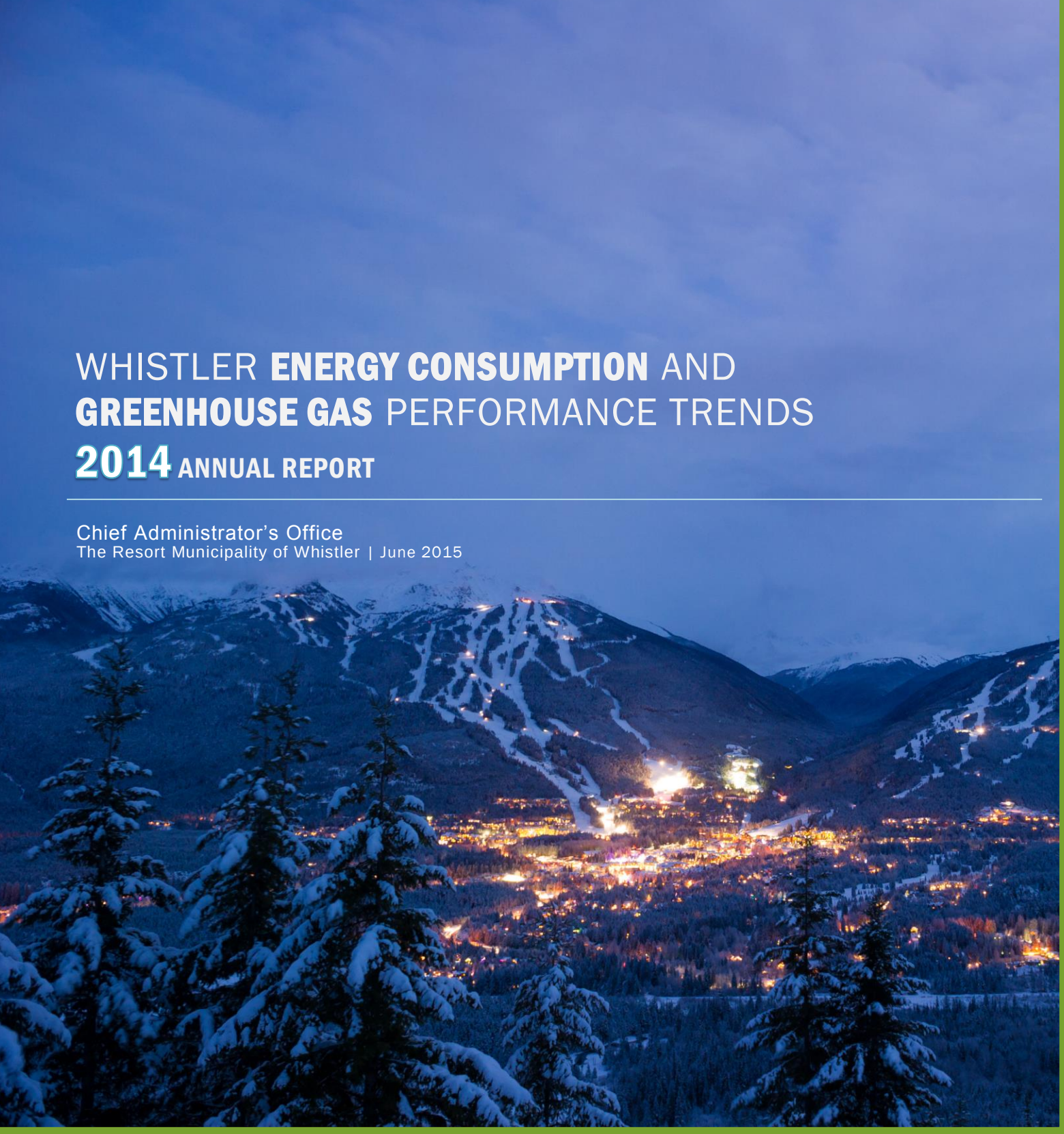
# WHISTLER **ENERGY CONSUMPTION** AND **GREENHOUSE GAS** PERFORMANCE TRENDS

## 2014 ANNUAL REPORT

Chief Administrator's Office
The Resort Municipality of Whistler | June 2015



THE PREMIER MOUNTAIN RESORT COMMUNITY
MOVING TOWARD A SUSTAINABLE FUTURE

WHISTLER

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# 1 EXECUTIVE SUMMARY

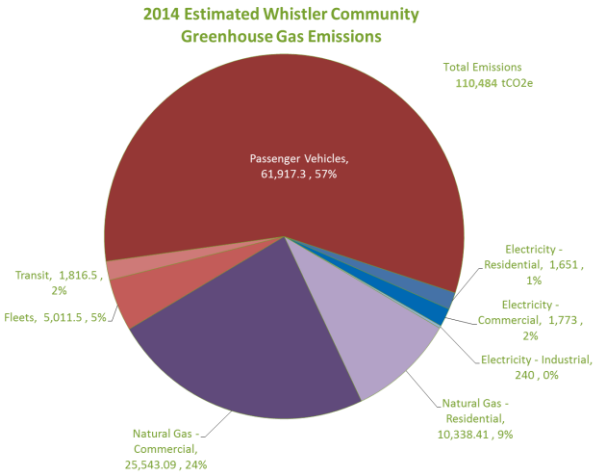
As a tourism-focused mountain town, Whistler has long been concerned with the issue of climate change. The resort community has a special dependence on stable snow and weather patterns, making us very aware of our shared responsibility to manage greenhouse gas emissions, and even more sensitive to the reality of the potential impacts if we do not.

Since 2010, the primary purpose of this Annual Report has been to provide a summary of Whistler's energy and greenhouse gas (GHG) emissions performance for the previous year. The secondary purpose of this report includes a summary of the energy and emissions performance for the RMOW's internal corporate operations. This ongoing performance data forms the foundation for informed energy cost management and ongoing climate change mitigation efforts.

## COMMUNITY-WIDE PERFORMANCE

**2014 COMMUNITY GHG EMISSIONS:** Greenhouse gas emissions in Whistler are made up of emissions from stationary sources (buildings and infrastructure systems), mobile sources (passenger vehicles, fleets, and transit), and emissions from landfilled wastes. Passenger vehicle transportation within Resort Municipality of Whistler (RMOW) boundaries continues to represent the largest share of the overall emission footprint at 57%, followed by natural gas consumption at 33% (primarily used for space and water heating).

The community of Whistler has committed to community-level greenhouse gas reductions of: 33% by 2020; 80% by 2050; and 90% by 2060 (each versus 2007 levels). From 2008 until 2012, the community managed to remain on pace towards these targets – **however the 2013 and 2014 community results suggest that Whistler is no longer be on pace to meet the community's 2020 target GHG reduction level.**

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Total community GHG emissions in 2014 were estimated to be **110,500 tCO2e**[1]. The 2014 level is approximately 17% lower than 2007 levels and 23% lower than 2000, but **1% above last year's level** and 46% higher than 1990 levels. It is worth noting that the primary driver for the GHG reductions over the last few years has been the decreasing GHG intensity of BC Hydro electricity – without this decrease in GHGs/kWh, Whistler's total emission level would be approximately 6,000 tCO2e higher than presented within this report.

From a GHG emissions intensity perspective, estimated 2014 GHG emissions per population equivalent[2] decreased year over year by 6% to 3.8 tCO2e/PE. This intensity is 26% lower than 2007 levels, and is the lowest annual per capita measure since detailed record keeping began in 2000.

Looking ahead, the key challenge for our community will be maintaining the rate of reduction achieved over the first five years of our commitment period as further 'one-time changes' (such as the piped propane to natural gas conversion and the landfill cap and capture projects) are, for the most part, no longer readily available. To remain on target toward our reduction goals, additional, incremental

[1] **Carbon dioxide equivalent** (or **$CO_2e$**) is the most common unit of measure for quantifying the amount of 'climate change impact' a given type and amount of greenhouse gas may cause, using the functionally equivalent amount or concentration of carbon dioxide ($CO_2$) as the reference.
[2] The nature of Whistler being a tourism community means the number of people in Whistler on any given day is generally far greater than the population counts provided Canada Census or BC Statistics estimates. The total Population Equivalent is an estimate of the total number of people in Whistler on an average annualized basis. The indicator is often used in 'per capita' measures to normalize the data and make it comparable to other communities. More detail on the composition of the Population Equivalent can be found at: http://www.whistler2020.ca/whistler/site/genericPage.acds?instanceid=2985334&context=2985223

reductions of ~4,000 tonnes of CO2e will be required each and every year for the remainder of the decade (or approx. a 4% reduction each year).

From an overall perspective, Whistler still needs to reduce annual emissions by 21,400 tCO2e by the end of the 2020 year to meet its target – a further reduction of approximately one fifth of our current annual emission levels.

**2014 COMMUNITY ENERGY CONSUMPTION & EXPENDITURES:** Community energy consumption since the base commitment year of 2007 did not follow the same downward trajectory as community GHG emissions initially. In fact, the three years from 2010 to 2012 were the three highest years of estimated energy consumption ever recorded in Whistler. However, in the past five years, community energy consumption has been steadily decreasing at a rate of approximately 2% each year.

It is expected that future GHG reductions will need to be premised primarily on *actual energy conservation* and *increased efficiency* rather than *one-time technological changes in community systems*.

Total community energy consumption in 2014 was estimated to be 3.01 million GJ (down 3.5% from 2007 levels, and down 2.1% year over year, but approximately 98% higher than 1990).

Electricity is the most prevalent type of energy consumed in Whistler, at 45% of the total consumption, followed by vehicle fuels (~31%), and natural gas at 23% of total consumption.

The estimated annual collective energy expenditure within Whistler has increased by more than $34 million since 2000 ($83 million vs. $49 million). Energy expenditures for residential buildings now total approximately $20 million/year, with commercial building expenditures totaling approximately $24 million on an annual basis (passenger vehicles and fleets make up the remainder). Total passenger vehicle estimated expenditures increased to an estimated $35M/year, which is an increase of over $7.7M/year compared to 2007 levels.

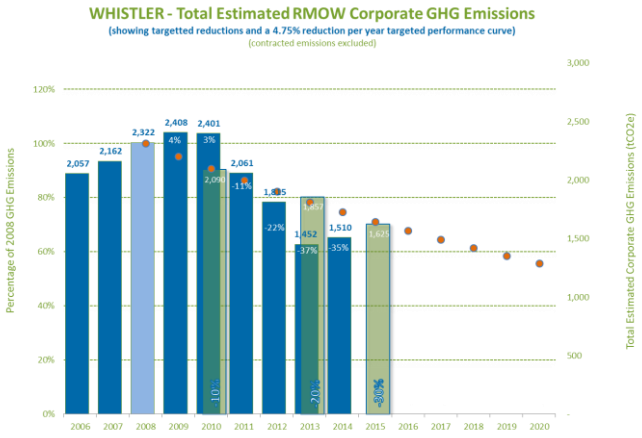
Finally, with the exception of recent changes to piped natural gas in Whistler, increases in energy rates continue to outpace the rate of inflation so it is expected that the combined community expenditure will continue to rise faster than our collective ability to pay for it. This fact underscores the importance of increasing community-wide energy conservation and energy efficiency.

## 2014 CORPORATE OPERATIONS PERFORMANCE

**2014 CORPORATE GHG EMISSIONS:** The RMOW's Carbon Neutral Operations Plan sets the targets for total corporate GHG reductions as follows: 10% by 2010; 20% by 2013; and 30% by 2015 – all relative to 2008 levels.

Total corporate GHG emissions in 2014 were 1,510 tCO2e. This level of emissions is 4% higher than 2013 levels, but it is still approximately 35% below the 2008 benchmark (the reference year for RMOW target setting).

**As demonstrated in the chart to the right, corporate emissions are currently below the 2014 annual GHG emission levels targeted in the 2009 Carbon Neutral Operations Plan. However, if emissions continue to increase year over year, it is possible that the RMOW will fail to meet future emissions reduction targets.**

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On a division-by-division basis, the relative emissions footprint of corporate operations is as follows: (46%) Infrastructure Services — which includes roads crews, solid waste systems, the water utility, and the sewer utility; (29%) Resort Experience (REX) —

which includes village maintenance operations, horticulture, turf, and irrigation crews, parks and trails, as well as facility construction and maintenance operations; and (25%) Corporate and Community Services — including bylaw, fire, Meadow Park Sports Centre, and other recreation programs.

GHG emissions across corporate operations are produced primarily from the combustion of mobile fuels (gasoline and diesels) at 47%, followed by natural gas at 43%, and electricity at 10%.

**Over the last few years, the primary source of GHG emission reductions across municipal operations has been attributed to a decrease in BC Hydro's emission factor, as well as natural gas reductions at the WWTP and Meadow Park Sports Centre (MPSC). Despite an a small increase year over year, 2014 MPSC emission levels were still 430 tCO2e lower than 2008 benchmark levels.**

**2014 Corporate Energy Consumption & Expenditures:** Total corporate energy consumption increased in 2014 by 3% year over year to 74,000 GJ/year. Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 69% of the total consumption, followed by natural gas (17%), and mobile fuels (14%).

While 2014 Resort Experience's energy consumption decreased by 5% year over year, Corporate and Community Services and Infrastructure Services both saw year over year increases of energy consumption, 3% and 8% respectively. Currently, Infrastructure Services' consumption level is 13% higher than 2008 base year levels. However, Resort Experience's consumption levels have decreased to 7% below base year levels, and Corporate and Community Services continue to see the largest consumption decrease, currently sitting at 31% less energy use compared to 2008.

Overall, 2014 energy expenditures across municipal operations increased by 8% to ~$1.78M (this was due to the combined influence of a 3% increase in consumption, and increases in the unit rates of various energy sources). Electricity consumption makes up the largest portion of corporate energy expenditures (~$1M/year), and expenses increased in all three of the major divisions: Corporate and Community Services' by 7%, Resort Experience's by 1%, and Infrastructure Services' by 13%.

## SUMMARY COMMENTS

The impact of changing climatic conditions – especially reliable snow patterns – has the potential to substantially impact Whistler's primary economic engine – tourism. Informed, strategic planning that considers and evaluates the impacts of the issues related to climate change and rising fuel costs can help to ensure that Whistler is best positioned to maintain its success into the future.

Accurate, detailed data is fundamental to these discussions; information such as that which is included in this report will continue to provide a strong basis for informed decision-making as our community measures its success, matures, evolves and thrives in the coming decades.

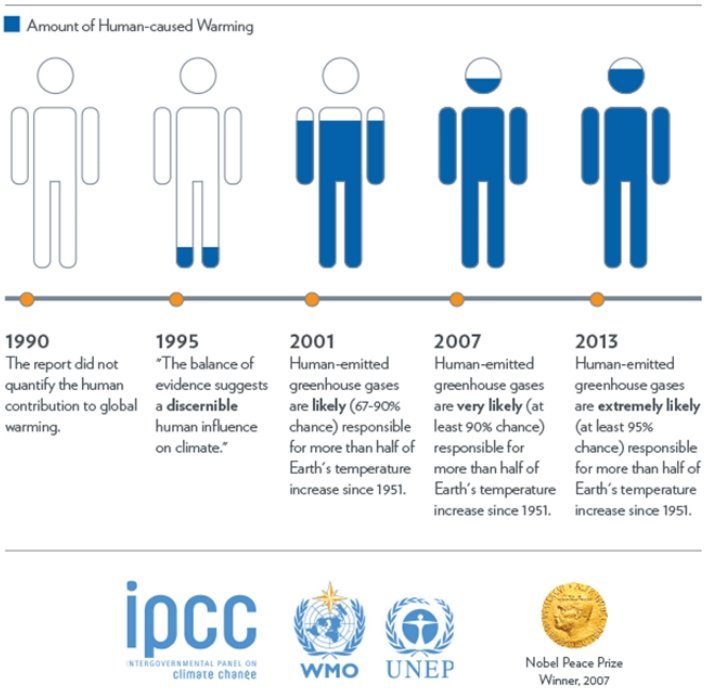
# 2 INTRODUCTION

**Whistler is not sustainable.** However, our Vision is to be the *Premier Mountain Resort as we move toward sustainability*. Implied in this vision is a journey — an understanding that it will take continued commitment to get to our intended destination. Whistler also understands that on this journey we will have to find a way to do things more efficiently.

As a mountain town, Whistler has long been concerned with the issue of climate change. Our resort community has a special dependence on stable snow and weather patterns, making us very aware of our shared responsibility to manage greenhouse gas emissions, and even more sensitive to the reality of the potential impacts if we do not. Throughout our community, both private and public organizations understand that the integrity of functional natural systems is absolutely fundamental to the wellbeing of our community, and the viability of our economic engines.

Moreover, we now live in an era of **climate responsibility** and by extension this **requires climate action**; climate change is a certainty, as is human responsibility for it[3]. The IPCC concluded in 2013 that "human emitted greenhouse gases are extremely likely (at least 95% chance) responsible for more than half of Earth's temperature increase since 1951."

Reducing our greenhouse gas emissions is one of the most significant actions we can take as a community to take responsibility for our part in solving the climate crisis.




The primary purpose of this Annual Report is to provide a summary of Whistler's community-wide energy and greenhouse gas emissions performance over the past year (Section 0). The report includes detailed performance data, highlights key trends and insights, and benchmarks our performance against our Council-adopted targets. **It is the intent of this report to support and inform the strategic management of energy and climate-changing emissions across our community.**

The second part of this report (Section 4) includes a summary of the energy and emissions performance of the RMOW's internal corporate operations. Although corporate emissions represent less than 1.5% of the total community GHG emissions, RMOW staff have the greatest level of direct control over these corporate emissions, and as such, have the opportunity and responsibility to both lead by example, and demonstrate success.

This is the 4th Performance Report that has been produced at this level of detail (2010, 2011, and 2013 are available on whistler.ca).

[3] Climate Change 2013, The Physical Science Basis – Working Group 1 Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC, 2013. http://www.ipcc.ch/report/ar5/wg1/

## 2.1 BACKGROUND

Whistler is one of the few communities in BC that has a relatively long history of both setting emissions reductions targets and actively monitoring its GHG emissions footprint. This commitment is evident in our dedication to Integrated Community Sustainability Planning, long-term measurement and reporting of energy consumption and GHG emissions performance, the integration of energy and emission reduction goals into broader municipal policies and practices, and continued participation on provincial and national advisory committees.

### 2.1.1 Whistler2020: Our Community's Comprehensive Sustainability Plan

The Whistler community understands that sustainability is not just about the environment; that three concepts – ecological integrity, fiscal viability, and social justice – point to a larger and integrated strategy, and that these three concepts are not as strong in isolation as they are when considered together.

In 2005 the RMOW adopted Whistler2020, the community's comprehensive, long-term sustainability plan, as direction setting policy.

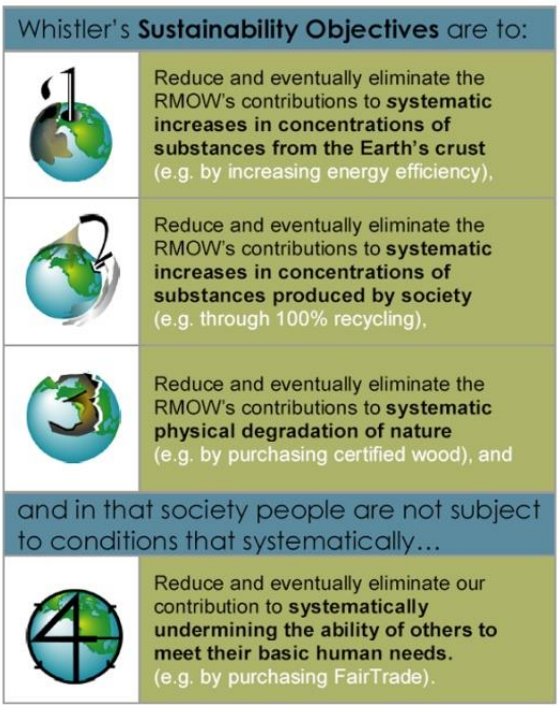
Whistler2020 is Whistler's Integrated Community Sustainability Plan, an expression of the community's vision as required by the Province of British Columbia. Whistler2020 is the product of thousands of voices across our resort community coming together to **articulate the vision of the resort community we aspire to be.**

The community vision articulated within Whistler2020 is organized around the following five priorities:

1. Enriching Community Life
2. Enhancing the Resort Experience
3. Ensuring Economic Viability
4. Protecting the Environment
5. Partnering for Success

Moreover, Whistler2020 imbeds and integrates four science-based Sustainability Objectives premised on the Natural Step principles (see box on the right) into the vision and the framework for making decisions. In this sense, these Sustainability Objectives act as a compass to help frame and guide decision-making and ongoing planning.

Working within the Whistler2020 framework, the community has aimed to steadily integrate the Sustainability Objectives broadly into all aspects of community planning and development strategies – from Energy and Transportation strategies, to Economic and Visitor Experience strategies. Through the consistent application of the four shared Sustainability Objectives, our community is striving to integrate climate change mitigation into all community policies and operational practices.




**Though climate change is viewed mainly as an environmental problem, it is much more than that.**

**Climate change extends far beyond a solely environmental perspective.**

### 2.1.2 Whistler's Community Energy Planning – A Brief History

Whistler committed to its first greenhouse gas emission reduction targets in 1997. In that year, Whistler Council endorsed the Kyoto Protocol target of having our community's emissions at 6% below 1990 levels by the year 2012. For municipal (corporate) emissions, Council also committed to being a part of the "20% Club", committing to reducing corporate emissions 20% below 1990 levels by 2012 — **two aspirations that the community of Whistler did not achieve**.

Following up on these commitments, the RMOW participated in the Federation of Canadian Municipalities' (FCM) Partners for Climate Protection (PCP) program. The PCP program was launched by FCM as an extension of ICLEI's (Local Governments for Sustainability) Cities for Climate Protection program in the United States. Partner cities become members in a network of municipalities that began working toward the achievement of the five management-based milestones of the program. The milestones were designed to create tools and processes that were easy to understand and implement, and also provide effective guidance for municipalities to take serious steps toward climate action.

To meet the commitments of the Partners for Climate Protection program process, the RMOW developed the first Integrated Energy, Air Quality, and Greenhouse Gas Management Plan in Canada in 2004.

#### FCM/ICELI Partners for Climate Protection

The five milestones of the Partners for Climate Protection program are:

1. Create a greenhouse gas emissions inventory and forecast;
2. Set an emissions reductions target;
3. Develop a local action plan;
4. Implement the local action plan or a set of activities; and
5. Monitor progress and report the results.

**In 2007, the Resort Municipality of Whistler became the first community in Canada to complete all five milestones for both community and corporate emissions.**

The recommended implementation scenario in the Integrated Energy Plan acknowledged that achieving our community target of 6% below 1990 levels would be very difficult to achieve by 2012. As such, the plan recommended a reductions scenario that would see Whistler's emissions at 9% below 2000 levels (but 22% above 1990 levels) by 2020. This was recommended in contrast to the forecasted *business as usual* (i.e. take no action) scenario that predicted Whistler community GHG emissions would rise to 92% above 1990 levels (47% above 2000) by the year 2020.

In September of 2007, at the Union of BC Municipalities (UBCM) conference in Vancouver, Whistler was one of original sixty-two[4] local governments in BC that signed on to the Province's voluntary BC Climate Action Charter. The Charter opens with the following statement, agreed to by all signatories, **"Scientific consensus has developed that increasing emissions of human caused greenhouse gases (GHG), including carbon dioxide, methane and other GHG emissions, that are released into the atmosphere are affecting the Earth's climate."[5]**

Currently approximately 180 BC communities have become signatories to the Charter. By signing, local governments agreed that:

5. In order to contribute to reducing GHG emissions:

   (a) Signatory Local Governments agree to develop strategies and take actions to achieve the following goals:

   (i) being carbon neutral in respect of their operations by 2012, recognizing that solid waste facilities regulated under the Environmental Management Act are not included in operations for the purposes of this Charter.

   **(ii) measuring and reporting on their community's GHG emissions profile; and**

   (iii) creating complete, compact, more energy efficient rural and urban communities(e.g. foster a built environment that supports a reduction in car dependency and energy use, establish policies and processes that support fast tracking of green development projects, adopt zoning practices that encourage land use patterns that increase density and reduce sprawl.)[6]

[4] The BC Climate Action Charter was eventually signed by more than 170 local governments across British Columbia.
[5] The British Columbia Climate Action Charter, Section 1
[6] The British Columbia Climate Action Charter. Section 5.

The charter is a voluntary agreement designed to bring local government support for the Province's broader overall climate action strategy of reducing emissions 33% (from 2007 levels) by 2020.

Enacted in 2008, Bill 27, *the Green Communities Act*, requires local governments to include (among other things) greenhouse gas emission targets, policies and actions in their Official Community Plans and Regional Growth Strategies.

In response to the *Green Communities Act*, the RMOW has integrated specific targets (discussed later in this report), policies, and actions within its Official Community Plan, and developed a Carbon Neutral Operations Plan.

Moving ahead, staff are in the process updating the Whistler Integrated Energy Plan. The **Community Energy and Climate Action Plan (CECAP)** project seeks to update the existing RMOW Integrated Energy, Air Quality and Greenhouse Gas Management Plan and set out strategic directions for mitigating Whistler's contribution to climate change. The project will also recommend adaptation strategies to prevent and minimize the likely impacts of 'locked-in' changes to future local climate regimes.

The current Integrated Energy Management Plan was completed in 2004 and is overdue for revision. Much has changed over the past 10 years, both in terms of infrastructure (for example, the community's conversion from propane to natural gas) as well as policy (in the form of the local OCP, the provincial Climate Action Charter, the Provincial Energy Plan, and, globally, the UN IPCC Reports). Furthermore, adaptation strategies aimed at preventing or minimizing anticipated negative impacts of climate change have become an increasingly critical component to climate action plans. Given these significant changes, our new Community Energy and Climate Action Plan must be updated to reflect this new context and its associated challenges and opportunities; the targeted completion date for the CECAP Q1 of 2016, with implementation to follow.

Building on the background and contextual elements presented in Section 2, Section 0 details how the community of Whistler is progressing toward our energy and emission reduction goals, while Section 4 presents similar performance data for RMOW corporate operations.

# 3 COMMUNITY PERFORMANCE

Since the year 2000, RMOW staff have tracked and compiled community energy consumption, energy expenditure and GHG emission data. At the community level, primary sources of data to support this inventory are accessed from local utilities (BC Hydro and FortisBC), as well as from local traffic counter data (both provincial and municipal) and annual RMOW waste and recycling performance tracking. Sections 3.1 and 3.2 of this report summarize the most current performance trends for 2014.

## 3.1 COMMUNITY GREENHOUSE GAS EMISSIONS

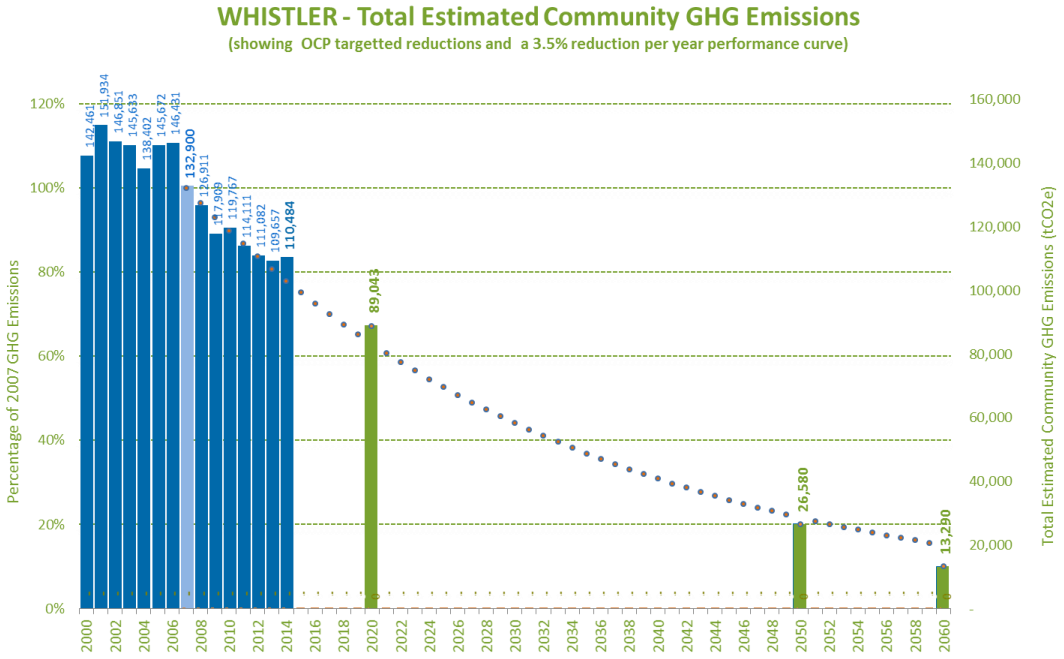
Section 3.1 deals specifically with GHG emissions at the community level, this section includes information on related Council-adopted targets, an overview of 2014 performance, as well as a short section on key associated insights and trends.

### 3.1.1 Community GHG Reduction Target

As previously stated, the *Provincial Green Communities Act* (Bill 27, 2008) requires all municipalities to adopt **targets**, policies and actions for the reduction of community-wide GHGs. As per the Whistler Official Community Plan, when compared to 2007 GHG emission levels, the community of Whistler has committed to community-level greenhouse gas reductions of: **33% by 2020, 80% by 2050[7]; and 90% by 2060**.

***33% by 2020***
***80% by 2050***
***90% by 2060***

If it is anticipated that the attainment of these targets is achieved at a consistent rate (or pace) over the coming decades, these targets translate into an **annual GHG reduction of approximately 3.5% per year**. The following chart illustrates the potential achievement of this 'target' over time. The chart presents the community targets (green bars), the historic community emissions levels (blue bars) as well as an indication of the annual reductions that would be required to achieve the prescribed targets using a constant rate of improvement model (orange dots).




[7] 33% by 2020 and 50% by 2050 are identical to the Provincial targets set by the Government of BC.

As demonstrated on the chart above, the community of Whistler managed to remain generally on pace towards our targets for the first five years of the target period. GHG emission reductions achieved during these five years (2008-2011) were impressive – averaging approximately 4,300 tonnes of reductions annually over the five year period.

It is worth noting however, that the primary sources of the reductions over the first four years were generally **one-time** only events:

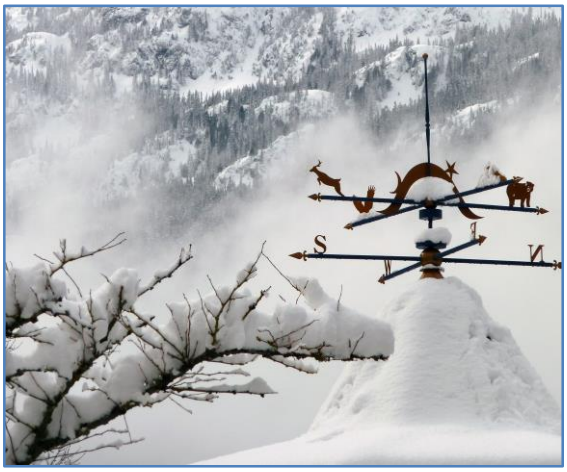
1) the changes to Whistler's waste management processes (i.e. landfill closure, landfill gas management, organics recycling and the switch to the advanced landfill management systems at Rabanco);
2) the switch from piped propane to natural gas across the community;
3) the changes brought about through the provincial low-carbon fuel standards for gasoline and diesel, and;
4) the decrease in GHG intensity (GHG/kWh) of BC Hydro supplied electricity.
5) the reduction in diesel consumption associated with the hydrogen transit bus pilot project, (Note that pilot project has since ended, resulting in an increase in diesel consumption in 2014)

It is also important to note that the 6th year of the commitment period **(2013) did not remain on the intended curve toward the 2020 adopted target** (33% reduction vs. 2007). 2013 year-over-year emission reductions levels were only 1,425 tCO2e (1.3%), which is far less than the targeted 3,000 to 4,000 tCO2e (3.5%) required to remain on the target curve. **Moreover, this past year (2014) is the first in the 7 years of the commitment period that has seen an increase in total emissions, rather than a reduction**. Whistler's emissions in 2014 were 110,484 tCO2e, which represents an increase of 1,242 tCO2e year-over-year, as opposed to the 5,800 tCO2e reduction that would have been necessary for the community to remain on the target curve of a 33% reduction by 2020.

2014 community GHG levels are estimated at 17% below the 2007 base year (rather than the targeted 22.1%). For the 2015 year to return to a level on or below the target curve will require an annual reduction of approximately 10,000 tCO2e. A reduction of this size has only once been achieved in Whistler's history (when the landfill was closed and the cap and capture membrane was installed).

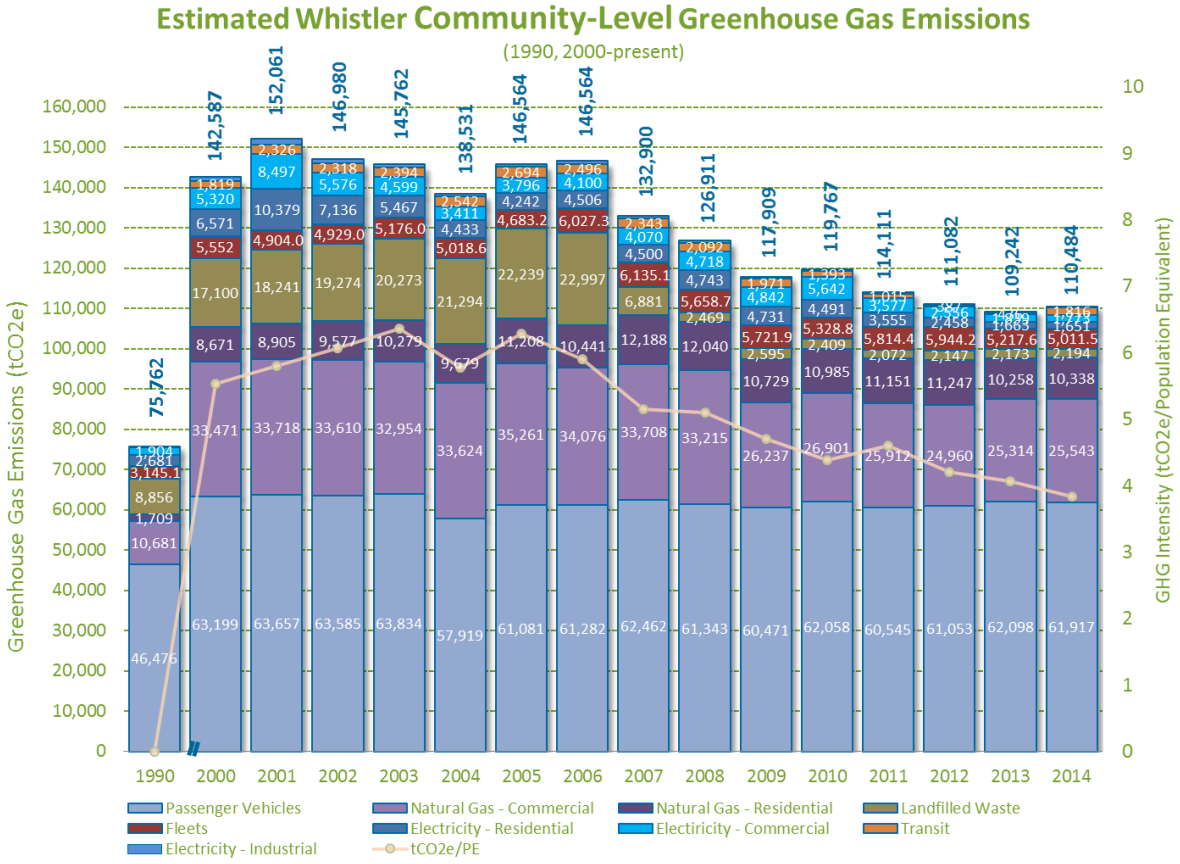
Looking ahead, the key challenge for our community will be regaining the rate of reductions achieved over the 2008-2012 period as further 'one-time changes' are, for the most part, no longer readily available. To remain under the target curve presented above, additional reductions of 3,500 to 4,500 tonnes of CO2e will be required annually for the next 10 years. Future GHG reductions will need to be primarily premised on ***actual energy conservation*** and ***increased efficiency*** rather **than *one-time technological or infrastructure changes in community systems*.** The required conservation will be particularly challenging for the community as historic performance assessments demonstrate the energy conservation gains have proven elusive over the past decade.

**Bottom Line:** Given that Whistler does not currently have plans for GHG reduction initiatives of a similar scale/impact as the natural gas conversion project coupled with the fact that annual collective energy efficiency improvements have historically modest across the community, **it is unlikely that community emissions will remain on target to achieve the adopted 2020 target levels included in Whistler's Official Community Plan.**



### 3.1.2 Community GHG Emission Performance

Total community emissions in 2014 were estimated to be **110,500 tCO2e**. This level is approximately 16.9% lower than 2007 levels, 22.5% lower than 2000, but **1% above 2013 levels** and above our current community target levels.




From a GHG emissions intensity perspective, 2014 GHG emissions per population equivalent[8] decreased to 3.8 tCO2e/PE. This level is 6% below 2013 levels and the lowest annual per capita measure since detailed record keeping began in 2000. This is primarily driven by an increase in population equivalent in the 2014 year. Stated another way, while total community emissions went up somewhat, the number of people in the resort increased more significantly, hence the ratio, or the emissions/person went down.

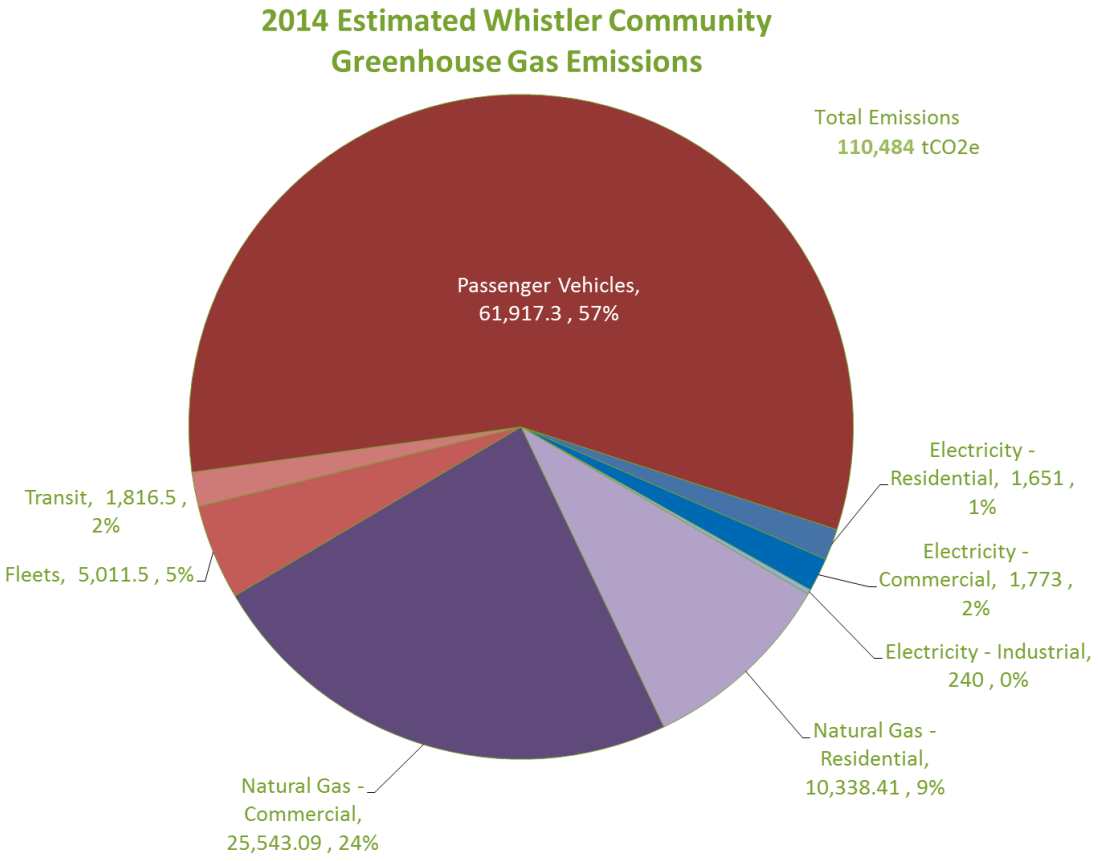
As noted above, the primary drivers of reductions in previous years have been the changes to the local waste management system (especially landfill gas capture); the switch from piped propane to piped natural gas, the BC Transit Hydrogen Transit Fleet pilot project (which has since ended), and more recently, the provincial low carbon fuel standards and the decreasing GHG intensity of BC Hydro electricity.

As further one-time changes such as those noted above become less available to our community, **Whistler will no longer achieve reductions without substantive 'energy conservation' becoming the core driver of further emission reductions.**

[8] The nature of Whistler being a tourism community means the number of people in Whistler on any given day is generally far greater than the population counts provided Canada Census or BC Statistics estimates. The total Population Equivalent is an estimate of the total number of people in Whistler on an average annualized basis. The indicator is often used in 'per capita' measures to normalize the data and make it comparable to other communities. More detail on the composition of the Population Equivalent can be found at:
http://www.whistler2020.ca/whistler/site/genericPage.acds?instanceid=2985334&context=2985223

## Distribution of Emissions

Greenhouse gas emissions in Whistler are made up of emissions from stationary sources (buildings and infrastructure systems), mobile sources (passenger vehicles, fleets, and transit), as well as emissions from landfilled wastes. The approximate share of each of these sources is presented in the following chart.



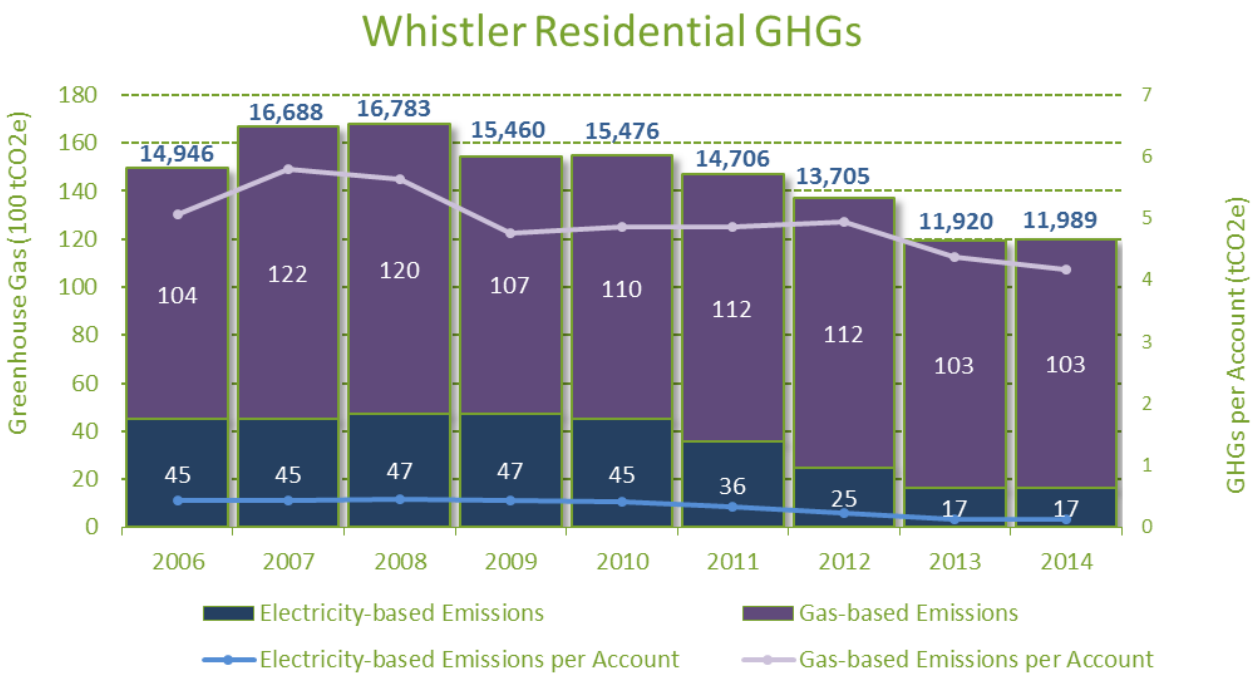

## Passenger Vehicles

Passenger vehicle transportation within RMOW boundaries continues to represent the largest share of the overall emission footprint (57%), followed by natural gas consumption at 33% (primarily used for space and water heating).

## Whistler Buildings - GHGs

The following two charts show the changes in greenhouse gas emissions from key segments of the community building inventory.

### Residential GHG Emissions



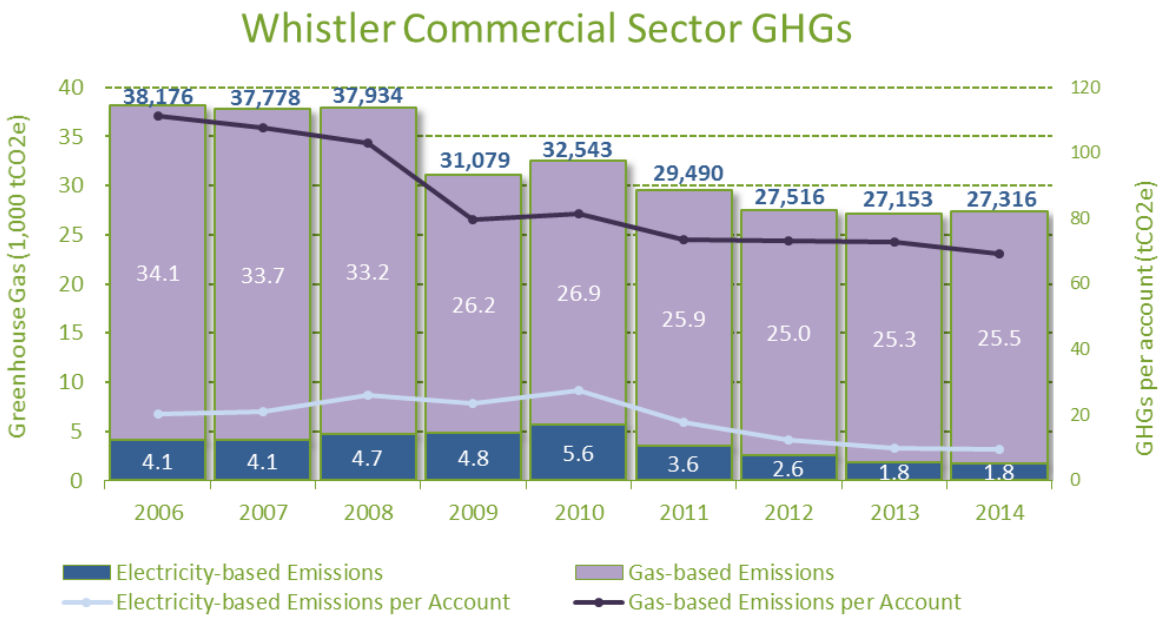

### Residential Natural Gas Emissions

Natural gas based GHG emissions across the residential sector have increased by 1% year over year, which represents relatively consistent emissions year over year. Additionally, 2014 natural gas emissions per residential account decreased year over year, and due to a similar reduction in 2013, this figure is currently the lowest on record.

### Residential Electricity Emissions

Electricity-based emissions have decreased in the residential sector on both a total basis, as well as an emissions per account basis. While total electrical consumption did decrease in 2014 (-4%), the primary driver of decreasing electricity-based emissions over the past few years is the reduction in system-wide BC Hydro GHG emissions intensities.

### Commercial GHG Emissions




### Commercial Natural Gas Emissions

Commercial sector GHG emissions have decreased substantively since the conversion from propane to natural gas was finalized in 2009 (commercial heating gas emissions have declined by 28% versus 2006 levels). Most recently however, commercial natural gas emissions have remained steady over the past three years and remain approximately 27% lower than pre conversion 2007 levels. Commercial heating gas emissions per account are also currently at all time lows.

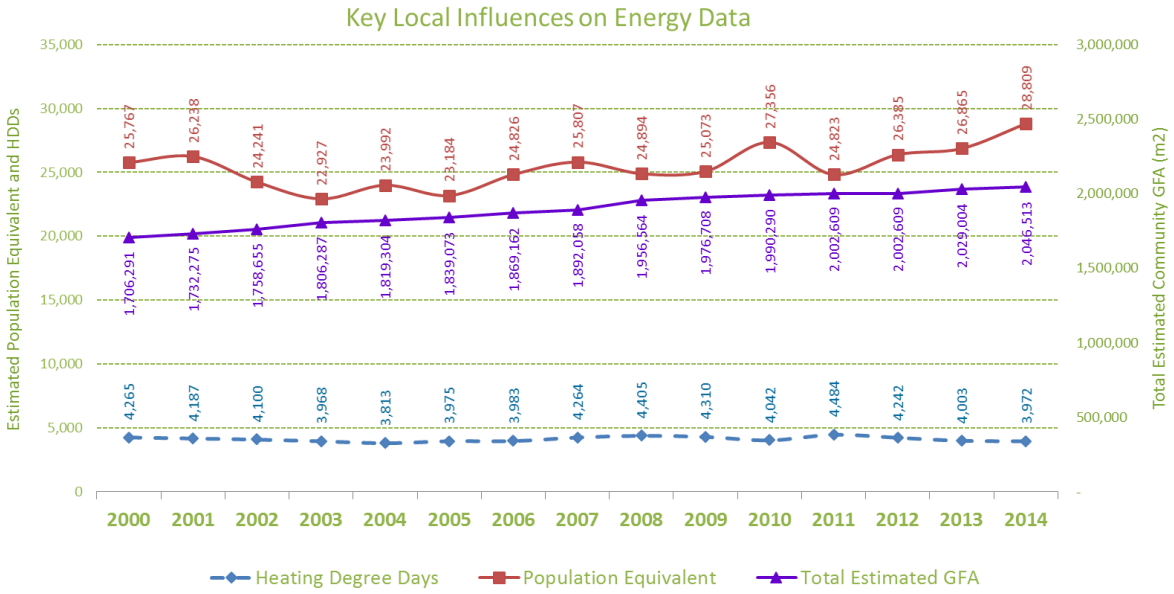
### Commercial Electricity Emissions

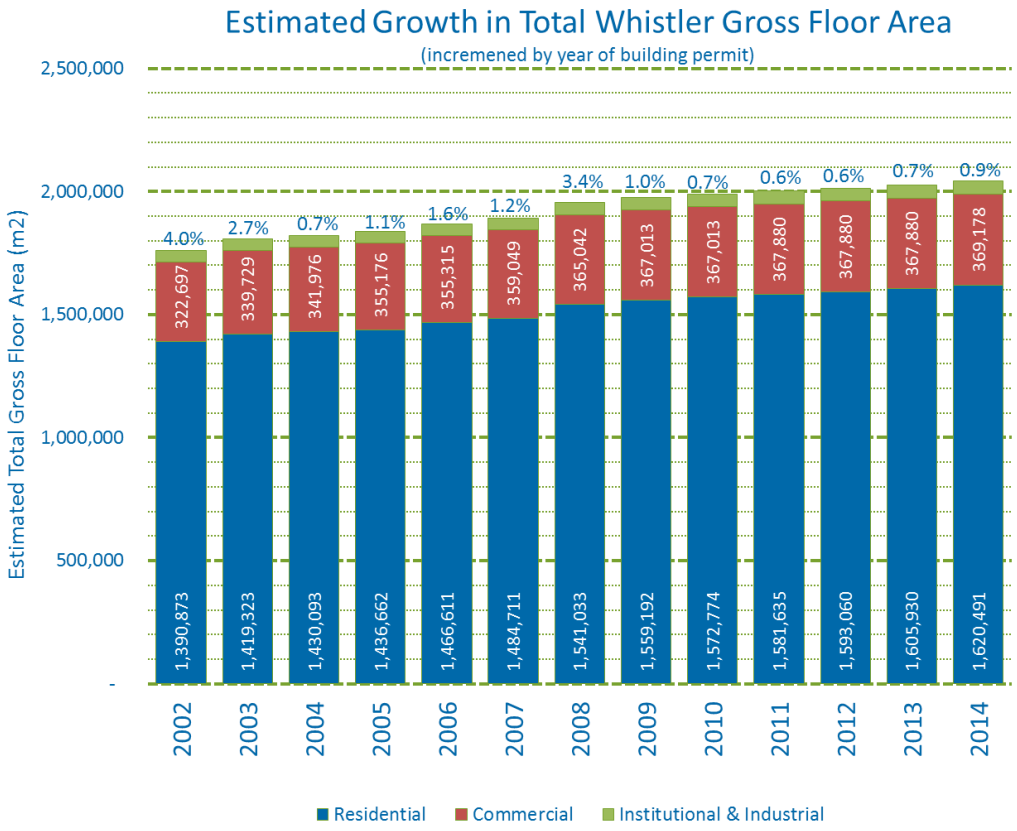
Over the last 10 years, GHG emissions from electricity consumption remained relatively steady until the 2010 Olympic Games year. Since the Games year, emission levels have decreased substantively for each of the following three years. These reductions are partially driven by a small drop in electrical consumption post Games (though still higher than pre-2010), but are primarily driven by decreasing GHG intensity levels across the BC Hydro system (i.e. reductions driven by forces outside our community). Commercial electricity based emissions have remained constant year over year.

Emissions per account have followed patterns similar to that described above.

The following three charts provide detail regarding the primary influences on energy consumption and emissions trends over time. These data are useful for the exploration of possible explanations for observed change over time. It is however important to note that Whistler's **emission reduction targets are set at total emission levels** – targets are not at set at per-capita or per-$ft^2$ intensity levels.

In the end, intensity measure may help us understand which factors are driving changes in performance, but it is only the total parts-per-million (ppm) of carbon in the atmosphere that defines and shapes the impacts of climate change. It is for this reason that Whistler chose to set total emission targets rather than emission intensity targets.




BC Hydro Emission Factor Comparison (tCO2e/GWh)

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 year rolling average | 40.7 | 34.7 | 23.7 | 24.7 | 26.3 | 24.7 | 26.0 | 25.3 | 25.3 | 19.0 | 13.7 | 10.6 |

### 3.1.3 Key Community GHG Performance Insights

**Total** GHG Emissions

- 57% of all estimated community-level emissions (~62,000 tonnes annually) are produced by passenger vehicle transportation within municipal boundaries. The passenger vehicle sector provides a critically important opportunity for future community emission reductions.
- For the first time since 2010, emission levels rose year over year in 2014, resulting in the fact that **the community is no longer on the anticipated statistical path to achieve our 2020 emission reduction goals.**
- Moreover, the lack of additional, significant one-time changes (i.e. low hanging fruit like the propane to natural gas conversion project) will make future progress toward our 2020 target much more difficult.

**Commercial Buildings** GHG Emissions

- Total emissions and emissions per commercial account are the lowest since detailed record keeping began (78 tCO2e/commercial acct).
- Collectively, commercial building emissions have decreased by 28% from the 2007 year – as such this sector is maintaining a strong trajectory toward the 2020 target (-33%). However, there was a slight increase in commercial building emissions in 2014.

**Residential Buildings** GHG Emissions

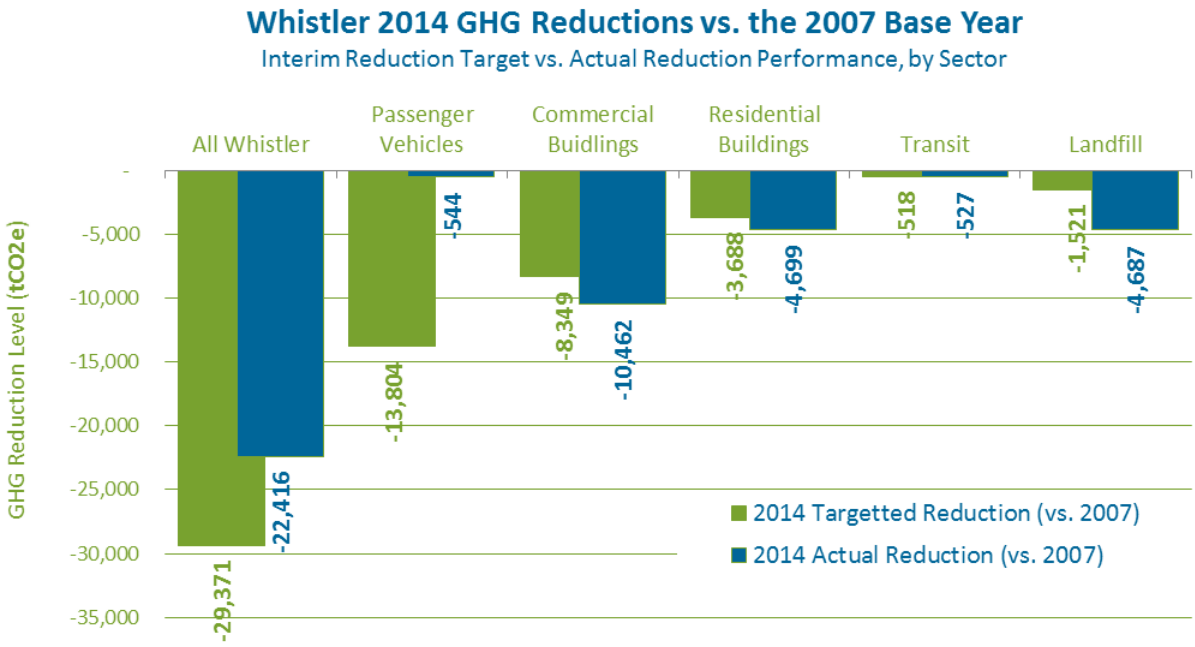
- Total residential GHGs have dropped from 2007 levels by 28% (primarily due to the shift to natural gas from propane and the decrease in BC Hydro GHG intensity – collectively cleaner fuels). This level of progress positions the residential building sector well for meeting the 33% reduction by 2020. However, year over year emissions remained relatively steady, and further reductions will be required to remain on target.
- The primary source of emissions across the residential inventory remains natural gas consumption (~80%).
- The shift to natural gas (from propane), and the decreasing GHG-intensity of BC Hydro electricity are the primary reasons for the strong GHG reductions in this sector. It should be noted that energy consumption across the sector has only decreased by 9% since 2007 (highlighting the role that cleaner fuels have contributed to the 28% GHG reduction noted above).

**Transportation** GHG Emissions

- Low carbon fuel standards have helped to mitigate the emissions from both gasoline and diesel consumption (5% ethanol blend in gasoline, and 4% biodiesel blend in diesel).
- Estimated total vehicle kilometres travelled (VKT) in Whistler (locals and visitors combined) has continued to increase over the last 10 years
- The average fuel efficiency of BC registered vehicles has only improved by ~3-4% over the last 10 years. This change has slowly reduced emission levels per kilometre driven from 2000 levels, but not by enough to cause sector-wide reductions in total estimated emissions. Moreover, recent trends indicate that lower gasoline prices may be contributing to an increase in the purchase of light duty trucks and SUVs, and a concurrent decrease in smaller passenger vehicle – a trend that works counter to the increased efficiencies noted above.
- The new fuel standards and the increases in vehicle efficiency are still far too small to move passenger vehicle emissions to the targeted reduction levels discussed in Section 3.1.1 above. Much more efficient vehicles, fuel switching to lower carbon fuel sources, and/or a decrease in VKT per person will be required to catalyze required emission reductions in this sector.
- **Estimated passenger vehicle emissions have remained at the same level as 2007 base year (vs. the 19% interim target level). This difference (11,500 tCO2e in unmet reductions) represents the single largest reason why the community is failing to maintain interim target reduction levels.**

### Looking Ahead

- As previously noted, the key challenge for our community moving forward, will be regaining the rate of reduction achieved over the five years of the commitment period. This is due to the fact that further 'one-time changes' are, for the most part, no longer readily available.
    - Future reductions will need to be primarily premised on actual energy conservation and efficiency rather than one-time technological changes in community systems.
    - As seen in the chart below, the greatest need (and opportunity) for ongoing emission reductions is in the **passenger vehicle sector**.



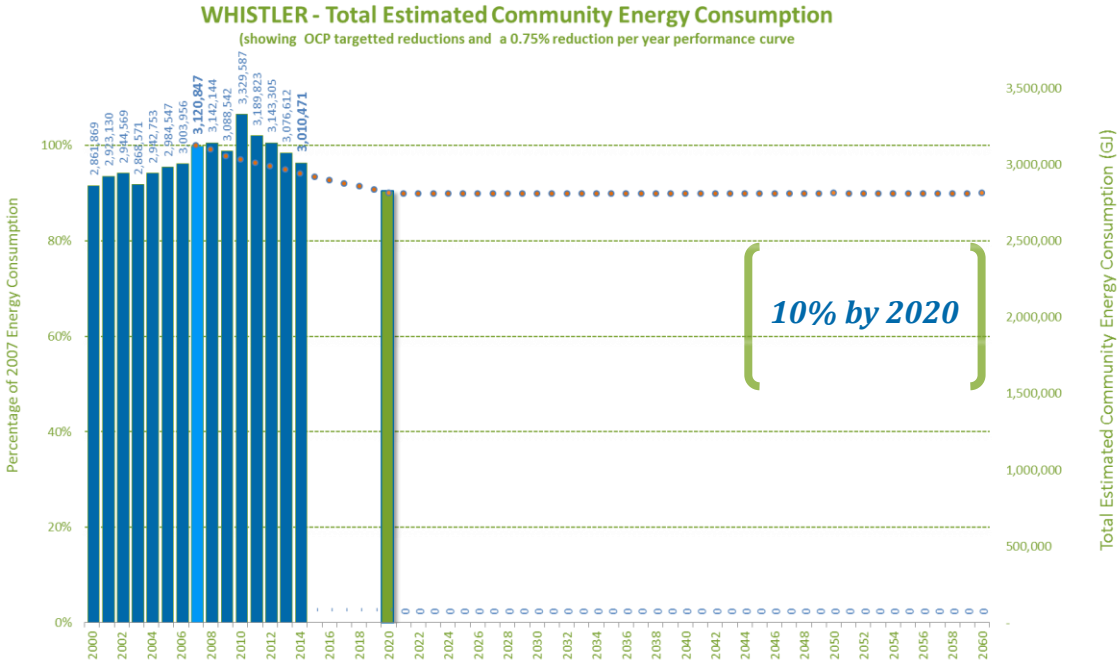
## 3.2 COMMUNITY ENERGY CONSUMPTION

Section 3.2 deals with energy consumption and energy expenditures at the community level. This section includes information on related targets, an overview of 2013 performance, as well as a short section on key associated insights and trends.

### 3.2.1 Community Energy Reduction Target

OCP Amendment Bylaw 1983, 2011 includes the Objective: '*Make Energy Conservation the Core Strategy and Highest Priority for Achieving Our Greenhouse Gas Emission Reduction Goals'*. To this end, the OCP Amendment Bylaw also includes a community-scale energy reduction target: "***The municipality will lead a community-wide effort to reduce total energy consumption to a level 10% lower than 2007 by 2020***".

This proposed policy introduces Whistler's first comprehensive energy reduction target – and one of the first by a local government in BC. Similar to the chart in Section 3.1.1 above , if it is assumed that this energy reduction target will achieved at a consistent pace over the next decade, this target translates into a 0.75% annual energy consumption reduction over the target period (2011 – 2020). A visual presentation of this rate of reduction is included below for clarity.

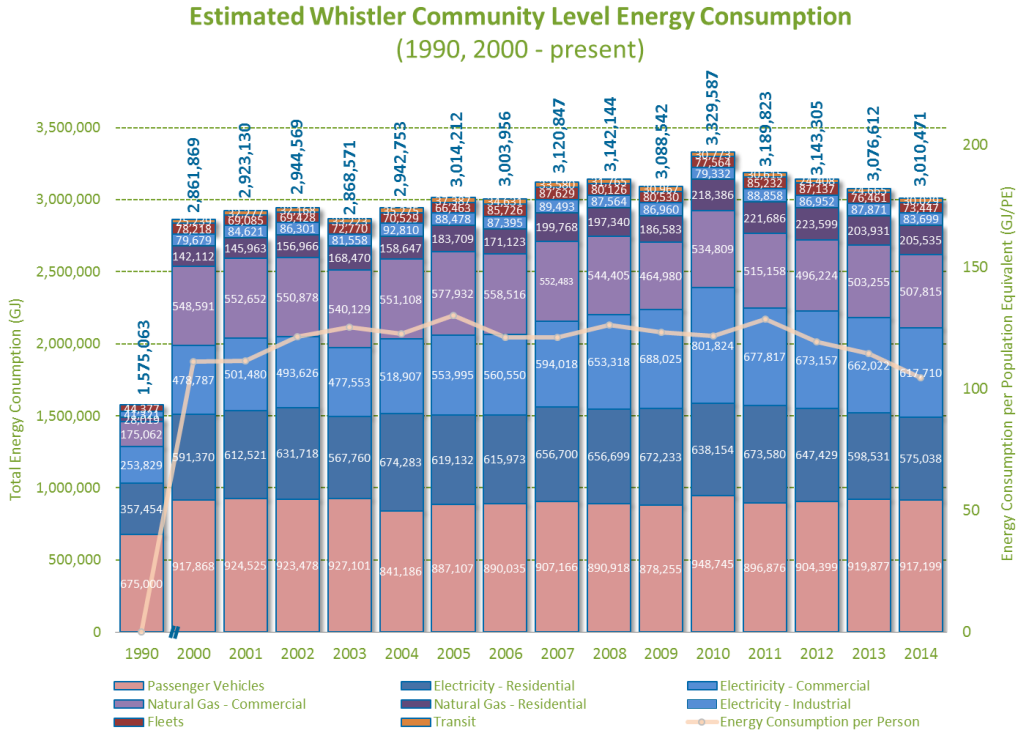



As evidenced in the chart above, historic energy consumption has not followed the same trajectory as community GHG emissions during the period between 2007 and 2013. **In fact, the 2010, 2011 and 2012 energy consumption levels were the highest three years of energy consumption ever recorded in Whistler.** However, community wide energy consumption has continued to decrease over the last 4 years, and if this trend continues the community may, in fact meet the anticipated 10% reduction target by 2020.

Currently, Whistler's total energy consumption is still 50,000 GJ higher than projected target levels for 2014.

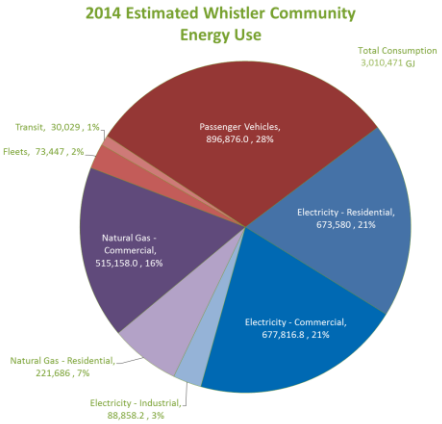
### 3.2.2 Community Energy Consumption Performance

Energy consumption in Whistler includes consumption from stationary sources (buildings and infrastructure), as well as mobile sources (passenger vehicles, fleets, and transit). Total community energy consumption in 2014 was estimated to be **3.01 million GJ** (down 3.54% from 2007 levels, and 2.2% below 2013 levels).Energy consumption per population equivalent has decreased over the last few years as well, with 2014 showing a marked improvement over the 10 year average, and the single best performance level since detailed reported began in 2000.




To sum, 2014 total energy consumption is lower than the 10 year average and the current trend suggests that it is possible to meet our 2020 goal if this improvements continue. Year over year consumption continue to show signs of modest improvement (~2%/yr), and per population equivalent levels have improved over each of the last three years.

Electricity is the most prevalent type of energy consumed in Whistler at 45% of the total consumption (unchanged from previous years), followed by vehicle fuels (~30%), and natural gas at approximately one quarter of total consumption. It is worth noting that due to the fact that different energy sources have differing carbon content, GHG emissions are much more heavily associated with consumption of fossil fuels (i.e. gasoline, diesels, and natural gas). This fact accounts for the differences in relative proportions depicted in this chart as compared the similar chart presented in Section 0.



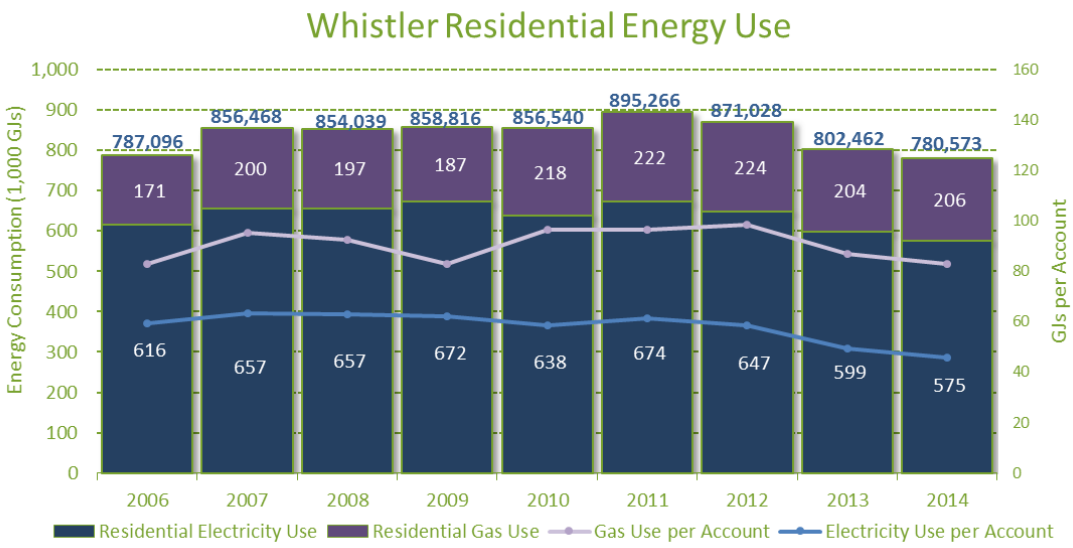

**Though overall consumption has decreased year over year, GHG emissions have increased.** In 2014, there was an increase in consumption of natural gas (~6,000 GJ, +300 tCO2e) and a decrease in electricity consumption (~70,000GJ, -100 tCO2e). Additionally, although there was a small decrease in fleet and passenger vehicle usage (down ~3,000 GJ, ~200 tCO2e and ~2,600 GJ, 100 tCO2e

respectively), there was an increase in consumption by Transit buses (~5000 GJ), which was also associated with a large increase in emissions (+1,380 tCO2e) as the hydrogen bus pilot project was phased out last year.

## Whistler Buildings – Energy Consumption

Total energy consumption across Whistler's buildings is presented in the following two charts.

### Residential Building Energy Consumption

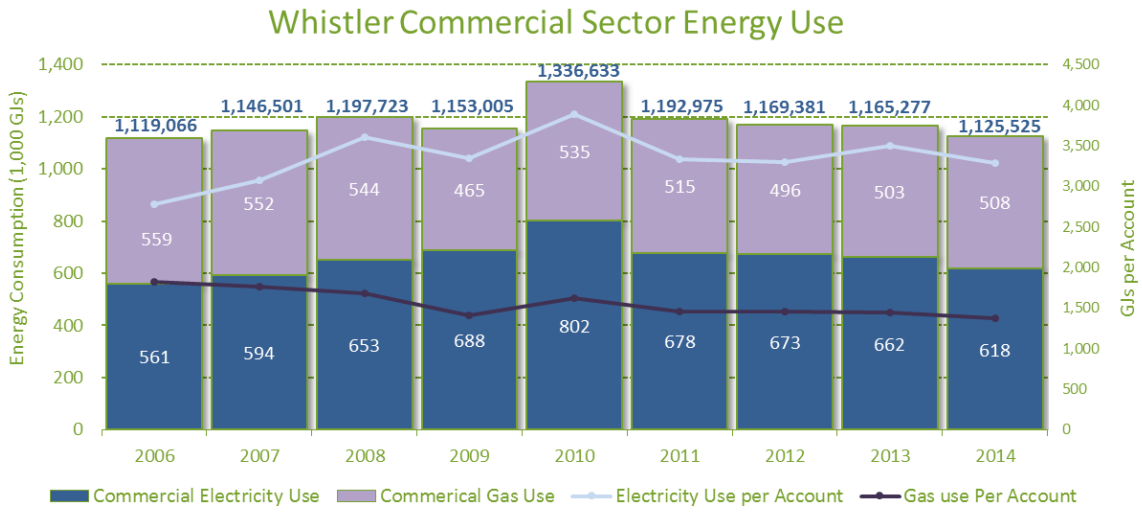



Residential electricity consumption decreased in 2014 in both total terms and on a per account basis. Total 2014 residential energy consumption was the lowest since 2005 at 780,573 GJ (down 8.9% versus the average of the previous 5 years). This change reflects decreases in both electricity and gas consumption across the residential sector and may be partially explained by a slightly warmer winter in 2014 versus the average of the previous five seasons.

**Residential Natural Gas**
2014 natural gas consumption per account is 8% below the 10 year average consumption levels. Currently, the data may be beginning to suggest is that Whistler homes served by natural gas are, on average, becoming slightly more (gas) efficient over time.

**Residential Electricity**
Residential electricity consumption per account decreased in 2014 to one of the lowest levels in the last decade.

### Commercial Building Energy Consumption




2014 results indicated that there has been a 4% decrease year over year in overall energy consumption by the commercial sector.

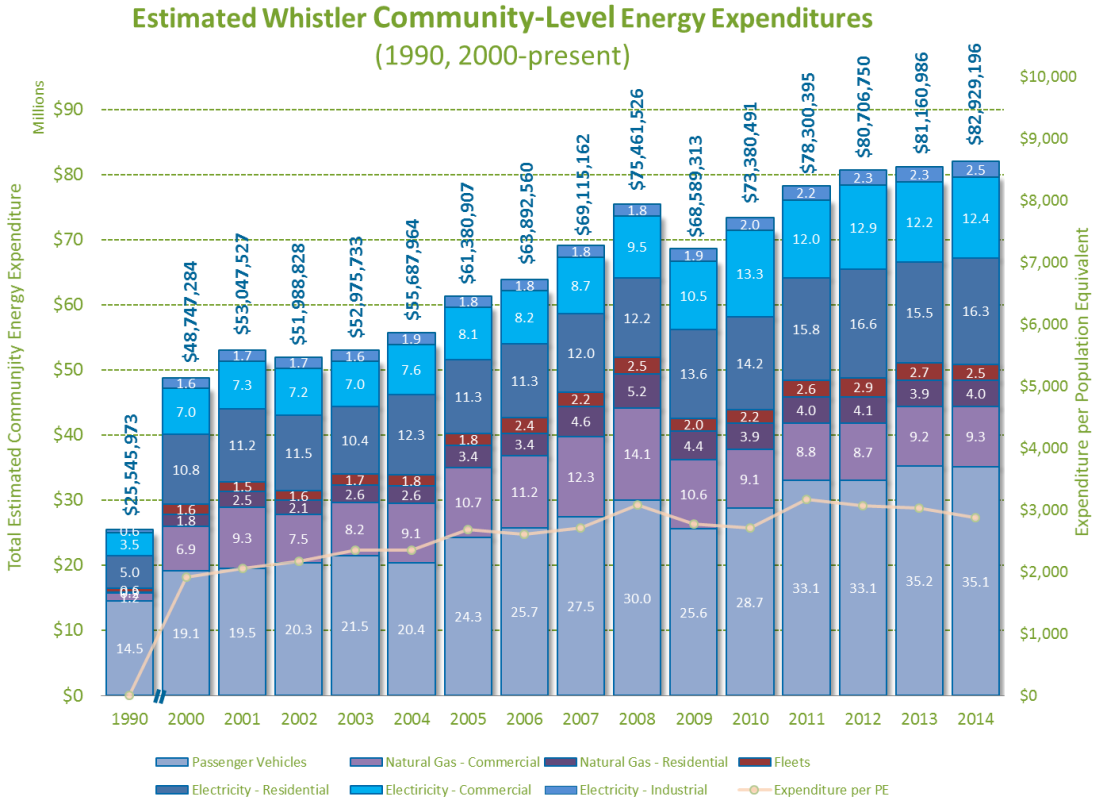
### Commercial Natural Gas & Electricity

The period from 2003 through to 2008 saw a significant shift in commercial energy consumption trends. This period saw decreases in propane use at the same time as commensurate increases in electricity use across the sector. In sum, energy consumption was little changed, but the 'fuel-shift' did lead to lower overall GHG emissions. The primary reason for this shift was likely attributable be the increased use of hybrid electric boilers for space and water heating loads in the large hotel sector (i.e. a fuel shift from natural gas/propane to electricity for space and water heating loads in the commercial sector).

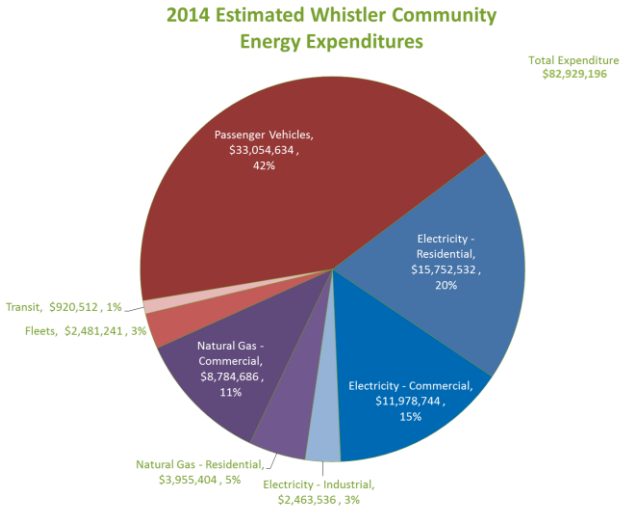
Given the recent change in rate structures in Whistler, it will be important to track this trend into the future. It is quite possible that a shift back to natural gas from electricity may occur. If this effect is observed, the net effect would likely be an increase in GHGs associated with this sector.

## Energy Expenditures

The estimated annual collective energy expenditure within Whistler[9] has increased by more than $34 million between 2000 and 2014 ($83 million vs. $49 million). Increases in energy rates continue to outpace the rate of inflation, so it is expected that the collective community energy expenditure will continue to rise faster than our collectively ability to pay for it – a trend that underscores the importance of increasing both energy conservation and energy efficiency across the community.



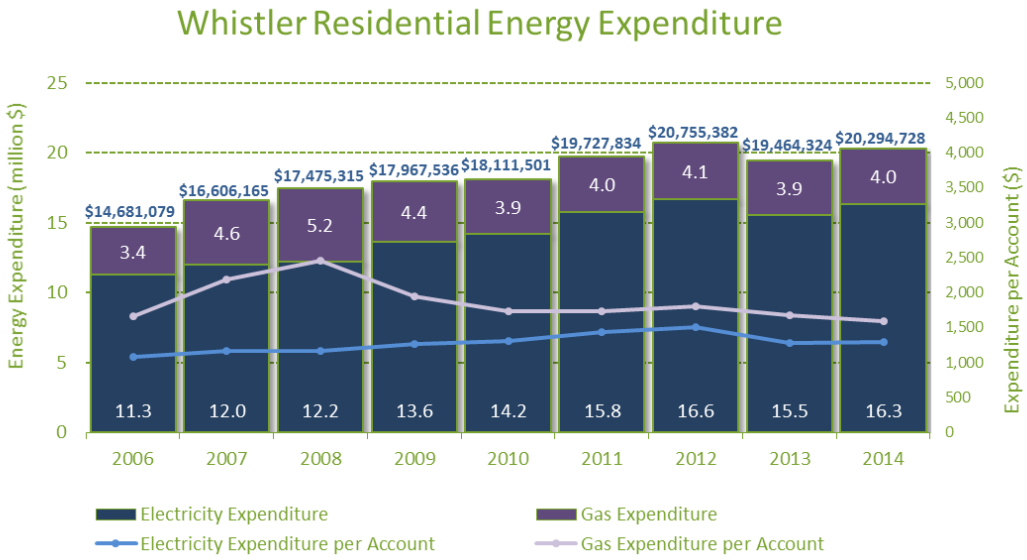

Energy expenditures for buildings (both commercial and residential) have remained relatively constant since 2008 at approximately $42-44 million/year with electricity expenditures increasing by a margin nearly equal to the drop in natural gas expenditures. Fuel prices for gasoline increased markedly in 2012 and 2013, resulting in significant increases in total passenger vehicle estimated expenditures (2013: $35M vs. 2009: $25.5 M). However, gasoline prices dropped in the latter half of 2014, which resulted in constant expenditures for passenger vehicle fuels year over year.



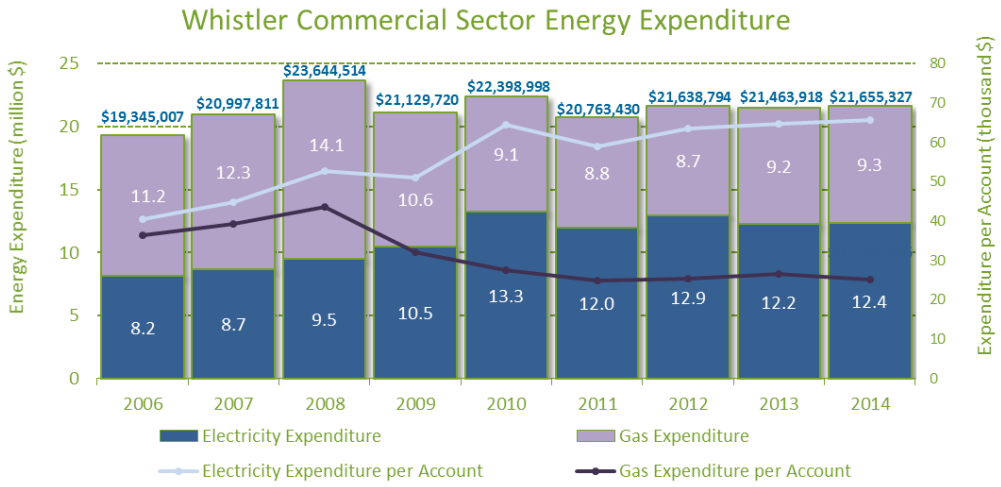

[9] Note that this number includes an estimate of the consumption of gasoline for all vehicle kilometres travelled within Whistler's municipal boundaries. As such it includes a portion (i.e the portion within municipal boundaries) of the incurred costs of energy consumption associated with both visitors arriving by automobile, as well as commuting employees from neighbouring communities.

The final two charts in this section present the nine-year trend in cumulative energy expenditures across Whistler's key building inventory. Despite the decrease in the price of natural gas (versus propane) in 2009 and 2010, total expenditures in the residential sector continues to demonstrate an upward trend. Residential expenditures now exceed $20 million/year, and commercial expenditures are slightly above $21 million.

Rate escalation expected electricity over the next number of years will average approximately 5% per annum. However, given the recent British Columbia Utilities Commission (BCUC) amalgamation ruling, an expected that a 30-40% reduction in local natural gas pricing has begin its three year-phase in process (Jan, 2015).




Residential building expenditures decreased in 2013 for the first time in a decade due to a reduction in total energy consumption across this sector. However, expenditures increased again in 2014 despite a continued reduction in overall consumption. This is due to the fact that rates increased (primarily electricity) by a margin in excess of the per cent reduction in 2014 consumption levels.




Total commercial energy expenditures have remained constant for the past three years despite continued reductions in overall consumption. There was a small increase in 2014 commercial building energy expenditures on a per account basis for electricity (+1.4%) and a more market decrease in expenditures in 2014 for natural gas per account (-5%).

### 3.2.3 Power Down - Residential Energy Assessment Rebate Program

The Residential Energy Assessment Rebate Program offers Whistler homeowners $250 towards an Energuide for Homes home energy evaluation - a service which normally cost between $300 and $400. Since the program began in August, 2014, approximately 160 new and existing homes have been assessed.

Although the current sample size is small (approx. 120 existing homes), staff have been evaluating the results of these assessments and will continue to update the program and associated policies to maximize the efficiency benefits targeted through the program.


### 3.2.4 Key Community Energy Consumption & Expenditure Performance Insights

**Total Energy Consumption**

- Total community energy consumption decreased each of the last four years. Despite this positive performance, 2014 was still the 8th highest level of energy consumption since detailed record keeping began in 2000.
- Community energy consumption trends are currently on track to meet OCP targeted levels if the community continues to reduce consumption by ~2% each year. If reductions slowed to 1% each year (or increased), the community will narrowly miss the 2020 target.
- Current community energy consumption levels (3.01 million GJ/yr) are approximately 15% higher than the recommended forecast in the RMOW's 2003 Integrated Energy Plan.

**Residential Energy Consumption**

- 2014 residential energy consumption decreased in both total terms, as well as on a per account basis.
- 2014 was the lowest level of residential energy consumption since 2003 – this trend is driven primarily by lower levels of electricity consumption in the sector, as gas consumption remains slightly higher than the 10 year average.

**Commercial Consumption**

- 2014 commercial consumption levels have decreased by 3.4% year over year and are slightly below the 10 year average
- Though there was a marked shift from natural gas consumption to electricity consumption in the commercial sector between 2005 and 2012, over the past two years natural gas consumption has increased while electricity consumption has decreased.

**Passenger Vehicles**

- Despite increases in vehicle fuel efficiencies, estimated energy consumption associated with passenger vehicles has not changed significantly since 2000 – this is the primary reason that GHGs within this sector have lagged so far behind all other sectors with respect to meeting the reduction targets.

## Total Energy Expenditures

- Though overall consumption levels continue to decline, rising fuel and electricity rates have combined to ensure that total energy expenditures are at the highest levels ever in Whistler ($83M/yr)
- Gasoline expenditures associated with passenger vehicle use remained constant year over year. Despite a marked drop in gasoline prices in the latter half of 2014, yearly expenditure remained at ~$35M.
- Declining natural gas rates contributed to lower (but recently rising) total natural gas expenditures over the years since the conversion to natural gas from propane (now at $13.3 M/yr)

### Residential Building Sector Expenditures

- 2014 residential electricity expenditures increased by ~$1M versus 2013, and this year is the second highest year on record ($16.3M/yr)
- Residential gas expenditures remained relatively level year over year, at $4.0/yr from 2013 levels ($3.9M).

### Commercial Building Sector Expenditures

- Total 2014 commercial energy expenditures remained relatively constant at 2013 levels ($21.6M/yr)
- 2014 commercial electricity expenditures were the third highest on record, but are expected to decrease in 2015 due to decreasing natural gas rates.
- Due to increased consumption in 2014, gas expenditures increased year-over-year to the highest level post conversion ($9.3M)

### Looking Ahead

- The data suggests that there is some increasing energy efficiency in the residential sector, but more years of consistent trend data is required to confirm. Opportunities exist to catalyze further gains in this sector.
- The commercial sector has made some progress toward decreased energy intensity across its collective inventory. However, further energy reduction initiatives are required to keep this sector on track to meet 2020 goals.
- Passenger vehicle trends have fallen far behind targeted levels of reductions – this fact represents a critically important opportunity to target future improvements.

# 4 CORPORATE PERFORMANCE

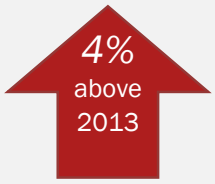
Initiated as part of the 2004 RMOW Integrated Energy, Air Quality, and GHG Management Plan, detailed energy and emission inventories are now compiled, assessed, and presented to key operations staff across the organization on a regular basis. Energy consumption, emissions, and expenditures are tracked independently by fuel type (gasoline, diesels, electricity and natural gas) for each division, department, and workgroup across all corporate operations.

The primary purpose of these inventories is to provide the basis for identifying energy conservation opportunites, assessing energy performance across key municipal building assets, and structuring business case assessements for potential upgrades and efficiency retrfofits. Additionally, these inventories are designed to satisfy Council-adopted commitments to external programs such as the Partners for Climate Protection program and the BC Climate Action Charter, as well as the internal commitments in the RMOW Integrated Energy Plan, the RMOW Carbon Neutral Operations Plan, and the Whistler Offical Community Plan.

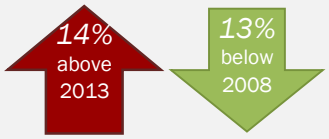
As a means of comparison to community-wide emissions, RMOW corporate emissions represent approximately 1.4% of the total community estimated emissions. Despite this relatively small share of overall emissions, the RMOW has recognized and accepted the need for leadership in carbon and energy management across the organization.

Further, the ongoing upward pressure on energy rates (energy rates are rising 3-5 percentage points faster than the rate of inflation) makes it clear for all organizations that energy consumption should be tracked, managed and ultimately reduced.

## 4.1 KEY CORPORATE INSIGHTS and SUMMARY

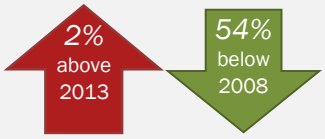



Total corporate GHG emissions in 2014 were **1,510 tCO2e**, which is **4% higher than the 2013 level**, but approximately **35% below the benchmark 2008 level** (the reference year for RMOW target-setting).

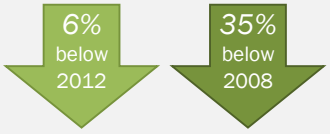

### Infrastructure Services

increased emission levels by 14% year over year (YOY), but still remain 13% lower than 2008 benchmark levels




### Corporate and Community Services

emission levels increased by 2% YOY, which means that current levels are now 54% below their corresponding 2008 benchmark level.

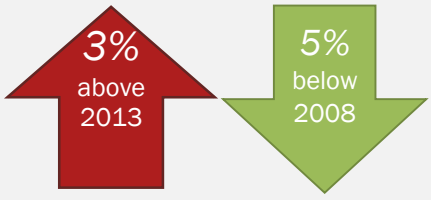



### Resort Experience (REX)

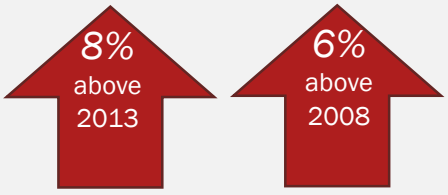
decreased annual emissions by 6% in 2014 to a level that is now approximately 35% lower than 2008 levels.

GHG emissions are still markedly lower compared to the base year despite the 2014 rise in emissions year over year. However, if emissions continue to increase in 2015, it will be difficult for the RMOW to continue meeting reduction targets. Trends in total energy use and expenditures have reversed year over year, and as such, the RMOW has seen an increase in both areas.

### 2014 Total Corporate Energy Use




### 2014 Total Corporate Energy Expenditures



## 4.2 CORPORATE GREENHOUSE GAS EMISSIONS

Section 4.2 deals specifically with greenhouse gas emissions associated with RMOW corporate operations, this section includes information on related targets, an overview of 2014 performance results, as well as a short section on key associated insights and trends.

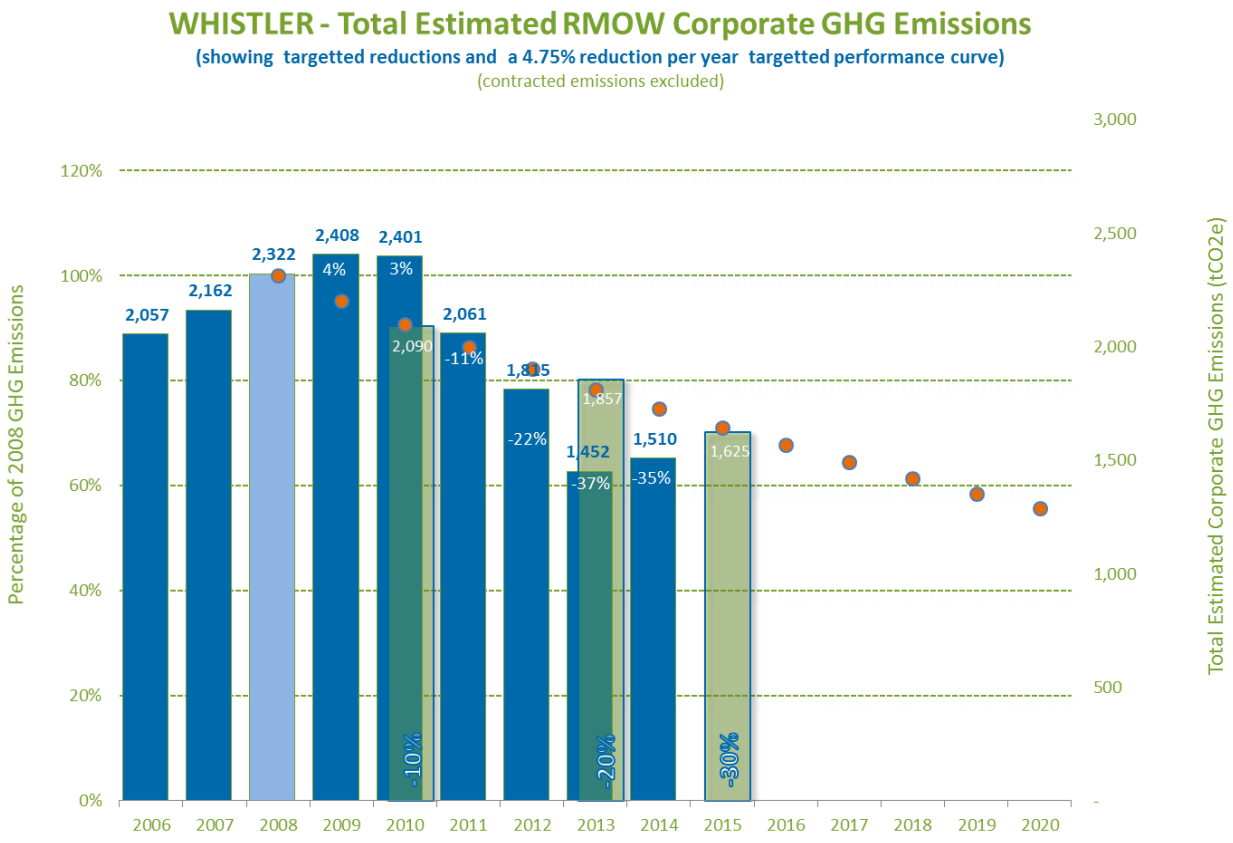
### 4.2.1 Corporate GHG Reduction Targets

The RMOW's Carbon Neutral Operations Plan sets the targets for total corporate GHG reductions as follows:

- 10% by 2010
- 20% by 2013
- 30% by 2015

(all relative to **2008** levels)

The following chart presents these targets graphically (light green bars), the historic corporate emissions levels (blue bars) as well as an indication of the annual reductions that would be required to achieve the prescribed targets using a constant rate of improvement model at approximately -5% (orange dots).

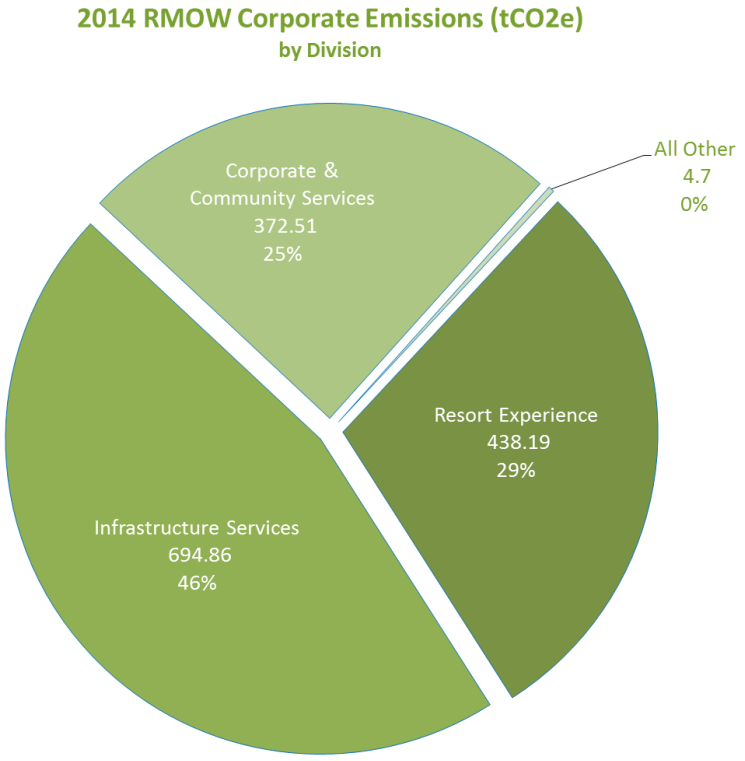



As demonstrated in the chart above, RMOW corporate emissions reduced substantively between 2010 and 2013. However, between 2013 and 2014, emissions increased by 4%. While this level of emissions is still ~220 tCO2e below the 2014 target curve, if emissions continue to increase in 2015 it will be increasingly difficult for the RMOW to meet future reduction targets.

### 4.2.2 Corporate GHG Performance

Total direct corporate GHG emissions in 2014 were **1,510 tCO2e**, which is 4% higher than the 2013 level, but 35% below the benchmark 2008 level (the reference year for RMOW target setting). As demonstrated by the previous chart, this level of emissions is still ~13% lower than the emissions target for 2014.

On a division-by-division basis, the relative emissions footprint of corporate operations is primarily associated with the following three divisions: (46%) **Infrastructure Services** (which includes roads crews, solid waste systems, the water utility as well as the sewer utility); (25%) **Corporate and Community Services** (including bylaw, fire, Meadow Park Sports Centre, and other recreation programs); and (29%) **Resort Experience** (which includes village maintenance operations, horticulture, turf, and irrigation crews, parks and trails, and facility construction and maintenance operations). The relative contributions from each division are shown below.




2014 Corporate GHG emissions by organizational Division are presented below.

13% below 2008

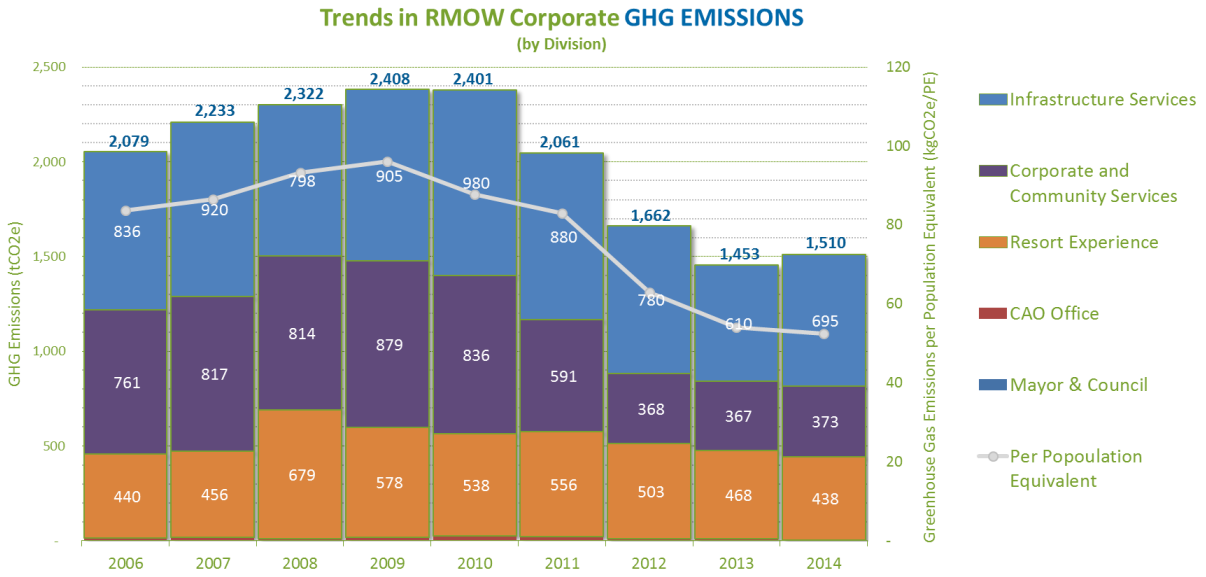
- **Infrastructure Services**
  emission levels **increased** by 14% year over year (YOY), which puts current levels at 13% lower than 2008 benchmark levels

54% below 2008

- **Corporate and Community Services**
  emission levels **increased** by 2% YOY, which means that current levels are 54% below their corresponding 2008 benchmark level.

35% below 2008

- **Resort Experience** (REX)
  **decreased** annual emissions by 6% in 2013, and emission levels are now approximately 35% lower than 2008 levels.

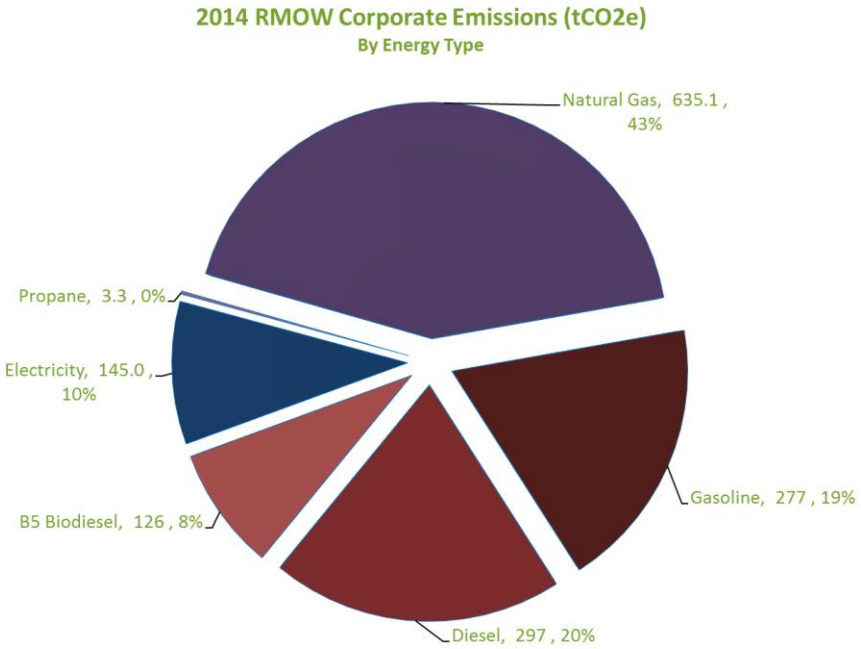



As seen in the chart above, the primary source of 2014 emissions increases was the Infrastructure Services division, which coincidently was the primary source of reductions in 2013 (this volatility seems to be primarily associated with the emissions from the roads crew, and may be related to changes in snow clearing requirements).

In the bigger picture, the largest source of reductions over the last decade has clearly been the energy retrofits at MPSC – especially the geo-exchange and solar hot water systems.

## Distribution by Fuel Type

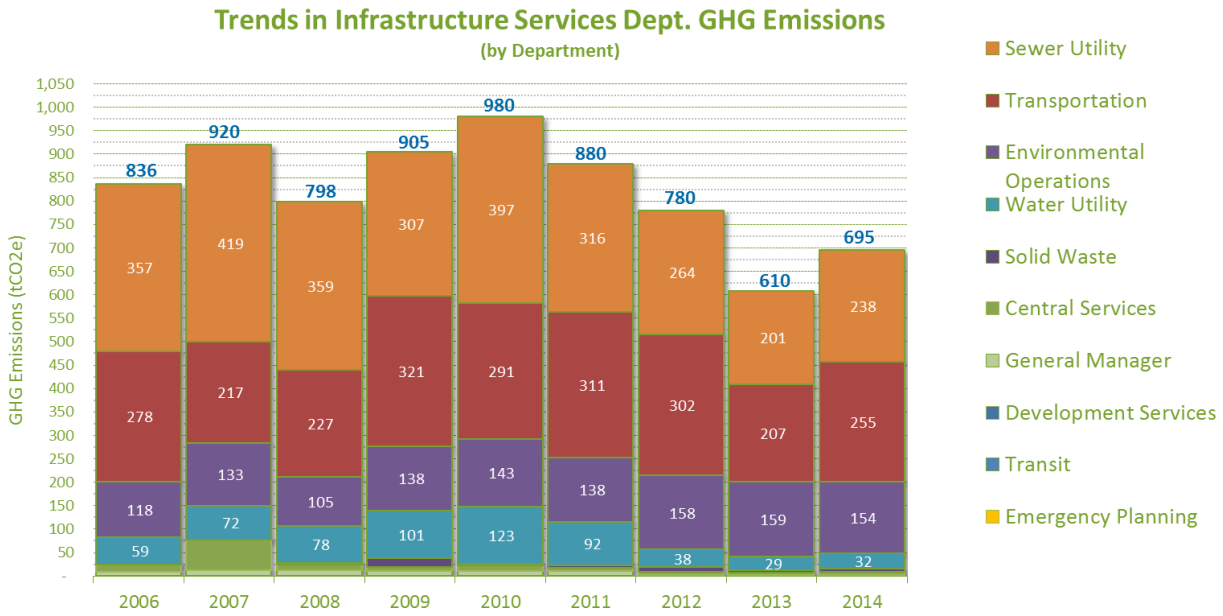
Seen as a whole, corporate emissions come from two primary sources – 47% from mobile sources (gasoline and diesels), and 53% stationary sources (natural gas and electricity). The relative shares of each of these energy types are presented below.



### 4.2.3 Divisional Trends

#### Infrastructure Services

Changes in Infrastructure Services emission levels over the last eight years are presented below:




Infrastructure Services' GHG emission trends by key functional area:

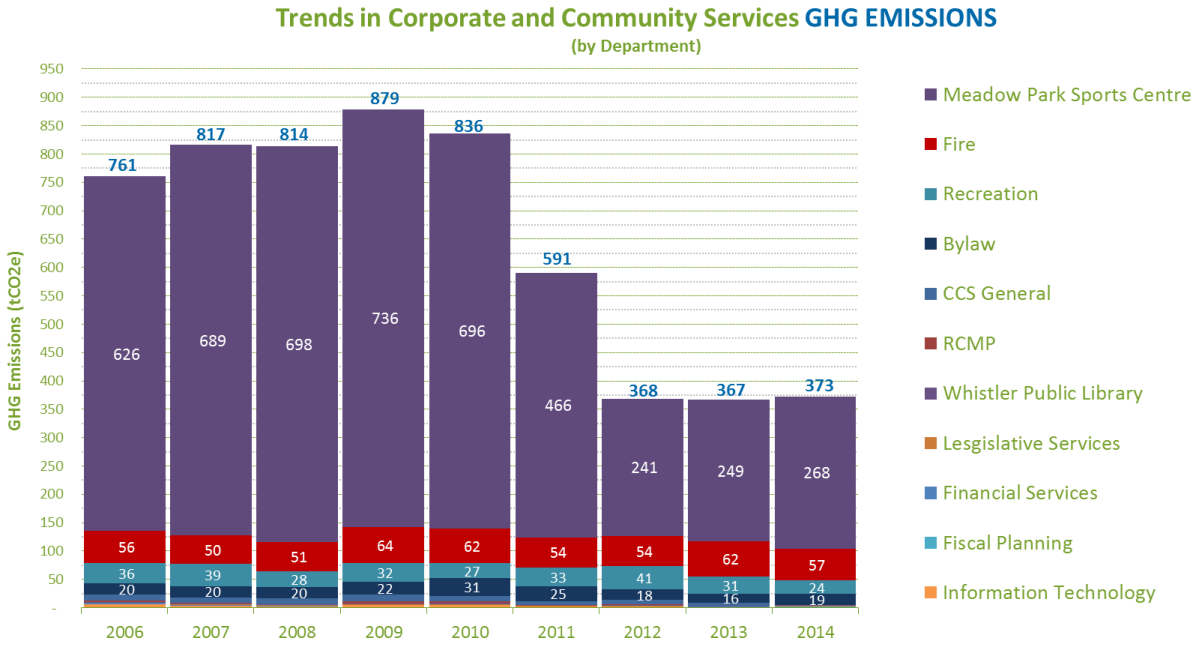
| 2014 | Sewer | Transport. | Env. Ops | Water | TOTAL |
|---|---|---|---|---|---|
| YOY | 19% | 23% | -3% | 9% | 14% |
| vs. 2008 | -34% | 12% | 46% | -59% | -13% |

**Key Insights**

- WWTP emissions increased on a year over year basis but are still 121 tCO2e (34%) lower than the 2008 benchmark level. In 2013, emissions associated with the WWTP reached an all-time low of 201 tCO2e and 2014 emissions are still the second lowest ever recorded.
- Mobile emissions from the transportation (roads) department saw a year over year increase of almost 50 tCO2e. This is at least partially the result of a lower than average snow clearing year in 2013, which resulted in almost a 100 tCO2e decrease. However, the current emission levels for the transportation department are currently 12% higher than 2008 benchmark levels.

## Corporate and Community Services

Changes in Corporate and Community Services emission levels over the last eight years are presented below:




Corporate and Community Services GHG emission trends by key functional area:

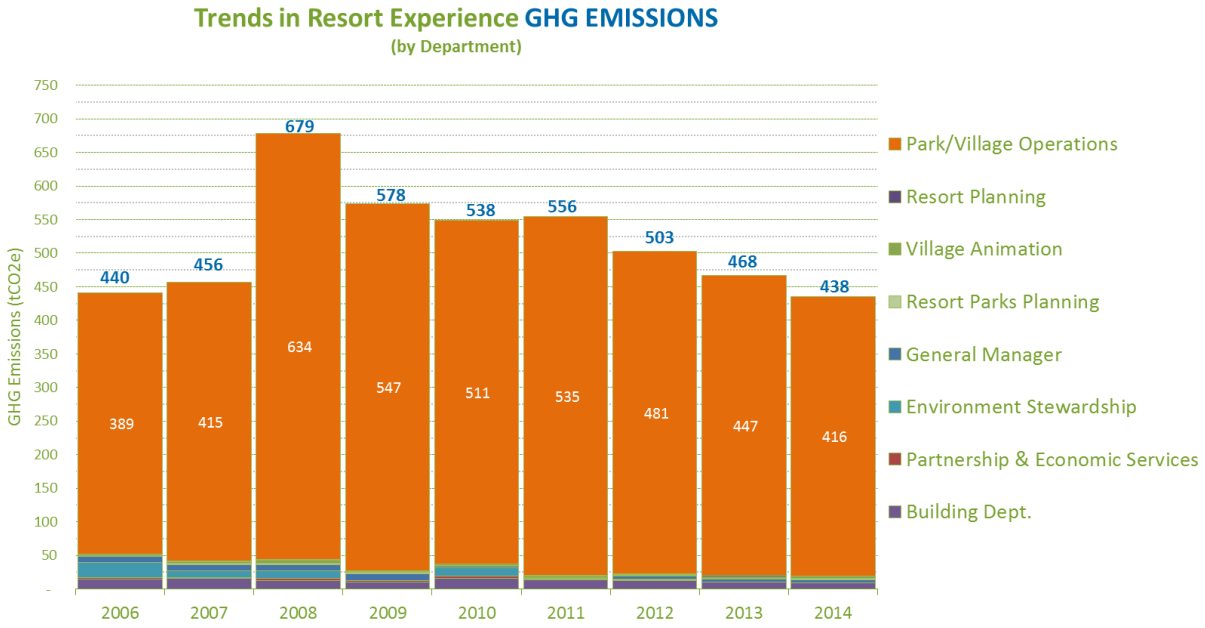
| 2014 | MPSC | Fire | Rec | Bylaw | TOTAL |
|---|---|---|---|---|---|
| YOY | 8% | -9% | -23% | 20% | 2% |
| vs. 2008 | -62% | 12% | -16% | -5% | -54% |

### Key Insights

- The primary driver of reduced emissions within this division was MPSC. At MPSC emission levels have remained relatively constant for the past few years, with a small growth trend appearing in the recent data. Despite an 8% increase year over year, 2014 MPSC emission levels were still 430 tCO2e lower than 2008 benchmark levels.
- The Fire department's emissions have increased compared to 2008 benchmark levels, however the scale of these changes are small in total terms (<10 tCO2e in each case).

## Resort Experience

Changes in REX emission levels over the last six years are presented below.




As the emissions from the REX division are overwhelmingly associated with the Parks/Village Operations functional area, a more detailed breakdown is included in the table below.

Park/Village Operation dept. GHG emission trends by key functional area are demonstrated below along with the total REX trends:

| 2014 | P/Vops | V.Maint. | Land S | Parks &T | FC & M | TOTAL |
|---|---|---|---|---|---|---|
| YOY | -7% | 7% | -5% | 24% | -7% | -6% |
| vs. 2008 | -34% | 25% | 34% | 3% | -35% | -35% |

### Key Insights

- Facility Construction & Maintenance emissions represent the largest share of this division, so their reductions of 20 tCO2e year over year and 140 tCO2e versus 2008 levels contribute the most to the total reductions for the division. These reductions in 2014 came primarily from decreased natural gas use at buildings such as MY Place, WAG, and Municipal Hall.
- Increases in emissions in Village Maintenance and Parks and Trail Maintenance are relatively small, with no more than ~10 tCO2e increases year over year in either department. However, Village Maintenance, Landscaping, and Parks and Trail Maintenance divisions are all above 2008 benchmark levels.

### 4.2.4 Key Corporate GHG Emission Performance Insights

**Overall**

- RMOW corporate emissions are up 4% YOY but are still 35% lower than the 2008 benchmark year and 13% lower than the emissions target for this year.
- Large reduction in GHG emissions in previous years were largely due to upgrades at Meadow Park Sports Centre, a decrease in BC Hydro's emission factor for electricity, and also a reduction in consumption across departments, specifically in Infrastructure Services. However, since many of the larger retrofit projects were completed in previous years, consumption in 2014 stayed relatively constant or increased in many departments, which resulted in an overall increase in emissions year over year.

**Divisional Insights**

- Infrastructure Services' emissions increased by 14% year over year, mainly as a result of increased natural gas consumption at the WWTP, and an increase in the Transportation department's mobile fuel use. Current levels are still this division are currently 13% lower than 2008 benchmark levels.
- Corporate and Community Services emissions increased by 2% year over year. However, there has been a 54% decrease in emissions since the 2008 base year, mainly due to upgrades at MPSC.
- REX was the only major division that saw an emissions decrease in 2014 (-6%), and the majority of this decrease was due to a decrease in stationary natural gas use in Facilities, Construction & Maintenance (specifically at MY Place, WAG, and Municipal Hall)
- Municipal buildings with the lowest energy intensity of GHG emissions include the following: (all expressed as kgCO2e/ft2/year)
  - *Lost Lake Passivhaus: 0.07*
  - *Spruce Grove Field House 0.16*
  - *Whistler Public Library 0.29*[10]

## 4.3 CORPORATE ENERGY CONSUMPTION

Section 4.3 deals specifically with the energy consumption associated with RMOW corporate operations. This section includes information pertaining to energy consumption targets, an overview of 2014 performance levels, and a short section on key associated insights and trends.

### 4.3.1 Corporate Energy Consumption Reduction Targets

The RMOW does not currently have any formally adopted targets for corporate energy consumption. The existing RMOW Integrated Energy, Air Quality and GHG Management Plan does, however, include recommended corporate energy consumption targets for 'consideration' (p. 58). These recommended energy consumption targets for municipal operations are: year 2010 (64,000 GJs), and year 2020 (55,000 GJs).

The RMOW Carbon Neutral Operations plan does not include formal targets but rather recommends ongoing commitment to energy conservation as both (a) the primary strategy for reducing corporate GHG emissions, and (b) an important means of controlling ongoing utility and fuel costs across corporate operations.

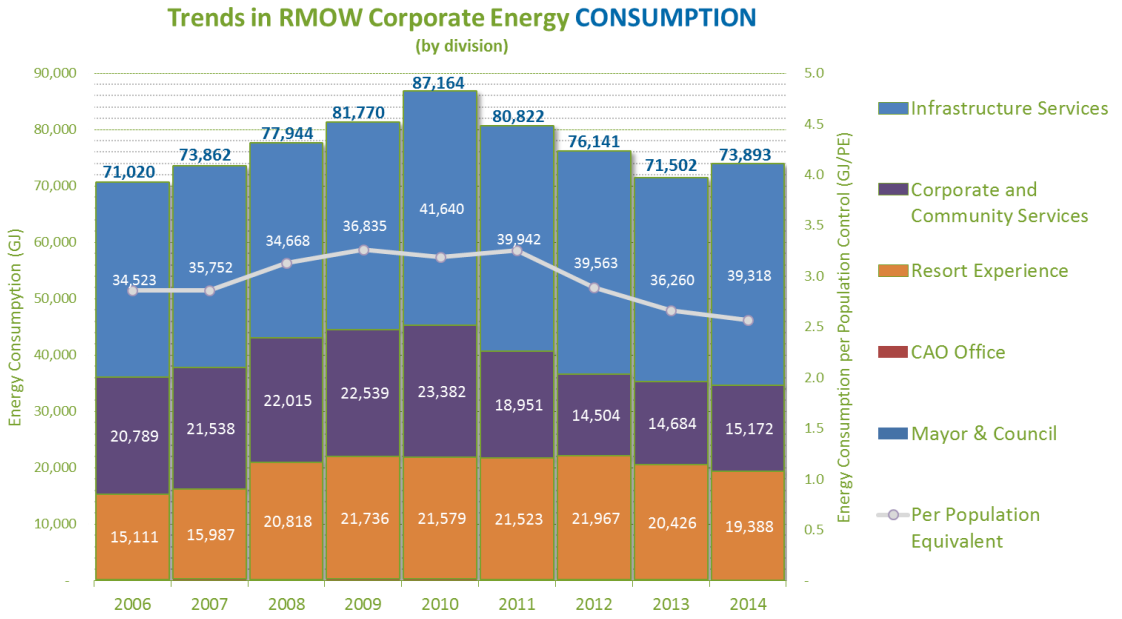
NOTE: the OCP Amendment Bylaw 1983, 2011 includes a commitment to update the Community Energy & Emissions Plan every five years. When updated, this new community energy plan will include a

[10] For reference, MY Place emits 2.10 kgCO2e/ft2/year

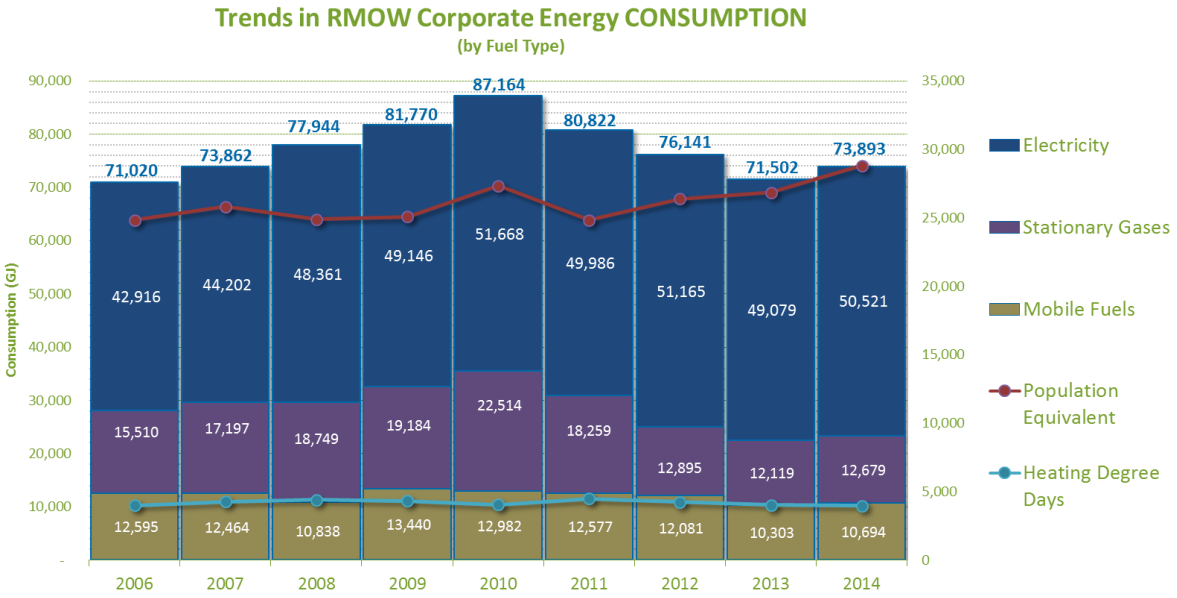
community and corporate engagement process that should provide a suitable forum for the consideration of any future formalized corporate energy consumption targets for municipal operations.

### 4.3.2 Corporate Energy Consumption Performance

Total corporate energy consumption increased in 2014 by 3% to **73,893 GJ/year**. This is still above the 2010 target recommended within the RMOW Integrated Energy Plan (64,000 GJ/year), and considerably higher than the upcoming 2020 target (55,000 GJ). The nine-year trends in corporate energy consumption are presented below:

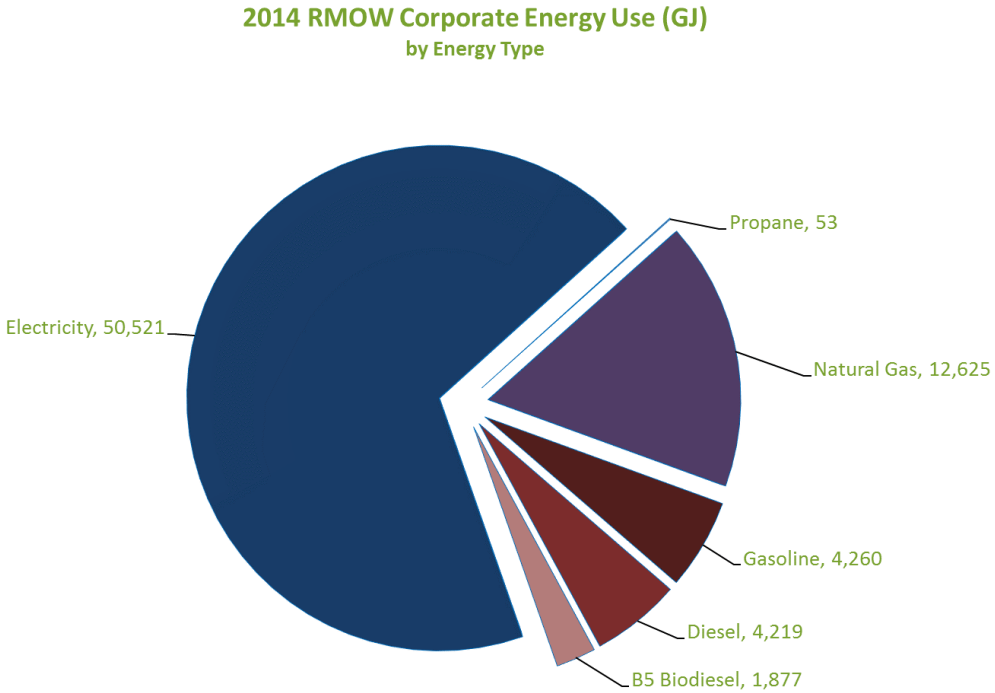



If the corporate energy consumption is subdivided by fuel type rather than by organizational division, the nine-year trends appear as follows:

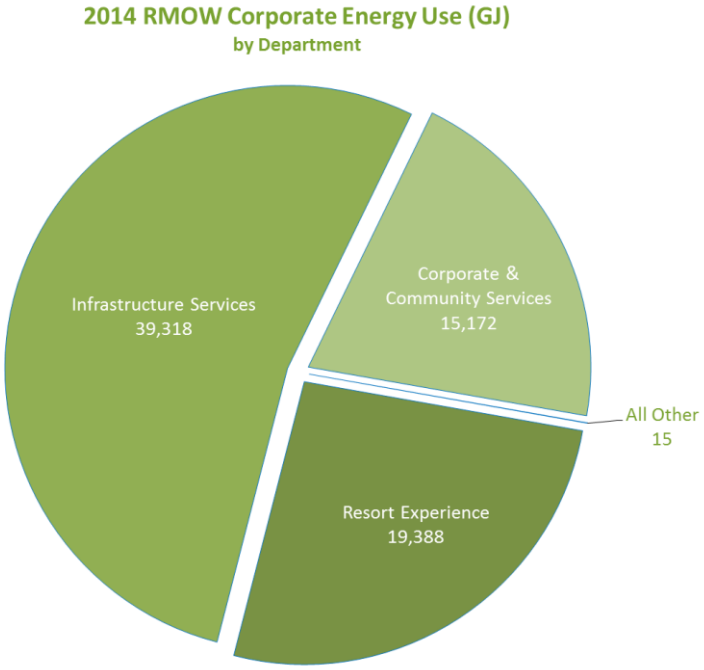


Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 68.4% of the total consumption, followed by natural gas (17.1%), and mobile fuels (14.5%).

A more detailed breakdown of 2013 corporate energy consumption, presented by energy type, is included below:



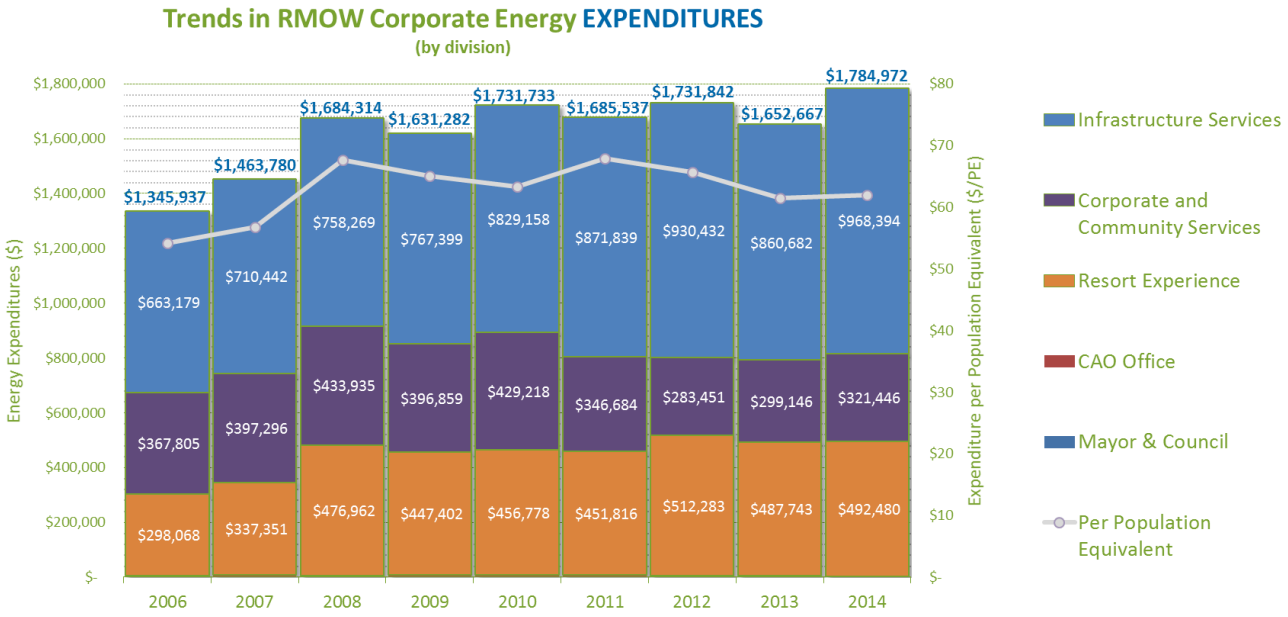

Finally, 2013 energy consumption by division is included for reference below:



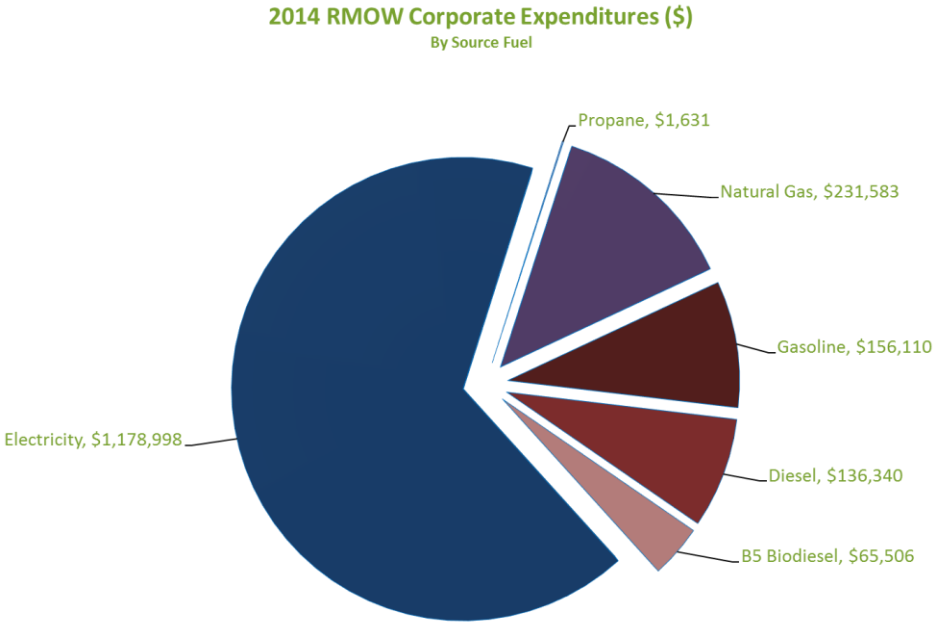
## Corporate Energy Expenditures

Total 2014 corporate energy expenditure increased by approximately 8% to a total of $1.78 million in 2014. Note that the increase in expenditures is greater than the increase in consumption. Further conservation will be the key to controlling future expenditures at a level consistent with the current budgets given the ongoing trends in rate inflation (with the exception of recent natural gas rate changes, utility rate inflation continues to generally exceed the Consumer Price Index (CPI)).

The nine-year trends in total corporate energy expenditure are presented below:




2014 corporate energy expenditures by fuel type are presented in the following chart:



### 4.3.3 Performance of Key Corporate Buildings

Across its operations, the RMOW has made investments into energy efficiency and green building technologies for more than a decade. The benefits of these initiatives vary according to the project, but include reduced GHG emissions, reduced energy consumption, decreased energy expenditures, healthier buildings and decreased materials and resources within the construction process. For the purposes of this report, an update on energy consumption, expenditure and emissions is provided for key buildings across RMOW operations.

**Whistler Public Library**

Whistler Public Library (WPL) opened in 2008 as Whistler's first LEED Gold certified building. The building has won numerous awards, including BC Wood Works award for innovative hemlock construction methods, as well as the Lieutenant-Governor Award in Architecture.

Energy performance at the WPL indicates that the building is operating at more than 64% better than the Model National Energy Code for Buildings (MNECB). At this level of performance (~840 GJ/yr.), annual utility costs are running approximately $22,000 less than had the building been built to typical building code standards (MNECB).

**Spruce Grove Field House**

In 2001, the RMOW chose to install a geo-exchange heat pump instead of a gas furnace at SGFH. The incremental cost of the GHX equipment was $126,350, however the system was forecast to reduce operating costs by $21,800/year thereby producing an expected simple pay back (SPB) period of 5.8 years and an internal rate of return (IRR) on invested capital of 16.5%.

Actual annual reductions in energy costs have averaged $20,700 since the installation of the GHX equipment, producing a SPB of 6.1 years (IRR of 15.5%). As of 2008, the incremental cost of the GHX system had been fully recovered and annual utility savings continue to run at approx. $18,000/year versus the forecasted gas-powered furnace baseline. 2014 annual energy costs at SGFH were less than $10,000 ($1.67/ft2/year; 163 kWh/m2/year). Annual GHG emissions from SGFH were 0.94 tCO2e (emissions with a gas furnace were forecasted at 56-67 tCO2e/year).

**Meadow Park Sports Centre**

In 2010, a $930,000 energy system upgrade was installed at MPSC. The new system incorporated both evacuated tube solar technology and a vertical loop geo-exchange bore field. The system design employs the solar panels to pre-heat the domestic hot water loads directly, while the heat pumps draw heat from the ground (70 boreholes at 155' depth) to serve the various pool loads within the building (lap pool, leisure pool & hot tub).Utility cost reductions that were anticipated as a result of these upgrades were estimated at $115,000 - $130,000/ year (SPB: 6.5 – 7.8 years; IRR: 10% - 13%), with annual GHG reductions forecasted at 300-350 tCO2e/year.

While the finalization of the project construction and commissioning phases was delayed until mid-2011, the system is now fully functional and working well. In 2014, annual energy expenditures at MPSC were $256,482, a 7% increase from 2013 expenditures, but still 32% ($123,000/yr) lower than 2008 base year expenditures. Note that year over year increase is due to a 4% increase in energy consumption, coupled with an increase in electricity rates.

**Lost Lake PassivHaus**

The $1.5 million project was the result of partnership between the RMOW, the Austria Passive House Group (APG) and Sea-to-Sky Consulting. A grant from the Whistler Blackcomb foundation was also instrumental to the realization of this project. The Passive House (PH) approach to construction uses radically improved building envelope design and components to achieve dramatic reductions in building energy consumption of approx. 90% compared with standard Building Code construction. This energy usage translates into has less than half of the energy consumption of a Platinum LEED house – Canada's current high standard for "green"

building. The small amount of heating energy which is still needed in a Passive House can then be supplied via the ventilation air stream. Passive houses are well established in Europe with over 17,000 existing passive units; approximately 4,000 of these are in Austria.

In partnership with BC Hydro, the RMOW tracked the energy consumption at the LLPH from Jan of 2011 to Dec '12 using a real time Energy Management Information System (EMIS). At the end of the pilot project, the results showed that all building heating loads (including hot water) consumed 2,922 kWh (11.7 kWh/m2/yr), and all other loads in the building combined for a total of 15,156 kWh (60 kWh/m2/yr) – both values well inside the limits allowable within the rigorous passive house certification protocol.

The bottom line is that over the course of an entire year, it cost only $250 to provide all the heat required by this 2,700 ft2 building (a typically built building in our climate would consume approx. 10 times this amount).

### 4.3.4 Key Corporate Energy Consumption Performance Insights

#### Energy Consumption

**Overall**

- Corporate energy consumption increased in 2014 for the first time since 2010. Corporate consumption was 3% higher in 2014 than it was in 2013, but this level is still approximately 4,000 GJ lower than 2008 benchmark levels.

**Divisional Insights**

- Corporate and Community Services and Infrastructure Services both saw year over year increases of energy consumption (3% and 8% respectively). Resort Experience saw a decrease in consumption of 5% below 2013 levels.
- Infrastructure Services' consumption level is still 13% higher than 2008 base year levels.
- Resort Experience's consumption levels have decreased to 7% below base year levels, while Corporate and Community Services continue to see the largest consumption decrease, currently sitting at 31% less energy use compared to 2008.

#### Energy Expenditures

**Overall**

- Overall 2014 energy expenditures across municipal operations increased by 8% year over year to ~$1.78M. Current expenditures have increased by approximately $100,000 (6%) from benchmark 2008 levels.
- Electricity makes up over $1M/yr of the total corporate energy expenditure.

**Divisional Insights**

- Corporate and Community Services' energy expenses increased year over year by 7%. However, CCS's expenditures are still over $112,000 lower than benchmark 2008 levels, primarily related to savings achieved at MPSC.
- Year over year, Infrastructure Services and Resort Experience both saw increases in expenditures (13% and 1%, respectively). The large increase in Infrastructure Services is due to an increase in mobile fuel use in the Transportation department, and an in natural gas consumption at the WWTP. Opposite trends in these factors contributed to a decrease between 2012 and 2013.
- Upgrades in energy efficiency across the operation have yielded solid, expected returns on investment. However, without further investments in additional energy efficiency and conservation across the operation, continued increases in energy expenses are likely.

# 5 CLOSING COMMENTS

The impact of changing climatic conditions – especially reliable snow patterns – has the potential to substantially impact Whistler's primary economic engine – tourism. Informed, strategic planning that considers and evaluates the impacts of the issues related to climate change and rising fuel costs (on which Whistler's economy is fundamentally dependent) can help to ensure that Whistler is best positioned to maintain its success into the future.

Energy management as sound fiscal management is seen as a key priority by leading organizations both across our community, and beyond. As such, RMOW staff are committed to tracking corporate and community level energy consumption, expenditures, and associated greenhouse gas emissions on an annual basis. Moreover, our community is vocally concerned about both effective energy management and the ongoing mitigation of our local contributions to global climate change, and they continue to tell us so across a variety of community engagement channels.

Accurate, detailed data is fundamental to these discussions; information like that which is included within this report will continue to provide a strong basis for informed decision-making as our community measures its success, matures, evolves, and thrives in the coming decades.

Emissions from our corporate and community inventories are not the only emissions related to the activities of our community – as a community premised on destination tourism, there are significant emissions associated with the travel to, and from Whistler. While precise data on the scale of these emissions is difficult to quantify, the research undertaken during the creation of our existing Integrated Energy, Air Quality and GHG Emissions Management Plan did endeavor to estimate the approximate level of these emissions. By using visitor point-of-origin data from Tourism Whistler research and applying typical distance-based emission factors for various travel modes, a total estimate of 'inter-community' estimated GHG emissions was calculated for the year 2000. Assuming a relatively stable point-of-origin mix, and then applying total annual visitation numbers, inter-community travel emissions have been coarsely estimated for each year from 2001 through 2014. In approximate terms, inter-community travel emissions likely represent 5-10 times the total footprint included within our community inventory. Given its scale and relation to our community economic engines, this is an issue that should not be overlooked within Whistler's ongoing discussions of climate mitigation and adaptation approaches.

# 6 APPENDICES

| | |
|---|---|
| A | Whistler Updated 2014 Community Energy & Emissions Inventory |
| B | RMOW 2014 Corporate Energy & Emissions Inventory |
| C | Summary of Emission Factors |
| D | Summary of Corporate Carbon Neutral Commitment<br>• RMOW Carbon Footprint<br>• Verified Emission Reductions (VERs) |

# APPENDIX C – Summary of Emission Factors

## Summary of Emission Factors

based on 2012 BC Best Practices Methodology for Quantifying GHG Emissions, BC Ministry of Environment (Sept, 2012)

### Stationary Emissions

| Source Fuel | TOTAL (Petro) | | Key Conversion | |
|---|---|---|---|---|
| | t CO2e/GJ | tCO2e/litre | | |
| Natural Gas | 0.0503 | n/a | | |
| Propane | 0.0610 | 0.001544 | 0.025310 | GJ/litre |
| Diesel (B0) | 0.0728 | 0.002790 | 0.038300 | GJ/litre |

### Mobile Emissions

#### Light Duty Vehicles

| Source Fuel | TOTAL (Petro) | | TOTAL (Bio) | | TOTAL (All) | | Key Conversion | |
|---|---|---|---|---|---|---|---|---|
| | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | | |
| Gasoline (E0) | 0.0709 | 0.00248 | 0.00000 | 0.0000 | 0.0709 | 0.002483 | 0.03500 | GJ/litre |
| E5 Gasoline | 0.0675 | 0.00236 | 0.00319 | 0.0001 | 0.0707 | 0.002436 | 0.03500 | GJ/litre |
| E10 Gasoline | 0.0641 | 0.00224 | 0.00638 | 0.0001 | 0.0705 | 0.002389 | 0.03500 | GJ/litre |
| Diesel (B0) | 0.0713 | 0.00273 | 0.00000 | 0.0000 | 0.0713 | 0.002732 | 0.03830 | GJ/litre |
| B4 Diesel (RLCFR) | 0.0685 | 0.00262 | 0.00275 | 0.0001 | 0.0713 | 0.002722 | 0.03830 | GJ/litre |
| B5 Diesel | 0.0678 | 0.00260 | 0.00343 | 0.0001 | 0.0712 | 0.002720 | 0.03830 | GJ/litre |
| B10 Diesel | 0.0643 | 0.00246 | 0.00687 | 0.0002 | 0.0711 | 0.002707 | 0.03830 | GJ/litre |
| B20 Diesel | 0.0572 | 0.00219 | 0.01373 | 0.0003 | 0.0710 | 0.002681 | 0.03830 | GJ/litre |
| Propane | 0.0605 | 0.00153 | 0.00000 | 0.0000 | 0.0605 | 0.001532 | 0.02531 | GJ/litre |
| Natural Gas | 0.0562 | | 0.000000 | 0.0000 | 0.0562 | | 0.05379 | GJ/kg |

#### Light Duty Trucks (incl. SUVs & Minivans)

| Source Fuel | TOTAL (Petro) | | TOTAL (Bio) | | TOTAL (All) | | Key Conversion | |
|---|---|---|---|---|---|---|---|---|
| | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | | |
| Gasoline (E0) | 0.0720 | 0.00252 | 0.00000 | 0.0000 | 0.0720 | 0.002519 | 0.03500 | GJ/litre |
| E5 Gasoline | 0.0685 | 0.00240 | 0.00319 | 0.0001 | 0.0717 | 0.002471 | 0.03500 | GJ/litre |
| E10 Gasoline | 0.0650 | 0.00228 | 0.00638 | 0.0001 | 0.0714 | 0.002422 | 0.03500 | GJ/litre |
| Diesel (B0) | 0.0713 | 0.00273 | 0.00000 | 0.0000 | 0.0713 | 0.002733 | 0.03830 | GJ/litre |
| B4 Diesel (RLCFR) | 0.0685 | 0.00262 | 0.00275 | 0.0001 | 0.0713 | 0.002722 | 0.03830 | GJ/litre |
| B5 Diesel | 0.0678 | 0.00260 | 0.00343 | 0.0001 | 0.0713 | 0.002720 | 0.03830 | GJ/litre |
| B10 Diesel | 0.0643 | 0.00246 | 0.00687 | 0.0002 | 0.0712 | 0.002707 | 0.03830 | GJ/litre |
| B20 Diesel | 0.0572 | 0.00219 | 0.01373 | 0.0003 | 0.0710 | 0.002681 | 0.03830 | GJ/litre |
| Propane | 0.0605 | 0.00153 | 0.00000 | 0.0000 | 0.0605 | 0.001532 | 0.02531 | GJ/litre |
| Natural Gas | 0.0562 | | 0.000000 | 0.0000 | 0.0562 | | 0.05379 | GJ/kg |

#### Heavy Duty Vehicles

| Source Fuel | TOTAL (Petro) | | TOTAL (Bio) | | TOTAL (All) | | Key Conversion | |
|---|---|---|---|---|---|---|---|---|
| | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | | |
| Gasoline (E0) | 0.0672 | 0.00235 | 0.00000 | 0.0000 | 0.0672 | 0.002352 | 0.03500 | GJ/litre |
| E5 Gasoline | 0.0640 | 0.00224 | 0.00319 | 0.0001 | 0.0672 | 0.002235 | 0.03500 | GJ/litre |
| E10 Gasoline | 0.0607 | 0.00212 | 0.00638 | 0.0001 | 0.0671 | 0.002117 | 0.03500 | GJ/litre |
| Diesel (B0) | 0.0708 | 0.00271 | 0.00000 | 0.0000 | 0.0708 | 0.002712 | 0.03830 | GJ/litre |
| B4 Diesel (RLCFR) | 0.0680 | 0.00260 | 0.00275 | 0.0001 | 0.0708 | 0.002722 | 0.03830 | GJ/litre |
| B5 Diesel | 0.0673 | 0.00258 | 0.00343 | 0.0001 | 0.0707 | 0.002720 | 0.03830 | GJ/litre |
| B10 Diesel | 0.0638 | 0.00244 | 0.00687 | 0.0002 | 0.0707 | 0.002707 | 0.03830 | GJ/litre |
| B20 Diesel | 0.0568 | 0.00218 | 0.01373 | 0.0003 | 0.0705 | 0.002681 | 0.03830 | GJ/litre |

#### Off Road Vehicles

| Source Fuel | TOTAL (Petro) | | TOTAL (Bio) | | TOTAL (All) | | Key Conversion | |
|---|---|---|---|---|---|---|---|---|
| | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | t CO2e/GJ | tCO2e/litre | | |
| Gasoline (E0) | 0.0675 | 0.00236 | 0.00000 | 0.0000 | 0.0675 | 0.002361 | 0.03500 | GJ/litre |
| E5 Gasoline | 0.0642 | 0.00225 | 0.00319 | 0.0001 | 0.0674 | 0.002243 | 0.03500 | GJ/litre |
| E10 Gasoline | 0.0609 | 0.00213 | 0.00638 | 0.0001 | 0.0673 | 0.002125 | 0.03500 | GJ/litre |
| Diesel (B0) | 0.0785 | 0.00301 | 0.00000 | 0.0000 | 0.0785 | 0.003007 | 0.03830 | GJ/litre |
| B4 Diesel (RLCFR) | 0.0754 | 0.00289 | 0.00275 | 0.0001 | 0.0782 | 0.002722 | 0.03830 | GJ/litre |
| B5 Diesel | 0.0746 | 0.00286 | 0.00343 | 0.0001 | 0.0781 | 0.002720 | 0.03830 | GJ/litre |
| B10 Diesel | 0.0707 | 0.00271 | 0.00687 | 0.0002 | 0.0776 | 0.002707 | 0.03830 | GJ/litre |
| B20 Diesel | 0.0630 | 0.00241 | 0.01373 | 0.0003 | 0.0767 | 0.002681 | 0.03830 | GJ/litre |

# APPENDIX D –Summary of 2014 Corporate Carbon Neutral Commitment

## RMOW Energy and GHG Emissions Assessment - 2014

By Division, Department, and Worksgroup - showing potential carbon carbon costs related to 'neutrality' commitment

| Division | Dept. | Workgroup | Organizational Unit | Totals GHGs (tCO2e) | | carbon cost ($) (not GST) |
|---|---|---|---|---|---|---|
| **1100** | | | **Mayor & Council** | **0.29** | $ | **7.29** |
| | 1101 | | Mayor & Council | 0.29 | $ | 7.29 |
| | | | | - | | |
| **1200** | | | **CAO Office** | **4.39** | $ | **109.67** |
| | 1201 | | Administrator | 4.38 | $ | 109.47 |
| | 3100 | | Human Resources | 0.01 | $ | 0.20 |
| | | | | - | | |
| **5000** | | | **Resort Experience** | **438.19** | $ | **11,107.33** |
| | 5100 | | General Manager | 4.43 | $ | 110.84 |
| | 1401 | | Partnership & Economic Services | 0.00 | $ | 0.07 |
| | 5200 | | Resort Parks Planning | 1.84 | $ | 45.90 |
| | 1402 | | Village Animation | 3.44 | $ | 86.02 |
| | 5400 | | Resort Planning | 1.50 | $ | 37.42 |
| | 5300 | | Park/Village Operations | 415.98 | $ | 10,552.09 |
| | 7200 | | Building Dept. | 9.38 | $ | 234.56 |
| | 8300 | | Environment Stewardship | 1.62 | $ | 40.44 |
| | | | | - | | |
| **6000** | | | **Infrastructure Services** | **694.86** | $ | **17,598.34** |
| | 6100 | | General Manager | 2.45 | $ | 61.25 |
| | 6200 | | Development Services | 0.02 | $ | 0.58 |
| | 6400 | | Transportation | 255.15 | $ | 6,454.92 |
| | 6500 | | Central Services | 6.61 | $ | 165.37 |
| | 6600 | | Environmental Operations | 153.81 | $ | 3,921.39 |
| | 8200 | | Water Utility | 31.73 | $ | 793.33 |
| | 8300 | | Sewer Utility | 237.73 | $ | 5,943.32 |
| | 6600 | | Solid Waste | 7.21 | $ | 256.54 |
| | 6800 | | Transit | - | $ | - |
| | 6800 | | Emergency Planning | 0.07 | $ | 1.63 |
| | | | | - | | |
| **7000** | | | **Corporate & Community Services** | **372.51** | $ | **9,312.66** |
| | 7100 | | CCS General | 0.10 | $ | 2.56 |
| | 2200 | | Lesgislative Services | 0.68 | $ | 16.92 |
| | 2300 | | Financial Services | 0.42 | $ | 10.39 |
| | 2400 | | Fiscal Planning | 0.29 | $ | 7.37 |
| | 2500 | | Information Technology | 1.46 | $ | 36.59 |
| | 4100 | | Bylaw | 19.12 | $ | 478.03 |
| | 4300 | | Fire | 56.54 | $ | 1,413.56 |
| | 5800 | | Meadow Park Sports Centre | 267.94 | $ | 6,698.38 |
| | 4200 | | RCMP | 0.84 | $ | 20.95 |
| | 5500 | | Whistler Public Library | 1.35 | $ | 33.68 |
| | 5700 | | Recreation | 23.77 | $ | 594.24 |
| | | | | - | | |
| | | | | **1,510.24** | $ | **38,135.28** |

## Verified Emission Reduction (VERs)

**2010 – 2012 Carbon Neutrality:** The RMOW has purchased and retired Verified Emission Reduction credits equal to its entire corporate carbon footprint for every year between 2010 and 2012 inclusive. A summary is provided below:

| Year | VERs | Project | Certification Standard | Registry | Vendor |
|---|---|---|---|---|---|
| 2010 | 1,145 tonnes | Mare Monastir Wind Farm, Turkey | Gold Standard – project reference: GS368 | GS APX Registry | Offsetters Clean Technology Inc. |
| | 1,145 tonnes | Sun Select Aldegrove Biomass Boiler, British Columbia | ISO 14064-3 and CDM additionality tool | Markit Registry | Offsetters Clean Technology Inc. |
| 2011 | 1,063 tonnes | Mare Monastir Wind Farm, Turkey | Gold Standard – project reference: GS368 | Markit Registry | Offsetters Clean Technology Inc. |
| | 1,063 tonnes | Sun Select Aldegrove Biomass Boiler, British Columbia | ISO 14064-3 and CDM additionality tool | Markit Registry | Offsetters Clean Technology Inc. |
| 2012 | 973 tonnes | Mare Monastir Wind Farm, Turkey | Gold Standard – project reference: GS368 | Markit Registry | Offsetters Clean Technology Inc. |
| | 974 tonnes | Sun Select Aldegrove Biomass Boiler, British Columbia | ISO 14064-3 and CDM additionality tool | Markit Registry | Offsetters Clean Technology Inc. |

**2013 and 2014 Carbon Neutrality**. The RMOW, in support of the Cheakamus Community Forest (CCF) has delayed the purchase of VERs to allow time for the CCF to fully finalize the the creation of third-party certified VERs locally. The CCF has recently finished the validation and verification processes for its first tranche of offsets. More information about the project can be found on the Cheakamus Community Forest (CCF) website (http://www.cheakamuscommunityforest.com/ccf-projects/)

RMOW staff feel that the benefits of supporting a local offset project, the co-benefits associated with the project approaches, and the independent, third party rigour that is being applied to the CCF project, justify the delay in achieving formal neutrality with respect to 2013 and '14 corporate operations.

The RMOW is currently in negotiations with the CCF to purchase offsets to fully neutralize both the 2013 and 2014 corporate operations.

Consistent with our commitments in both the UBCM Climate Action Charter, and the RMOW Carbon Neutral Plan, the RMOW remains committed to achieving carbon neutrality with respect to all corporate operations. All RMOW departments have been charged internally for the costs associated with the RMOW carbon neutrality commitments. All departments continue to use the price signals that these costs imply ($25/tCO2e) to improve financial decision making and preference cost-effective projects and initiatives that are capable of continuously reducing carbon emissions, and decreasing carbon costs across corporate operations. See Appendix D above for more detail.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4325 Blackcomb Way
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**www.whistler.ca**

**TEL** 604 932 5535
**TF** 1 866 932 5535
**FAX** 604 935 8109