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1 EXECUTIVE SUMMARY

As a mountain town, Whistler has long been concerned with the issue of climate change. Our 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.

The primary purpose of this Annual Report is to provide a summary of the Whistler community's energy and greenhouse gas (GHG) emissions performance for the year 2010. The second part of this report includes a summary of the energy and emissions performance for the RMOW's internal corporate operations.

COMMUNITY-WIDE PERFORMANCE

COMMUNITY GHG EMISSIONS: The community of Whistler has committed to community-level greenhouse gas reductions of: 33% by 2020; 80% by 2050; and 90% by 2060 (versus 2007 levels). The Whistler community can be proud of the fact that collectively we have managed to remain on pace towards our goals over the first three years of the target period.

Total community emissions in 2010 were estimated to be 114,067 tonnes of carbon dioxide equivalent (tCO2e). This level is approximately 20% lower than 2000 levels, and approximately 2% below 2009 levels. Moreover, from an intensity perspective, 2010 GHG emissions per population equivalent dropped to 4.06 tCO2e/PE – the lowest annual per capita measure since detailed record keeping began in 2000.

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 RMOW boundaries continues to represent the largest share of the overall emission footprint (49%), followed by natural gas consumption at 34% (primarily used for space and water heating).

Looking ahead, the key challenge for our community will be maintaining the rate of reduction achieved over the last four years when further 'one-time changes' (such as the piped propane to natural gas conversion) are, for the most part, no longer readily available. To remain on target into the future, additional reductions of 3,000 to 4,000 tonnes of CO2e will be required annually for the next decade. These future reductions will need to be primarily premised on actual energy conservation and efficiency rather than one-time technological changes in community systems.

COMMUNITY ENERGY CONSUMPTION: Community energy consumption has not followed the same downward trajectory as community GHG emissions during the period between 2007 and 2010. Estimated total community energy consumption in 2010 was the highest ever recorded in Whistler – 3.2 million gigajoules (GJ) (up 5.6% from 2009). The primary driver of this increase was markedly increased consumption across the Whistler's commercial sector (15% increase in natural gas, and 16% increase in electricity consumption). While total consumption increased substantively, the resort in 2010 was notably busier than previous years. As such, from an energy intensity perspective, consumption per person decreased by 4% from 2009 levels (115 GJ/PE vs 119GJ/PE). That said energy consumption per person in 2010 was still higher than 2004, 2006 and 2007 levels.

Electricity is the most prevalent energy type consumed in Whistler representing 45% of the total consumption, followed by vehicle fuels (~31%), and natural gas (24%). The estimated total collective energy expenditure within Whistler has increased by more than \$20 million per year between 2000 and 2010 (\$69 million vs. \$49 million). Residential energy expenditures now exceed \$18 million/year, and commercial

¹ Carbon dioxide equivalent (or CO₂e) 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 (CO₂) as the reference.

² A gigajoule (GJ) is equal to one billion (10⁹) joules. The average single family home in Whistler consumes approx. 90-100 GJ per year.

expenditures total approximately \$22.5 million on an annual basis (vehicles and fleets make up the remainder).

Finally, increases in energy rates continue to outpace the rate of inflation so it is expected that the collective community expenditure will continue to rise faster than our collectively ability to pay for it – a trend that underscores the importance of increasing both energy conservation and energy efficiency across the community.

CORPORATE OPERATIONS PERFORMANCE

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 2010 were 2,290 tCO2e. This level of emissions is 4.3% lower than 2009 levels, but approximately 2.8% above 2008 levels (the reference year for RMOW target setting). On a division by division basis, the relative emission footprint of corporate operations demonstrates that almost all emissions are associated with the following three divisions: (41%) Environmental Services (which includes the roads crews, solid waste systems, the water utility as well as the sewer utility); (36%) Community Life (including bylaw, fire, meadow park sports centre, and other recreation programs); and (20%) Resort Experience (which includes village maintenance operations, horticulture/turf/irrigation crews, parks and trails, as well as facility construction and maintenance operations).

CORPORATE ENERGY CONSUMPTION: Total corporate energy consumption grew by more than 8% in 2010 to 85,896 GJ/year. This total is considerably (34%) higher than the 2010 target considered within the RMOW Integrated Energy Plan (64,000 GJ). Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 60% of the total, followed by natural gas (25%), and mobile fuels (15%).

Environmental Services experienced the greatest year-over-year increase in energy consumption (13%). This is primarily attributable to increases in natural gas consumption at the upgraded waste water treatment plant (WWTP) – not including the District Energy System (DES) – and additional electricity consumption increases within the water utility primarily associated with the new infrastructure on Alta Lake road (21 Mile Creek Supply station and associated infrastructure).

Total 2010 corporate energy expenditure was approximately \$1.7 million (up 4.5% versus 2009).

CLOSING COMMENTS

The impact of changing climatic conditions – especially reliable snow patterns – has the potential to substantially impact Whistler's primary economic engine – tourism. Informed, strategic planning that considers and evaluates the impacts of the issues related to climate change and rising fuel costs (on which

Whistler's economy is fundamentally dependent) can help to ensure that Whistler is best positioned to maintain its success in the future.

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



2 INTRODUCTION

Whistler is not sustainable. Our Vision is to be the *Premier Mountain Resort as we move Toward Sustainability*. Implied in this vision is our journey - and what Whistler does understand is that it will take continued commitment to get to our intended destination. Whistler also understands that on the journey that lies ahead, 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 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 our natural systems is absolutely fundamental to the well being 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. Reducing our greenhouse gas emissions is one of the most significant actions we can take as a community to take responsibility for our part in solving the climate crisis.

The primary purpose of this Annual Report is to provide a summary of Whistler's community-wide energy and greenhouse gas emissions performance over the past year (Section 3). The report includes detailed performance data, highlights key trends and insights, as well as benchmarks our performance against our Council-adopted targets. As such it is the intent of this Report to support and inform the strategic management of energy and climate-changing emissions across our community.

The second part of this report (Section 4) includes a summary of the energy and emissions performance of the RMOW's internal corporate operations. Although corporate emissions represent only about 2% of the total community emissions, it is these corporate emissions for which our staff have the greatest level of direct control, and for which we have the opportunity – and perhaps responsibility – to both lead by example and demonstrate success.

2.1 BACKGROUND

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

2.1.1 Whistler2020: Our Community's Comprehensive Sustainability Plan

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

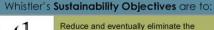
In 2005 the Resort Municipality of Whistler adopted Whistler2020, the community's comprehensive, long-term sustainability plan, as direction setting policy. Whistler2020 is the community's vision and framework that guides the actions of the RMOW. The five community priorities that define Whistler2020 are:

Whistler's Sustainability Objection

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

The four sustainability objectives in Whistler2020 (see box on the right) are based on the Natural Step principles. The sustainability objectives act as a compass to frame and guide decision-making and planning.

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





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



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 Fair Trade)

Viewed mainly as an environmental problem, climate change is much more than that. The largest comprehensive review on the economics of climate change was undertaken by British economist Nicholas Stern, and it makes the point well. In October of 2006, the British Government released the *Stern Review on the Economics of Climate Change* and it clearly states,

"Using the results from formal economic models, the Review estimates that if we don't act, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. If a wider range of risks and impacts is taken into account, the estimates of damage could rise to 20% of GDP or more. In contrast, the costs of action – reducing greenhouse gas emissions to avoid the worst impacts of climate change – can be limited to around 1% of global GDP each year."

Simply put, climate change is a problem that's borders extend beyond a solely environmental perspective.

³ Stern, N. (2007). Stern Review on The Economics of Climate Change. Executive Summary. HM Treasury, London: http://www.hm-treasury.gov.uk/sternreview index.htm

2.1.2 Whistler's Community Energy Planning - a brief history

Whistler committed to its first greenhouse gas emission reduction targets in 1997. In that year, Whistler

Council endorsed the Kyoto Protocol target of having our community's emissions at 6% below 1990 levels, by the year 2012. For municipal (corporate) emissions, Council also committed to being a part of the "20% Club", committing to having corporate emissions 20% below 1990 levels by 2012 – **two aspirations that the community of Whistler will clearly 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 climate action 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 sixty-two 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."

As of July 2011, 179 communities have become signatories to the Charter. By signing, local governments agreed that:

- 5. In order to contribute to reducing GHG emissions:
 - (a) Signatory Local Governments agree to develop strategies and take actions to achieve the following goals:
 - (i) being carbon neutral in respect of their operations by 2012, recognizing that solid waste facilities regulated under the Environmental Management Act are not included in operations for the purposes of this Charter.
 - (ii) measuring and reporting on their community's GHG emissions profile; and
 - (iii) creating complete, compact, more energy efficient rural and urban communities(e.g. foster a built environment that supports a reduction in car dependency and energy use, establish policies and processes that support fast tracking of green development projects, adopt zoning practices that encourage land use patterns that increase density and reduce sprawl.)⁵

⁴ The British Columbia Climate Action Charter, Section 1

⁵ The British Columbia Climate Action Charter. Section 5.

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

Enacted in 2008, Bill 27, the Green Communities Act, requires local governments to include (among other things) greenhouse gas emission targets, policies and actions in their Official Community Plans and Regional Growth Strategies. Under this legislation, local governments are also able to use development permits to promote energy and water conservation and the reduction of greenhouse gases, and encourage alternative transportation options for off-street parking.

In response to the *Green Communities Act*, the RMOW has integrated specific targets (discussed later in this report), policies and actions within its Official Community Plan, developed a Carbon Neutral Operations Plan, and created draft Development Permit Guidelines designed to reduce energy consumption and reduce greenhouse gas emissions.

Moving ahead, staff intend to initiate an update to Whistler Integrated Energy Plan in 2012. The new Community Energy and Emissions Plan will build from the former Plan forecasting future patterns of consumption and emissions relative to adopted targets, evaluating opportunities to improve performance, as well as recommending specific projects and sector-specific targets for consideration.

Building on the background and contextual elements presented in Section 2.1, Section 3 details how the community of Whistler is progressing toward our energy and emission reduction goals, and Section 4 presents similar performance data for RMOW corporate operations.

3 COMMUNITY PERFORMANCE

Since the year 2000, RMOW staff have 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 Fortis BC), as well as from local traffic counter data and annual RMOW waste and recycling performance tracking. Sections 3.1 and 3.2 of this report summarize the most current performance trends for 2010⁶.

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 2010 performance, as well as a short section on key associated insights and trends.

3.1.1 Community GHG Reduction Target

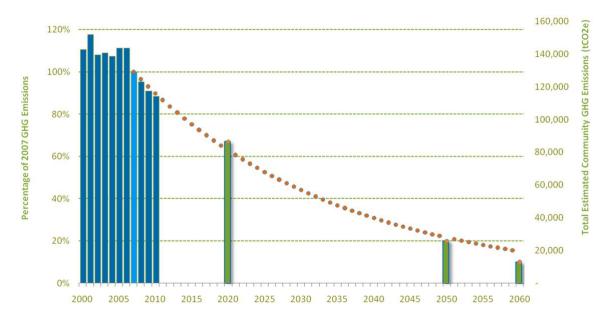
As previously stated, the *Provincial Green Communities Act* (Bill 27, 2008) requires all municipalities to adopt **targets**, policies and actions for the reduction of community-wide GHGs. As per the existing (and draft updated) Whistler Official Community Plan, when compared to 2007 GHG emission levels,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

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

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

WHISTLER - Total Estimated Community GHG Emissions

(showing OCP targetted reductions and a 3.5% reduction per year performance curve



⁶ It is expected that the 2011 community inventory will be compiled, assessed and reported during Q2/Q3 of 2012.

As demonstrated on the chart on the previous page, the community of Whistler has managed to remain on pace towards our targets for the first three years of the target period. GHG emission reductions achieved during these three years (2008-2010) has been impressive – averaging approximately 5,000 tonnes of reductions annually over the last four years. It is worth noting however, that the primary sources of these reductions have been **one-time** only events:

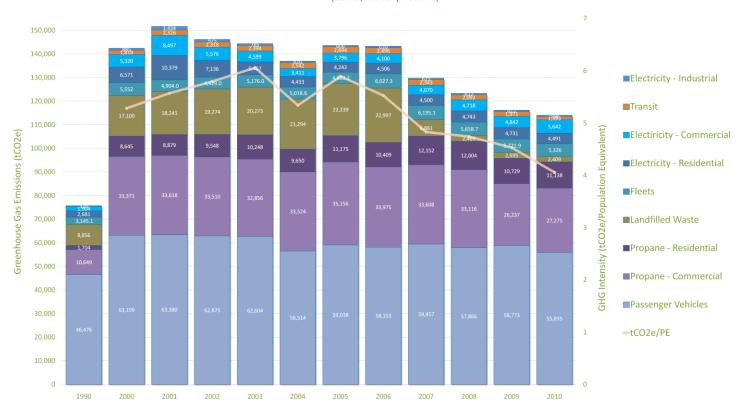
- 1) the changes to Whistler's waste management processes (i.e. landfill closure, landfill gas management, organics recycling and the switch to the advanced landfill management systems at Rabanco):
- 2) the switch from piped propane to natural gas across the community; and
- 3) the reduction in diesel consumption associated with the hydrogen transit bus pilot project.

Looking ahead, the key challenge for our community will be maintaining the rate of reduction achieved over the last four years when further 'one-time changes' are, for the most part, no longer readily available. To remain under the target curve presented above, additional reductions of 3,000 to 4,000 tonnes of CO2e will be required annually for the next decade. **These future reductions will need to be primarily premised on actual energy conservation and efficiency** rather than one-time technological changes in community systems.

3.1.2 Community GHG Emission Performance

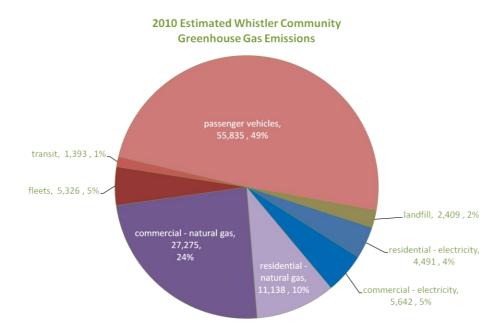
Total community emissions in 2010 were estimated to be **114,067 tCO2e**. This level is approximately 20% lower than 2000 levels, and approximately 2% below 2009 levels.

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



Moreover, from an intensity perspective, 2010 GHG emissions per population equivalent⁷ dropped to 4.06 tCO2e/PE – the lowest annual per capita measure since detailed record keeping began in 2000. As noted above, the primary drivers of these reductions have been the changes to the local waste management system (especially landfill gas capture); the switch from piped propane to piped natural gas, as well as BC Transit Hydrogen Transit Fleet pilot project. As further one-time changes such as these are not currently available to our community, the pace of reduction is not likely to continue without substantive 'energy conservation' becoming the core strategy for further emission reductions.

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.



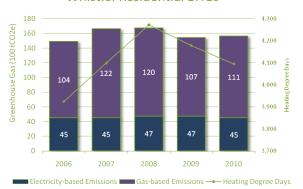
Passenger vehicle transportation within RMOW boundaries continues to represent the largest share of the overall emission footprint (49%), followed by natural gas consumption at 34% (primarily used for space and water heating).

The following two charts show the changes in greenhouse gas emissions from Whistler's building sector. Emissions in both the commercial and residential sector have increased year over year – especially in the commercial sector. However, in both cases emission levels in 2010 have decreased relative to 2008 levels (prior to the propane conversion project) – though this improvement has narrowed over the past year.

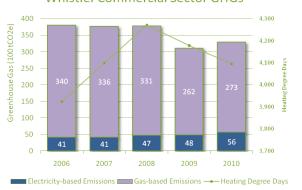
http://www.whistler2020.ca/whistler/site/genericPage.acds?instanceid=2985334&context=2985223

⁷ 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 Residential GHGs



Whistler Commercial Sector GHGs



3.1.3 Key Community GHG Performance Insights

- It is estimated that nearly half of all our community-level emissions (~55,000 tonnes annually) are produced by passenger vehicle transportation within municipal boundaries.
- 2010 was the first full year of piped natural gas supply versus propane; natural gas emits approximately 15% fewer GHG emissions per unit of energy consumed.
 - 2010 emissions from stationary gases (propane & natural gas) have decreased versus 2008 levels for both the residential (-867 tCO2e (-7%)) and commercial (-5,841 tCO2e (-17%)) sectors.
 - That said, due to increased consumption 2010 stationary gas emissions increased 4% in both sectors over the past year (2010 vs 2009)
- Due to the integration of hydrogen transit buses within the Whistler transit fleet, the estimated tailpipe emissions from Whistler's transit system dropped by ~575 tCO2e year over year (-30%).
- Provincial 'Renewable Fuel Requirements Regulation' introduced lower carbon fuel standards in 2010 for almost all gasoline and diesel sold across the Province (e5 gasoline and b3 biodiesel). Partially due to this fact, key tracked local fleet emissions (RMOW, WB, RCMP, School Buses) dropped by 7%.
- Total collective emissions from Whistler total building inventory increased by ~4% year over year. However these increases were more than compensated for by the decreases in emissions from passenger vehicles, fleets, transit (all related to lower carbon fuels) and landfilled waste.
- Current Whistler-wide GHG emission levels are consistent with the recommended scenario in the current RMOW Integrated Energy Plan (~114,000 tCO2e/year), although current levels are higher on a per capita basis (2010: 4.0 tCO2e/PE vs recommended target for 2010: 3.5 tCO2e)
- A previously noted, the key challenge for our community will be maintaining the rate of reduction
 achieved over the last four years when further 'one-time changes' are, for the most part, no longer
 readily available. These future reductions will need to be primarily premised on actual energy
 conservation and efficiency rather than one-time technological changes in community systems.

3.2 COMMUNITY ENERGY CONSUMPTION

Section 3.2 deals with energy consumption and energy expenditures at the community level. This section includes information on related targets, an overview of 2010 performance, as well as a short section on key associated insights and trends.

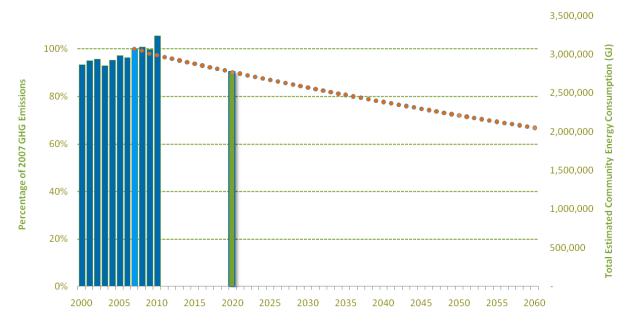
3.2.1 Community Energy Reduction Target

The proposed 2011 update of the Whistler's Official Community Plan (OCP) includes the Objective: 'Make Energy Conservation the Core Strategy and Highest Priority for Achieving Our Greenhouse Gas Emission Reduction Goals'. To this end, the 2011 OCP Update also proposes the adoption of a community-scale energy reduction target. As currently proposed, the draft 2011 OCP text includes the following, "The municipality will lead a community-wide effort to reduce total energy consumption to a level 10% lower than 2007 by 2020".

If adopted by Council, this policy would introduce Whistler's first comprehensive <u>energy</u> 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.

WHISTLER - Total Estimated Community Energy Consumption

(showing OCP targetted reductions and a 0.75% reduction per year performance curve



As evidenced in the chart above, historic energy consumption has not followed the same trajectory as community GHG emissions during the period between 2007 and 2010. In fact, estimated total energy consumption in 2010 was the highest ever recorded in Whistler.

3.2.2 Community Energy Consumption Performance

Total community energy consumption in 2010 was estimated to be **3.2 million GJ** (up 5.6% from 2009). The primary driver of this increase was the substantially increased consumption across the commercial sector (15% increase in natural gas consumption, and 16% increase in electricity consumption).

Estimated Whistler Community Level Energy Consumption (1990, 2000 - present)



While total consumption increased substantively, the resort was notably busier than previous years. From an energy intensity perspective, consumption per person⁸ decreased 4% from 2009 levels (115 GJ/PE vs 119GJ/PE). That said, energy consumption per person in 2010 was still higher than 2004, 2006 and 2007 levels, suggesting that there is still little evidence that the community is becoming more energy efficient per person we host in town – in fact, the three-year rolling average suggests that are performance may be declining.

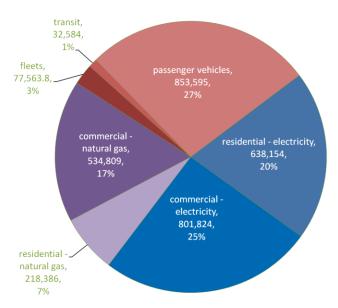
NOTE: Normalizing the data to account for newly built gross floor area over time (<0.5% annually), or annual changes in weather (winter 2010 had 2% fewer heating degree days) does not change the aforementioned energy consumption trends.

Energy consumption in Whistler includes consumption from stationary sources (buildings & infrastructure), as well as mobile sources (passenger vehicles, fleets, and transit). The approximate share of each of these sources is presented in the following chart.

-

⁸ per Population Equivalent –see Section 3.1.2

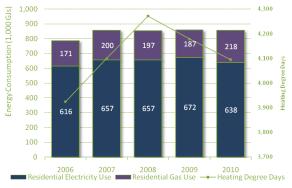




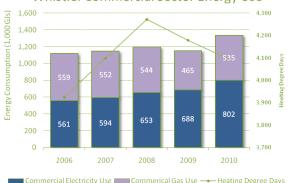
Electricity is the most prevalent type of energy consumed in Whistler at 45% of the total consumption, followed by vehicle fuels (~31%), and natural gas at approximately one quarter of total consumption. It is worth noting that due to the fact that different energy sources have differing carbon content – GHG emissions are much more heavily associated with consumption of hydrocarbons (fossil fuels) – i.e. gasoline, diesels and natural gas. This fact accounts for the differences in relative proportions depicted in this chart as compared the similar chart presented in Section 3.1.2.

Total energy consumption across Whistler's building sector is presented in the following two charts. Residential electricity consumption declined in 2010, while gas consumption increased resulting in net residential consumption remaining unchanged year over year. Total commercial energy consumption increased substantially for both energy sources (16% for electricity, and 15% for natural gas).

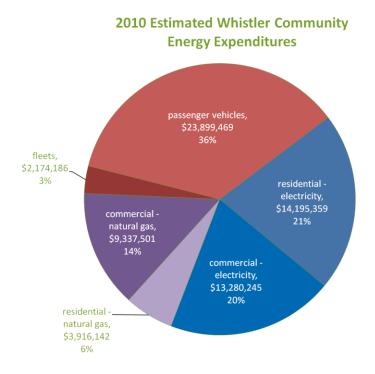




Whistler Commercial Sector Energy Use



The estimated collective energy expenditure within Whistler 9 has increased by more than \$20 million per year between 2000 and 2010 (\$69 million vs. \$49 million). Increases in energy rates continue to outpace the rate of inflation so it is expected that the collective community expenditure will continue to rise faster than our collectively ability to pay for it – a trend that underscores the importance of increasing both energy conservation and energy efficiency across the community.



The final two charts in this section present the five-year trend in cumulative energy expenditures across Whistler's building sector. Despite the marked decrease in the price of natural gas (versus propane) in 2009 and 2010, expenditures in both sectors continue to demonstrate upward trends with total expenditure. Residential expenditures now exceed \$18 million/year, and commercial expenditures total approximately \$22.5 million on an annual basis (vehicle and fleet expenses make up the remainder).

Rate escalation expected for both natural gas and electricity over the next number of years, combined with rising consumption levels suggest that increases in total energy expenditure will continue for the foreseeable future.

9

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

Whistler Residential Energy Expenditure



Whistler Commercial Sector Energy Expenditure



3.2.3 Key Community Energy Consumption Performance Insights

- Commercial energy consumption increased substantially in 2010 (~15% year over year). While it is likely that it was primarily driven by the increased visitation during the 2010 Games, it is worth noting that the energy consumption per person (per PE) still exceeded consumption per person in 2004, '06 & '07. (NOTE: the 2010 population equivalent (PE) was ~10% larger than 2009).
- Residential electricity consumption decreased by 3% in 2010. NOTE: a small improvement (<1%)
 could be partially explained due to the reduced heating demands of the 2010 winter.
- However, despite the warmer winter, total natural gas consumption was up 4% in 2010 both in the
 residential sector, as well as the commercial sector. NOTE: the total number of Fortis customers did
 not change significantly in either the commercial or residential sectors. As such, 2010 represented an
 increase in gas consumption per account that cannot be easily explained through a 'colder winter'
 hypothesis.
- It is also worth noting that the failure of the RMOW traffic counter near Blueberry has created staff challenges for accurately estimating traffic volumes (and consequently mobile fuel consumption and emissions) during 2010.
- As stated in the previous Section, while overall GHG emissions levels have trended downward over the last five years (putting us on the right track), these reductions are primarily the result of significant one-time infrastructure projects (pipeline conversion, landfill management and increased organics recycling), not community scale energy conservation.
 - Without significant reductions in total energy consumption (particularly fossil fuels), the future pace of emission reductions will slow dramatically, or potentially even resume an upward trajectory.
- Current community energy consumption levels (3.2 million GJ/yr) are approximately 16% higher than the recommended forecast in the RMOW's Integrated Energy Plan.

4 CORPORATE PERFORMANCE

Initiated as part of the 2004 RMOW Integrated Energy, Air Quality and GHG Management Plan, detailed energy and emission inventories are now compiled, assessed and presented to key operations staff across the organization on an annual 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 corporate operations.

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

As a means of comparison to community-wide emissions, RMOW corporate emissions represent approximately 2% 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 management across the organization.

Lastly, the ongoing upward pressure on energy rates (energy rates are rising 3-5 percentage points faster than the rate of inflation) makes it clear for all organizations that energy consumption should be tracked, managed and ultimately reduced – quite simply, at constant consumption levels, future costs are likely to outstrip future budgets.

4.1 CORPORATE GREENHOUSE GAS EMISSIONS

Section 4.1 deals specifically with greenhouse gas emissions associated with RMOW corporate operations, this section includes information on related targets, an overview of 2010 performance, as well as a short section on key associated insights and trends.

4.1.1 Corporate GHG Reduction Targets

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

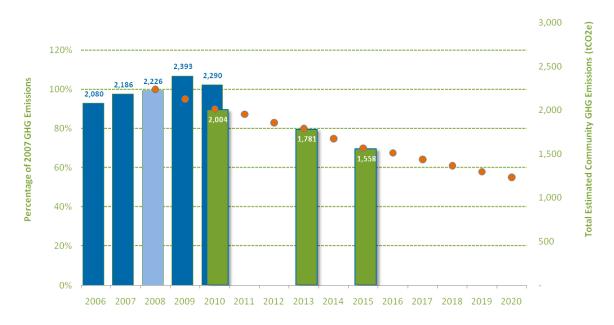
- 10% by 2010
- 20% by 2013
- 30% by 2015

(all relative to 2008 levels)

The following chart presents these targets graphically (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 (@ -5%) (orange dots).

WHISTLER - Total Estimated RMOW Corporate GHG Emissions

(showing targetted reductions and a 5% reduction per year performance curve



As demonstrated in the above chart, while emissions from RMOW corporate operations decreased in 2010 (~4%), 2010 emission levels **are clearly above** targeted corporate emission level for 2010.

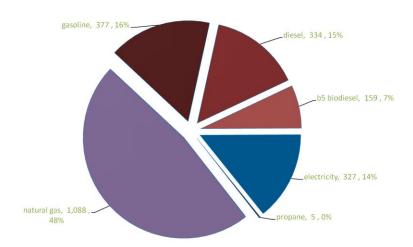
4.1.2 Corporate GHG Performance

Total corporate GHG emissions in 2010 were **2,290 tCO2e**. This level of emissions is 4.3% lower than 2009 levels, but approximately 2.8% above 2008 levels (the reference year for RMOW target setting).



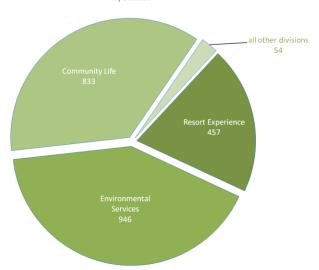
Corporate emissions come from two primary sources – mobile sources (gasoline and diesels), and stationary sources (natural gas and electricity). The relative shares of each of these energy types are presented below.





On a division-by-division basis, the relative emissions footprint of corporate operations is primarily associated with the following three divisions: (41%) **Environmental Services** (which includes roads crews, solid waste systems, the water utility as well as the sewer utility); (36%) **Community Life** (including bylaw, fire, meadow park sports centre, and other recreation programs); and (20%) **Resort Experience** (which includes village maintenance operations, horticulture/turf/irrigation crews, parks and trails, as well as facility construction and maintenance operations). The relative contributions from each division are shown below.

2010 RMOW Corporate Emissions (tCO2e) by Division



4.1.3 Key Corporate GHG Emission Performance Insights

- Year over year, the Resort Experience division achieved the greatest reduction in GHG emissions at 17% (-93 tCO2e), followed by Community Life at a 5.5% reduction (-49 tCO2e),
- The Environmental Services division however, increased emissions in 2010 by 4.4% or 40 tCO2e. As previous stated however, the net change to RMOW corporate emissions was a 4.3% decrease in 2010 relative to 2009 levels.
- Increases in emissions from Environmental Services are primarily associated with increased natural gas consumption at the WWTP (not including the District Energy System (DES)) – an increase of ~90 tCO2e per annum (30%).
 - Staff are closely monitoring this facility and believe that natural gas conservation at the WWTP (particularly the primary treatment building) will provide a good opportunity for energy retrofits in 2011 and 2012.
- Emission reductions at MPSC totalled ~40tCO2e for the year much less than the ~300tCO2e reduction that is ultimately expected through the SHW/GHX retrofit. There are however, reasons for optimism:
 - There are two primary reasons for this difference: (a) the project took longer than expected for installation, commission and optimization, and as such was not 100% operational for much of 2010, and (b) significant mechanical failures on other energy consuming systems at MPSC have occurred over the past 18 months (a significant leak in the Leisure Pool and the failure of the heat recovery system in the large poolside Dectron air handling unit).
 - Natural gas consumption at MPSC for the most recent three month billing period (April 15 July 21, 2011) is tracking 44% lower than the same period in 2009 (~1,200 GJ; ~\$20,000 less for the period at current rates).
- 2010 GHG emission reductions within the Resort Experience division are primarily attributable to decreased space heating emissions for municipal buildings (a function of reduced gas consumption (~20%), and the switch from propane to natural gas (a 15% cleaner burning fuel)).
- Finally, fleet-based emissions provide a good opportunity for future emission reductions (across all divisions) more aggressive vehicle right-sizing, more efficient vehicles, and potentially decreased service demands.

4.2 CORPORATE ENERGY CONSUMPTION

Section 4.2 deals specifically with the energy consumption¹⁰ associated with RMOW corporate operations. This section includes information pertaining to energy consumption targets, an overview of 2010 performance levels, as well as a short section on key associated insights and trends.

4.2.1 Corporate Energy Consumption Reduction Targets

The RMOW does not currently have any formally adopted targets for corporate energy consumption.

The existing RMOW Integrated Energy, Air Quality and GHG Management Plan does, however include recommended corporate energy consumption targets for 'consideration' (pg 58). These recommended energy consumption targets for municipal operations are: year 2010 (64,000 GJs), and year 2020 (55,000 GJs).

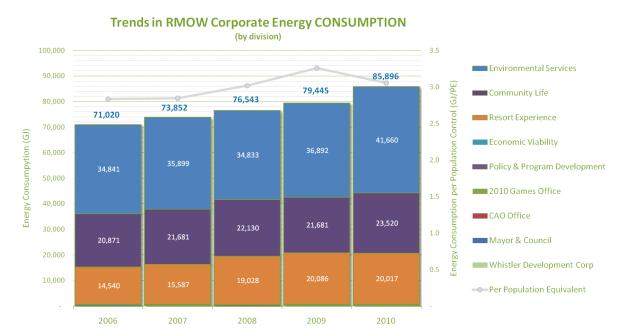
The RMOW Carbon Neutral Operations plan does not include formal targets but rather recommends ongoing commitment to energy conservation as both (a) the primary strategy for reducing corporate GHG emissions, and (b) an important means of controlling ongoing utility and fuel costs across corporate operations.

NOTE: an updated Community Energy & Emissions Plan will be undertaken by staff over the next year, this community and corporate engagement process will provide a suitable forum for the consideration of any future formalized corporate energy consumption targets for municipal operations.

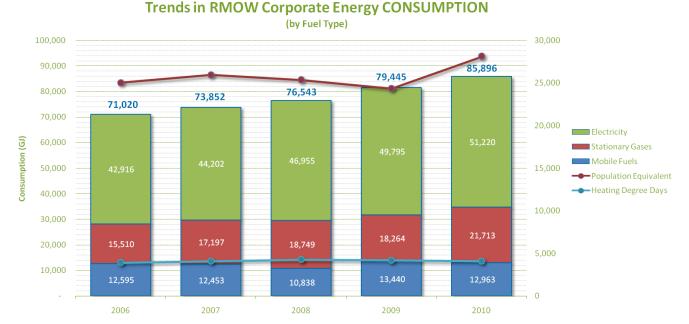
¹⁰ Energy consumption includes the consumption of mobile fuels (gasoline and diesels) as well as the consumption of stationary fuels (natural gas and electricity)

4.2.2 Corporate Energy Consumption Performance

Total corporate energy consumption grew in 2010 by more than 8% in 2010 to **85,896 GJ/year**. This total is considerably higher (34%) than the 2010 target considered within the RMOW Integrated Energy Plan (64,000 GJ). The five year trends in corporate energy consumption are presented below:

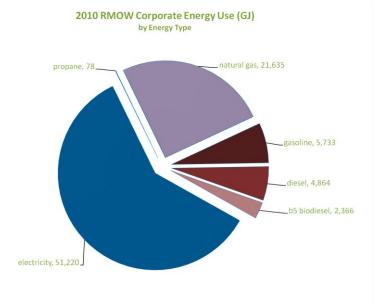


If the corporate energy consumption is subdivided by fuel type rather than by organizational division, the five-year trends appear as follows:

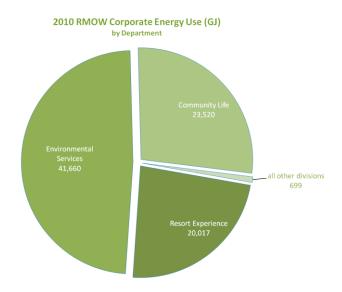


Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 60% of the total consumption, followed by natural gas (25%), and mobile fuels (15%).

A more detailed breakdown of 2010 corporate energy consumption, presented by energy type, is included below:



Finally, 2010 energy consumption by division is included for reference below:

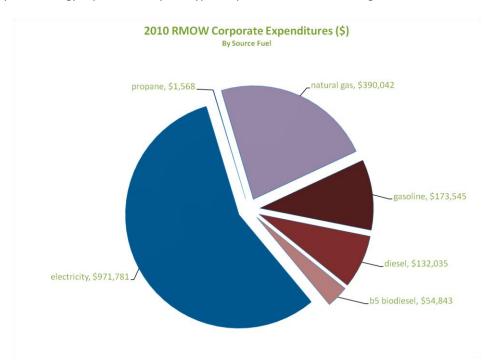


Total 2010 corporate energy expenditure was approximately \$1.7 million (up 4.5% versus 2009). The five-year trends in total corporate energy expenditure are presented below:

Trends in RMOW Corporate Energy EXPENDITURES



2010 corporate energy expenditures by fuel type are presented in the following chart:



4.2.3 Key Corporate Energy Consumption Performance Insights

- Environmental Services experienced the greatest year-over-year increase in energy consumption (13%). This is primarily attributable to increases in natural gas consumption at the upgraded WWTP (not including the DES), as well as electricity increases within the water utility primarily associated with the new infrastructure on Alta Lake road (21 Mile Creek Supply station and associated infrastructure).
- 2010 mobile fuel used by the RMOW roads crews decreased in 2010 relative to 2009 levels; however it remained higher than 2008 levels.

- The Resort Experience division reduced total energy consumption marginally in 2010 (-0.3%). This was primarily driven by decreases in natural gas consumption across the municipal buildings that are managed by the Parks/Village Operations staff (-21%). These reductions however, were almost entirely counter-balanced by increases in the electricity use across Parks/Village ops.
- Energy reduction improvements at MPSC have been substantially mitigated due to an enduring pool
 water leak in the Leisure pool as well as the substantive failure of the heat recovery system within
 the poolside air handling unit (Dectron unit). Both issues are being repaired during the summer of
 2011, and improved results are expected once these issues are resolved.
 - Natural gas consumption at MPSC for the most recent three month billing period (April 15 July 21, 2011) is tracking 44% lower than the same period in 2009 (~1,200 GJ; ~\$20,000 less for the period at current rates).
- Given the ongoing increase in utility and mobile fuel rates (>5% per annum), substantial conservation
 across all municipal operations will need to be realized in order to keep municipal energy
 expenditures at current levels.

5 CLOSING COMMENTS

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

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

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

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 endeavour 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 2009.

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

6 APPENDICES

- A Whistler Updated 2010 Community Energy & Emissions Inventory
- B RMOW 2010 Corporate Energy & Emissions Inventory
- C Summary of Emission Factors
- D Summary of Corporate Carbon Neutral Commitment
 - RMOW Carbon Footprint
 - Verified Emission Reductions (VERs)
 - Key Variance Summary Traditional Services Scope Boundary

APPENDIX C – Summary of Emission Factors

Energy Type	Emission Factor	Source
Propane	0.0600125 tCO2e/ GJ	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Natural Gas	0.0503034 tCO2e/GJ	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Gasoline	0.0022271 tCO2e/litre	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Diesel	0.0026523 tCO2e/litre	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
B5 Biodiesel	0.0025957 tCO2e/litre	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Electricity	0.0063900 tCO2e/ GJ	three year rolling avg of BC Hydro's published GRI emission rates (http://www.ec.gc.ca/ges-ghg/default.asp?lang=En&n=AC2B7641-1)

APPENDIX D – Summary of Corporate Carbon Neutral Commitment

RMOW Carbon Footprint

		9	Totals		
Division	Dept.	Organizational Unit	GHGs (tCO2e)		carbon cost (\$)
1100		Mayor & Council	1.95	\$	48.84
	1101	Mayor & Council	1.95	\$	48.84
1200		CAO Office	22.30	\$	557.38
1200	1201	Administrator	20.96	\$	524.12
	3100	Human Resources	1.33		33.26
			-		
1300		2010 Games Office	7.13	\$	178.16
	1302	2010 Games Office	3.44		86.06
	1401	Partnership & Economic Services	3.68		92.10
1500		Policy & Program Development	11.09	\$	277.23
1300	1501		9.85	\$	246.25
	2200	Policy & Program Development Lesgislative Services	1.24	۶ \$	30.98
	2200	Ecogistative Services	-		30.30
2000		Economic Viability	10.19	\$	254.67
	2100	General Manager	5.13	\$	128.17
	2300	Financial Services	0.82		20.57
	2400	Fiscal Planning	0.11		2.66
	2500	Information Technology	4.13		103.27
		Parant Francisco	457.24		
5000		Resort Experience	457.34	\$	11,433.62
	5100	General Manager	2.14		53.55
	5200	Resort Parks Planning	1.30		32.46
	1402 5400	Village Animation	1.74		43.62
	5300	Resort Planning Park/Village Operations	0.03 452.13	\$ \$	0.67 11,303.32
	3300	rain/ village Operations	- 432.13		11,303.32
6000		Environmental Services	946.25	\$	23,656.28
	6100	General Manager	10.07		251.69
	6200	Development Services	0.24		5.94
	6400	Transportation	282.01		7,050.34
	6500	Central Services	10.84		271.07
	6600 8200	Environmental Operations Water Utility	137.80 114.80	\$ \$	3,445.07 2,870.03
	8300	Sewer Utility	386.26	\$	9,656.47
	6600	Solid Waste	2.93	\$	73.14
	6800	Transit	-		
	8300	Environment Stewardship	1.30		32.53
7000		Community Life	833.40	Ś	20,835.04
	7100	Community Life General	9.73	\$	243.26
	4100	Bylaw	28.95		723.65
	4300	Fire	60.02		1,500.48
	5800	Meadow Park Sports Centre	690.19		17,254.79
	7200	Building Dept.	14.95		373.69
	4200	RCMP	2.52		62.88
	5500	Whistler Public Library	1.59		39.77
	5700	Recreation	25.46		636.52
9000		Whistler 2020 Development Corp	1.22	\$	30.60
	9100	Whistler2020 Development Corp	1.22	\$	30.60
		İ	2,290.87	\$	57,271.82

Verified Emission Reduction (VERs)

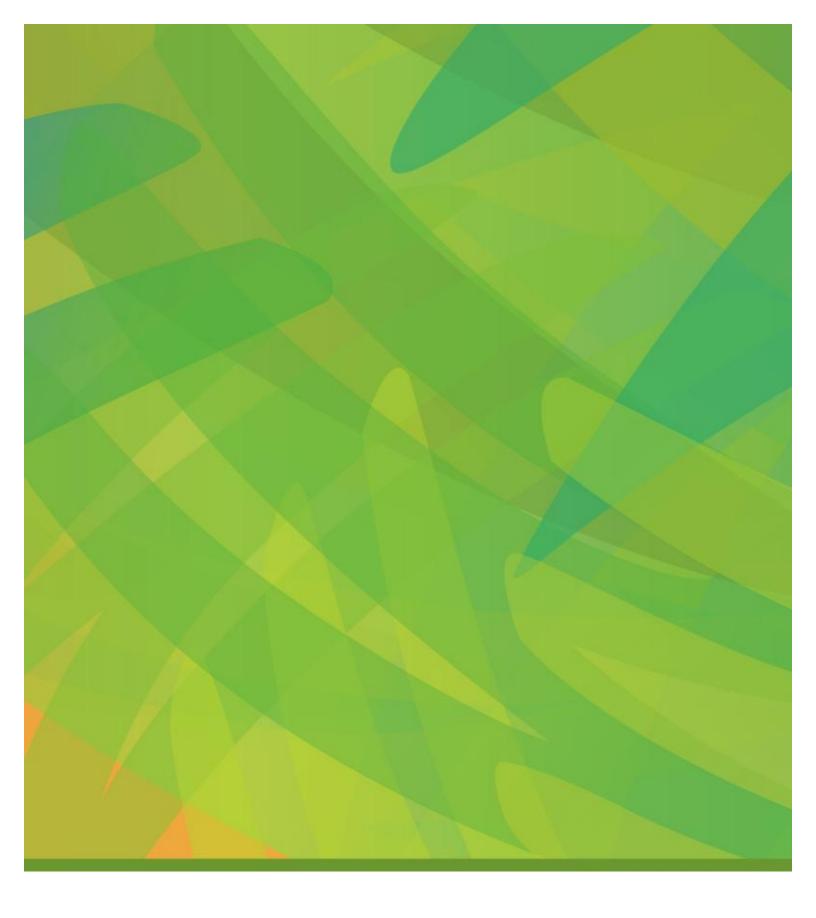
Summary of VERs Purchased and Retired in the name of the Resort Municipality of Whistler

VERs	Project	Certification Standard	Registry	Vendor
1,145 tonnes	Mare Monastir Wind Farm, Turkey	Gold Standard – project reference: GS368	GS APX Registry	Offsetters Clean Technology Inc.
1,145 tonnes	Sun Select Aldegrove Biomass Boiler, British Columbia	ISO 14064-3 and CDM additionality tool	Markit Registry	Offsetters Clean Technology Inc.
2,290 tonnes				

Key Variance Summary – Traditional Services Scope Boundary

The following is a summary of the variances in the inventory scope boundary between the 2010 RMOW corporate inventory and the corporate emissions boundary described within *The Carbon Neutral Workbook–Helping Local Governments Understand How to be Carbon Neutral in their Corporate Operations.*

Traditional Service Area	Variance from 'Workbook' Traditional Service Approach
Administration & Governance	 All local government buildings related to this service area are included All local government vehicles used for governance and administration are included Staff travel for conferences and meetings is included Fuel for staff vehicles used in the execution of administration and governance responsibilities is included Although partially funded by local government, the chamber of commerce building space is not included Although partially funded by the local government, Tourism Whistler's building assets and corporate travel is not included (Tourism Whistler is a membership—based tourism marketing not-for-profit organization) Consultant travel associated with work on specific contracts related to this service area is not included The Whistler Housing Authority (WHA) is not included
Drinking, Storm and Waste Water	 All municipally owned and operated water intakes, wells, reservoirs, dams, treatment facilities, distribution systems, and collection systems are included All municipal vehicles used within the provision and maintenance of these services is included The privately operated VanWest water distribution system in Function Junction is not included Heavy vehicles used for gravel extraction on Fitzimons Creek is not included
Solid Waste Collection, Transportation and Diversion	Note that the operation of the entire solid waste management system (solid waste, recycling & compost) is a service contracted out by the local government – renewal of this contract is expected in 2012 The operation of buildings at the Solid Waste and Recycling Transfer Station is Included The operation of buildings and infrastructure at the Composting Facility (located at the Transfer Station) is not included – The operation of the heavy vehicles at the Transfer Station (both Compost Facility responsibilities & Transfer Station responsibilities) are not currently included The pick-up and transfer of waste, recycling and compost from local community compactor sites to the Transfer Station is not included The transfer of solid waste, recycling and compost beyond the Transfer Station is not included
Roads & Traffic Operations	 The operation of buildings related to the provision of this service area are included The operation of vehicles related to the operation, roads, trails street lights/signals, bike lanes, parking lots and sidewalks is included Road resurfacing activities are included Vehicles used for snow removal on municipal roads is included Snow removal for Day Ski parking lots is not included Snow removal for municipal roads in Function Junction & Cheakamus crossing is not included (contracted) Vehicles used for snow removal on strata roads is not included Vehicles used for the snow removal within the Whistler village pedestrian environment are not included.
Arts, Recreation & Cultural Services	 The operation of all municipally-owned recreation facilities (parks, recreation centres, libraries, theatres) is included The operation of municipally-owned parks vehicles and equipment used for the maintenance and operation of parks and parkland areas is included All electricity and natural gas used at municipal festival and event stages and village infrastructure locations is included Third party vehicles used in the delivery and execution of local festivals and events is not included
Fire Protection	 All fire protection vehicles are included All energy consumed by local fire halls is included Private vehicles used by 'paid-on-call' firefighters to travel to their home fire hall when responding to a call is not included



THE RESORT MUNICIPALITY OF WHISTLER

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