

WHISTLER **ENERGY CONSUMPTION** AND **GREENHOUSE GAS** PERFORMANCE TRENDS 2011 ANNUAL REPORT

Chief Administrator's Office
The Resort Municipality of Whistler | August 2012

THE PREMIER MOUNTAIN RESORT COMMUNITY
MOVING TOWARD A SUSTAINABLE FUTURE



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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 2011. 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

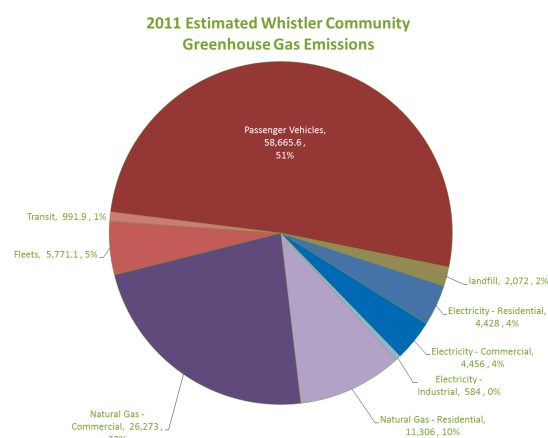
COMMUNITY GHG EMISSIONS: Greenhouse gas emissions in Whistler are made up of emissions from stationary sources (buildings and infrastructure systems), mobile sources (passenger vehicles, fleets, and transit), and emissions from landfilled wastes. Passenger vehicle transportation within RMOW boundaries continues to represent the largest share of the overall emission footprint (51%), followed by natural gas consumption at 33% (primarily used for space and water heating).

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

Total community GHG emissions in 2011 were estimated to be **114,548 tCO₂e**¹. This level is approximately 13.5% lower than 2007 levels, 20% lower than 2000, 4.5% below last year's levels, but still 51% higher than 1990 levels.

From a GHG emissions intensity perspective, 2011 GHG emissions per population equivalent² dropped to 4.23 tCO₂e/PE. This value is 1% below 2010 levels and the lowest annual per capita measure since detailed record keeping began in 2000.

Looking ahead, the key challenge for our community will be maintaining the rate of reduction achieved over the 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 toward our reduction goals, additional, incremental reductions of 3,000 to 4,000 tonnes of CO₂e will be required annually for the remainder of the decade. These future GHG reductions will need to be premised primarily on actual energy conservation and increased efficiency rather than one-time technological changes in community systems. The required conservation will be particularly challenging for the community as historic performance assessments



Larger version of this chart in Section 3.1.2

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 The nature of Whistler being a tourism community means the number of people in Whistler on any given day is generally far greater than the population counts provided Canada Census or BC Statistics estimates. The total Population Equivalent is an estimate of the total number of people in Whistler on an average annualized basis. The indicator is often used in 'per capita' measures to normalize the data and make it comparable to other communities. More detail on the composition of the Population Equivalent can be found at:

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

demonstrate the community-wide energy conservation gains have proven to be largely elusive over the past decade.

COMMUNITY ENERGY CONSUMPTION: Community energy consumption has not followed the same downward trajectory as community GHG emissions during the period between 2007 and 2010. In fact, the 2010 and 2011 total estimated community energy consumption were the two highest years ever recorded in Whistler.

Total community energy consumption in 2011 was estimated to be 3.19 million GJ (down 4.2% from 2010 levels, but 3.2% higher than 2009, 11% higher than 2000, and more than 100% higher than 1990). Relative to pre-Games levels, the primary drivers of this increase is increased electricity consumption in both the residential and commercial sectors, as well as increases in residential natural gas consumption.

Electricity is the most prevalent type of energy consumed in Whistler at 45% of the total consumption (unchanged from 2010), followed by vehicle fuels (~32%), and natural gas at approximately one quarter of total consumption.

The estimated annual collective energy expenditure within Whistler has increased by more than \$25 million since 2000 (\$78 million vs. \$49 million). Energy expenditures for residential buildings now exceed \$19 million/year, with commercial buildings expenditures totaling approximately \$21 million on an annual basis (passenger vehicles and fleets make up the remainder). Fuel prices for gasoline have increased markedly over the past two years resulting in significant increases in total passenger vehicle estimated expenditures (2011: \$33M vs 2009: \$25.5M).

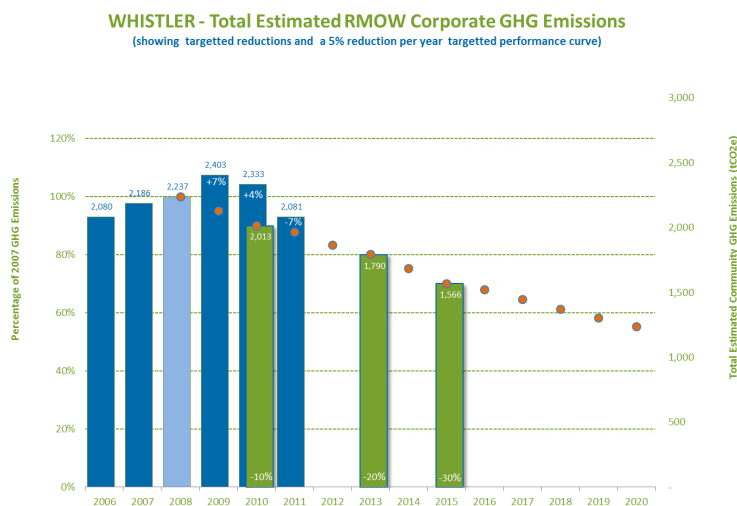
Finally, increases in energy rates continue to outpace the rate of inflation so it is expected that the combined community expenditure will continue to rise faster than our collectively ability to pay for it – a trend that underscores the importance of increasing both energy conservation and energy efficiency 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 2,081 tCO2e. This level of emissions is 10.8% lower than 2010 levels, and approximately 7% below the benchmark 2008 level (the reference year for RMOW target setting). However, as demonstrated in the chart to the right, corporate emissions were targeted to be more than 10% lower than 2008 levels by now.

On a division-by-division basis, the relative emissions footprint of corporate operations is primarily associated with the following three divisions: (43%) Environmental Services (now Infrastructure Services)- which includes roads crews, solid waste systems, the water utility as well as the sewer utility; (29%) Community Life (now Corporate and Community Services) –



Larger version of this chart in Section 4.1.1

including bylaw, fire, meadow park sports centre, and other recreation programs; and (26%) Resort Experience (REX) – which includes village maintenance operations, horticulture/turf/irrigation crews, parks and trails, as well as facility construction and maintenance operations).

Emissions across corporate operations are produced primarily from the combustion of natural gas (44%), followed by mobile fuels (gasoline, diesels) at 40%, and electricity at 15%.

Over the last few years, the primary source of emission reductions across municipal operations has been natural gas reductions at Meadow Park Sports Centre (MPSC) – emissions from this facility are down more than 35% (260 tCO₂e) since 2009.

CORPORATE ENERGY CONSUMPTION: Total corporate energy consumption decreased in 2011 by more than 6% to 80,822 GJ/year. However, this total is considerably higher (26%) than the 2010 target recommended within the RMOW Integrated Energy Plan (64,000 GJ). Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 62% of the total consumption, followed by natural gas (23%), and mobile fuels (15%).

While 2011 REX energy consumption increased by 6% versus 2010, Environmental Services and Community Life divisions both achieved year-over-year reductions in 2011 (4% and 19% respectively). However, both ES and REX's 2011 consumption levels are still higher than 2008 base year benchmark. Only CL energy consumption is below 2008 levels – in fact, CL's 2011 energy consumption is now the lowest level since detailed record keeping began in 2006.

Overall, 2011 energy expenditures across municipal operations held constant at ~\$1.7M (this was due to the combined influence of a 6% decrease in consumption, and increases in the unit rates of various energy sources). Electricity consumption makes up the largest portion of corporate energy expenditures (~\$1M/yr), and while CL division expenses dropped by more than \$80,000 in 2011 (attributable primarily to increased efficiencies at MPSC), 2011 expenses increased in both the ES division (5.2%), and REX (3.6%).

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

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



2 INTRODUCTION

Whistler is not sustainable. However, our Vision is to be the *Premier Mountain Resort as we move Toward Sustainability*. Implied in this vision is a journey - 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 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. 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 less than 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 most 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 Whistler's Integrated Community Sustainability Plan, an expression of the community's vision as required by the Province of British Columbia. Whistler2020 is moreover the product of thousands of voices across our resort community coming together to **articulate the vision of the community we aspire to be.**





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

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

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

Working 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 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).

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.”¹

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

2.1.2 Whistler's Community Energy Planning – a brief history

Whistler committed to its first greenhouse gas emission reduction targets in 1997. In that year, Whistler Council endorsed the Kyoto Protocol target of having our community's emissions at 6% below 1990 levels, by the year 2012. For municipal (corporate) emissions, Council also committed to being a part of the "20% Club", committing to reducing corporate emissions 20% below 1990 levels by 2012 – **two aspirations that the community of Whistler 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 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.

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-two³ 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.**"⁴

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

FCM/ICLEI 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.

³ The BC Climate Action Charter was eventually signed by more than 170 local governments across British Columbia.

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 (an option Whistler has chosen not to pursue), and encourage alternative transportation options with off-street parking-in-lieu funds.

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

Moving ahead, staff plan to initiate an update to the Whistler Integrated Energy Plan in 2013. 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 further consideration and implementation.

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, while Section 4 presents similar performance data for RMOW corporate operations.

3 COMMUNITY PERFORMANCE

Since the year 2000, RMOW staff have tracked and compiled community energy consumption, energy expenditure and GHG emission data. At the community level, primary sources of data to support this inventory are accessed from local utilities (BC Hydro and 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 2011⁶.

3.1 COMMUNITY GREENHOUSE GAS EMISSIONS

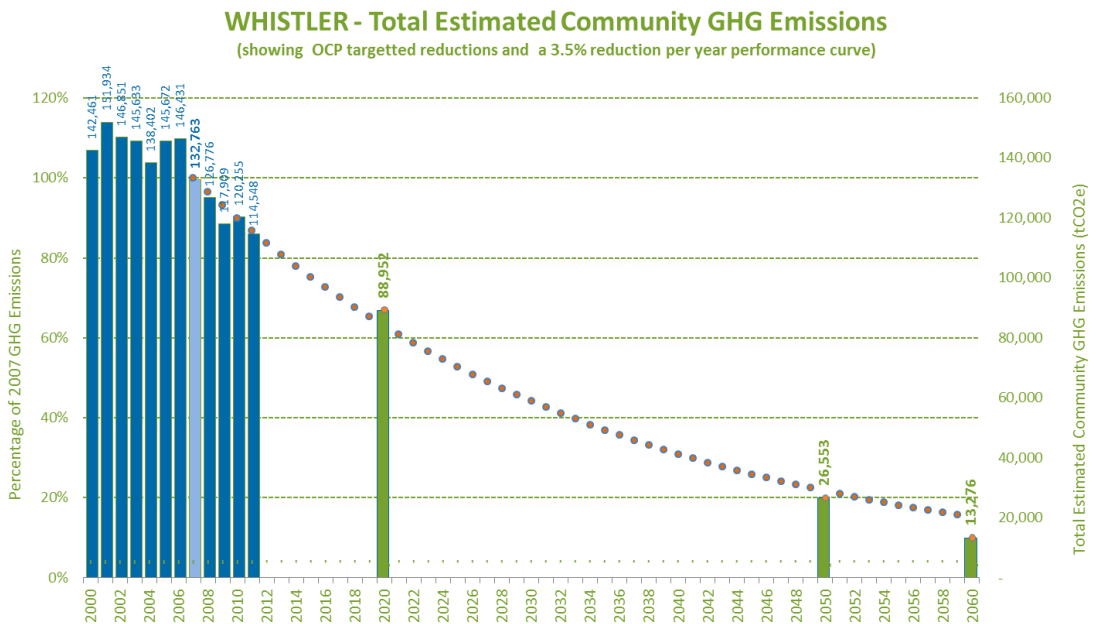
Section 3.1 deals specifically with GHG emissions at the community level, this section includes information on related Council-adopted targets, an overview of 2010 performance, as well as a short section on key associated insights and trends.

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 2050⁷; 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 the community targets (green bars), the historic community emissions levels (blue bars) as well as an indication of the annual reductions that would be required to achieve the prescribed targets using a constant rate of improvement model (orange dots).



⁶ It is expected that the 2012 community inventory will be compiled, assessed and reported during Q2/Q3 of 2013.

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

As demonstrated on the chart on the previous page, the community of Whistler has managed to remain on pace towards our targets for the first four years of the target period. GHG emission reductions achieved during these four years (2008-2011) has been impressive – averaging approximately 4,500 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;
- 3) the reduction in diesel consumption associated with the hydrogen transit bus pilot project, and
- 4) the changes brought about through the Provincial low-carbon fuel standards for gasoline and diesel.

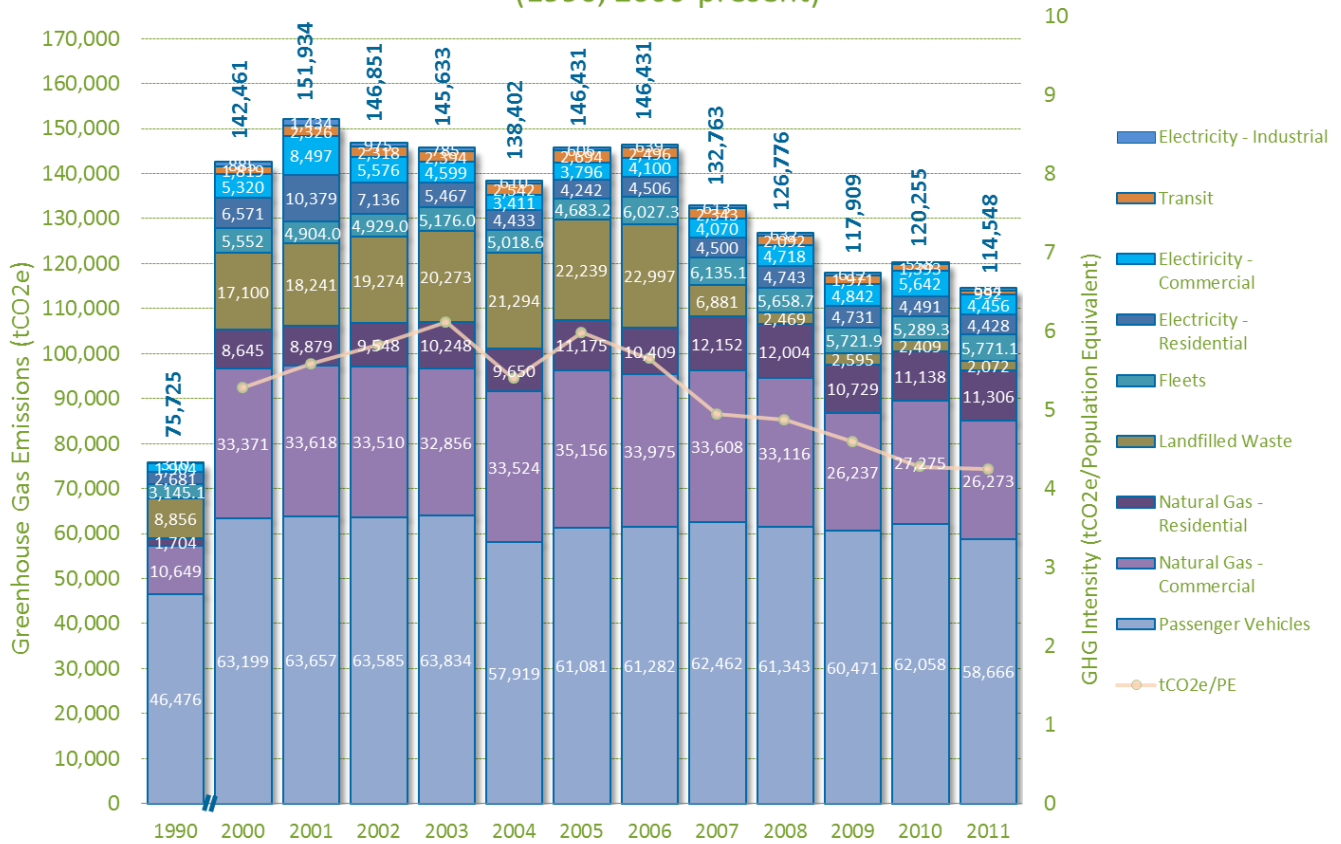
Looking ahead, the key challenge for our community will be maintaining the rate of reduction achieved over the last four years when further ‘one-time changes’ are, for the most part, no longer readily available. To remain under the target curve presented above, additional reductions of 3,000 to 4,000 tonnes of CO₂e will be required annually for the next decade. **These future GHG reductions will need to be primarily premised on actual energy conservation and increased efficiency** rather than one-time technological changes in community systems. The required conservation will be particularly challenging for the community as historic performance assessments demonstrate the energy conservation gains have proven elusive over the past decade.

3.1.2 Community GHG Emission Performance

Total community emissions in 2011 were estimated to be **114,548 tCO₂e**. This level is approximately 13.5% lower than 2007 levels, 20% lower than 2000, 4.5% below 2010 levels, but still remain 51% higher than 1990 levels.



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



Moreover, from a GHG emissions intensity perspective, 2011 GHG emissions per population equivalent⁸ dropped to 4.23 tCO2e/PE – 1% below 2010 levels and 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 and more recently, the Provincial low carbon fuel standards.

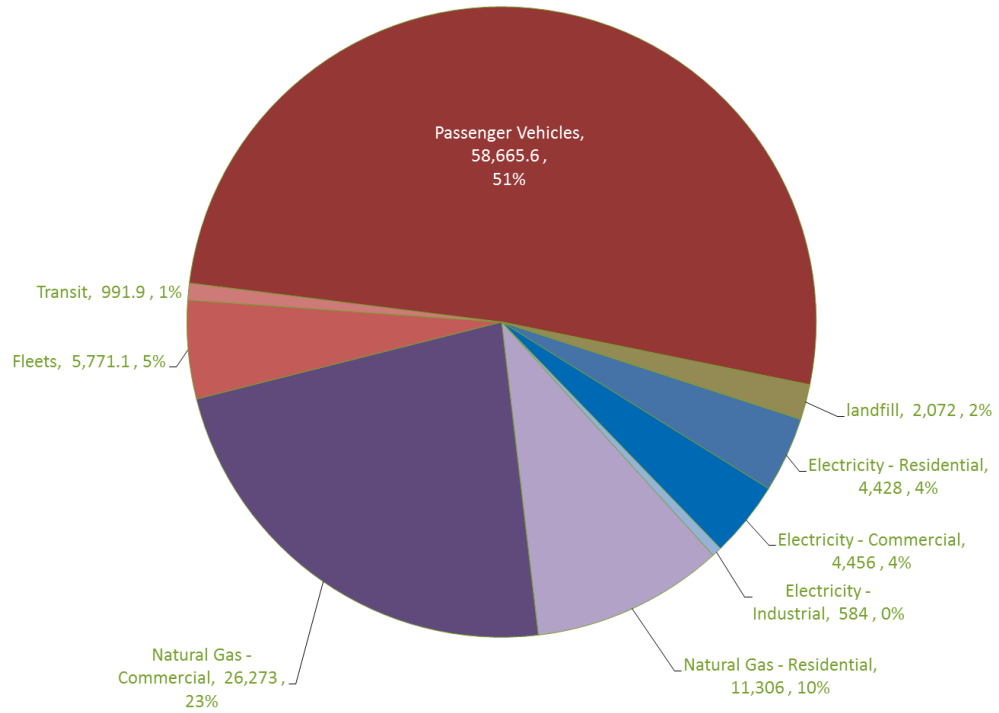
As further one-time changes such as those noted above become less available to our community, **the pace of reduction is likely to slow considerably without substantive ‘energy conservation’ becoming the core driver of further emission reductions.**

Distribution of Emissions

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

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

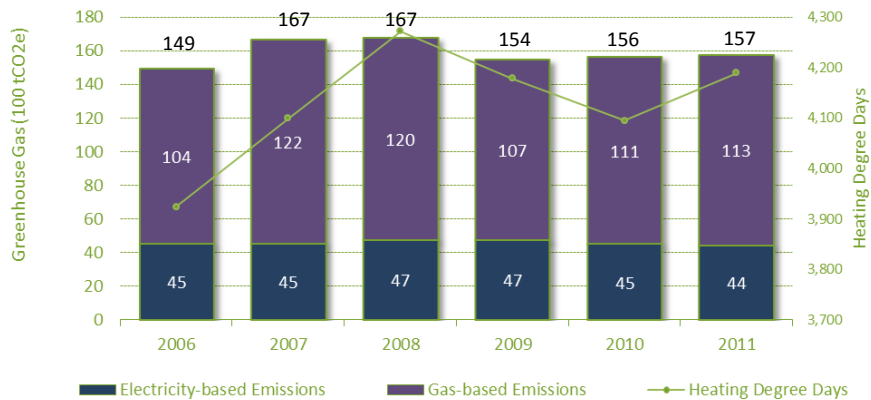
2011 Estimated Whistler Community Greenhouse Gas Emissions



Passenger vehicle transportation within RMOW boundaries continues to represent the largest share of the overall emission footprint (51%), followed by natural gas consumption at 33% (primarily used for space and water heating).

The following two charts show the changes in greenhouse gas emissions from Whistler’s building inventory.

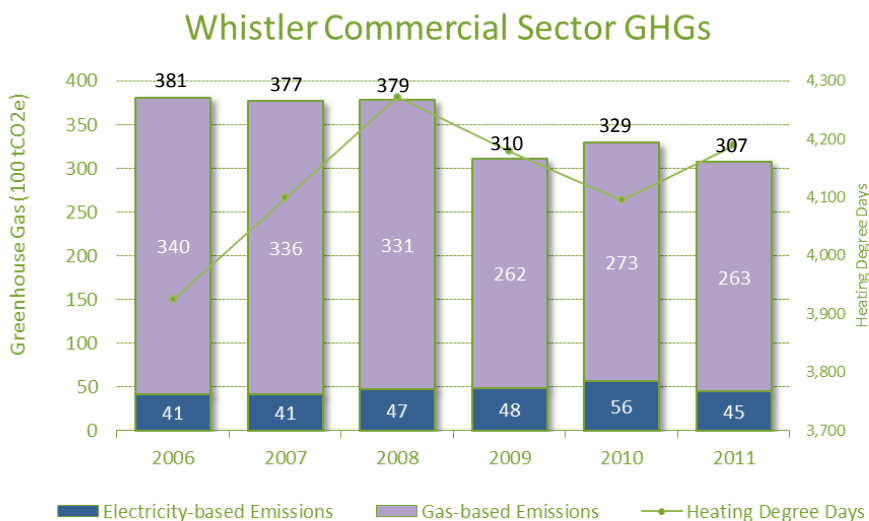
Whistler Residential GHGs



Residential Natural Gas

GHG emissions across the residential sector have increased marginally year over year (~0.5%). The primary driver of this increase is the fact that the number of natural gas accounts (2,296 accts), as well as the consumption per account continues to increase (2011 was 7% higher than the average consumption/acct of the previous five years).

If normalized by growth in total residential GFA as well as heating degree days (HDDs), residential GHG emissions have declined by approximately 10% since 2000, indicating that the sector has achieved some improvement with respect to GHG per square foot of residential floor space. The primary reason for this improvement is the reduced GHGs/kWh associated with BC Hydro’s electricity supply and the propane to natural gas conversion. Residential emissions from natural gas use have in fact, increased on a per-GFA basis since 2000 – a trend that would be even worse if it were not for the 2009 conversion from propane to natural gas (which has mitigated the emissions impact of the increased per/ft2 consumption).



Commercial Natural Gas

Commercial sector emissions have decreased substantively since the conversion from propane to natural gas was finalized in 2009 (commercial heating gas emissions have declined by more than 20% versus 2008 levels). Year-over-year, 2011 commercial emissions declined 6% versus 2010 levels, but remain at approximately the same level as 2009.

If commercial GHG emissions are normalized by HDDs, change in total commercial GFA, and by population equivalent (PE⁹), then even more substantive intensity reductions are evident. When normalized as noted, 2011 demonstrates the lowest emission levels on record (on a per ft2 basis) for the commercial sector. Key drivers of this performance appear to be a pronounced fuel shift in the commercial sector from propane/natural gas to electricity (likely associated with the installation of electric hybrid boilers in large commercial buildings), and the 2009 natural gas conversion project.

Commercial Electricity

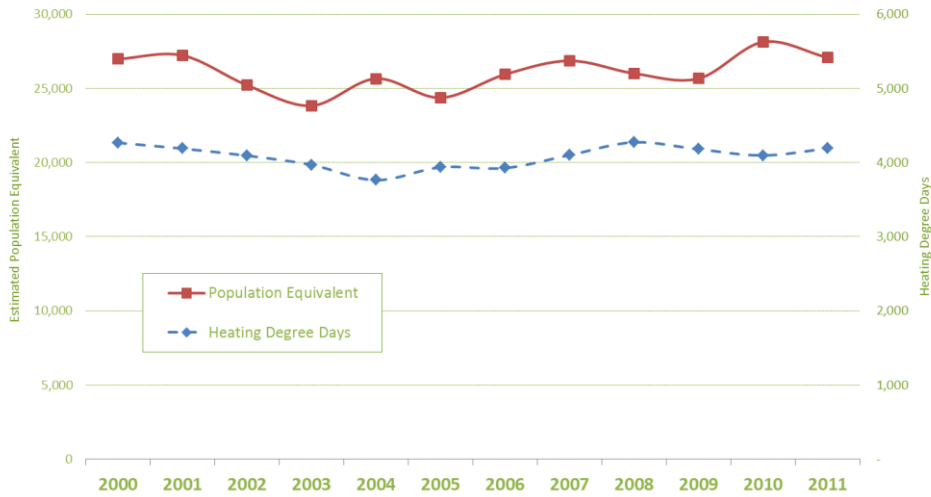
Over the last 10 years, GHG emissions from electricity consumption have remained relatively steady on both a per-ft2 basis, and on a total emissions basis.

⁹ Refer to footnote #9 on page 10 for more detail about population equivalent (PE) measures.

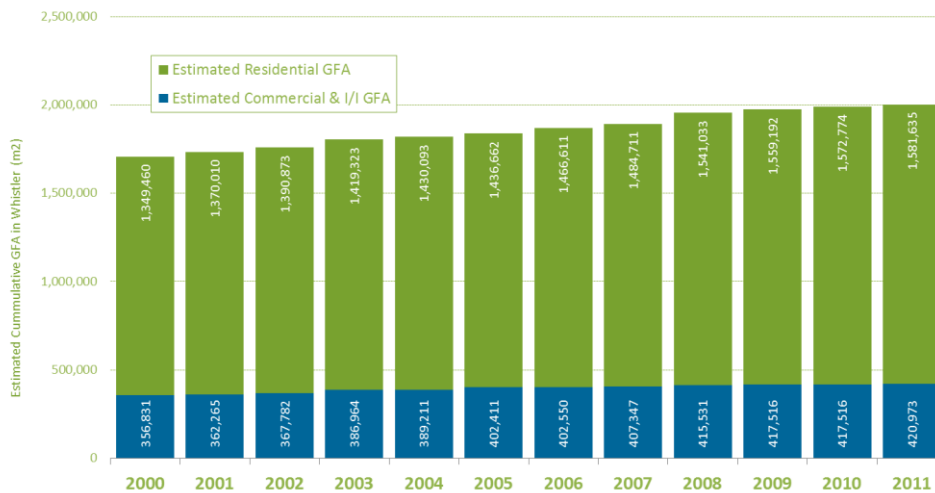
The following two charts provide detail regarding the primary influences on the energy and emissions trends over time. As per the discussion above, these data points are used to explore possible explanations for observed change over time.

It is however important to note that Whistler’s emission reduction targets are set at total emission levels – not at per-capita or per-ft2 intensity levels. In the end, intensity measure may help us understand what factors are driving changes in performance but it is only the total parts-per-million (ppm) of carbon in the atmosphere that defines and shapes the impacts of climate change. It is for this reason that Whistler chose to set total emission targets, not emission intensity targets.

Key Local Influences on Energy Data



Key Local Influences on Energy Data



3.1.3 Key Community GHG Performance Insights

Total GHG Emissions

- Consistent with previous years, approximately half of all estimated community-level emissions (~58,500 tonnes annually) are produced by passenger vehicle transportation within municipal boundaries. The passenger vehicle sector provides a good opportunity for future community emission reductions.
- While current emission reduction levels¹⁰ are on an appropriate statistical path to achieve our 2020 emission reduction goals, the lack of additional, significant one-time changes (i.e. low hanging fruit like the propane to natural gas conversion project) will make future progress toward our 2020 target much more difficult.
- The 2009 propane to natural gas conversion produced a significant drop in emissions associated with heating gas consumption (5,000 tCO₂e across the community, ~15% versus previous propane levels).

Commercial GHG Emissions

- Total emissions and emissions per commercial account are the lowest since detailed record keeping began (96 tCO₂e/commercial acct). This achievement seems to be primarily related to a combination of (a) the shift to natural gas from propane, (b) the fuel shift to electric hybrid boilers at key large hotel properties, rather than a consistent trend toward increased conservation or efficiency.
- Total commercial GHG emissions are down versus 2010, but similar to 2009 levels. However, commercial per capita emission levels now at their lowest level since reporting began in 2000 (primarily driven by a decrease in electrical consumption per PE across the commercial sector).

Residential GHG Emissions

- Total residential GHGs have dropped from 2008 and 2007 levels (likely due to the shift to natural gas from propane), but are still higher than 2003-2006 levels.
- Emissions per residential account have remained steady over the last few years at ~5.3 tCO₂e/acct.
- The primary source of emissions across the residential inventory remains natural gas consumption.

Transportation GHG Emissions

- [Low carbon fuel standards](#) have helped to mitigate the emissions from both gasoline and diesel consumption (5% ethanol blend in gasoline, and 4% biodiesel blend in diesel).
- Estimated total local vehicle kilometres travelled (VKT) has not changed significantly over the last 5-8 years
- The average fuel efficiency of BC registered vehicles has only increased by ~3% over the last 10 years. This change has slowly reduced emission levels per kilometre driven from 2000 levels.
- However, even when combined, the new fuel standards and the increases in vehicle efficiency are still far too small to move passenger vehicle emissions to the targeted reduction levels discussed in Section 3.1.1 above. Much more efficient vehicles, fuel switching to electricity, and/or a decrease in VKT per person will be required to catalyze required emission reductions in this sector.
- Due to the integration of hydrogen transit buses within the Whistler transit fleet, the tailpipe emissions from Whistler's transit system dropped by approximately 400 tCO₂e year over year, and has decreased by over 1,100 tCO₂e (-53%) vs. 2008 levels. The most significant sector for future energy reductions is passenger vehicles – future reductions will need to be a combination of increased fuel efficiency, fuel shifting to cleaner fuels (eg. electricity) and lower annual vehicle-kilometers-travelled (VKTs) per vehicle user.

¹⁰ Current Whistler-wide GHG emission levels also lag slightly behind the recommended scenario in the current RMOW Integrated Energy Plan (~114,000 tCO₂e/year vs. targeted 112,000 tCO₂e). Current per capita levels are also higher than the targeted in the Integrated Plan (2011: 4.2 tCO₂e/PE vs recommended target for 2011: 3.5 tCO₂e/PE – i.e. 20% over the targeted levels) and are far in excess of our 1997 targets.

Looking Ahead

- As previously noted, the key challenge for our community moving forward, will be maintaining the rate of reduction achieved over the last four years. This is due to the fact that further ‘one-time changes’ are, for the most part, no longer readily available.
 - Future reductions will need to be primarily premised on actual energy conservation and efficiency rather than one-time technological changes in community systems.
 - Without further conservation and increased energy efficiency, 2012 GHG levels will not remain on track to reach our 2020 GHG reduction target (OCP target) – see Section 3.2 for more information on current energy conservation trends.

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 2011 performance, as well as a short section on key associated insights and trends.

3.2.1 Community Energy Reduction Target

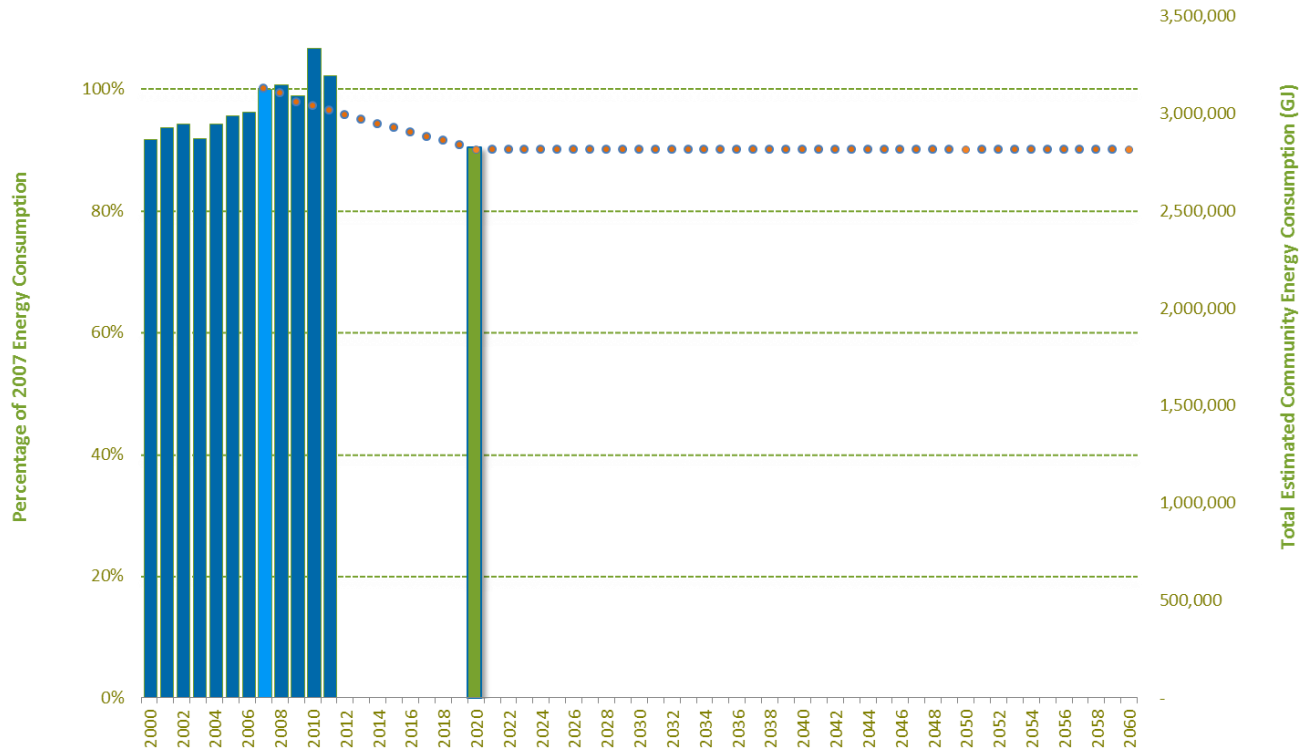
The proposed 2012 update of the Whistler’s Official Community Plan (OCP) includes the Objective: *‘Make Energy Conservation the Core Strategy and Highest Priority for Achieving Our Greenhouse Gas Emission Reduction Goals’*. To this end, the 2012 OCP Update also proposes the adoption of a community-scale energy reduction target. As currently proposed, the draft 2012 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”*.

10% by 2020

If adopted, this policy would introduce 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 be 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 encouraging trajectory as community GHG emissions during the period between 2007 and 2011. In fact, the 2010 and 2011 estimated total community energy consumption are the two highest years ever recorded in Whistler.

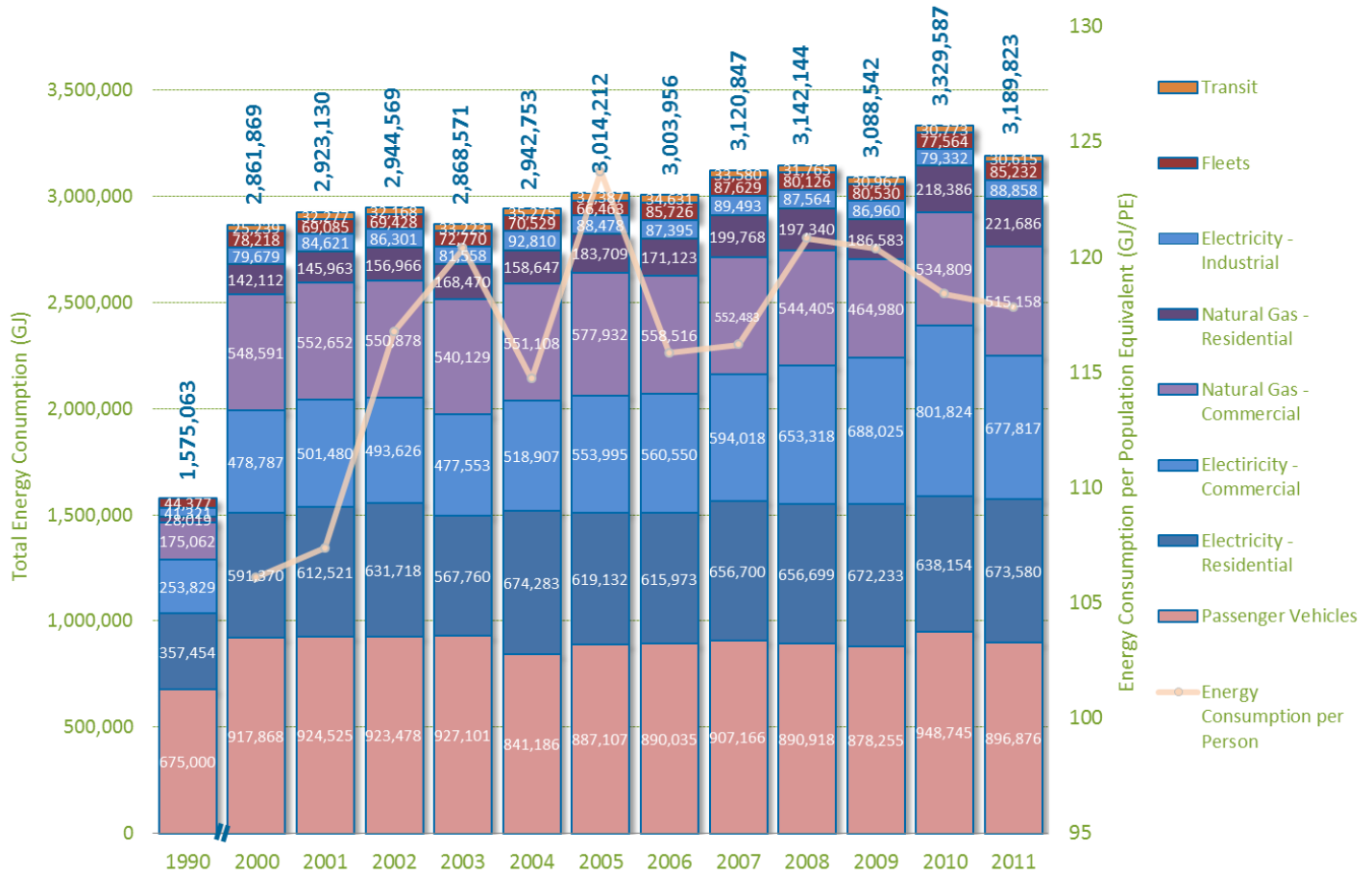
3.2.2 Community Energy Consumption Performance

Total community energy consumption in 2011 was estimated to be **3.19 million GJ** (down 4.2% from 2010 levels, but 3.2% higher than 2009, 11% higher than 2000, and more than 100% higher than 1990).

The primary driver of this increase over this period is energy consumption in buildings – in particular:

- residential natural gas consumption continues to rise (2011 consumption was 2% higher than 2010, and is now 56% higher than 2000)
- electricity consumption continues to rise across the commercial sector (40% increase over 2000), as well as the residential sector (14% increase over 2000)

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



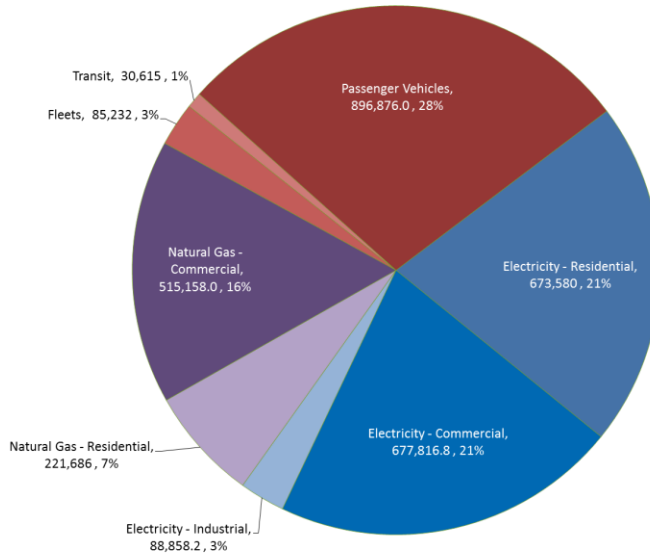
From an energy intensity perspective, energy consumption per person¹¹ decreased for the second year in a row (117 GJ/PE vs. 118 GJ/PE in 2010 and 120 GJ/PE in 2009). Despite this fact, energy consumption per person in both 2010 and 2011 was still higher than 2000-2002, 2004, 2006 and 2007 levels. However, if energy consumption over this entire period is adjusted for weather (HDDs), occupancy levels in the Resort (PE), growth in heated floor space (GFA), then the resultant energy intensity in 2011 is similar to 2007 and near the lowest ‘intensity’ level since detailed record keeping began in 2000.

To sum, total energy consumption continues to rise (this is a problem), but recent energy intensity levels (per PE, adjusted for weather and total GFA heated) are remaining constant or improving slightly (cause for some optimism –especially in the commercial sector). However, as stated earlier, without a substantive improvement in the community’s overall use of energy, the OCP targets will not be achieved.

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.

¹¹ per Population Equivalent –see Section 3.1.2

2011 Estimated Whistler Community Energy Use



Electricity is the most prevalent type of energy consumed in Whistler at 45% of the total consumption (unchanged from 2010), followed by vehicle fuels (~32%), and natural gas at approximately one quarter of total consumption. It is worth noting that due to the fact that different energy sources have differing carbon content – GHG emissions are much more heavily associated with consumption of fossil fuels (i.e. gasoline, diesels and natural gas). This fact accounts for the differences in relative proportions depicted in this chart as compared the similar chart presented in Section 3.1.2.

Total energy consumption across Whistler’s building sector is presented in the following two charts.

Whistler Residential Energy Use



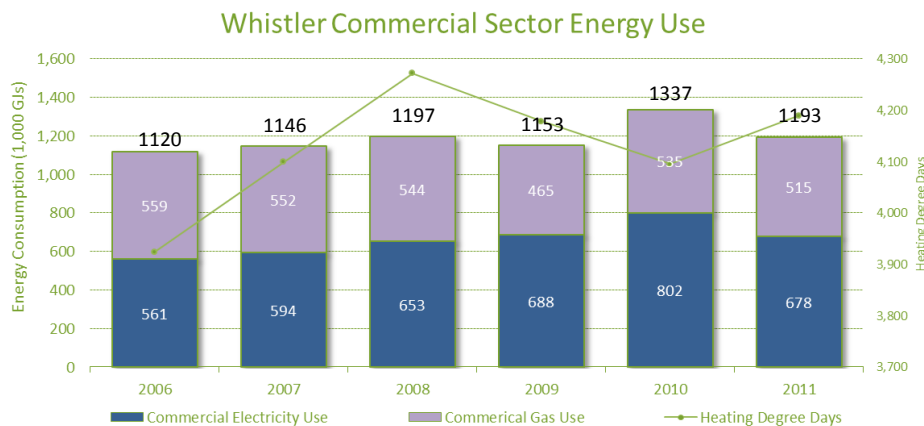
Residential electricity consumption increased in 2011 in both total terms, as well as on a per account basis. Total 2011 residential energy consumption is the highest on record at 895,000 GJ (up 6% versus the average of the previous 5 years). This change was primarily driven by a 13% increase in natural gas consumption versus the average of the previous 5 years (electrical consumption increased by 3% vs. the same benchmark).

Residential Natural Gas

It is worth noting that 2011 natural gas consumption per account remains tied for the highest level on record (96.6 GJ/yr/acct). 2011 natural gas consumption per account was 6% higher than the average of the previous 5 years despite the fact that HDDs were only 2% higher versus the same benchmark. Reasons for the increase could include increased second home use, increased occupancy levels associated with residential rentals, fuel shifting of appliances to gas-fired from electricity (e.g. hot water tanks and/or dryers). One thing that the data does not currently seem to suggest is that Whistler homes served by natural gas are, on average, becoming more efficient over time.

Residential Electricity

Residential electricity consumption per account increased versus 2010 levels but remains similar to the average of the last 5 years at 61 GJ/yr/acct.



Total energy consumption and energy consumption per commercial account dropped in 2011 versus 2010 levels. Moreover, average consumption per account (4,798 GJ/yr/acct) also decreased versus the average of the previous 5 years. Despite both of these positive trends, the total commercial energy consumption in 2011 was still the third highest level on record (lower only than 2010 and 2008).

Commercial Natural Gas

The most dramatic trend in the commercial sector is the marked decrease in total natural gas consumption. With the exception of 2009, 2011 commercial customers consumed less natural gas (or propane) than all other years on record. This trend, when combined with the 2009 shift from propane to natural gas is the primary reason why commercial GHG emissions have fallen over the last few years.

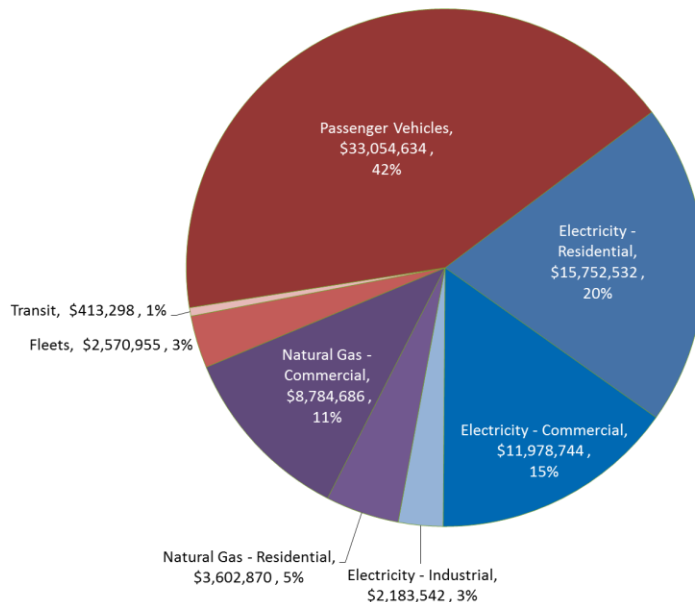
Commercial Electricity

Commercial electricity consumption has not demonstrated the same reductions as noted for natural gas consumption above. 2011 levels for both total commercial electricity consumption and consumption per account were each the third highest on record. One reason for this increase may be the trend toward increased use of hybrid electric boilers for space and water heating loads in the large hotel sector (i.e. a fuel shift from natural gas/propane to electricity for space and water heating loads in the commercial sector).

Energy Expenditures

The estimated annual collective energy expenditure within Whistler¹² has increased by more than \$25 million since 2000 and 2011 (\$78 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.

2011 Estimated Whistler Community Energy Expenditures



Energy expenditures for buildings (both commercial and residential) have remained relatively constant since 2008 at approximately \$42 million/year with electricity expenditures increasing by a factor nearly equal to the drop in natural gas expenditures. Fuel prices for gasoline have increased markedly over the past two years resulting in significant increases in total passenger vehicle estimated expenditures (2011: \$33M vs. 2009: \$25.5 M).

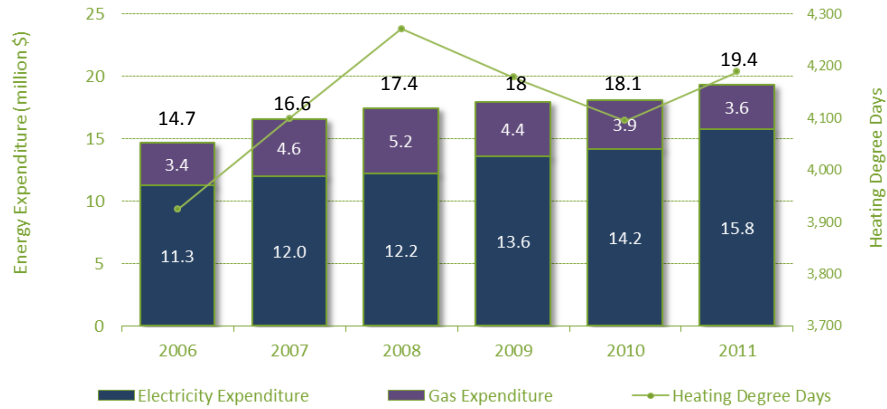
The final two charts in this section present the five-year trend in cumulative energy expenditures across Whistler's building sector. Despite the decrease in the price of natural gas (versus propane) in 2009 and 2010, total expenditures in the residential sector continues to demonstrate an upward trend. Residential expenditures now exceed \$18 million/year. On the other hand, commercial expenditures dropped to approximately \$20.8 million (from \$22.4M) on an annual basis – the lowest since 2006.

Rate escalation expected for both natural gas¹³ 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.

¹² 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.

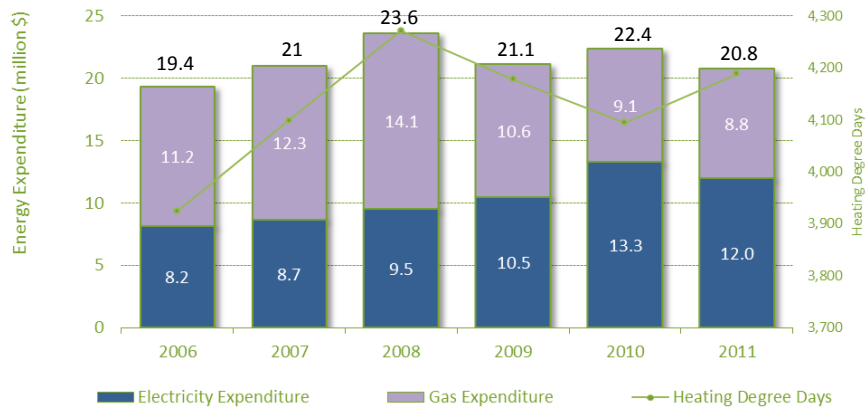
¹³ If approved, the current BCUC application by FortisBC to amalgamate all of its service areas (including FEW) into a single entity would result in a significant variance from the forecasted trend of ongoing annual increases. If approved, the natural gas rates in Whistler would potentially be reduced by as much as 40% versus current rates (annual escalations would continue after this significant one-time change). A decision on the BCUC application is not expected until 2013.

Whistler Residential Energy Expenditure



Residential expenditures continue to climb – both in terms of total spend, as well as spend per ft2 of built inventory. Consistent with changes in rates over the last few years, electricity expenditures have increased steadily over the last decade, while natural gas expenditures have shown a small decrease each year since the pipeline and conversion in 2009. It is worth noting that the decline in natural gas expenditures is strongly related to the changes in rates and that total consumption, and that 2011 consumption per account was actually the highest level on record.

Whistler Commercial Sector Energy Expenditure



Commercial energy expenditures per account decreased versus 2010 for both electricity and natural gas. However, 2011 commercial electricity expenditure per account was significantly higher than all other years on record (i.e. all years except 2010). Due to both the decrease in natural gas rates (versus propane) as well as the recently reduced gas consumption per account, gas expenditures per account have decreased to the lowest level since 2003.

3.2.3 Key Community Energy Consumption Performance Insights

Total Energy Consumption

- Total community energy consumption increased substantially in 2010 (~15% year over year) but returned to near pre-Games levels in 2011. However, despite the decrease versus 2010 levels, 2011 still represented the second highest level of total consumption ever recorded in Whistler.
- Despite increases in vehicle fuel efficiencies, estimated energy consumption associated with passenger vehicles has not changed significantly since 2000¹⁴.
- 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.

Residential Consumption

- Residential energy consumption continues to rise – both on a total basis (highest ever), as well as on a per-account basis.
- Moreover, residential energy consumption (normalized for HDDs) has increased each of the last four years on a per gross floor area (GFA) basis.
- There is little empirical evidence to support a finding that the residential sector is becoming more efficient over time.

Commercial Consumption

- Commercial consumption levels have decreased versus 2010 levels, but remain near the highest levels ever recorded in Whistler.
- There has been a marked shift from natural gas consumption to electricity consumption that began in 2008/09.
- If normalized for HDDs, PE, & GFA energy intensity levels have decreased to a level similar to 2000 (the lowest on record).

Total Energy Expenditures

- Rising electricity rates combined with rising consumption levels have combined to ensure that total electricity expenditures are at, or near the highest levels ever in Whistler – residential (highest), commercial (3rd highest).
- Declining rates helped 2011 total gas expenditures decrease to approx. \$12.4 M – the lowest level since 2004.
- Gasoline expenditures associated with passenger vehicle use is now at the highest level ever recorded (~\$33 M).

Residential Expenditures

- 2011 residential electricity expenditures per account are now the historical high.

¹⁴ 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.

- Despite the highest levels of residential natural gas consumption per account on record, rate reductions over the last few years have led to 2011 residential gas expenditures decreasing to the lowest level since 2006.

Commercial Expenditures

- Total 2011 commercial energy expenditures decreased versus 2010, but were higher than 2009 levels.
- Commercial electricity expenditures were the second highest on record – both in total, and on a per-account basis.
- Due to both declining rates, and reduced fuel consumption, gas expenditures decreased to the lowest level since 2003.

Looking Ahead

- There is little evidence of increasing energy efficiency in the residential sector – without significant increases in energy efficiency across Whistler’s existing buildings (low likelihood), the community’s GHG reduction targets will not be achieved, and total utility costs will continue to increase.
- The commercial sector has made some progress toward decreased energy intensity across its collective inventory. However, intensity improvements are not sufficient to move the community toward its GHG reduction targets if total consumption continues to rise.

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 all corporate operations.

The primary purpose of these inventories is to provide the basis for identifying energy conservation opportunities, assessing energy performance across key municipal building assets, and structuring business case assessments for potential upgrades and efficiency retrofits. Additionally, these inventories are also 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 included within the RMOW Integrated Energy Plan, the RMOW Carbon Neutral Operations Plan, and the Whistler Official Community Plan.

As a means of comparison to community-wide emissions, RMOW corporate emissions represent approximately 1.8% 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 current 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 2011 performance, as well as a short section on key associated insights and trends.

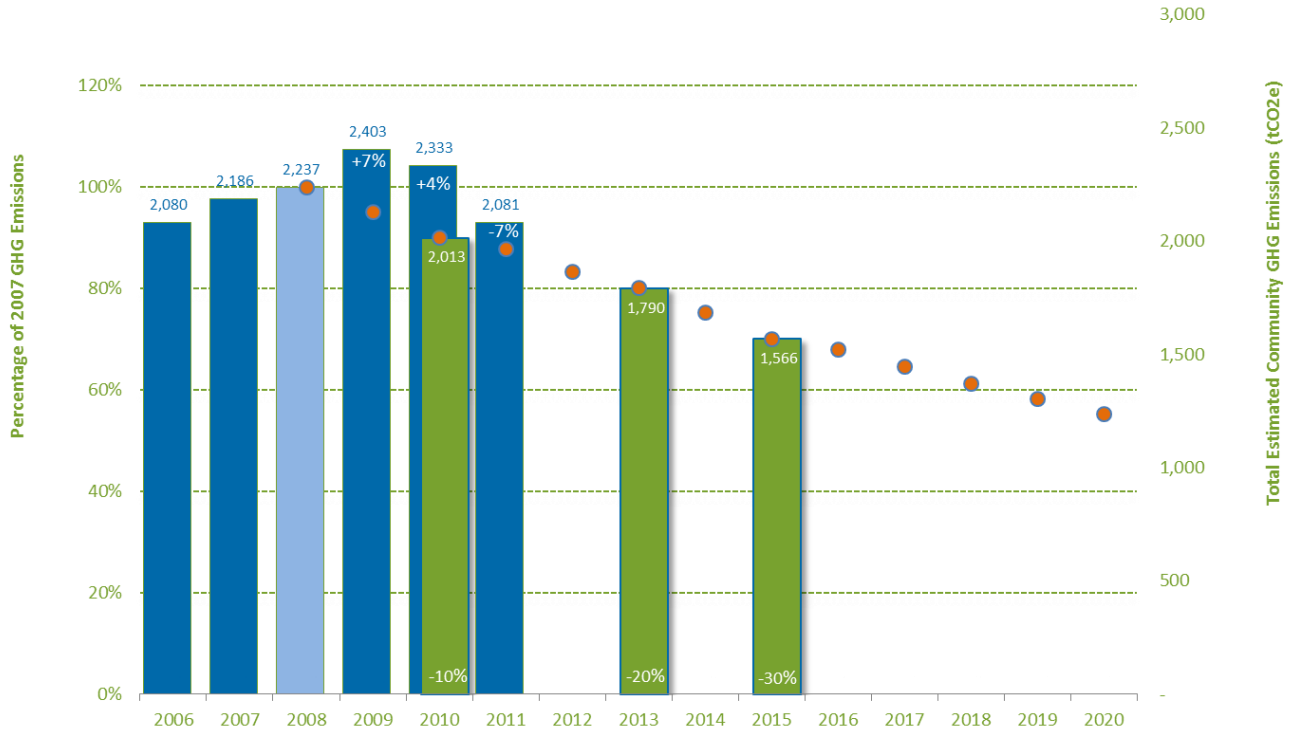
4.1.1 Corporate GHG Reduction Targets

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 targetted performance curve)



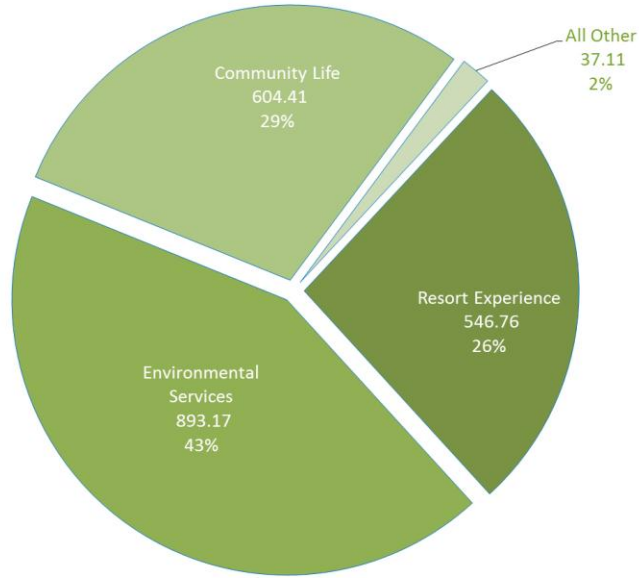
As demonstrated in the chart above, while emissions from RMOW corporate operations decreased substantively in 2011 (~10%), current emission levels **are still clearly above** our targetted corporate emission levels.

4.1.2 Corporate GHG Performance

Total corporate GHG emissions in 2011 were **2,081 tCO2e**. This level of emissions is 10.8% lower than the 2010 level, and approximately 7% below the benchmark 2008 level (the reference year for RMOW target setting). However, as demonstrated in the previous chart, corporate emissions were targetted to be more than 10% lower than 2008 levels by now.

On a division-by-division basis, the relative emissions footprint of corporate operations is primarily associated with the following three divisions: (43%) **Environmental Services** (which includes roads crews, solid waste systems, the water utility as well as the sewer utility); (29%) **Community Life** (including bylaw, fire, meadow park sports centre, and other recreation programs); and (26%) **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.

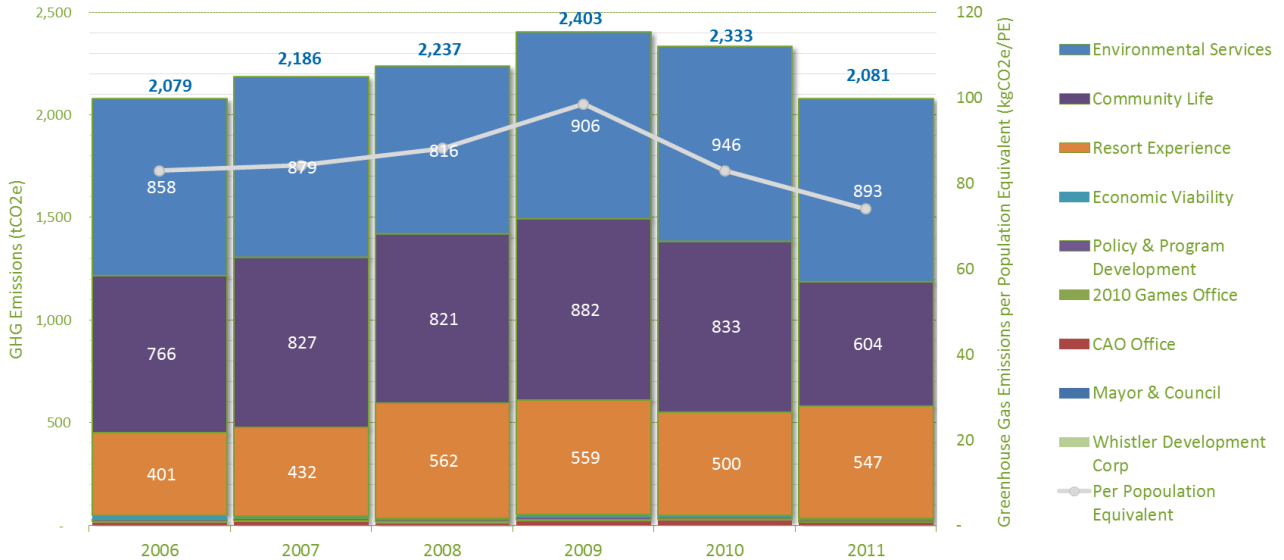
**2011 RMOw Corporate Emissions (tCO2e)
by Division**



Corporate GHG emissions by organizational Division are presented below.

- **Environmental Services** (now Infrastructure Services) reduced emission levels by 5% YOY, but remains 10% higher than 2008 benchmark levels
- **Community Life** (now Corporate and Community Services) reduced emission levels by 27% YOY and is now 26% lower than their corresponding 2008 benchmark level.
- **Resort Experience** (REX) increased annual emissions by 9% in 2011, and is now approx. 2.6% lower than 2008 levels.

**Trends in RMOw Corporate GHG EMISSIONS
(by Division)**

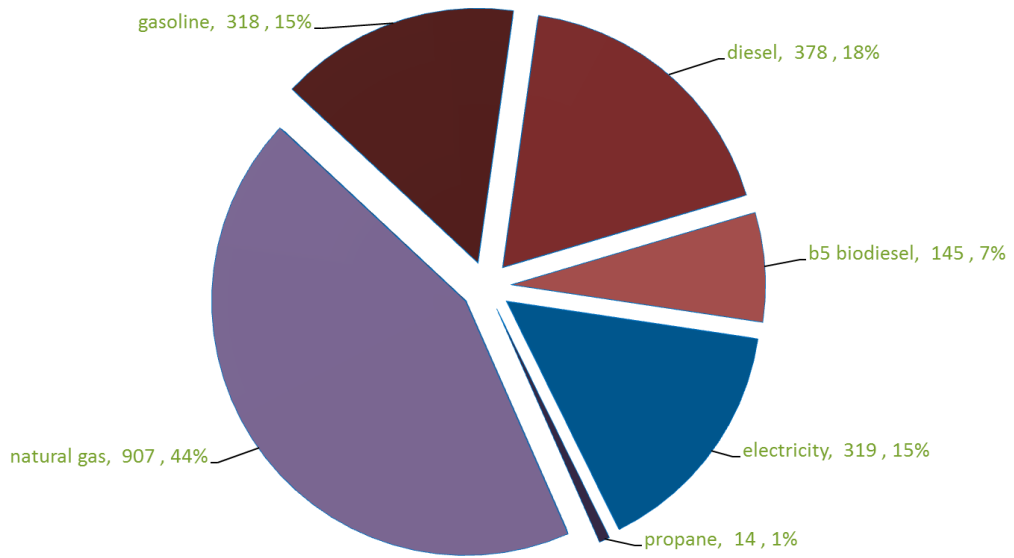


As seen in the chart above, the primary source of 2011 reductions was the Community Life Division (specifically Meadow Park Sports Centre).

Distribution by Fuel Type

Seen as a whole, 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.

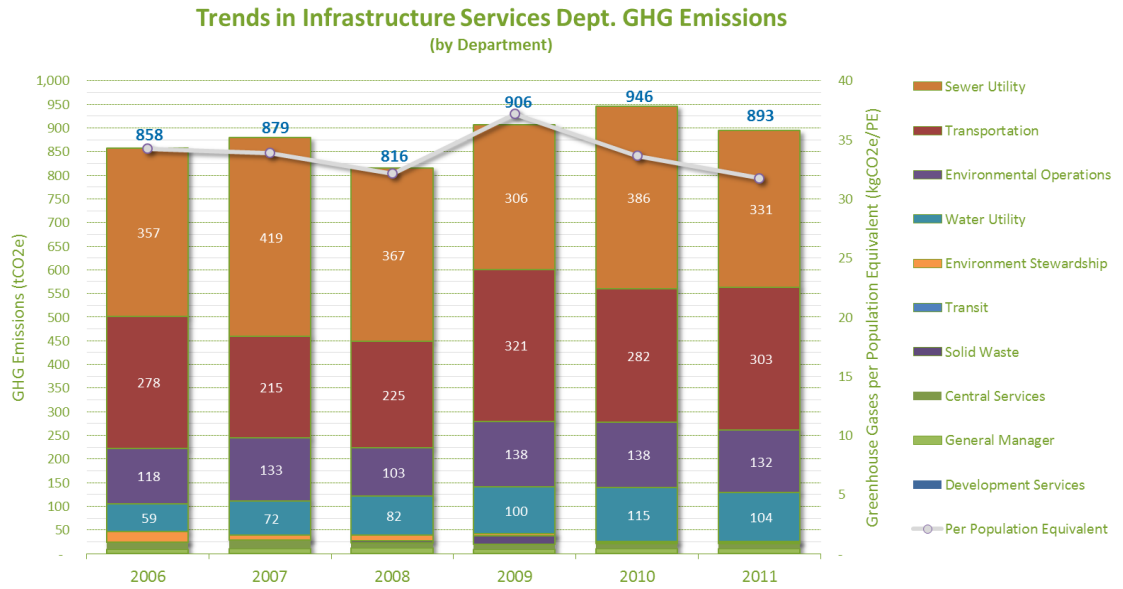
2011 RMOW Corporate Emissions (tCO₂e)
By Energy Type



4.1.3 Divisional Trends

Environmental Services (now Infrastructure Services)

Changes in Environmental Services emission levels over the last six years are presented below:



Environmental Services' GHG emission trends by key functional area:

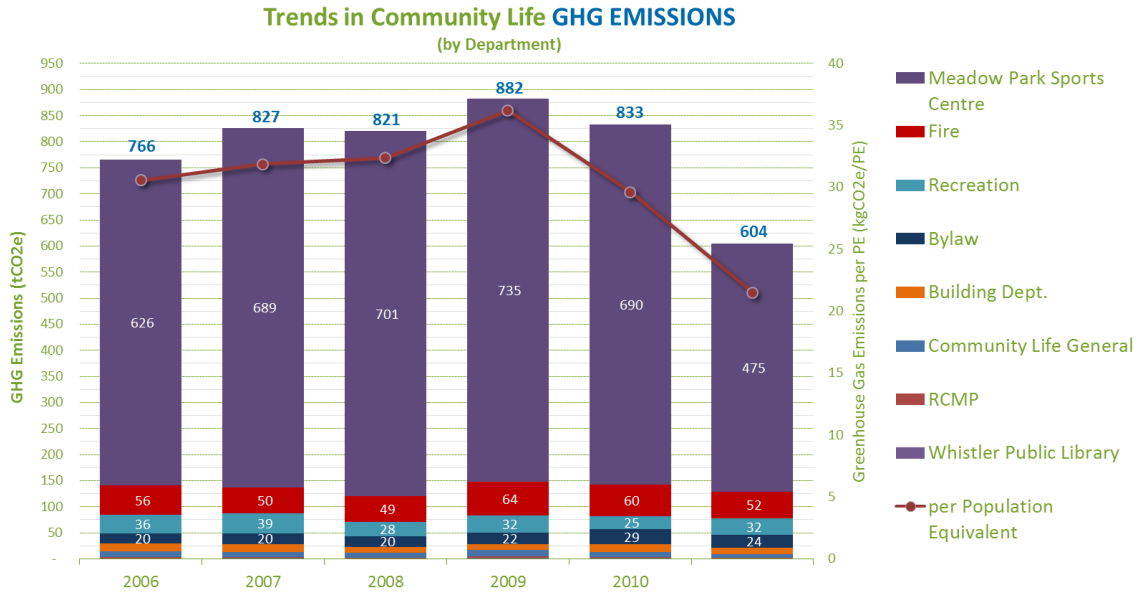
	Sewer	Transport	Env. Ops	Water	TOTAL
YOY	-14%	+7%	-4%	-10%	-5%
vs 2008	-10%	+35%	+28%	+27%	+10%

Key Insights

- WWTP emissions decreased on a YOY basis and are now 36 tCO2e lower than the 2008 benchmark level.
- Mobile emissions from the transportation dept. are the largest source of increased emissions. Emissions from the Transportation dept. are now 78 tCO2e higher than 2008 levels.
- Increased emissions in the water utility are primarily due to increased electricity consumption associated with west side infrastructure. Emissions from the water utility have increased 22 tCO2e since 2008.

Community Life (now Corporate & Community Services)

Changes in Community Life emission levels over the last six years are presented below:



Community Life GHG emission trends by key functional area:

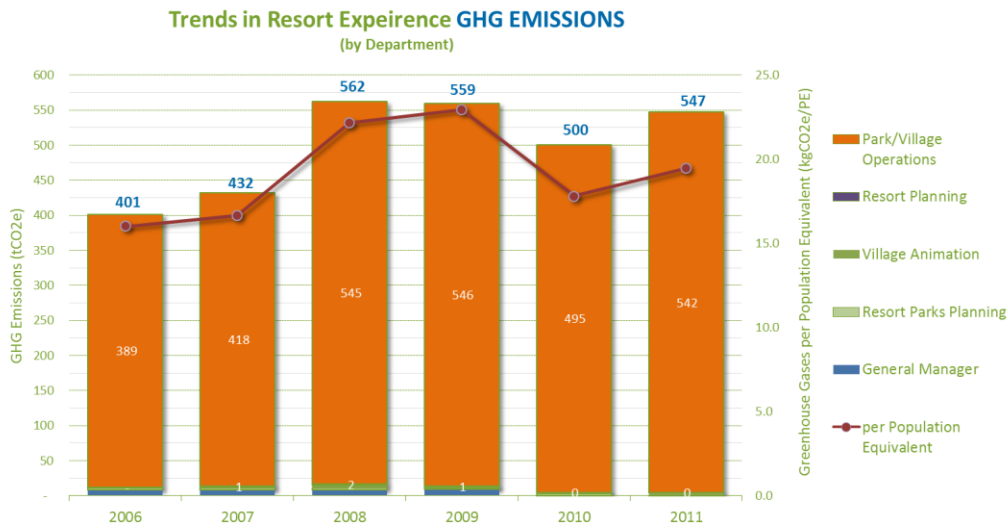
2011	MPSC	Fire	Rec	Bylaw	TOTAL
YOY	-31%	-13%	+27%	-17%	-27%
vs 2008	-32%	+6%	+14%	+20%	-26%

Key Insights

- The primary driver of reduced emissions within this division is MPSC. 2011 MPSC emission levels were 226t CO2e lower than 2008 benchmark levels.
- Fire, Recreation and Bylaw depts. have each increased versus 2008 levels, however the scale of these changes are small in total terms (~4 tCO2e in each case).
- Further reductions at MPSC will present the greatest opportunity for further progress into 2012.

Resort Experience

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



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

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

2011	P/VOps	V. Maint.	Land S	Parks & T	FC & M	TOTAL
YOY	+10%	-7%	+8%	+9%	+10%	+9%
vs 2008	-0.5%	+17%	+20%	+12%	-5%	-2.6%

Key Insights

- Facility Construction & Maintenance emissions were up 38 tCO2e YOY (the incremental emissions associated with the Olympic Plaza outdoor gas fireplaces was 33 tCO2e)
- Emissions from the Public Works Yards buildings increased by 27tCO2e (natural gas consumption)
- My Place GHG emissions were down by 49 tCO2e versus 2010 levels, but remain similar to 2009 levels, but remain high on a per-ft2 basis relative to other municipal facilities. (see Divisional Insights below for detail)

4.1.4 Key Corporate GHG Emission Performance Insights

Overall

- RMOW corporate emissions are down 11% YOY and are now 7% lower than the 2008 benchmark year.
- However, despite the positive performance noted above, corporate emissions are currently tracking behind the Council-adopted reduction targets included in the RMOW Carbon Neutral Plan.
- Across the organization, emissions from mobile fuels dropped by 25 tCO2e (2.9%) – primarily associated with decreased gasoline use across municipal operations (diesel emissions increased slightly in 2011)

Divisional Insights

- Infrastructure Services and Community Life achieved YOY reductions versus 2010 (5% and 27% respectively)
- MPSC emissions dropped dramatically in 2011: 215 tCO₂e lower than 2010, and 226 tCO₂e lower than 2008.
- REX emissions increased in 2011 by 47t CO₂e (9%) – 33 tCO₂e of this growth was associated with outdoor gas fireplaces at Olympic Plaza.
- Key Municipal buildings with the lowest intensity of GHG emissions include the following: (all expressed as kgCO₂e/ft²/year)
 - *Lost Lake Passivhaus:* 0.15
 - *Spruce Grove Field House* 0.39
 - *Whistler Public Library* 0.69¹⁵

4.2 CORPORATE ENERGY CONSUMPTION

Section 4.2 deals specifically with the energy consumption 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).

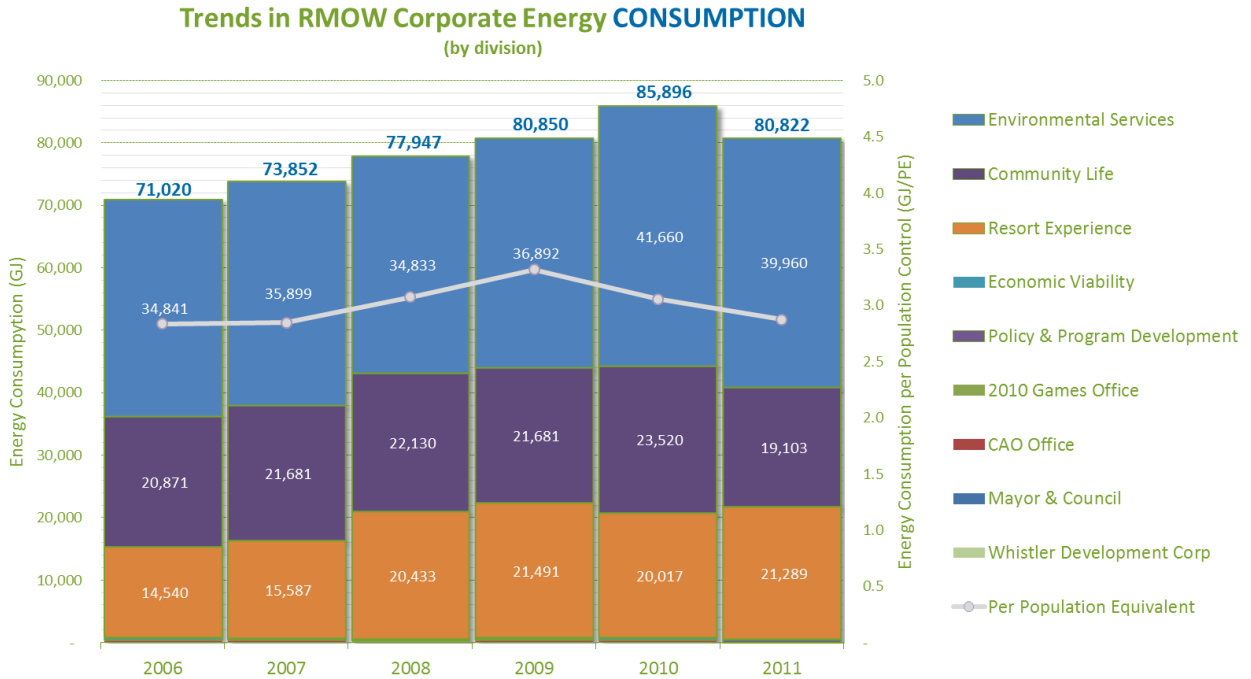
The RMOW Carbon Neutral Operations plan does not include formal targets but rather recommends ongoing commitment to energy conservation as both (a) the primary strategy for reducing corporate GHG emissions, and (b) an important means of controlling ongoing utility and fuel costs across corporate operations.

NOTE: the updated OCP includes a commitment to update the Community Energy & Emissions Plan every five years. When updated, this new community energy plan will include a community and corporate engagement process that should provide a suitable forum for the consideration of any future formalized corporate energy consumption targets for municipal operations.

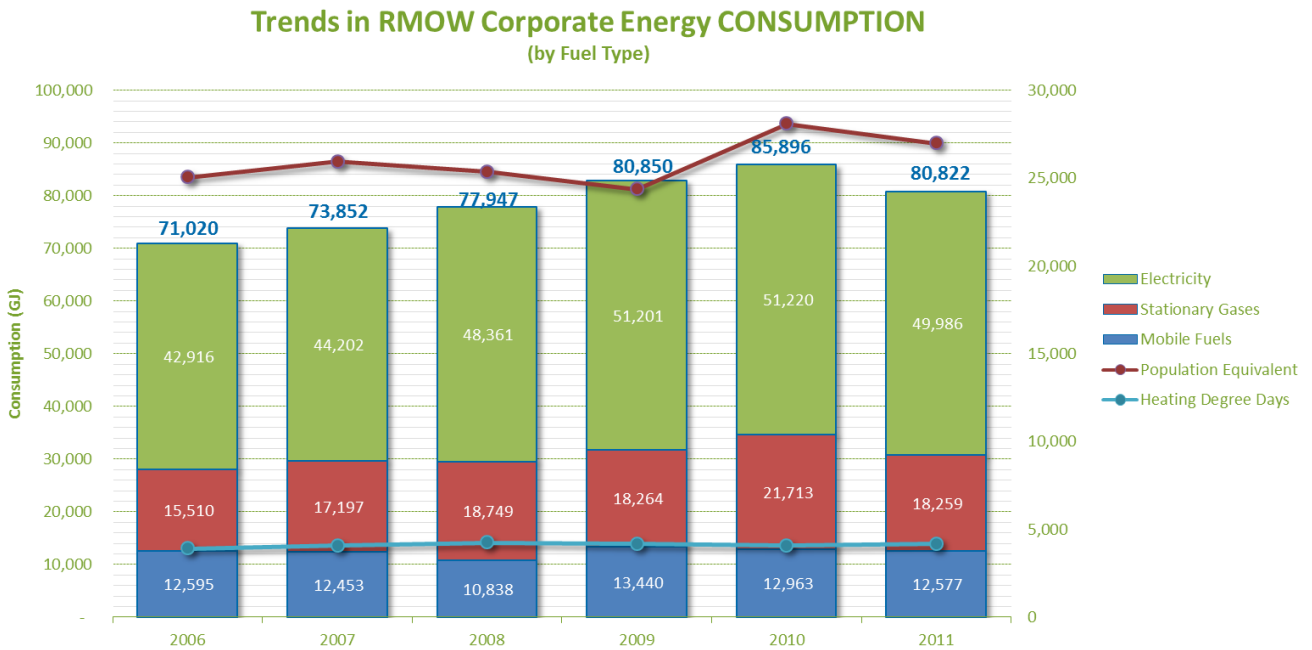
¹⁵ For reference, MY Place emits 4.06 kgCO₂e/ft²/year

4.2.2 Corporate Energy Consumption Performance

Total corporate energy consumption decreased in 2011 by more than 6% to **80,822 GJ/year**. This total is considerably higher (26%) than the 2010 target proposed within the RMOW Integrated Energy Plan (64,000 GJ). The six year trends in corporate energy consumption are presented below:

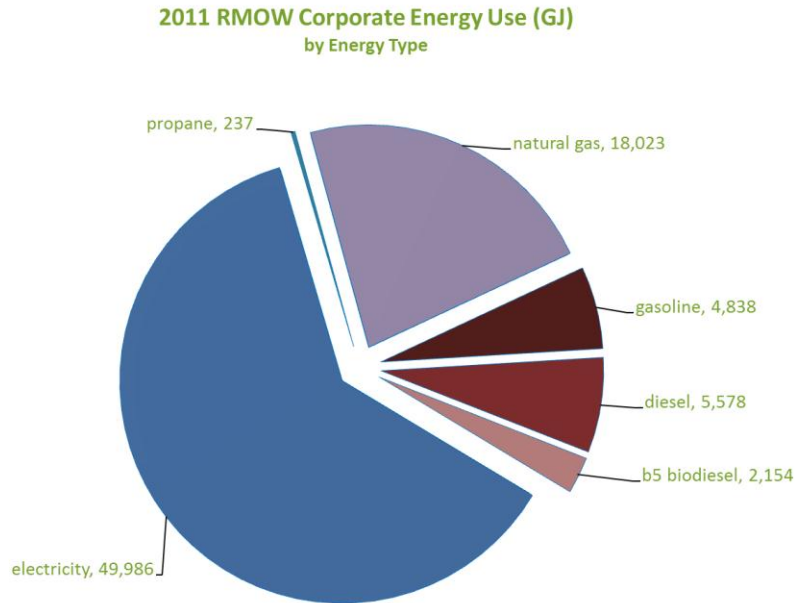


If the corporate energy consumption is subdivided by fuel type rather than by organizational division, the six-year trends appear as follows:

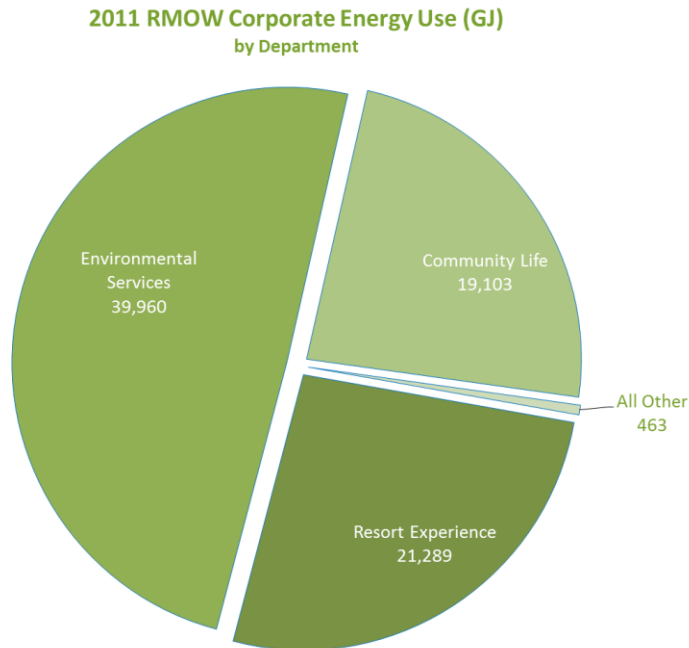


Electricity consumption makes up the greatest portion of total energy consumed across municipal operations at 62% of the total consumption, followed by natural gas (23%), and mobile fuels (15%).

A more detailed breakdown of 2011 corporate energy consumption, presented by energy type, is included below:



Finally, 2011 energy consumption by division is included for reference below:

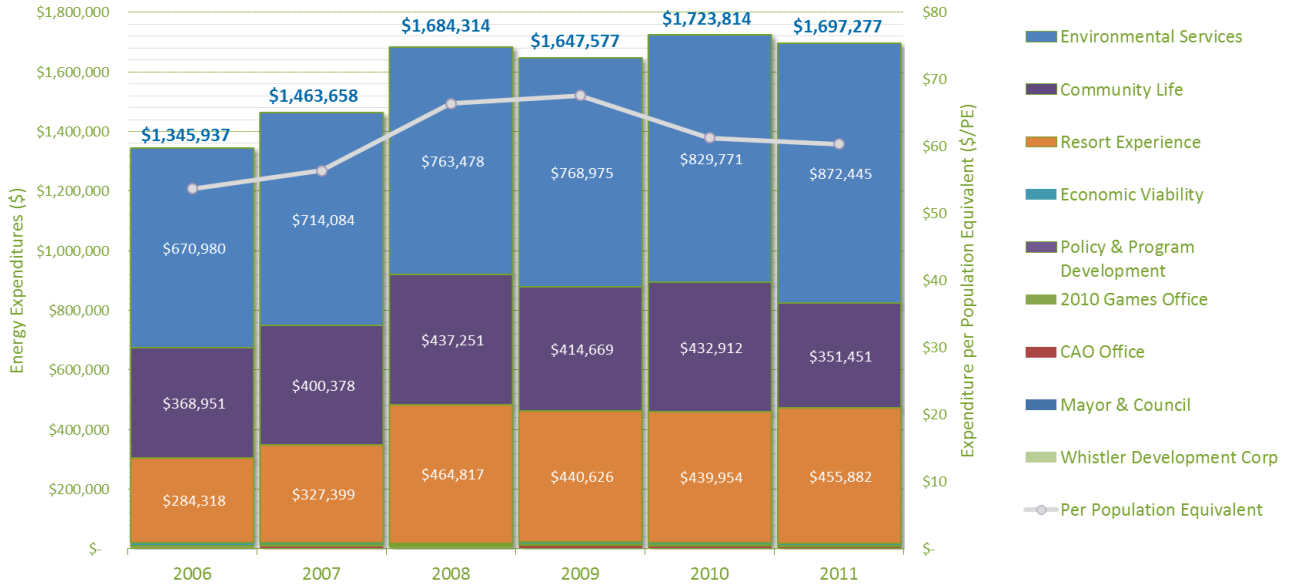


Corporate Energy Expenditures

Total 2011 corporate energy expenditure remained steady at approximately \$1.7 million (up 4.5% versus 2009). It is worth noting that it took a 6% reduction in corporate energy consumption to hold expenditures steady between 2010 and 2011. Further conservation will be the key to controlling future expenditures at a level consistent with the current costs given the ongoing trends in rate inflation (utility rate inflation continues to consistently exceed the consumer price index (CPI)).

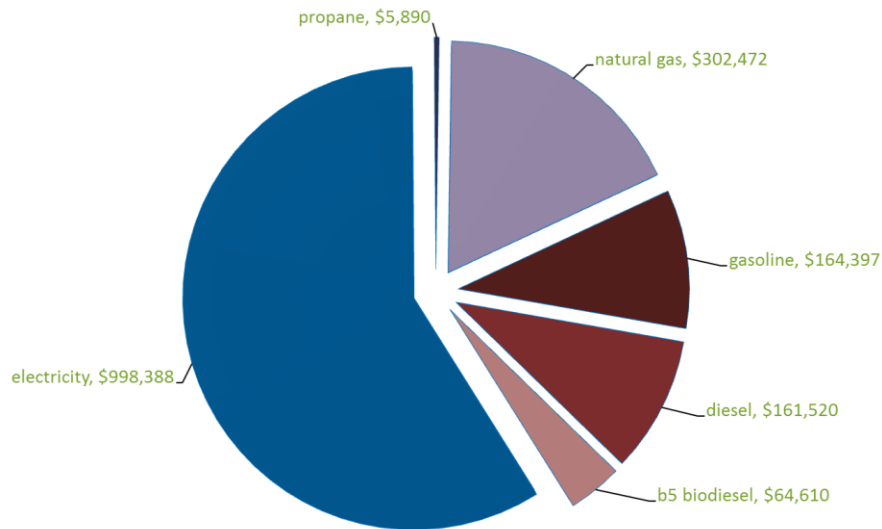
The six-year trends in total corporate energy expenditure are presented below:

Trends in RMOV Corporate Energy EXPENDITURES
(by division)



2011 corporate energy expenditures by fuel type are presented in the following chart:

2011 RMOV Corporate Expenditures (\$)
By Source Fuel



4.2.3 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.

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 continues to run at approx. \$20,000/year versus the forecasted gas-powered furnace baseline.

2011 annual energy costs at SGFH were \$8,050 (\$1.35/ft²/year; 181 kWh/m²/year). Annual GHG emissions from SGFH were 2.31 tCO₂e (emissions with a gas furnace were forecasted at 56-67 tCO₂e/year).

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.

The most recent 12 months of energy performance at the WPL indicates that the building is operating at more than 47% better than the Model National Energy Code for Buildings (MNECB). At current levels of performance (1,139 GJ/yr), annual utility costs are running approximately \$15,000 (800 GJ/yr) less than had the building been built to typical building code standards (MNECB).

2011 energy costs at WPL totaled \$24,400 (\$1.42/ft²/yr; 208 kWh/m²/year). Annual GHG emissions from WPL were 11.9 tCO₂e.

Note that ongoing monthly energy tracking at WPL indicates that the building's rolling 12 month consumption level has decreased a further 13% since Dec. 31st of 2011. With ongoing commissioning of the building, staff expect WPL to achieve an energy performance level at least 50% below MNECB (1,061 GJ/yr) by year-end 2012.

Meadow Park Sports Centre



In 2010, a \$930,000 energy system upgrade was installed at MPSC. The new system incorporated both evacuated tube solar technology and a vertical loop geo-exchange bore field. The system design employs the solar panels to pre-heat the domestic hot water loads directly, while the heat pumps draw heat from the ground (70 boreholes at 155' depth) to serve the various pool loads within the building (lap pool, leisure pool & hot tub).

Utility cost reductions that were anticipated as a result of these upgrades were estimated at \$115,000 - \$130,000/year (SPB: 6.5 – 7.8 years; IRR: 10% - 13%), with annual GHG reductions forecasted at 300-350 tCO₂e/year.

While the finalization of the project construction and commissioning phases was delayed until mid-2011, the system is now fully functional and working well. Despite less than a full year of fully optimized performance levels in 2011, 2011 annual energy expenditures at MPSC decreased to \$278,000 from \$364,000 in 2010 and \$374,000 in 2008. This represents a YOY reduction of \$87,000, and a reduction from pre-project expenditures of \$96,000 annually. Moreover, during the most recent 12 months of billing (May, 2011 – April, 2012), annual expenditures have reduced even further to \$241,000/yr (or \$123,000/yr less than 2008 levels).

Lost Lake PassivHaus



The \$1.5 million project was the result of partnership between the Resort Municipality of Whistler (RMOW), the Austria Passive House Group (APG) and Sea-to-Sky consulting. A grant from the Whistler Blackcomb foundation was also instrumental to the realization of this project.

The Passive House (PH) approach to construction uses radically improved building envelope design and components to achieve dramatic reductions in building energy consumption of approx. 90% compared with standard Building Code construction. This energy usage translates into has less than half of the energy consumption of a Platinum LEED house - Canada's current high standard for "green" building. The small amount of heating energy which is still needed in a Passive House can then be supplied via the ventilation air stream. Passive houses are well established in Europe with over 17,000 existing passive units; approximately 4,000 of these are in Austria.

In partnership with BC Hydro, the RMOW has been tracking the energy consumption at the LLPH since January of 2011 with a real time Energy Management Information System (EMIS). At the end of the first year of energy tracking (Feb, 2012), the results are as follows: 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.

Bottom line: over the course of an entire year, it cost only \$233 to provide all the heat required by this 2,700 ft² building (a typically built building in our climate would consume approx. 10 time this amount).

4.2.4 Key Corporate Energy Consumption Performance Insights

Energy Consumption

Overall

- Corporate energy consumption decreased 6% YOY, but remains nearly identical to 2009 levels, and higher than all other years on record.
- Despite areas of substantial energy reductions (i.e. MPSC), other areas of the operation have increased consumption so as to mostly negate the aforementioned savings (vs. 2009).

Divisional Insights

- Environmental Services and Community Life both achieved YOY reductions in energy consumption, however REX's consumption increased by 6%.
- Both ES and REX 2011 consumption levels remain higher than 2008 base year benchmark.
- CL energy consumption is now at the lowest level since detailed record keeping began in 2006.

Energy Expenditures

Overall

- Overall 2011 energy expenditures across municipal operations held constant at ~\$1.7M (this was due to the combined influence of a 6% decrease in consumption, and increases in the unit rates of various energy sources)
- Electricity makes up approx. \$1M/yr of the total corporate energy expenditure.

Divisional Insights

- ES & REX energy expenses increased YOY (5.2% and 3.6% respectively)
- Year over year, CL expenses decreased by more than \$80,000 (19%) – this is primarily related to the savings achieved at MPSC (discussed in Section 4.2.3 above)
- Upgrades in energy efficiency across the operation are yielding solid, expected returns on investment. Without further investments in additional energy efficiency and conservation across the operation, future increases in energy expenses are highly likely and corporate energy conservation and emission reduction goals will not be met.

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 2011.

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 2011 Community Energy & Emissions Inventory
B	RMOW 2011 Corporate Energy & Emissions Inventory
C	Summary of Emission Factors
D	Summary of Corporate Carbon Neutral Commitment <ul style="list-style-type: none"> • RMOW Carbon Footprint • Verified Emission Reductions (VERs) • Key Variance Summary – Traditional Services Scope Boundary

APPENDIX B

RMOW Energy and GHG Emissions Assessment - 2011

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



Division	Dept.	Workgroup	Organizational Unit	Totals					GHGs (tCO2e)	carbon cost (\$)	
				cost (\$)	mobile fuels (Litres)	mobile fuels (GJ)	stationary gas (GJ)	Electricity (GJ)			Total Energy Use
1100			Mayor & Council	\$ 358	275.5	10	-	-	10	0.61	\$ 15.34
	1101		Mayor & Council	\$ 358	275.5	10	-	-	10	0.61	\$ 15.34
				\$ -	-	-	-	-	-	-	-
1200			CAO Office	\$ 6,729	5,176.1	179	-	-	179	18.48	\$ 462.08
	1201		Administrator	\$ 6,711	5,162.0	179	-	-	179	18.45	\$ 461.29
	3100		Human Resources	\$ 18	14.1	0	-	-	0	0.03	\$ 0.79
				\$ -	-	-	-	-	-	-	-
1300			2010 Games Office	\$ 556	425.6	15	-	-	15	0.95	\$ 23.81
	1302		2010 Games Office	\$ -	-	-	-	-	-	-	\$ -
	1401		Partnership & Economic Services	\$ 556	427.7	15	-	-	15	0.95	\$ 23.81
				\$ -	-	-	-	-	-	-	-
1500			Policy & Program Development	\$ 5,288	4,067.8	141	-	-	141	9.06	\$ 226.49
	1501		Policy & Program Development	\$ 4,779	3,676.5	127	-	-	127	8.19	\$ 204.70
	2200		Legislative Services	\$ 509	391.3	14	-	-	14	0.87	\$ 21.79
				\$ -	-	-	-	-	-	-	-
2000			Economic Viability	\$ 4,344	3,400.7	118	-	-	118	7.57	\$ 189.35
	2100		General Manager	\$ 3,106	2,389.4	83	-	-	83	5.32	\$ 133.04
	2300		Financial Services	\$ 199	153.3	5	-	-	5	0.34	\$ 8.54
	2400		Fiscal Planning	\$ -	-	-	-	-	-	-	\$ -
	2500		Information Technology	\$ 1,038	858.0	30	-	-	30	1.91	\$ 47.77
				\$ -	-	-	-	-	-	-	-
5000			Resort Experience	\$ 455,882	71,812.4	2,606	5,833	12,851	21,289	546.76	\$ 13,665.88
	5100		General Manager	\$ 526	404.5	14	-	-	14	0.90	\$ 22.52
	5200		Resort Parks Planning	\$ 774	666.2	23	-	-	23	1.48	\$ 37.09
	1402		Village Animation	\$ 1,079	930.5	32	-	-	32	2.07	\$ 51.81
	5400		Resort Planning	\$ 281	216.3	7	-	-	7	0.48	\$ 12.04
	5300		Park/Village Operations	\$ 441,480	69,594.9	2,529	5,833	12,851	21,212	541.82	\$ 13,542.42
				\$ -	-	-	-	-	-	-	-
6000			Environmental Services	\$ 872,445	199,527.4	7,518	4,164	28,279	39,960	893.17	\$ 22,329.27
	6100		General Manager	\$ 4,638	3,958.0	137	-	-	137	8.82	\$ 220.38
	6200		Development Services	\$ 240	184.5	6	-	-	6	0.44	\$ 11.12
	6400		Transportation	\$ 174,164	111,530.4	4,308	-	1,788	6,096	302.89	\$ 7,572.36
	6500		Central Services	\$ 3,445	2,485.9	86	18	-	105	6.66	\$ 166.47
	6600		Environmental Operations	\$ 64,002	55,598.5	2,007	-	-	2,007	131.52	\$ 3,287.95
	8200		Water Utility	\$ 262,492	12,855.0	497	-	11,046	11,543	104.07	\$ 2,601.76
	8300		Sewer Utility	\$ 334,264	12,391.2	457	4,145	14,356	18,959	330.65	\$ 8,266.20
	6600		Solid Waste	\$ 28,593	-	-	-	1,088	1,088	6.95	\$ 173.86
	6800		Transit	\$ 2	1.7	0	-	-	0	0.00	\$ 0.10
	8300		Environment Stewardship	\$ 606	522.2	18	-	-	18	1.16	\$ 29.08
				\$ -	-	-	-	-	-	-	-
7000			Community Life	\$ 351,451	54,805.1	1,984	8,263	8,856	19,103	604.41	\$ 15,110.34
	7100		Community Life General	\$ 3,644	3,141.0	109	-	-	109	7.00	\$ 174.88
	4100		Bylaw	\$ 16,697	10,228.5	356	-	204	561	24.26	\$ 606.57
	4300		Fire	\$ 23,967	20,902.3	779	-	-	779	51.79	\$ 1,294.67
	5800		Meadow Park Sports Centre	\$ 284,282	1,931.2	67	8,238	8,615	16,920	475.43	\$ 11,885.79
	7200		Building Dept.	\$ 6,513	5,068.4	176	25	-	201	12.82	\$ 320.42
	4200		RCMP	\$ 416	358.9	12	-	-	12	0.80	\$ 19.98
	5500		Whistler Public Library	\$ 205	176.9	6	-	-	6	0.39	\$ 9.85
	5700		Recreation	\$ 15,727	12,997.8	478	-	36	515	31.93	\$ 798.18
				\$ -	-	-	-	-	-	-	-
9000			Whistler 2020 Development Corp	\$ 225	-	-	-	-	-	0.43	\$ 10.80
	9100		Whistler2020 Development Corp	\$ 225	194.0	7	-	-	7	0.43	\$ 10.80
				\$ -	-	-	-	-	-	-	-
				\$ 1,697,277	339,490.6	12,570	18,259	49,986	80,816	2,081.46	\$ 52,033.36

APPENDIX C – Summary of Emission Factors

Energy Type	2011 Emission Factor	Source
Propane	0.0600125 tCO ₂ e/GJ	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Natural Gas	0.0503034 tCO ₂ e/GJ	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Gasoline (E5)	0.0022271 tCO ₂ e/litre	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Diesel (B4)	0.002623 tCO ₂ e/litre	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011) updated to reflect B4 standard
B5 Biodiesel	0.0025957 tCO ₂ e/litre	Methodology for Reporting BC Public Sector GHG Emissions (Ministry of Environment - Feb, 2011)
Electricity	0.0063900 tCO ₂ e/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 NOTE: The 2011 BC Hydro GHG emission factor was not released in BC Hydro's GRI report at time of publishing this report. As such the 2011 emission factor was assumed to be identical to 2010 levels, and the three year rolling average protocol applied.

APPENDIX D – Summary of Corporate Carbon Neutral Commitment

RMOW Carbon Footprint

Division	Dept.	Workgroup	Organizational Unit	Totals	
				GHGs (tCO2e)	carbon cost (\$)
1100			Mayor & Council	0.61	\$ 15.34
	1101		Mayor & Council	0.61	\$ 15.34
				-	
1200			CAO Office	18.48	\$ 462.08
	1201		Administrator	18.45	\$ 461.29
	3100		Human Resources	0.03	\$ 0.79
				-	
1300			2010 Games Office	0.95	\$ 23.81
	1302		2010 Games Office	-	\$ -
	1401		Partnership & Economic Services	0.95	\$ 23.81
				-	
1500			Policy & Program Development	9.06	\$ 226.49
	1501		Policy & Program Development	8.19	\$ 204.70
	2200		Legislative Services	0.87	\$ 21.79
				-	
2000			Economic Viability	7.57	\$ 189.35
	2100		General Manager	5.32	\$ 133.04
	2300		Financial Services	0.34	\$ 8.54
	2400		Fiscal Planning	-	\$ -
	2500		Information Technology	1.91	\$ 47.77
				-	
5000			Resort Experience	546.76	\$ 13,665.88
	5100		General Manager	0.90	\$ 22.52
	5200		Resort Parks Planning	1.48	\$ 37.09
	1402		Village Animation	2.07	\$ 51.81
	5400		Resort Planning	0.48	\$ 12.04
	5300		Park/Village Operations	541.82	\$ 13,542.42
				-	
6000			Environmental Services	893.17	\$ 22,329.27
	6100		General Manager	8.82	\$ 220.38
	6200		Development Services	0.44	\$ 11.12
	6400		Transportation	302.89	\$ 7,572.36
	6500		Central Services	6.66	\$ 166.47
	6600		Environmental Operations	131.52	\$ 3,287.95
	8200		Water Utility	104.07	\$ 2,601.76
	8300		Sewer Utility	330.65	\$ 8,266.20
	6600		Solid Waste	6.95	\$ 173.86
	6800		Transit	0.00	\$ 0.10
	8300		Environment Stewardship	1.16	\$ 29.08
				-	
7000			Community Life	604.41	\$ 15,110.34
	7100		Community Life General	7.00	\$ 174.88
	4100		Bylaw	24.26	\$ 606.57
	4300		Fire	51.79	\$ 1,294.67
	5800		Meadow Park Sports Centre	475.43	\$ 11,885.79
	7200		Building Dept.	12.82	\$ 320.42
	4200		RCMP	0.80	\$ 19.98
	5500		Whistler Public Library	0.39	\$ 9.85
	5700		Recreation	31.93	\$ 798.18
				-	
9000			Whistler 2020 Development Corp	0.43	\$ 10.80
	9100		Whistler2020 Development Corp	0.43	\$ 10.80
				-	
				2,081.46	\$ 52,033.36

Verified Emission Reduction (VERs)

As of August 10th, **the RMOW's 2011 Corporate Emissions have not yet been neutralized** through the purchase of VERs, local credits or any other carbon offset programs.

Current Status: The RMOW, in support of the Cheakamus Community Forest (CCF) has delayed the purchase of VERs to allow time for the CCF to fully explore the potential for the creation of third-party certified VERs locally. The CCF is currently working with Provincial Ministries, representatives from the Pacific Carbon Trust and others to execute on a proposed carbon offset project designed to leverage the new Provincial Forest Carbon Offset Protocol (in particular, increased carbon storage approaches permitted under the Improved Forest Management (IFM) section of the protocol).

If successfully validated, executed and verified, the CCF will be in a position to provide high quality, independently certified VERs for potential purchase by the RMOW. At this point, RMOW staff feel that the benefits of supporting a local offset project, the co-benefits associated with the IFM approaches, and the independent, third party rigour that is being applied to the CCF project, justify the delay in achieving formal neutrality with respect to 2011 corporate operations.

The CCF anticipates that they will have the ability to vend VERs by late 2012, or early in 2013.

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 2011 corporate operations. All RMOW departments have been charged internally for the costs associated with the RMOW carbon neutrality commitments. All departments continue to use the price signals that these costs imply (\$25/tCO₂e) to improve financial decision making and preference cost-effective projects and initiatives that are capable of continuously reducing carbon emissions, and decreasing carbon costs across corporate operations. See Appendix D above for more detail.

Key Variance Summary – Traditional Services Scope Boundary

The following is a summary of the variances in the inventory scope boundary between the 2011 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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	<p><i>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</i></p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 not 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	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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



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