# WHISTLER ENERGY CONSUMPTION AND GREENHOUSE GAS PERFORMANCE TRENDS 2018 ANNUAL REPORT

Corporate, Economic & Environmental Services Department The Resort Municipality of Whistler | July 2019





# TABLE OF CONTENTS

1 E	XECU	TIVE SUMMARY	1				
2 II	NTRO	DUCTION	5				
2.1 2	BAC 2.1.1	KGROUND Whistler2020 Whistler's Community Energy Planning – A Brief History	6				
3 C	соми	IUNITY PERFORMANCE	9				
		MMUNITY GREENHOUSE GAS EMISSIONS					
	8.1.1	Community GHG Reduction Target	9				
3	8.1.2	Community GHG Emission Performance	11				
	3.1.3	Key Community GHG Performance Insights	19				
3.2	COI	MMUNITY ENERGY CONSUMPTION & ENERGY EXPENDITURES	21				
	3.2.1	Community Energy Reduction Target	21				
3	3.2.2	Community Energy Consumption Performance	22				
3	3.2.3	Community Energy Expenditure Performance					
3	3.2.4	Key Community Energy Consumption & Energy Expenditure Performance Insights	28				
4 CORPORATE PERFORMANCE							
4.1	KEY	CORPORATE INSIGHTS AND SUMMARY	31				
4.2	COF	PORATE GREENHOUSE GAS EMISSIONS	32				
4	1.2.1	Corporate GHG Reduction Targets	32				
4	1.2.2	Corporate GHG Performance					
4	1.2.3	Divisional Trends	35				
	1.2.4	Key Corporate GHG Emission Performance Insights	38				
4.3	COF	PORATE ENERGY CONSUMPTION	39				
	1.3.1	Corporate Energy Consumption Reduction Targets	39				
4	1.3.2	Corporate Energy Consumption Performance	39				
	1.3.3	Performance of Key Corporate Buildings					
4	1.3.4	Key Corporate Energy Consumption Performance Insights	44				
5 C	CECAP	IMPLEMENTATION UPDATES	45				
5.1	REC	UCTION/MITIGATION INITIATIVES	46				
5.2	ADA	APTATION INITIATIVES	57				
6 C	CLOSI	IG COMMENTS	62				
APPEN	DICES		62				

#### EXECUTIVE SUMMARY 1

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. Finally, this report also includes a progress update on key Community Energy & Climate Action Plan (CECAP) implementation progress.

#### COMMUNITY-WIDE PERFORMANCE

2018 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 56%, followed by natural gas consumption at 34% (primarily used for space and water heating).

The community of Whistler has committed to community-level greenhouse gas reductions of:

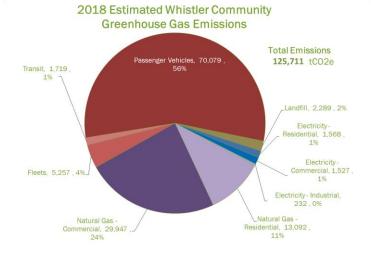
- 33% by 2020; •
- 80% by 2050; and •
- 90% by 2060 (each versus 2007 levels).

From 2008 until 2012, the community managed to remain on pace towards these targets, averaging annual reductions of approximately 3.8% per year - however from 2014 through 2018 community results indicate that Whistler is no longer on pace to meet the community's 2020 target GHG reduction level. From 2014 to 2017, emissions have increased by an average of 4.7%. In the most recent year, emissions have declined by 3% compared to the previous year, reversing the recent trend of increasing emissions. Emissions are now 5% below 2007. This is in comparison to total GHG reductions of 19% in 2013, giving up much of the early years' improvements.

Total community GHG emissions in 2018 are estimated to be 125,711 tC02e1 (5% lower than 2007 levels, 12% lower than 2000 levels, and 3% below 2017 levels).

From a GHG emissions intensity perspective, estimated 2018 GHG emissions per population equivalent<sup>2</sup> levels have increased year over year by 3% to 3.66 tCO2e/PE, as population equivalent has dropped

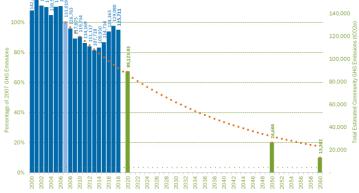
http://www.whistler2020.ca/whistler/site/genericPage.acds?instanceid=2985334&context=2985223



<sup>&</sup>lt;sup>1</sup> Carbon dioxide equivalent (or CO<sub>2</sub>e) 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<sub>2</sub>) as the reference. <sup>2</sup> 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:



WHISTLER - Total Estimated Community GHG Emissions



faster (-5%) compared to community level emissions (-3%). This intensity level is 26% lower than 2007 levels, and is the fourth lowest annual per capita measure since detailed record keeping began in 2000.

Looking ahead, the key challenge for the community continues to be slowing the recent growth in emissions, and regaining the rate of reduction when 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. Given the distribution of emissions within the community, **a significant reduction in emissions from passenger vehicle and natural gas use** will be critical to achieving the required reductions needed to regain the targeted reduction curve.

To achieve the Official Community Plan's 2020 GHG target, annual reductions of  $\sim$ 18,300 tonnes of CO2e would be

required for each of the next two years (approx. a 15% reduction each year). This level of reduction is highly improbable and **the community's 2020 GHG emission reduction target will not be achieved.** 

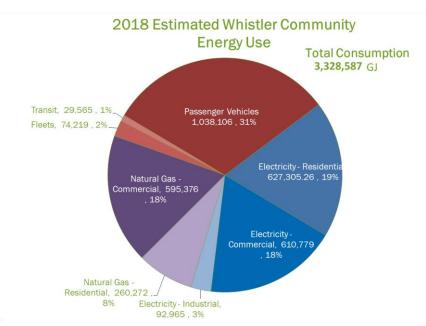
160,000

**2018** COMMUNITY ENERGY CONSUMPTION & EXPENDITURES: Electricity is the most prevalent type of energy consumed in Whistler, at 40% of the total consumption, followed by vehicle fuels (~34%), and natural gas at 26% of total consumption.

Total community energy consumption in 2018 is estimated to be 3.33 million GJ (up approximately 7% from 2007 levels, but down by 3% year over year). The annual decline is at least partly driven by a warner 2018 winter (7.1% warmer than 2017), as well as decline in local population equivalent (down by 5% vs. 2017 levels).

## Community energy

consumption since the base commitment year of 2007 has followed a generally similar pattern as community GHG emissions. From 2011 through to 2014 Whistler achieved small but consistent reductions in total energy



consumption, while from 2015 to 2017, energy consumption increased, reaching an all-time high in 2017. In 2018, energy use declined by 3%. At the same time, similar to the recent emissions trends, total energy consumption per population equivalent has decreased for six of the last eight years. 2018 levels are down markedly compared to 2007 levels (-17%), but are 2% higher than the previous year.

The estimated annual **collective energy expenditure within Whistler has increased by approximately \$44 million since 2000 (\$93 million vs. \$49 million/yr), an increase of 89%.** Energy expenditures for residential buildings now total approximately \$24 million/year, with commercial building expenditures totaling approximately \$23 million on an annual basis (passenger vehicles and fleets make up the remainder). As such, 2018 marks the second consecutive year that residential energy expenditures exceeded commercial expenditures. Total passenger vehicle estimated expenditures increased to an estimated \$44M/year (+12% YOY) due to fuel price increases more than offsetting slightly lower passenger vehicle demand (-1.3% compared to 2017). Total estimated passenger vehicles fuel expenditures represent an increase of approximately \$25 million/yr as compared to 2000 levels.

2018 energy expenditures per population equivalent increased by 5% compared to 2017 levels.

Finally, over the long term it is expected that energy rates will continue to outpace inflation. In addition, continued increases to the costs of carbon pollution (due to B.C.'s carbon tax and other regulatory measures) will drive further fossil fuel related energy expenditure increases. As such, if current energy use trends continue, it is expected that the combined community expenditure will continue to rise faster than our collective ability to pay for it. A fact that underscores the importance of increasing community-wide energy conservation and energy efficiency, and switching to non-carbon based energy sources.

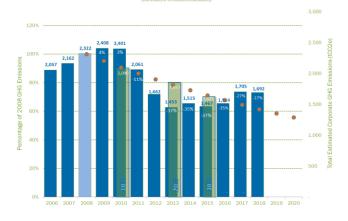
#### 2018 CORPORATE OPERATIONS PERFORMANCE

**2018 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 2018 were 1,692 tCO2e. This level of emissions is 1% below 2017, but 15% above the recent low in 2015. Corporate emissions are approximately 27% below the 2008 benchmark (the reference year for RMOW target setting). Emissions per population equivalent have declined by 47% compared to 2008.

As demonstrated in the chart to the right, 2018 corporate emissions are no longer below the 2015 annual GHG emission level targeted in the 2009 Carbon Neutral Operations Plan. Currently the RMOW does not have corporate targets beyond 2015, but 2018 levels are neither below the last 2015 target nor the extrapolated reduction curve inferred by the Carbon Neutral Ops Plan targets (i.e an extended sequence of 4.75% annual reductions).





On a division-by-division basis, the relative emissions footprint of corporate operations is as follows: (47%) Infrastructure Services — which includes roads crews, solid waste systems, the water utility, and the sewer utility; (26%) Corporate and Community Services — including bylaw, fire, Meadow Park Sports Centre, and other recreation programs; and (27%) Resort Experience (REX) — which includes village maintenance operations, horticulture, turf, and irrigation crews, parks and trails, as well as facility construction and maintenance operations.

GHG emissions across corporate operations are produced primarily from combustion of natural gas at 49%, followed by use of mobile fuels (gasoline and diesels) at 43% and electricity at 8%.

The slight decline in 2018 corporate emissions were primarily driven by 14% decline of natural gas use at Meadow Park Sports Centre, lower natural gas use by Parks/Village operations (4% decline), offset by higher natural gas use by the sewer utility (+15%).

**2018** CORPORATE ENERGY CONSUMPTION & EXPENDITURES: Total corporate energy consumption decreased in 2018 by 7% year over year to 73,220 GJ/year. Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 62% of the total consumption, followed by natural gas (22%), and mobile fuels (15%).

All major departments used less energy compared to 2017. Resort Experience's energy consumption declined by 10%, Corporate and Community Services declined by 5% and Infrastructure Services declined by 3%. Resort Experience's consumption levels are 12% below 2008 benchmark levels while Infrastructure Services' current consumption level is 14% above the benchmark level. Corporate and Community Services continues to demonstrate the largest consumption decrease in relation to the 2008 benchmark year, consuming 32% less than 2008.

Overall, 2017 energy expenditures across municipal operations decreased by 1% to ~\$2.05M. This was primarily due to a ~7% decrease in the total electricity use, which makes up the largest portion of corporate energy expenditures (~\$1.53M/year), and helped offset rising electricity and mobile fuel rates. By division total energy expenses held constant for Infrastructure Services, while they decreased for resort Experience and Corporate and Community Services by 1% and 6% respectively.

#### COMMUNITY ENERGY & CLIMATE ACTION PLAN (CECAP) UPDATE

Section 5 of this Annual Report includes a detailed update on key RMOW- initiatives recommended within the CECAP for the second quarter of 2019. The update provides separate detail on mitigation (or energy and emission reduction) initiatives as well a sub-section on key initiatives related climate adaptation initiatives. Details include 2020 priorities where possible, and reflect the high level progress as of Q2, 2019.

The updates demonstrate that a wide range of activities have been undertaken, but it is also clear that the strategic emphasis for recent years mitigation initiatives continues to be transportation-sector initiatives; and for adaptation initiatives, wildfire protection.

#### SUMMARY COMMENTS

The impact of changing climatic conditions (see CECAP for more detail) has the potential to substantially impact the Whistler community. Informed, strategic planning that considers and evaluates the impacts of the issues related to climate change and rising long term 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's 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. The Whistler community 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 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<sup>3</sup>. The IPCC concluded in 2016 that "**Human influence on the climate system is clear; and that limiting climate change will require substantial and sustained reductions of GHG emissions**." Reducing Whistler's 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.

Recent reporting from California notes that, "...the state reached their 2020 carbon pollution reduction goal four years ahead of schedule – a reduction of 13 per cent from the 2004 peak, while the economy grew by 26 per cent in the same period". This is the type of shift that Whistler aspires to – a demonstration that GHGs can decrease while the economy remains strong; that a healthy, prosperous economic sector is not mutually exclusive with declining emission levels

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 3). The report includes detailed performance data, highlights key trends and insights, and benchmarks our performance against our Council-adopted Official Community Plan (OCP) targets. It is the intent of this report therefore, 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.

Similar to the 2017 Annual Performance Report, this report includes a brief update on CECAP implementation initiatives that are led by the organization. This update and associated details is included as Section 5 of this Report.

Finally, this is the 8<sup>th</sup> Performance Report that has been produced at this level of detail (2010, 2011, 2013 to 2017 available at <u>www.whistler.ca/climateaction</u>).

<sup>&</sup>lt;sup>3</sup> 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. <u>http://www.ipcc.ch/report/ar5/wg1/</u>

#### 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 annually monitoring its GHG emissions footprint. This commitment is evident in our dedication to long term planning, measurement and reporting of energy consumption and GHG emissions performance; the integration of energy and emission reduction goals into broader municipal policies and practices; as well as continued participation on provincial and national advisory committees.

#### 2.1.1 Whistler2020

The Whistler community understands that sustainability is not just about the environment; that three integrated (not just balanced) concepts – ecological integrity, fiscal viability, and social justice – point to a larger 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 was the product of thousands of voices across the 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 imbedded and integrated 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 were designed to act as a compass to help frame and guide decisionmaking and ongoing planning.

Working within the Whistler2020 framework, the community has aimed to steadily integrate the Sustainability Objectives into all aspects of community planning and development strategies – from Energy and Transportation strategies, to Economic and Visitor Experience strategies. Through the application of this approach, our community is striving to integrate climate change mitigation (and increasinglyt adapation) into a broad spectrum of community policies and operational practices.

#### Whistler's Sustainability Objectives are to:



Reduce and eventually eliminate the RMOW's contributions to systematic increases in concentrations of substances from the Earth's crust (e.g. by increasing energy efficiency),

Reduce and eventually eliminate the RMOW's contributions to **systematic** increases in concentrations of **substances produced by society** (e.g. through 100% recycling).



Reduce and eventually eliminate the RMOW's contributions to systematic physical degradation of nature (e.g. by purchasing certified wood), and

and in that society people are not subject to conditions that systematically...



Reduce and eventually eliminate our contribution to systematically undermining the ability of others to meet their basic human needs. (e.g. by purchasing FairTrade).

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

#### 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 the 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<sup>4</sup> 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.<sup>75</sup>** 

Currently approximately 180 BC communities are signatories to the Charter. By signing the Charter, 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.)<sup>6</sup>

<sup>&</sup>lt;sup>4</sup> The BC Climate Action Charter was eventually signed by more than 170 local governments across British Columbia.

<sup>&</sup>lt;sup>5</sup> The British Columbia Climate Action Charter, Section 1

<sup>&</sup>lt;sup>6</sup> 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*, required 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 integrated specific targets (discussed later in this report), policies, and actions within its Official Community Plan, and developed a Carbon Neutral Operations Plan.

In 2015 and 2016 staff undertook the process of updating the Whistler Integrated Energy Plan. Developed by a committee of more than 30 leaders from across the community, the new **Community Energy and Climate Action Plan (CECAP)** project updated the existing RMOW Integrated Energy, Air Quality and Greenhouse Gas Management Plan and set out new strategic directions for mitigating Whistler's contribution to climate change, included detailed 50 year climate projections for the Whistler area, and also recommended a series of adaptation strategies to prevent and minimize the likely impacts of 'locked-in' changes to future local climate regimes. The CECAP was endorsed by municipal Council on July 26, 2016 and is available online at: <a href="https://www.whistler.ca/climateaction">www.whistler.ca/climateaction</a>.

In 2017 and 2018, a further update to the Whistler Official Community Plan was initiated and continues to be in progress. The updated OCP significantly expands on previous climate and energy related content and now includes integrated content both within a new Climate Acton and Energy chapter as well as significant related content in the Transportation and Infrastructure chapters <u>www.whistler.ca/ocp</u>.



Building on the background and contextual elements presented in Section 2, Section 3 details how the community of Whistler is progressing toward its energy and emission reduction goals, Section 4 presents similar performance data for RMOW corporate operations, and Section 5 provides a brief 2018/19 update on the RMOW-led, CECAP-recommended initiatives.

# **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), from local traffic counter data (both provincial and municipal), from BC Transit, as well as from annual RMOW waste and recycling performance tracking. Sections 3.1 and 3.2 of this report summarize the most current performance trends for 2018.

## 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 2018 performance, as well as a short section on key associated insights and trends.

#### 3.1.1 Community GHG Reduction Target

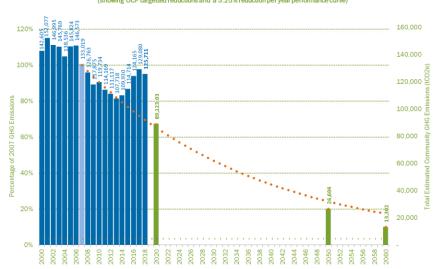
As previously noted, the *Provincial Green Communities Act* (Bill 27, 2008) requires all municipalities to adopt **targets**, policies and actions for the reduction of community-wide GHGs. As per the Whistler Official Community Plan, when compared to 2007 GHG emission levels, the community of Whistler has targeted community-level greenhouse gas reductions of: **33% by 2020, 80% by 20507; and 90% by 2060**. It should be noted that the Province of B.C. recently cancelled its 2020 targets (same 33% reduction as Whistler) as it was not on track to achieve the start of the start

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

2020 targets (same 33% reduction as Whistler) as it was not on track to achieve this, and has instead committed to a new 2030 target of a 40% reduction below 2007 levels.

If it was anticipated that the attainment of these targets would be achieved at a relatively consistent rate (or pace) over the coming decades, these targets translate into an **annual GHG reduction of approximately 3.25% per year (or approx. 3,500 tCO2e per year).** The following chart illustrates the potential achievement of this 'targets' and an inferred 'pace' over time. The chart presents the adopted community targets (green bars), the historic community emissions levels (blue bars) as well as an indication of the approximate annual reductions that would be required to achieve the prescribed targets using a constant rate of improvement model (orange dots).

<sup>7 33%</sup> by 2020 and 50% by 2050 are identical to the Provincial targets set by the Government of BC.



WHISTLER - Total Estimated Community GHG Emissions

As demonstrated on the previous chart, the community of Whistler remained generally on pace towards its targets for the first six years of the commitment period. GHG emission reductions achieved during these first six years (2008-2011) were impressive – averaging more than 4,000 tonnes of reductions annually

It is worth noting, that the primary sources of the reductions over the first four years were generally **onetime** only events. These included:

- 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 piped natural gas across the community;
- the changes brought about through the provincial low-carbon fuel standards for gasoline and diesel;
- 4) the decrease in GHG intensity (GHGs/kWh) of BC Hydro supplied electricity; and
- 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 transit diesel consumption in 2014 through 2016)



over the six year period.

It is also important to note that the 7<sup>th</sup> year of the commitment period (2014) did not remain below the intended curve toward the 2020 adopted target (33% reduction vs. 2007). **The 2014 year-over-year emission levels not only did not decrease by the target 3,000-4,000 tonnes, but actually increased by 2,200 tCO2e (2.1%) and for the first time in the commitment period produced a level above the target curve.** Unfortunately this trend continued for the following three years (2015-2017), reaching a recent peak in 2017 at 129,370 tCO2e. In 2018, emissions reversed the trend of recently raising emissions, and were down 3% year-over-year to 125,711. Nevertheless, emissions are still 18,000 tonnes (17%) above the recent low in 2013.

2018 community GHG levels are now estimated at 5% below the 2007 base year (rather than the targeted 30.5%), or 125,711 tCO2e rather than the targeted 92,500 tCO2e. At this point, to achieve the OCP targeted 2020 GHG emission level, would require annual reductions of more than 18,000 tonnes per year for the next two years.

Unfortunately, this level of reduction is highly improbable and, the community's 2020 GHG emission reduction target will not be achieved.

Looking ahead, the key challenge for our community will be firstly to ensure recent increases (2014-2017) are not repeated, and secondly regaining the rate of reductions achieved over the 2008-2013 period. This will be challenging due to the fact that further 'one-time changes' are, for the most part, no longer readily available. To regain a performance level consistent with the target curve presented above, additional reductions of approximately 6,000 tonnes of CO2e would be required annually for the next 10-12 years.

Future GHG reductions will need to be premised on greater energy conservation and increased efficiency, as well as greater adoption of cleaner fuels (such as more clean electricity, and low carbon liquid and gaseous fuels) across the community. In Contrast, further reductions from one-time technological or infrastructure changes in community systems are less likely to drive meaningful GHG reductions. The required conservation or efficiency improvements will be particularly challenging for the community as historic performance assessments demonstrate that even while GHG reductions were being achieved, communityscale energy conservation gains have proven to be more elusive. Climate action at the provincial (CleanBC) and federal (Pan-

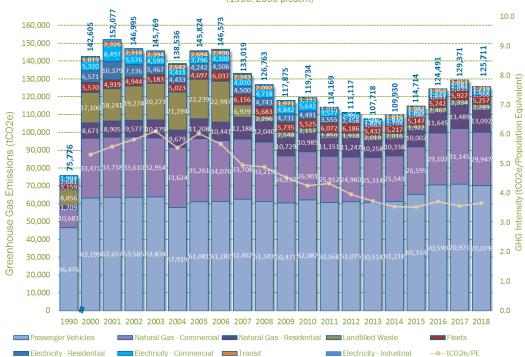


Canadian Framework for Climate and Clean Energy) level are focusing on increasing the supply of diverse low carbon energy sources, offering a chance for Whistler to leverage this policy leadership to adopt lower carbon fuels into its energy mix and reduce the community's GHG emissions.

Current trends suggest that the opportunity for near term gains in GHG performance will need to come primarily from the transportation sector, and secondarily from improvements in fossil fuel-based space heating demands across both the commercial and residential sectors.

#### 3.1.2 Community GHG Emission Performance

Total community emissions in 2018 were estimated to be **125,711 tCO2e**. This level is approximately 3% below 2017 level, 5% below 2007 levels, and 12% below 2000, but well above (+36%) our current community target levels.



Estimated Whistler Community-Level Greenhouse Gas Emissions (1990, 2000-present)

From a emissions intensity perspective, 2018 GHG emissions per population equivalent<sup>8</sup> increased by 3% to 3.66 tCO2e/PE, reversing a trend from previous years (when overall emissions increased but PE emissions were lower). However, it is worth noting that this level is well below the reference year (26% below 2007 levels), and the fourth lowest annual per capita measure since detailed record keeping began in 2000. Stated another way, while total community emissions were down only modestly compared to 2007 (-5%), the number of people in the resort (both residents and visitors alike) increased materially, hence the ratio, or the emissions/person declined more substantially. This intensity improvement may suggest an increase in overall efficiency from a GHG perspective when the resort community is at higher levels of occupancy.

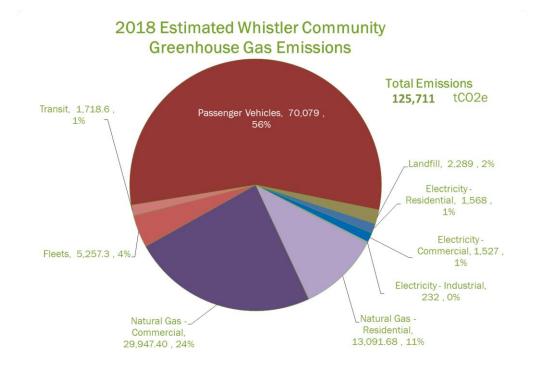
As noted above, the primary drivers of reductions in previous years have been the changes to the local waste management system (especially landfill gas capture); the switch from piped propane to piped natural gas, the BC Transit Hydrogen Transit Fleet pilot project (which has since ended), and more recently,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

As further one-time, system-level changes such as those noted above become less available to our community, Whistler will no longer achieve significant reductions without substantive 'energy conservation' or potential switches to lower carbon energy sources (e.g. electrification of transportation and/or space heating, adoption of renewable natural gas and/or hydrogen, biofuels) becoming core drivers of further emission reductions.

#### **Distribution of Emissions**

<sup>&</sup>lt;sup>8</sup> 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: <a href="http://www.whistler2020.ca/whistler/site/genericPage.acds?instanceid=2985334&context=2985223">http://www.whistler2020.ca/whistler/site/genericPage.acds?instanceid=2985334&context=2985223</a>

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.

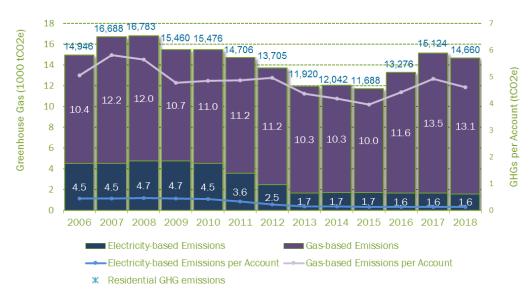


#### **Passenger Vehicles**

Passenger vehicle transportation within RMOW boundaries continues to represent the single largest share of the overall emission footprint at 56%, followed by natural gas consumption at 35% (primarily used for space and water heating, and since 2018 for transit). Together, these two sources account for 90% of Whistler's total GHG emissions.

#### Whistler Buildings - GHGs

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



#### Whistler Residential GHGs

#### **Residential Natural Gas Emissions**

Total natural gas based GHG emissions across the residential sector have decreased 3% year over year. This decrease is at least partially driven by a warmer winter in 2018 (2018 was 7.1% warmer than 2017, and 3% warmer than the 10 yr average).

Emissions per residential account decreased by 6%, with the greater reduction in emissions per account explained by an increase in the number of accounts connected to the natural gas grid. Warmer weather can explain some of the GHG reductions per account, though we caution against over-relying on this one indicator to explain the change.

In past years, incremental increase in per account consumption have exceeded what can easily be explained by recent weather, raising questions on what drives natural gas use in the residential sector. Possible rationales could include: pricing signals (i.e. the new lower costs of natural gas) may be influencing resident behavior; it could also be attributable to more frequent use of second-home or vacation properties than in previous years; or possibly increases in heated floor area per account. Regardless, current data does not support an 'increasing average space heating efficiency' hypothesis for the residential sector as a whole at this time.

#### **Residential Electricity Emissions**

2018 electricity-based emissions declined by 4% based on a total basis and per account, mirroring a 4% reduction in electricity consumption. In contrast to previous years, the GHG intensity per unit of electricity remained the same. Over the past decade or so, the decreasing electricity emissions in the sector have primarily been driven by a decrease in system-wide BC Hydro GHG intensities. The stalling of this improvement may suggest that there is little improvement left, given BC Hydro's already very low GHG intensity (estimated at 9g/KWh).

Finally, the total estimated 2018 GHG intensity (electricity + gas) of Whistler's residential sector appeared to decrease by 4% on a per m<sup>2</sup> basis (vs. 2017). As above, this is a decrease that cannot solely be attributed to a warmer winter and lower population equivalent, and seems to be related to potentially greater usage rates (i.e. more use of the existing residential housing inventory), **and a greater load share** 

of natural gas (i.e. in 2003 natural gas represented approximately 23% of all residential energy use, in 2018 it had risen to 29%).



#### Whistler Commercial Sector GHGs

#### **Commercial Sector Natural Gas Emissions**

Commercial sector GHG emissions decreased substantially after the conversion from propane to natural gas was finalized in 2009 (2009 commercial heating gas emissions declined by 25% versus 2005 levels). Commercial natural gas emissions remained relatively steady during 2011-2015 at approximately 27% lower than pre conversion 2007 levels. More recently however, 2016 -2017 levels have demonstrated a substantial increase, 2016 rising 14% above the '11-14 average, and 9.3% year over year, and 2017 increasing YOY by a further 6.5%. In 2018, emissions declined by 4%. This decline is less than explained by heating-degree days, adding to a trend observed in '16-17' in which winters were warmer than '11-14', but natural gas consumptions and emissions increased. The rational may be rooted in price signals leading to fuel switching (i.e. driven by the recently reduced delivered price of natural gas), by increased occupancy levels in the resort, by a small increase in heated commercial floor space, or by a combination of all three.

Commercial natural gas emissions per account decreased by 6% in 2018. Emissions are 14% higher than the recent low in 2014 (before natural gas price declines were fully passed on to customers), however are still considerably lower (more than 25% lower) than pre-conversion levels.

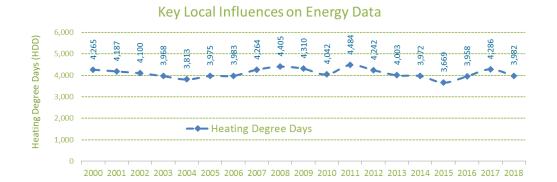
#### Commercial Sector Electricity Emissions

Commercial sector GHG emissions from electricity consumption peaked in 2010 (Olympic Games year). Since the Games year, total sector electricity-based emission levels have decreased substantively. These reductions are partially driven by a drop in electrical consumption post Games (2018 commercial electrical consumption is 24% lower than 2010), **but are primarily driven by decreasing GHG intensity levels across the BC Hydro system** (i.e. reductions driven by forces outside of the community). In 2018, commercial electricity based emissions have decreased by 3% year over year. Importantly, emissions are 73% below 2010 level. The GHG intensity of electricity appears to have plateaued at a low level (annually calculated as a three-rolling average), indicating that further reductions will be harder to achieve. (Moving forward, higher emissions from increased electricity usage may be good news as it could indicate displacement of much more carbon intensive natural gas in the commercial sector).

Emissions per account have followed patterns similar to that described above and commercial electricitybased GHG emissions per account are now at the lowest level since detailed reporting began almost 15 years ago (i.e. 2018 per account emission levels are now less than half of 2003 levels).

The following five charts provide additional detail regarding the primary influences on energy consumption and emissions trends over time. These trends are useful for the exploration of possible explanations for

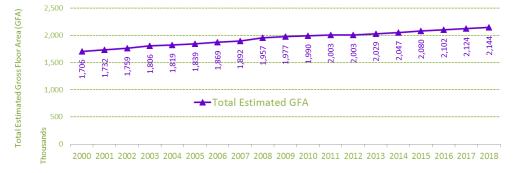
observed change over time. It is however important to note that Whistler's **GHG emission reduction targets are set at total emission levels** – i.e. targets are not at set at per-capita, or per-m<sup>2</sup> intensity levels, as only **total emissions** levels have an influence overall climate impacts. Intensity measures do help provide insights as to the factors are driving changes in performance, but it is only the <u>total</u> 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.

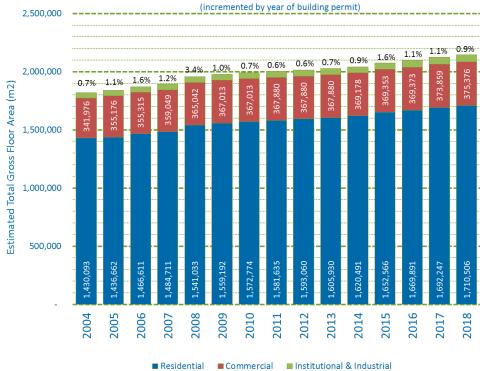


50,000 45,000 35,000 30,000 25,000 15,000 5,000 0 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018

**Key Local Influences on Energy Data** 







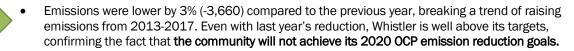
Estimated Growth in Total Whistler Gross Flo	oor Area
--	----------

BC Hydro Emission Factor Comparison				(tCo2e/GWh)												
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
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	10.0	10.7	10.7	9.7	9.0

# 3.1.3 Key Community GHG Performance Insights

#### **Total GHG Emissions**

56% of all estimated community-level emissions (~70,000 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.



While total emissions were down, emissions per population equivalent increased by 3% to 3,66 tCO2e/pe as population equivalent was down more (5.4%) than emissions. Still, emissions per population equivalent are well below (more than 30%) the 2000 level.

 The lack of additional, significant one-time changes (i.e. low hanging fruit similar to the propane to natural gas conversion project or the landfill cap-and-capture project) will make future progress toward our GHG reduction goals much more difficult.

#### Commercial Buildings GHG Emissions



- Total commercial emissions, and emissions per commercial account decreased—4% and 6% respectively.
- Collectively, commercial building emissions have decreased by 17% from the 2007 year. Unfortunately, the sector has given back significant ground in this respect as it was more than 27% below 2007 in 2014. The sector is now no longer on target to meet its share of the 2020 target (-33%). See page 16 for more detail on sector by sector progress).

#### **Residential Buildings GHG Emissions**

• Total residential GHGs have dropped from 2007 levels by 12% (primarily due to the shift to natural gas from propane, and the decrease in BC Hydro GHG intensity – collectively the use of cleaner fuels). Unfortunately, the sector has collectively also given back significant ground in this respect as it was more than 30% below 2007 as recently as 2015.



- Unfortunately, 2018 emission levels have also slipped below target reduction pace for the sector and the sector is no longer on pace to meet its share of the 2020 reduction target. See page 14 for more detail.
- The primary source of emissions across the residential inventory remains natural gas consumption (~89%) for space and water heating.
- The shift to natural gas (from propane), and the decreasing GHG-intensity of BC Hydro electricity are the primary reasons for the GHG reductions in this sector. It should be noted that 2017 total energy consumption across the residential sector has now increased by 4% since 2007 (highlighting the role that cleaner fuels have contributed to the 12% GHG reduction noted above).

#### **Transportation GHG Emissions**

- <u>Low carbon fuel standards</u> 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 kilometers travelled (VKT) in Whistler (locals and visitors combined) decreased by just over 1% in 2018, reversing a trend of increasing traffic from 2014-2017.

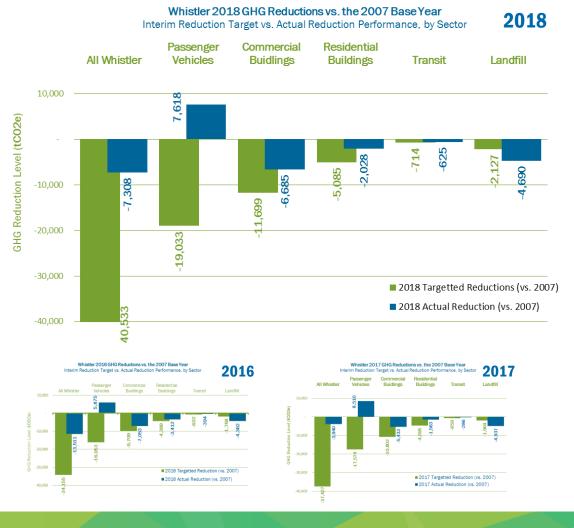


The average fuel efficiency of BC registered vehicles has only improved by ~3-5% over the last 10 years. This change has slowly reduced emission levels per kilometer driven from 2000 levels, but not by enough to cause sector-wide reductions in total estimated emissions. Moreover, recent trends indicate 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 low carbon 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. Significantly more efficient vehicles, fuel switching to lower carbon fuel sources, and/or a significant decrease in VKT per person will be required to catalyze required emission reductions in this sector. Given the large share of Whistler's emissions associated with vehicle travel, continued improvements in these categories are necessary to materially reduce the community's emissions and get back on track to our climate targets.
- Estimated passenger vehicle emissions have increased by 12% since 2007 base year (+7,618 tCO2e). This difference between targeted emissions reductions from the transportation sector (-30.5%) and the actual passenger vehicle performance levels (+12%) is the single largest reason why the community is failing to maintain interim GHG target reduction levels (net difference between target reductions and actual performance is ~28,200 tCO2e for vehicle transport, vs 33, 200 tCO2e for the community as a whole, or 85%).

#### Looking Ahead

- As previously noted, the key challenge for the community moving forward, will be regaining the rate of reduction achieved over the first 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, and widespread adoption for lower carbon fuels across various economic sectors.
  - As seen in the chart 2017 below, the greatest need (and opportunity) for ongoing emission reductions is in the **passenger vehicle sector**
  - o Note that the 2016 and 2015 charts are also included below for reference and comparison.



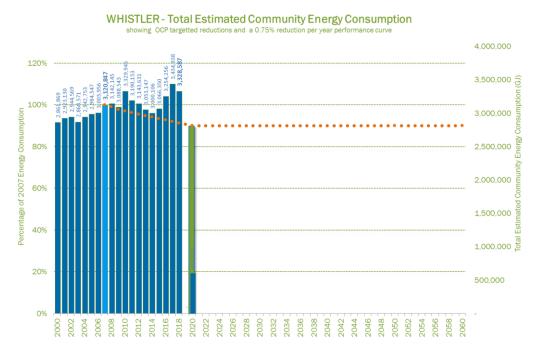
#### 3.2 COMMUNITY ENERGY CONSUMPTION & ENERGY EXPENDITURES

Section 3.2 deals with energy consumption and energy expenditures at the community level. This section includes information on related targets, an overview of 2018 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, and while there are similarities since 2010, the longer term historic energy consumption has not followed exactly the same trajectory as community GHG emissions. Fuel shifting (propane to natural gas, and changes associated with landfill management) primarily impact GHG levels but do not influence the total energy consumption.

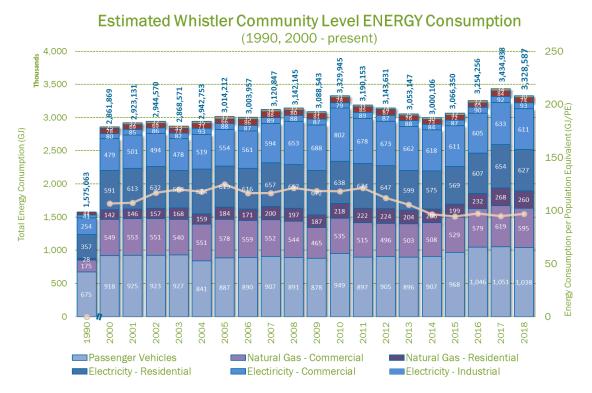
2018 energy consumption decreased by 3% year-over-year. However, 2017 had the highest consumption levels recorded in Whistler, and 2017 and 2018 rank as the two highest years in energy consumption. Community-wide energy consumption did decrease at an average rate of -2.5% between 2011 and 2014 and the community was quite close to being on-track to meet OCP targeted levels. However, reductions reversed in 2015 and has continued to increase through 2016, and 2017 thereby moving the community significantly off pace for the proposed 2020 target.

Currently, Whistler's total energy consumption is approximately 450,000 GJ higher than projected target levels for 2018 (i.e. 7% higher than 2007 levels, rather than 9% below).

#### 3.2.2 Community Energy Consumption Performance

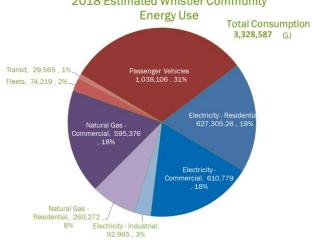
Energy consumption in Whistler includes consumption from stationary sources (buildings and infrastructure), as well as mobile sources (passenger vehicles, fleets, and transit). Total community energy consumption in 2018 was estimated to be **3.3 million GJ** (3% below 2017 levels).

Energy consumption per population equivalent (96.9 GJ/pe) increased in 2018, but is still near the **lowest** performance level since detailed reported began in 2000 (2.4% YOY and 22% below peak levels in 2005).



Per population equivalent consumption has been trending downwards, with 2018 showing a slight increase in a longer-term trend of improvements. Unfortunately per population equivalent improvements have been less than increases in population, and 2018 total energy consumption was the second highest year on record (approx. 4% higher than the 10 year average). Given the material gap to our targets and the short time to achieve them suggest that it is highly unlikely for the community to meet its proposed 2020 energy consumption target (see Section 3.2.1).

Electricity is the most prevalent type of energy consumed in Whistler at 40% of the total consumption (slightly down from previous two years), followed by vehicle fuels (~34%), 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 to the similar chart presented in Section 3.1.2.



Over the last few years there has been a substantive increase in the consumption of natural gas (natural gas consumption is up 175,000 GJ versus 2013, an increase of 25%). Fleet consumption decreased by 11% YOY, with 2017 being an abnormally high year compared to recent past. Electricity consumption is down 3% YOY, and down 12% compared to the recent peak in 2010, and finally passenger vehicle consumption decreased 1%, reversing a recent trend of increasing energy use suggesting some positive impacts associated with the work of the TAG recommendations.

#### Whistler Buildings – Energy Consumption

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

Residential Buildings - Energy Consumption



#### Whistler Residential Energy Use

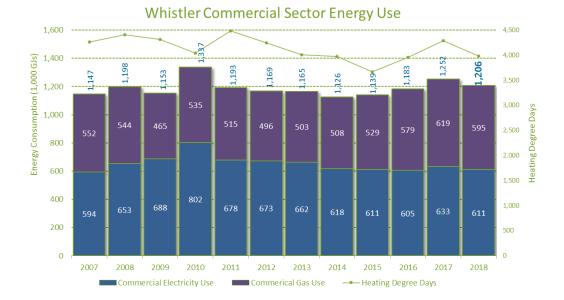
Residential electricity consumption decreased in 2018 in both total terms (-4%), and on a per account basis (-4%) vs 2017. Total 2018 residential energy consumption was the third highest ever at 887,577 GJ (up 5% versus the average of the previous 10 years). The YOY change reflects decreases in both electricity (-4%) and gas consumption (-3%). While overall declines are promising, they are likely influenced by a warmer 2018 (HDD declined 7% YOY) and lower population equivalent (-5% YOY). In fact, the decline in energy are less than both HDD and PE (and materially less than the decline in the product of the two). Only about 40% of residential consumption is sensitive to HDD fluctuations, explaining some of the difference. The additional shortfall in energy savings compared to HDD and PE may be due to an increasing amount of heated floor space within the residential sector (~1% increase in floor area YOY and 11% over the last 10 years) and/or an increased use of vacation properties and second homes in the residential sector vs. previous levels.

#### **Residential Natural Gas**

Total 2018 natural gas consumption is down 3% YOY, and 17% above the average of the previous 10 years; and per account consumption of gas consumption is down 6.% YOY and up 2% versus the 10 year average.

#### **Residential Electricity**

Residential electricity consumption decreased by 4% in total, and by 4% on a per-account basis. 2017 peraccount electricity levels were 6% lower than the average of the last 10 years. The total estimated residential sect energy use intensity<sup>9</sup> (EUI) for 2018 was approximately equivalent to the average of the last 10 years. 2018 was warmer (3% fewer HDD) but more populated (PE is +12%) compared to the 10 year average. This may suggest that sector's energy efficiency is improving slightly helping offset an increase in population equivalent, but that this increase in efficiency is modest and not enough to achieve the sector's energy targets.



#### Commercial Building Energy Consumption

2018 results indicated that there has been a 4% decrease year over year in total building energy consumption by the commercial sector, driven by declines in both electricity and natural gas consumption.

#### **Commercial Natural Gas & Electricity**

The period from 2003 through to 2009 saw a significant shift in commercial energy consumption trends. This period saw decreases in propane use at the same time as roughly equal 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 meaningfully. The primary reason for this shift was likely attributable be the increased use of hybrid electric/gas 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).

By 2010 60% of all energy consumed in the commercial sector was electricity (up from 47% in 2003). As previously noted, this shift had favourable impacts from a GHG perspective (and to a lesser extent, financial), even as total energy consumption remained relatively constant. Since 2010, the electricity share of the commercial energy consumption has decreased steadily. The 2018 electricity share remains at 51% (identical to 2017) suggesting a shift back toward natural gas for space and water heating may be occurring in these same facilities. This shift back toward natural gas is generally well correlated with the reductions in Whistler natural gas rates that have been phased in through the broader standardization of the gas rates across the FortisBC service area. Response to these changing price signals appear to be moderating commercial sector total energy costs, but increasing commercial sector GHG emissions.

Electricity consumption per account in the commercial sector declined in 2018, after increasing the previous year. The 2018 consumption per account remains approximately 9% below the 10 year average.

<sup>&</sup>lt;sup>9</sup> EUI measures the estimated energy use per area of developed indoor space (i.e. GJ/m2)

Natural gas consumption per account increased by 6% in 2018, and is now approximately 3% higher than the average of the previous 10 year period.

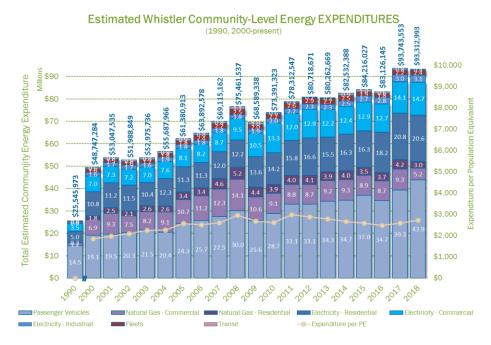
It is however worth noting that both commercial gas consumption and commercial electricity consumption per population equivalent are now near their lowest level since detailed recording began (just higher than the 2017 level which was the lowest yet). Commercial energy use per PE is now 26% below the recent peak in 2008.

#### 3.2.3 Community Energy Expenditure Performance

The estimated annual collective energy expenditure within Whistler<sup>10</sup> has increased by approximately \$44 million (+89%) between 2000 and 2018 (\$93 million vs. \$49 million). Energy rates have shown divergent trends in recent years with liquid transport fuels (gasoline and diesel) increasing again after years of lower costs related to the crude oil price decline of 2014, electricity rate growth slowing after years of increases, and natural gas rates near all-time low levels. With Whistler's energy consumption weighted towards electricity and transport fuels, the average rate of energy increased YOY, such that even with lower energy consumption (-3% YOY), total energy expenditures stayed relatively constant compared to the previous year.

In addition, 2018 saw the first increase in the provincial carbon tax in six years (raising to a rate of \$35/t CO2e), which increases the costs of fossil fuel use. Carbon taxes and other climate policies introduced in the province's new climate strategy (CleanBC) will continue to increase the cost of carbon pollution over the coming years. The increasing carbon costs could materially increase Whistler's energy expenditures in years to come, but can effectively be mitigated against by adopting more low carbon energy into Whistler's energy supply.

When and if energy rates regain more historical increases (gasoline rates have already begun to rise steadily – up >25% vs 2016 average rates), total expenditures are expected to climb relatively quickly. This fact underscores the importance of increasing both energy conservation and energy efficiency across the community. It is quite likely that a total expenditure of \$100 million could be reached in the near future.

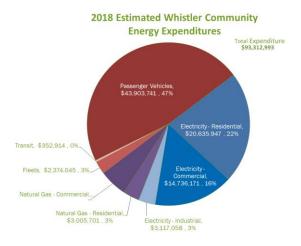


<sup>10</sup> Note that this number includes an estimate of the consumption of gasoline for all vehicle kilometres travelled within Whistler's municipal boundaries. As such it includes a portion (i.e the portion within municipal boundaries) of the incurred costs of energy consumption associated with both visitors arriving by automobile, as well as commuting employees from neighbouring communities.

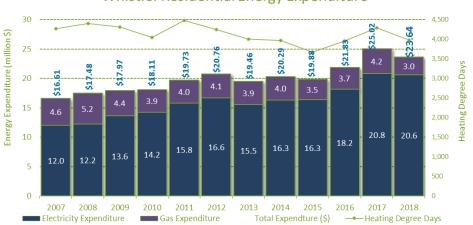
Energy expenditures for buildings (both commercial and residential) had remained relatively constant between 2008 and 2016 at approximately \$42-44 million/year with electricity expenditures increasing by a margin nearly equal to the drop in natural gas expenditures. More recently, building energy costs have increased to \$47 million in 2018, about 8% above the recent average.

The final two charts in this section present the ten-year trend in cumulative energy expenditures across Whistler's key building inventory. Despite the decrease in the price of natural gas, total expenditures in the residential sector continued to demonstrate a generally upward trend since 2007, reaching a record of \$25 million in 2017, but declining 5% in 2018 to \$24 million. Commercial expenditures were \$20 million, 8% below their 10 year average.

Historic rate escalation for electricity averages approximately 3-5% per annum. However, given the relatively recent British Columbia Utilities Commission (BCUC) amalgamation ruling, the delivered rate of natural gas decreased by more than 50% between 2014 and 2018.



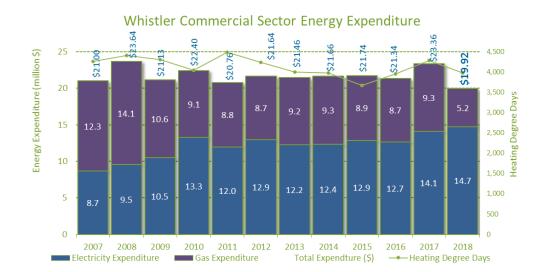
#### **Residential Building Energy Expenditures**



#### Whistler Residential Energy Expenditure

Residential building expenditures decreased in 2013 for the first time in a decade due to a reduction in total energy consumption across this sector. Residential expenditures increased from 2014-2017, reversing this trend in 2018 with a 5% decline. While natural gas rates dropped materially since 2014, a large majority of residential energy costs have been associated with electricity, which has seen rates grow materially over the past decade. Increasing electricity rates explain most of the increase in overall residential energy expenditure (up more than 40% since 2007, compared to a 4% increase in consumption).

After a year of strong growth in 2017, 2018 saw residential energy expenditures relatively flat despite a warmer winter and lower occupancy levels.



#### **Commercial Building Energy Expenditures**

Total commercial energy expenditures were relatively stable from 2010 to 2015, brought on by a shift towards lower cost natural gas offsetting electricity rate increases. In 2018, total expenditure were 8% below the 10 year average, due in large part to natural gas rates declining to historic lows, and increasing use of the fuel over the past decade (up almost 30% since 2009).

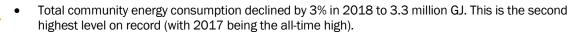
#### Power Down - Residential Energy Assessment Rebate Program

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 \$450. Since the program began in August, 2014, approximately 250 new and existing homes have been assessed through this program.

Although the current sample size is relatively small, staff have been evaluating the results of these assessments and using the insights to inform ongoing policy development (eg. Energy Step Code) and to track both uptake levels and changes in home energy performance over time. Your home probably has a hole this big in it. Find out why and what you can do about it.

> whistler.ca/powerdown Power Down to Save Up

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



- Community energy consumption trends were on track to meet 'proposed' OCP targeted levels between 2011 and 2014, however sharp increases in 2016 and 2017 have put the target out of reach, and Whistler is not on track to meet its 2020 goals.
- Current community energy consumption levels (3.3 million GJ/yr) are more than 500,000 GJ higher (19%) than the proposed OCP 2020 target.
- Energy consumption per population equivalent is near the lowest level since detailed reporting began (96.9 GJ/pe vs. the 130 GJ/pe in 2005). This represents a 27% reduction in energy consumption per person over a 12 year time frame. However, energy consumption per population equivalent increased 2.4% YOY.

#### **Residential Energy Consumption**

- 2018 residential energy consumption decreased by 4%YOY. This is less than the decline in heating degree days and the decline in population equivalent.
- The estimated residential sector energy use intensity (EUI) for 2018 was equivalent to the average EUI of the last 10 years. Unfortunately, this fact does not currently support an 'increasing efficiency' observation for the residential sector.

#### **Commercial Consumption**

- 2017 commercial consumption levels have decreased by 4% year over year and are approximately even (+1%) to the 10 year average for the sector.
- There appears to be a continuing shift from electricity consumption to natural gas in the commercial sector. This has helped to moderate total commercial sector energy expenditures, but has increased the GHG emissions from the sector (up 16% since a recent low in 2013).

#### **Passenger Vehicles**

• Despite small increases in average vehicle fuel efficiencies, estimated energy consumption associated with passenger vehicles has steadily increased since 2013. However in 2018, estimated energy consumption within the sector declined by 1%.

#### **Total Energy Expenditures**

 Increases in electricity rates and mobile fuel costs – Whistler two largest sources of energy respectively – offset declines in energy consumption, with total energy costs staying even at \$93 million/yr. Whistler's total energy expenditures have almost doubled since 2000 (up 89%).



- Passenger vehicle energy expenditures increased by 12% YOY due to higher fuel costs, more than
  offsetting slightly lower energy demand (-1%).
- Lower natural gas rates more than offset increasing use. Total natural gas expenditures in 2018 was \$8.4 million, 37% below 2014 before rate declines were passed to consumers.

#### **Residential Building Sector Expenditures**

- 2017 residential electricity expenditures decreased by 1% YOY, but ranks second highest ever after 2017. (\$20.6M/yr, or approx. \$1,600 per account)
- Total residential gas expenditures decreased to \$3 million (approx. \$1,100 per account), a decline by 43% compared to a recent high in 2008 (despite a 32% increase in energy over the period).

#### **Commercial Building Sector Expenditures**

- Total 2018 commercial energy expenditures were \$20 million, an 8% decline compared to the recent 10 year average.
- Both total, and per-account, commercial electricity expenditures increased year over year.
- Both total, and per-account, commercial natural gas expenditures decreased year over year.

#### Looking Ahead

- The commercial sector has made progress toward decreased energy expenditures across its collective inventory. However, this reduction may have the net effect of increasing GHGs as it seems to be based primarily on an increasing shift to natural gas use away from electricity.
- The data had suggested that there was improved energy efficiency (per m2) in both the residential and commercial sectors between approximately 2012 and 2015 but this trend did not continue, with energy efficiency declining in 2016-2017. 2018 saw energy efficiency improve again, though it remains below levels achieved a few years earlier. This cannot be rationalized solely by a colder winter rationale (though that is part of the story for 2017), and is likely attributable to higher occupancy/use rates across the resort over the last few years.
- 2018 saw the first increase in the provincial carbon tax in six years (raising to a rate of \$35/t CO2e), which increases the costs of fossil fuel use. Carbon taxes and other climate policies introduced in the province's new climate strategy (CleanBC) will continue to increase the cost of carbon pollution over the coming years. The increasing carbon costs could materially increase Whistler's energy expenditures in years to come, but can be effectively mitigated against by adopting more low carbon energy into Whistler's energy supply.



# 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 shared with 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 functional areas of the organization.

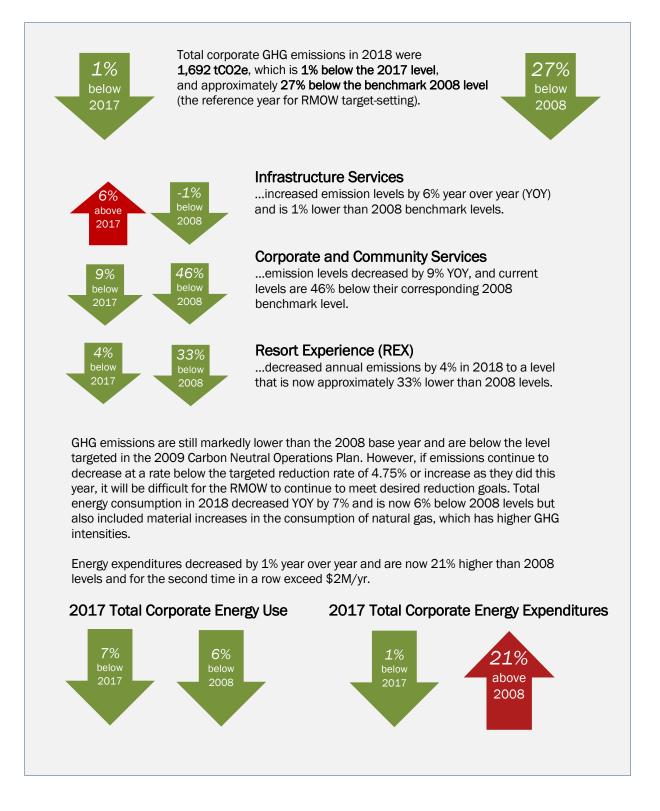
The primary purpose of these inventories is to provide a foundation for identifying energy conservation opportunites, assessing energy performance across key municipal building assets, and structuring business case assessements for potential upgrades and efficiency retrfofits. Additionally, these inventories 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 CECAP, the RMOW Carbon Neutral Operations Plan, and the Whistler Offical Community Plan (OCP).

As a means of comparison to community-wide emissions, RMOW corporate emissions represent approximately 1.3% 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 historic upward pressure on energy rates (over the long term energy rates rise faster than the rate of inflation) and carbon prices makes it clear for all organizations that energy consumption and carbon pollution should be tracked, managed and ultimately reduced as a fiscal strategy, not just an environmental one.



# 4.1 KEY CORPORATE INSIGHTS and SUMMARY



#### 4.2 CORPORATE GREENHOUSE GAS EMISSIONS

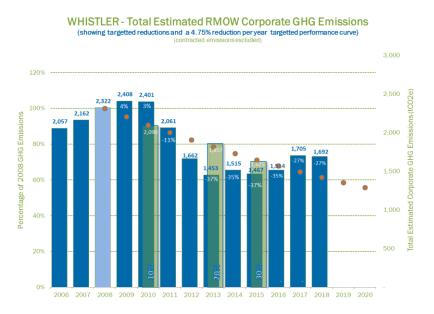
Section 4.2 deals specifically with greenhouse gas emissions associated with RMOW corporate operations. This section includes information on related targets, an overview of 2018 performance results, as well as a short section on key associated insights and trends.

#### 4.2.1 Corporate GHG Reduction Targets

The RMOW's 2009 Carbon Neutral Operations Plan sets the targets for total corporate GHG reductions as follows:

10% by 2010         20% by 2013         30% by 2015         (all relating the second	
---	--

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%/yr (orange dots).

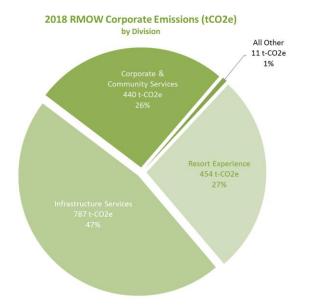


As demonstrated in the chart above, RMOW corporate emissions reduced substantively between 2010 and 2013, stabilized between 2013 and 2015, increased materially from 2016 to 2017, before declining slightly in the most recent year. 2018 emission levels decreased 1% YOY; are still 27% below 2008 levels; but are currently at a level 19% (265 tCO2e) above the target reduction rate curve.

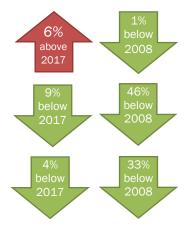
#### 4.2.2 Corporate GHG Performance

Total direct corporate GHG emissions in 2018 were 1,692 tCO2e.

On a division-by-division basis, the relative emissions footprint of corporate operations is primarily associated with the following three divisions: (47%) **Infrastructure Services** (which includes roads crews, solid waste systems, the water utility as well as the sewer utility); (27%) **Resort Experience** (which includes village maintenance operations, horticulture, turf, and irrigation crews, parks and trails, and facility construction and maintenance operations); and (26%) **Corporate and Community Services** (including bylaw, fire, Meadow Park Sports Centre, and other recreation programs). The relative contributions from each division are shown in the graphic below.



Key 2017 Corporate GHG emissions trend by organizational Division are presented below.



#### Infrastructure Services

emission levels **increased** by 6% year over year (YOY), which puts 2018 levels at 1% lower than 2008 benchmark levels.

# Corporate and Community Services emission levels decreased by 9% YOY, which means that current

levels are 46% below their corresponding 2008 benchmark level.

#### Resort Experience (REX) emission levels decreased by 4%, making current levels now approximately 33% lower than 2008 levels.



#### Trends in RMOW Corporate GHG EMISSIONS

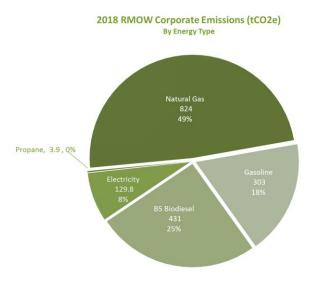
As seen in the chart above, Infrastructure Services (blue segments) was the largest source of increased emissions YOY, primarily due to material increases (+24%) in natural gas use at the sewer utility (IS' largest source of energy and emissions). On the other hand, emissions declined materially for Corporate and Community Services (purple segment), primarily driven by a 14% decline in natural gas use at MPSC due to less use of the back-up gas boiler system. In 2017 the core HVAC system at MPSC failed, causing the back-up gas boiler system to increase load share. While performance increased, emissions are still higher than in 2016 suggesting there remains potential for future improvements. REX saw its emissions decline by 4% due to lower natural gas use in its buildings (partly explained by a warmer 2018).

Overall, the largest source of GHG reductions over the last decade has clearly been the energy retrofits at MPSC (Corporate and Community Services) – especially the installation of the geo-exchange and solar hot water systems.

#### **Distribution by Fuel Type**

RMOW corporate emissions come primarily from two sources – 49% from natural gas combustion, followed by 43% from mobile sources (gasoline and diesels).

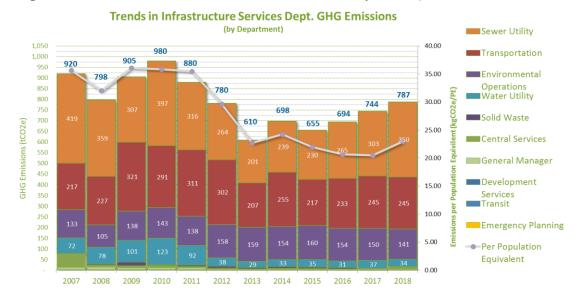
The relative shares of each of these energy types are presented to the right.



### 4.2.3 Divisional Trends

### Infrastructure Services

Changes in Infrastructure Services emission levels over the last 12 years are presented below:



#### Infrastructure Services' GHG emission trends by key functional area:

2018	Sewer	Transport.	Env. Ops	Water	TOTAL
YOY	15%	0%	-6%	-7%	6%
vs. 2008	-2%	8%	34%	-56%	-1%

#### Key Insights

- WWTP emissions (Sewer Utility) increased materially on a year over year basis, and is currently just 9 tCO2e (2%) lower than the 2008 benchmark level. In 2013, emissions associated with the WWTP reached an all-time low of 201 tCO2e, however 2018 emissions have returned nearly to 2008 levels (albeit at much higher levels of processing volume). This 2018 increase is primarily attributed to a 24% YOY increase in natural gas consumption at the WWTP.
- Mobile emissions from the transportation (roads) department were steady year over year. The current emission levels for the transportation department are now 8% higher than 2008 benchmark levels.
- Environmental Operations emissions decreased by 7% year over year, but is still 36 tCO2e (34%) above the 2008 benchmark levels. The overall increase since 2008 is primarily driven by an increased amount of mobile fuel use in the utilities workgroup.

### **Corporate and Community Services**

Changes in Corporate and Community Services emission levels over the last 12 years are presented below:



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

2018	MPSC	Fire	Rec	Bylaw	TOTAL
YOY	-13%	11%	-4%	-16%	-9%
vs. 2008	-54%	26%	5%	-16%	-46%

#### Key Insights

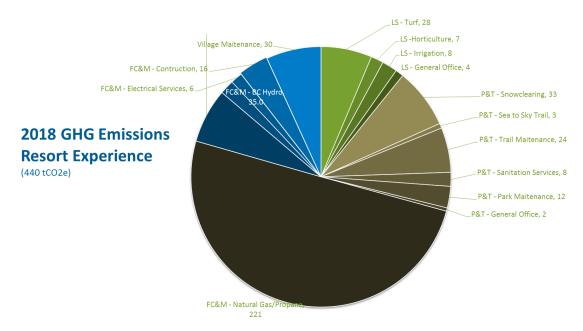
- For 2018, the primary driver of decreased emissions (-47 tC02e) within the division was MPSC natural gas consumption (-14% YOY). Emissions are 374 tCO2e lower than 2008 benchmark levels. This year's sharp decline is due to higher reliability of the geo-exchange loops, which had experienced failure in the previous year. Emissions are still almost 40 tCO2e above the 2016 levels, suggesting that there is further room for improvements.
- Bylaw emissions decreased by ~3 tCO2e year. This increase is attributed to a 17% decrease year . over year of gasoline mobile fuel usage.
- The Fire department's emissions have increased YOY and as compared to 2008 benchmark . levels, however the scale of this change is relatively small in total terms (+13 tC02e vs. 2008 levels).
- Recreation emissions decreased by 1 tCO2e year over year, which was primarily due a small decrease in mobile fuel consumption.

### **Resort Experience (REX)**

Changes in REX emission levels over the last 12 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 graphic below.



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

2018	P/Vops	V.Maint.	Land S	Parks &T	FC & M	TOTAL
YOY	-4%	-3%	4%	-1%	-7%	-4%
vs. 2008	-30%	13%	36%	28%	-31%	-33%

### Key Insights

- Facility Construction & Maintenance (FC&M) emissions represent by far the largest emission share for this division (within the Parks/Village Operations above). The FC&M decrease (-14 tCO2e) came primarily from decreased natural gas use at buildings.
- Parks and Village Operations decreased in 2018 by ~20 tCO2e year over year. This decrease in tCO2e is primarily due to decreases in the use of natural gas for building heating systems (-6%), while diesel use for parks and trail snow clearing & associated maintenance remained constant YOY.

### 4.2.4 Key Corporate GHG Emission Performance Insights

### Overall



- RMOW corporate emissions declined 1% YOY, and are 27% lower than the 2008 benchmark year but are now 19% higher than the emissions target for this year. 2018 saw emissions relatively stable YOY, with material emission increases at the sewer facility offset by lower emissions at MPSC.
- Large reductions 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 divisions, specifically in Infrastructure Services. However, as many of the large retrofit projects were completed in recent years, future reductions will have to come more from operational efficiencies and fuel switching than in the previous decade.

### **Divisional Insights**



 Infrastructure Services' emissions increased by 6% year over year, mainly as a result of increased natural gas consumption (24%) at the WWTP. The transportation department's mobile fuel use remained steady YOY. 2018 emission levels in this division are currently 1% lower than 2008 benchmark levels.



Corporate and Community Services emissions declined by 9% year over year. This decrease in
emissions is due to lower natural gas usage at MPSC (2017 saw issues with the geo-exchange
system, and a resulting higher usage of the gas back-up boiler). Emissions for this division 46%
below 2008. However, emissions at MPSC remain 40 tCO2e above 2016, suggesting further
GHG performance improvements are viable.



- The REX division saw an emissions decrease in 2018 (4%) and the majority of this was due to a decrease in stationary natural gas use (7%) in Facilities, Construction & Maintenance (building heating systems).
- Municipal buildings with the lowest intensity of GHG emissions include the following: (all expressed as kgC02e/ft2/year)
  - Lost Lake Passivhaus: 0.07
  - Spruce Grove Field House 0.16
  - Whistler Public Library 0.33<sup>11</sup>

 $<sup>^{\</sup>rm 11}$  For reference, Maurice Young Arts Centre emits 2.1 kgCO2e/ft2/year

### 4.3 CORPORATE ENERGY CONSUMPTION

Section 4.3 deals specifically with the energy consumption associated with RMOW corporate operations. This section includes information an overview of 2018 performance levels, and a short section on key associated insights and trends.

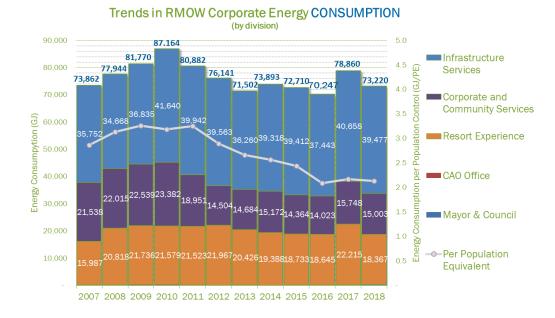
### 4.3.1 Corporate Energy Consumption Reduction Targets

The RMOW does not currently have any formally adopted targets for corporate energy consumption. The 2004 RMOW Integrated Energy, Air Quality and GHG Management Plan did, however, include recommended corporate energy consumption targets for 'consideration'. These recommended energy consumption targets for municipal operations were: 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.

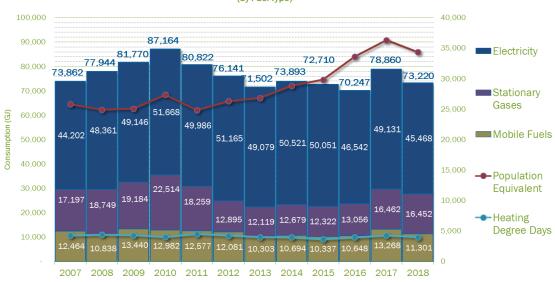
### 4.3.2 Corporate Energy Consumption Performance

Total corporate energy consumption decreased in 2018 by 7% to 73,220 **GJ/year**. This is still above the 2010 target recommended within the 2004 RMOW Integrated Energy Plan (64,000 GJ/year), and considerably higher than the upcoming 2020 target (55,000 GJ). At the same time, 2018 corporate energy consumption per population equivalent continued to be very near historic lows, similar to 2016 and 2017 levels, and 35% below the recent high in 2011.



The 12-year trends in corporate energy consumption are presented below:

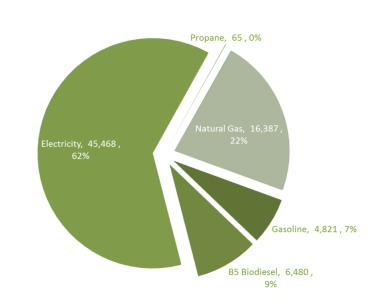
If the corporate energy consumption is subdivided by fuel type rather than by organizational division, the ten-year trends appear as follows:



Trends in RMOW Corporate Energy CONSUMPTION (by Fuel Type)

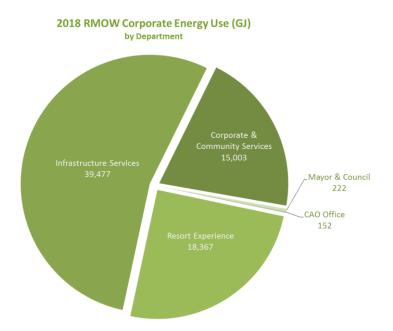
Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 62% of the total consumption, followed by natural gas (22%), and mobile fuels (15%).

A more detailed breakdown of 2018 corporate energy consumption, presented by energy type, is included Below for reference:





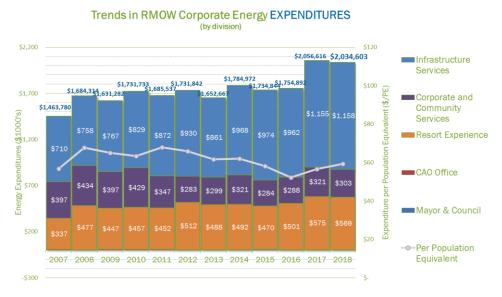
Finally, 2018 energy consumption by division is included for reference below:



#### **Corporate Energy Expenditures**

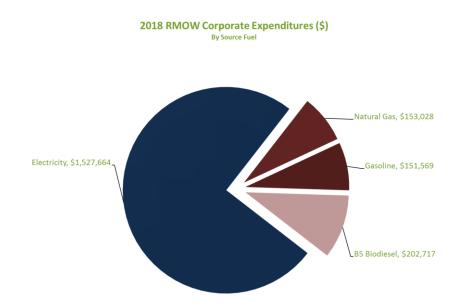
After increasing by 17% in 2017, 2018 corporate energy expenditure decreased by 1% to \$2.03 million. Lower energy consumption was offset by increasing rates, especially for mobile fuels and to a lesser extend electricity.

Further conservation will be the key to managing expenditures at a level consistent with current levels given that long term trends in energy rate inflation generally exceeds the Consumer Price Index (CPI). Increasing carbon costs over the near- and long-term will further raise rates for fossil fuels, but can be mitigated against by switching to cleaner fuels. It is worth noting that corporate expenditures would already be higher was it not for the current low price of natural gas and the consolidation of Fortis Whistler into the broader FortisBC rate structure (~50% decline in prices between 2014 and 2018).



The 12-year trends in total corporate energy expenditure are presented below:

2018 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 still operating at approximately 60% better than the 2007 Model National Energy Code for Buildings (MNECB). At this level of performance (~800 GJ/yr.), annual utility costs are approximately \$20,000 less than had the building been built to typical building code standards (MNECB) at the time.

### 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.

#### 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 generally working very well (with the exception of the ground loop leak in 2017 discussed above). In 2018, annual energy expenditures at MPSC were \$240,744, which is 5% lower than 2017 expenditures. 2018 expenditures were still 36% (\$138,000) lower than 2008 base year expenditures (before the renovation). The year over year decrease is largely due to lower natural gas costs from lower reliance on the back-up boiler following HVAC system issues discussed in 4.2.3 above.

#### 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 system air flows. Passive houses are well established in Europe with well over 17,000 existing passive units; approximately 4,000 of these are in Austria.

In partnership with BC Hydro, the RMOW tracked the LLPH from Jan of 2011 to Dec '12 using a real time Energy Management Information System (EMIS energy consumption at). 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.

### 4.3.4 Key Corporate Energy Consumption Performance Insights

### **Energy Consumption**

### Overall

• Corporate energy consumption decreased by 7% in 2018. Operations experienced decreases in electricity (-7%), while natural gas and mobile fuels stayed relatively constant.

### **Divisional Insights**

- Corporate and Community Services saw a year over year decrease in energy consumption of 5%, Infrastructure Services decreased by 3%, and REX by 10% each relative to 2017 levels.
- In a historical context, Corporate and Community Services' 2017 consumption is substantially less than 2008 benchmark levels (-32%).

#### **Energy Expenditures**

### Overall

- Overall 2018 energy expenditures decreased slightly (1% YOY) after gaining 17% in 2017, with lower energy consumption offsetting increases in electricity and mobile fuels. Current expenditures have increased by approximately \$350,000 (21%) from benchmark 2008 levels.
  - Electricity represents approximately \$1.5M/year (75%) of the total corporate energy expenditure.

### **Divisional Insights**



• Corporate and Community Services saw expenditures decline by 6%, while they stayed relatively even for Resort Experience and Infrastructure Services.



- Corporate and Community Services' energy expenses declined year over year, the CCS's expenditures are more than \$130,000 lower than benchmark 2008 levels, primarily related to savings achieved at MPSC.
- 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 CECAP IMPLEMENTATION UPDATES**

The CECAP was developed to update the 2004 Integrated Energy, Air Quality and GHG Emissions Plan, and to respond to the critical fact that Whistler was not on target to meet its GHG reduction targets as articulated in the Official Community Plan (Bylaw No 1021, 1993). The CECAP was designed to include a formal adaptation plan to ensure increased community resilience to projected local climate changes over time. Detailed CECAP modelling and associated analyses projected the following key climate changes for Whistler over the next 25 to 55 years:

- 1. Increase in the frequency and intensity of heavy rain events.
- 2. Longer, hotter and drier summers.
- 3. Milder winters, with increased precipitation falling as rain near valley bottom, while snow pack at higher elevation sees limited change.

The CECAP attempts to articulate a vision of a resilient, lower carbon Whistler and confirms community targets for the reduction of GHG emissions, and the stabilization of community energy consumption as well as builds a foundation for significant increases in the use of renewable energy over time.

The Plan was collaboratively developed with a Community Advisory Group (CAG), an internal staff content expert team, and led by a cross-departmental project management team. There were also several opportunities for public and stakeholder input to be integrated into the plan. The CECAP establishes a series of emission reduction and climate adaptation objectives, and includes priority recommended actions designed to reduce GHG emissions and to increase Whistler's resilience in the face of climate change.

The effective implementation of these recommended initiatives is designed to better position Whistler to meet the challenges of a changing climate, reduce community dependence on fossil fuels, and decrease collective energy-related expenditures. Key recommended **energy and GHG reduction initiatives** range from support for expanding access to mass transportation services and growing electrification of transportation, to reducing emissions related to solid waste management and to homeowner and commercial sector incentives for improving the energy efficiency of Whistler's built environment. Key recommended **adaptation initiatives** included range from renewing our integrated storm water management, expanded water conservation and wildfire protection plans, to increasing access to weather independent attractions in the valley and increasing communication and engagement around climate and energy related issues.

The 2016 CECAP outlines the targeted implementation timelines, lead organization and general resource implications for each of the recommended actions. For each of the recommended 'Reduction Actions', the CECAP also includes an estimated energy and emissions reduction potential for each identified action.

In the 2017 Report, a summary of action for the full year was provided. However, in August 2018, Council requested quarterly updates be provided. Given the timing of this Report, it is combined with an update related to the RMOW's CECAP implementation for the second quarter of 2019 (April-June). The following section will provide information on key initiatives advanced over this time period. For a complete status of CECAP's 94 recommendations for mitigating climate change and for 40 recommendations to adapt to climate change, please refer to Appendix E.

### 5.1 REDUCTION/MITIGATION INITIATIVES

The below table summarizes key changes in the CECAP implementation for the second quarter of 2019. Consistent with the fact that the majority of Whistler's GHG emissions come from the passenger vehicle sector, significant internal effort has been applied to **transportation sector reductions**. Highlights of the 94 CECAP recommended 'reduction' initiatives are included in the tables below.

Note that the numbering references below relate directly to the 2016 CECAP structure.

# 6.1 Mobile Energy Use – Transportation-based GHG Emissions

### 6.1.1 Design Land Use for Location Efficient Living, Working and Playing

	Reco	ommended Action	Updates		
short	6.1.1.1	Continued commitment to ensuring that Whistler is made up of increasingly complete and compact neighbourhoods	Commitment to complete and compact neighbourhoods is still in place.		
short	6.1.1.2	Investigate raising the target for the number of employees, especially full-time employees, living locally (i.e. > than the current 75%)	In progress. Unchanged from Q1 2019 update		
short	6.1.1.3	Adhere to the Whistler Urban Development Containment Area (WUDCA) as a means of reducing automobile trip distances.	OCP due to receive 3rd reading July 23, 2019		
short	6.1.1.4	Ensure that whenever possible, new development or significant redevelopment is concentrated in existing neighbourhoods or settled areas that are well-served by transit, pedestrian and cycling routes, amenities and services; and are characterized by increased residential density.	OCP due to receive 3rd reading July 23, 2019		
short	6.1.1.5	Explore opportunities to expand live-work use designations within existing zones where this inclusion would not have adverse impacts on the neighborhoods' character.	OCP due to receive 3rd reading July 23, 2019		
short	6.1.1.6	Proposals for significant new development or redevelopment should be required to quantify future GHG emissions and energy consumption impacts (including transportation-based) and incorporate measures to minimize and/or mitigate projected increases.	OCP due to receive 3rd reading July 23, 2019		

# 6.1.2 Advance Local and Regional Mass Transportation Service

	Deer		
	Reco	ommended Action	Updates
short	6.1.2.1	Work with regional passenger carriers and provincial regulatory bodies to encourage greater frequency and more affordable choices for regional bus travel	• RMOW staff have responded to referrals on this issue and made specific requests for encouraging better flexibility for motor carriers that would allow them to respond to passenger's needs. Work continues.
short	6.1.2.2	Support the expansion, promotion and increased convenience of mass transportation services between Vancouver and Whistler	<ul> <li>Funding proposal has been rejected by Prov Govt. Staff to meet to discuss alternatives.</li> </ul>
short	6.1.2.3	Develop a public realm with improved multi-modal integration and comfortable, convenient transition areas – Bus Loop/taxi loop	Gateway Loop is in operation.
short	6.1.2.4	Advance a community-based social marketing research project to determine the key perceived barriers and benefits of increased use of mass transit transportation. Based on the associated results, develop and execute targeted community- based social marketing campaign and other relevant, practical solutions to increase use of mass transit	• Work on community-based social marketing did not continue in spring 2019.
short	6.1.2.5	Advance all potential opportunities to avoid increases in local transit fares.	<ul> <li>Monthly pass rates remain at the reduced price through the use of revenue from the pay parking in Day Lots 1 – 5.</li> </ul>
med	6.1.2.6	Continue to pass the infrastructure, maintenance, congestion, environmental and land costs of road and parking infrastructure onto users.	User pay parking in high-demand areas in Whistler Village continues.
med	6.1.2.7	Optimize the road network and highway to prioritize the flow of high occupancy vehicles (HOVs).	• RMOW has received the final draft of the Highway Capacity Study from MOTI and are reviewing the recommendations.
med	6.1.2.8	Strategically expand transit system service levels and frequency where possible and affordable	• An additional 2,500 expansion hours are being added to the 2019/2020 Whistler transit schedule. The majority of these hours are dedicated to continued pilot project through spring, summer & fall 2019 because of winter program success.
med	6.1.2.9	Explore and consider opportunities to link Whistler Blackcomb and other local business products with (discounted) local and regional mass transit passes.	No specific initiative led by RMOW staff at this time
long	6.1.2.10	Continue to encourage the provincial government and private sector to pursue the return of higher- volume, affordable and more frequent passenger rail service to Whistler.	Current focus on regional bus/coach transit

long

6.1.2.11

Ensure that any potential investigation into new regional air service or a new airport facility includes a full assessment of the GHG emissions balance of the proposed project.

• No new regional air services are proposed at this time.

# 6.1.3 Activate Walking, Biking and other Forms of Healthy Transportation

	Reco	ommended Action	Updates
short	6.1.3.1	Prioritize the recommendations of and regularly update the Whistler Transportation Cycling Plan and the Whistler Recreational Cycling Plan in planning for the pedestrian and bicycle network.	<ul> <li>Projects initiated in Q2:</li> <li>New 1.8 km Millar Creek valley trail with lighting, 50% complete.</li> <li>New 900m valley trail with lighting from Prism property to Highway 99.</li> <li>New 1.5km valley trail from Rainbow Park to Scotia Creek in planning stage.</li> <li>Trail lighting additions on valley trail between Village Gate Blvd and Lorimer Rd.</li> </ul>
short	6.1.3.2	Consider opportunities to permit the repurposing of existing village parking to other purposes to support preferred modes of transportation (i.e. bike parking, end of trip facilities).	<ul> <li>The underground bike parking has been better advertised for Spring / Summer 2019 and more people are using this facility.</li> </ul>
short	6.1.3.3	Advance a community-based social marketing research project to determine the key perceived barriers and benefits of increased use of active transportation. Built upon the findings of the research, develop and execute targeted community-based social marketing campaign and other practical relevant solutions to increase use of active transportation	• Same as 6.1.2.4
med	6.1.3.4	Where opportunities exist, prioritize the optimization and enhancement of pedestrian infrastructure and safety throughout the community.	Sidewalks and crosswalks installed in Function Junction.

### 6.1.4 Support Electrification, and the Adoption of other Low Carbon Transport Options

	Reco	ommended Action	Updates	
short	6.1.4.1	Support the development of, and increased access to, reduced-carbon mobile fuel options such as natural gas, appropriate biofuels, and electrical charging stations across the community.	<ul> <li>Discussions underway internally to coordinate planning and access to provincial funding.</li> </ul>	
short	6.1.4.2	RMOW to aggressively advance the average fleet GHG and energy efficiency of the municipal vehicle fleet.	<ul> <li>Two new EVs/PHEV added to fleet in 2019</li> <li>Each new vehicle purchase is viewed through the lens of providing the most efficient vehicle that can reliably perform the required tasks.</li> </ul>	
short	6.1.4.3	Champion and support inter-community travel providers (including airlines) that are progressive leaders in energy and GHG innovation through preferred marketing relationships and other in-kind partnership opportunities	No specific initiative led by RMOW staff at this time	

med	6.1.4.4	Integrate electric and/or lower carbon fuel vehicles into existing private and public fleets (transit/delivery/taxis/shuttles).	• RMOW staff have initiated discussions with BC Transit about Electric Transit vehicles for Whistler. They will be tested in Victoria and then deployed around BC as service is expanded.
med	6.1.4.5	Support the use of 'appropriate' electric assist bicycles on Whistler's roads, and Valley Trail network, and support appropriate opportunities to increase secure storage and charging infrastructure in the Village.	Council Policy before Council for consideration July 9, 2019
med	6.1.4.6	Explore opportunities to structure local incentives to support electric vehicle use within and to/from Whistler.(i.e. preferred or reduced parking fees for electric vehicles)	• Ongoing consideration of this action through the lens of our overall parking strategy and the work of the TAG.
med	6.1.4.7	Profile ultra-low emission private vehicle fleets (hotels, commercial recreation, as appropriate).	No specific initiative led by RMOW staff at this time
med	6.1.4.8	Increase the enforcement of the Whistler anti-idling bylaw.	• Complete
med	6.1.4.9	Invest in electric vehicle integration across municipal fleet	Grants for additional charging stations are being investigated.
med	6.1.4.10	Encourage local commercial recreation and leisure operators to minimize the GHG emissions associated with their activities	• Ongoing
long	6.1.4.11	Develop a social marketing initiative to drive the use and purchase of more efficient vehicles.	No specific initiative led by RMOW staff at this time
long	6.1.4.12	Explore opportunities to effectively support and encourage the development of a new car coop/sharing program in Whistler, in addition to promoting ride-share and carpool programs.	Staff survey completed by JSMC reps

# 6.2 Stationary Energy Use – Buildings & Infrastructure GHG Emissions

### 6.2.1 Improve the Energy Efficiency and Comfort of Existing Buildings and Infrastructure

rastructure
oughout 2019. ih social media, ie Building eedback on
ih social media, ne Building
-
in 2005 and 2013

short	6.2.1.10	Support and improve staff training on energy efficiency practices across hotel operations (start-up practices, etc).	No specific initiative led by RMOW staff at this time
short	6.2.1.11	Advance a system of voluntary and mandatory energy benchmark reporting across Whistler's large energy consumers (leverage NRCAN Portfolio Manager updates into Canada).	No specific initiative led by RMOW staff at this time
short	6.2.1.12	Promote increased awareness of Energy Performance Contracting and other energy efficiency opportunities for commercial sector properties.	No specific initiative led by RMOW staff at this time
short	6.2.1.13	Support the reestablishment of the former Whistler Facility Managers Association (WFMA).	Climate Change Coordinator started June 10, 2019
pem	6.2.1.14	Encourage approaches that reduce the direct heating of outdoor areas such as through open shop doors, patio heaters and heated driveways (i.e. explore the potential to create and enforce a closed door - energy waste bylaw in commercial and retail zones).	<ul> <li>In progress. No change from Q1 update</li> <li>Determined that the RMOW does not have authority to enforce closed door policy. Community campaign lead to encourage door closures.</li> <li>OCP due to receive 3rd reading July 23, 2019</li> </ul>
med	6.2.1.15	Encourage existing multi-tenant or multi-owner commercial buildings to maintain or add individually metered energy use (i.e. encourage user-pays principle).	No specific initiative led by RMOW staff at this time
med	6.2.1.16	Catalogue and develop strategies for maximizing the re-use of waste heat resources across the resort community.	No specific initiative led by RMOW staff at this time

# 6.2.2 Ensure the Most Energy Efficient and Comfortable New Buildings and Infrastructure as Possible

	Recommended Action		Updates		
New	RESID	DENTIAL Buildings			
short	6.2.2.1	Support the trades, sub-trades, developers and building community with programs and initiatives designed to increase the uptake of energy efficient residential building designs, programs and technologies in Whistler.	• The Building Department is considering holding two open house events in 2019 in regards to Certified Energy Modelling of existing and new Part 9 buildings. Will also plan an open house for the future implementation of Part 3 Energy Step Code.		
short	6.2.2.2	Streamline the development of passive house- certified, and net-zero residential buildings using tools such as accelerated permit processing.	<ul> <li>In progress. No change since Q1 update</li> <li>Building Department focused on the successful roll out of Energy Step Code (Part 9)</li> </ul>		

med	6.2.3	Explore the feasibility for requiring energy modeling for new residential buildings and significant renovations at building permit phase.	<ul> <li>In progress. No change since Q1 update</li> <li>Building Department focused on the successful roll out of Energy Step Code (Part 9)</li> </ul>
long	6.2.2.4	Maintain and update the RMOW Green Building Policy to require higher energy performance standards during rezoning for new residential buildings.	<ul> <li>Ongoing. No change since Q1 update</li> <li>As of Jan 1, Step 4 of the Energy Step Code applies to all new Part 9 residential buildings on properties applying for rezoning to increase density or permit additional uses, and any new residential buildings that include construction of additional in-ground basement floor area excluded from gross floor area calculations.</li> </ul>
long	6.2.2.5	Encourage new multi-tenant or multi-owner residential buildings to have individually metered energy use (i.e. encourage user-pays principle).	No specific initiative led by RMOW staff at this time
Existi	ng CO	MMERCIAL/INSTITUTIONAL Buildings and Infrastructure	
short	6.2.2.6	Designate Whistler Village as a District Energy Investigation Area to encourage flexible building systems for future potential District Energy System connectivity.	• OCP due to receive 3rd reading July 23, 2019
short	6.2.2.7	Streamline the development of certified high- performance commercial buildings and/or significant renovations using tools such as accelerated permit processing.	No specific initiative led by RMOW staff at this time
med	6.2.2.8	Explore the feasibility of requiring energy modeling for new commercial buildings and significant renovations at building permit phase.	<ul> <li>Staff engaged in internal discussions on advancing Energy Step Code for Part 3 Buildings.</li> </ul>
med	6.2.2.9	Support the trades, sub-trades, developers and building community with programs and initiatives designed to increase the uptake of energy efficient commercial building designs, programs and technologies in Whistler.	Staff engaged in internal discussions on advancing Energy Step Code for Part 3 Buildings.
guol	6.2.2.10	Update the RMOW Green Building Policy to modernize the framework, and ensure that opportunities to increase energy performance outcomes are identified and leveraged during permit approval and rezoning processes (commercial, institutional and residential).	<ul> <li>Staff engaged in internal discussions on advancing Energy Step Code for Part 3 Buildings.</li> </ul>
guoj	6.2.2.11	Encourage new multi-tenant or multi-owner commercial buildings to have individually metered energy use (i.e. encourage user-pays principle).	No specific initiative led by RMOW staff at this time

# 6.3 Renewable Energy and Energy Supply Alternatives

# 6.3.1 Encourage the Use of Renewable Energy across the Community

		ommended Action	Updates
short	6.3.1.1	Encourage the use and fair commodity pricing of 'renewable' natural gas.	No specific initiative led by RMOW staff at this time
short	6.3.1.2	Investigate and advance opportunities to incent electric heat pump systems to replace existing gas/propane/basic electric heating systems.	<ul> <li>In progress. No change since Q1 update</li> <li>New incentives will begin Jan, 2019 (heat pump conversion incentives integrated with new Provincial EfficiencyBC programs)</li> </ul>
short	6.3.1.3	Evaluate the potential for including support for local renewable energy installations within future energy and/or climate related community-based social marketing campaigns.	No specific initiative led by RMOW staff at this time
short	6.3.1.4	Support provincial building code extensions and other tools that maximize the extent that local building regulation can require or support increased energy efficiency or renewable energy systems in local development and construction.	<ul> <li>Ongoing</li> <li>Regulation effective as of Jan1, 2019 (Building and Plumbing Bylaw Amendment (Energy Step Code) No. 2197 2018.)</li> </ul>
med	6.3.1.5	Develop a Renewable Energy Strategy to move Whistler toward the new 100% renewable energy target	No specific initiative led by RMOW staff at this time
med	6.3.1.6	Undertake a research study to evaluate the best opportunities for developing and expanding renewable energy production in Whistler.	No specific initiative led by RMOW staff at this time
med	6.3.1.7	Develop and/or expand renewable energy pilot installations on appropriate municipal buildings and facilities	No specific initiative led by RMOW staff at this time

# 6.3.2 Encourage the Addition of Responsible, Regional Renewables

	Rec	ommended Action	Updates
short	6.3.2.1	Support local and regional renewable electricity production opportunities that include a careful assessment of potential negative impacts on ecosystem function, wildlife values, air quality, community character and visual aesthetics.	No specific initiative led by RMOW staff at this time
med	6.3.2.2	Partner with utilities to provide feedback on the Integrated Resource Plans, and advocate for the inclusion of renewable energy provisions.	No current IRP engagement at present (on mailing list)

# 6.4 Solid Waste System-based GHG Emissions

### 6.4.1 Materials Minimization and Diversion

	Recommended Action Updates					
	Necc		opuales			
short	6.4.1.1	Support the implementation of a strong SLRD Solid Waste Management Plan - with strong targets and actions, regional collaboration, and continued avoidance of waste/garbage incineration as part of the Plan.	New 5-year contract for composter operation has been executed.			
short	6.4.1.2	Support the expansion of local compost diversion programs (marketing, education, pricing, infrastructure, etc.)	In progress. No change since Q1 update			
short	6.4.1.3	Evaluate opportunities to require new development or significant redevelopment to incorporate meaningful measures to minimize solid waste during design and construction, deconstruct rather than demolish, and encourage alternative and evolving methods of waste diversion during building operation.	No specific initiative led by RMOW staff at this time			
med	6.4.1.4	Continue moving towards the Zero Waste goal endorsed in 2005, and update the municipal solid waste strategy to advance zero-waste goals, planning and actions.	• Terms of Reference for Zero Waste committee being developed.			
med	6.4.1.5	Support and promote the increased use of the Sustainable Events Guide and monitor performance outcomes for all key events.	Events Bylaw before Council for consideration July 9, 2019			
med	6.4.1.6	Evaluate and support implementation of efficient and convenient methods of collecting solid waste, recyclables and compost for people utilizing preferred methods of transportation.	<ul> <li>Transport of waste and/or recyclables on local transit now permitted as a pilot project (with some limitations).</li> </ul>			
med	6.4.1.7	Encourage the private sector to develop and/or participate in innovative, cost-effective and environmentally sustainable solid waste and recycling programs in support of achieving our Zero Waste goal.	• Solid Waste Technician is organizing an outreach program to better inform businesses about their options and responsibilities regarding waste management.			
med	6.4.1.8	Implement standardized SLRD signage across Whistler to improve recycling and composting rates.	New compost bins installed in Village area			

# 6.4.2 Reduce Upstream Emissions from Goods and Services

	Reco	ommended Action	Updates
short	6.4.2.1	Support the creation of a 'sharing economy' working group to explore the best opportunities for sharing locally available skills and equipment as a means of increasing affordability, reducing new consumption and decreasing local waste production.	Will be integrated with Zero Waste Committee
short	6.4.2.2	Encourage the use of the Re-Build-It Centre and Re- Use it Centre for the reuse of building materials, products and to support community services.	New Re-Use-It and Re-Build-It Centres are operating successfully.
short	6.4.2.3	Promote opportunities for education and learning related to food production and associated GHG and environmental impacts.	RMOW staff attends Squamish Lillooet Food Project meetings.
short	6.4.2.4	Promote and facilitate opportunities to shorten food supply chains and that support less GHG intensive food growing and menu choices.	OCP due to receive 3rd reading July 23, 2019

# 6.5 Enabling Energy Reduction and Climate Change Mitigation

# 6.5.1 Ensure Adequate Governance and Funding for ongoing Climate Action progress

	Reco	ommended Action	Updates	
short	6.51.1	Create a 'Climate Leadership Committee' as a select committee of Council.	<ul> <li>No specific initiative led by RMOW staff at this time</li> <li>Committee and task force priorities and resources dedicated to Transportation and Housing initiatives</li> </ul>	
short	6.5.1.2	Investigate and advance opportunities to fund expanded local energy efficiency incentive programs with the annual RMOW corporate carbon tax rebate (CARIP).	<ul> <li>In progress. No change since Q1 update</li> <li>Launch of incentive co-funding for air-source heat pump retrofits (from natural gas) began on Jan 1st. Currently promoting EfficiencyBC as the primary host of all related incentive information.</li> <li>Update to CARIP council policy underway for effective funding use.</li> </ul>	
short	6.5.1.3	Create a Climate Action Coordinator position on municipal staff to lead the coordination and implementation of this CECAP and related energy and climate management responsibilities at the RMOW.	Climate Change Coordinator started June 10, 2019	
short	6.5.1.4	Review and consider the implementation of a FortisBC franchise fee and dedicate the incremental funds to energy efficiency programs.	No specific initiative led by RMOW staff at this time	

short 6.5.1.5

Consider use of cash-in-lieu parking fees for improvement of pedestrian, cycling, and transit infrastructure.

• A consultant will need to be engaged to develop a design that will meet MOTI requirements.

# 6.5.2 Actively Work With Other Levels of Government to Advance Shared Climate Goals

	Reco	ommended Action	Updates
short	6.5.2.1	Lobby the Provincial government for further systematic increases in the BC Carbon Tax, and for a shift toward VKT-based car insurance structures (vehicle-kilometers-travelled-based).	<ul> <li>Ongoing</li> <li>Letters sent in 2016.</li> <li>BC Carbon Tax increased again April 1, 2019 to \$40/tC02e, the highest explicit charge in North America</li> </ul>
short	6.5.2.2	Lobby the Provincial government for further systematic improvements to the BC Building Code that focus on energy efficiency.	<ul> <li>In progress. No change since Q1 update</li> <li>It is expected that BCBC will increase the base code to Step 3 by 2022/23</li> </ul>
short	6.5.2.3	Lobby senior governments to encourage increased energy and GHG innovation in the automotive and aviation sectors.	No specific initiative led by RMOW staff at this time
short	6.5.2.4	Increase collaboration with neighbouring Sea to Sky communities and the SLRD on climate-related issues.	Regional transit funding model rejected by Province. Options being considered.
med	6.5.2.5	Work with other groups and jurisdictions (i.e. BC Mayors Climate Leadership Council, City of Vancouver and other leading communities) toward advancing Whistler's 100% renewable energy goals.	<ul> <li>Climate Change Coordinator started June 10, 2019</li> <li>Part of the anticipated responsibilities</li> </ul>

# 6.5.3 Support High Quality, Third-Party Verified Local Offset Products

	Recommended Action		Updates
short	6.5.3.1	Encourage local organizations to support local carbon reduction projects like the Cheakamus Community Forest offset project.	RMOW completed CARIP report and identified 2018 emissions. Carbon offsets to be purchased from CCF.
short	6.5.3.2	Encourage local accommodation providers and booking companies to provide options for purchasing local offset products.	No specific initiative led by RMOW staff at this time
short	6.5.3.3	Continue to meet municipal carbon neutral commitments through the purchase of locally and regionally sourced high quality, externally verified offset products (i.e. Cheakamus Community Forest).	• The RMOW has maintained its carbon neutral status every year since 2010. Annual offset purchases are now 100% sourced from the Cheakamus Community Forest.

### 5.2 ADAPTATION INITIATIVES

Consistent with both the 2017 and 2018 Council Priorities and the key findings of the CECAP vulnerability and risk assessments, the primary (though not exclusive) focus of the Adaptation activities over the last two years was wildfire protection initiatives. Highlights of CECAP recommended initiatives as well as recent updates are included below for reference.

Note that the numbering references below relate directly to the 40 recommended 'climate adaptation' actions included within the 2016 CECAP structure.

# 8.5 Recommended Adaptation Initiatives

### 8.5.1 Minimize Wildfire Threats

	Reco	ommended Action	Updates
short	8.5.1.1	Continue to implement the Community Wildfire Protection Plan, including emphasis on public education and engagement.	<ul> <li>Kadenwood fuel thinning treatment resumed in April and will be complete summer 2019 (fire hazard allowing).</li> <li>Blackwell &amp; Associates completed the 2019-2027 fuel thinning plan.</li> <li>FireSmart program started treatment to Lost Lake loop and areas near Lakeside Park.</li> <li>Private residents are actively engaging in the Chipper Service. A total of 15 stratas participated in FireSmart workdays.</li> </ul>
short	8.5.1.2	Prioritize the implementation of the landscape-level wildfire management plan for the Cheakamus Community Forest area.	• Cheakamus Lake Road Phase 1 wildfire fuel reduction project completed. Forest Enhancement Society BC funding confirmed for Phase 2 in winter 2019/20.
short	8.5.1.3	Increase municipal and collaborative efforts around wildfire prevention with key corridor partners (i.e. MFLNRO, Sea to Sky fire rescue services, SLRD, Vancouver Coastal Health).	• RMOW, CCF and FLNRO coordinating on fuel thinning projects (Cheakamus Lake Road, Callaghan FSR, Alpine Meadows/CCF5).
short	8.5.1.4	Continue to review and update pre-incident and emergency response plans and communication protocols for wildfire situations.	<ul> <li>Ongoing</li> <li>RMOW Emergency Management staff collaborating with provincial staff and WFRS to update response plans, contact information and scenario task lists.</li> </ul>
short	8.5.1.5	Develop private property wildfire risk reduction guidelines and implement through municipal policy and/or procedures.	<ul> <li>Information being developed to inform public on new Wildfire DP guidelines.</li> </ul>
short	8.5.1.6	Review existing and consider more restrictive campfire and backyard fire bans and increase the enforcement of fire bans and ticketing/fines for offenses during high fire risk periods.	<ul> <li>Ongoing</li> <li>The proposed Fire and Life Safety Bylaw 2201, 2018 remains in draft at least until September 2019. The existing Fire Protection and Fireworks Bylaw 2046, 2014 remains in effect. 6.5 request for "Campfire Permit" remains in effect until further notice. 6.11 Garden Debris Fires are no longer allowed in the RMOW and will be repealed in the new Fire and Life Safety Bylaw. Further, WFRS are part of the Wildfire Working Group together with Protective Services, Emergency Management and Environmental Stewardship preparing a coordinated effort at education, response and enforcement with wildfire, illegal campfires, etc</li> </ul>

short	8.5.1.7	Consider creating Development Permit Areas for wildfire protection.	• OCP due to receive 3rd reading July 23, 2019
med	8.5.1.8	Lobby Provincial and Federal governments to increase funding for community and landscape level wildfire fuel reduction and response.	Ongoing. No change from Q1 update.
med	8.5.1.9	Encourage private operators to implement wildfire prevention best practices for outdoor tourism and recreation facilities, particularly in and around high- risk interface areas.	No specific initiative led by RMOW staff at this time
long	8.5.1.10	Enhance collaborative efforts with regional partners to prevent and respond to wildfires (i.e. MFLNRO, Sea to Sky fire rescue services, SLRD, Vancouver Coastal Health).	<ul> <li>Sea to Sky Multimodal Evacuation Plan Guidance Document complete and approved by Council.</li> <li>Fire Danger Rating Plan in draft form - details RMOW and partner activities pre-season, during High Fire Danger, during Extreme Fire Danger.</li> <li>Air quality advisory response plan in draft to detail measures RMOW will take when an air quality advisory is issued due to wildfire smoke.</li> <li>Purchse of repeater for Combined Events radio frequency to improve inter-agency communitions in the works.</li> </ul>
long	8.5.1.11	Lobby the Province to incorporate FireSmart principles into the BC Building Code.	No specific initiative led by RMOW staff at this time

# 8.5.2 Minimize Congestion on Highway 99

		0	0	-	
	Reco	ommended Action			Updates
short	8.5.2.1	Facilitate, develop and promote alternation options to and from the second seco		r.	Regional transit funding model rejected by Province. Options being considered.

# 8.5.3 Minimize Damage from Heavy Rain Events

	Reco	ommended Action	Updates
short	8.5.3.1	Continue to conduct annual assessments of significant waterways to identify and mitigate high risk flood locations while respecting in-stream and riparian habitat regulations.	• Funding was received and now hazard assessment in progress.
med	8.5.3.2	Complete and implement a comprehensive update of the Whistler Integrated Stormwater Management Plan (ISMP) that accounts for future climate change and related hydrologic changes within the lifespan of all existing and new infrastructure, buildings and developments. The ISMP should include key components of leading best practices in stormwater management planning and risk assessment.	• Funding was received and now hazard assessment in progress.

med	8.5.3.3	Complete and/or update floodplain mapping for all significant Whistler watersheds. Amend zoning and/or policies as needed to reflect adequate flood protection measures.	Funding was received and now hazard assessment in progress.
med	8.5.3.4	Follow changes in risk-based insurance premiums and overland flood insurance and adapt as needed to changing context and regulations.	No changes required yet.
med	8.5.3.5	Review and adapt as appropriate emergency planning protocols for extreme weather occurrences and related impacts, in consideration of projected climate changes.	<ul> <li>In progress. No change from Q1 update</li> <li>Emergency planning protocols are constantly being updated, improved and expanded.</li> <li>Specific work is underway to improve evacuation protocols, internal communication systems, as well as critical infrastructure management in light of potential new emergencies – with a focus on wildfire threat.</li> </ul>
med	8.5.3.6	Improve the design and maintenance of current and future outdoor recreation assets to better absorb heavy rain events (i.e. trails, roads and other activity infrastructure).	Trail improvements currently in progress
med	8.5.3.7	Consider improvements to signs and lighting for Highway 99 and municipal bridges with respect to weather and flooding alerts. Explore new or additional tools for monitoring at-risk areas.	No specific initiative led by RMOW staff at this time
guoj	8.5.3.8	Update relevant policies and plans aimed at protecting Whistler's potable water supply from contamination (i.e. 21 Mile Watershed Protection Plan and Groundwater Protection Plan) to consider additional potential impacts related to projected local climate changes.	<ul> <li>Completed</li> <li>21 Mile Creek surface water protection plan endorsed by Council in June 2018.</li> </ul>
long	8.5.3.9	Explore opportunities to improve sediment and erosion control requirements during development and construction.	• OCP due to receive 3rd reading July 23, 2019
guol	8.5.3.10	Join the UN campaign "My City's Getting Ready!"	No specific initiative led by RMOW staff at this time

# 8.5.4 Ensure Adequate Water Supply

Continue to update and prioritize implementation of the Comprehensive Water Conservation and Supply Plan focused on municipal conservation and		Reco	ommended Action	Updates	
• In progress. No change since Q1 update	short	8.5.4.1	the Comprehensive Water Conservation and Supply Plan focused on municipal conservation and infrastructure improvements, in addition to relevant policies, community-wide regulations and enforcement. The plan should be updated as needed to include or consider best practices in	<ul> <li>In progress. No change since Q1 update</li> <li>Work has started on evaluating metered water rates for industrial, commercial, and institutional properties in Whistler.</li> </ul>	

short	8.5.4.2	Enhance public engagement, communications and social marketing initiatives to optimize water conservation efforts and emergency preparedness related to water shortages.	In progress
short	8.5.4.3	Explore opportunities to improve municipal irrigation systems to maximize efficiency and reduce irrigation needs.	<ul> <li>Completed</li> <li>Significant upgrades done in 2016, and further refinements to systems and policies undertaken in 2017. RMOW system is now very efficient and responsive.</li> </ul>
long	8.5.4.4	Consider opportunities to increase and promote rainwater and grey water capture and use in public and private infrastructure.	No specific initiative led by RMOW staff at this time

# 8.5.5 Enhance Weather Independent Tourism Opportunities

	Reco	ommended Action	Updates					
short	8.5.5.1	Consider the development of a comprehensive resort-wide product enhancement, communications and marketing strategy to improve and promote the range of weather-independent and all-season tourism and recreation opportunities.	<ul> <li>Ongoing</li> <li>Advancement of Arts, Culture and Heritage programing and itineraries under development</li> </ul>					
short	8.5.5.2	Explore possibilities to secure additional appropriate waterfront areas for parks and recreation as needed (according to carrying capacity research) to support long-term growth in summer visitation, while preserving the environmental values of new site(s).	<ul><li>Ongoing</li><li>Land acquisition opportunity being advanced</li></ul>					
short	8.5.5.3	Continue to advance both cultural tourism development and the expansion of complementary learning and education initiatives.	In progress. No change since Q1 update					
med	8.5.5.4	Explore opportunities to develop easily-accessible and affordable non-skiing, snow-based winter activities above the valley.	No specific initiative led by RMOW staff at this time					
med	8.5.5.5	Explore opportunities to accelerate Whistler Blackcomb Bike Park and other multi-use trail expansion in both physical footprint and length of season.	<ul> <li>In progress. No change since Q1 update</li> <li>Alpine Trail program continues to be progressed</li> </ul>					
med	8.5.5.6	Place emphasis in relevant municipal policies on re- purposing existing under-used space to diversify tourism economy and provide non-snow-dependent recreation opportunities; remove barriers and encourage innovation.	<ul> <li>In progress. No change since Q 1 update</li> <li>Parks Master Plan underway, update provided at March 12 Council meeting.</li> </ul>					

# 8.5.6 Improve Ski Infrastructure for Weather Variability

short	8.5.6.1	Anticipate snowline changes and consider building, improving and/or moving lifts, trails and other infrastructure accordingly to maintain and enhance terrain quality and user experience.	Unchanged, RMOW not lead
short	8.5.6.2	Continue to improve summer/fall grooming, trail surfacing and snowmaking operations at lower elevations to facilitate more effective snow management in low-snow conditions for alpine and cross-country ski trails.	Unchanged, RMOW not lead
short	8.5.6.3	Consider the potential to offer a Whistler Blackcomb combination ski/bike park pass and promote the overlap of recreation offerings earlier and later in the respective seasons.	Unchanged, RMOW not lead
med	8.5.6.4	Investigate potential land exchanges to optimize potential ski terrain.	Unchanged, RMOW not lead
med	8.5.6.5	Investigate opportunities to develop and/or improve policies related to alpine land use and development, with emphasis on enhancing recreation offerings and protecting the environment.	<ul> <li>Unchanged, RMOW not lead</li> <li>WB has ongoing environmental policy focus on 'Mountain Ecosystems' including Operation Green Up, integration into Standard Operating Procedures outlined on website</li> </ul>

# 8.5.7 Minimize Threats to Ecosystems, Biodiversity and the CCF

			5					
	Reco	ommended Action	Updates					
short	8.5.7.1	Improve invasive species management efforts related to increasing pressures associated with a changing climate.	• Sea to Sky Invasive Species Council (SSISC) engaged for 2019 to focus on monitoring and treating priority invasive species.					
med	8.5.7.2	Develop and implement a Biodiversity Conservation Strategy that considers climate change and includes recommendations to monitor and protect ecosystem health and biodiversity from pressures including climate change.	<ul> <li>Ecosystem monitoring consultant developing the biodiversity conservation/priority habitat framework.</li> </ul>					
med	8.5.7.3	Conduct research and modify Cheakamus Community Forest management plans and practices to minimize risks related to climate change.	CCF has changed silviculture strategy and modified tree stocking standards to take climate change into account					

### 6 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 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, the Whistler 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.

Finally, 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 2018. In approximate terms, inter-community travel emissions likely represent 5-10 times the total footprint included within Whistler's community inventory. Given its scale and relation to our community economic engines, this is an issue that should not be overlooked within Whistler's (or any similar community's) ongoing discussions of climate mitigation and adaptation approaches.

### **APPENDICES**

А	Whistler Updated 2018 Community Energy & Emissions Inventory (printed copy only)
В	RMOW 2018 Corporate Energy & Emissions Inventory
С	Summary of Emission Factors
D	Summary of Corporate Carbon Neutral Commitment <ul> <li>RMOW Carbon Footprint</li> <li>Verified Emission Reductions (VERs)</li> </ul>

# **APPENDIX B** Summary of RMOW 2018 Corporate Energy & Emissions Inventory

RMOW Energy and GHG Emissions Assessment - 2018 By Division, Department, and Worksgroup - showing potential carbon carbon costs related to 'neutrality' commitment

	٩		Totals							
Division	Dept. Workgroup	Organizational Unit		cost (\$)	mobile fuels (Litres)	mobile fuels (GJ)	stationary gas (GJ)	Electricity (GJ)	Total Energy Use (GJ)	GHGs (tCO2e)
1100		Mayor & Council	\$	2,519	2,034.5	222.3	-	-	222	4.81
	1101	Mayor & Council	\$	2,519	2,034.5	222.3	-	-	222	4.81
			\$	-	-	-	-	-	-	-
1200		CAO Office	\$	2,977	2,537.6	151.8	-	-	152	6.00
	1201	Administrator	\$	2,977	2,404.6	147.2	-	-	147	5.68
	3100	Human Resources	\$	-	133.0	4.6	-	-	5	0.31
			\$	-	-	-	-	-	-	-
5000		Resort Experience	\$	568,586	83,614.6	3,039.2	4,386	10,942	18,367	454.25
	5100	General Manager	\$	1,027	1,072.5	37.2	-	-	37	2.43
	1401	Partnership & Economic Services	\$	-	50.6	1.8	-	-	2	0.12
	5200	Resort Parks Planning	\$	814	657.8	22.8	-	-	23	1.48
	1402	Village Animation	\$	998	805.8	27.9	-	-	28	1.81
	5400	Resort Planning	\$	-	425.2	14.7	-	-	15	1.00
	5300	Park/Village Operations	\$	562,625	77,982.9	2,844.0	4,386	10,942	18,171	441.38
	7200	Building Dept.	\$	2,347	1,993.8	69.1	-	-	69	4.54
	8300	Environment Stewardship	\$	775	626.0	21.7	-	-	22	1.48
			\$	-	-	-	-	-	-	-
6000		Infrastructure Services	\$	1,157,720	164,246.3	6,060.8	6,100	27,315	39,477	786.83
	6100	General Manager	\$	836	794.6	27.5	-	-	28	1.80
	6200	Development Services	\$	-	10.2	0.4	-	-	0	0.02
	6400	Transportation	\$	177,183	96,106.6	3,673.5	-	1,243	4,916	244.73
	6500	Central Services	\$	2,355	5,505.7	125.7	29	-	155	14.64
	6600	Environmental Operations	\$	71,586	58,885.8	2,126.4	-	-	2,126	140.87
	8200	Water Utility	\$	398,586	-	-	-	11,582	11,582	34.32
	8300	Sewer Utility	\$	417,689	2,858.1	104.4	6,071	12,802	18,977	350.19
	6600	Solid Waste	\$	89,485	-	-	-	1,689	1,689	0.07
	6800	Transit	\$	-	-	-	-	-	-	-
	6800	Emergency Planning	\$	-	85.3	3.0	-	-	3	0.21
			\$	-	-	-	-	-	-	-
7000		Corporate & Community Services	\$	303,176	50,154.9	1,826.6	5,966	7,211	15,003	439.97
	7100	CCS General	\$	-	119.0	4.1	-	-	4	0.28
	2200	Lesgislative Services	\$	-	80.4	2.8	-	-	3	0.03
	2300	Financial Services	\$	-	109.1	3.8	-	-	4	0.26
	2400	Fiscal Planning	\$	-	-	-	-	-	-	-
	2500	Information Technology	\$	399	1,152.0	39.9	-	-	40	2.68
	4100	Bylaw	\$	17,615	7,173.4	248.6	-	255	503	16.89
	4300	Fire	\$	30,103	25,819.4	957.6	-	-	958	63.57
	5800	Meadow Park Sports Centre	\$	242,221	1,503.6	52.1	5,966	6,956	12,974	324.12
	4200	RCMP	\$	-	436.0	15.1	-	-	15	0.99
	5500	Whistler Public Library	\$	-	567.7	19.7	-	-	20	1.34
	5700	Recreation	\$	12,837	13,194.4	482.9	-	-	483	29.80
			\$	-	-	-	-	-	-	-
			\$	2,034,977	302,587.9	11,301	16,452	45,468	73,220	1,692

# APPENDIX C Summary of Emission Factors

Summary	of Emiss	sion Fac	tors					
based on 2012 BC Bes	st Practices Me	thodology for (	Quantifying GH	G Emissions, B	C Ministry of E	nvironment (Sept,	2012)	
Stationary Emi	ssions							
Source Fuel	TOTAL	(Petro)					Key Con	version
	t CO2e/GJ	tCO2e/litre						
Natural Gas	0.0503	n/a					0.00504.0	o. //
Propane	0.0610	0.001544					0.025310	GJ/litre
Diesel (BO)	0.0728	0.002790					0.038300	GJ/litre
Mobile Emissio		_	_	_	_	_	_	
ight Duty Vehicles	T	(D = t = = )		(0:-)		. ( . !!)		
Source Fuel		(Petro)		L (Bio)	-	L (AII)	Key Con	version
Gasoline (EO)	t CO2e/GJ 0.0709	tCO2e/litre 0.00248	t CO2e/GJ 0.00000	tCO2e/litre 0.0000	t CO2e/GJ 0.0709	tCO2e/litre 0.002483	0.03500	GJ/litre
5 Gasoline	0.0675	0.00248	0.00319	0.0001	0.0709	0.002485	0.03500	GJ/litre
10 Gasoline	0.0673	0.00238	0.00638	0.0001	0.0705	0.002389	0.03500	GJ/litre
iesel (BO)	0.0713	0.00224	0.00000	0.0001	0.0703	0.002389	0.03830	GJ/litre
								GJ/litre
4 Diesel (RLCFR) 5 Diesel	0.0685	0.00262	0.00275	0.0001	0.0713	0.002722	0.03830	GJ/litre
	0.0678	0.00260	0.00343	0.0001	0.0712	0.002720	0.03830	
10 Diesel	0.0643	0.00246	0.00687	0.0002	0.0711	0.002707	0.03830	GJ/litre
20 Diesel	0.0572	0.00219	0.01373	0.0003	0.0710	0.002681	0.03830	GJ/litre
ropane	0.0605	0.00153	0.00000	0.0000	0.0605	0.001532	0.02531	GJ/litre
latural Gas	0.0562		0.000000	0.0000	0.0562	I	0.05379	GJ/kg
ight Duty Trucks (i	1	/		. (5: )		. ( . !!)		
Source Fuel	-	(Petro)		L (Bio)		L (All)	Key Con	version
(50)	t CO2e/GJ	tCO2e/litre	t CO2e/GJ	tCO2e/litre	t CO2e/GJ	tCO2e/litre	0.00500	0.411
iasoline (EO)	0.0720	0.00252	0.00000	0.0000	0.0720	0.002519	0.03500	GJ/litre
5 Gasoline	0.0685	0.00240	0.00319	0.0001	0.0717	0.002471	0.03500	GJ/litre
10 Gasoline	0.0650	0.00228	0.00638	0.0001	0.0714	0.002422	0.03500	GJ/litre
iesel (BO)	0.0713	0.00273	0.00000	0.0000	0.0713	0.002733	0.03830	GJ/litre
4 Diesel (RLCFR)	0.0685	0.00262	0.00275	0.0001	0.0713	0.002722	0.03830	GJ/litre
5 Diesel	0.0678	0.00260	0.00343	0.0001	0.0713	0.002720	0.03830	GJ/litre
10 Diesel	0.0643	0.00246	0.00687	0.0002	0.0712	0.002707	0.03830	GJ/litre
20 Diesel	0.0572	0.00219	0.01373	0.0003	0.0710	0.002681	0.03830	GJ/litre
ropane	0.0605	0.00153	0.00000	0.0000	0.0605	0.001532	0.02531	GJ/litre
latural Gas	0.0562		0.000000	0.0000	0.0562		0.05379	GJ/kg
leavy Duty Vehicle	es							
Source Fuel	TOTAL	(Petro)	ΤΟΤΑ	L (Bio)	ΤΟΤΑ	L (AII)	Key Con	version
Source ruer	t CO2e/GJ	tCO2e/litre	t CO2e/GJ	tCO2e/litre	t CO2e/GJ	tCO2e/litre	key con	rension
asoline (EO)	0.0672	0.00235	0.00000	0.0000	0.0672	0.002352	0.03500	GJ/litre
5 Gasoline	0.0640	0.00224	0.00319	0.0001	0.0672	0.002235	0.03500	GJ/litre
10 Gasoline	0.0607	0.00212	0.00638	0.0001	0.0671	0.002117	0.03500	GJ/litre
iesel (BO)	0.0708	0.00271	0.00000	0.0000	0.0708	0.002712	0.03830	GJ/litre
4 Diesel (RLCFR)	0.0680	0.00260	0.00275	0.0001	0.0708	0.002722	0.03830	GJ/litre
5 Diesel	0.0673	0.00258	0.00343	0.0001	0.0707	0.002720	0.03830	GJ/litre
10 Diesel	0.0638	0.00244	0.00687	0.0002	0.0707	0.002707	0.03830	GJ/litre
20 Diesel	0.0568	0.00218	0.01373	0.0003	0.0705	0.002681	0.03830	GJ/litre
off Road Vehicles	Т		r		1		_	
Source Fuel	TOTAL	(Petro)	ΤΟΤΑ	L (Bio)	TOTA	L (All)	Key Con	version
Jource ruer	t CO2e/GJ	tCO2e/litre	t CO2e/GJ	tCO2e/litre	t CO2e/GJ	tCO2e/litre		
	0.0675	0.00236	0.00000	0.0000	0.0675	0.002361	0.03500	GJ/litre
asoline (EO)	0.0642	0.00225	0.00319	0.0001	0.0674	0.002243	0.03500	GJ/litre
			0.00638	0.0001	0.0673	0.002125	0.03500	GJ/litre
5 Gasoline	0.0609	0.00213		1	0.0785	0.003007	0.03830	GJ/litre
5 Gasoline 10 Gasoline		0.00213	0.00000	0.0000				
5 Gasoline 10 Gasoline viesel (B0)	0.0609	0.00301		1			0.03830	
5 Gasoline 10 Gasoline Diesel (B0) 14 Diesel (RLCFR)	0.0609 0.0785 0.0754	0.00301 0.00289	0.00275	0.0001	0.0782	0.002722	0.03830	GJ/litre
Gasoline (EO) 25 Gasoline 210 Gasoline Diesel (BO) 34 Diesel (RLCFR) 35 Diesel 310 Diesel	0.0609	0.00301		1			0.03830 0.03830 0.03830	GJ/litre GJ/litre GJ/litre

# APPENDIX D Summary of 2018 Corporate Carbon Neutral Commitment

# RMOW Energy and GHG Emissions Assessment - 2018 By Division, Department

By Division, Department

By Divisi	on, Departn	nent				
		ē				WHISTLER
Division	Dept.	W orkgroup	Organizational Unit		carbon cost (\$)	carbon cost w contracted emissions(\$)
Divi	De	Worl			(not GST)	(not GST)
1100			Mayor & Council	\$	120.18	\$ 120.18
	1101		Mayor & Council	\$	120.18	\$ 120.18
			1	\$	-	\$ -
1200			CAO Office	\$	149.89	\$ 149.89
	1201		Administrator	\$	142.04	\$ 142.04
	3100		Human Resources	\$	7.85	\$ 7.85
				\$	-	\$ -
5000			Resort Experience	\$	11,356.23	\$ 12,326.23
	5100		General Manager	\$	60.86	\$ 60.86
	1401		Partnership & Economic Services	\$	2.99	\$ 2.99
	5200		Resort Parks Planning	\$	36.88	\$ 36.88
	1402		Village Animation	\$	45.18	\$ 45.18
	5400		Resort Planning	\$	25.12	\$ 25.12
	5300		Park/Village Operations	\$	11,034.62	\$ 12,004.62
	7200		Building Dept.	\$	113.62	\$ 113.62
	8300		Environment Stewardship	\$	36.98	\$ 36.98
				\$	-	\$-
6000			Infrastructure Services	\$	19,670.82	\$ 30,825.82
	6100		General Manager	\$	44.91	\$ 44.91
	6200		Development Services	\$	0.61	\$ 0.61
	6400		Transportation	Ś	6,118.20	\$ 8,179.45
	6500		Central Services	Ś	365.99	\$ 365.99
	6600		Environmental Operations	\$	3,521.68	\$ 4,249.18
	8200		Water Utility	\$	857.93	\$ 6,677.93
	8300		Sewer Utility	\$	8,754.68	\$ 9,482.18
	6600		Solid Waste	\$	1.67	\$ 1,820.42
	6800		Transit	\$	-	\$ -
	6800		Emergency Planning	\$	5.14	\$ 5.14
	0000		8	\$		\$ -
7000			Corporate & Community Services	\$	10,999.18	\$ 10,999.18
7000	7100		CCS General	\$	7.03	\$ 7.03
	2200		Lesgislative Services	\$	0.66	\$ 0.66
	2300		Financial Services	\$	6.44	\$ 6.44
	2300		Fiscal Planning	\$	0.44	\$ 0.44 \$ -
	2400 2500		Information Technology	\$	- 67.08	\$ - \$ 67.08
	2500 4100		Bylaw	\$ \$	422.25	\$ 67.08 \$ 422.25
	4100 4300		i Bylaw	\$	422.25	\$ 422.25 \$ 1,589.21
	4300 5800		1	\$		
			Meadow Park Sports Centre		8,103.07	
	4200		RCMP	\$	24.83	
	5500		Whistler Public Library	\$	33.53	\$ 33.53
	5700		Recreation	\$	745.07	\$ 745.07
				\$	-	\$ -
				\$	42,296.29	\$ 54,421.29

### Verified Emission Reduction (VERs)

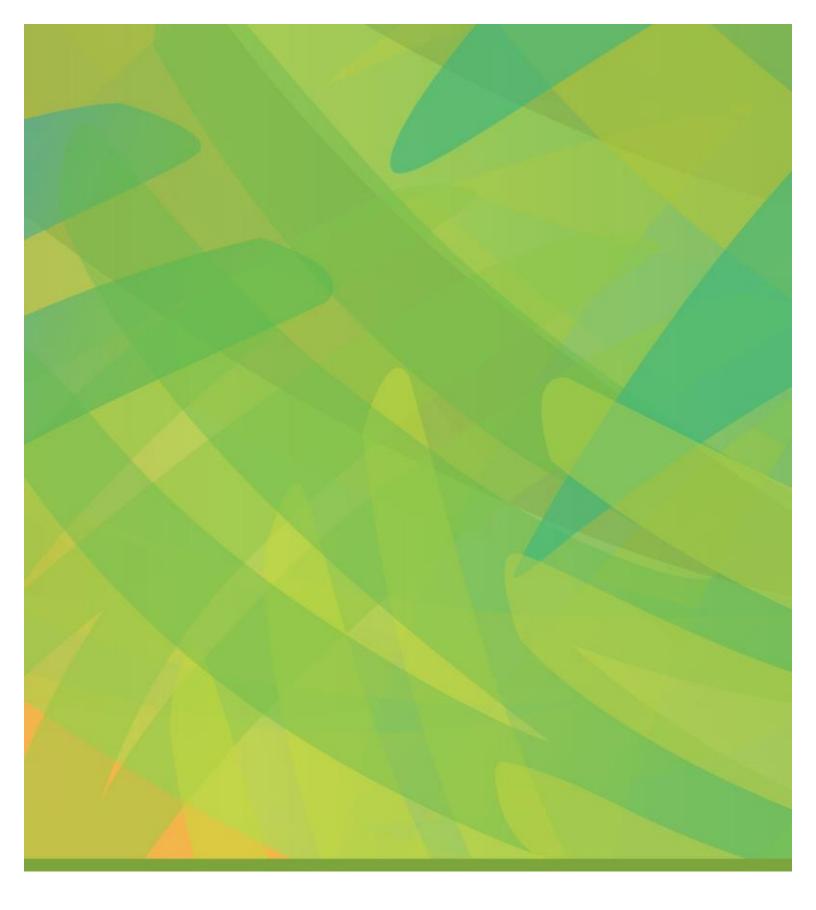
**2010 – 2017 Carbon Neutrality:** The RMOW has purchased and retired Verified Emission Reduction credits equal to its entire corporate carbon footprint for every year between 2010 and 2017 inclusive. The RMOW is committed to purchase such credits again to offset its 2018 GHG emissions, but details were not yet available at the time of release of this Report. A summary for 2010 to 2017 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.
2010	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.
2011	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.
2012	974 tonnes	Sun Select Aldegrove Biomass Boiler, British Columbia	ISO 14064-3 and CDM additionality tool	Markit Registry	Offsetters Clean Technology Inc.
2013	1,617 tonnes	Cheakamus Community Forest, British Columbia	BC Emission Offsets Regulation using the BC Forest Carbon Offset Protocol	Markit Registry	Cheakamus Community Forest
2014	1,805 tonnes	Cheakamus Community Forest, British Columbia	BC Emission Offsets Regulation using the BC Forest Carbon Offset Protocol	Markit Registry	Cheakamus Community Forest
2015	1,751 tonnes	Cheakamus Community Forest, British Columbia	BC Emission Offsets Regulation using the BC Forest Carbon Offset Protocol	Markit Registry	Cheakamus Community Forest
2016	1,810 tonnes	Cheakamus Community Forest, British Columbia	BC Emission Offsets Regulation using the BC Forest Carbon Offset Protocol	Markit Registry	Cheakamus Community Forest
2017	2,385 tonnes	Cheakamus Community Forest, British Columbia	BC Emission Offsets Regulation using the BC Forest Carbon Offset Protocol	Markit Registry	Cheakamus Community Forest

**2013 - 2017 Carbon Neutrality**: The RMOW has purchased VERs from the Cheakamus Community Forest (CCF) to offset 2013 - 2017 corporate emissions. More information about the project can be found on the Cheakamus Community Forest (CCF) website (<u>http://www.cheakamuscommunityforest.com/ccf-projects/</u>)

RMOW staff are confident in 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. 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. Note that consistent with Provincial policy, the carbon neutral commitment of the RMOW includes an estimate of the contracted emissions associated with 'traditional services of local government' (eg. any contracted snow clearing in the Village, solid waste collection contracts etc...)

See Appendix D above for more detail.



### THE RESORT MUNICIPALITY OF WHISTLER

Host Mountain Resort 2010 Olympic and Paralympic Winter Games

 4325 Blackcomb Way
 TEL
 604
 932
 5535

 Whistler, BC Canada VON 1B4
 TF
 1
 866
 932
 5535

 www.whistler.ca
 FAX
 604
 935
 8109