Given significant light and heavy industrial activity in Chetwynd, there may be an opportunity to capture waste resources from these activities. For example, the active forest industry may have a source of wood waste that could serve as fuel for production of bioenergy. In particular, the expected establishment of a community forest licence this year may secure a community-owned resource for producing bioenergy.

Example: In 2008, an evaluation of opportunities to recover energy and water from industrial and community waste streams was completed for the municipality of Quesnel, BC. One year later, the City received a grant to fund a community electricity and heating system that was the top recommendation in the initial assessment.

The District, in partnership with local industry, will conduct an opportunity assessment to capture waste resources for energy production in Chetwynd. Public facilities, such as the District's recreation complex, may serve as customers for this energy.

Strategy: Education & Leadership

Action AE-2: *Coordinate with neighbouring municipalities to train building inspectors and operational staff in alternative energy technologies.*

Advancing new and alternative technologies is a challenge that requires a diversity of strategies and approaches to ensure success. Outreach and education will help to raise consumer awareness of the options and their benefits, but once consumers are ready to implement, they will be looking for expertise to better understand and navigate the complexities of implementation.

The District, in coordination with the Regional District and neighbouring municipalities, will ensure that building inspectors are trained in the implementation of alternative technologies. Inspectors should be able to guide residents through the set of codes and regulations that need to be followed in order to add an alternative energy system to their home or business. Inspectors should also be able to communicate inspection requirements to residents and provide guidance on the documentation required to access rebates from utilities, funding agencies, or warranty programs.

Action AE-3: *Promote the District's alternative energy projects to the public and share lessons learned.*

There are many opportunities for harnessing alternative energy throughout the Peace region. Opportunities include heat recovery from waste sources (e.g. industrial), heat and electricity generation from wind, biomass, geothermal and solar, and distribution through district energy systems. The District has taken a leadership role by installing several alternative energy systems, including wind-powered decorative lighting, solar-powered sign, and a geo-exchange heating system for the airport terminal. These projects demonstrate that alternative energy systems are feasible in the region and can act as catalyst for local economic development, fostering trust in new technologies and ways of doing business.

Figure 8. District of Chetwynd windmills used to power decorative lighting.

The District will continue to explore alternative energy technologies, and will share experiences with community members to encourage broader uptake.

Policies & Regulation

Action AE-4: *Update bylaws (zoning/building) to define allowances for alternative energy systems, based on a model bylaw developed regionally.*

Bylaws that explicitly allow alternative energy can reduce unnecessary barriers to building these systems. These bylaws allow the local government to define appropriate size, scale, setbacks, development standards, zoning etc for the systems. Several municipalities in Alberta have undertaken efforts to define "wind ready" land use bylaws, including Cardston, AB. In the Cardston bylaw "Wind Energy Systems" are defined and split into two categories (Type A and B). For each land use type, the appropriate wind system category is defined as a Discretionary Land Use.[27] The Village of Pouce Coupe recently incorporated a "Sustainable Design" section into its Zoning Bylaw (section 1.30) that addresses energy-related issues such as siting, landscaping, water conservation, etc. and these may also be incorporated into a model bylaw.

The PRRD will develop a model bylaw that defines allowances for these systems in the context of the Peace region. *The District may* modify the model bylaw as necessary or incorporate the allowances into the existing building and zoning bylaws.

[27] http://www.town.cardston.ab.ca/_data/docs/CardstonTownLUB1581July2009maps.pdf

Theme 5: Solid Waste

Goal: Our residents and businesses minimize waste.

State: In 2007, almost 71,000 tonnes of waste was disposed at PRRD landfills.

Indicators & Targets:

Indicator-10: Tonnes of CO_2 equivalent GHG emissions from solid waste disposed regionally.
Target-9: 35,000 tonnes less GHG emissions by end of RSWMP Phase 2.
(Note: this will be monitored by the Regional District)

Actions:

Strategy: Policies & Regulation

Action SW-1: *Work with the Regional District to implement the Regional Solid Waste Management Plan.*

The Regional District developed and adopted a Regional Solid Waste Management Plan (RSWMP) in 2008. Key objectives of the RSWMP also support the Community Energy Plan goals to minimize waste and reduce GHG emissions. These objectives include:

Phase	RSWMP Objectives
1 (first 2 yrs)	1: Establish a baseline set of practices with respect to the existing waste management system. 2: Establish levels of service for both rural and urban areas of the region, supported through the transfer station and landfill network. 3: Establish a policy platform or foundation for changes in later phases. 4: Support and/or expand existing programs and services, including education and awareness-building. 5: Enhance product stewardship program access. 6: Initiate greater outreach to and partnership with the ICI (Industrial, Commercial, Institutional) and agricultural sector stakeholders.
2 (3 to 5 yrs)	1: Increase reuse and recycling opportunities for residents. 2: Focus on the business and construction/demolition sectors. 3: Address landfill and transfer station capacity needs.
3 (5 to 10 yrs)	1: Continue to improve existing programs and waste management system infrastructure. 2: Investigate long-term waste management facility options.

The District will continue to support the RSWMP Objectives and implement necessary programs, as defined in the RSWMP.

7. Implementation

The District will need to dedicate staff time and annual funding to support the implementation of this plan and help the community reach the identified goals and targets. It will also be important to build partnerships with community organizations, businesses and industry to implement programs and activities throughout the community. During implementation of the plan, the District should continually monitor, report and review progress on these activities so that they can be adjusted as necessary to improve the outcomes.

7.1 Prioritizing actions

An initial set of actions that employ various strategies (education, leadership, incentives, partnerships, policy and regulation) have been identified to begin implementation of this CEP. Over time, actions may become more or less relevant with changing conditions, such as new technologies, availability of funding, development of new partnerships, council priorities etc. Therefore, actions will need to be re-evaluated on an annual basis and re-prioritized in an opportunistic manner.

As a starting point, each action is categorized by expected duration of the activity and by the recommended time line for initiating the action, as shown in Table 8. The duration of activity provides an approximation of the time span for implementing the activity, though staff may only need to be engaged at key points during that time (for example, if a consulting study is undertaken, or if a partner is carrying out some or all of the duties). The time line for initiation indicates the recommended year for beginning the action between one and five years.

Table 8. Timeline for implementing actions

Action	Duration of activity	Time line for initiation
B-1: Develop an education campaign to encourage energy efficient renovations and new buildings.	Ongoing	1
B-2: Provide an "Energy Efficiency Checklist" with building permits.	6 months	1
B-3: Build / retrofit District facilities to LEED equivalent standards and promote this to the public.	As needed	As needed
B-4: Encourage the Regional District to develop a regional financial incentive program to improve energy efficiency in buildings.	1 year	1
B-5: Work with education institutions to encourage projects that demonstrate energy efficiency and alternative energy technologies and promote these in the community.	1 year	2-3
LU-1: Accommodate new growth through re-development, increased density and infill of existing lots.	Ongoing	Current
LU-2: Encourage a variety of housing types, including multi-family units, secondary suites and cottages.	Ongoing	Current
T-1: Support development of a region-wide social marketing campaign to reduce fuel consumption from driving.	2 years	1
T-2: Work with major employers to encourage ride-sharing and investigate the potential for daily shuttle buses for commuting.	2 years	2-3
T-3: Engage local businesses in the Climate Smart Program by becoming a Climate Smart Host.	2 years	2-3
T-4: Continue to install and maintain pedestrian and cycling infrastructure to encourage non-motorized transportation.	Ongoing	Current
T-5: Work with the Regional District and neighbouring municipalities to reduce idling.	6 months	2-3
AE-1: Conduct an opportunity assessment for potential use of waste industrial resources.	6 months	2-3
AE-2: Coordinate with neighbouring municipalities to train building inspectors and operational staff in alternative energy technologies.	6 months	2-3
AE-3: Promote the District's alternative energy projects to the public and share lessons learned.	1 year	1
AE-4: Update bylaws (zoning/building) to define allowances for alternative energy systems, based on a model bylaw developed regionally.	6 months	4-5
SW-1: Work with the Regional District to implement the Regional Solid Waste Management Plan.	Ongoing	Current

7.2 Personnel requirements

Dedicated staff time will be required to prioritize, initiate, carry out and monitor the plan's activities. It is likely these activities will need to be incorporated into existing staff roles. Staff responsibilities will include:

- Continue participation on the Peace Region Climate Action Task Group to align activities regionally.
- Champion implementation of activities by communicating with staff and community partners.
- Monitor and report on activities internally and externally.
- Make connections with community partners to promote the plan and find areas for local government involvement.
- Develop internal awareness.
- Act as ambassadors in the community regarding energy and GHG emission reductions.
- Apply for funding through various provincial and federal programs to meet the plan objectives.

7.3 Funding commitment

Plan implementation also requires a commitment of sufficient funds for disbursements, such as planning studies, legal services, consultant fees and program fees (as applicable), in addition to dedicated staff time discussed above. Several external funding sources exist that the District may pursue to share some of these costs. Appendix D provides a list of selected funding opportunities for implementing CEPs.

7.4 Monitor, report, re-evaluate

In applying an adaptive management approach to plan implementation, it is important to monitor changes in energy use and GHG emissions over time to gauge the effectiveness of activities being undertaken. To accomplish this, a monitoring program needs to be developed that tracks specific indicators of progress. Proposed indicators for this plan are outlined by theme area in Section 6 and summarized in Table 9. Suggested data sources are also described, including three indicators that the District would need to start tracking at time of issuing building and development permits (see indicators 3, 4, and 9).

Table 9. Summary of indicators for monitoring plan implementation

Indicator	Data Source	Target
1. Total GHG emissions from buildings (residential, commercial and small/medium industrial).	CEEI updates (to be provided by MOE every 2 years 2010 and beyond)	Reduce by 15% from 2007 levels by 2020 Reduce by 30% from 2007 levels by 2030
2. Percent of new District (corporate) buildings built to LEED equivalent standards.	District records	100% by 2020
3. Percent of existing homes renovated to high efficiency standards (exceeding EGH 80).	Currently not tracked. District will need to track this at time of issuing building permits, OR in a survey as part of property tax collection process	25% by 2020 75% by 2030
4. Percent of new developments occurring in the Town Centre.	Currently not tracked. District will need to track this through issuance of development permits and re-zoning application process.	No target
5. Housing starts by structural type (Single-family, Duplex, Multi-family, Modular).	Statistics Canada	No target
6. Total transportation emissions (from personal and commercial vehicles).	CEEI updates (to be provided by MOE every 2 years 2010 and beyond)	Reduce by 10% from 2007 by 2020 Reduce by 25% from 2007 by 2030
7. Percent of residents using alternative transportation to get to work (shuttle bus, walking, cycling).	Statistics Canada	25% by 2020
8. Percent of energy consumed in buildings derived from alternative energy sources.	Unknown at this time	10% by 2030
9. Number of alternative energy systems installed (e.g. solar roofs, geo-exchange, small wind).	Currently not tracked. District will need to track this at time of issuing building permits, OR in a survey as part of property tax collection process	75 systems by 2020
10. Tonnes of CO_2 equivalent GHG emissions from solid waste disposed regionally.	PRRD to track through RSWMP implementation	35,000 tonnes less GHG emissions by end of RSWMP Phase 2

As implementation progresses, the list of actions will be re-evaluated and modified to ensure the community is moving towards the goals and targets. Corrective action may need to be taken if indicators show the community is not progressing towards the goals and targets.

A: Community Survey

There were 77 responses from residents to the community energy plan survey. The survey questions and responses are included below.

Community Action: Individuals and Organizations

Question 1: As individuals and organizations there are many actions we can take to reduce energy consumption and GHG emissions. Please review the list of actions and fill in the check boxes as appropriate.

Actions	I'm already doing this!	I'm willing to do this on my own	I'm willing to do this with support	I'm not willing to do this	Not applicable/ possible
Make energy efficiency improvements to your home or office	65%	11%	21%	0%	3%
Turn down the temperature in your home or office	76%	8%	0%	8%	8%
Install programmable thermostate at home/work	26%	24%	15%	10%	25%
Replace your furnace	33%	6%	33%	9%	20%
Replace your boiler	3%	3%	8%	2%	85%
Have an energy assessment	9%	2%	22%	8%	60%
Set your water	51%	32%	4%	9%	4%
Install solar panels	3%	13%	60%	15%	9%
Wash your clothes	62%	11%	3%	22%	3%
Install low flow	59%	15%	15%	10%	0%
Turn off your car	72%	20%	2%	6%	0%
Scrap your old car	32%	4%	15%	35%	13%
Telecommute to work	18%	0%	0%	11%	71%
Schedule or perform	88%	9%	1%	0%	1%
Grow some of your own food	76%	15%	3%	1%	4%
Compost organic wastes	64%	19%	7%	5%	5%
Reuse products wherever possible	90%	8%	1%	0%	0%
Buy good quality, long lasting	86%	12%	1%	0%	1%
Buy products with minimal	67%	30%	3%	0%	0%
Buy local	73%	20%	4%	0%	3%

Community Action: Local Government

Question 2: The Community Energy Plans will outline measures that local governments in the Peace can implement, either individually, collectively, or in partnership with other agencies to reduce energy use and GHG emissions. What types of activities do you think your local government should focus on in order to reduce energy consumption and GHG emissions?

We do not have enough information and knowledge about the workings of our local government (Pouce Coupe) to make an informed comment.
Education - more info on Geothermal, other housing options (strawbale, etc), info on other forms of renewable energy sources (solar, wind, etc).
Eliminate flaring in oil patch Find an alternative to site c dam possibility
Government incentive (provincial + federal) for geothermal, wind + solar power on private properties for personal use. (Tax incentives, rebates)
Schools - education and practical hands on opportunity Water Conservation - particularly those who use publically treated water Block heater timers for winter - potential subsidy? Or at least promotion - Efficient / active transportation corridors - like a bike trail from Charlie Lake to FSJ and expansion of current active transportation routes - they will be used.
Invest in alternate energy (solar, wind, geothermal) and subsidize individuals and businesses to help retrofit their homes and businesses.
Cut out any flaring at well sites
Encourage and support off the grid energy producing projects. Recycling facilities in rural communities
Where does our community's energy come from? - should come from alternative energy sources as much as possible Try to make it easier to get inspections - encourage inspections at all commercial buildings. Encourages or give incentives for alternative energy.
Use more but smaller efficient shuttle buses Private transportation is a huge energy user. Programs are required to encourage public transit, to make the routes more user friendly and responsive to user needs. - shuttle bus back and forth between Charlie Lake - FSJ - Taylor - internet interaction from transportation needs - make a website people can log in to, to modify routes and schedules "interactive"
Wind/solar in resident applications
Subsidize in whole or part individual energy saving innovations
Eliminate flaring at leases and plants. Reinvest in rail for transport of goods
Implement regular curbside pick up (more people recycle if they don't have to put so much effort into it. Subsidize solar hot water heaters installation or offer an incentive such as lower taxes to a household that implements alternative energy practices
Put sand on roads and not gravel. Will save tons of glass
Need to help with financial support to make changes. We are charged a carbon tax we do need to have fuel for farming, to get to town. We should be compensated for carbon excess that our land produces - trees and vegetation
House is very old and is to be torn down when the new house is built
Less reliance on natural gas for heating
Get the industrial plants under control. Reduce trucking - quit using air travel for government business. How much energy is wasted by this constant flaring by Spectra, etc. in Taylor?
Maximize use of solar/wind/geothermal where cost benefit shows it to be of value in redrawing total costs, including capital and operating, over the life of the project.
As far as packaging is concerned, I am constantly infuriated about how hard it is to get (buy) anything that isn't inside hard plastic bubbles which are very hard to open. I tried writing to Revlon cosmetics once but didn't even get a response. Something should be done in my opinion.
Build renewable energy facilities
Pursue alternative energy sources
Heat & light reduction in homes and workplace
Energy efficiency of new buildings - complete with landscaping that benefits environment i.e. wind breaks (helps with

heat loss and provides shade in summer & mitigates GHG emissions). Focus on local government , local regional provincial buildings 1st - set examples. Do not focus on subsidies for those individuals / businesses who have done nothing to date - recognize those who have already shown good practices and paid for them on their own

Question 3: Please provide any further comments about the Community Energy Plans.

The community needs natural gas
Maybe incentives for people to make their homes more efficient
Continue rebates for homeowners to upgrade to energy efficient furnaces, etc.
These questions in the survey seem contradictory: re-use products and scrap old car. Encouraging people to buy new cars will be good for the economy but the overall GHG emissions are greatly increased by buying new vehicles in most cases. It is better to encourage people to get all the practical usability they can out of a vehicle and then help them make efficient, good quality, lasting product once a replacement is necessary.
Funds could be made available if BC Hydro instead of building dams (Site C) would invest our taxpayer's money in helping with this retrofitting to greener energy, and quit using their pockets and [] people. A dam is nothing but a bank for Hydro and a destroyer of the environment
I do all I can such as shutting off lights and drying clothes outside when possible. Never leave the car running.
No Site C.
One of our biggest needs is natural gas
Need proven technologies for this area
The carbon tax goes into general revenue. This is not leadership, just a tax grab - negative. Taxing to reduce activities that are harmful to people or the environment is only acceptable if the same taxes encourage, promote and subsidize the positive activities that heal or help people and the environment.
No carbon tax. Solar farms, wind farms Solar Wind & Geothermal rebates Wood burning stove
There is no real community here, just scattered farms and businesses - no local recycling. No help to install solar or other forms of energy.
Would like to see stores replace Styrofoam with something we could recycle
Need agriculture plastic recycling or stockpiling to reduce the temperature to reduce it.
I would like to see the recycling depot start taking glass again___ too much glass is needlessly entering our landfill sites.
While I appreciate the suggestion to select products that contain a minimal amount of packaging, I do have to question why the onus is placed on the consumer rather than the manufacturer. Surely more responsibility can be placed on those who can make a far greater impact; the manufacturer. Ban Styrofoam and plastic grocery bags
We are on a fixed income. These changes should have been done 4-5 years ago. Due to economic down turn in the beef prices, we can't afford these changes that need to be done
Building a new house. Ship is done heating a 24x28 shop using only about 1000 W of power at about 15 degrees Celsius.
Good to have one!
Not aware of what plans they have at the present time
Put our dump back so we don't have to haul garbage 50 miles or more. That wastes energy.
A lot of this may not apply as we're both retired seniors
Taxes to all should not be increased as those demonstrating good practices (and paying for them) are charged for those who do not - and do not intend to show good practices or commitment to energy savings. Hopefully focus will be placed on O&G industry for their excessive use of energy and excessive GHG emissions along with harmful pollutants - mitigation should be part and parcel of every individual agreement for land use - temporary or more permanent on a site specific - use specific case! DO not focus on wind energy (small for farm/ranch? cost prohibitive! - being a solution for public - public benefit? Public pays for it! Why single out farms and ranches? How about explore opportunities for every house in DC?

B: Stakeholder Interviews

Each stakeholder interview consisted of five questions as follows:

1. What are some opportunities and challenges for reducing GHG emissions in the Peace region?
2. What are some potential strategies for the Community Energy Plans for each of the following categories?
    a. Transportation and equipment
    b. Buildings and infrastructure
    c. New development
    d. Solid waste
    e. Energy supply
    f. Other
3. What can the Regional District / municipality do to support the community in reducing energy consumption and/or GHG emissions?
4. Can you identify any potential partners for implementation of the CEPs?
5. Do you have any other comments?

The answers have been compiled into a list of opportunities by sector:

Transportation & Equipment
More development closer to town centres in Taylor, Pouce Coupe, Chetwynd could make towns more walkable
PC - many residents commute to DC - any opportunity for shuttles?
Work with big companies to right-size fleet and reduce idling. Many workers in region expense all fuel costs and don't "care" about conserving - no direct incentives to do so.
Anything possible with reducing emissions from huge commercial trucks? Major part of transportation.
Trip combination, car pooling, trip reduction
Buildings & Infrastructure
Need council-level decision to proceed with alternative energy projects (mostly for corporate) - especially for large facilities to change marketplace
Increase awareness / understanding of benefits of geothermal with builders and developers - currently only reactively including these systems
Increase training of qualified trades people in alternative energy installation
If implementing residential program - market & sell to realtors
Real estate buyers not aware of alternative energy systems, but realtors are - perhaps a campaign to raise more awareness of the options
Taylor: a lot of old homes, many mobile homes, some very efficient. Government needs to provide incentive programs to help people (esp lower income) upgrade the efficiency of homes. E.g. new furnaces; windows; adding peaked roof with R-40 insulation; possibly poly-sio insulation membrane on flat roofs (like commercial bldgs, but use on mobile

homes).
Incentive programs to build above building code standards for efficiency - e.g. solar situation; higher insulation; solar hot water heating systems; 3-pane windows...
Energy audit program for agricultural operations - check into program run in Chilliwack with BC Hydro
Set up development fund to implement components of the LiveSmart program: the building assessment component, cited the Get Green program in Dawson Creek as a positive example of this
Homes / buildings typically need improved insulation before alternative energy supply gets installed. So first priority should be improving efficiency.
New Development
Set up designated "geothermal" area in muni where all new development must use geothermal system (e.g. restrictive covenants)
Looking at Revitalization Tax Exemption in Tumbler Ridge - have funding, but nothing yet
Really need criteria, need to know how/what to measure, need guidance, toolkits very helpful
Taylor, PC, Chet all quite spread out, but have opportunity for more development closer to town centre to create more walkable towns
Northern Lights College program builds a new house every year that gets put on the market - opportunity to showcase green technologies
Taylor: muni needs to remove obstacles and start encouraging new businesses to set up in core. E.g. could use a bank. Residential devt closer to core could happen too.
Property tax reduction for energy efficient building / sustainable building - especially b/c materials for these houses cost more, so would be nice to have taxes on "even playing ground"
Program with a local bank to have reduced interest rates on mortgages for energy efficient homes
Solid Waste
Capture of landfill gas; investigate potential for portable unit for pyrolisis to generate electricity and feed into grid?
Opportunity (?) to divert cattle waste to generate energy from SRM = Specified Risk Materials that now go to Bessborough Landfill. SRMs are parts of the animal that may contain BSE protein and cannot ever enter food stream.
Energy Supply
Reduce barriers to applications for wind turbines - bring in bylaw (amend zoning bylaw?) to enable wind in appropriate sizes, locations, forms etc. Can work with non-profit (e.g. Canadian Wind Energy Association) or private firm to help develop this.
Improve incentives for passive solar and micro-gen wind turbines for residential applications. BC currently provides up to 50% rebate for micro-gen installation (???what program is this??? - apparently Ontario has even better program - http://news.ontario.ca/mei/en/2009/09/green-energy-for-ontario-communities.html). Solar can get some rebates through Federal ecoEnergy program.
Very strong ethic for self-sufficiency - work with this to encourage more alternative energy development / installation.
Passive solar opportunities are excellent for individual / small operations - direct heating of air, water, ... - smaller initial investment, opportunity to expand over time. Incentives help!
Pyrolosis excellent developing technology - wood/pulp waste from mills; muni solid waste; agric waste. Anaerobic, efficient, end result is high quality fertilizer product. Can get portable units that can be shared by a region and moved to from landfill to landfill etc. Potential to investigate further for PRRD and member munis?
Some (low level) interest from ranchers to invest in mid-size wind to feed back into grid. Uncertainty over set-up costs, sourcing, pay-back.
Install alternative energy backup systems. E.g. in Dawson Creek, currently working to get wind/solar backup system installed on fire hall for 911 emergency backup. While not needed, feeds into grid; also kicks in to supply power when grid is down. (Taylor expressed interest in this?)
Moberley Lake pilot project for solar hot water (not sure of details...could call back to ask for more)
Small wind may not be that viable b/c a lot of turbulence in wind - payback may not be as good. Larger projects okay in right places.

Cost is biggest barrier to individuals installing alternative energy systems - more grants would help; also education needed.
Peace Energy Cooperative is considering developing Renewable Energy Packages for homeowners - i.e. kits to simplify installation of solar; maybe wind too.
Municipalities can ensure bylaws are in place for: appropriate placement / guidelines for wind turbines, solar panels, etc.
Definite interest and awareness, however, upfront capital cost is huge barrier
Generally not supportive of large-scale wind projects if they are in proximity to ranching operations and residences (e.g. Bear Mountain project). High level of impact / disruption on residents and on animals from: Noise, Lights, and Increased traffic.
Huge concern that cereal straws and fescue straw will be used for energy production – these are currently used as bedding and supplementary livestock feed. If new market develops for these straws and drives up prices, it would have a direct impact on ability of ranchers to continue operating. Conversion of some fields to canola production for biofuels is already reducing availability of these straws to cattle industry. These straws are sometimes also used as soil conditioners, by grain producers to improve soil quality, which would be lost.
Education
More education needed, needs to be enforced, collective presence is required to put solutions forward
Taylor: involve residents more in discussions about where the town should go - surveys, input sessions, etc.
Wind turbine applications - set up pilot projects to demonstrate that they are feasible, not too noisy, etc. when done properly (understand when / where appropriate to use). Can be done in cities too.
Education must be presented in positive ways; negative is not effective, incentives presented rather than regulations
More connections need to be made with energy use and the climate change implications, lack of understanding of the linkages
Municipalities need to take lead in education & promotion - through demonstration projects; workshops; leadership
Need to get alternative energy technologies into curriculum for engineers and architects who are designing and developing buildings in the region. (Note: Northern Lights College has good programs - or are developing them - for training installation of these systems)
Centennial Green project in Dawson Creek - may become a resource for energy efficiency / alternative energy for region...being developed now with Peace Energy Cooperative & City.
Partnerships
Chamber of Commerce(s) very supportive of NEAT (Northern Environmental Action Team)
Work with industry to develop partnerships
Need to identify champions within each community (preferably not muni staff) to take leadership and work with muni to promote the issue / opportunities
Other
Ranchers are concerned that government will require them to further reduce emissions or pay a penalty if unable to do so. Ranchers already do as much as possible to conserve energy to reduce operating costs, as they are barely scraping by and this is a necessity.
Ranchers already practice carbon sequestration techniques, but no credit is given to these practices. E.g. no or low-till practices; manure put back into soil
Have always supplied local food system – good connections to local farmer's market; have local abattoir

C: Renewable Energy Opportunities

The potential for developing renewable energy resources in the Peace River area is discussed by energy source:

Solar thermal

The Peace River region has a very good solar resource, one of the best in BC. Solar thermal is the use of solar energy for hot water and space heating. While this is the most cost effective use of solar energy, it is still a fairly long payback in most cases. The best applications for solar thermal are those that have a consistent year round heating requirement and relatively low temperature requirements. The best application is usually for heating swimming pools, while buildings with large water heating loads (e.g. hotels or hospitals) are also potential candidates. In residential applications it is usually used for water heating. Although solar can be used for space heating, it is not an ideal application as the highest loads occur in the winter, when there is the least solar energy available.

While most solar energy systems use hot water panels mounted on the roof of a building, passive solar is another means of using the sun's energy. Orienting houses or buildings to the south, minimizing windows on the east, west, and north sides, and incorporating appropriate shading can all significantly reduce heating requirements. Passive solar is something that local governments have control over through the use of development permit guidelines.

Within the Peace Region, areas further away from the mountains have the best solar potential, although the solar resource is still quite good in Chetwynd and Tumbler Ridge. The low cost of natural gas in the Peace will reduce the dollar savings from solar energy and contribute to longer paybacks. Some of the best residential applications may be for homes in remote communities that are not on the natural gas grid, where solar could offset the use of more expensive propane or electricity.

Solar photovoltaics

Solar photovoltaics (PV) is the generation of electricity from solar panels. While the price of PV has come down recently, it is still a very expensive technology. PV will generally not be cost effective versus electricity from BC Hydro. It may be cost effective for applications that require significant lengths of distribution wiring (e.g. streetlights, remote signage) or for homes that are off the BC Hydro grid.

Wind

The Peace region has proven to be viable for wind power with the opening of the Bear Mountain wind project – the first in BC. Although the best wind resources are usually in mountainous areas that are difficult to access, the Peace is one of the few areas in BC that has good wind in relatively flat terrain. However, wind power is generally only viable in large scale wind farms such as Bear Mountain. Although small wind turbines are available for use on buildings, they are much more expensive per kW than large wind turbines. Their relatively low mounting height and obstructions from surrounding buildings also reduce the effectiveness of small turbines. Therefore wind power opportunities are likely to be limited to large turbines feeding power into the grid. These projects are usually developed by specialty wind power companies with the technical expertise and financial backing to undertake large projects.

Based on BC Hydro's wind resource maps, the area between Dawson Creek and the Rocky Mountains has the best wind potential, with relatively flat terrain. There is good wind resource shown in the Rocky Mountains, but this is likely to be too difficult to access.

Micro-hydro

Micro-hydro is the most common form of renewable power generation in BC, with dozens of small run-of-river power projects operational and many more planned. The best sites for micro-hydro tend to be near the coast, where there are high precipitation rates, moderate winter temperatures, and large elevation changes. The Peace region does not generally have good micro-hydro potential, although areas in the Rocky Mountains are identified as moderate potential. No potential sites over 2 MW have been identified by BC Hydro. Although micro-hydro can be developed at a scale smaller than this, they benefit from economies of scale and very small projects are not likely to be cost effective. There may be some potential to use the municipal water supply in Tumbler Ridge for electricity generation, which is discussed in the corporate plan.

Biomass

Biomass is the most common form of renewable energy, used mostly in fireplaces and wood stoves in homes. But it can also be used at a much larger scale, for heating buildings, supplying district energy systems, or generating power. Biomass can include wood waste from mills or logging operations, manufactured wood pellets, wood waste from construction, garbage, animal by-products, or plant crops. Whatever form of biomass is used, it needs to be located fairly close (within 50 – 100 km) to the plant in order to be cost effective.

There are several mills in the Peace region that may provide sources of wood waste. While wood waste from mills was once freely available, in recent years there has been an increased demand for it, with prices rising accordingly. But if there are no competing buyers for it, wood waste may still be available at low or no cost. A consideration in using wood waste from mills is the stability of the mill, as a long term stable supply of wood waste is essential to the viability of a biomass energy project. Air quality impacts also need to be considered, as there may be public resistance to wood burning plants.

Another possibility for biomass in the Peace region is the use of agricultural waste. Dawson Creek has been investigating the use of seed grass straw as a fuel source, which appears to be viable. There is apparently a large volume of this available, and it would be worthwhile to follow-up further with Dawson Creek. However, an assessment of the potential impact on other uses of the

"waste" material may be needed as well. For example, cattle ranchers use waste straw as bedding and introducing a competing buyer of the straw could negatively impact the ranching industry.

Although general municipal solid waste can be used for energy, this is usually only viable at a very large scale, and the population of the Peace region would not support it. Wood waste from construction or green waste is a possibility for producing energy, utilizing some newer digestion technologies (e.g. Nexterra). Again, the relatively small population of the Peace will make this a challenge.

Any consideration of biomass for energy must include potential negative impacts. These can include impacts on air quality, food crops, or the financial well-being of other industries that rely on wood waste (e.g. pulp mills, OSB plants) and straw (e.g. cattle ranchers).

Landfill gas

Both the Ft. St. John landfill and Bessborough landfill will be required to install landfill gas collection systems by 2016 under new provincial legislation. While collecting landfill gas for energy has not been cost effective for small landfills in the past, it likely would be once the gas collection system is put in place. The collected gas can be used to generate electricity or it can be cleaned and injected into the PNG gas system. If there are nearby buildings the landfill gas can be used for heating, or in a cogeneration system.

Geothermal

Geothermal is the use of high temperature hot springs to supply heat or generate power (although the term is often used for geo-exchange or ground source heat pumps – see below). The Peace does have some high potential geothermal areas around Hudsons Hope and Chetwynd. However, it should be noted that no geothermal resources have been developed in BC, and is unlikely to be viable at this time.

Geo-exchange

Geo-exchange is extraction of low temperature heat within the ground through the use of heat pumps. The use of this technology has been growing rapidly in BC. Most geo-exchange systems have been installed in individual homes or buildings, but larger systems serving multiple buildings are now being developed. Almost any ground can be used for geo-exchange, but the type of soil will impact the cost and effectiveness of the ground field. Other similar heat sources, such as groundwater or water from wastewater treatment can also be used with heat pumps.

The prairies have historically been leaders in the use of geo-exchange systems, due to good soil conditions, underground aquifers, and low cost electricity. The Peace has similar soil conditions and most areas are probably good candidates for geo-exchange. Commercial/institutional buildings are generally more cost effective than homes due to larger size, but economics will vary from project to project.

Industrial waste heat

Industry often has a lot of wasted heat which is too low temperature for their needs, but could possibly be used to heat other buildings, perhaps through a district heating system. There are many industries in the Peace, and some may have waste heat available. To justify the cost of piping, the industry must be located reasonably close to where the heat will be used.

Cogeneration

Cogeneration is the simultaneous production of electric power and heat. The fuel used is often natural gas, but other renewable fuels such as biomass or landfill gas can be used. To be cost effective, cogeneration plants need to be located where there is a use for the heat. Facilities with large year round heating loads (such as hospitals, recreation centres, or industry) are preferred. BC Hydro's new firm purchase rates for plants under 5MW has made it easier to plan cogeneration plants, while low gas rates would increase potential viability in the Peace. Cogeneration can also be used with a district heating system.

District heating

District heating is not a renewable energy technology. It is a means by which renewable energy can be distributed to multiple buildings and there has been a lot of interest in district heating systems recently. District heating connects multiple buildings to a central heating plant. The heat is usually distributed to the buildings by means of hot water. The central heating plant could heat the water with a number of renewable technologies, including biomass, solar thermal, or geo-exchange.

The key factor in establishing a district heating plant is to have a number of significant heating loads within a short distance of each other. A source of low cost heat is also desirable. Generally one or more large core buildings would be desirable in establishing a district heating system, while smaller or more distant buildings can be added later. There are no specific criteria for assessing viability, but if buildings are more than 200 - 300 metres apart the piping costs may become excessive.

Municipal planning should support a district heating system by focusing development around the system distribution. Civic facilities or other institutional buildings can be core customers. And facilities that may be sources of waste heat (e.g. sewage treatment plants or ice rinks) should be located nearby.

Of the Peace River municipalities, Tumbler Ridge probably has the best potential for a district heating system, with a relatively compact town centre that includes a number of larger buildings. Whether a district heating system would be viable would depend on the heating loads and systems within those buildings and any available heat sources. The other municipalities are either too spread out or the buildings are too small to make good candidates for district heating, although local governments could focus development in certain areas with the intention of supporting district heating in the future.

D: List of Tools & Resources

Category	Source / agency	Example program, toolkit or resource
Resources and guides for local governments	UBCM, Smart Planning for Communities & Provincial government	**Toolkit** with a collection of actions, case studies, and resources to support local government action: http://toolkit.bc.ca/
	Non-profit (West Coast Environmental Law)	**BILL 27: Opportunities and Strategies for Green Action by BC Local Governments:** http://wcel.org/resources/publication/bill-27-%E2%80%93-opportunities-and-strategies-green-action-bc-local-governments
	Provincial government (MCRD)	**A Guide to Green Choices: Ideas & Practical Advice for Land Use Decisions in British Columbia Communities:** http://www.cd.gov.bc.ca/lgd/planning/greenchoices.htm
	Provincial government (MAL)	**Reducing Agricultural GHG Emissions in Your Community:** http://www.agf.gov.bc.ca/resmgmt/ClimateActionPlan/toolkit_for_local_govt/How_toolkit.htm
Incentive programs for residents and businesses	Provincial government	**LiveSmart BC:** Rebates and incentives to help British Columbians reduce their carbon footprint at home, on the road, and at work.
	Utility (BC Hydro)	**Power Smart:** Rebates and incentives to encourage energy efficiency in new construction and the installation of energy efficient products and appliances in existing facilities.
Funding sources for local governments	Non-profit (Community Energy Association)	**Funding your community Energy and Climate Change Initiatives:** a guide to funding and resources for local governments. http://www.communityenergy.bc.ca/sites/default/files/CEA%20Funding%20Guide%202009-May.pdf
	Utility (BC Hydro)	**Energy Manager Funding:** BC Hydro has provided partial funding to some municipalities for an Energy Manager position.
	Provincial government	**Local*Motion*:** Cost-sharing (50/50) between provincial and local governments for capital projects that make communities greener, healthier and more active and accessible places in which to live.
	Provincial government (BC Housing)	**Housing Endowment Fund:** $10 million annually to support housing initiatives that are consistent with the provincial housing strategy and address the needs of households with low to moderate incomes. Projects must have strong partnership contributions from local government, community organizations, private and non-profit sectors, and other government agencies.
	Federation of Canadian Municipalities (FCM)	**Green Municipal Fund:** Grants available to support sustainability and climate action planning efforts. Low-interest loans available to support capital projects that reduce energy and GHG emissions. Competitive process with RFPs launched annually to fund projects related to brownfield redevelopment, energy, planning, transportation, waste and water.

Category	Source / agency	Example program, toolkit or resource
	Provincial government	**Innovative Clean Energy (ICE) Fund:** $25 million per year is currently allocated by the provincial government to assist with funding of clean energy and technologies to help support local economies and livelihoods in communities across BC.
	Provincial government	**Climate Action Revenue Incentive Program (CARIP):** The Regional District may elect to use its annual CARIP grant to support both community and corporate (operational) climate action initiatives.