CLIMATE ACTION WR

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EXECUTIVE SUMMARY

Over 1000 communities around the world are taking action on climate change. A local effort to develop a community-wide GHG Action Plan for Waterloo Region is currently underway through a partnership called *ClimateActionWR*. This leadership-based partnership formed initally to develop a community-scale GHG emissions inventory and currently involves local governments, two non-profit organizations along with local electric and gas utilities. *ClimateActionWR* is following the framework provided by the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) program, which includes participation by 220 other communities across Canada.

This discussion paper summarizes the inventory process and GHG emissions data for the geographical boundary of Waterloo Region. The inventory considers local activities within five main sectors or sources of emissions as indicated below:

Waterloo Region GHG Emissions by Source (2010)

Sector	GHG Emissions (tonnes CO_2e*)
Residential - energy use	782,459
Industrial, Commercial and Institutional Buildings (ICI) – energy use	1,152,389
Transportation – fuel consumption	1,467,858
Agriculture –methane from livestock	167,053
Community Waste - methane from landfill	44,112
TOTAL	**3,613,870**

*(CO2e = carbon-dioxide equivalents is a unit of measurement combining different GHGs)

Community-wide GHG emissions for Waterloo Region from these sources are estimated to be 3,613,870 tonnes of carbon-dioxide equivalents (CO_2e) for 2010 as the base year. The PCP program also requires a business-as-usual or status quo forecast of future emissions be developed 10 years outward from the base year. Based on projected population growth within Waterloo Region, emissions are expected to grow by approximately 17% to 4,239,187 tonnes CO_2e by 2020 if no new emission reduction initiatives are put into place.

The next step for *ClimateActionWR* is to build on the emission inventory by conducting further stakeholder engagement and initiating public consultation sessions as a means to develop a community-wide action plan and reduction target for the year 2020. This plan will contain actions that participating stakeholders own in the sense that they have the authority to implement the individual initiatives. Moreover, there will be clear additional social, economic and environmental benefits to these actions being implemented as the community works together to achieve the reduction target.

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1.0 INTRODUCTION

BACKGROUND

Many communities around the world have taken action to reduce greenhouse gas (GHG) emissions by creating and implementing local action plans and by establishing emission reduction targets. A local effort to achieve this objective is currently underway in Waterloo Region through a partnership called *ClimateActionWR* (initially known as the *Climate Collaborative*[1]). The overall goal of *ClimateActionWR* is to reduce GHG emissions and improve energy efficiency in Waterloo Region.

ClimateActionWR is a partnership among the following organizations:

- Cambridge and North Dumfries Hydro;
- City of Cambridge;
- City of Kitchener;
- City of Waterloo;
- Kitchener-Wilmot Hydro;
- Kitchener Utilities;
- REEP Green Solutions;
- Region of Waterloo;
- Sustainable Waterloo Region;
- Union Gas; and,
- Waterloo North Hydro.

This initiative is being guided by the five-milestone framework provided by the Federation of Canadian Municipalities (FCM) Partners for Climate Protection (PCP) program. Through the PCP program, more than 220 municipalities across Canada have developed, or are developing, GHG inventories and reduction plans.[2] The milestones associated with the PCP process are shown in Figure 1.

Figure 1: PCP Five Milestone Framework

[1] In October 2012, the *Climate Collaborative* partnership launched *ClimateActionWR* as its new public presence. The *ClimateActionWR* identity was designed to facilitate community engagement and active participation by displaying action, community and collaboration as its core foundations.

[2] Federation of Canadian Municipalities. Partners for Climate Protection. Accessed March 18, 2012 from http://fcm.ca/home/programs/partners-for-climate-protection/members.htm .

The PCP program encourages municipalities to complete these five milestones at both the corporate and community level. To do this, municipalities must develop Corporate and Community Action Plans to addresses GHG emissions within municipal operations and the greater community. The Region of Waterloo, City of Cambridge, City of Kitchener, and City of Waterloo are participating members of the PCP program, each at various stages of completing Corporate Milestones 1 to 3.

The assessment of community GHG emission levels and development of subsequent reduction initiatives represents a great opportunity for municipalities and stakeholders to leverage resources and work together towards a common goal. *ClimateActionWR* was assembled through the leadership of two non-profit organizations, Sustainable Waterloo Region and REEP Green Solutions, along with the Region of Waterloo. Through partnership with *ClimateActionWR,* local municipalities who are participating members of the PCP program will together complete Community Milestones 1 to 3.

This report provides an overview of the process and results of the community GHG emissions inventory for 2010 as well as a 10-year emissions forecast (*i.e.,* 2020) for Waterloo Region. This inventory and forecast will fulfill the requirements of Community Milestone 1of the PCP program for locally participating municipalities. Furthermore, it will provide a solid foundation on which to develop real, achievable GHG reduction targets and a local action plan for Waterloo Region as part of Milestones 2 and 3. The widespread benefits of these achievements are briefly outlined in the Context section of this document.

CONTEXT

Impacts to the global climate are now well documented to include both naturally occurring and human-caused emissions of carbon dioxide and other greenhouse gases.[3] These impacts include increased intensity and frequency of extreme weather events such as heat waves, intense rainfall and wind gusts, as well as significant seasonal climate variability.[4] In addition to the global scale of this impact on ecological systems, changes in our climate can affect the economy, energy security, quality of life and health and safety of communities within North America including Waterloo Region. [5]

Although climate change affects our whole planet, communities and municipalities have a unique and important role to play in reducing our contribution to the problem. In fact, over 1000 municipalities around the world are demonstrating that community-scale action is where real measurable achievements can be realized while maintaining or improving quality of life.[6]

Communities, through the activities of residents and businesses, are a considerable cumulative source of GHG emissions at a global scale. Additionally, municipal governments have influence over policy and community programming that affects local energy use and GHG emissions through factors such as building construction and energy efficiency, local land use, transportation patterns, and economic development. Through these various roles and services provided by local government, municipalities are said to have direct control or indirect influence of approximately 44% of GHG emissions in Canada.[7]

Waterloo Region is a vital and prosperous area in southern Ontario, about 100 kilometres west of Toronto. The region is made up of three urban municipalities, Cambridge, Kitchener, and Waterloo, and four rural townships, North Dumfries, Wellesley, Wilmot, and Woolwich. With a combined population of 541,900 at year-end 2010, Waterloo Region is one of the fastest-growing areas in Ontario and is expected to reach a total population of 729,000 by 2031.[8]

The Region and its area municipalities (here now referred to as "local governments") have direct control of emission sources within their own corporate operations. They

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[3] Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html

4 Lemmen, D.S.,Warren, F.J., Lacroix, J., and Bush, E., editors (2008), From Impacts to Adaptation: Canada in a Changing Climate 2007; Government of Canada (Natural Resources Canada), Ottawa, ON.

5 Chiotti, Q. and B. Lavender, 2007, From Impacts to Adaptation: Canada in a Changing Climate, Chapter 6 Ontario, Natural Resources Canada, Ottawa: 227-274.

6 ICLEI, Cities for Climate Protection Campaign, Accessed May, 7, 2012 from http://iclei.org/index.php?id=10829.

[7] Federation of Canadian Municipalities. (2009). Act locally: The municipal role in fighting climate change, prepared by EnviroEconomics. Ottawa, ON: Federation of Canadian Municipalities.

8 Population data: Region of Waterloo, Planning, Housing and Community Services, 2012; projected population is based on the Province of Ontario's 'Places to Grow' projections for Waterloo Region to 2031.

can also indirectly influence emission sources from the community through the wide variety of services that they provide. Municipalities can collectively be a catalyst for change in their communities by working with local stakeholders to gain their input and involvement on reduction activities. Figure 2 illustrates this concept of how local governments can have direct and indirect influence over different spheres of operations, services and systems.

Figure 2: Local Government "Spheres of Influence"

- The centre sphere represents the most direct control local governments can have, which are factors within their own internal operations (*e.g.,* government buildings, vehicle fleets, purchasing).

- The middle sphere represents areas in which local governments have indirect influence, through the development of bylaws, programs, pricing structures, etc. (*e.g.,* water treatment and distribution, wastewater treatment, solid waste collection, street and traffic lighting, public transit, and land use planning).

- The outer sphere shows areas that are outside the jurisdiction of local governments where local goverment may seek to influence change via partnerships (*e.g.,* energy supply, which has traditionally been provided by regulated power generators or fuel suppliers external to the community).

It is important to draw connections with social, environmental and economic factors when accounting for current GHG emission sources and considering opportunities for their reduction. Often, actions taken to conserve energy and use it more efficiently can also save money. There are economic benefits from more efficient use of infrastructure related to these civic services (e.g. water facilities, roads, landfills). Additionally, increased economic opportunities may be available to communities through developing local energy supply and infrastructure. There are many examples of such "co-benefits", where the reduction of GHG emissions generates other economic, social and environmental benefits for a community, including:

- **Energy Security** - Actions to encourage energy efficiency and conservation, and to promote the use of renewable energy may assist local governments in developing energy resilient communities, in addition to reducing GHG emissions. Wise use of energy in communities also contributes to energy security at larger provincial and national scales.

- **Sustainable Transportation** - Increasing the number of trips we take by transit, bike or by walking instead of by car not only reduces GHG emissions, but also helps us to live healthy, active lifestyles and decreases local air pollution.

- **Home Energy Savings** - Reducing the amount of energy used in your home can save you money on heating and electricity bills while also reducing GHG emissions.

- **Waste Diversion** - Using the green bin for organic waste diversion means there is less waste going to the landfill which extends the useful life of the landfill and reduces the GHG emissions that are produced there.

- **Water Conservation -** For every 100 million litres of drinking water pumped and treated in Waterloo Region, about 10.7 tonnes of CO_2e are emitted through electricity consumption within water service infrastructure. Therefore, as our community has reduced its annual consumption of water by 5 billion litres between 2000 and 2011, this has also helped to avoid the release of approximately 535 tonnes of CO_2e emissions.

When the connections are made between local activities, emission sources and the resulting co-benefits, we can begin to see how GHG reductions are closely related to improvements in our local quality of life.

2.0 METHODS

This section provides a brief summary of methods used in the development of the inventory and forecast. Detailed discussion of the methods, assumptions and data sources used for this study have been documented in a separate technical data management manual.[9]

INVENTORY PROTOCOL

The methods used to develop the community GHG inventory align with the PCP program practices and guidance.[10] To calculate GHG emissions in the identified sectors, the International Local Government GHG Emissions Analysis Protocol (IEAP) was used as the preferred inventory guidance document for municipalities participating in the PCP program.[11] This protocol recommends that a single year be used to quantify the baseline emissions for a community. The year 2010 was chosen for this community GHG inventory as the most complete and recent year with available data and as such will be used as a base year for monitoring progress in future years.

The protocol also defines three classifications or "scopes" used to categorize community-scale GHG emissions sources. Differentiating between emission scopes by ownership reduces the potential of multiple parties reporting the same emissions (*i.e.,* double-counting). Emissions classified by IEAP as Scopes 1 and 2 are mandatory in GHG emissions inventory reporting under the PCP program. The GHG emissions categories, by scope, are presented in Table 1.

Table 1: GHG Emissions Sources by Scope

Scope	Community Inventory
Scope 1 (Mandatory)	All direct GHG emissions. (*e.g.,* fuel for heating and local transportation)
Scope 2 (Mandatory)	Indirect GHG emissions from consumption of purchased electricity, heat, or steam.
Scope 3 (Optional)	Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities not originating within the community e.g. train, airline traffic,

Calculating a community GHG emissions profile can be complicated due to the variety of activities occurring in the community. GHG emissions inventories need to accurately reflect the activities within the community. At the same time, it is important

[9] **Manual is available by request through the contacts listed at the end of this report.**
10 Developing Inventories for Greenhouse Gas Emissions and Energy Consumption http://www.sustainablecommunities.fcm.ca/files/Capacity_Building_-_PCP/pcp-ismd-pub-en.pdf
11 ICLEI. International Local Government Greenhouse Gas Emissions Analysis Protocol (IEAP). Accessed May 2012 from http://www.iclei.org/index.php?id=ghgprotocol

that the analysis conforms to international standards for GHG reporting to ensure consistency and comparability with other communities.

Table 2 summarizes the sectors in which data was compiled and reported for the Region's Community GHG emissions inventory and the sources of GHG emissions associated with each sector.

Table 2: GHG Emissions Inventory Reporting Sectors

Sector	Emission Sources	Scope
Residential Buildings	• Fuel consumption from heating • Electricity use	Scope 1 Scope 2
Industrial, Commercial and Institutional Buildings (ICI)	• Fuel consumption from heating and processes • Electricity use	Scope 1 Scope 2
Transportation	• Fuel consumption from personal vehicles, business vehicles, trucks and buses	Scope 1
Agriculture	• Methane from livestock and manure management practices	Scope 1
Community Waste	• Methane from landfill waste decomposition	Scope 1

There are additional sources of GHGs which are deemed to be optional by the PCP for inclusion in community-scale inventories, including land use change, off-road vehicles and equipment, watercraft, construction equipment, landscaping equipment, refrigerant leakage, heavy industrial use of coal and industrial fuel, as well as air and rail transport. These sources were investigated as part of this community inventory; however, they were ultimately not included due to:

- The absence or difficulty in obtaining data required to undertake emission calculations;
- The uncertainty associated with the accuracy, reliability, and reproducibility of the data, if available;
- Controversial issues surrounding estimation techniques (*i.e.,* discrepancy in estimation methods regarding carbon sink/source from the Land Use and Land Use Change and Forestry sector);
- Sources were anticipated to represent a small or insignificant portion of the total GHG emissions;
- Emission calculations tend to be overly complex and not commonly included in community GHG inventories; and,
- The community itself has little control over these GHG emission sources thereby making it difficult or impossible to implement reduction opportunities.

The decision-making process regarding which sources were included in the final inventory is detailed in the *Inventory Data Management Manual* (IDMM)[12]. These

[12] **Manual is available by request through the contacts listed at the end of this report.**

sources, as discussed in the IDMM, could be considered for inclusion in future iterations of the inventory should, for example, data be more readily available or methodologies be better defined in the future.

To simplify reporting, GHG emissions are normalized and reported as metric tonnes of carbon dioxide equivalents (tonnes CO_2e). CO_2e represents the sum of individual GHGs weighted to represent the atmospheric effects of CO_2 relative to corresponding Global Warming Potentials (GWP) for each GHG. GWP is a measure of the warming effect that a particular GHG will have on the atmosphere relative to the impact of CO_2 (which is the most abundant GHG by volume). Table 3 provides the GHGs included in this report and their respective GWPs.[13]

Table 3: Global Warming Potential (100 year) of Greenhouse Gases

Greenhouse Gas	Global Warming Potential (100 year)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous Oxide (N_2O)	310

It should be noted that although there are other GHGs with much greater GWP these GHG emissions are not present in the reporting sectors for this community inventory due to their limited use and difficulty to account for with actual data.

GHG emissions from a source are calculated using the appropriate GWP in order to estimate CO_2e emissions. The resulting emissions (by source) are summed to calculate the total tonnes of CO_2e emitted for the 2010 base year. The spreadsheet tool provided by the PCP program was adapted to this community's needs in order to better reflect estimated GHG emissions for Waterloo Region.[14]

EMISSION FACTORS

Emissions were calculated using emission intensity values (or emission factors), which specify the amount of CO_2e produced per unit of GHG-producing activity. The emissions factor is then multiplied by the total amount of GHG-producing activity to determine the total amount of CO_2e produced as shown in the following equation.

*CO_2e (tonnes) = Activity (Unit) * Emission Factor (tonnes of CO_2e/Unit)*

[13] Intergovernmental Panel on Climate Change, Second Assessment Report, Climate Change 1995 http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf

[14] GHG Inventory Quantification Support Spreadsheet: http://www.fcm.ca/Documents/tools/PCP/Inventory_Quantification_Support_Spreadsheet_EN.xls

Emission factors can vary by region, from year to year, and are dependent on variables such as the annual average mix of fuel types used to produce electricity. The PCP spreadsheet has been updated to reflect the provincial electricity intensity values for Ontario released in the most recent version of Environment Canada's Annual National Inventory Report.[15] Where regional emission factors were unavailable, provincial factors are used. National emission factors are also used in cases where neither regional nor provincial values are available.

DATA COLLECTION

Table 4 summarizes the data sources for the 2010 Waterloo Region community inventory.

Table 4: Community Inventory Data Collection Sources

Sector	Data Source	Notes
Residential - Electricity	Cambridge and North Dumfries Hydro; Kitchener-Wilmot Hydro; Waterloo North Hydro	Electricity usage based on 2010 records.
Residential - Fuel Consumption	Union Gas; Kitchener Utilities	Natural gas usage based on 2010 records. Fuel oil and propane consumption estimated using electricity consumption rates.
Industrial, Commercial and Institutional Buildings (ICI)- Electricity	Cambridge and North Dumfries Hydro; Kitchener-Wilmot Hydro; Waterloo North Hydro	Electricity usage based on 2010 records.
ICI - Fuel Consumption	Union Gas; Kitchener Utilities	Natural gas usage based on 2010 records. Fuel oil and propane consumption was estimated using electricity consumption rates.
Transportation	Kent Marketing	Fuel sales data. Township fuel data were estimated based on per capita metric. Excludes commercial fuel sales.
Agriculture	Statistics Canada Agricultural Community Profiles	Livestock counts based on most recent statistics at the time of inventory preparation (2006). [16]
Waste	Waste Management Division at the Regional Municipality of Waterloo	Waste tonnage based on 2010 scale records at the Waterloo and Cambridge Landfills and landfill gas collection efficiencies.

[15] Environment Canada National Inventory Report, 1990-2010: Greenhouse Gas Sources and Sinks in Canada: http://ec.gc.ca/ges-ghg/default.asp?lang=En&n=83A34A7A-1

[16] Statistics Canada. 2006 Agriculture community Profiles: http://www12.statcan.gc.ca/census-recensement/2006/index-eng.cfm

3.0 COMMUNITY INVENTORY AND FORECAST

The following sections discuss the results of the community GHG inventory for Waterloo Region for the 2010 base year and 10-year forecasting.

INVENTORY SUMMARY

A community-wide GHG emissions inventory for Waterloo Region was compiled for the 2010 base year. Community-wide GHG emissions for Waterloo Region are estimated to be 3,613,870 tonnes CO_2e for 2010 activities. This is equivalent to 6.67 tonnes CO_2e per capita based on a population of 541,900 in the Waterloo Region at year-end 2010. Table 5 summarizes the 2010 GHG emissions by sector. Figure 3 illustrates the sector breakdown of GHG emissions for Waterloo Region in 2010.

Table 5: Waterloo Community GHG Emissions by Sector (2010)

Sector	**Absolute GHG Emissions** (tonnes CO_2e)
Residential	782,459
Industrial, Commercial and Institutional Buildings (ICI)	1,152,389
Transportation	1,467,858
Agriculture	167,053
Community Waste	44,112
TOTAL	**3,613,870**

There may be an under emphasis of certain emissions sources within these GHG values due to limited availability of data at the time of analysis and report preparation. For example, off-road vehicles and equipment was identified above as an additional source that was not included in the emissions inventory at this time. Future inclusion of this source would increase the total tonnes CO_2e from the Agriculture sector within Waterloo Region. Progress reports developed in the future can incorporate improvements to the emissions inventory to best reflect local activities.

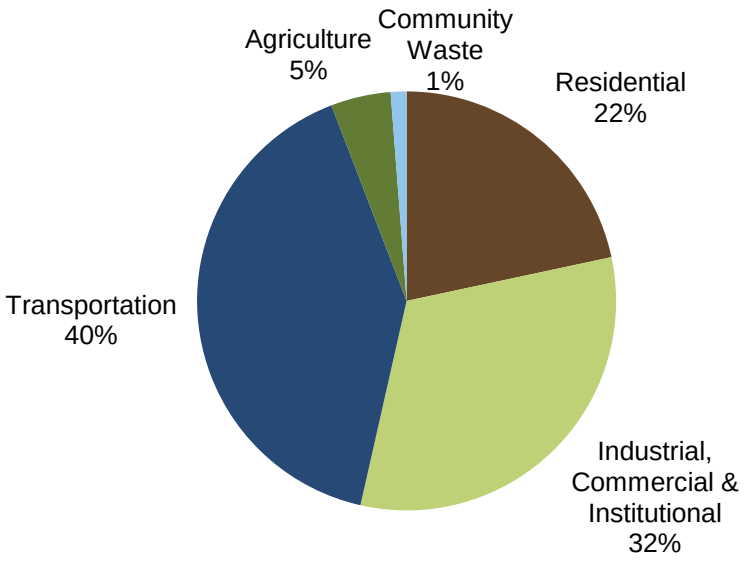

Figure 3: Waterloo Community GHG Emissions by Sector (2010)

Another common method of characterizing GHG emissions is to represent them by energy consumption. This type of representation may be useful in determining which fuels make the greatest contribution to the overall community emissions. A summary of the energy consumption and GHG emissions by source is presented in Table 6.

Table 6: Waterloo Region Energy Consumption and GHG Emissions by Source (2010)

Source	Energy Consumption	GHG Emissions (tonnes CO_2e)
Natural Gas	550,976,113 m^3	1,041,690
Electricity	4,663,435,273 kWh	699,515
Gasoline	582,978,973 L	45,644
Diesel	16,712,725 L	447,620
Fuel Oil	48,095,318 L	129,857
Propane	41,670,745 L	63,840
TOTAL		**3,402,706***

** The emissions included in this table can be attributed to energy consumption from the Residential, ICI and Transportation sectors and do not include emissions from the Agriculture or Community Waste sectors.*

The GHG emissions attributed to electricity, natural gas, fuel oil, diesel, propane, and gasoline consumption in the community are presented in Figure 4. These emissions from energy sources represent more than 95% of the total CO_2e produced in Waterloo Region, thus emphasizing the importance of supporting activities through the local action plan that reduce energy use or provide an alternate energy supply.

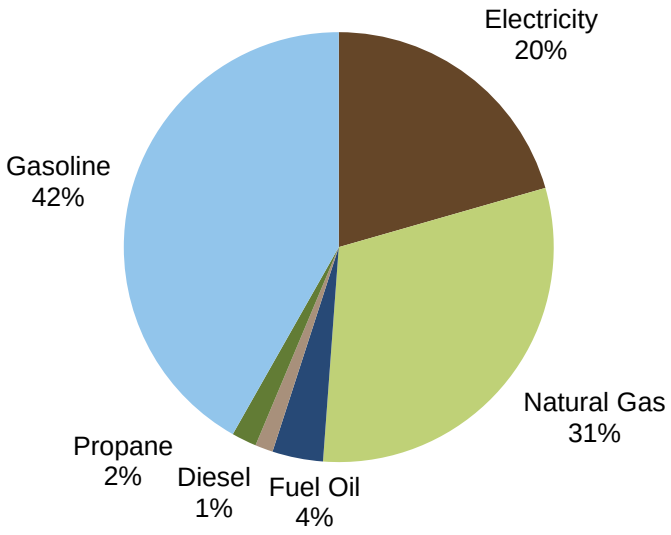

Figure 4: Community GHG Emissions by Energy Source (2010)

This inventory is an important first step towards setting a baseline measurement from which the Waterloo Region community can monitor its progress on emission reductions over time. It is common to question how we compare with other municipalities in terms our total GHG emissions. Unfortunately, it is very difficult to compare "apples to apples" when it comes to community GHG inventories because the methods for assessing these inventories vary based on the individual set of circumstances that apply to different communities (*e.g.*, emission sources, exclusions, base years, etc). Inventories are also prepared at the provincial and national level; however these figures do not provide direct comparison with Waterloo Region emissions either as these inventories takes into account many sources which are not part of Waterloo Region's community inventory (*e.g.* air, rail and marine transport, etc.). Given the importance of monitoring progress, the most appropriate measure of comparison moving forward will be to assess progress against our region's 2010 baseline inventory over time.

FORECAST SUMMARY

A business as usual (BAU) GHG forecast was developed for the period from 2010 to 2020. This forecast was based on a population growth of 18.4% during this time and represents a scenario where no new actions are implemented which reduce GHG emissions (*i.e.,* per capita GHG emissions continue to grow at current rates).[17] Under this scenario, emissions are expected to grow by 17.5% from 3,613,870 tonnes CO_2e to 4,239,187 tonnes CO_2e by 2020.[18]

Further to the *BAU forecast*, an *enhanced BAU forecast* was also developed for Waterloo Region. This *enhanced BAU forecast* goes beyond population growth to also consider planned changes to electrical grid supply[19] and increased vehicle efficiency[20] expected as a result of existing provincial policy and federal regulations. These efficiency improvements that were assumed to create this forecast include:

- A 67% reduction in emissions from purchased grid electricity by 2020 due to the reduction of coal usage in favor of natural gas and other energy sources (*i.e.,* electrical emission factor of 0.049 kg/kWh CO_2e in 2020 versus 0.15 kg/kWh CO_2e in 2010); and,
- A 7.5% reduction in emissions from light-duty vehicles (*i.e.,* cars and light trucks using all fuel types) due to regulated improvements in vehicle fuel efficiencies.

Under these assumptions, the enhanced BAU Community emissions in Waterloo Region are expected to grow by 1.1% from 3,613,870 tonnes CO_2e to 3,653,403 tonnes CO_2e in 2020. Figure 5 graphically illustrates the difference between the BAU and the enhanced BAU forecasts.

[17] Population growth data were based on 'Places to Grow' projections for Waterloo Region to 2031 (Region of Waterloo, Planning, Housing and Community Services, 2012)
[18] The forecasted emission growth is slightly less than the population growth as no change in emissions from Agricultural emissions were assumed for this simplified forecast.
[19] Ontario's Long-Term Energy Plan forecast for 2030 (http://www.mei.gov.on.ca/en/pdf/MEI_LTEP_en.pdf)
[20] Government of Canada: http://www.gazette.gc.ca/rp-pr/p2/2010/2010-10-13/html/sor-dors201-eng.html#REF6

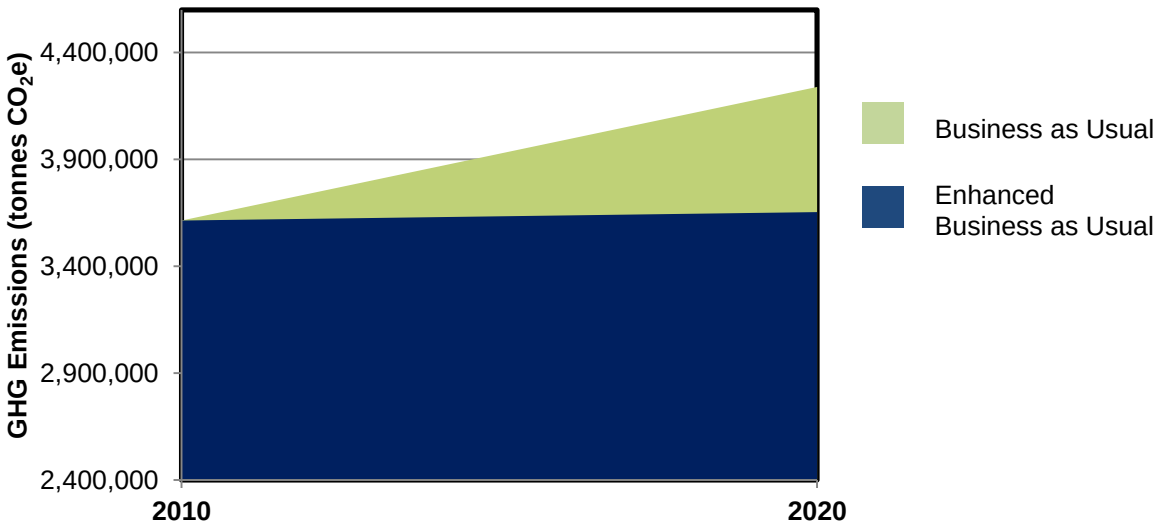

Figure 5: BAU and Enhanced BAU Forecast (2010 – 2020)

A more detailed view of the forecasts can be informative on a community sector basis. Figure 6 illustrates the differences between the GHG emissions for the 2010 base year, BAU, and enhanced BAU forecasts by community sector.

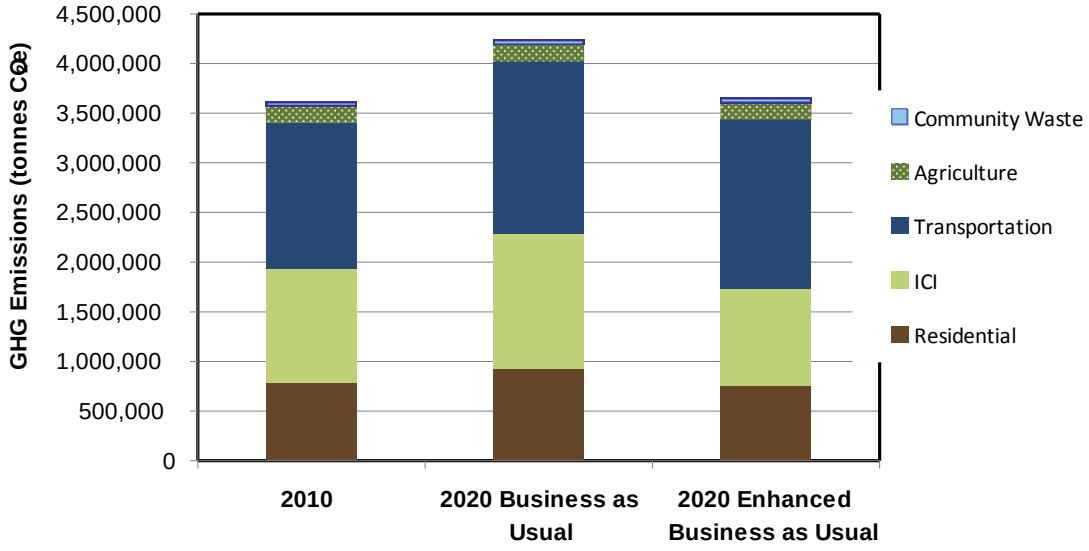

Figure 6: 2010 Baseline, BAU and Enhanced BAU Forecast by Sector

Based on this information, the anticipated reduction in the electricity emission factor offsets much of the forecasted increase in GHG emissions from the anticipated growth from the residential and ICI sectors. This will help Waterloo Region establish a realistic yet ambitious community GHG reduction target in the near future.

4.0 NEXT STEPS

The next step for *ClimateActionWR* is to set a GHG emissions reduction target (Milestone 2) and to create a local action plan (Milestone 3) with specific initiatives that the community wants to implement to help reduce GHG emissions.

Local action planning will require close collaboration and strong communication among local levels of government, non-profit organizations, the business sector and the broader community. Results from other communities indicates that a coordinated approach is the most effective way to develop goals, actions and implementation strategies to realize reductions in energy use and GHG emissions. These measures will help to support Waterloo Region's future economic development and prosperity while maintaining a clean and healthy environment and enhancing quality of life.

Community engagement is an important part of the local action planning process, as collective action is essential to reduce community energy consumption and GHG emissions at a community scale. Therefore, the final reduction strategy should only include those actions that participating stakeholders support and commit to implement.

Prioritizing which actions to undertake can be challenging for communities as many factors must be considered including cost, impact on reducing emissions, ease of implementation, availability of technology and public support. These criteria, among others, should be considered when developing implementation strategies during the local action planning process.

It is also helpful to consider what other communities have done to reduce energy consumption and GHG emissions, which can give some guidance to planning within our region. Case studies and best practices are abundant and come from a variety of sources, including:

- an annual report from the PCP program on the impact that PCP members are having on energy and GHG emissions.[21]

ClimateActionWR has received generous financial and in-kind support for the completion of the inventory and development of the action plan through contributions from the Ontario Trillium Foundation, The Kitchener and Waterloo Community Foundation, the FCM Green Municipal Fund as well as the *ClimateActionWR* participating organizations listed at the front of this report. Beyond development of

[21] PCP, Demonstrating Results: Municipal Initiatives for Reducing GHGs, National Measures Report 2009: http://www.sustainablecommunities.fcm.ca/files/Capacity_Building_-_PCP/Demonstrating-result-reducing-GHGs_EN.pdf

the plan, for the future implementation of local reduction activities, further financial support is available through sources such as the FCM Green Municipal Fund. In addition to providing grants to support sustainability planning and local action planning efforts (as has been received to date), this fund may also provide low-interest loans to support capital projects that reduce energy and GHG emissions.[22]

With baseline inventories and forecasts completed, Waterloo Region is well-positioned to take their energy and emission reduction planning efforts to the next level. Strong collaboration and two-way communication among local stakeholders will be vital as we move forward as a community to develop a local action plan that will produce measureable emissions reductions and ultimately contribute to the economic, social and environmental prosperity of Waterloo Region.

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[22] FCM Green Municipal Fund: http://www.sustainablecommunities.fcm.ca/GMF/