



# WHISTLER

October 3<sup>rd</sup>, 2007

Devin Causley,  
Centre for Sustainable Community Development  
Federation of Canadian Municipalities  
24 Clarence Street  
Ottawa, ON  
K1N 5P3

**Re: 5<sup>th</sup> Milestone – Partners for Climate Protection Program**

Dear Mr. Causley

This report is the Resort Municipality of Whistler's formal submission for the fifth milestone within the joint Federation of Canadian Municipalities (FCM) and ICLEI 'Partners for Climate Protection' program. Within this document you will find an outline of our planning processes to date, a summary of emission targets, our most recent results from the 2006 calendar year, as well as a summary of our ongoing progress toward our identified 'measures'.

At this time, we would like to thank the FCM as well as ICLEI for their support and feedback on earlier versions of this report, their technical advice, as well as their ongoing commitment to GHG reductions across the country.

Please feel free to contact either James or myself if you have any questions or comments concerning this submission.

Kind Regards,

**Ted Battiston**  
Sustainability Initiatives  
Resort Municipality of Whistler

and,

**James Hallisey, P.Eng**  
Manager of Environmental Projects  
Resort Municipality of Whistler



## SUMMARY REPORT of Whistler's 2006 Greenhouse Gas Inventory FCM/ICLEI Partners for Climate Protection Program “Milestone Five”

October, 2007

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# SUMMARY REPORT of Whistler's GHG Reductions and Targets

## FCM Partners for Climate Protection Program

### 1. BACKGROUND

The RMOW joined FCM's and ICLEI's 'Partners for Climate Protection' (PCP) Program in 1997. The PCP program is based on a five-milestone framework to guide municipalities toward the reduction of greenhouse gas emissions (GHGs). As you know, the five milestones are:

1. Creating a greenhouse gas emissions inventory and forecast;
2. Setting an emissions reduction target;
3. Developing a local action plan;
4. Implementing the local action plan or a set of activities; and
5. Monitoring progress and reporting results.





Whistler received recognition of completing the 1st and 3rd milestones of the PCP program in June 2004, and the 2nd and 4th milestones in October 2004.

As part of this process, Whistler's *Integrated Energy, Air Quality and Greenhouse Gas Management Plan* was the first integrated plan in Canada to include energy, air quality and greenhouse gases management planning in one document. This plan was adopted by the Whistler municipal council in March of 2004.

The *Integrated Energy, Air Quality and Greenhouse Gas Management Plan* provides a description of the air quality and energy consumption in year 2000 and was our first detailed monitoring program for GHG emissions. An energy and emissions inventory for the year 2000 was prepared using fuel consumption estimates for buildings, infrastructure, and transportation. GHG and Common Air Contaminant (CAC) emissions resulting from energy use were then estimated using standard emission factors for the various fuel types used in Whistler.

The plan also described a number of measures to reduce air contamination, energy consumption, and GHG emissions. These measures included switching the community's gas distribution system from propane to natural gas, an expanded transportation demand management (TDM) program, increased recycling rates to reduce GHG emissions from landfill, improvements to the municipal fleet vehicles, and increasing density in land-use planning.

It is also important to note that to further guide the RMOW's journey toward a more sustainable future, the Whistler community has also developed an ambitious vision, process, and planning approach known as Whistler2020. This vision articulates what we aspire to be, but more importantly it inspires and guides our strategic planning and action development. Whistler2020 is founded on the science- and system-based Natural Step framework to define sustainability. This framework, developed by Dr. Karl-Henrik Robert consists of four complete, yet non-overlapping

Whistler's Sustainability Objectives are to:	
	Reduce and eventually eliminate the RMOW's contributions to <b>systematic increases in concentrations of substances from the Earth's crust</b> (e.g. by increasing energy efficiency).
	Reduce and eventually eliminate the RMOW's contributions to <b>systematic increases in concentrations of substances produced by society</b> (e.g. through 100% recycling).
	Reduce and eventually eliminate the RMOW's contributions to <b>systematic physical degradation of nature</b> (e.g. by purchasing certified wood), and
<b>and in that society people are not subject to conditions that systematically...</b>	
	Reduce and eventually eliminate our contribution to <b>systematically undermining the ability of others to meet their basic human needs</b> . (e.g. by purchasing FairTrade).

Please refer to [www.whistler2020.ca](http://www.whistler2020.ca) for more information on the TNS framework.

conditions that society needs to stop violating in order to achieve a ‘sustainable’ society. The condition most relevant to GHG emissions, the need to “reduce and eventually eliminate Whistler’s contribution to progressive build-up of materials taken from the Earth’s crust”, is integrated into all of our Whistler2020 planning processes.

Currently, 16 community-based task forces meet annually to review and recommend action items to help move Whistler towards our sustainability goals. The recently activated monitoring section of the Whistler2020 website is also being used to both track the success of these action items and to inform our decisions through detailed performance metrics. The Energy, Materials and Solid Waste, Built Environment, and Transportation task forces each play key roles in recommending actions to reduce our GHG emissions.

Moreover, over the past few months, the entire municipal organization has been re-organized and realigned to better execute on our commitments within the Whistler2020 vision. In the new structure, what was previously the planning department is now the department of Community Life, Parks is now Resort Experience, and importantly Engineering and Public Works has become Environmental Services. This is particularly relevant as the realignment has improved the integration of Whistler’s Sustainability Objectives and Natural Step framework into the entire organizational culture. In this sense, our commitments to reducing the systemic build-up of materials taken from the earth’s crust expands far beyond our community task forces and now permeates the entire organization structure on a daily basis.

## 2. REPORTING ON IDENTIFIED TARGETS

RMOW council joined the Partners for Climate Protection Program in 1997, and through the achievement of Milestone 2 committed to a 20% reduction in GHG emissions from municipal operations from 1990 levels, and a minimum 6% reduction for the entire community from 1990 levels. Moreover, Whistler has also committed to preserving the ‘Whistler Experience’, and clean air is an integral part of this experience.

The implementation plan included within Whistler’s *Integrated Energy, Air Quality and Greenhouse Gas Management Plan* also includes a detailed set of performance targets – a quick summary of key indicators are reported below:

Indicator	Baseline (2000)	Current (2006)	Percent Change	Target (2010)	Target (2020)
Total annual energy use per population equivalent	119 GJ	123 GJ <sup>1</sup>	+ 3.36%	85 GJ	82GJ
Total annual GHG emissions per population equivalent	5.34 tCO <sub>2</sub> e	5.93 tCO <sub>2</sub> e	+ 11.04%	3.5 tCO <sub>2</sub> e	3.4 tCO <sub>2</sub> e
Percentage of electricity generated in Whistler	0%	0%	0%	10%	20%
Total landfilled waste generated by community	18,432 t <sup>2</sup>	14,403 t <sup>3</sup>	- 21.86%	18,768 t	12,146 t
Total landfilled waste per population equivalent	0.70 t <sup>4</sup>	0.54 t	- 22.9%	0.58 t	0.35 t
Percentage of total waste recycled	24%	38%	+ 58.33%	40%	70%
Percentage of dwelling units within 300m of valley trail	77% <sup>5</sup>	87%	+ 12.98%	97%	100%
Percentage of dwelling units within 300m of transit	91% <sup>6</sup>	92%	+ 1.10%	90%	100%

Moreover, the ‘Monitoring Progress’ component of the Whistler2020 website was activated in October of 2006 which now reports on a total of 92 sustainability-related indicators. These indicators are intended to measure our progress toward our sustainability goals and the community is committed to their annual update with more frequent reporting planned for the future. GHG emissions from energy use, built infrastructure, and fleet inventory are presented, and more detailed information will be added to the website as we compile more granular emission inventories. These GHG monitoring results (as well as the other performance metrics) are used throughout the community to evaluate the success of our past actions, set priorities and to direct new initiatives. To review the Energy, GHGs, Air Quality and other related indicators,

<sup>1</sup> Assumes a 2006 population equivalent of 26,500 (this number is yet to be finalized, 2005 value was 25,966)

<sup>2</sup> Improved data from recent Environmental Services Department Analysis (CH2MHill) - value changed from 21,551t to 18,432t

<sup>3</sup> Assumes a 2006 population equivalent of 26,500 (this number is yet to be finalized, 2005 value was 25,966)

<sup>4</sup> Improved data from recent Environmental Services Department Analysis (CH2MHill) - value changed from 0.88t to 0.70t

<sup>5</sup> Data point changed from 81% to 77% due to improved GIS assessments techniques and access to increased granularity in the dwelling unit datasets

<sup>6</sup> Data point changed from 93% to 71% due to improved GIS assessments techniques and access to increased granularity in the dwelling unit datasets

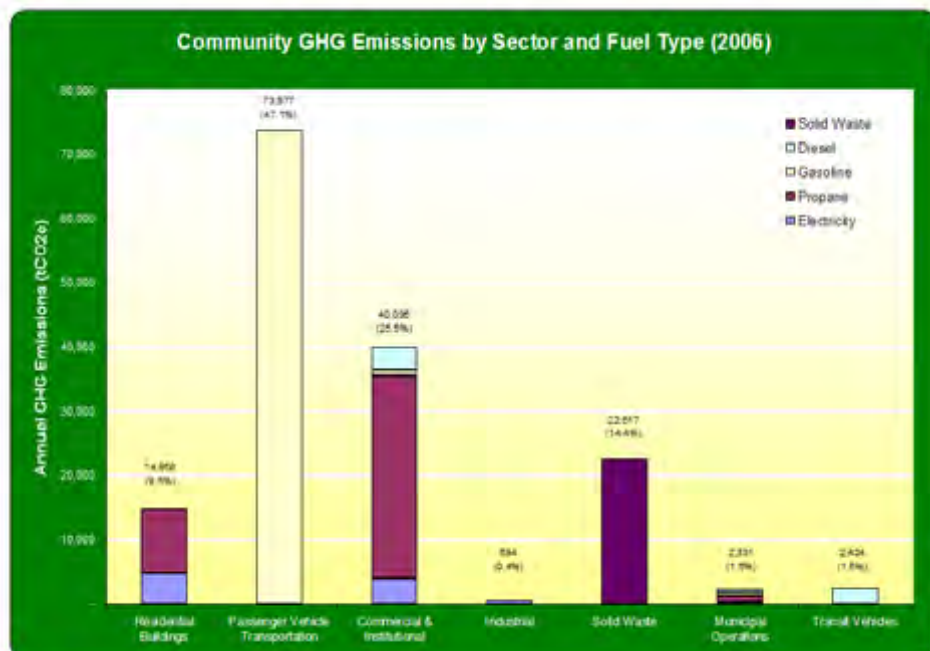
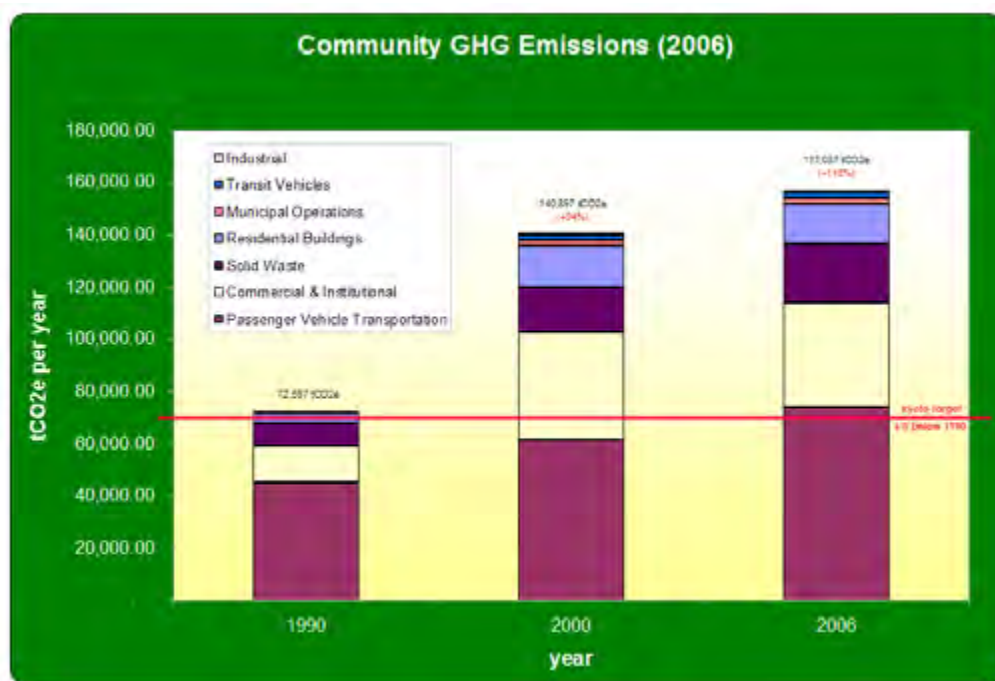
visit the website at [www.whistler2020.ca](http://www.whistler2020.ca) and navigate to the energy indicators through 'measuring success' tab or go directly to: [www.whistler2020.ca/whistler/site/indicator.acds?instanceid=1807604&context=1793958](http://www.whistler2020.ca/whistler/site/indicator.acds?instanceid=1807604&context=1793958).

For the purposes of updating our current performance related to our Integrated Plan, we have also compiled a detailed 2006 emissions inventory for both community-wide emissions as well as our in-house organizational emissions. Summary charts from this recent inventory are included below for reference, and a more comprehensive inventory is included as Appendix A for further review.

## 2.1. Community Emissions

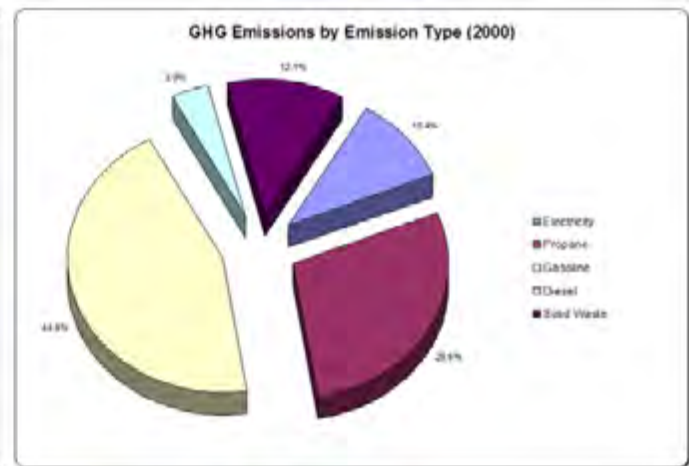
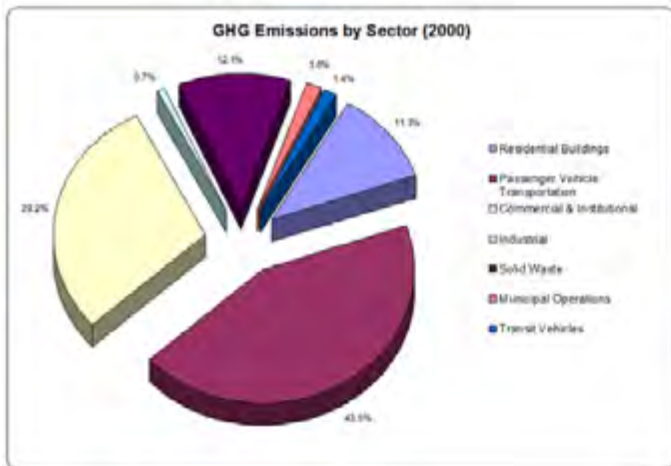
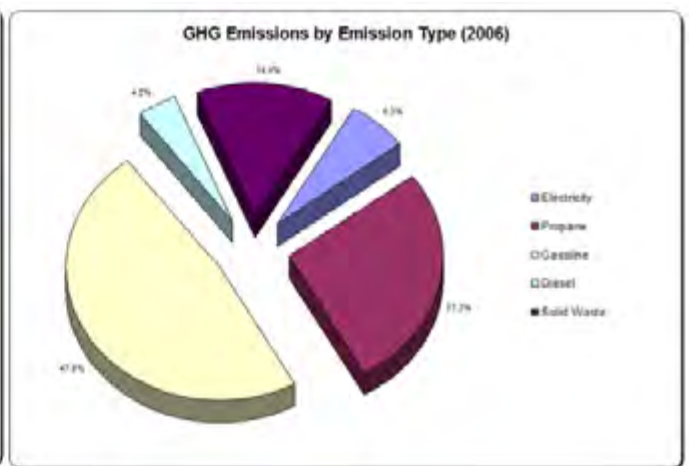
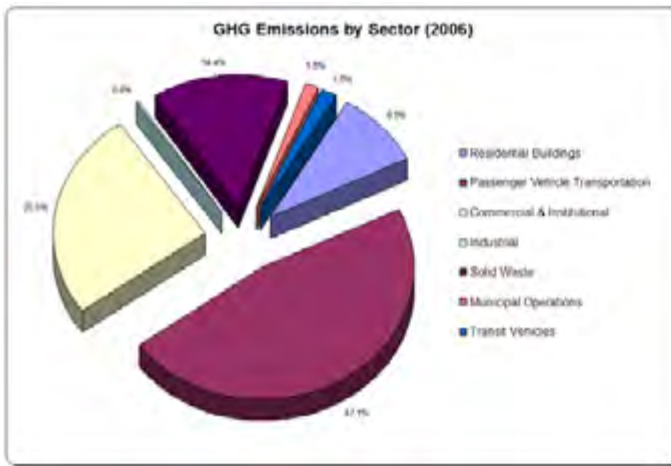
As seen in the chart above, GHG emissions rose dramatically during Whistler's accelerated growth between 1990 and 2000. While the rate of GHG growth has slowed over the past few years it continues to move away from our stated PCP targets. Moreover, these results indicate that our community is also falling short with respect to the recommended implementation scenario outlined within our Integrated Energy, Air

Quality and GHG Management Plan. According to this plan, by 2006 Whistler's community emissions should have decreased by approximately 10% relative to 2000 levels. However, the 2006 inventory indicates that current emissions are now 11% greater than in 2000<sup>7</sup>. Coarse estimates for the next few years indicate that the 10% reduction in emissions (relative to 2000) will not likely be achieved until the 2010 or 2011 calendar years.



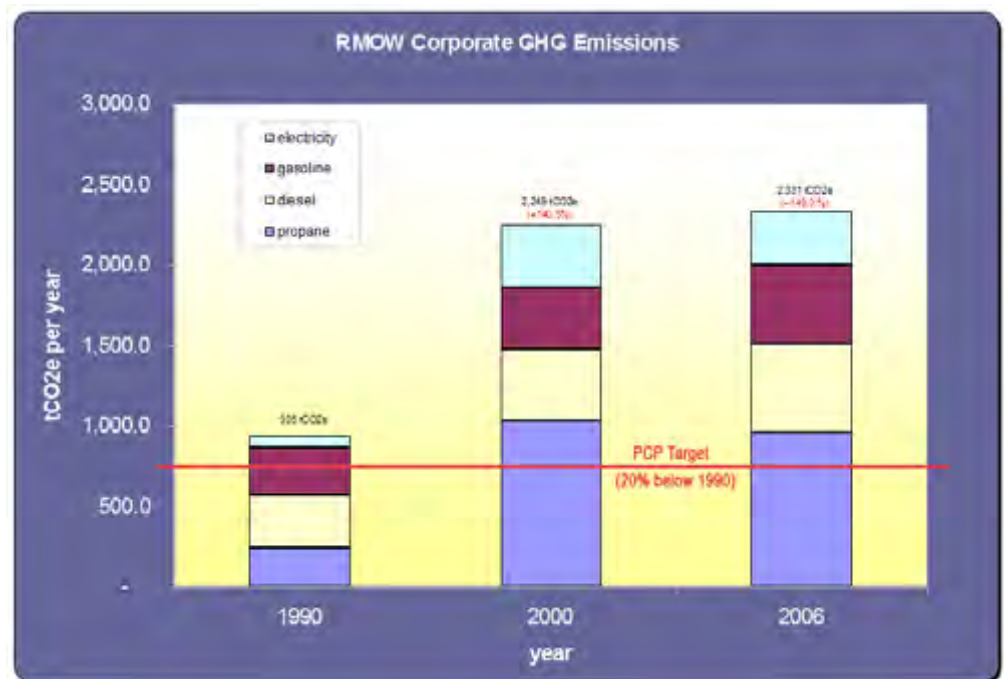
Relative to 2000 levels, the distribution of emissions by sector has changed little, with passenger transportation continuing to represent just less than half of all GHG emissions. Solid waste as a source of emissions has increased relative to other emission types, however due to the recent closure, capping and the initiation of the methane flaring operations at the Whistler landfill, this emission type will be reduced by up to 20,000 tonnes per annum beginning in 2007 (see detail in Section 3.4 below).

<sup>7</sup> One primary reason for this shortfall is the later than anticipated conversion from propane to natural gas.

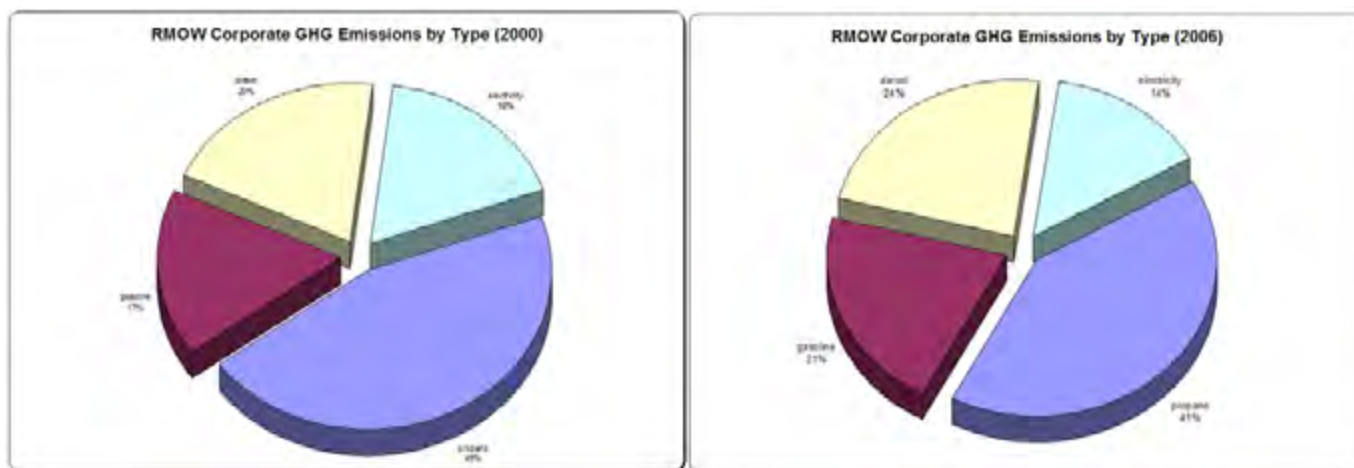


## 2.2. Corporate Emissions

Corporate emissions (exclusive of public transit<sup>8</sup>) rose steadily during the 1990's. Since 2000 the emissions have been relatively stable, however current levels are a long way from the committed 20% PCP reduction.



<sup>8</sup> Whistler had no public transit in 1990, and as GHG emissions from diesel powered transit vehicles account for more than 2,000 tCO2e annually, the inclusion of these values within the corporate inventory substantially skews the interpretation of the data. For this reason transit emissions are tracked separately, and presented in the previous section.



The source of corporate emissions (by type) have varied little over the past six years. When public transit is excluded, propane represents the largest portion of the corporate emission profile. However, propane's overall share of the total emissions (vs. 2000) has decreased by 5 points and has reduced in absolute value by approximately 60 tCO<sub>2</sub>e per annum.

### 2.3. Discussion

As seen on the above charts, RMOw corporate emissions have been relatively stable for the past few years, but the organization has a considerable challenge remaining to meet the PCP targets by 2012. On the community side of the commitment, the results are substantially better but still far short of our stated goals and our Milestone 1 forecasts. Yet, with respect to community-wide emissions, the preceding chart fail to capture one significant recent achievement. As of March of 2007, the former Whistler landfill has been capturing and flaring methane gas. It is estimated that as much as 20,000 tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) emissions will be avoided in 2007, and a total of approximately 450,000 tCO<sub>2</sub>e will be avoided over the next 25 years. Factoring in the estimated 2007 reduction in landfill based emissions, while holding all other emission sectors constant would result in a 2007 overall performance of 83% over 1990 levels (a 6% improvement relative to 2006 performance).

These detailed GHG inventory results have been presented in two extended workshops to the RMOw senior management team, and are being actively presented to every single staff in the municipal organization (>250 individuals) over the summer of 2007. Moreover, this data is being shared throughout the NGO and private sector communities to inform dialogues and highlight our current shortfall relative to our PCP targets.

The fact remains that growth in Whistler's emissions is highly correlated to the considerable community development and expansion during the early 1990's, during which time the RMOw was one of the fastest growing communities in Canada at approx. 12% per year. However, it is also obvious that more can, and must be done, to substantively move toward our emission targets – despite the challenges that this growth has presented over the past 16 years. Toward this end, the following section presents many of the current and ongoing actions the Whistler community has undertaken over the last few years.

## 3. TAKING ACTION TO REDUCE OUR EMISSIONS

As per the intent of the PCP initiative, and consistent with Whistler's larger commitment to its sustainability objectives initiative, the RMOw is actively working to measure, assess and act in a adaptive and iterative process designed to continually improve our performance – and ultimately achieve our stated targets.

Building on the goals set out in the *Integrated Energy, Air Quality & GHG Management Plan* the RMOw has taken many important steps towards reducing GHG emissions across our community. A select list of highlighted actions are presented below for reference:

### 3.1. Education and Leadership

- a. The information highlighted in the corporate and community emissions graphs is currently being used in a series of workshops throughout municipal operations. A member of the Whistler2020 team is meeting with every department over the next three months to discuss our GHG emissions and develop actions to reduce them. Getting this information to our entire staff will help to harness their creative ideas, improve dialogue between junior staff and the senior management team, and ultimately to improve our GHG profile.
- b. Similar workshops have been presented to key community stakeholder groups, including Tourism Whistler, Whistler Blackcomb, local Rotary Chapters and more recently a local youth environmental film-making workshop.

### 3.2. Propane to Natural Gas Conversion

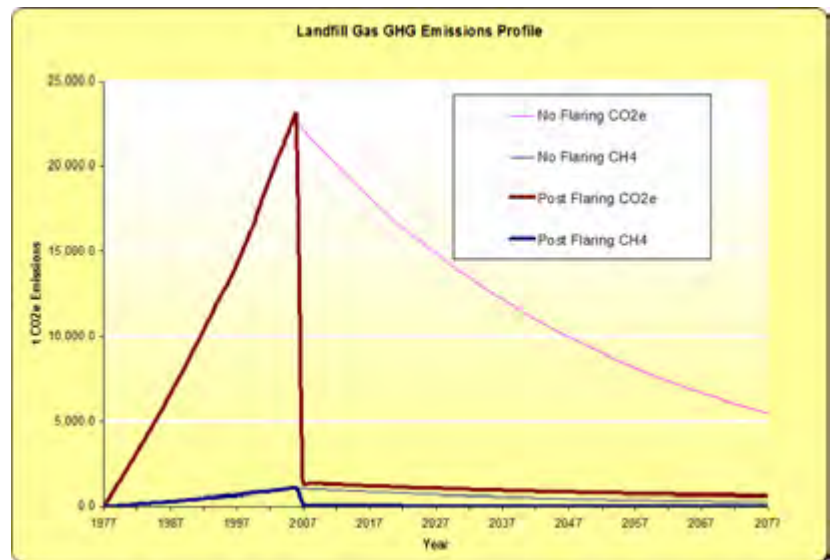
- c. As planned within the Integrated Energy Plan, Terasen has recently started construction of a natural gas pipeline from Squamish to Whistler. Conversion of the current propane system to natural gas is expected to be completed by September 2008. This will have an immediate benefit as natural gas produces 15% less GHG emissions than propane (Whistler currently has the largest piped propane distribution system in BC). At current levels of propane use in Whistler, a 15% improvement would represent a hard reduction of approximately 6,400 tCO<sub>2</sub>e (or approximately 4% of the total 2006 community emissions). Furthermore, it will also provide an opportunity for fleet and transit vehicles to operate on natural gas, thereby contributing to potential further reductions within our transportation sector.

### 3.3. Land Use Planning

- d. A commitment to an urban containment approach to land settlement has led to the selected location for the Olympic Athletes Village being 7km closer to the centre of Whistler than the location originally proposed in the Bid. This choice reflected our commitment to sustainability and GHG reductions and substantially reduced the projected vehicle kilometers travelled by the legacy neighbourhood residents.
- e. The RMOW has also established in-fill housing guidelines to concentrate future developments in existing neighbourhoods to increase density and reduce the distance that residents will need to commute. Infill refers to the incremental addition of new, renovated or adapted buildings within existing developed areas, with benefits including more efficient use of land, infrastructure and services and reduced pressure to develop previously unsettled areas that offer important ecological and/or recreational values. Strong policy to support these initiatives has been integrated into the Whistler2020 Built Environment, Transportation, and Resident Housing Strategies.
- f. The Athlete Village and Legacy Neighbourhood Project is a LEED-ND Pilot Project (Leadership in Energy and Environmental Design). LEED-ND emphasizes the elements that bring the buildings together, and relate the neighborhood to its larger region and landscape. As guidelines for design and decision-making, they serve as an incentive for better location, design, and construction of new residential, commercial, and mixed developments in a manner that reduces the negative impacts of traditional development patterns.

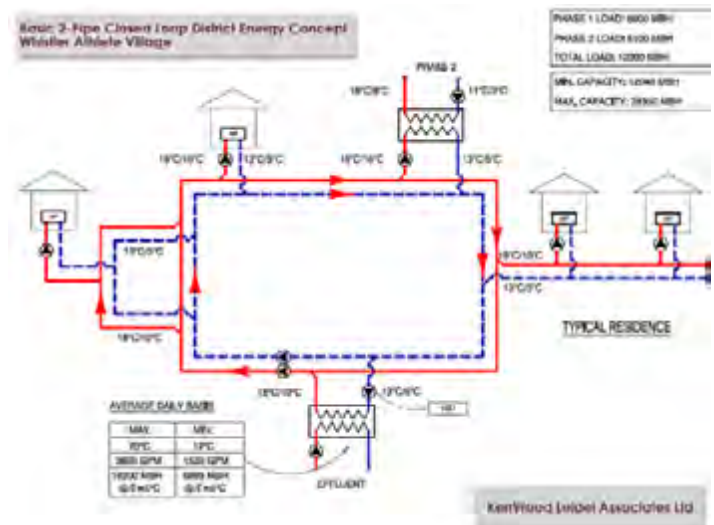
### 3.4. Waste Stream Emissions

- g. Although Whistler's landfill is below the size required by Provincial legislation for gas collection, responsible management of the gas from our landfill is strongly consistent with our community's sustainability commitments in general, and our GHG emission commitments in particular. Previously, the methane emitted from the landfill was the biggest point source of GHG emissions in the Whistler municipality. As illustrated in the graph, flaring the gas is projected to significantly reduce our GHG emissions. It is estimated that 21,000 tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) emissions will be avoided in 2007, with a total of approximately 450,000 tCO<sub>2</sub>e reductions over the next 25 years.
- h. Currently assessments are being undertaken to evaluate the feasibility of using the landfill methane stream to power a potential cogeneration plant designed to provide electricity for the nearby wastewater treatment plant, and additional heat to an adjacent district energy system, further reducing energy-related emissions in the area.
- i. The RMOW is finalizing the purchase of an in-vessel industrial composting system to be located at our new waste transfer station in the Callaghan Valley. This equipment will increase our local diversion potential, and significantly reduce emissions currently associated with local solid waste management practices. The RMOW 2006 waste diversion rate is 38% - our target is 50% by 2010.
- j. The RMOW is currently piloting solar powered garbage compactors in Whistler village. It is expected that these compactors will reduce pickup and transfer frequencies by more than 500%.



### 3.5. Built Form

- k. A "Whistler Green" green building standard has recently been developed. Energy efficiency is a cornerstone element of this standard. This is particularly important as hundreds of additional dwelling units are proposed in Whistler during the next 5 to 10 years in new neighbourhoods and through redevelopment within existing settled areas. Whistler Green homes will set a new standard for residential construction that is consistent with Whistler2020 and will serve as a model for the community.
- l. District Energy System (DES) design and financial modelling is progressing for the proposed DES at the Lower Cheakamus neighbourhood. The proposed DES will consist of heat extraction equipment,

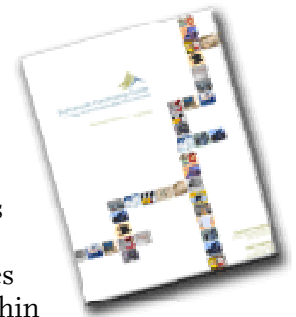


boilers and pumping facilities located at the wastewater treatment plant. A two-pipe loop system that will carry heated water from the wastewater treatment plant over to and through the Lower Cheakamus neighbourhood. Each cluster of dwellings or buildings will have heat pump equipment that will extract the necessary heat energy from the DES, for provision of space heat and hot water supply to the buildings. In order to use this technology, the structures within the Lower Cheakamus neighbourhood must have central heating/cooling systems. Current estimates of potential GHG savings versus typical construction are approximately 60-70%.

- m. The new library facility construction continues and is scheduled to open this fall (2007). LEED Gold is the target and building highlights include; ground-source heating and cooling, durable building construction and green roof technology.
- n. Whistler2020 Partner, Whistler-Blackcomb, has undergone an extensive energy audit of many of its on-mountain facilities in collaboration with Vancouver consultants Sempa Power. By swapping propane boilers and equipment in the Glacier Creek, Legends at Creekside and the Roundhouse Lodge for more efficient electrical units, 846.5 tonnes of GHG emissions have been reduced over the past two years. Moreover, In January, a meteorological (MET) tower was erected on the southwest side of Whistler Mountain to gather valuable data regarding the quality and quantity of wind available for power generation. If the study proves adequate wind supply, Whistler Blackcomb hopes to erect six, two megawatt wind turbines. This proposal could produce enough power to energize 6000 homes. Whistler Blackcomb's renewable strategy also involves building a 6.6 megawatt run of the river power project on Fitzsimmons Creek. Projected power created from this project could offset the annual energy requirements of Whistler Blackcomb's entire on-mountain demand.

### 3.6. Municipal Purchasing and Procurement

- o. Through the purchase of smaller, more efficient alternatives, Municipal vehicle procurement is making significant progress towards improved fleet efficiency. Currently within the fleet, are two Smart Cars, one fully electric village maintenance vehicle, and two Ford Escape Hybrids.
- p. Municipal Council adopted Purchasing Policy F-28, and authorized staff to implement the Administrative Procedure for Procurement in association with the RMOW Sustainable Purchasing Guide. The changes proposed reflect the RMOW's shift to more sustainable procurement practices and improves the manner by which the Sustainability Objectives contained within the Whistler2020 Plan influence day-to-day practice within Municipal operations.



### 3.7. Transportation and Transit

- q. All Municipal diesel vehicles are now powered by biodiesel blended fuels – throughout the summer all vehicles are fueled with B20, and during the colder winter months B5. Our research indicates that B20 fuel represents an immediate GHG reduction of approximately 17%, and B5 approximately 4% for all vehicles using these fuels.
- r. The annual Commuter Challenge was held again in 2006 in conjunction with Clean Air Day. During this event 700 participants took part in sustainable transportation options and cumulatively 105,000 kms were saved and more than 30 tCO<sub>2</sub>e avoided during the two week program.
- s. RMOW Municipal Council supported, in principle, the proposed hydrogen fuel cell bus project, which would see twenty fuel cell buses deployed in Whistler in regular transit service. As of August, 2007 the entire fleet of WAVE buses has been powered by B5 biodiesel. Council has also supported a move toward natural gas powered transit vehicles through an accelerated vehicle replacement

schedule. Shifting to these technologies will result in substantial improvements in overall transit fleet efficiencies.

- t. Although not required by municipal policy, purchasing carbon offsets to ‘offset’ the GHG impacts associated with municipal staff flying on municipal business has increased significantly over the last two years. Moreover, although generally not required through community GHG registries, Whistler has calculated the impact of guests travelling to the resort and is actively working toward the integration of whole-trip GHG calculators and offset purchasing tools within our major travel booking systems.

#### 4. SUMMARY UPDATE ON MILESTONE 3 ‘MEASURES’

Measure	Status	Comments
1. Switch fuel from Piped Propane to Natural Gas	in progress, nearing completion	<ul style="list-style-type: none"> <li>• Pipeline construction is currently underway</li> <li>• Conversion Premise Audit is currently underway</li> <li>• Full conversion is expected by the early Fall of 2008</li> <li>• Propane to Natural Gas conversion should result in a 15% reduction in GHG levels (assuming constant volumes, this results in approximately a 6,400 tCO<sub>2</sub>e reduction in GHG emissions)</li> </ul>
2. Implement Expanded Whistler Comprehensive Transportation Strategy	in progress, ongoing	<ul style="list-style-type: none"> <li>• WAVE received ‘Exception Performance’ award from the Canadian Urban Transit Association</li> <li>• To encourage preferred modes of transportation, the ‘Whistler Way’ social marketing campaign is ongoing</li> <li>• ‘Neighbourhood Infill’ Policy adopted by Whistler Council</li> <li>• WAVE buses now fueled with B5 biodiesel (annual GHG reduction estimate of 75 tCO<sub>2</sub>e)</li> <li>• Whistler Council has supported the natural gas hybrid buses for fleet replacement, and Whistler will be receiving 20 hydrogen powered buses in time for the 2010 Games.</li> <li>• Transportation Cycling Plan endorsed by Council</li> <li>• Highway improvements ongoing</li> </ul>
3. Divert Solid Waste	ongoing	<ul style="list-style-type: none"> <li>• The RMOW recently purchased the idle In-Vessel Composting infrastructure from Carney’s Waste Systems. This facility will be operational at the new transfer station by summer 2008.</li> <li>• 38% destreaming rate (2006) expected to increase as composting opportunities expanded in 2008</li> </ul>
4. Increase Municipal Fleet Efficiencies	ongoing	<ul style="list-style-type: none"> <li>• Vehicle purchases increasingly consistent with GHG and Purchasing commitments (see above)</li> <li>• Fleet efficiency currently not calculated due to dataset inconsistencies. A new system to track fleet efficiency is currently being integrated in the public works yard practices. Despite commitments to improved fleet efficiency total fleet fuel use continues to rise within municipal operations (2006 increase over 2000 levels of 208.9 tCO<sub>2</sub>e, or 25.2%)</li> </ul>
5. Support Public Education and Outreach through the “Whistler Its Our Nature” Sustainability Initiative	ongoing	<ul style="list-style-type: none"> <li>• Whistler2020 Comprehensive Sustainability Planning process includes more than 160 volunteers annually</li> <li>• Multiple presentations to community groups re: Climate Change and community GHG levels</li> <li>• Weekly column in the local newspapers to highlight community-wide action and successes related to sustainability</li> <li>• 2006 ‘Idle-Free’ public education campaign</li> <li>• Whistler2020.ca website launched – approximately 4,000 visits and 100,000 hits monthly</li> </ul>
6. Switch from Large Hydroelectric to Small-Scale Local Renewable Energy	just initiated	<ul style="list-style-type: none"> <li>• Waste-heat powered District Energy system currently under construction at the Athlete Village and associated Legacy neighbourhood</li> <li>• Whistler Blackcomb has MET towers tracking potential wind energy resources on the south side of Whistler Mountain</li> <li>• Whistler Blackcomb continues to work toward a run-of-the-river micro-hydro project on Fitzimmons Creek.</li> </ul>
7. Improve Energy Efficiency for Buildings	ongoing	<ul style="list-style-type: none"> <li>• Whistler Green green building standards and checklist launched</li> <li>• Municipal commitment to LEED library, and LEED fire hall</li> <li>• LEED building designs for local 2010 venues</li> <li>• LEED-ND pilot project for the 2010 Athlete Village &amp; Legacy neighbourhood</li> </ul>

## 5. CONCLUSIONS

As per the intent of the FCM/ICLEI PCP fifth milestone, we believe that Whistler is well along the path of monitoring its emissions, reporting these results, and actively using this information to inform and prioritize our future actions while concurrently assessing and evaluating the impact of our past decisions.

Whistler recognizes that monitoring our results is a ‘necessary’ step in achieving our targets, however, it is important to remember that, by itself, monitoring is not ‘sufficient’. Working together within our community, our region and through organizations like the FCM and ICLEI at the National level new solutions, new tools and access to new resources are required. Whistler is committed to working with other like-minded organizations to achieve these results, and we believe that the integration of a science and systems-based sustainability framework, like the Natural Step into our highest level municipal policy is both a strategic and effective way to ultimately catalyze this shared vision.

## 6. APPENDICES

Appendix Number	Description
1	Summary of Emission Factors by Fuel Type
2	Detailed Tabular Summary of RMOW Corporate and Community-wide Emissions by Sector and Fuel Type (1990, 2000, 2006)
3	Chart Summary - Community-wide Emissions by Sector and Type (1990, 2000, 2006)

### Appendix 1

#### Emission Factors

Fuel Type	Emission Factor			Source
Propane	59.25 kg CO <sub>2</sub> e/GJ			Canadian GHG Challenge Registry
Gasoline	2.34345 kg CO <sub>2</sub> e/litre			World Resources Institute
Diesel	2.68163 kg CO <sub>2</sub> e/litre			World Resources Institute
Solid Waste	55% methane by volume in LFG			US EPA LandGEM Model
Electricity	1990	2000	2006	BC Hydro
	5.3 kg CO <sub>2</sub> e/GJ	12.7 kg CO <sub>2</sub> /GJ	7.8 kg CO <sub>2</sub> /GJ	

## APPENDIX 2

Source	1990 (estimated)			2000				2006			
	Usage		GHG	Usage		GHG	% change over 1990	Usage		GHG	% change over 1990
	volume (l)	energy (GJ)	(t CO2e)	volume (l)	energy (GJ)	(t CO2e)		volume (l)	energy (GJ)	(t CO2e)	
RMOW Ops											
propane	160,449.0	4,062.0	240.7	684,471.0	17,328.4	1,026.7	327%	640,270.5	16,209.4	960.4	299%
gasoline	126,393.7	4,424.0	296.2	162,212.6	5,677.7	380.1	28%	208,618.1	7,302.0	488.9	65%
diesel	122,795.3	4,703.0	329.3	167,177.3	6,402.8	448.3	36%	204,507.0	7,832.5	548.4	67%
electricity		13,000.0	68.9		30,842.0	394.1	472%		42,640.5	333.6	384%
subtotal		26,189.0	935.1		60,250.9	2,249.3	141%		73,984.3	2,331.3	149%
<b>Grand Totals</b>		26,189.0	935.1		60,250.9	2,249.3	141%		73,984.3	2,331.3	149%

Source	1990 (estimated)			2000				2006			
	Usage		GHG	Usage		GHG	% change over 1990	Usage		GHG	% change over 1990
	volume (l)	energy (GJ)	(t CO2e)	volume (l)	energy (GJ)	(t CO2e)		volume (l)	energy (GJ)	(t CO2e)	
Propane											
res-propane	1,106,750.5	28,019.0	1,660.1	5,613,424.0	142,112.0	8,420.1		6,759,358.5	171,123.0	10,139.0	
com-propane	6,914,949.0	175,062.0	10,372.4	21,268,143.0	538,434.0	31,902.2		21,708,173.0	549,574.0	32,562.3	
subtotal	8,021,699.5	203,081.0	12,032.5	26,881,567.0	680,546.0	40,322.4	235%	28,467,531.5	720,697.0	42,701.3	255%
Fleet Usage											
gasoline	470,647.0	16,473.5	1,102.9	764,536.6	26,760.1	1,791.7	62%	565,016.0	19,776.6	1,324.1	20%
diesel	728,573.7	27,904.0	1,953.8	1,343,525.5	51,456.4	3,602.8	84%	1,549,521.9	59,345.9	4,155.2	113%
subtotal	1,199,220.7	44,377.5	3,056.7	2,108,062.1	78,216.5	5,394.5		2,114,537.9	79,122.5	5,479.3	
Electricity											
res-electricity		357,453.6	1,894.5		591,370.0	7,556.5			615,973.0	4,818.8	
com-electricity		253,829.4	1,345.3		478,787.0	6,117.9			560,550.0	4,385.2	
ind-electricity		41,321.1	219.0		79,679.0	1,018.1			87,395.0	683.7	
subtotal		652,604.1	3,458.8	55,871,196.1	1,149,836.0	14,692.6	325%	59,049,600.9	2,863,556.9	9,887.6	186%
Passenger Vehicle											
gasoline	19,284,750.0	675,000.0	45,192.9	26,223,488.8	917,868.0	61,453.5	36%	31,567,502.6	1,104,917.8	73,977.0	64%
Landfill			8,855.7			17,100.3	93%			22,617.0	155%
WAVE											
diesel				721,078.2	25,239.0	1,933.7		904,215.0	34,631.0	2,424.8	25%
<b>Grand Totals</b>		1,327,604.1	72,596.68		2,092,943.0	140,897.0	94%		4,003,105.8	157,087.0	116%

