

# Meeting the Challenge

A CARBON NEUTRAL 2010 WINTER GAMES  
DISCUSSION PAPER



David  
Suzuki  
Foundation

SOLUTIONS ARE IN OUR NATURE

## Meeting the Challenge: A Carbon Neutral 2010 Winter Games Discussion Paper

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## Foreword

This Discussion Paper was commissioned by the Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (VANOC) to support discussions between VANOC and its key partners and stakeholders on development and implementation of a greenhouse gas management program for the 2010 Olympic and Paralympic Winter Games (2010 Winter Games). It reviews pertinent information on climate change and greenhouse gas management within both national and international contexts, including:

- an explanation of carbon neutral and carbon offset concepts;
- a summary of the latest science and policy developments;
- a summary of the approach taken by other major events, including sporting events;
- an exploration of potential scope for a carbon neutral 2010 Winter Games;
- an initial, high-level projection of the greenhouse gas footprint of the 2010 Winter Games; and
- identification of a greenhouse gas management framework and potential opportunities for achieving a carbon neutral Games.

The David Suzuki Foundation was asked to prepare this Discussion Paper as a result of their knowledge on climate change, their offer to help deliver carbon neutral Games and their engagement with VANOC, its Government Partners and other Environmental Non-Government Organizations (ENGOS) on climate change issues. The David Suzuki Foundation conducted research and provided information about best practice and innovation on greenhouse gas management. VANOC provided the David Suzuki Foundation with information on planning to date as well as access to other relevant background materials, staff members and contacts at previous Olympic Organizing Committees.



## Executive Summary

Climate change is likely to be the defining environmental issue for this generation. The Vancouver 2010 Olympic and Paralympic Winter Games have the opportunity to meet growing public and stakeholder expectations around global warming by delivering a comprehensive climate change strategy that effectively manages the greenhouse gas emissions associated with the Games.

The scientific debate about whether climate change is happening is over. It is clear that there is an urgent need to act. Climate change has already been recognized at previous Winter Olympic Games as a significant threat to winter sports, and is likely to impact future Olympic Games even more. In Canada, public opinion polls consistently show that Canadians believe that climate change is a critical national issue with impacts that extend beyond the environment and include security, health and the economy as a whole. All sectors of Canadian society, from business leaders to athletes, are speaking out about the need to address climate change with decisive action.

Beginning with the Salt Lake 2002 Olympic Winter Games, and supported by developing Olympic policy and practice, greenhouse gas management for Olympic Games has come to be understood in the context of a ‘carbon neutral’ strategy. In practice this means measuring and reducing the greenhouse gas emissions associated with the Games, and then balancing remaining emissions with reductions elsewhere, known as ‘carbon offsets.’ The result is zero net greenhouse gas emissions.

VANOC has already undertaken initiatives to reduce emissions: emphasizing energy efficiency in venue construction, innovative demand-side power management for the Games, transportation planning that includes public transit, and strategies to reduce solid and liquid waste. However, there are major emission sources for the 2010 Winter Games like local transportation, energy consumption and air travel that cannot be avoided, only mitigated.

A credible carbon neutral strategy for VANOC would combine best practices in greenhouse gas management and reductions with the use of high quality carbon offsets for remaining emissions.

At present there are both regulated and unregulated markets for carbon offsets. Regulated trading within national and international emission reductions schemes exists under the ‘Clean Development Mechanism’ of the Kyoto Protocol, and within the European Union, Japan, and Australia. It is also being developed on a regional basis in the United States and Canada. Recently, British Columbia and Manitoba announced their plans to participate in the Western Regional Climate Action Initiative with six western U.S. states.

At the same time, a voluntary carbon market has developed. Any individual or organization may purchase carbon offsets from a growing number of vendors worldwide, use those offsets as part of a self-managed carbon neutral strategy, and demonstrate their support for action on climate change. Offset projects include renewable energy like wind farms, or energy

efficiency projects, which reduce the demand for energy from fossil fuels. Other offset project types include methane capture, planting trees, and low-till agriculture.

Because the voluntary carbon market is unregulated, and carbon offsets are an intangible good, quality is a primary concern. Investment in offset projects should create new emission reductions that would not otherwise have happened to ensure that overall reductions are achieved. Some other quality issues include: reliable quantification, double counting, and whether the offset project leads to a reduction in fossil fuel use – the primary cause of climate change. Offsets from tree planting projects involve extra risk and uncertainty related to quantification and lack of permanence, and may not be the best model for encouraging behaviour change around energy use. Quality concerns can be addressed by using high quality offsets such as those registered to The Gold Standard.

To undertake a carbon neutral program VANOC will require a comprehensive greenhouse gas management plan. Key elements of this plan would include:

- Determining emissions scope;
- Conducting a greenhouse gas emissions inventory;
- Engaging partners and sponsors;
- A policy for procuring carbon neutral or low carbon products and services;
- Reduction strategies;
- Procurement of renewable energy certificates and carbon offsets;
- Reporting requirements to ensure transparency; and
- A communications strategy with a strong public engagement component.

One of the primary goals of the greenhouse gas management plan will be to address the greenhouse gas footprint of the 2010 Winter Games. According to the approach outlined in this paper, VANOC's footprint would include all emissions sources that it controls directly (mainly related to operating venues and vehicles) as well as electricity use. It would also include some important indirect emissions sources, such as air travel emissions from athletes, sponsors, media and spectators. Through partner, sponsor and public engagement VANOC has the opportunity to reduce and mitigate these significant emissions.

The 2010 Winter Games will be one of the highest profile international events in the world, and with an effective climate change strategy the Games can significantly advance public understanding of global warming solutions. In the process, the Games will create legacies of improved public transportation, energy efficiency and renewable energy capacity, and galvanize collaborative action on climate change by athletes, sponsors, partners, employees, volunteers, and the general public.



## Introduction

**T**he Vancouver 2010 Olympic and Paralympic Winter Games (2010 Winter Games) have the opportunity to be one of the most climate friendly Games ever. While past Olympic and Paralympic Games have been applauded simply for taking on climate change initiatives, growing public awareness and desire for action mean that the Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (VANOC) will have more exacting performance expectations. This will require delivery of a comprehensive climate change strategy that effectively manages the greenhouse gas emissions associated with the 2010 Winter Games.

Everything points to climate change as the defining environmental issue for this generation. VANOC and its key partners and stakeholders have the opportunity to take action that makes a difference – locally, nationally and globally. With an expected three billion television viewers, no other winter sporting event in the world offers the same opportunity to raise the profile of an issue such as climate change and demonstrate solutions.

VANOC can deliver on its bid promise to “move towards a zero net emissions Games” by adopting a carbon neutral strategy – calculating greenhouse gas emissions associated with an organization’s activities, reducing those emissions wherever possible, and then purchasing high quality carbon offsets to mitigate remaining emissions. The benefits of an effective carbon neutral strategy for the 2010 Winter Games include improved environmental and economic performance, collaborative action by sponsors and the public, risk avoidance, and a legacy of sustainable energy initiatives and projects that will both set a standard for other major sporting events, and transform the communities where VANOC directs its activities.

This Discussion Paper describes the general context regarding climate change, explains carbon neutrality and carbon offsets, and proposes what a greenhouse gas management plan and carbon neutral strategy for VANOC could look like. It also explores how VANOC could work with Olympic and Paralympic partners<sup>1</sup>, sponsors, athletes and the public to implement this strategy. While direct reductions are a key part of any carbon neutral strategy, a discussion of specific initiatives undertaken by VANOC to reduce its greenhouse gas emissions is outside the scope of this paper. The Appendices of this document summarize environmental initiatives undertaken by previous Olympics and other large hallmark events, and briefly discuss current pricing and supply of carbon offsets.

## Scientific Certainty About Climate Change

The debate about whether climate change is happening is over. Scientists overwhelmingly agree we need to take immediate action to avert the most serious impacts of climate change. Greenhouse gases from activities such as electricity generation and transportation are accumulating in the atmosphere, creating a heat-trapping layer that is causing global warming.

The global atmospheric concentration of carbon dioxide – the most common greenhouse gas produced by human activity – has increased from a pre-industrial value of about 280 ppm (parts per million) in 1750 to 379 ppm in 2005<sup>2</sup> – an increase of about 35 per cent. The atmospheric concentration of carbon dioxide is higher now than it has been in the last 650,000 years, which is as far back as ice core data are currently available. Scientists say that to avoid catastrophic impacts of climate change during this century, developed countries including Canada will have to cut greenhouse gas emissions from today's levels by amounts variously estimated at between 50 per cent and 90 per cent.<sup>3</sup>

The impacts of climate change are already being seen around the world. The Intergovernmental Panel on Climate Change (IPCC) is the world's pre-eminent authority on climate change, and in 2007 it released its *Fourth Assessment Report*. The report concludes that the earth's rising temperatures are "unequivocal", and are almost certainly linked to human activities. For example, 11 of the last 12 years (1995–2006) are among the warmest on record; more intense and longer droughts have been observed; and arctic ice cover is shrinking in depth and extent.

## Impacts of Climate Change on Winter Sports

For Olympic and Paralympic Winter Games, one of the biggest challenges in the near future will be the decrease in snow cover and more variable winter temperatures as a result of climate change. The organizers of the 2006 Olympic and Paralympic Winter Games in Turin, Italy made climate change a major part of their environmental platform, recognizing that the very future of winter sports was at stake because of a possible lack of snow and cold temperatures.<sup>4</sup> In January 2007, the Organization for Economic Cooperation and Development (OECD) released a report showing that climate change is already threatening Europe's skiing industry. Many regions in the Alps had the warmest November on record in 2006 and numerous World Cup ski races were cancelled in November and December as a result.<sup>5</sup>

In 2007 the World Glacier Monitoring Service announced that mountain glaciers are shrinking three times faster than they were in the 1980s. Swiss glaciers have lost about a fifth of their surface area over the past 15 years and it is predicted that 70 per cent will have melted over the next 30 years. Many ski operators rely on glaciers for their livelihoods, and some are so desperate that they are wrapping entire glaciers in plastic foil sheets as large as football fields to keep them from melting.<sup>6</sup> It is expected that snowmaking costs will increase considerably as temperatures warm, and even artificial snow will not be viable if temperatures rise above a certain threshold.

## Canadian Public Opinion on Climate Change

Public support for action on climate change has been growing very rapidly in the past few years. Major tipping points along the way have included the devastation caused by Hurricane Katrina and, most recently, Al Gore's film, *An Inconvenient Truth*, which was seen in theatres by nearly a quarter of a million Canadians in 2006, not to mention subsequent



DVD sales and rentals. All of these events – combined with a backdrop of extreme and unusual weather that many Canadians have witnessed first hand – have led to a huge surge in public awareness of climate change. Nearly every day there is a front-page article in Canadian newspapers and magazines on climate change and the Kyoto Protocol. Even a recent edition of *Sports Illustrated* featured a cover story on “Sports and Climate Change”, ending with advice that it is “time for our teams and athletes to take the lead, galvanize attention and influence behavior.”<sup>77</sup>

All sectors of Canadian society are demonstrating an awareness of the need to address climate change. As a *Globe and Mail* story pointed out, “it is often difficult to separate the words of environmental groups and government ministers on climate change – and you can now throw some business leaders into that mix too.”<sup>78</sup> The business community was once uniformly opposed to any kind of regulations to deal with greenhouse gas emissions, but now some business leaders are publicly calling on the Canadian government for decisive action, including caps on emissions. And growing numbers of businesses are making their entire operations carbon neutral.

Public opinion polls have registered the increasing concern of the Canadian public. In January 2007, one of the largest public opinion surveys conducted in Canada on the environment found broad support for action on climate change. According to the pollsters, the rapid shift in attitude about environmental issues amounts to a “public opinion earthquake”. Specifically, 26 per cent of those polled cited the environment as the most critical issue facing the country, up from four per cent one year ago. Environment even superseded health care – the number-two issue at 18 per cent. The poll results showed that 83 per cent say climate change could potentially harm future generations, and that 78 per cent have witnessed events they believe are related to climate change.<sup>79</sup> Similar levels of concern were found by another recent poll by Angus Reid Strategies,<sup>80</sup> with global warming being seen as a serious threat by 73 per cent of Canadians.

## Some Projections for 2010

By 2010, it is likely that the political climate will have shifted in favour of increased action on climate change. Internationally, the Kyoto Protocol will be midway through the first commitment period (2008–2012), and the details of the second phase of the Kyoto Protocol, post-2012, will be in the process of negotiation. Individual countries – particularly in Europe – will likely have introduced further innovative measures to reduce their emissions. The 2006 midterm election in the United States created a shift in Congressional representation that is advocating action on climate change, and in January 2009 a new US president will be inaugurated. Almost all the front-runners in that election have shown an increased willingness to take action on global warming. Important developing countries such as China, India, Brazil, and South Africa may in the future take on additional obligations under Kyoto, although binding targets on emissions for these countries are unlikely before the third commitment period of the Kyoto Protocol.

In Canada, the House of Commons is debating various climate change plans for the country, and is also proposing \$200 million in funding for sustainable energy projects.



In British Columbia, the provincial government announced several climate change initiatives in the February 2007 Throne Speech, including goals to:

- Reduce greenhouse gas emissions by at least 33 per cent below current levels by 2020;
- Investigate practical options and actions for making the government of B.C. carbon neutral by 2010;
- Require all electricity produced in B.C. to have net zero greenhouse gas emissions by 2016, and 90 per cent of B.C.'s electricity to come from renewable sources;
- Introduce tailpipe emission standards for all new vehicles sold in B.C. between 2009 and 2016, reducing carbon dioxide emissions from autos by 30 per cent;
- Require 100 per cent carbon sequestration for any coal-fired electricity project;
- Extend the \$2,000 sales tax exemption on new hybrid vehicles;
- Require all new cars leased or purchased by the Province to be hybrids; and
- Work with the federal government to develop a system to register, trade, and purchase carbon offsets and credits.

In the run-up to 2010, it is likely that greenhouse gas management strategies will shift in their focus. The carbon market will continue to grow in prominence and size, and the use of carbon instruments (like offsets) will become more common as a way of mitigating greenhouse gas emissions.<sup>11</sup> However, criticism will likely be directed at organizations that choose to only purchase offsets rather than also acting to reduce their emissions. Similarly, as the carbon market matures, more emphasis will be placed on the *quality* of the offsets being used, and it will be much less acceptable to use offsets that do not meet the rigour of national or international standards, a trend that can already be seen in Europe.

What this means for the 2010 Winter Games is that there is likely to be extraordinary attention paid to its climate impact. Efforts and achievements with respect to greenhouse gas emissions will be watched carefully by the media and a public that is increasingly well-acquainted with climate change issues and solutions. As such, climate change must be a strong focal point in all sustainability and communications planning associated with the Games. The 2010 Winter Games will be judged in part on the success and integrity of its greenhouse gas management plan and how VANOC and its key partners and stakeholders respond to the challenge to demonstrate leadership and motivate athletes, spectators and the public.

## History of Olympic Policy on the Environment

Olympic policy on the environment has developed rapidly in little more than a decade. In 1992, two key events appear to have been catalysts. First, the Winter Olympic Games in Albertville, France provoked strong public criticism over the destruction of alpine habitat for venue and road construction. Second, the United Nations Earth Summit in Rio de Janeiro, Brazil made the environment a leading global issue. Following these events, the 1994 Winter Olympic Games in Lillehammer, Norway showcased innovative approaches to reduce environmental impact from venue development, transportation and energy use, garnering a reputation in the process as the first 'Green Games'.



The International Olympic Committee (IOC) took notice of the new ‘green’ agenda, and at the Centennial Olympic Congress in 1994, ‘environment’ became the third pillar of the Games (along with ‘sport’ and ‘culture’). The IOC also signed a co-operative Agreement with the United Nations Environment Programme (UNEP) in February 1994, in which the two parties agreed to undertake joint international actions to promote sustainable development. In 1999 the IOC adopted “Olympic Movement’s Agenda 21, Sport for Sustainable Development,” which includes an ‘environmental defense policy’ that covers all aspects of staging the Games.

In an effort to support conversion of policy goals into environmental performance by host cities, the IOC created the Sport and Environment Commission in 1995 to provide advice on the environmental aspects of all Olympic Games. As well, the Evaluation Commission for the Olympic Games bid process now includes an environmental expert, as does the Coordination Commission that supports cities that have been awarded the Games.<sup>12</sup> Since 2003, Olympic Host Cities must participate in the Olympic Games Impact (OGI) Project, which is carried out over a 12-year period leading up to and following the Games, and involves measuring and reporting on the social, economic and environmental impact of hosting an Olympic and Paralympic Games. Beijing, Vancouver and London are the first three host cities to take part. The aim of OGI is to help transfer knowledge to successive bid and host cities, and improve sustainable development outcomes of the Games.<sup>13</sup>

While climate change policies and greenhouse gas management plans have not yet been addressed in detail, the IOC *Guide on Sport, Environment and Sustainable Development*, from June 2006, states “sports activities should not emit toxic gases which destroy the ozone layer or greenhouse gases,” and promotes energy conservation and energy efficient modes of travel.<sup>14</sup>

For a history of GHG management programs implemented at previous Olympics, as well as other large sporting events and conferences, please see Appendix A.

## Managing Greenhouse Gases at the 2010 Winter Games

Vancouver’s bid for the 2010 Winter Games included a commitment in its 2003 submission to the IOC to ‘move towards a zero emissions Games’. Much has happened since that submission four years ago and a commitment to carbon neutrality is now considered a minimum performance requirement for a world event on the scale of the Olympic and Paralympic Games. To go beyond this minimum level, VANOC will need to focus on the substance of its commitment.

VANOC has already made efforts to reduce the greenhouse gas footprint that will be associated with the 2010 Winter Games. Some examples include promoting energy efficiency in buildings constructed and used for the Games, developing innovative demand-side management of power use during the Games, transportation planning that includes an emphasis on public transit, and strategies to minimize solid and liquid waste. Nearly all the planning related to these reduction efforts has taken place well in advance of the drafting of this paper, and will not be addressed here, except to note that further reduction opportunities may arise in the process of developing an inventory of GHG emissions. However, there are major

emission sources associated with the 2010 Winter Games, such as ground transportation of people and goods, energy consumption at events (including electricity, heating, snow making, and freezing ice rinks and sliding tracks), and air travel for participants and spectators. These emissions cannot be reduced or avoided – only mitigated – and are therefore the primary focus of this paper.

A credible carbon neutral strategy for VANOC consists of demonstrating best practices in reducing greenhouse gas emissions from all aspects of its activities and then acquiring high quality credits for emission reductions in appropriate projects elsewhere (carbon offsets). The result will be zero net emissions for the defined scope of the 2010 Winter Games. In undertaking such a strategy there is an opportunity for the 2010 Winter Games, as one of the most high-profile international events in the world, to significantly advance public understanding of global warming solutions, create legacies of improved public transportation, energy efficiency and renewable energy capacity, and galvanize action on climate change by Olympic partners, sponsors, workforce and spectators.

Before examining the nature of a greenhouse gas management plan for the 2010 Winter Games, it is important to understand the evolving carbon market, including carbon offsets.

## **Carbon Offsets for the 2010 Winter Games**

Carbon offsets can be an effective part of VANOC's overall plan to reduce the climate change impact of the 2010 Winter Games, as well as a key component in its public engagement strategy around climate change. However, not all carbon offsets are created equal, and it is important that any carbon offset program designed for the Games take this fact into account.

### **WHAT ARE CARBON OFFSETS?**

A “carbon offset” is a reduction in greenhouse gas emissions generated by one project that can be used to cancel out emissions from another source.<sup>15</sup> A purchaser of offsets is essentially paying another party to make reductions on their behalf. The reductions are quantified as ‘tonnes of CO<sub>2</sub> equivalent’ and sold to buyers who can either apply the offsets to current emissions, or ‘bank’ them for future use. Once the offset is used, it needs to be retired to ensure that the benefit of the reductions is only counted once.

Because offsets are an intangible commodity, and the offset purchaser is not involved in the activities that produce them, it is important that offsets be consistently quantified, verified by third parties, and tracked and retired through a public registry. Offset projects should also have the support of the communities and the stakeholders involved. Finally, in order to help solve the problem of global warming, carbon offsets should ideally address the root cause of our present global climate crisis – burning fossil fuels – by stimulating the development of sustainable energy sources and encouraging energy efficiency and innovation.

Many activities have the potential to generate carbon offsets. Renewable energy initiatives such as wind farms, or installations of solar, small hydro, geothermal, and biomass energy can all create carbon offsets by displacing fossil fuels. Energy efficiency projects can

also create offsets by conserving energy and reducing the need to burn fossil fuels. Some other offset project types include methane capture, planting trees, and low-till agriculture; these projects avoid the release of greenhouse gases or remove carbon dioxide from the atmosphere through photosynthesis.

#### INTERNATIONAL CARBON TRADING AND CARBON OFFSETS

Using market mechanisms to address pollution has worked effectively in the past – notably cap and trade regimes for sulfur dioxide emissions to reduce acid rain – but international carbon trading is relatively recent, first advanced under the Kyoto Protocol. Developed countries that have national emission reduction targets under Kyoto and have ratified Kyoto may, under certain conditions, invest in projects in developing countries that reduce greenhouse gas emissions and obtain credits for those reductions to count towards their own reduction targets. This is known as the “Clean Development Mechanism” (CDM), and the logic is that developed countries can help other countries bypass fossil fuel technology by developing sources of sustainable energy. Another Kyoto mechanism, known as “Joint Implementation” (JI), allows the development of projects in countries that have Kyoto targets.

Emissions trading is also being carried out within several jurisdictions around the world, and some of these schemes are linked to the trading under Kyoto. The European Union Emissions Trading Scheme (EU ETS), for example, is the largest trading system. The EU ETS regulates emissions from large point source emitters within the EU, and provides for trading of emissions allowances among these emitters. The Regional Greenhouse Gas Initiative (RGGI), comprised of New York and the New England states, plans to have emissions trading and offsets as part of a compulsory cap and trade system for energy generators. The California Climate Action Registry (CCAR), set up by the State of California, is a voluntary reporting initiative for companies and other organizations, such as municipalities, with plans for targets and trading in the future. Another voluntary registry and trading platform is the Chicago Climate Exchange (CCX), where members take part in a cap and trade regime, with allowances and offsets being traded on the CCX.

In Canada, uncertainty with respect to the development of the carbon market has to date slowed the growth of domestic offset projects, but to the extent that this uncertainty is resolved in the future there will likely be more options for offset purchases within Canada. For example, in 2006 the Chicago Climate Exchange announced a partnership with the Montreal Exchange to create the Montreal Climate Exchange (MCX), but the MCX is still waiting for appropriate government regulation.

#### THE VOLUNTARY MARKET

In addition to the Kyoto regime and other formal trading initiatives, an entirely voluntary or ‘retail’ carbon market has arisen, driven by demand for carbon offsets from individuals, businesses, and organizations desiring to reduce their carbon footprints and demonstrate support for action on climate change. In some cases they purchase enough carbon offsets to achieve zero net emissions and become carbon neutral. The voluntary market is expected to nearly quadruple in size in 2007 over 2006, with 75 megatonnes of carbon offsets being traded.<sup>16</sup>

Some of the offsets purchased on the voluntary market originate within the international initiatives described above, such as credits from the CDM, or allowances or credits from



the CCX. Many, however, are from offset projects outside these regimes and come from a variety of offset providers, including non-profit and for-profit organizations.

Another product that is sold almost exclusively in the voluntary market is Renewable Energy Certificates (RECs). Also known as 'green tags', RECs represent the environmental attributes associated with renewable electricity such as wind and solar. They are typically sold in kilowatt-hours or megawatt-hours. While RECs are not electricity *per se*, they have the same environmental effect as buying green electricity. By purchasing RECs, customers in effect support clean, renewable energy.

### HIGH QUALITY CARBON OFFSETS

The integrity of any carbon neutral initiative rests on the quality of the offsets used. For an organization to claim that it is carbon neutral, it must ensure that the offsets it purchases have resulted in real reductions in greenhouse gas emissions elsewhere that would not have happened in the absence of the offset investment.

Offset quality is a critical issue in both the voluntary and emerging regulatory offset markets. In the voluntary market, standards are being developed by a number of different organizations to ensure that participating vendors meet certain quality thresholds. The Gold Standard, discussed below, is an example of a strong voluntary standard that is becoming synonymous with high quality carbon neutral initiatives. However, many offsets on the voluntary market have not been registered to any standard, and the onus therefore falls on the purchaser to assess quality. Numerous media articles have documented the potential pitfalls of using offsets from projects that have not been carefully assessed.

Below is a list of the main quality criteria that need to be met in order to ensure high quality carbon offsets:

- **Additionality:** the emission reductions being counted as offsets should not be 'business as usual'. There are a number of ways to test for additionality. For example, the investment obtained from the sale of offsets should be a significant factor in making the reductions happen, and the emission reductions must be greater than those required under existing laws and regulations;
- **Reliable quantification of emission reductions:** this is important to ensure that the reductions have genuinely been achieved and are accurately quantified, and is best assured by using accredited third-party verifiers and accepted methodologies;
- **Registration:** there should be transparent, verifiable procedures in place to register and retire the offsets to ensure that they are only counted once;
- **Permanence:** it is important that the emission reductions be maintained over time. Energy efficiency and renewable energy projects, for example, result in avoided emissions that are not subject to reversal;
- **Mitigation of leakage:** it is important that offset projects prevent or take into account the shifting of emissions to another location as a result of their development; and
- **Positive impacts on the communities where the offsets are developed:** it is important to ensure that the projects are targeted to meet local needs and have stakeholder and community approval.

## THE GOLD STANDARD FOR CARBON OFFSETS

Faced with a largely unregulated and unstandardized marketplace, organizations like VANOC can ensure the integrity of their initiatives and minimize potential risk by selecting offsets based on the generally accepted criteria for high quality offsets noted above.

The Gold Standard is widely recognized to be the premier standard in the world for carbon offsets. It ensures that all of these criteria are met for offset projects. Purchasing offsets registered to The Gold Standard significantly reduces the due diligence and investigation required by an offset purchaser looking for high quality offsets.<sup>17</sup>

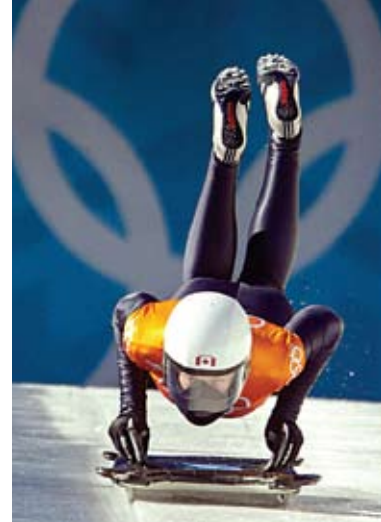
Investment in Gold Standard offset projects supports the transition to sustainable energy systems primarily in developing countries. The reductions must be from renewable energy and energy efficiency projects, such as wind power, solar power, and energy efficiency initiatives. Registration with The Gold Standard requires third-party verification according to recognized methodologies, additionality screening, and evaluation against sustainable development criteria to ensure that the projects create real benefits for the communities where they are developed.<sup>18</sup> Because of the potential for double counting, as discussed below, voluntary offset projects in Canada and other countries with Kyoto targets cannot currently be registered with The Gold Standard.

Some of the organizations that have purchased Gold Standard offsets include: the G-8 Summit, FIFA World Cup, the David Suzuki Foundation, the Pembina Institute, Environment Canada, the United Nations, as well as major corporations worldwide. The Organizing Committee for the London 2012 Olympic and Paralympic Summer Games has also stated that it will purchase Gold Standard offsets as part of its low carbon initiative.

## PARTICULAR QUALITY ISSUES WITH OFFSETS FROM TREE PLANTING

Because investment in tree planting projects has been used to offset all or a portion of the carbon footprint of several previous large-scale events, it is useful to discuss how to approach these offsets with respect to the 2010 Winter Games. Within the carbon market, offsets from planting trees have been subject to particular scrutiny. While there are other benefits associated with planting trees or restoring ecosystems – for example, biodiversity enhancement, food production, recreational advantages, and mitigation of soil erosion – relying on trees and forests to address the climate impact of burning fossil fuels is subject to significant risk. Some specific areas of concern are outlined below:

- **Quantification:** quantifying the climate benefit of planting trees is more difficult than for renewable energy and energy efficiency projects. The amount of carbon sequestered and stored in forests varies significantly and depends on the age, type and density of trees, as well as soil and other site conditions.<sup>19</sup>
- **Permanence:** trees and forests are vulnerable to logging, disease, and fire, all of which will cause a significant portion of their stored carbon to be released back into the atmosphere. The rock band Coldplay offset one of its albums by planting mango trees in India, but it has since been reported that many of the trees died, resulting in public relations issues for the band.<sup>20</sup> This example demonstrates that tree planting offsets are at best a temporary response, whereas carbon offsets from avoided fossil



fuel emissions (renewable energy projects) or reduced fossil fuel emissions (energy efficiency projects) are a permanent solution, because they prevent additional carbon stored in fossil fuels in geological reserves from entering the atmosphere. Furthermore, recent evidence suggests that global warming itself is stressing ecosystems around the world, including parts of Canada, and turning forests and forest soils into net sources of CO<sub>2</sub>.<sup>21</sup>

- **Reducing fossil fuel use:** planting trees to ‘neutralize’ emissions created by burning fossil fuels does not require individuals or organizations to reflect about the behaviours that contribute to global warming, nor do offsets from tree planting help to develop new sources of renewable energy or ways to use energy more efficiently – something that is urgently needed to address global warming. In the context of a carbon neutral strategy, where the goal is not only to balance emissions but also to educate and inspire broader action on global warming, using offsets from tree planting can help to perpetuate the idea that ‘business as usual’ can be maintained without consequences for the climate.

It should be noted that offsets from tree planting were excluded from the EU Emissions Trading System. They were included within the Kyoto Protocol’s CDM only after much debate, and as a ‘temporary’ credit that must be periodically renewed or replaced. Even on the voluntary market, offsets from tree planting are recognized as a particularly risky offset option, being avoided by leading businesses,<sup>22</sup> offset retailers<sup>23</sup> and standards organizations.<sup>24</sup>

#### THE PROBLEM OF DOUBLE-COUNTING EMISSION REDUCTIONS

One issue that is of particular concern with offsets is the potential for ‘double-counting’ of emission reductions. As a recent report by Tufts University pointed out:

A hypothetical extreme example would be an electricity provider who builds a wind farm and then sells their power at a premium as ‘green power’ to local customers but also sells their carbon credits and their Renewable Energy Credits (RECs), and uses the wind farm to qualify for Renewable Portfolio Standards. In addition, if the wind farm was located in a state or country that has a legislated cap on carbon emissions or needs to reduce its emissions under the Kyoto protocol, the wind farm would also count toward that state’s or country’s emissions reductions goal.<sup>25</sup>

In this example, the same emission reduction could potentially be counted six times (green power, carbon offsets, RECs, Renewable Portfolio Standards, state cap, Kyoto target).

Some of these forms of double counting can be addressed through the creation of registries and appropriate regulations. If provincial or national governments set up or join registries for reporting greenhouse gas emissions and reductions, and create strict rules for registering offsets and retiring them after they have been used once, the likelihood that a single offset is being sold twice can be minimized. Rules and regulations relating to RECs and renewable energy can also be designed to ensure that there is no double-counting. For offsets sourced from developing countries, the same safeguard can be provided by private registries if they





are governed by comparable rules and standards. An example of this is the Gold Standard registry, which ensures that all Gold Standard offsets are counted only once.

It is clear that with respect to offset projects within Canada there also needs to be linkages between provincial and national registries, and that municipal programs need to be part of the same system, so that offsets are not counted more than once in different jurisdictions. Currently, the provincial governments of British Columbia, Manitoba and Quebec have agreed to participate in a common registry – the Climate Registry, along with more than thirty American states. It is expected this registry will be operational in British Columbia sometime in 2008.

The double-counting problem related to Kyoto targets presents some particular challenges. To understand the problem, consider a wind farm project in Canada that sells its emission reductions as offsets to a private purchaser on the voluntary carbon market. The purchaser will count these offsets towards its own carbon neutral initiative. However, the reductions from the wind farm project will show up in Canada's national emissions inventory, as a reduction in the emissions associated with the generation of electricity, and Canada will count the same emission reductions achieved by the wind farm towards its national reduction target. At first glance, this may not seem problematic, as long as the emissions accounting by the private purchaser is entirely voluntary, and not required by regulation. However, in effect the private purchaser's investment is contributing towards Canada's existing Kyoto obligation, by replacing another set of emission reduction measures that Canada would have had to take. This effectively reduces the need for other organizations covered by national regulations to make reductions by that amount. The result is that instead of the private purchaser's investment generating further emission reductions within Canada, all it really accomplishes is what is already mandated by international law (Canada's national targets under the Kyoto Protocol).

There are ways to address this type of double-counting. One way is for countries with emission reduction obligations under Kyoto to transfer Kyoto emission allowances to offset projects that create reductions in the voluntary market in those countries. To date, this has not happened in Canada. Alternatively, purchasers could rely on projects whose emission reductions are not part of the national inventory.<sup>26</sup>

Relying on offsets sourced through a reputable registry is one way to address most double-counting issues, but it is nonetheless critical that offset purchasers be aware of these issues. Double-counting has a strong negative effect on the environmental integrity of offsets, and, by extension, on the overall credibility of any carbon neutral initiative. In the case of VANOC, all offsets purchased or obtained through other means, such as by donation, should be subject to careful scrutiny to ensure that any potential issues relating to double-counting are minimized.<sup>27</sup>

#### **EMERGING OPPORTUNITIES FOR CARBON OFFSETS IN BRITISH COLUMBIA**

There may be opportunities for VANOC to source some of its carbon offsets from within British Columbia, in light of the province's participation in the Western Regional Climate Action Initiative. British Columbia has joined with six western U.S. states to partner in this new initiative, which aims to "identify, evaluate and implement ways to collectively

reduce greenhouse gas emissions in the region and to achieve related co-benefits.” In addition to setting an overall regional goal to reduce emissions, participating governments have committed to develop market-based mechanisms to help achieve reductions, and to participate in a cross-border greenhouse gas (GHG) registry.

Details of any carbon offsets that may be available in British Columbia pursuant to this or similar initiatives have yet to be announced. Regulators in British Columbia have an excellent opportunity to learn from the lessons of the voluntary market and require strong standards to ensure offset integrity.

To the extent that VANOC is able to source carbon offsets from within British Columbia or Canada that meet the quality criteria identified above, such offsets would be a good regional complement to Gold Standard offsets from developing countries.

#### LOCAL AND INTERNATIONAL CARBON OFFSETS

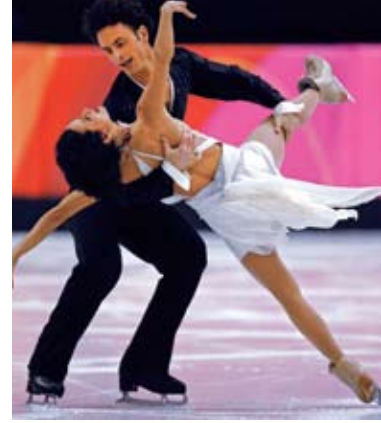
Purchasing carbon offsets from local and regional offset projects is an important opportunity for VANOC to help catalyze local innovation within Canada. Possible examples of local and regional offset projects include energy efficiency retrofits of public buildings like arenas and low-income housing, innovative heating/cooling solutions like geothermal transfer and waste heat recovery (particularly if associated with sports facilities), and developing renewable energy sources.

As well, in keeping with the spirit of internationalism that underlies the Olympics, it makes sense to purchase carbon offsets that would allow the 2010 Winter Games to have a positive impact in communities in less economically privileged parts of the world.<sup>28</sup> VANOC is already making a significant investment in technologies and building practices within Canada through venue construction. International offset projects, like those registered to The Gold Standard, can help communities in developing countries ‘leapfrog’ fossil fuel technologies and develop their economies using sustainable energy. It is also possible to commission offset projects specifically for the 2010 Winter Games.

As VANOC states in its 2005-06 Sustainability Report, “Sustainability means managing the social, economic and environmental impacts and opportunities of our Games to produce lasting benefits – both locally and globally.”<sup>29</sup> A combination of high quality carbon offsets sourced both local and globally would therefore be a powerful statement that global warming requires a broad-based approach, involving all countries of the world.

## Defining a Greenhouse Gas Inventory for the 2010 Winter Games

The first step in managing greenhouse gas emissions is to perform an emissions inventory. Because the greenhouse gas emission sources associated with the 2010 Winter Games are so varied, it is necessary for VANOC to determine what is known as its ‘operational boundary’ with respect to its emissions. This involves identifying emissions associated with the Games, categorizing them as direct or indirect, and choosing the scope of accounting and reporting. To provide guidance on this, the *Greenhouse Gas Protocol for Corporate Accounting* (“GHG Protocol”)<sup>30</sup> presents a logical approach to accounting for greenhouse gas emissions from a variety of emission sources. The



GHG Protocol was developed by the World Resources Institute and the World Business Council for Sustainable Development, and has become the *de facto* standard used by industry, NGOs and governments around the world to prepare greenhouse gas inventories.

The GHG Protocol covers the accounting and reporting of the six greenhouse gases included in the Kyoto Protocol. It also recognizes three broad categories of emission sources: Scope 1, Scope 2, and Scope 3. These are defined as:

- **Scope 1 – Direct GHG Emissions:** Includes emissions from the generation of electricity, heat or steam in company owned or controlled sources; physical or chemical processing; transportation of materials, products, waste, and employees in company-owned/controlled trucks, trains, ships, airplanes, buses, and cars; fugitive emissions – either intentionally or unintentionally released – for example, leaks from equipment joints; HFC emissions during the use of refrigeration and air conditioning equipment; and methane leakages from transport.
- **Scope 2 – Indirect GHG Emissions:** Includes emissions from purchased electricity.
- **Scope 3 – Indirect GHG Emissions (other):** Includes emissions that are a consequence of the activities of the organization, but occur from sources not owned or controlled by the organization. Examples of this include waste generation, outsourced activities (e.g. couriers and sub-contractors), and employee commuting to and from work.

In general, including all Scope 1 and Scope 2 emissions is considered to be the bare minimum for accounting and reporting purposes. Although Scope 3, as a whole, is an optional reporting category, there are often very good reasons to account for and offset major and relevant Scope 3 emissions – for example, if they are large relative to the organization’s Scope 1 and Scope 2 emissions, or if they are deemed to be critical by key stakeholders. As well, certain Scope 3 emissions may be crucial to an organization’s core business, and therefore should be accounted for.

An example of an organization taking responsibility for large Scope 3 emissions is DHL, a major transportation and logistics company. DHL included Scope 3 emissions in its inventory because it found that 98 per cent of its emissions in Sweden originated from the transport of goods via outsourced transportation firms. Similarly, IKEA decided to include Scope 3 emissions from customer vehicle travel to its stores when it became clear that these emissions were large relative to its Scope 1 and Scope 2 emissions.<sup>31</sup>

In the context of previous Winter Games, there is growing precedent for including Scope 3 emissions, including air travel, waste, and accommodations (Turin 2006) plus the Torch Relay and transportation not directly controlled by the Organizing Committee (Salt Lake City 2002).

#### WHICH GREENHOUSE GAS EMISSIONS SHOULD BE INCLUDED IN VANOC’S INVENTORY?

VANOC has already investigated the feasibility of expanding the ‘17 Day’ approach taken by the Salt Lake and Torino Winter Games into a ‘60 Day’ approach that would involve taking responsibility for emissions occurring between the opening of the Olympic Athletes’ Villages and the closing of the Paralympic Athletes’ Village, plus the Torch Relay that occurs during the 100 days prior to the Olympic Games Opening Ceremonies on February 12, 2010.

Although it would be convenient to use the ‘60 Day’ concept for deciding which emissions are ‘in’ or ‘out’, this approach – while advantageous from the point of view of the Games schedule – is limited, as it ignores Scope 1 and Scope 2 emissions that are clearly the result of the Games but that occur before or after the 60-day period – for example, electricity and heating of VANOC offices, and VANOC-controlled vehicles used by its employees. It also excludes significant Scope 3 emissions, including air travel by VANOC staff, the Olympic family, partners, and others.

Instead, VANOC could use a modified approach that is less focussed on time, and more consistent with operational boundary and scope as defined by the GHG Protocol. This approach would see VANOC take responsibility for all of its Scope 1 and 2 emissions, plus other relevant Scope 3 emissions, regardless of when they take place. This approach would facilitate GHG accounting by VANOC’s business units and functions, and would mean that VANOC’s GHG inventory would be developed in accordance with standard business practice.

Below is a summary of Scope 3 emissions associated with the Games grouped in two categories: ‘Operations’ and ‘Travel and Accommodation’. In many cases it is logical for VANOC itself to measure its Scope 3 emissions and take steps to offset them. In other cases it may make sense to promote a sense of shared responsibility for emissions by engaging other organizations, like sponsors and partners, and working with them to measure and offset their carbon footprints associated with the 2010 Games. Of course, if sponsors and partners choose not to offset all of their own emissions, VANOC can offset whatever remains.

#### SCOPE 3 OPERATIONS

- Torch relay (vehicles, train, air travel, and accommodation)
- Waste generation during the Games
- VANOC administration (paper use including reports and photocopying, but also tickets, brochures, etc.), employee business air travel, employee commuting
- Construction-related emissions from venues (cement, steel)
- Logistics shipping (the shipment of Games-related goods to and from warehouses by rail, air, and truck)
- Athletes and Team Officials shipping (of equipment, etc.)
- Contracted Services (e.g. food delivery during the Games)

#### SCOPE 3 TRAVEL AND ACCOMMODATION

- Athletes and Team Officials travel to and from Vancouver for Games
- Olympic family travel to and from Vancouver for Games
- Partner travel to and from Vancouver for Games
- Sponsor travel to and from Vancouver for Games
- Security travel to and from Vancouver for Games
- Media travel to and from Vancouver for Games
- Spectator travel to and from Vancouver for Games
- Local Accommodation for Olympic Partners during Games time
- Local Accommodation – Spectators, Media, Sponsors, VIPs, Security
- Media travel in non-VANOC vehicles during Games

- Sponsor travel in non-VANOC vehicles during Games
- VIP travel in non-VANOC vehicles during Games
- Security travel in their own vehicles (including helicopters, etc.)

#### THE CHALLENGE OF AIR TRAVEL

There are several reasons why VANOC should include an accounting of air travel associated with the 2010 Winter Games in its inventory. Air travel is extremely damaging to the climate<sup>32</sup> and is also one of the fastest growing source of emissions globally. The general public is beginning to understand the impacts of air travel on the climate, which is one of the major reasons that voluntary offsetting has grown so rapidly. Given the surge in public awareness surrounding climate change that has already occurred – and will continue to occur between now and 2010 – it is likely that air travel will be even more commonly recognized as a significant issue. It will therefore be difficult to ignore air travel in any offset plans related to the Games.

For the 2010 Games, significant air travel emissions will be associated with athletes and team officials, Olympic family, partners, sponsors, the media, and spectators travelling to Vancouver from around the world. There will also be business air travel by VANOC staff in the lead-up to the Games.<sup>33</sup> As a result, air travel is expected to be the largest projected emission source by far in staging the 2010 Winter Games, at roughly 226,000 tonnes according to the preliminary estimate referenced in this paper. Of this, spectator air travel accounts for approximately 160,000 tonnes. It should also be noted that, according to the Intergovernmental Panel on Climate Change (IPCC), the climate impact of air travel could be two to four times greater than the impact of CO<sub>2</sub> emissions alone.<sup>34</sup> While the emerging practice is to consider this upper atmospheric damage and this may be commonplace by 2010, at present the more general practice is to calculate only the CO<sub>2</sub> emissions.

Because of the size of this emissions source, it is difficult to rationalize how the Games can be considered carbon neutral if these emissions are not included within the scope of the GHG program. Although it has been suggested that most of the planes arriving in Vancouver during the Games period in 2010 would arrive anyway, and that few additional flights will likely result from the Games, this is not the accepted methodology used to account for emissions. If that were the case, then it could also be argued that electricity used by the Games could be excluded from its inventory because the electricity generation facilities were already constructed. The purpose of conducting an inventory is to identify the emissions resulting from an individual or organization's activities, even if they represent only a small share of emissions of the overall activity, as is the case when flying in a plane with other passengers.

The case of spectator air travel illustrates, as well, some practical reasons for VANOC to consider including this source in its scope. The sheer number of people flying independently to and from Vancouver makes it unlikely that all or even a majority of these emissions will be voluntarily offset – even if visitors were actively encouraged to offset their flights. It is therefore more effective for the organizers to aggregate these emissions and take responsibility for ensuring that they are offset.

There is ample precedent for including air travel in climate change offsetting programs. Examples include: the 2006 Winter Games; the World Summit on Sustainable Development



in 2002 (where the flights of 50,000 delegates were offset by the organizers); the World Economic Forum in 2006; and also FIFA World Cup 2006, where all spectator travel within Germany was included. By including all domestic and international air travel to and from the Games within its scope, VANOC would build on these past precedents. Including spectator air travel would also provide VANOC with an opportunity to communicate to the public just how significant an emission source air travel is, and to demonstrate that solutions are available.

## A Preliminary Estimate of GHG Emissions for the 2010 Winter Games

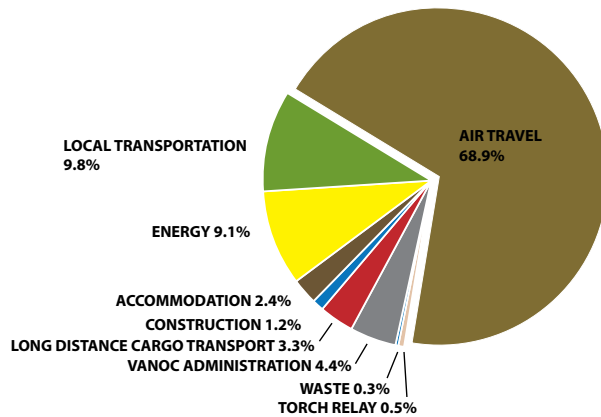
Below is a preliminary estimate of the emissions for the 2010 Winter Games. Please note that the calculations used to arrive at these figures are based on estimated figures obtained from VANOC. In cases where information from VANOC was not available, estimates are based on publicly available data. In some cases, no estimates were made because no data was available; these are labelled “no estimate”. It is also likely that as VANOC further develops its inventory, other relevant emission sources will be identified which are not included here. The David Suzuki Foundation has no ability to assess the accuracy of the data supplied by VANOC or other publicly available data and does not make any claims to have verified its accuracy. With respect to the estimates and assumptions, the David Suzuki Foundation has made reasonable efforts given the available time and data but accepts no responsibility for reliance on these estimates by any party, and it is understood that these estimates are for discussion purposes only.

### Preliminary Estimate of GHG Emissions for the 2010 Winter Games

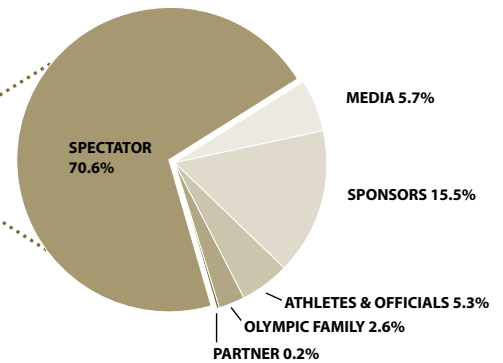
EMISSION SOURCE	SCOPE 1,2,3	ESTIMATED TONNES OF CO <sub>2</sub> e	CONFIDENCE INDEX <sup>35</sup>
<b>TORCH RELAY</b>		<b>1,505</b>	
VANOC Vehicles	1	700	high
Train Travel	3	160	high
Air Travel	3	100	medium
Torchbearer travel	3	450	low
Torch Relay staff accommodation	3	90	low
Olympic Torch fuel	1	5	medium
<b>ENERGY</b>		<b>29,900</b>	
All Venues – electricity	2	12,000	high
All Venues – non-electric space heating	1	13,000	medium
All Venues – back-up power	1	2,300	medium
Warehouses – non-electric space heating	1,3	1,000	low
Olympic Flame	1	1,600	low

EMISSION SOURCE	SCOPE 1,2,3	ESTIMATED TONNES OF CO <sub>2</sub> e	CONFIDENCE INDEX
<b>LOCAL TRANSPORTATION</b>		<b>32,300</b>	
VANOC fleet emissions	1	25,000	high
Logistics – VANOC transport	1	1,700	high
Logistics – additional transport	3	330	very low
Contracted services	3	5,000	very low
Media – own travel	3	230	very low
Sponsors – own travel	3	40	very low
<b>AIR TRAVEL TO AND FROM GAMES<sup>36</sup></b>		<b>226,500</b>	
Athletes and Team Officials travel	3	12,000	medium
Olympic Family travel	3	6,000	low
Partner travel	3	500	low
Spectator travel	3	160,000	medium
Media travel	3	13,000	medium
Sponsors travel	3	35,000	medium
<b>WASTE</b>		<b>1,100</b>	
Solid waste disposal	3	1,100	medium
<b>VANOC ADMINISTRATION</b>		<b>14,400</b>	
VANOC Energy (electricity, heating)	2,1	300	very low
VANOC Paper Use	3	3,500	medium
VANOC staff commute	3	2,600	medium
VANOC business air travel	3	8,000	medium
<b>LONG DISTANCE CARGO TRANSPORT</b>		<b>11,000</b>	
Logistics shipping	3	11,000	very low
Athletes and Team Officials shipping	3	no estimate	
Media shipping	3	no estimate	
Sponsors shipping	3	no estimate	
<b>CONSTRUCTION</b>		<b>4,000</b>	
Embodied emissions in venues	3	4,000	very low
<b>ACCOMMODATION</b>		<b>7,780</b>	
Olympic Family accommodation	3	200	medium
Partner accommodation	3	80	medium
Spectator accommodation	3	3,000	medium
Media accommodation	3	2,500	medium
Sponsor accommodation	3	2,000	medium
<b>MISCELLANEOUS</b>		<b>no estimate</b>	
Fugitive refrigerant emissions (e.g. HFC)	1	no estimate	
Test events	1,2,3	no estimate	
Cultural Olympiad	1,2,3	no estimate	
<b>TOTAL</b>		<b>328,485</b>	

**Estimate of Emissions by Sources for the 2010 Winter Games**



**Breakdown of Air Travel Emissions by Group**



The numbers from the preliminary estimate of emissions for the 2010 Winter Games appear to be similar to those from the 2006 Winter Games and the 2002 Winter Games, although emissions from the use of electricity and back-up generators will be much lower in Vancouver.<sup>37</sup> Overall emissions for the 2006 Winter Games (including Olympics and Paralympics), which did not include spectator air travel, were approximately 120,000 tonnes, and the 2002 Winter Games reported similar totals. However, it was acknowledged that if the emissions for the two-month period around the 2002 Winter Games had been included, the total would have been approximately 180,000 tonnes.<sup>38</sup>

Clearly the three largest sources of emissions are air travel, transportation at the Games, and energy use.



## Projected Costs of Carbon Offsets for the 2010 Winter Games

Below is a table with an estimate of the projected costs of offsetting all Scope 1, 2 and 3 emissions for which inventory estimates have been prepared. Estimates have not been prepared for sources with the entry 'no estimate'.

### Projected Costs of Carbon Offsets for the 2010 Winter Games

GHG EMISSION SOURCE	GHG EMISSIONS SUBTOTAL (TONNES CO <sub>2</sub> e)	GHG EMISSIONS TOTAL (TONNES CO <sub>2</sub> e)	ESTIMATED COST AT \$15/TONNE <sup>39</sup>
<b>SCOPE 1</b>		45,605	684,075
• Transportation	27,400		
• Fuel use for heating, auxiliary power, Olympic Flame, Olympic torch	18,205		
<b>SCOPE 2</b>			
• Electricity – offices, venues, villages	12,000	12,000	300,000
<b>SCOPE 3 – OPERATIONS</b>		35,530	532,950
• VANOC administration (paper use, business travel, commuting)	14,100		
• Construction-related emissions (cement and steel)	4,000		
• Logistics shipping (shipment to/from warehouses by rail, air and truck)	11,330		
• Athletes and Team Officials shipping	no estimate		
• Contracted services (e.g. food delivery during the Games)	5,000		
• Waste generation	1,100		
<b>SCOPE 3 – TRAVEL AND ACCOMMODATION</b>		235,350	3,530,250
• Olympic athletes/officials travel	12,000		
• Olympic Family travel	6,000		
• Torch Relay train travel, air travel and accommodation	800		
• Partner travel to and from Vancouver	500		
• Sponsor travel to and from Vancouver	35,000		
• Security travel to and from Vancouver	no estimate		
• Media travel to and from Vancouver	13,000		
• Spectator travel to and from Vancouver	160,000		
• Sponsor and media travel in non-VANOC vehicles	270		
• VIP travel in non-VANOC vehicles	no estimate		
• Security travel in non-VANOC vehicles	no estimate		
• Accommodation – Olympic Family	200		
• Accommodation – Partners	80		
• Accommodation – Spectators, Media, Sponsors	7,500		
<b>GRAND TOTAL FOR ALL EMISSIONS SOURCES CALCULATED</b>		<b>\$328,485</b>	<b>\$4,927,275</b>



## Proposed Financing Mechanisms for Carbon Offsets for the 2010 Winter Games

Below are some options for innovative financing of offsets and renewable energy certificates. It is important to note that all offsets used by VANOC, whether purchased or donated (e.g. from corporations, government or the general public), should be subject to the same quality criteria discussed earlier in this paper, so that the integrity of VANOC's carbon neutral initiative is not weakened.

- 1. Financing of carbon offsets by the 2010 Winter Games** – While it is acknowledged that there are budgetary constraints limiting this option, nonetheless there are some opportunities for the 2010 Winter Games to directly address the cost of offsets. A small charge could be added to each admission ticket, for example, or an environmental 'levy' could be added to Olympic merchandise. Alternatively, a special Olympic souvenir could be developed to focus attention on climate change, such as a polar bear toy, and revenues could be used to finance offsets.
- 2. Olympic partner donation of offsets from federally- or provincially-financed projects that develop renewable energy and energy efficiency capacity in British Columbia and Canada** – The 2010 Winter Games would provide an opportunity to showcase these offset projects to both Canadians and international visitors and to potentially stimulate further investment in similar offset projects. Involvement of municipal partners might assist in the strategic development of these projects. In the case of the 2006 Torino Winter Games, the largest portion of carbon offsets was obtained from the Region of Piedmont, which undertook the financing of renewable energy and energy efficiency projects, and allocated a portion of the reduction credits that were generated to the Games.
- 3. Offset donations or contributions towards the purchase of offsets from Olympic sponsors** – There are any number of ways that this could be done, ranging from straightforward financial contributions or offset donations to more innovative strategies. An airline sponsor, for example, could offer to help offset spectator flights. Other sponsors could offer special versions of standard products and donate a portion of the profits towards offsets for the Games. The 2002 Salt Lake Winter Games provide an example of obtaining corporate donations of offsets – more than 200,000 tonnes of offsets were obtained from corporations and retired on behalf of the Games. The offsets were retired with the Clean Air Conservancy and were considered to be charitable donations for tax purposes in the United States.
- 4. Public donations for offsets** – Beginning well in advance of the Games (and continuing throughout the Games), it is possible to promote the carbon neutral initiative, create public awareness and encourage the public to purchase offsets on behalf of the Games through an interactive website and related public outreach. It may be possible to structure this so that contributions are considered to be charitable donations (this can be coordinated with the sponsor donations of offsets discussed

above). While the number of offsets contributed is likely to be modest, the educational impact of such an initiative should not be underestimated. The public outreach could be supported by athletes and sponsors, and could also encourage the public to learn about and reduce their own emissions sources. Outreach activities could also showcase the emission reduction success stories of the 2010 Winter Games, and could tie in with related public education campaigns by Olympic partners.

5. **Reductions and other alternatives to offsets to manage GHG emissions** – Every time the 2010 Winter Games reduces its emissions, it reduces the amount of offsets that need to be obtained. For example, if carbon neutral paper were used, this would significantly reduce the emissions associated with paper use (estimated at around 3,500 tonnes).
6. **Using Renewable Energy Certificates to mitigate emissions associated with electricity use** – The 2010 Winter Games could obtain Renewable Energy Certificates to mitigate its electricity use (estimated to be around 12,000 tonnes) from sponsors that are providers of these products.

## Summary of a GHG Management Program for the 2010 Winter Games

For VANOC to meet its greenhouse gas commitments on a time-efficient, cost-effective basis, it will need to create and implement an appropriate GHG Management Program.

The main elements of this program would include:

### 1. PROGRAM PLANNING AND DESIGN

- A policy statement and overall greenhouse gas management program should be created, and approval obtained within VANOC at the executive level. Outside stakeholders should be also consulted. To generate internal support for (and awareness of) the GHG management program, it would be useful at this stage to make a commitment to make the business travel of the VANOC CEO carbon neutral, for example. This could also be an effective way to communicate VANOC's carbon neutral strategy to partners and sponsors, and to begin to build public awareness of VANOC's greenhouse gas management program. Over time this commitment could be broadened to include all executive business travel, etc.
- A GHG Team should be assembled, including GHG consultants if necessary.
- Roles and responsibilities of participants (VANOC, partners, sponsors, etc.) should be established.
- An offset and REC strategy should be established to ensure that all offsets conform to basic quality principles, including third party verification, additionality, and the absence of double counting (see "Carbon Offsets for the 2010 Winter Games" section above for more details). These requirements should apply regardless of whether the RECs and/or offsets are purchased or secured through corporate donations.



- A funding strategy should be developed. See section above, “Financing the GHG Management Program”, for more details.
- An implementation plan should be developed, including: tasks and timeframe required to implement the GHG program; relevant information management systems; required training for the GHG team members (if necessary); resources (financial and time) required to fulfill the action plan; activities targeted for sponsors and partners.
- A communications plan should be created that includes the following audiences: athletes, VANOC staff, Olympic family, partners, sponsors, volunteers, and the general public.
- If VANOC wishes to participate in a voluntary GHG program, then it will be important to take into account the requirements of the program when VANOC designs its own management program.

## 2. PARTNER AND SPONSOR ENGAGEMENT

- One of the most important elements of VANOC’s GHG management program concerns partners and sponsors as this is where VANOC has the opportunity to leverage its efforts and multiply the benefits. These groups should be approached as soon as possible. Below are some options for engaging each of these key groups.

### *i. Engagement of Olympic partners*

- The Province of British Columbia has already expressed interest in making its own carbon neutral commitment for 2010, and Vancouver and Whistler may be interested in following suit and tying in public engagement initiatives to the 2010 Winter Games.
- Similarly, First Nations partners may be interested in participating in the carbon neutral initiatives.
- It is likely there will be opportunities to cooperate with the federal government to promote solutions to global warming. The National Research Council work on refrigeration systems for sports facilities is one example.

### *ii. Sponsor and Supplier Engagement*

- Financial support from sponsors can be sought for the GHG management/offset program. One major sponsor could be targeted, or, alternatively, a number of sponsors could be solicited (for example, with tiered “Gold, Silver, Bronze” recognition program for relative financial contributions). Sponsorship could provide funding, for example, for the purchase of offsets or Renewable Energy Certificates (RECs), or for the multi-media communications campaign. In-kind goods and services could also be provided.
- Whether they make a specific financial contribution to the GHG management program or not, sponsors and suppliers could be approached and encouraged to go carbon neutral themselves, and these commitments could be publicized along with VANOC’s. The David Suzuki Foundation, for example, is working with businesses that wish to go carbon neutral, and could be of assistance with this initiative.

- Sponsors could also undertake other Games-times initiatives that directly or indirectly support VANOC's GHG Management Program. For example, an air travel sponsor could undertake an offset program for spectators traveling to the Games.

### 3. IMPLEMENT POLICIES FOR PROCUREMENT OF CARBON NEUTRAL/LOW CARBON PRODUCTS AND SERVICES

- Carbon neutral/low carbon guidelines could be incorporated into VANOC procurement policy. Examples of carbon neutral/low carbon products and services include: carpeting, certain taxi/courier services, and 100 per cent recycled paper. Using these products and services will help lower the emissions that result from the Games, and, in some cases, will reduce the expense associated with purchasing RECs and offsets.

### 4. CREATE A GREENHOUSE GAS EMISSIONS INVENTORY

- Quantification procedures and methodologies should be chosen. For example, since VANOC is preparing sustainability reports using the Global Reporting Initiative (GRI), it should consider using the Greenhouse Gas Protocol.
- The operational boundary should be established – i.e. which emission sources will be included in the inventory.
- A baseline or 'business as usual' inventory could possibly be established so that actual emissions could be compared to the baseline to identify benefits from the reduction strategies applied.
- A GHG Management Handbook should be assembled. This will act as a guide to GHG management systems and ensure consistency in the inventory processes.
- An information management system should be created, which will help VANOC to effectively coordinate its GHG management program.
- Inventory quality should be managed to ensure credibility of VANOC's GHG management program. Checks should be performed at regular intervals throughout the process to ensure data quality.
- The emissions inventory should be verified, ideally by an experienced third party. Verification is an objective assessment of the accuracy and completeness of reported GHG information, and the information should adhere to pre-established GHG accounting and reporting principles, standards/protocols, programs, and other requirements.

### 5. SET TARGETS AND IMPLEMENT REDUCTION STRATEGIES

- Because the 2010 Winter Games are a one-time event, setting appropriate reduction targets and quantifying reductions could be challenging – for example with respect to venues. However, setting targets can be a valuable way to monitor and encourage performance. Even though VANOC is relatively advanced in the process of venue construction, and constrained in various ways regarding transportation and the use of alternative fuels, there are still decisions to be made in the future that will affect overall GHG emissions.
- Test events planned for 2008 and 2009 can also be used to set approximate baselines, and find ways to reduce emissions for the actual events in 2010.



- Targets can be also be established with respect to how VANOC ‘neutralizes’ its overall GHG emissions. For example, 100 per cent green electricity through renewable energy certificates (RECs), and using RECs to entirely offset the emissions from back-up generators used during the Games is a realistic target for VANOC.

#### 6. PROCURE RENEWABLE ENERGY CERTIFICATES (RECS) AND CARBON OFFSETS

- Once the GHG inventory is completed, all emissions within the organizational boundary will need to be balanced with RECs and carbon offsets. The emerging customary practice is to first use RECs to ‘green’ electricity use, and then neutralize remaining emissions with carbon offsets.
- The RECs and offsets that are chosen should conform to the established offset and REC strategy, discussed above.
- Typically RECs and offsets are obtained at the end of a business cycle or fiscal year, or after the inventory is complete. However, due to the large volumes required for the Games, it would be advisable for VANOC to begin the procurement activities prior to the completion of the final emissions inventory.

#### 7. DEVELOP REPORTING PROCEDURES

- Generally, how information is reported by VANOC depends on the objectives of the program, the needs of intended users (e.g. stakeholders), and any voluntary programs that VANOC participates in. It also depends on the standards VANOC chooses to meet – for example, the ISO 14064-1 standard has very specific requirements with regards to reporting, and the GHG Protocol for Corporate Accounting also sets out reporting requirements.
- In VANOC’s case the GHG management report would likely include information about its emissions inventory, reductions achieved, carbon offsets and RECs procured, verification, and an outline of its policy for procuring carbon neutral/low carbon products and services.
- Ideally, VANOC will integrate GHG reporting with its existing reporting tools and processes and take advantage of any relevant data already collected and reported by business units within VANOC.

#### 8. CREATE A COMMUNICATIONS AND PUBLIC OUTREACH STRATEGY

- The communications and public outreach strategy could include the following:
  - **General Public** – During the lead-up to the Games, VANOC could carry out a communications campaign directed at the general public outlining the successes of VANOC’s emission reduction strategies, detailing its offset plans and likely offset projects, and soliciting public support in the form of donations for offsets. An example of a similar communications campaign, on a smaller scale, was prepared for a major triathlon in the United States. The one-minute spot effectively highlights the carbon neutrality of the event, describing how and why the event was made carbon neutral, and

who sponsored the initiative. The ad can be viewed on the David Suzuki Foundation website at: [www.davidsuzuki.org/Climate\\_Change/05\\_DL.asp](http://www.davidsuzuki.org/Climate_Change/05_DL.asp). The VANOC campaign could feature an interactive website where the public could retire offsets on behalf of VANOC. The website could also include calculators for individuals to determine their own emissions and the option to purchase offsets for themselves. Any emissions not offset by the public could be offset by VANOC.

- **A carbon neutral Torch Relay** – Emissions associated with the Torch Relay can be inventoried and offset, and this can be highlighted in VANOC’s public communications campaign. In addition, local events in support of the Torch Relay can also be encouraged to go carbon neutral. A small package of information can be distributed to local event organizers that would allow them to do some basic calculations and estimate their emissions, and they could be directed to purchase offsets through the VANOC website.
- **Volunteer engagement** – During training for the Games, volunteers could be provided with education about VANOC’s carbon neutral initiative and any actions they can take as volunteers (e.g. using public transit) that will contribute to reducing the overall emissions associated with the Games. They can also be directed to VANOC’s website for offset donations and personal GHG calculators.
- **An outreach program for schools** that will educate students about climate change, and offer solutions (e.g. going carbon neutral) to be implemented by individuals, classrooms and schools. There are already a number of programs in Canada dealing with climate change in schools,<sup>40</sup> and this program could plug into existing programs, adding some Olympic content and the participation of well-known Olympic athletes.
- **A challenge to local and international media** to offset their emissions from transportation to and from the Games, and to create some feature clips and news items about sustainable energy use and carbon offsets at the 2010 Winter Games.
- **Working with athletes and athletic federations and associations** across Canada to promote GHG awareness and energy conservation. This could be coordinated with the athlete participation in the general communications campaign. The David Suzuki Foundation has already launched a carbon neutral campaign with prominent winter athletes called “Play It Cool” and this campaign could be a model for an Olympic campaign. See [www.davidsuzuki.org/Climate\\_Change/play\\_it\\_cool.asp](http://www.davidsuzuki.org/Climate_Change/play_it_cool.asp).



## Conclusion

The 2010 Winter Games present both challenges and opportunities in terms of climate change. This paper has discussed how VANOC can meet the challenge of hosting a carbon neutral Olympics, including an innovative financing strategy that takes into consideration the limitations that have been set for public funding of the Games.

The carbon neutral goal for the 2010 Winter Games also presents an opportunity to broaden understanding of climate change solutions by reaching out to athletes, spectators, sponsors, schools, the media, communities and businesses, and inspiring them to take action. Specifically, the communications campaign would not only inform the world how the 2010 Winter Games were made carbon neutral, but could also motivate others to take action to reduce their greenhouse gas emissions and go carbon neutral.

Finally, this carbon neutral strategy proposes the use of high-quality offsets from renewable energy and energy efficiency projects that are seen by many observers as the most effective way to address climate change. Through sponsor and public participation, funding can be raised to purchase high-quality offsets.

For generations, the Olympics have inspired athletes to strive for excellence. Right now, climate change is very likely the single greatest challenge the world faces, and the decisions we make in the next few years will determine the extent to which future generations will be affected. At this pivotal time, the 2010 Winter Games can provide inspiration for Canadians and the world by playing a part in meeting the challenge.



## APPENDIX A

### History of GHG Management Programs at Previous Olympics and Other Large Sporting Events and Conferences

EVENTS	NOTABLE ACHIEVEMENTS	LESSONS LEARNED
<b>1994 Lillehammer Winter Games, Norway</b>	Often referred to as the first 'green' Games, Lillehammer used natural materials in construction wherever possible, promoted energy conservation in heating and cooling systems, emphasized mass transit, and set up a recycling program. New arenas were designed to be in harmony with the surrounding landscape.	Lillehammer became a model for cooperating with local stakeholders on environmental issues. They showed that environmental concerns and initiatives could be integrated into the staging of the Games by developing an environmental plan with specific objectives and standards.
<b>1996 Atlanta Summer Games, USA</b>	Atlanta faltered on the delivery of its environmental initiatives. For example, Atlanta's state-of-the-art recycling facility was not used during the Games because organizers failed to obtain the proper licenses. Hundreds of alternative fuel buses were procured, but untrained drivers struggled with Atlanta's sprawling freeway system, stranding fans that missed events. The Atlanta Games were also criticized for building facilities with no ongoing utility, and for the lack of environmental responsibility shown by sponsors.	In hindsight, it would appear that one reason for Atlanta's mediocre performance was its failure to integrate environmental planning into development, operations and sponsor relations, leading to delivery problems on key environmental initiatives. However, it should be noted that the IOC did not require environmental criteria at the time of Atlanta's successful bid.
<b>1998 Nagano Winter Games, Japan</b>	Nagano organizers made efforts to locate new venues away from sensitive ecosystems, and to use existing venues where possible. Advances were also made in the use of recyclable materials for cutlery and dishes, low-emission transportation, and innovative construction.	Nagano demonstrated the potential for the Games to use procurement policies to promote environmentally friendly goods, and showed that low emission public transportation was achievable. Nagano worked to increase public consultation about the environmental effects of staging the Games.
<b>2000 Sydney Summer Games, Australia</b>	The Sydney Games were the first to fully integrate environmental issues into the planning at the bid stage, and to consider greenhouse gas management. The Sydney Organizing Committee (SOCOG) not only worked with Greenpeace and other environmental organizations; but they also worked to engage sponsors and other corporate interests in environmental initiatives. Recognizing the importance of global warming, SOCOG signed a "Greenhouse Challenge Agreement" with the Australian Federal Government. This initiative was a voluntary program that encouraged businesses to work with the Australian Department of Environment to reduce their emissions associated with energy use. SOCOG also worked on reducing greenhouse gas emissions associated with transport (use of private vehicles was banned), and by designing their ticketing system so that each ticket to an Olympic event came with a pass to travel free on Olympic transport routes for the day of the event.	While SOCOG does not appear to have fully integrated greenhouse gas management into its planning, it did make efforts to produce a greenhouse gas inventory, and it was the first Olympics to attempt to influence its corporate sponsors to make commitments related to greenhouse gas reductions. Full compliance from sponsors was not achieved, however, particularly with respect to the use of HFCs. Nonetheless, through the construction and development of energy efficient facilities, renewable energy sources, and public transportation, SOCOG demonstrated that an Olympic Games could leave a lasting legacy of ongoing greenhouse gas reductions. Sydney also demonstrated that an organizing committee could take part in a federal government program like the Greenhouse Challenge, and show leadership in the business community.
<b>2002 Salt Lake Winter Games, USA</b>	Despite facing severe budget constraints, the Salt Lake Organizing Committee (SLOC) environmental team made important advances, formulating an Environmental Policy that applied to all employees, venues, operations, contractors, and suppliers of goods and services. SLOC was particularly innovative with respect to climate change	Salt Lake demonstrated that 'zero net emissions' was a realistic goal for an Olympic Games, relying on the combined support of corporate sponsors, stakeholders and an engaged public. Salt Lake also established that a creative approach to obtaining carbon offsets (in its case, corporate donations) could produce results where budgetary resources were limited. On the other hand, Salt

APPENDIX A. Continued		
EVENTS	NOTABLE ACHIEVEMENTS	LESSONS LEARNED
<b>2002 Salt Lake Winter Games, USA, continued</b>	initiatives, being the first Olympic organizer to set, and reach, the goal of 'zero net emissions'. SLOC worked closely with NGOs and sponsors to produce public education and engagement programs. SLOC estimated the greenhouse gas emissions from venue construction, test events held prior to the Games, the Torch Relay, the Games themselves, the Paralympic Games and auxiliary activities of SLOC such as office energy use. The estimates also took into account energy used for temporary generators, heating of tents, and increases in regional traffic.	Lake also showed the desirability of integrating the GHG management into the earliest planning stage possible, to flag important sources of emissions like transportation, and to avoid last-minute substitutions of resources (like SUVs for buses) at Games-time that can cause significant increases in GHGs.
<b>2004 Athens Summer Games, Greece</b>	Although the Athens Games did undertake certain environmental initiatives related to energy conservation and improvements to the public transportation system, they did not have a climate change initiative per se. The Athens Games were criticized by environmental organizations like Greenpeace and WWF, and even the United Nations Environment Programme was not enthusiastic about the environmental achievements of Athens. With respect to energy use, Athens did not use any renewable sources of energy in its Olympic Village, a location where innovation is typically showcased.	Athens illustrates that while the IOC Guidelines encourage environmental initiatives, the onus for undertaking such initiatives lies with the host city and organizing committee. In Athens, most public attention was focused on the drama of the last-minute completion of the venues and the associated cost overruns.
<b>2006 Turin Winter Games, Italy</b>	Climate protection was a major theme of the Turin Olympics, with the recognition that climate change, and less snow, represents a real threat to the Winter Games. TOROC created the HECTOR (Heritage Climate TORino) programme, with the goals of making the Olympic and Paralympic Games climate neutral through carbon offsets and raising awareness about climate change issues. HECTOR was self-financing, but it had strong support from regional and local governments. In addition to the HECTOR program, TOROC used a coordinated environmental management system (certified under ISO 14001) to undertake various environmental programs including reductions in the greenhouse gas emissions produced by the Games.	While TOROC received some criticism for its energy consumption during the Game with respect to snow-making, and the fossil fuel used in the Olympic cauldron, in the final analysis it appears that the climate change initiatives undertaken by TOROC were largely successful, with significant support from local and regional governments. Although TOROC used a coordinated environmental management system, it is not clear to what extent climate change indicators were part of this system. Similarly, the detailed greenhouse gas inventory carried out for HECTOR has not been made widely available, which is problematic in terms of transparency.
<b>2008 Beijing Summer Games, China</b>	Beijing has placed a strong focus on reducing the city's significant air pollution. The Beijing Organizing Committee for the Olympic Games has stated that it will be a zero net emissions Games (without specifying the emissions sources to be counted) and that it will purchase carbon offsets from programs within China and internationally. A public engagement strategy around the carbon neutral aspects of the Games is also being planned.	China's long experience with public engagement campaigns in various sectors means that the public engagement efforts associated with the Olympics could well be highly effective in terms of participation and outcome. A powerful demonstration of public support for Beijing's environmental initiatives will create further expectations for succeeding Olympics.
<b>2012 London Summer Games, UK</b>	The sustainability theme of the London Games is the 'One Planet Olympics', one component of which is the 'low carbon' program. The low-carbon program has three parts:  (1) Low-carbon transport and energy efficiency	Organizers have already indicated that they would like to use carbon offsets to make a positive impact in a less developed country that will likely never have a chance of hosting the Olympic Games. The London Organizing Committee for the Olympic Games is presently contemplating Gold Standard offsets from clean energy projects

APPENDIX A. Continued		
EVENTS	NOTABLE ACHIEVEMENTS	LESSONS LEARNED
<b>2012 London Summer Games, UK, continued</b>	<p>(2) Renewable energy – the goal is to have 20 per cent of the energy used by Olympic Park met by local renewable energy sources</p> <p>(3) Carbon offsets, which will be purchased to compensate for all athlete, official and Olympic family travel to and from Games, and IOC travel leading up to the Games.</p>	<p>as a lasting legacy, and they indicated at the bidding stage that offsets would be either Gold Standard or certified under the Clean Development Mechanism of the Kyoto Protocol. LOCOG has also set GHG reduction targets for its new construction, measuring its performance against 2005 standards.</p>
<b>2006 FIFA World Cup, Germany</b>	<p>The most recent World Cup in Germany was the first climate neutral World Cup. As part of its climate plan, called “Green Goal,” the organizers reduced energy use at all 12 World Cup stadiums through optimized light management, more efficient energy production, heat recovery and other electricity- and heat-saving measures. Sponsors such as Coca Cola actively supported Green Goal objectives with their own activities and participated financially in climate protection activities. Spectator air travel within Germany was offset – an important precedent in taking responsibility for the overall emissions of the event. Offsets used for the event not only met the requirements of the Kyoto Protocol’s Clean Development Mechanism (CDM), but they also met The Gold Standard – the most rigorous standard for carbon offsets in the voluntary market.</p>	<p>The 2006 World Cup provides an excellent model for how to offset the climate impact of a large sporting event. The organizers solicited input from NGOs and received funding from sponsors. Aggressive emissions reduction targets were set. The scope included emission sources that are significant but often ignored, such as the construction of venues and the air travel of spectators. Gold Standard offsets were used exclusively. As the organizers pointed out, “the high standards (“Gold Standard”) of the projects are the most important factor in voluntary climate compensation, and they represent both a model and a challenge for future large sporting events.”</p>
<b>2002 World Summit on Sustainable Development (WSSD), South Africa</b>	<p>Over 50,000 government, NGO and business delegates attended the event, and it was estimated that the air travel, ground transport, and energy use at the venues was 500,000 tonnes. Organizers set up a Johannesburg Climate Legacy (JCL) Trust Fund. Offset projects were based primarily in South Africa. Verification of the footprint of the event and certification that the offset projects achieved their goals was carried out by KPMG. JCL estimated a budget of \$5 million for the carbon neutral initiative: 80 per cent of the funds for carbon offset projects; 20 per cent for managing the project, the emissions inventory itself, and marketing efforts. The budget was raised from three key sources: corporate funders (in Gold, Silver, and Bronze levels), overseas development agencies and other governmental institutions, and individuals.</p>	<p>As one of the first large events to offset its emissions, WSSD was innovative in many ways. By budgeting \$5 million for the carbon neutral initiative, the organizers ensured that the event would be carbon neutral and that funding would be available to “tell the story” to the public. To ensure the environmental and social integrity of Legacy offset projects, JCL was governed by a multi-stakeholder body comprising business, NGOs, government, labour organisations and renewable energy experts. The organizers hired third parties to verify both the event’s footprint and the offset projects. Sponsors were solicited via a tiered recognition program (Gold, Silver, Bronze), and their contributions were structured to be tax-deductible. Delegates were also involved in the offsetting project, as were citizens from around the world.</p>
<b>2007 Super Bowl, USA</b>	<p>The NFL has had a ‘green’ Super Bowl for the past 14 years, recycling souvenirs and donating surplus meals to food banks. But in 2007 the NFL offset the Super Bowl’s greenhouse gas emissions from electricity with renewable energy certificates (RECs) from Sterling Planet. For the remaining emissions from fuel generators and vehicles (estimated at 500 tonnes), approximately 3000 trees were planted.</p>	<p>Sporting events in the US are becoming more environmentally conscious. The Super Bowl is one of the largest sporting events in the US, and it is significant that the organizers chose to offset its GHG emissions. However, the organizers sustained criticism for the use of tree-planting projects as a source of offsets.</p>

APPENDIX A. Continued		
EVENTS	NOTABLE ACHIEVEMENTS	LESSONS LEARNED
<b>2006 Commonwealth Games, Australia</b>	The 2006 Melbourne, Australia, Commonwealth Games claimed to be the “first major multi-sports event in the world to be carbon-neutral.” Energy-efficient appliances were installed at venues, renewable energy was employed, and public transportation was encouraged by waiving fares for spectators. To offset the emissions of participants and spectators, a million trees were planted.	The Victorian Government sought to use a tree planting initiative to accomplish multiple goals: enhance biodiversity, mitigate salinity, and generate carbon offsets. But the 2006 drought in Australia subsequently killed many trees in Melbourne, illustrating the risks associated with using trees to offset greenhouse gas emissions.
<b>2005 Escape From Alcatraz Triathlon, USA</b>	This Triathlon in California was the first ‘Climate Neutral Triathlon’ in the United States. Emissions from electricity use, participant travel and accommodations were calculated, and offset with renewable energy certificates purchased from NativeEnergy. Clif Bar and IMG sponsored the climate neutral initiative. Innovative commercials were aired during the event, highlighting the climate neutral initiative and inviting the public to take action on climate change.	Although not as large as an Olympic Games, this triathlon showed that partnerships with sponsors are one way to fund offset programs. The short commercials that aired during the triathlon were a good example of how to communicate the event’s sustainability programs to the general public.
<b>2005 United Nations Climate Change Conference, Canada</b>	As hosts to the annual conference to negotiate the Kyoto Protocol, the Government of Canada ensured the event was carbon neutral. All conference-related greenhouse gas emissions that could not be reduced were offset. Participants from developed countries were requested in advance to purchase offsets for their own delegations. If they chose not to, Environment Canada purchased offsets on their behalf. Emissions that were offset included those from: energy used in multiple venues, ground transportation, and the air travel and accommodations of all delegates. Gold Standard offsets were purchased. Donations from sponsors were also accepted. In total, over 70,000 tonnes of offsets were retired on behalf of the conference.	The Government of Canada chose to offset the conference’s emissions by purchasing offsets from renewable energy projects (including Gold Standard offsets) as a first priority. Although significant volumes of offsets were also donated by businesses, these offsets were over and above the core number required to make the event carbon neutral, thereby reducing the chance of criticism for any perceived lack of quality. The Government of Canada also encouraged delegates to the conference to offset their own travel emissions, but paid for them if they chose not to.
<b>2006 World Economic Forum, Switzerland</b>	The conference organizers convened the Davos Climate Alliance (DCA) to manage the offsetting of the event’s emissions. The organizers initially compensated 50 per cent of the estimated 6,417 tonnes of greenhouse gases from participant air travel, and encouraged participants to offset their own air travel emissions by providing flight calculators on its website. In the end, the DCA appears to have offset all outstanding emissions not offset by participants. All of the offsets purchased by DCA were from the Clean Development Mechanism (CDM) of the Kyoto Protocol.	Through the offsetting initiative of the Davos Climate Alliance, the World Economic Forum succeeded in highlighting the issue of climate change and involving delegates in the offset effort. Only Kyoto-compliant offsets were used, with additional quality requirements. The DCA accounted for emissions from all six GHGs mentioned under the Kyoto Protocol. Because air travel produced the vast majority of the event’s emissions, the DCA chose to include air travel in the event’s scope.
<b>2004 Democratic National Convention &amp; Republican National Convention, USA</b>	Renewable energy certificates were purchased for 100 per cent of the venues’ electricity use. All ground and air travel to and from the conventions by convention participants was offset. Organizers of each convention sought offset donations from several large companies, and together succeeded in obtaining 122,100 tonnes – more than enough to offset both conferences.	Air travel to and from the event – the largest source of emissions – was entirely offset. Donations of offsets resulted in significant volumes of offsets, although it is not clear if there was a minimum quality threshold for these donations.

**APPENDIX A. Continued**

EVENTS	NOTABLE ACHIEVEMENTS	LESSONS LEARNED
<b>2003 Carbon Neutral Premiers' Conference, Canada</b>	In 2003, Prince Edward Island hosted the 44th Annual Premiers' Conference, the first to be carbon neutral. The conference organizers offset the emissions from air travel, vehicles, and hotel accommodations.	There is political support in Canada for efforts to make events carbon neutral, and precedents have been set in this regard.

## APPENDIX B

### Offset Pricing

Offset prices vary considerably depending on, for example, the project type, the volume of offsets generated, and whether or not the project is verified by third parties. In 2006, prices ranged from US\$0.45 to US\$45 per tonne, with the volume-weighted average price being US\$4.10 per tonne of CO<sub>2</sub>e.<sup>41</sup>

For Gold Standard offsets, there are at present relatively few vendors. In Canada, Gold Standard offsets from international projects are available for purchase through the Montreal-based organization, Planetair. Internationally, Gold Standard offsets are available through My Climate, based in Switzerland; the German organization, Atmosfair; Sustainable Travel International, based in the United States; and the Australian company, Climate Friendly. The German and Swiss organizations both source Gold Standard projects from developing countries, while Climate Friendly sells Gold Standard offsets from a wind farm in New Zealand that will only be available until 2008 when the first Kyoto commitment period begins. If VANOC wished to commission the development of specific Gold Standard projects, it would be possible to work with developers like South Pole Carbon Asset Management Ltd., a Swiss-based organization that participated in developing offset projects for the 2006 FIFA World Cup. Below are some price estimations for Gold Standard offsets:

- Gold Standard Voluntary (VER) Offsets that are registered Gold Standard – approximately \$17-22/tonne
- Kyoto CDM-compliant (CER) offsets that are registered Gold Standard – approximately \$25/tonne

Note that the above prices are for 'futures' contracts, which is what FIFA used for the 2006 World Cup. Offsets from projects where emission reductions have already been delivered would cost approximately \$4-5 more per tonne. The cost to commission an exclusive offset project for the 2010 Winter Games, in addition to the offsets themselves, would be approximately \$30,000 for VERs and \$75,000 for CERs. The cost would also be approximately \$0.75 higher per tonne.

Locally, the Vancouver Renewable Energy Co-operative is selling offsets produced by installing solar hot water and photovoltaic systems in housing cooperatives in the Vancouver region at \$40 per tonne. Offsetters.ca is also based in Vancouver, and while to date they are

only selling offsets purchased through Climate Care (a U.K.-based offset vendor and developer) they plan to sell offsets from projects developed in the Lower Mainland.

Elsewhere in Canada, offsets from projects developed within Canada are available, for example, through CarbonZero, a Toronto-based organization. Their projects include wind farms in Alberta (priced at \$22 per tonne) and retrofit lighting for low-income families in southern Ontario (\$36.50 per tonne).

Please note that the offset prices mentioned in this document are based primarily on Internet research and are provided for discussion purposes only. Because offset prices can fluctuate considerably, potential buyers are encouraged to contact vendors directly for price quotations.

## NOTES

- 1 For the purposes of this Discussion Paper, Olympic and Paralympic ‘partners’ include the Government of Canada, the Government of British Columbia, City of Vancouver, Resort Municipality of Whistler, and the Four Host First Nations: the Lil’wat, Musqueam, Squamish and Tseil-Waututh Nations.
- 2 From IPCC Fourth Assessment Report summary, footnote 3.
- 3 See, for example, Matthew Bramley, *The Case for Deep Reductions*, David Suzuki Foundation and The Pembina Institute, 2005.
- 4 See HECTOR (Heritage Climate Torino), The Climate Legacy Programme of Torino 2006, Torino 2006.
- 5 <http://www.cbc.ca/technology/story/2006/12/06/tech-alps.html>
- 6 See, for example, the Gurschen glacier near Andermatt, Switzerland. From <http://www.timesonline.co.uk/tol/news/world/article521440.ece>
- 7 <http://sportsillustrated.cnn.com/2007/more/03/06/eco0312/>
- 8 <http://www.theglobeandmail.com/servlet/story/RTGAM.20070127.wclimatemain0127/BNStory/ClimateChange/>
- 9 <http://www.theglobeandmail.com/servlet/story/RTGAM.20070127.wclimatemain0127/BNStory/ClimateChange/>
- 10 Angus Reid Strategies conducted the online survey among a randomly selected, representative sample of 1,122 adult Canadians between February 6 and 7, 2007.
- 11 Between 2005 and 2006 the voluntary offset market grew 200%, with 23.7 million tons of carbon dioxide equivalent (MtCO<sub>2</sub>e) being transacted in 2006. See *Picking Up Steam: State of the Voluntary Carbon Markets 2007*, Ecosystem Marketplace, July 18 2007 at 5.
- 12 Richard Pound, Ken Bagshaw, Linda Coady, Joseph Weiler, Margaret Dickson and Arun Mohan, “The Olympic Games, the Law and the Triple Bottom Line of Sustainability”, paper prepared for the 2006 CIAJ Conference, “Sustainable Development and the Law” at 16.
- 13 “What is the Olympic Games Global Impact Study?” *Olympic Review*, June 2006.
- 14 *IOC Guide on Sport, Environment and Sustainable Development*, International Olympic Committee, June 2006, Section 2.4, “General Rules.”
- 15 While the term carbon offsets is commonly used, reflecting the fact that carbon dioxide is the most common greenhouse gas produced by humans, there are in fact six greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) produced by humans that are covered by the Kyoto protocol. Emissions and reductions from these six sources are usually quantified and then converted to CO<sub>2</sub> equivalents.
- 16 Point Carbon, *Voluntary carbon markets: Lost in transactions?*, Point Carbon Research, 24 October 2007 at 6.
- 17 The Gold Standard was originally developed by World Wildlife Fund (WWF) International, and is now supported by a broad stakeholder group including businesses, scientists, and environmental organizations from around the world. Gold Standard supporters include Greenpeace International, WWF, David Suzuki Foundation, Pembina Institute, and others. A recent report from Tufts University found “the Gold Standard is the most rigorous standard available to date. Although adhering to the Gold Standard incurs higher transaction costs and can therefore lead to higher prices for consumers, we strongly recommend purchasing offsets that follow these strict guidelines.” See Anja Kollmuss, Benjamin Bowell, *Voluntary Offsets For Air-Travel Carbon Emissions: Evaluations and Recommendations of Voluntary Offset Companies* Tufts Climate Initiative, January 27, 2007.
- 18 [www.cdmgoldstandard.org](http://www.cdmgoldstandard.org)
- 19 Nicholas Stern, *The Economics of Climate Change: The Stern Review*, Cambridge, UK: Cambridge University Press, 2006 at 548.



- 20 Alex Roslin, "Cool Carbon Credits Our Hottest Commodity," *The Georgia Straight*, January 11, 2007.
- 21 Food and Agriculture Organization of the United Nations, *State of the World's Forests 2007*, <http://www.fao.org/docrep/009/a0773e/a0773e00.htm>. The Canadian Forest Service announced in 2007 that according to its current analysis there is a greater than nine in ten chance of Canada's managed forest being a net source of greenhouse gas emissions in 2008-2012. See <http://cfs.nrcan.gc.ca/news/544>. And a recent UN report warned that climate change is likely to lead to a dramatic increase in both the incidence and severity of forest fires in Canada's forests. See Food and Agricultural Organization of the United Nations, *Fire management – global assessment 2006*, FAO Forestry Paper 151, Rome, 2007 at 59.
- 22 A recent UK report surveying greenhouse gas management and carbon neutral programs in leading companies identified eight different limitations associated with forestry offsets. Francis Sullivan, environmental advisor at HSBC, stated that after looking at the offset schemes available, forestry schemes were not a credible option. See *Carbon Management and Carbon Neutrality in the FTSE All-Share*, Standard Life Agency, 2006.
- 23 For example, Climate Care, a leading UK offset provider, has gradually reduced its tree planting projects, and now forecasts that in 2006/2007 its portfolio will be 95% sustainable energy projects. See <http://www.climatecare.org/projects/technologies/index.cfm>
- 24 EcoLogo (the Environmental Choice Program originally set up by Environment Canada) has specifically excluded forestry offsets from its list of eligible projects because they do not create permanent greenhouse gas reductions. See for example, Environmental Choice Program, Certification Criteria Document CCD-162, Greenhouse Gas Neutral Air Travel. [http://www.environmentalchoice.com/images/ECP\\_per\\_cent20PDFs/CCD\\_162.pdf](http://www.environmentalchoice.com/images/ECP_per_cent20PDFs/CCD_162.pdf)
- 25 Anja Kollmuss, Benjamin Bowell, *Voluntary Offsets For Air-Travel Carbon Emissions: Evaluations and Recommendations of Voluntary Offset Companies*, Tufts Climate Initiative, January 27, 2007 at 15.
- 26 See Valentin Bellassen and Benoit Leguet, "The emergence of voluntary carbon offsetting," Caisse des Depots Climate Taskforce Research Report No. 11, September 2007, at 27-28. The specific problem of Kyoto double-counting has been addressed already in a number of countries. In New Zealand, the government set up a program to purchase credits from domestic projects (primarily new sources of renewable energy), and transfer the same amount of Kyoto emission allowances to the projects. Extra reductions towards New Zealand's Kyoto targets will be accomplished because the number of emission allowances purchased tend to be less than the number of reductions created by the offset projects. Within the EU-ETS, countries may cancel national emission allowances to account for offset credits, and beginning in 2008 this will be accompanied by the cancellation of the corresponding Kyoto allowances for that country. In Switzerland, Gold Standard offset provider myclimate has begun selling offsets from projects developed in Switzerland, but in recognition of the fact that the reductions from these domestic projects will be counted towards Switzerland's existing reduction obligations, myclimate is retiring an offset from its international portfolio for each domestic credit sold.
- 27 Anja Kollmuss, Benjamin Bowell, *Voluntary Offsets For Air-Travel Carbon Emissions: Evaluations and Recommendations of Voluntary Offset Companies*, Tufts Climate Initiative, January 27, 2007 at 15.
- 28 The organizers of the 2006 FIFA World Cup opted for offsets from international sources, reasoning that "...projects in newly-emerging and developing countries would not only be concerned with relieving the local environment, they would also make a contribution to sustainable development in these countries ...the FIFA idea of solidarity could be supported and the global spirit of the World Cup conveyed." See *Green Goal, Legacy Report*, FIFA World Cup Germany 2006 at 86.
- 29 Vancouver Organizing Committee (VANOC), *Vancouver 2010 Sustainability Report 2005-06*, June 2007 at 4.
- 30 *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard*, Revised Edition, World Resources Institute and World Business Council for Sustainable Development, 2004.
- 31 *Ibid.*, at 30-31.
- 32 [http://www.davidsuzuki.org/Climate\\_Change/What\\_You\\_Can\\_Do/air\\_travel.asp](http://www.davidsuzuki.org/Climate_Change/What_You_Can_Do/air_travel.asp)
- 33 Increasing numbers of corporations are measuring and offsetting the business travel of their employees, often beginning with CEO and executive travel.



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- 34 Joyce E. Penner, David Lister, David J. Griggs, David J. Dokken and Mack McFarland, *Aviation and the Global Atmosphere, A Special Report of the Intergovernmental Panel on Climate Change*, Cambridge, UK: Cambridge University Press, 1999.
- 35 A number of different calculation and estimation techniques were employed to develop these estimates. Generally accepted national and international emission factors were used. The Confidence Index for the estimates is correlated with the quantity and quality of data available and its direct relevance to the 2010 Winter Games. Where no quantitative data was available, no estimate was made.
- 36 This list excludes participants and spectators arriving via rail, bus, and vehicle.
- 37 Estimated emissions from energy use are 30,000 tonnes, versus 65,000 tonnes for the 2006 Winter Games.
- 38 Diane Conrad Gleason and Joseph Martone, "Salt Lake City 2002: Going for Gold, Coming Up Green," EM, February 2002 at 17. It's not clear if spectator air travel was included in the totals for the 2002 Winter Games.
- 39 This price is for discussion purposes only. Please see Appendix B for additional information on offset pricing.
- 40 For example, the Pembina Institute's Green Learning program, ([www.greenlearning.ca](http://www.greenlearning.ca)), Clean Air Achievers, a program of Clean Air Champions ([www.cleanairchampions.ca](http://www.cleanairchampions.ca)) and the David Suzuki Foundation's Nature Challenge for Schools ([www.davidsuzuki.org/NatureChallenge/at\\_School](http://www.davidsuzuki.org/NatureChallenge/at_School)).
- 41 *Picking Up Steam: State of the Voluntary Carbon Markets 2007*, Ecosystem Marketplace, July 18 2007 at 7.

**T**he 2010 Winter Olympic and Paralympic Winter Games (2010 Winter Games) have the opportunity to be the most climate friendly Games ever.

With climate change widely seen as the defining environmental issue of our generation, and one that is already threatening the viability of winter sports around the world, the 2010 Winter Games have the potential to broaden understanding of climate solutions by reaching out to athletes, spectators, sponsors, volunteers and the general public, and inspiring action.

This Discussion Paper was commissioned by the Vancouver Organizing Committee for the 2010 Olympic and Paralympic Games (VANOC) to support discussions between VANOC and its key partners and stakeholders on the development and implementation of a greenhouse gas management program for the 2010 Winter Games. It reviews pertinent information on greenhouse gas management strategies within both national and international contexts, and identifies potential opportunities for achieving a carbon neutral Games.

**The David Suzuki Foundation** is committed to achieving sustainability within a generation. A healthy environment is a vital cornerstone of a sustainable, prosperous future.



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