

The Interpretation of Environmental Sustainability (ES) by the
IOC/Olympic Games 1994 - 2008

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Abstract

The purpose of this qualitative multi-case study was to examine the interpretation of environmental sustainability (ES) within the Olympic Movement. Two research questions guided the inquiry - first, how has the concept of ES been defined by the International Olympic Committee (IOC), and second, how has the concept of ES been defined and enacted by the Organizing Committees of the Olympic Games (OCOGs)? During the past two decades, the International Olympic Committee (IOC) established several policies and programs related to ES. Its actions reflect a broader trend of environmentalism within economic and social spheres around the world (Milton-Smith, 2002). Despite the numerous initiatives, the Olympic Games continue to cause significant environmental damage. Frey, et al. (2007) argued that the Olympic Movement contradicts the fundamental premises of ES because the Games are hosted in a two week time period, are situated in a confined area, and accumulate operating and infrastructure costs in the billions of dollars. Further, Etzion (2007) stated “there is positive and significant correlation between firm size and environmental performance” (p. 642) and in the context of the Olympics the size-impact relation is striking. Since 1972, the year the UN launched its international environmental awareness efforts, the Summer Olympics grew to 201 nations (39% increase), 10,500 athletes (32% increase), 28 sports (30% increase), and 302 events (43% increase) (Johnson, 2004; Girginov & Parry, 2005; Upegui, 2008). The proliferation of Games activities counters the ES principles that exist within many of the IOC declarations, policies and programs.

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Acronyms

International Olympic Committee (IOC)

Organizing Committee for the Olympic Games (OCOG)

Environmental Sustainability (ES)

United Nations Environmental Program (UNEP)

Olympic Coordination Authority (OCA)

The OCOG cases included:

1994 Lillehammer Games (LOOC)

1996 Atlanta Games (ACOG)

1998 Nagano Games (NAOC)

2000 Sydney Games (SOCOG)

2002 Salt Lake Games (SLOC)

2004 Athens Games (ATHOC)

2006 Torino Games (TOROG)

2008 Beijing Games (BOCOG)

CHAPTER ONE: INTRODUCTION

For decades the protection of the environment has been a leading concern for the United Nations (UN) (Melnick, McNeely, & Kakabadse Navarro, 2005). To illustrate this concern a number of documents were written and conferences held to promote the protection of the earth's ecosystem. In 1972, following the *UN Conference on the Human Environment*, a document was released called the *Report of the United States National Academy of Science* (Melnick et al., 2005). This report delineated the state of climate change, including acid rain effects, ozone depletion and made recommendations to reduce the impact of human activity on the natural environment. However, despite the release of UN recommendations, pollution continued to spread, greenhouse gas emissions accumulated, and forests disappeared (Melnick et al., 2005; UN Development Program, 2005; UN, 1992). By 1992 the UN again called for action and hosted a conference called the *UN Conference on Environment and Development*. This conference resulted in the development of a key document called Agenda 21 (Melnick et al., 2005; UN Conference on Environment and Development, 1993).

Agenda 21 acknowledged the concept of international sustainable development, which included environmental sustainability (ES) (Agenda 21 of the Olympic Movement, 1999; UN Conference on Environment and Development, 1993). Signed by 179 Heads of Government, according to the UN:

Agenda 21 stands as a comprehensive blueprint for action to be taken globally – from now into the twenty-first century – by Governments, United Nations organizations, development agencies, non-governmental organizations and independent-sector groups, in every area in which human activity impacts on the environment (UN Conference on Environment and Development, 1993, p. 3).

This Agenda proposed national and international policy, encouraged multinational cooperations, and emphasized private, public and community sector partnerships and decision making on environmental issues (UN Conference on Environment and Development, 1993). Overall, Agenda 21 contained forty chapters that were organized into four parts: social and economic dimensions, conservation and management of resources for development, strengthening the role of major groups, and the means of implementation. The document produced a framework to guide Governments and international, national, regional and local organizations to create their own Agenda 21 (International Olympic Committee [IOC], 1995; UN 1993).

The IOC utilized the UN Agenda 21 framework to apply ES to the Olympic Movement. An application of ES followed the concept that sport was an integral component of society and that sport managers must be environmentally aware and enact ES. According to Suzuki (2007), “to protect the natural environment, environmental awareness must transcend politics and become a central value of all members of society (p. 6). The IOC positioned sport as an element of the environmental solution and promoted awareness of ES, biodiversity conservation, the protection of ecosystems, resource and waste management (IOC, 2005).

IOC and the Natural Environment

Pierre de Coubertin’s initial vision for the Olympics was not concerned with the protection of the environment. However, as the world evolved to a contemporary state of environmental degradation, corporations and organizations began to associate with the concept of ES, including the Olympic Movement. An initial illustration that ES had

penetrated the Olympic Movement was that during the preparation of the 1994 Lillehammer Games, the IOC announced the environment as the third pillar of Olympism, following sport and culture (Cantelon & Letters, 2000; Frey, Iraldo, & Melis, 2007, IOC, 2005, IOC, 2007; Environment the New Dimension 1993). Olympism is a universal social philosophy that is defined as a “focus of interest not just the elite athlete, but everyone; not just a short truce period, but the whole of life; not just competition and winning, but also the values of participation and co-operation; not just sport as an activity, but also as a formative and developmental influence contributing to desirable characteristics of individual personality and social life” (Parry, 2003, p.2). Cantelon and Letters (2000) indicated that the 1992 Winter Olympic Games in Albertville were the motivating factor that pressured the IOC to rethink their environmental efforts. This is because the Albertville Games were publicly scrutinized for negatively impacting the environment. It was noted that, “in two short years, from 1992 to 1994, the IOC went from an organization with no environmental policy to one with a policy fully integrated into its philosophy of Olympism” (Cantelon and Letters, 2000, p. 295). This pillar indicated that the Olympic Movement planned to take responsibility to protect the natural environment. Sport was now positioned to play a direct role in ES as the Olympic ideals were adapted for this concept.

A Partnership for ES

Sport is viewed by millions of citizens around the world annually, it has an underlying profound communication ability that can influence these viewers (Melnick et al., 2005). With the global communication reach of sport, the UN encouraged sport

organizations to promote and execute ES within their operations. In 2005, the *UN Sport and Environment Strategy* was introduced (Melnick et al., 2005; UN Development Program, 2005) and the IOC became a key partner. This United Nations Environment Program (UNEP) explored possible actions to reduce environmental impacts during the production of sport. The program strategy included three objectives, including: to promote environmental awareness, promote environmental initiatives within sport, and to promote environmentally friendly facilities and sporting goods (Melnick, et al., 2005). From this program, the IOC adopted their *Sport and Environment Strategy* objectives (UN Development Program, 2005). This adoption indicated that the IOC felt a duty to promote ES.

Overall Concept of ES and the Olympics

To protect the environment from the impact of mega sporting events, it has been noted that the Organizing Committee for the Olympic Games (OCOG) must take multiple factors into account when planning for the Olympic Games. For example, Kaspar (1998) suggested that OCOGs must ensure careful selection of land for new construction of buildings, roads, railways and parking spaces. This selection must consider the environmental sensitivity of the land, as well as the impact of the transportation infrastructure. Kaspar (1998) indicated that OCOGs should strive for minimal private transport and maximum public transportation. A design of shorter distances between Olympic venues was viewed as striving to utilize existing infrastructures and encouraging the use of public transportation. Further, Kaspar (1998) indicated that the implementation of waste management programs has to be resolved by organizers and that important

factors included recycling systems, waste separation, multi-use cups and biodegradable plates.

According to Kaspar (1998), the IOC needed to implement standards with national and regional environmental legislation that all OCOGs must surpass. It is then the duty of OCOGs to follow up on the environmental initiatives through continuous monitoring. However, the author of this paper examined Kaspar's (1998) assertion and concluded that considering the importance the IOC placed on the protection of the natural environment that the IOC should perform the ultimate ES oversight duty. This requires the establishment of an environmental committee that ensures OCOGs are monitored for ES and that there is an evaluation and penalty process. However, the IOC leaves the OCOGs to assess their own environmental performance (Huet, 2007). More importantly, Huet (2007) noted that the IOC is not responsible for the environmental actions OCOGs take. The Olympic host city and their governments are the groups responsible for the ES performance (Huet, 2007). In addition, the owners of the venues or infrastructure were noted as responsible for the management of waste generated by the Olympic Games. For example, the Beijing Municipal Administration Commission was responsible for the waste generated from transportation (Huet, 2007).

However, the IOC recently implemented the Olympic Games Global Impact (OGGI) study in 2001. The purpose of the OGGI is to reduce the size, cost and complexity of the Games (Holden, MacKenzie and Van Wynsberghe, nd). The study provided methodological framework for standardizing the sustainable development impact along with 117 recommended actions. Some of the recommendations were implemented at the 2008 Beijing Games and will also be implemented at the 2010

Vancouver Games. Full implementation of all 117 recommendations will also be applied by the 2012 London Games. It was noted that,

while OGGI is not specifically framed in terms of sustainability, it is operationalized in a framework identical to that used by many sustainability indicator reports. OGGI indicator themes range widely, from atmospheric pollutants to sports team composition (Holden, MacKenzie and Van Wynsberghe, nd, p. 18).

The implementation of the OGGI requires an 11 year period of study for each Games. In this time the OCOGs report to the IOC on sustainable development criteria and indicator reports of baseline, pre-Games and post-Games results and the reports are sub-divided into three areas, including the social, economic and environmental impacts (The Five Pillars of Olympic Games Management, 2006; Holden et al., nd). According to Holden, MacKenzie, and VanWynsberghe (nd):

The substantial time series represented by the OGGI requirement provides a clear message that the IOC understands host communities' need for legacies that start before the Games and last beyond the closing ceremonies. It is a move in the direction of sustainability, that is, longer-term planning and a more realistic assessment of the impacts of mega-events as well as the time lags that often precede their felt impacts (p. 19).

The reporting process in the OGGI positions the IOC as the oversight body. However, the OCOGs continue to self report no penalties for harming the environment were found within the study documents.

In contrast to the OGGI, Frey, Iraldo, & Melis (2007) argued that the Olympic Movement contradicted the very notion of sustainable development and ES. This argument focused on the fact that the Olympic Games were hosted in a two week time period, was situated in a concentrated area, and the operating and infrastructure costs were in the billions of dollars (Frey, Iraldo, & Melis, 2007). This concentrated time, impact and cost was seen as being in conflict with ES. Within sustainable development,

spatial concentration supported the dispersion of impacts over time and space (Frey, Iraldo, & Melis, 2007). Thus, the large size that the Olympic Games have grown and has been noted to cause damage to the environment (IOC, 2005).

Impact of the Olympic Growth

A concern has been voiced that in the process of Olympic growth, the Olympic ideals seem to have vanished and been replaced by corporate messages and other stakeholder priorities. Corporate messages are desperately needed to help pay off the financial commitments of the Olympic host city and the multiple stakeholders that are needed to stage the large Games. According to Pruess (2004) a number of changes have resulted due to the growth of the Games, such as:

1. The interests of organizing committees is to produce a financial surplus
2. The interests of politicians is to develop the infrastructure and image of the host city
3. The interests of sponsors is to link their image to sport and the uniqueness of the Olympic Games
4. The interests of the media is to broadcast the Games to increase viewing rates and sell commercial times
5. The interests of businesses within a host region is to claim a fraction of the immense monetary sums involved (p.1).

Pruess indicated that the Olympic Games sought to meet the needs of multiple stakeholders; therefore, the IOC downgraded the emphasis on the Olympic ideals set by de Coubertin.

After the Olympic Games began in 1896, de Coubertin's principles were often hard to reconcile due to the rise of the Games as a worldwide television entertainment and commercial enterprise. Mollins (1992) argued that success has tarnished de Coubertin's initial vision of the Olympic motto, which stated "swifter, higher, stronger"

(Mollins, 1992). Many believed the emphasis had shifted to the swiftest, highest and strongest in television entertainment (Essex & Chalkley, 1998; Mollins, 1992; Whitson, 2005). The Olympic Games have been transformed into a global festival costing billions of dollars. Large sporting events produce pollution and cause other environmental concerns (Cantelon & Letters, 2006) such as environmental degradation during the construction of facilities and the development of infrastructures, noise pollution, waste from food products, pollution from vehicles and not recycling products properly (IOC, 2005). This growth has forced host cities to plan and execute the Games in a manner that can compromise the original principles.

The pursuit of hosting a large Games has spurred what Milton-Smith (2002) indicated was: “The backlash against the Olympic Games [which] reflects the failure of the major global institutions in dealing with the social and ethical consequences of globalization in areas such as the environment” (p. 131). According to Milton-Smith, the IOC’s response has been dismal with respect to addressing the Olympic Games environmental protection. Thus, even though the IOC has indicated the importance of ES, the Olympic Games are publicly scrutinized for negatively impacting the environment.

The researcher of this paper purports that the Olympic Movement has the potential to reverse this perception should the leadership dictate. Although it is noted as impossible to host the Olympic Games without any negative impact on the natural environment (TED Case Studies: Lillehammer Olympic Games, 1997), the IOC has the ability to offset much of the impact on the environment (Kaspar, 1998). Due to this potential, according to Frey, Iraldo and Melis (2007), there should be consideration taken for studying ES in large sporting events.

The purpose of this qualitative multi-case study was to examine the concept of ES in the context of the Olympic Movement, specifically the IOC and OCOGs from 1994 to 2008. The researcher examined the IOC's interpretation of Environmental Sustainability (ES) (to act responsibly to do no harm to the earth) and the incorporation of this interpretation within the Olympic Games from 1994 to 2008.

The four research questions that guided this study were:

Research Question 1:

How has the concept of ES been defined by the IOC from 1994 to 2008?

Research Question 2:

How has the concept of ES been defined by the OCOGs from 1994 to 2008?

Research Question 3:

How has the concept of ES been enacted by the OCOGs from 1994 to 2008?

Research Question 4:

How does the IOC's definition of ES compare to the OCOGs' definition and enactment of ES from 1994 to 2008?

The research questions were answered by utilizing a qualitative content analysis research methodology. This qualitative research elicits multiple constructed realities and was studied holistically (Marshall & Rossman, 2006). This type of "qualitative research is concerned with explaining social phenomenon... [as] the qualitative approach focuses on people's behavior" (McGloin, 2008, p. 45) within society and culture in a real life setting (Marshall & Rossman, 2006).

The settings in this research were the IOC and the Olympic Games. Documents for analysis were based on the IOC and each case of Olympic Games from the years of 1994 to 2008. In order to gain an understanding of the IOC's and OCOG's definition of

ES and the OCOG's enactment of ES, data from documents and official reports were collected for analysis.

The method of collection and analysis followed an adaptation of Wolfe, Hoeber and Babiak's (2002) five-stage process for a content analysis. Content analysis allowed for the researcher to attempt to make sense of the perspectives of the events that were being studied (Creswell, 2003). The *five-staged* process included: determining the sampling units, the recording units, the themes to be coded, the themes' factors or sub-themes and the coding mode (Wolfe et al.). In this study, the Wolfe et al. stages were adapted to include an additional stage which involved delineating the theoretical framework used for data analysis.

The recording of the data from the text documents in this study was framed with an adapted version of the four phases of the Olympic cycle defined by Hillier (1998). These phases included the bid phase, preparation phase, event phase and the post-event phase. In this study, Hillier's cycle was adapted to include an additional phase, called the pre-event phase. In addition, the record of data was framed with the components within the Sport Event–Environmental Performance Measure (SE-EPM) by Mallett, Stevens, Adams and McRoberts (2009). The theoretical framework used for the analysis of the data was informed by Ruafflet's (2006) Corporate Environmental Management (CEM) paradigms, including incremental, adaptive and radical paradigms. The CEM paradigms are explained in full in the review of literature.

To provide a full explanation of this research, this thesis was subdivided into five chapters. The first chapter, the introduction, provides an overview of the study, including the purpose and research questions. The second chapter, the literature review, contains

the history of the IOC and the Olympic Games and an overview of paradigms in ES.

Thirdly, the method chapter describes the methods utilized to complete the study.

Fourthly, the findings chapter provides a detailed account of what was found within the

data. Lastly, the discussion and conclusion chapter outlines the interpretations of the

findings. The purpose of this qualitative multi-case study was to examine the concept of

ES in the context of the Olympic Movement, specifically the IOC and OCOGs from 1994

to 2008. The researcher examined the IOC's interpretation of ES and the incorporation of

this interpretation within the Olympic Games from 1994 to 2008.

CHAPTER TWO: LITERATURE REVIEW

The natural environment continues to be a vital component to human life. Over the past several decades, organizations have been working to manage the challenge of ES to protect the environment for future generations. For instance, in 1972, Maurice Strong, the Secretary General of the UN, convened a conference on the natural environment. From this conference, Strong commissioned a report entitled *Only one earth: The care and maintenance of a small planet* (Ward & Dubos, 1972). This report outlined the contemporary status and challenges with regard to the natural environment and the degradation to the earth. In 1992, the UN *Earth Summit* reiterated the current activities that were harming the environment, such as greenhouse gas emissions, the cutting of trees and the pollution to bodies of water and soil. This conference led to the development of the UN Agenda 21 that was introduced earlier in this thesis. The Agenda promoted an action plan towards sustainable development worldwide (United Nations, 1992). An analysis of the literature indicated that more than a decade later, we are still living in a time of environmental ES challenges. The following section will discuss the growth of the Olympic Games and the negative impact the Olympic Games have on the environment due to its continuous growth.

The Evolution of the Olympic Games

The Olympic Games began in Athens in 1896 and evolved into the largest sporting event in the world with the Olympic symbol of five rings being identifiable world-wide (Furrer, 2002). In order to provide the foundations for this study, the following topics concerning the evolution of the Olympic Games are presented: The Olympic vision and

ideals, the development of the IOC, Olympic growth in terms of the structure, the number of athletes, nation participation, spectator numbers, and venue and size requirements.

The Olympic Vision and Ideals

The visionary behind the modern Olympic Games was Baron Pierre de Coubertin. In 1896 de Coubertin used sport as a catalyst to encourage physical and cultural renewal throughout the world (Essex & Chalkley, 1998). His intention was to reinstate the Olympic Games to bring nations together to participate in friendly sporting competitions that could promote social equality (Essex & Chalkley, 1998; Whitson, 2005). de Coubertin's vision of the Olympic Games encapsulated the Olympic ideals that included the concept of promoting a better world with a quest for peace, integrity, as well as the mind, body and spirit that transcends culture (Girginov and Parry, 2005). de Coubertin envisioned the Olympic Games to include opening and closing ceremonies that served as a symbolic tool of international understanding (IOC, 2008). These ceremonies were seen as a tool for bringing the athletes from the world's nations into a forum that allowed them to walk and participate together. The ceremonies have also been seen as an opportunity to express the culture of the host nation of the Olympic Games (IOC, 2008).

de Coubertin reintroduced the modern Olympic Games in 1896 and by 2008 they had been hosted 45 times. The Summer Games have been held every four years. The Winter Games were introduced in 1924 and are also held every four years (IOC, 2008). The Summer and Winter Games were held in the same calendar year until 1992 when the Albertville Games were the last Winter Games to be hosted in concert with the Summer Games. Since this time, the Olympic Games have been held every two years, alternating between summer and winter.

The first Winter Olympic Games in this format was the 1994 Lillehammer Games (NOC of the Republic of Belarus, 2002). The following section outlines the growth of the Olympic Games in terms of its structure, events, athletes, facilities and spectators.

Olympic Growth – The Olympic Structure

Since the 1896 reinstitution of the Olympic Games, the growth has been dramatic. The Games started as a small scale event that had a minimal impact on the surrounding urban area (Essex & Chalkley, 1998). The majority of organizers staged the events in existing sports facilities. Then, as time progressed, more events were added and the size of the Olympic Games expanded. Since the 1960s, the IOC encouraged smaller developing countries to host the Olympic Games and they have been hosted from Asia to Mexico. Therefore, the IOC believed every country with the ability to host the Olympic Games should be provided the same opportunity as fully developed countries (Whitson, 2005). In addition, the IOC has encouraged every country to participate and each Olympic Games have reached audiences around the world (Whitson, 2005).

Olympic Growth – The Number of Olympic Events

The number of Olympic competition events has grown over the years. *Table 1.0 Evolution of Olympic Sporting Events* demonstrated the amount of growth in sport events that have occurred over the decades. This growth indicated the pressure exerted for increasing the number of sports and events offered.

Table 1.0: Evolution of Olympic Sporting Events

Olympic Games	Events
1896 Athens	43
1900 Paris	88
1904 Saint Louis	89
1908 London	109
1912 Stockholm	43
1920 Antwerp	154
1924 Paris	126
1924 Chamonix (Winter)	16
1928 Amsterdam	109
1928 – St. Moritz (Winter)	25
1932 Los Angeles	128
1932 – Lake Placid (Winter)	14
1936 Berlin	129
1936 Bavaria (Winter)	17
1948 London	136
1948 St. Moritz (Winter)	22
1952 Helsinki	43
1952 Oslo (Winter)	22
1956 Melbourne	152
1956 Cortina D’Ampezzo (Winter)	24
1960 Rome	150
1960 Squaw Valley (Winter)	27
1964 Tokyo	163
1964 Innsbruck (Winter)	34
1968 Mexico	163
1968 Grenoble (Winter)	35
1972 Munich	172
1972 Sapporo (Winter)	35
1976 Montreal	198
1976 Innsbruck (Winter)	37
1980 Moscow	203
1980 Lake Placid (Winter)	38
1984 Los Angeles	221
1984 Sarajevo (Winter)	49
1988 Seoul	263
1988 Calgary (Winter)	46
1992 Barcelona	286
1992 Albertville (Winter)	57
1994 Lillehammer (Winter)	61
1996 Atlanta	271

1998 Nagano (Winter)	72
2000 Sydney	300
2002 Salt Lake City	78
2004 Athens	301
2006 Turin (Winter)	84
2008 Beijing	302

(Johnson, 2004; Upegui, 2008; Winter Olympic Games, nd)

Table 1.0 indicated that the Olympic Games continuously added sports and events. The growth from the first modern Olympic Games in 1896 until the 1936 Berlin Games increased in the number of events by 200 percent. In addition, from the 1936 Berlin Games to the recent 2004 Athens Games the number of events increased by a further 133 percent. Overall, from the 1896 Athens Games to when they returned to Athens in 2004, the number of events increased by 600 percent. Initially, in Athens there were only nine sports and when they returned 108 years later, 19 sports were added, resulting in a total of 29 sports. This represented an increase of 211 percent in the number of sports offered. The IOC's continuous addition of events caused the overall operational planning and structure to amplify. The addition of events meant that OCOGs must prepare and accommodate thousands of athletes and spectators.

Olympic Growth – The Number of Olympic Athletes

The Olympic Games began with a small number of traditional sports such as track and field events. In an attempt to be inclusive concerning sport events and to maintain fairness among all countries (Pruess, 2004), the IOC attempted to accommodate the entry of a growing number of sporting events. The growth was interpreted by Pruess (2004) to mean that the IOC desired as many nations participating in the Olympic Games as

possible, allowing more events enabled more countries to compete. However, the growth created the need for additional venues, the management of a greater number of athlete participants, along with the increase of infrastructure to accommodate athletes and tourists (Pruess, 2004). Due to the growth in events, a greater number of athletes have the opportunity to compete in the Olympics. As illustrated in *Table 1.1 Evolution of Olympic Athlete and Nation Participation*, the increase in the number of athletes is staggering from the first Modern Games in 1896 Athens to the return of the Games to Athens more than 100 years later.

Table 1.1: Evolution of Olympic Athlete and Nation Participation

Olympic Games	Number of Nations participating	Number of athletes competing
1896 Athens	13	311
1900 Paris	23	1330
1904 St. Louis	12	687
1908 London	23	2035
1912 Stockholm	28	2545
1920 Antwerp	29	2607
1924 Paris	44	3092
1924 Chamonix (Winter)	16	258
1928 Amsterdam	46	3014
1928 St. Moritz (Winter)	14	464
1932 Los Angeles	37	1408
1932 Lake Placid (Winter)	17	252
1936 Berlin	49	4066
1936 Bavaria (Winter)	28	646
1948 London	59	4099
1948 St. Moritz (Winter)	28	670
1952 Helsinki	69	4925
1952 Oslo (Winter)	30	694
1956 Melbourne	67	3342
1956 Cortina D'Ampezzo (Winter)	32	821
1960 Rome	83	5348
1960 Squaw Valley (Winter)	30	665
1964 Tokyo	93	5140
1964 Innsbruck (Winter)	36	1091
1968 Mexico	112	5531
1968 Grenoble (Winter)	37	1158
1972 Munich	122	7147
1972 Sapporo (Winter)	35	1006
1976 Montreal	92	6085

1976 Innsbruck (Winter)	37	1123
1980 Moscow	81	5353
1980 Lake Placid (Winter)	37	1072
1984 Los Angeles	141	7078
1984 Sarajevo (Winter)	49	1272
1988 Seoul	159	9421
1988 Calgary (Winter)	57	1423
1992 Barcelona	172	10563
1992 Albertville (Winter)	64	1801
1994 Lillehammer (Winter)	67	1737
1996 Atlanta	197	10319
1998 Nagano (Winter)	72	2176
2000 Sydney	199	10651
2002 Salt Lake City (Winter)	78	2399
2004 Athens	201	10500
2006 Turin (Winter)	80	2508
2008 Beijing	201	10500

(Girginov & Parry, 2005; Upegui, 2008; Winter Olympic Games, nd)

From 1896 to 2004 the increase in the number of nations participating was 188 nations and the increase in the number of athletes competing was 10,189 athletes (Girginov & Parry, 2005). Host cities needed to adjust their Olympic infrastructure to the demands of the growing number of nations and athletes in the Olympic Games. This increase also related directly to additional spectators, more Olympic family members, and the need for a larger athlete support system and media personnel to cover all of the events. Olympic family members included the International Federations (IF), National Olympic Committees (NOC) and OCOGS. Therefore, further hotels, restaurants and

transportation systems were needed. This additional infrastructure caused an impact on the natural environment.

Olympic Growth – Venues and Size Requirements

During de Coubertin's first modern Olympic Games in Athens 1896, the venues consisted of existing infrastructure and only a few new venues to stage events. The next two Olympic Games, the 1900 Paris Games and the 1904 St. Louis Games, were low impact events for the natural environment (Essex & Chalkley, 1998). No new facilities were built and the swimming competitions took place in rivers and ponds. The 1908 London Games faced problems after building the White City Stadium as the organizers attempted to build too many sport facilities within the one venue (Essex & Chalkley, 1998). The Melbourne Games of 1956 also had problems with their facilities. One of the stadiums, the Olympic Velodrome was viewed as unsuccessful because the cycling track did not conform to the specified requirements and the swimming stadium deteriorated (Essex & Chalkley, 1998). Unfortunately, the contractors calculated the measurements incorrectly and the materials utilized for the swimming stadium was poorly planned. It should be noted that the Mexico Games of 1968 used a variety of existing facilities (Essex & Chalkley, 1998).

As the Olympic Games grew substantially the need for large expenditures to renovate whole cities into an Olympic host society was required. The Tokyo 1964 Games focused on improving the roads, developing the harbor, accommodating housing and tourist projects, water supply, sewage disposal plants, and public health improvements. The government spent 2.7 billion dollars USD on infrastructure (Essex & Chalkley,

1998). The Munich 1972 Games also involved the development of the urban area. The improvements included the advance of new shopping centers, hotels and three new expressways. It is important to note that the Olympic Village was used afterwards to house middle and lower income families (Essex & Chalkley, 1998).

Starting in the late 1960s, a host city improved their infrastructure to ensure their capability of hosting the Olympic Games. Every host city offered their personal unique Olympic experience. Creating this experience has created financial deficits. For example, the historic 1976 Montreal Olympic Games concluded in a deficit in the billions of dollars (Essex & Chalkley, 1998). The creation of this experience has also created profits. For example the Los Angeles Olympic Games incurred a surplus with sustaining economic benefits by focusing on private partnerships. The Olympic Games have had a diverse effect on each host city. Impacting this effect is the pattern of continuous growth from the early 1900s to current times, underscoring the Games physical structure and causing the expenditure requirements to increase (Essex & Chalkley, 1998).

The Vancouver/Whistler Games, Canada preparations for the 2010 Olympic Winter Games included transportation projects that upgraded the Vancouver/Whistler Highway for an estimated cost of 600 million dollars (McHugh, 2006). In addition, the Airport/Vancouver rapid transit line was built at the cost of 1.9 billion dollars (McHugh). Vancouver built six new facilities and upgraded eight existing venues (McHugh, 2006). Vancouver's Organizing Committee for the Olympic Games (VANOC) also expanded the Olympic Village to another city, resulting in two Olympic Villages: one situated in Vancouver, the other in Whistler. Both villages provide all amenities to the athletes, Olympic family, media personnel and spectators. This example illustrated the demand for

facilities and infrastructure when hosting the Olympic Games, and these demands in turn cause impacts on the natural environment.

Olympic Growth - The Number of Olympic Spectators

The Olympic Games have always been successful in drawing spectators to participate in the Olympic experience. The continuous growth of the Olympic Games has also meant an increase in growth in the number of spectators. The host cities needed to accommodate the spectators that visit their city. This required greater financial resources for infrastructure of hotels, restaurants and transit systems. Host cities spend a great amount of their financial expenditures on accommodating the tourists, the Olympic family and Olympic workers such as volunteers, security and media. Host cities have also executed OCOG's plans to build additional hotels, Athlete's Village, Olympic Village, venues, restaurants and accessible transportation systems. Overall, host cities prepare years in advance to plan for the restructuring of the city to accommodate to the IOC's Olympic model.

Environmentalists have voiced disagreement with the Olympic structure and hosting requirements. In response, the IOC has become involved in ES. This involvement seeks to minimize the negative impact the Olympic Games have on the environment. With this in mind, the IOC has implemented the following ES initiatives.

The IOC's Agenda 21

The IOC followed the guidelines within the UN's Agenda 21 and created a document called: *Olympic Movement's Agenda 21* (IOC, 1999). The purpose of this

Agenda was to set actions for the Olympic Movement to effectively contribute to sustainable development, including ES (IOC, 2005). The IOC's Agenda 21 was adopted at the *Third IOC World Conference on Sport and the Environment* on October 23, 1999 in Rio de Janeiro, Brazil. The UNEP and IOC Working Group developed a partnership to implement the Olympic Movement's Agenda 21. The Agenda was applied as a source of reference for the OCOGs and the sports community at large to protect the environment (IOC, 1999).

Within this Agenda 21, the Olympic Movement recommended sport governing bodies to institute sustainable development within their policies. Further, the Agenda 21 established three key objectives (IOC, 1999). The first was to improve socio-economic conditions. This objective included the integration of sustainable development into the sport governing bodies' policies. The second objective, the conservation of resources, promoted minimizing the environmental impact concerning the infrastructure and encouraged only building sports facilities when demand could not be met by renovating existing facilities. The third objective sought to strengthen the role of major societal groups, including a movement to focus attention on women and young people (IOC, 1999).

The IOC's Agenda 21 also emphasized considerable environmental planning. ES planning was promoted as necessary when sport utilized land built or refurbished a facility. The Agenda recognized that sport facilities constituted potentially high damage sources from areas such as: land waste, landscape harm, high energy consumption, pollution and waste (Frey, Irlando & Melis, 2006). In addition, the Agenda encouraged the utilization of non-polluting means of transport; the use of public transit systems; the

reduction of energy consumption; and the use of renewable energy sources. Further, the IOC's Agenda 21 encouraged the planned use of structures for the post-Games time period (IOC, 1999). According to the Agenda's guidelines, organizations involved within the Olympic Movement, their ES responsibilities included the establishment of an environmental impact study to determine if ES was achieved based on a number of indicators outlined in the IOC's Agenda 21.

Overall, the IOC's Agenda 21 promoted ES within sport by initiating action to improve elements such as conservation and management of resources for sustainable development. All members of the Olympic Movement, including the IOC, OCOGs, NOC and IFs, were encouraged to implement ES within their policies and activities (Frey, Iraldo & Melis, 2006). The IOC entrusted their Agenda 21 to the IOC Sport and Environment Commission to enact the Agenda guidelines within the operations of the Olympic Games.

Furthering the IOC Environmental Commitment

After the environment was declared the third pillar of Olympism and the IOC's Agenda 21 was in development, in 1995 the IOC held the *First World Conference on Sport and the Environment* at the Olympic Museum in Lausanne, Switzerland, in cooperation with the UNEP. This conference lasted four days and included 120 delegates that represented governments, the UN, non-governmental organizations and the Olympic family (Mascagni, 1995). This conference discussed environmental issues, the importance of governments addressing ES and strategies to minimize or solve the environmental issues (Mascagni, 1995). It was at this time that Dick Pound, IOC

member, reiterated that the IOC's role extends beyond organizing the Olympic Games and should include being an agent that focused attention on environmental issues (Mascagni, 1995). Conference members also spoke about ensuring the ability to build facilities that were compatible with ES (Mascagni, 1995). The IOC then organized a *Second World Conference on Sport and the Environment* in 1997 in Kuwait City, Kuwait with 200 participants from 62 nations (Stivachtis, 1997). Since this time the conference has been hosted annually. At the 1999 conference in Seoul, Korea the IOC stated that the Olympic Games have to guarantee the highest safeguard and pursue environmental objectives (Frey, Iraldo & Melis, 2007). As stated earlier, it was at this 1999 conference that the IOC approved the IOC's Agenda 21 for the Olympic Movement. This action underscored further support for ES within the Movement.

The Olympic Rings – A Green Ring for 'Greening' the Games

The Olympic Charter stated that the Olympic symbol consisted of five rings including a white, red, yellow, blue and black ring (IOC, 2007). These rings initially symbolized the five parts of the world and the meeting of athletes from around the world at the Olympic Games (IOC, 2007). In another effort that promoted world unity, in 2006, the IOC emphasized the importance of educating children through sport and created the Olympic Education Programme (Cappato & Pennazio, 2006). This program encouraged the growth and development of sport within each Olympic host city. For example, the 2006 Torino Organizing Committee for the Olympic Games (TOROC) education department developed their own Olympic Education Programme. An objective within this program was to educate teachers, youth and their families with regard to the benefits

of sport. This program was created to raise awareness and encourage sport participation among youth (Cappato & Pennazio, 2006).

The Olympic Education Programme then adapted the themes assigned to the five different colors in the Olympic rings to align with the education program themes (Frey, Iraldo & Melis, 2006). The adaptations meant that the blue ring represented sport, health and education and aimed to inform youth to avoid doping and eating disorders (Frey, Iraldo & Melis, 2006). The black ring represented sports, multiculturalism, lawfulness and human rights which included education on peace and solidarity issues. The yellow ring signified sports and science, technology and communications and encouraged youth to adopt an approach to scientific and technological reading (Frey, Iraldo & Melis, 2006). The red ring signified sport and culture and aimed at enhancing youths' knowledge of history and sporting disciplines of the Olympic Games. Lastly, the green ring symbolized sport and the environment and aimed at providing knowledge on practices to reduce the impact on the natural environment (Cappato & Pennazio, 2006; Frey, Iraldo & Melis, 2006).

Beyond designating the green ring for the protection of the environment, the IOC continued to develop environmental programs that encouraged sporting society to act with environmental responsibility (Cappato & Pennazio, 2006). One key program involved a partnership with the UN that aimed at building awareness of sustainability, including ES.

IOC Environmental Programs

The IOC introduced ES within the bid process. In 1991, the IOC amended the Olympic Charter to include an environmental component within candidate host city bid documents. Also, the IOC mandated acquiring the International Organization for Standardization (ISO) 9,000 and 14,000 certificates for Quality Assurance and Environmental Management (IOC, 2005). ISO is a nongovernmental organization that set standards for products and processes. The ISO 14,000 series assisted businesses and industries to meet environmental challenges. Further, the IOC included in their official bid specification document that environmental consideration and ecological studies were required prior to the awarding of the Olympic Games to a host city. Environmental Impact Assessments (EIAs) are now carried out by applicant cities according to scientific and legal standards and are presented to the IOC in environmental reports (IOC, 2005).

The IOC and Environmental Reporting

TOROC was the first OCOG to take initiative to develop reports on sustainability. Their reporting project began in June 2003 and included sustainability reporting until 2006. Starting in 2002, this assembly met every two months to discuss the progress towards the Olympic operations (Frey, Iraldo & Melis, 2007). The aim of the assembly was to gather environmental and social Non-Governmental Organizations (NGO) to discuss TOROC's environmental policies and initiatives. More importantly, TOROC chose to implement within their reporting the *Sustainability Reporting Guidelines 2002 Edition of the Global Reporting Initiative* (Frey, Iraldo, & Melis, 2007). In the process of establishing the reporting process, TOROC created a local consultative assembly. The resulting environmental report was seen as an important communication tool that

informed both the internal and external stakeholders. On a variety of environmental issues, including a focus on the water cycle, soil use, energy consumption, waste production, ecosystems, landscape and the urban environment (Frey, Iraldo & Melis, 2007). The final TOROC environmental report provided a long term strategy and encouraged the integration of ES within the policies from the beginning of the Olympic planning process (Frey, Iraldo & Melis, 2007). From this report it was noted that public-private partnerships must be strong to enhance networking among socio-economic partners and the use of monitoring and reporting tools encouraged enduring ES effects on the host cities and regions (Frey, Iraldo & Melis, 2007).

This thesis utilized an environmental management framework to analyze the IOC's and OCOG's ES progress. The framework consists of three different levels of paradigms proposed by Raufflet (2006). To begin, the researcher will identify how ES is interpreted within this study followed by the research framework of analysis.

Definition of Environmental Sustainability (ES)

In this study, the concept of ES was defined as being a component of CSR. Carroll's (1991) definition of CSR involved "decisions and actions taken for reasons at least partially beyond the firm's direct economic or technical interest" (p. 39). Whereas Bhattacharya and Sen (2004) believed CSR was the organization's status with regards to societal and stakeholder obligations, more importantly, not everyone has the same definition of CSR. Similar to the concept of CSR there has been no single definition of sustainability; thus, each organization must define and determine actions to implement CSR, including ES. In this study, ES is interpreted based on the UN's definition, which is

to do no harm to the earth (UN, 1987). Within CSR, it is the responsibility of sport managers to ensure ES is implemented within an organization's management practices. According to Carroll (1991), ES falls under the CSR umbrella. A growing body of research examined the manner by which an organization manages its environmental impact (Dunlop, 2008; Kolk and Mauser, 2002; Dunlop, Van Liere, Mertig, & Jones, 2000; Elkington, 1994). One of the most insightful commentaries within this literature is by Raufflet (2006) who utilized paradigms to map the relation between an organization and its environment. The following section will explain the definition of a paradigm.

Definition of a Paradigm

In this study, a paradigm in ES was defined as “a constellation of concepts, values, perceptions, and practices shared by a community, which forms a particular vision of reality that is the basis of the way the community organizes itself” (Capra, 1996, p. 5). A paradigm “can be said to be a lens through which we see the world, has the power to shape, define, and dominate academic discourse through its deeply rooted assumptions and values” (Costa, 1995, p. 119). In addition, Lawson (2009)⁶ stated that “special communities-as-paradigms” (p. 100) were socially and culturally constructed. Andersson and Bateman (2000) indicated that a paradigm “affects how issues are interpreted and acted upon within an organization” (p. 553) and that “the emergence of the new environmental paradigm is important to the changing relationship between business and the natural environment” (p. 553). Finally, a paradigm has also been described as a belief system (Willis, 2007), that can be identified within an organization's values.

The concept of paradigms, according to Hazlett, McAdam, Gallagher (2005), involved “those shared beliefs, assumptions, and values that guide a community of theorists and practitioners” (p. 32). A paradigmatic lens allows a researcher:

- To facilitate the understanding of many perspectives associated with knowledge management, including organizational and prevailing societal norms
- To generate viable integrated interdisciplinary research directions
- To provide a basis for comparative analysis
- To help formulate a firm foundation for the design of knowledge management processes and methods (Hazlett et al., 2005, p. 32).

A paradigm lens has also identified a community’s shared ideas which is characterized by a shared belief system, and guides the members in doing what they do. This study followed Shafer’s (2006) statement that a paradigm offers a means to describe the belief system utilized to shape the way communities think about their subject matter and how the community defines and resolves problems.

Paradigms in ES

Since the development of Agenda 21, the management literature illustrated multiple examples of paradigms/models created in an effort to understand the realities of ES. An example of a paradigm created in the 1970’s included the internationally used New Environmental Paradigm (NEP) scale developed by Dunlap, Van Liere, Mertig, and Jones (2000) to measure “ecological beliefs” (Dunlap, 2008, p. 10). The NEP Scale is the world’s most widely used environmental paradigm scale. The scale utilized a standard Likert measurement scale (for example, agree – disagree) based on questions, concerning such areas as support for pollution control and resource conservation. The NEP Scale included 15 items to be measured. This scale was subsequently updated in 1992 to include measurements on items such as “the degree to which respondents feel modern

industrial society is exempt from ecological constraints” and “the likelihood of eco-crises” (Dunlap, 2008, p. 9). Overall, the NEP Scale was able to measure an organization’s commitment to the natural environment.

The use of phases within the paradigms has become one “generally accepted ... method to improve understanding and further the practice of environmental management” (Kolk & Mauser, p. 24). For example, paradigms developed in the 1990s included Elkington’s (1994) examination of the response to environmental problems that led to the developmental stages that included ES: ignorance, an awakening, denial, guilt reduction, tokenism, conversion, and integration. Also Shrivastava and Hart’s (1995) examination of organizations and environmental problems established three categories of ES response: the band-aid, the more serious, and the deep change. Further, Rondinelli and Vastag (1996) classified environmental policies into four sectors, including reactive, proactive, crisis prevention, and strategic. Meanwhile, Grant (1998) identified three characteristics, including: goals and values, resources and capabilities, and organizational structure. Grant (1998) linked the corporation’s strategy to the external and internal demands and indicated that any strategy must have values and goals that must be shaped by the resources available to the organization.

The applicability of paradigms developed for ES in the 1990s were found to be difficult to utilize in practice due to the complexity of ES (Kolk & Mauser, 2002). Thus, more advanced paradigms, with a more comprehensive focus on ES, were developed in the new millennium (Kolk & Mauser). These paradigms have been developed “to enlarge insights into the greening of business, and the complex web of factors involved” (Kolk & Mauser, p. 24).

Similarly, Korhonen (2003) utilized a paradigmatic method to examine business ethics regarding CSR, including the environmental dimensions. This particular paradigm indicated that “two stages that are required for a shift away from the current dominant unsustainable paradigm and toward a more sustainable paradigm. The first stage is paradigmatic, metaphoric and normative. The second stage is ... analytic, descriptive and positive.” More specifically the method encourages a paradigm shift from the current dominant unsustainable paradigm towards a more sustainable paradigm. This paradigm shift allowed the researcher to see the actions of social actors and public and/or private organizations carried with a common set of thought processes and practices.

Shafer (2006) identified a paradigm model by developing a NEP that was compared to the established Dominant Social Paradigm (DSP) model. The core values of the DSP consisted of economic growth and domination over nature. There was a need for the NEP as the DSP values were seen as “being displaced by the realizations that the natural world possesses intrinsic value and that man must live in greater harmony with nature” (Schafer, 2006, p. 126). Supporters of the NEP acknowledge that humans severely impact the environment and the world is approaching major environmental crisis (Shafer, 2006). Shafer’s model promoted a paradigm shift to ES.

Another example is the Environmental Performance Model (EPM) created by Xie and Hayase (2007) and adapted by Mallen, Stevens, Adams, and McRoberts (2009) for the sport context. This model provided categories of ES that included criteria for environmental management performance and environmental operational performance. Within the environmental management performance there were two themes. The first theme involved the environmental organizational system and the second theme involved

the environmental activities, stakeholder disclosure and relationships. In operational performance there were five themes including: countermeasures against global warming, ES issues in sport event production, environmental risk, environmental tracking, and measuring environmental inputs and outputs. The aim of this model was to determine the environmental impact (EI) of specific organizational activities in sport that degrade the environment and the environmental performance (EP) to limit and/or offset each impact. This work followed the opinion of Shriberg (2002) that ES involved an evolving baseline of performance and the opinion of Hazlett, McAdam, and Gallagher (2005), that researchers who study a particular discipline require a model to address the problem.

According to Siebenhuner and Arnold (2007), applying ES to an organization, there are two types of changes, incremental and radical changes. “While incremental changes encompass limited adaptations in processes.....radical improvements require far-reaching changes in processes and product concepts, which can also aim at a switch to completely new forms of satisfying customer needs” (Siebenhuner & Arnold, 2007, p. 342). Incremental and radical changes can be found within CEM. CEM is an organizational process whereby an organization attains knowledge that is absorbed, generated, disseminated and then implemented. CEM is also a process to improve ES understanding; the process included classifying environmental behaviour and followed with an evaluation of the organization’s environmental management performance. This CEM process has caused the popularity of staged and/or phased models. Kolk and Mausser (2002) suggested models increase management productivity. Models also inform organizations to set environmental goals in order to arrive at a prominent ES future (Kolk & Mausser, 2002). The phases and models act as a progression tool for the organization

to integrate ES into a policy or strategy. Berry and Rondinelli (1998) suggested for an organization's environmental management to be successful the organization must recognize its employees, shareholders and environmental groups. As well with the recognition, communication is important to indicate the organization's environmental performance. CEM moves beyond the basis of environmental management and identifies the organization's environmental performance. To expand further within the CEM models and phases, this study has identified Raufflet's CEM model as a key framework to explain the IOC's environmental management and performance indicators.

Raufflet (2006) developed the CEM model to aid researchers to map organizations and their relations with the environment. This model has three CEM paradigms, including the incremental, adaptive and radical paradigms. The incremental environmental management paradigm indicated an improved "use of natural resources within existing systems....and redesigning the organization so that it imitates an ecosystem" (Raufflet, 2006, p. 68). The adaptive paradigm indicated an aim to redesign internal operations for ES. In this paradigm, firms rethink their positions, and partner with other firms. The radical environmental management paradigm was deemed the ultimate ES paradigm as firms took action to reformulate their organizational operations for ES (Raufflet, 2006). Each paradigm is described in *Table 1.2: Raufflet's Corporate Environmental Management Paradigms*. The different paradigms represent an organization's environmental management limitations and contributions. The three paradigms "are not mutually exclusive; rather, they are interconnected and often represent three levels in a continuum" (Raufflet, 2006, p. 63).

Table 1.2: Raufflet's Corporate Environmental Management Paradigms

Paradigm of CEM	Incremental	Adaptive	Radical
1. Way of framing the issue	How does the firm reduce its environmental impact at the operational level?	To what extent does the firm operate as a system?	To what extent does the firm contribute to the evolution of society toward more-or-less polluting modes of production and consumption?
2. Thought processes	Adjustment: Implementation of strategies	System: adaptation and logic of interdependence and connectedness	Reformulation of mission and competencies according to the needs of the biosphere
3. Challenge for the firm	Adjusting to specific consumer or legal pressure groups	Adopting the ecosystem's production mode of functioning	Questioning current modes of production and consumption and their role in these modes
4. Representation of the natural environment	Natural environment as a supply depot and a waste repository remote from the firm	Natural environment as a living space and as an ecosystem (no comma?)	Natural environment as a sphere interacting with society, natural environment as a stake in struggles between groups in society
5. Illustrations from the literature	To implement a system to control polluting atmospheric emissions; ISO 14001	Industrial ecology to conceive the firm as a flow system based on organic functioning	To replace a polluting and unequal mode of production and consumption with a healthier one

(Ruafflet, 2006, p. 64)

Raufflet's model included five dimensions that aid the researcher to determine the specific CEM paradigm utilized by an organization (see Table 1.3). The first dimension, *the way of framing the issue*, enabled the researcher to examine how to manage ES. The researcher can look at the framing of the issue through such areas as ES policies for renewing energy, protecting the natural habitat, and reducing pollution. When a researcher determines the use of this dimension by an organization, questions are asked that include how the organization views the environment. For example, a question that aids to determine if an organization utilized the incremental lens, asks: How has the firm reduced its environmental impact at the operational level? The question to determine if an organization utilized the adaptive paradigm lens, asks: To what extent does the firm operate as a system? And finally, the question to determine if an organization utilized the radical paradigm lens, asks: To what extent does the firm contribute to the evolution of society toward more-or-less polluting modes of production and consumption? These questions are applied to each of the five dimensions in the CEM (see Table 1.2).

The second dimension, the *organization's thought process* concerning environmental management enabled the researcher to examine how an organization conducted ES initiatives they set out when framing the ES issue. The thought process recognized the assumptions inherent within each of the three CEM paradigms. When examining, the researcher can look at an organization's thought process by examining an organization's goals, such as the effectiveness of environmental committees, the numeric impact of ES and the organization's ES commitment. For example, the fundamental thought process of the radical paradigm focuses upon reformulation of organizational beliefs that place the needs of the biosphere as central to all practices (Raufflet, 2006).

The third dimension is *the challenge for the firm*. For instance, the legal system played a major role for the Olympic Games. Due to the large size of the Games, the sporting event created a significant impact to the environment; therefore many environmental groups keep a close watch on the development of the infrastructure and daily activities needed for the Games. When examining, the researcher can look at an organization's expectations in regard to ES that result from the assumptions in the challenges. For example, the incremental paradigm, which simply seeks to reduce impact and expectations relate to adjustments from consumer or legal pressures as opposed to self-initiated challenges that arise from a radical perspective.

In the fourth dimension, *representation of the environment*, Raufflet (2006) drew upon earlier work by Catton and Dunlap (1986) who proposed that society's view of the environment captures three main functions – supply depot, waste repository, and living habitat. When examining, the researcher can look at how an organization represents the natural environment. For example, within the incremental paradigm the natural environment is represented as a supply depot and a waste repository remote from the firm. The firm uses the environment for their production; however, it releases the waste into the environment. For adaptive, the natural environment is represented as a living space comparable to an ecosystem that is utilizing solar energy and technology. Lastly for radical, the natural environment is represented as a sphere interacting with society. Therefore, there is very little to no impact to the natural environment in this dimension (Raufflet, 2006).

Finally, the fifth dimension is *the illustrations from the literature*. When examining an organization, the researcher can look at the commitment to ES through

activities such as the impact of assessments and monitoring systems. For example, Raufflet identified that when an organization receives ISO certification to implement ES, the organization fits the incremental level. The IOC moves forward to the adaptive level when implementing further ES initiatives by committing their daily procedures to environmental management. When an organization dedicates their organizational values and goals to ES they move forward to the radical paradigm.

Together, Raufflet's (2006) CEM five dimensions and three paradigms frame the complex issue of ES based on a variation of assumptions and new ways of asking questions about organizational environmental practices. In this way, the CEM provided a valuable framework with which to examine environmental management. Raufflet's paradigms represent the ES commitment on a continuum within organizations. Raufflet's CEM guides an evaluation to determine the paradigm that best fits an organization's ES commitment during a certain time period. Thus, this framework is utilized in the methods of analysis in this study.

Overall, within the environmental literature, there has been "a lack of agreement on what, how and where to measure" (Kolk & Mauser, 2002, p. 26) and thus, a cohesive body of ES literature does not exist (Etzion, 2007). Dunlap (2008) purported that a "paradigm war" (p. 15) is emerging in the literature as there are now various paradigm interpretations on the environmental situation. In response to this "war," Dunlap (2008) promoted environmental action that is dependent upon elements such as leadership that "promotes scientific understanding of ecological conditions" (p. 15) and "policy makers to recognize and acknowledge the reality of ecological deterioration" (p. 15).

The literature also suggested that research was needed in order to establish data and to facilitate understandings to advance ES practices (Ilinitch, Soderstrom, & Thomas, 1998; Olsthoorn, Tyteca, Wehrmeyer, & Wagner, 2001). Thus, this study sought to analyze the IOC's data and OCOG's data concerning ES. The data collection and analysis methods are outlined in the Methods chapter.

This thesis will contribute to the reader's understanding of the Olympic Movement's involvement in ES. More specifically the IOC's commitment to ES as well the OCOG's responsibility to implement ES under the IOC's leadership. The study will further enhance the reader's understanding of Raufflet's CEM model and its application to the Olympic Games.

CHAPTER THREE: METHODOLOGY

The Olympic Movement has recognized the impact sport events have on the environment and therefore, the IOC and OCOGs have engaged with ES. This study sought to develop understandings concerning the interpretation and enactment of ES within the Olympic Movement. The purpose of this study was to examine the concept of ES in the context of the Olympic Movement, specifically the IOC and OCOGs from 1994 to 2008.

This study involved case study, qualitative research methodology. Case studies tend to occur in an inductive manner as generalizations and hypotheses are developed from the examination of data (Willis, 2007). Also, case studies are heuristic in the way they bring discovery of new meaning and extend the reader's knowledge and confirm the known information (Willis, 2007). Yin (2003) stated that a case is used to gain a greater understanding of individual and organization phenomena. Case study research is utilized when a phenomenon exists and when a holistic in-depth investigation is needed (Yin, 2003). The actual case provided a product for analysis that contributed to answering questions such as 'how' and 'why' (Yin, 2003). A thorough investigation was completed with the use of qualitative methodology (Stake, 1995). In this study, qualitative methodology followed the guidelines outlined by Willis (2007) and involved a situated or contextual understanding. The Olympic cases meet these guidelines as they are naturalistic in nature due to the real people, situations and environment in which data was derived (Willis, 2007).

The purpose of this qualitative multi-case study was to examine the concept of ES in the context of the Olympic Movement. Specifically this study examined the

interpretations of ES by the IOC and OCOGs from 1994 to 2008. The research questions that guided this study are:

Research Question 1:

How has the concept of ES been defined by the IOC from 1994 to 2008?

Research Question 2:

How has the concept of ES been defined by the OCOGs from 1994 to 2008?

Research Question 3:

How has the concept of ES been enacted by the OCOGs from 1994 to 2008?

Research Question 4:

How does the IOC's definition of ES compare to the OCOGs' definition and enactment of ES from 1994 to 2008?

This methods chapter outlines the frameworks that underscore the data collection and data analysis process utilized within this examination.

General Overview of the Data Collection and Analysis

This research utilized a content analysis methodology for data collection and analysis. According to Krippendorff (2004) content analysis is a grounded method that enabled the researcher to explore data. Content analysis in this study was defined by Krippendorff (2004) as a “research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use” (p. 18).

The content analysis was applied to a qualitative multi-case research design. Case study research tended to seek to identify themes or categories of behavior or events rather than proving relationships or the testing of hypotheses (Algozzine & Hancock, 2005). In addition, this type of research provided researchers with an opportunity to develop in-depth understandings of the particular case being analyzed. To undertake a case study properly it is critical to develop a conceptual framework (McGloin, 2008).

In this case, the concept was framed with the time period of 1994 to 2008 and with documents that consisted of available journal articles or sources of media that involved the Olympic Games and ES. A total of 307 documents were collected. The total document count consisted of 30 journal articles, six OCOG bid documents, 225 media reports, 17 OCOG environmental reports, 12 IOC reports on the natural environment and 17 documents written by environmental organizations and other public sources. However, following the data collection the number of documents that were found to be pertinent to this case study included a total of 134 documents, including three journal articles, six OCOG bid documents, 79 media reports, 17 OCOG environmental reports, 12 IOC reports on the natural environment and 17 documents written by environmental organizations and other public sources.

The role of the researcher was to collect and analyze documents concerning the IOC and OCOGs to determine the interpretations of ES. The data collection and analysis process followed an adaptation of the five-staged process by Wolfe, Hoeber and Babiak (2002). The Wolfe, et al., staged process included a determination of the sample, the text to be analyzed, the themes to be coded, the themes' factors or sub-themes, and the coding mode. This staged process was adapted in this study to include a sixth stage: the determination of the theoretical framework used for the data analysis (see Table 1.3). The following section outlines the methods utilized in this study that were framed with this staged process.

Data Collection

In this study, the first stage of the content analysis process involved the determination of the sample. The sample consisted of the IOC and the Olympic Games from 1994 - 2008. All available documents collected included journal articles and other sources of media that involved the IOC, the Olympic Games, and the natural environment or ES from 1994-2008. The specific Olympic Games cases involved in this study were:

- 1994 Lillehammer Winter Olympic Games
- 1996 Atlanta Olympic Games
- 1998 Nagano Winter Olympic Games
- 2000 Sydney Olympic Games
- 2002 Salt Lake City Winter Olympic Games
- 2004 Athens Olympic Games
- 2006 Turin Winter Olympic Games
- 2008 Beijing Olympic Games

The year 1994 was selected as the starting time period for the content analysis as that year pertained to the 1994 Lillehammer Winter Games. The 1994 Lillehammer Winter Games were the first Olympic Games to acknowledge ES as a key component to hosting the Olympic Games (Greening the Games, 2003). Each Olympic Games starting from this time period until the 2008 Beijing Olympic Games were part of this content analysis study.

The second stage in the content analysis process as identified by Wolfe, Hoeber and Babiak (2002) involved the determination of the recording unit. It was determined that “a recording unit can be a word, sentence, paragraph, or any other meaningful unit of text” (Wolfe, Hoeber and Babiak, 2002, p. 285). Text to be recorded in this study was consistent with an adapted version of the phases of the Olympic cycle as defined by Hillier (1998). Hillier (1998) indicated that these phases included the bid phase, the preparation phase, the event phase, and the post-event phase. In this research a pre-event

phase was added to the list of phases to fully capture the data. Documents in the pre-event phase included IOC documents that related to ES, such as the IOC mission statement, policies, Olympic Movement's Agenda 21, the Manual on Sport and the Environment and relevant peer reviewed journal articles. Bid phase documents involved IOC candidature documents, OCOGs' bid documents and environmental reports. Preparation phase documents included environmental reports by the IOC, OCOGs and community as well as peer reviewed journal articles. Event phase documents included environmental reports by the IOC, OCOGs and community. Finally, post-event phase documents included IOC and OCOG environmental reports and relevant peer reviewed journal articles. Patton (2002) agreed that documents such as official statements, board conferences and annual reports can be compared. In addition, peer reviewed journal articles were seen as an important source of data that will be utilized to determine patterns and develop theories (Patton, 2002). Within the Olympic Games literature any sentence or paragraph that discussed ES and the natural environment was included within the data collection. Data regarding the environmental impact on a host Olympic city was also collected. Further, the IOC and OCOGs' documents on their ES policies, procedures and practices were collected.

Data Analysis

The third stage in the content analysis process as identified by Wolfe, Hoeber and Babiak (2002) is the data analysis component. This stage required the determination of the themes to be coded. The fourth stage in the content analysis process involved determining the theme's factors or sub-themes. In this study the themes and sub-themes

were framed with the SE-EPM by Mallen et al., (2009) discussed in the review of literature. The data collected was condensed by utilizing the following themes and sub-themes:

Environmental Management Performance Category:

Theme: The Environmental Organization System

Sub-themes included:

- the event environmental policy - it's existence, distribution, environmental targets, adoption of LEED, ISO, or Ecoflag programs
- the environmental committee's involvement, and
- the environmental funding

Theme: The Environmental Activities, Stakeholder Disclosure and Relationships

Sub-themes included:

- the level or scope of environmental activity disclosure
- the range, quantification, and comparability of the disclosed ES information
- the environmental disclosure method, and
- the relationships developed to aid to protect the natural environment

Environmental Management Performance Category:

Theme: The Environmental Operational Countermeasures

Sub-themes included:

A - Countermeasures Against Global Warming:

- the use of renewable energy, heat generated from incinerating refuse, saving electricity, installing energy-saving equipment, shifting transport from truck to train or ship, environmentally friendly automobiles.

B - Countermeasures Against Environmental Issues:

- reducing, reusing and recycling wastes, reducing the use of package material, implementing green purchase and implementing lifecycle assessment of products, utilizing environmental marks or labels, implementing enviro-concerned design, implementing environ marketing, and checking suppliers for enviro products.

C - Countermeasures Against Environmental Risk:

- proactive in countering environmental risk by establishing an environmental risk management system, reducing use of chemicals, measuring discharge of toxic chemicals, reducing the use of chlorofluorocarbon, training to deal with environmental emergencies, sorting out related environmental laws and regulations.

Theme: Environmental Tracking:

Sub-themes included:

- proactive ES tracking of energy use, environmental financial resource use, general wastes, water drainage, air and water pollution, greenhouse gases and compliance.

Theme: Indicators and measurement Items: Inputs and Outputs

Sub-themes included:

A - Calculated inputs:

- use of oil, gas, electricity, water, raw materials, paper, packaging and chemicals

B - (different size than above) Calculated outputs:

- general waste, industrial waste, carbon dioxide emissions, sulfur oxide emissions, nitrogen oxide emissions, chemical and biochemical oxygen demand, water drainage, and pollutant releases

The fifth stage in the content analysis process as identified by Wolfe, Hoeber and Babiak (2002) involved determining the coding mode. In this study, the human data coding mode followed the a priori themes outlined above. Human coding is conducted by the researcher as opposed to the data being managed by a computer software program.

The sixth stage in the content analysis process was an adaptation added to the Wolfe, Hoeber and Babiak (2002) process. This adaptation involved determining the theoretical framework used in the analysis. According to Booth (2003), “the critical question for sport historians is which theory?” (p.124). Following Booth’s critical question, a theory enabled the research questions to be answered most accurately. In this study, two frameworks were utilized for the analysis, Raufflet’s (2006) CEM paradigm model, and the Mallen et al., (2009) SE-EPM. Both of these theoretical frameworks are outlined in the review of literature. The data analysis sought to identify the paradigm, or combination of paradigms, utilized by the IOC and OCOGs.

The nature of the qualitative study allowed the data to emerge and is open to adapting to new methods. The research evolved to identify a new paradigm within the CEM. The data supported the inclusion of a new fourth paradigm, termed the detrimental paradigm within the CEM model. The addition of this paradigm followed Gladwin, Kennelly, and Krausse’s (1995) view that “new paradigms tend to emerge from entirely new fundamentals ...” (p.877). According to Avis, Drysdale, Gregg, Neufeldt and

Scargill (1983) detrimental is defined as damaging; injurious, and/or harmful. The IOC and OCOG data revealed that claims of damaging ES practices exist and therefore it is important to note that the detrimental paradigm has been included within Raufflet's three paradigms.

Raufflet's model was selected to analyze this study because the framework was the most recent model (2006) and interpreted as the best fit with the IOC and OCOG data. Raufflet's model is framed by earlier models that have been discussed and consequently is more advanced. This model allowed the researcher to categorize the IOC and OCOGs according to a particular paradigm from 1994 to 2008. The paradigm that was identified with the IOC and OCOGs during the staging and declared phase enabled the researcher to determine the IOC's and OCOG's ES process. This was demonstrated within the findings and discussion section of this thesis.

A limitation within Raufflet's CEM model is that it is a continuum model. A continuum model suggests that organizations progress to the highest category; however, this was not assumed within this study. Other models used typologies that allowed for more flexibility as to the extent organizations do not just have to fit one category (Kolk & Mausser, 2002). Another limitation is the difficulty for existing models to exhibit a specific organizations environmental behaviour. CEM models "have limited suitability for specific situations, and insufficiently reckon with organizational and strategic complexities" (Kolk & Mausser, 2002, p. 25). As well, models primarily focus on environmental management opposed to environmental performance indicators. The models approach is limited with encompassing everything within environmental management. Yet, according to Kolk and Mausser (2002), continuum models do have a

certain degree of flexibility. This flexibility was shown as this thesis concluded that there was a need for a fourth paradigm, the detrimental paradigm. This paradigm was added in order to fully identify performance indicators. In addition, this study indicated the predominantly used paradigm as well as indicating how the other paradigms punctuated the IOC and OCOGs interpretations of ES. Further, another model was used to support the findings. This model, the SE-EPM, established the performance indicators emphasized, including the themes and sub-themes. Table 1.3 provides a synopsis of the methods utilized in this study.

Table 1.3: Content Analysis Synopsis Based on an Adaptation of the Wolfe, Hoeber and Babiak (2002) Five-Stage Process

<p>Data Collection</p> <p>1. <u>Determine the sample</u></p> <ul style="list-style-type: none"> - Boundary of inclusion years: 1994 – 2008 - the Olympic case studies include: <ul style="list-style-type: none"> 1994 Lillehammer Winter Olympic Games 1996 Atlanta Olympic Games 1998 Nagano Winter Olympic Games 2000 Sydney Olympic Games 2002 Salt Lake City Winter Olympic Games 2004 Athens Olympic Games 2006 Turin Winter Olympic Games 2008 Beijing Olympic Games
<p>2. <u>Text to be analyzed</u></p> <ul style="list-style-type: none"> - Text to be analyzed will address the phases of an adapted version of the four phases of the Olympic cycle defined by Hillier (1998). Hillier's phases include the bid phase, preparation phase, event phase and the post-event phase. Hiller's phases were adapted to include a pre-event phase. In this study, these phases were sub-divided into the overall declared phase and enacted phase. <p><u>Declared Phase:</u></p> <ul style="list-style-type: none"> - <i>pre-event phase</i>: involve IOC documents relating to ES, such as the IOC missions statement

policies, Olympic Movement's Agenda 21 and the Manual on Sport and the Environment

- *bid phase*: involve IOC candidature documents, OCOG's bid documents and environmental reports

Enacted Phase:

- *preparation phase*: involved environmental reports by the IOC, OCOG's and community
- *event phase*: involved environmental reports by the IOC, OCOG's and community
- *post-event phase*: involved IOC and OCOG reports and peer reviewed journal article

- The documents consist of data from 1994 to 2008, and the cases are considered one unit of analysis, the text consists of any journal article or source of media that involves the Olympic Games and ES.
- "A recording unit can be a word, sentence, paragraph, or any other meaningful unit of text" (Wolfe, Hoeber and Babiak, 2002, p. 285).

Data Analysis

3. Determine the themes to be coded

Data displayed in chart form guided by an adaptation of the Sport Event – Evaluation Performance Measure (SE-EPM) by Mallen, Stevens, Adams and McRoberts (2009, under review). The data collection remained open and flexible for new categories to be introduced to the SE-EPM should the need arise. The themes included:

Environmental Management Performance Category:

Themes: The Environmental Organization System, and The Environmental Activities, Stakeholder Disclosure and Relationships

Environmental Operational Performance Category:

Themes: the Environmental Operational Countermeasures; Environmental Tracking; and Indicators and Measurement Items including Inputs and Outputs

4. Determine the themes' factors or sub-themes

For explicability purposes, data will be displayed in chart form guided by an adaptation of the SE-EPM by Mallen, Stevens, Adams and McRoberts (2009, under review). The themes' factors or sub-themes will be determined within the SE-EPM Evaluation Categories. The SE-EPM Evaluation Categories involve the following:

Under the Environmental Management Performance Category:

Theme: The Environmental Organization System

Sub-themes

(including the event environmental policy - it's existence, distribution, environmental targets, adoption of LEED, ISO, or Ecoflag programs, the environmental committee's involvement and environmental funding).

Under the Environmental Management Performance Category:

Theme: The Environmental Activities, Stakeholder Disclosure and Relationships

Sub-themes

[stakeholders include: administrators (board of directors, staff and volunteers), athletes, coaches, officials, delegates, host city, interpreters, and sponsors]. Involves the level or scope of environmental activity disclosure, the range, quantification, and comparability of the disclosed information, the environmental disclosure method, the relationships developed to aid to protect the natural environment.

Under the Environmental Operational Performance Category:

Theme: The Environmental Operational Countermeasures

Sub-themes

A - Countermeasures Against Global Warming by using renewable energy, heat generated from incinerating refuse, saving electricity, installing energy-saving equipment, shifting transport from truck to train or ship, environmentally friendly automobiles.

Sub-themes

B - Countermeasures Against Environmental Issues in Sport Event Production by reducing, reusing and recycling wastes, reducing the use of package material, implementing green purchase and procure, implementing lifecycle assessment of products, utilizing environmental marks or labels, implementing enviro-concerned design, implementing environ marketing, and checking suppliers for enviro products.

Sub-themes

C - Countermeasures Against Environmental Risk: How proactively is the sport event countering environmental risk by establishing a environmental risk management system, reducing use of chemicals, measuring discharge of toxic chemicals, reducing the use of chlorofluorocarbon, training to deal with environmental emergencies, sorting out related environmental laws and regulations.

Under the Environmental Operational Performance Category:

Theme: Environmental Tracking: How proactively are the games tracking energy use, environmental financial resource use, general wastes, water drainage, air and water pollution, greenhouse gases and compliance.

Under the Environmental Operational Performance Category:

Theme: Indicators and measurement Items: Inputs and Outputs

Sub-themes

A – Calculated inputs (use of oil, gas, electricity, water, raw materials, paper, packaging and chemicals

B - Calculated outputs (general waste, industrial waste, carbon dioxide emissions, sulfur oxide emissions, nitrogen oxide emissions, chemical and biochemical oxygen demand, water drainage, and pollutant releases

5. Determine the coding mode

There are three coding systems - they include human and computer coding and a combination of the two (Wolfe, Hoeber and Babiak, 1991). This research involved human coding.

6. Determine the theoretical framework used for the data analysis

Two frameworks are utilized in the data analysis of this study – Raufflet's (2006) CEM (see Table 1.0 in the Review of Literature section of this thesis) and the Mallen et al. (2009) SE-EPM (also described in the Review of Literature section of this thesis).

Research Validity and Reliability

Within qualitative research, validity was noted as vital to ensure trustworthiness. According to Krippendorff (2004) the “validating evidence, which is the ultimate justification of the content analysis” (p. 30) and is only “a content analysis be validatable in principle” (p.39). Validity is achieved as it is developed with the support of theoretical frameworks. The SE-EPM tool allowed individuals to answer the research questions by reading the data charts in the results section of this thesis.

To present the data, Mays and Pope (1995) indicated that validity:

Is to combine a qualitative analysis with some quantitative summary of the results. The quantification is used merely to condense the results to make them easily intelligible; the approach to the analysis remains qualitative since naturally occurring events identified on theoretical grounds are being counted (p. 112).

Within the Results section, data was condensed into charts and was displayed in a percentage format to make the data comprehensive to its readers. Validity was also achieved by using three factors of trustworthiness established by Guba (1981). The three criteria of trustworthiness include; truth value, applicability, and consistency.

The first criterion of trustworthiness, truth value, was determined by the researcher’s confidence and the truth of the findings. One source of discovering the truth value was having the research peer reviewed (McGloin, 2008). The researcher used external auditors in the form of a thesis advisory committee. The committee reviewed the data analysis procedures by editing early drafts and offering their insights on the analyzed data. Applicability also validated trustworthiness. Applicability enhanced the transferability of the research (McGloin, 2008). The SE-EPM tool enabled the researcher to expand into generalized theories; this can then be used by the broader research population. Lastly, Guba (1981) identified consistency as being a vital component to

trustworthiness. Consistency provided the opportunity for the research to be replicated. An audit trail was performed to ensure accurate data collection and that the data was analyzed properly. Raufflet's theoretical framework enhanced the validity of this research.

Validity is addressed by triangulating the data. The researcher utilized document analysis and the credibility was increased through the number of documents collected, 304 documents were collected and 134 pertained to the study and utilized for analysis. The researcher used their own voice to indicate paradigm interpretations and provided examples for each decision made from the data. Detailed description of the data samples was also provided (See Appendix A).

The content analysis process should enable the opportunity for the research to be replicated. This research complied with reliability because the data is recorded and analyzed on the basis that others can replicate it. Reliability is also an important aspect to contain within the research study. "Reliability refers to the demonstration that the operations and procedures of the research inquiry can be repeated by other researchers which then achieve similar findings, that is, the extent of findings can be replicated assuming that, for example, interviewing techniques and procedures remain consistent (Mays & Pope, 1995, p. 81). The four design tests to ensure reliability, is for the researcher to conduct confirmability, credibility, transferability, and dependability. Credibility is defined by Mays and Pope (1995) to retain rich, detailed meaningful descriptions of data which has been previously discussed and was achieved. Groundedness was necessary to ensure that the research was not composed from the researcher's imagination, and was therefore credible. Case studies come from real life

situations furthering the credibility of the study (McGloin, 2008). Reliability was achieved in this study through grounded theory. According to Mays and Pope (1995) grounded theory allowed the data to be processed through a systematic account, for example, recording words, ideas and actions while at the same time the researcher has a structured system for collecting and analyzing data. The study followed an apriori categorization. The first round of data was minimized into the SE-EPM themes and sub-themes and was further categorized into Raufflet's five dimensions and that data was further categorized by one of the four paradigms. This approach is also supported by Riege (2003), who stated that case studies require a certain level of prior theory. Case study method is based on theory building and construction, the purpose of which is to understand a real-life phenomenon.

Transferability is data that is substantial enough for an individual to conduct the research and achieve similar results and "assurance of meaningful parallelism of findings across multiple data sources" (Mays and Pope, 1995, p. 83). The recording units included a total of 307 documents which were collected for analysis and 134 documents which were utilized for analysis. The data was displayed in 45 charts for the readers to view the raw data and to allow them to interpret the data.

According to Mays and Pope (1995) dependability relies on the research to be consistent and the research data to contain stability. This is achieved through feedback from key informants that overview the data analysis and the final results, to determine if changes are needed within unclear aspects of the research. This is also referred to as peer debriefing, "such as presenting the data analysis and conclusions to colleagues on a regular basis during the data analysis stage so as to foster subsequent credibility" (Mays

and Pope, 1995, p. 83). The key informants are a team of researchers, who continually communicate on methodological decisions, which has been stated earlier, in the form of a thesis committee. The researcher did not receive ethics approval because human subjects were not used in this study. Therefore, validity and reliability has been integrated within the research study. The following section will discuss the study's findings, discussion and conclusion.

CHAPTER FOUR: FINDINGS

This study examined the IOC and the OCOGs interpretations of ES from 1994 to 2008. The IOC's interpretations were derived based on their declared phase data. The OCOG's interpretations were based on their declared phase data and then their enacted phase data. Two frameworks are used in the data analysis, including Raufflet's (2006) CEM paradigm dimensions, and the Mallen et al. (2009) SE-EPM. First, as each data item was examined, the data analysis interpretations were recorded in a chart format that visually displays the volume of data that fits within each of the Raufflet's CEM five dimensions and three paradigms (See Table 1.2: Raufflet's Corporate Environmental Management (CEM) Paradigms). The five dimensions include: ways of framing the issues; the organization's thought process behind environmental management; the ES challenges for the firm; how the IOC and OCOG's represented the natural environment; and examples that illustrated ES in literature. The three paradigms include: the incremental paradigm that involves a reduction of the environmental impact and indicates a reactive behavior for ES; the adaptive paradigm that involves an organization aligning their designs in the form of an ecosystem; and the radical paradigm that involves organizations transforming their operations to the needs of the biosphere (Raufflet, 2006).

During the analysis, the researcher became aware of the need for a new paradigm. This new paradigm was necessary to represent an organization's behaviour that harms or damages the natural environment during the course of organizational activities (Avis, Drysdale, Gregg, Neufeldt and Scargill, 1983). Within the initial stages of data collection, the data suggested the Olympic Games have damaged and/or harmed the natural

environmental through the hosting of the Games. Thus, a new paradigm, the detrimental paradigm, was added to Raufflet's (2006) CEM model during the analysis.

The predominant paradigm for the IOC and the OCOGs is then determined. Next, the data analysis incorporated the SE-EPM themes and sub-themes in the data and these findings are presented at the end of each chart. Finally, the congruence between the IOC and OCOGs paradigm is determined.

There are eight Olympic cases between 1994 and 2008 and each case required five charts - one chart for each of the five paradigm dimensions for a total of 40 Olympic case data analysis charts. In addition, the IOC case gave rise to five charts, again one for each of the five paradigm dimensions. In total, the analysis resulted in 45 charts which can be viewed in Appendix B.

This chapter now presents the findings concerning the IOC's declared data which is used to develop a response to Research Question One: How has the concept of ES been defined by the IOC from 1994 to 2008. The following section describes the interpretations made and the understandings of the IOC's definition of ES. This is followed by the findings of the OCOG's declared phase data and then the OCOG's enacted phase data.

The IOC's Interpretation of ES

An analysis of the IOC's data revealed the predominant use of the adaptive paradigm lens with respect to ES (see Table 1.3 for a review of the paradigms and Appendix A for the data interpretations). To illustrate this finding, examples based on each CEM dimension are provided. In the first Raufflet (2006) CEM dimension, the framing of the ES issue, it was found that 100% of the IOC environmental management

data was framed with the adaptive paradigm. The adaptive paradigm involved rethinking practices in order to realign an organization with its environment. This was illustrated as the IOC initiatives established environmental guidelines for inclusion within the *Candidate Procedure and Questionnaire* used by prospective host cities in their bid development. This action exemplified an expectation by the IOC that host cities must consider environmental practices (DIOC:6) and demonstrated ES within their Games bid. A more advanced radical paradigm lens was not exhibited as ES requirements were not mandated to ensure the standard of a high level of comprehensive ES.

Based on the second CEM dimension, ES thought processes, a majority (65.4%) of the IOC's data fit within the adaptive paradigm (see Table 1.4 and Appendix A). This was illustrated as the IOC announced their commitment to the environment to the world through the charter, conferences, seminars, environmental reports, and partnerships. Examples included that in the fall of 1991, the IOC, in partnership with UNEP, amended the Olympic Charter to highlight the importance of environmental stewardship in the staging of the Olympic Games (D1996:9). In addition, the IOC Sport and Environment Commission and the Olympic Solidarity collaborated on the organization of the World Conference on Sport and the Environment. The Olympic Solidarity was created in 1961 by the IOC. This committee guided the NOCs to develop sport through IOC programmes (IOC Olympic Solidarity Funding, nd). The world conference is held bi-annually in different locations around the world. To date the IOC has conducted their 8th conference in Vancouver, Canada, on March 29 -31, 2009 (DIOC:5). Also, a regional seminar on sport and the environment is organized annually by the IOC, with the first seminar being held in 2002 in Beijing. This initiative promoted a policy of ES in all areas associated

with the Olympic Games (DIOC:6). A final example is that the IOC made a commitment to the protection of the environment and sustainable development, whereby they would “place sport everywhere at the service of the harmonious development of man, with a view to encouraging the establishment of a peaceful society concerned with the preservation of human dignity” (DIOC:1, p. 24).

Although the findings indicated that the predominant paradigm used by the IOC with regard to their thought processes is the adaptive paradigm, the data also illustrated that the thought processes were punctuated with the radical paradigm. The radical paradigm represented an organization that transforms its production and consumption systems in order to synchronize its functions with the environment (Raufflet, 2006). A total of 30.8% of the data on the IOC’s thought process fit the radical paradigm. This was illustrated as the IOC advanced a number of ES partnerships, declarations, and programs. For example, during the Lillehammer Games, the IOC and UNEP signed a cooperation agreement stating common goals and actions set in place for sport and the protection of the environment. Also, the IOC placed the environment as a third pillar of Olympism (Cantelon & Letters, 2000; Frey, Iraldo, & Melis, 2007, IOC, 2005, IOC, 2007; Environment the New Dimension 1993). In addition, at the 1996 Centenary Conference, President Juan Antonio Samaranch noted that environmental responsibilities were a key tenet of the Olympic Movement (D2000:26). Also, the IOC implemented the OGGI study in 2001. The purpose of this study was to examine the reduction of the size, cost and complexity of the Games (DIOC:1). The study involved a methodological framework for standardizing the sustainable development impact of the Games and involved an 11 year period of study for each Olympic Games. Participation in the study required each OCOG

to report to the IOC on 150 sustainable development criteria and provide indicator reports of baseline, pre-Games and post-Games results (Holden, MacKenzie, & Van Wynsberghe, nd). The first Games to be involved in the OGGI study was the 2008 Beijing Games. All Games that have been awarded since the 2008 Beijing Games have joined the OGGI study (Holden, MacKenzie, & Van Wynsberghe, nd). However, due to the long time frame and self-assessment reporting process, the impact of this study has yet to be determined. These examples illustrate that the IOC's thought processes during the time period of study are adaptive and punctuated with the radical paradigm.

An application of the third CEM dimension by Raufflet (2006) involved challenges for the firm. In this dimension the IOC's predominant paradigm is detrimental (66.7% of the data) as the IOC faced public scrutiny due to the environmental impact of the Olympic Games. This scrutiny involved challenges from environmental groups, such as Greenpeace which suggested that the IOC lacked an environmental commitment.

Greenpeace made the following suggestions to advance the IOC's commitment to ES:

That the IOC incorporate a requirement of stringent environmental standards as a requirement rather than an option and incorporated into all aspects of the Games.

That the IOC punish violators who do not meet the required environmental standards, whether it involves the host city themselves, contractors or sponsors.

That the IOC and host cities reward sponsors and contractors who have the best environmental practices.

That the IOC and host cities provide the environmental data to the public.

That success is determined if it brings forth a long-term environmental legacy (D2008:4, p. 149).

The IOC's ES response has not yet satisfied groups such as Greenpeace.

In addition, the IOC represented the incremental paradigm with 33.3% of the data that concerned ES challenges. The incremental paradigm reflected a management approach whereby an organization reduced its impact through the efficient use of inputs and the reduction of outputs. Examples included that the organization operated by the IOC called the Olympic Coordination Authority (OCA) provided funding for costs of the world conference on sport and the environment. However, only a small budget of \$70,000 USD was earmarked for this conference. In contrast, Olympic Solidarity paid thousands of dollars in expenses for three NOC delegates just to attend (DIOC:6). This indicated a movement to financially support the promotion of ES, but with a low level of funding. Also, the IOC stated that the OCOGs needed to utilize sports equipment produced from non-polluting or recycled materials; however, no measures were taken to ensure any follow through on this ES initiative (DIOC:6).

An application of the fourth CEM dimension by Raufflet (2006) considered the representation of the natural environment by the organization. In this dimension, 80% of the IOC data fit within the adaptive paradigm as the IOC worked towards representing the environment as a living space and ecosystem (Raufflet, 2006). The following statement illustrated the IOC's commitment to this end:

The Olympic Games should not:
 Pollute water
 Discharge solid wastes
 Emit toxic gases which destroy the ozone layer or greenhouse gases
 Pollute or damage the soil
 Contribute to deforestation
 Reduce biodiversity
 Harm the landscape either physically or aesthetically
 Reduce renewable resources
 Waste resources, whether raw materials, energy or water
 Marginalize a group or section of the population
 Undermine culture and beliefs

Damage local economic activities (DIOC:1).

Rules to be respected for events held in the natural environment:

Areas that contain special ecological, historical or cultural value should be avoided

Trees should not have to be cut down, if so should be planted elsewhere or after the event

Choose solid ground in order to ensure stability and a secure base for installations

Clear vegetation from as small area as possible

Provide a suitable number of water supply points, portable toilets and bins for the number of people attending the event

It is vital to avoid white elephants

Facilities should have a variety of uses, preference should be given to installations that can be dismantled (DIOC:1).

Moreover, 20% of the IOC data fit the incremental paradigm within the fourth dimension.

For example, within the IOC's Agenda 21 the Olympic Games were required to avoid contaminating underground or service waters and to not jeopardize general water supplies, as well as to minimize all forms of pollution (DIOC:1). However, the IOC set an initiative to avoid environmental encounters as opposed to tackling the ES issue directly. When it came to the IOC representing the natural environment, the data indicated the predominant use of the adaptive paradigm, punctuated with the incremental paradigm.

The findings for Raufflet's fifth CEM dimension involved illustrations from the literature. It was here that the IOC shifted to the predominant use of the new paradigm, the detrimental paradigm (50%) (see Appendix A). This was illustrated as ES problems arose and the IOC did not enforce decision-making based on ES. For example, during the Sydney Games the OCA did not follow through with their initial ES initiatives; thus, the OCA failed to meet their own environmental guidelines. Also, during the 1998 Nagano Games, the Organizing Committee was pressured by the International Ski Federation to move the ski event from an existing course to a newly renovated longer course to make a

more challenging course. In this case, the IOC did not guide and support the Nagano Organizing Committee for the Olympic Games (NAOC) to enforce a response that aligned with ES. The response was left up to NAOC and the course was eventually adapted and impacted on environmentally sensitive natural area (Steele, 1996). However,

NAOC decided to cut the number of cross country courses to three from four, because of the goshawk nests in that area. After public scrutiny NAOC also moved some of the Alpine skiing events from Mt. Iwasuge in Shiga Kogen to existing courses at other locations; after environmental monitors recommended that new courses should not be built for the downhill (D1998:6; D1998:7).

Further, the data illustrated additional examples whereby problems associated with the “green” Games concept was directly attributed to the OCA, such as in Sydney, where the OCA ignored the requirement to utilize 100 percent renewable energy under Energy Australia’s Pure Energy scheme. According to Ian Kiernan, the Clean Up Australia chairman, the OCA’s actions diluted Sydney’s initial environmental guideline (D2000:5).

Also in Raufflet’s fifth dimension, 37.5% of the data fit within the adaptive paradigm (see Appendix A). For instance in 1992, for the first time in the history of the Olympic movement, the IOC asked cities bidding to host an Olympic Games to say how they proposed to address environmental issues (D2002:23; DIOC:9)

Also, following the 1994 Games, the bidding process sought cities that engaged in environmental stewardship by conducting impact analyses, re-using facilities, minimizing pollution, avoiding disrupting wildlife and destroying land (DIOC:10).

Lastly, 12.5% of the IOC’s illustrations from the literature data exhibited the incremental paradigm. An example is that the IOC encouraged the OCOGs to obtain ISO certification (DIOC:6). However, the IOC or the ISO certification does not mandate specific elements within ES and thus the ES program was established and evaluated by

each OCOG independently, without consideration of a baseline of ES; thus losing an element of consistency.

Overall, the analysis of the IOC declared data from 1994 to 2008 indicated that the concept of ES is defined predominately with an adaptive paradigm lens. This adaptive paradigm was represented in 54.3% of the overall data, with the radical paradigm at 17.4%, the detrimental paradigm at 17.4%, and the incremental paradigm dimensions at 10.9% of the data (see Table 1.4). This means that the IOC predominately framed the ES issue, illustrated their thought processes, managed challenges for the firm, represented the natural environment and illustrated within their literature the adaptive paradigm, moderately punctuated with the radical, detrimental and incremental paradigms.

A further analysis of the IOC data using the SE-EPM illustrated that the majority of the IOC data (77.8%) concentrated on environmental management performance indicators. This finding indicated a gap as the IOC predominately sets policies within their bid requirements, Agenda 21 and Manual on Sport and the Environment and annual conferences. The IOC did not guide the OCOGs to emphasize environmental operational tools to comprehensively and consistently track, measure and respond to ensure the implementation of ES.

Table 1.4: Percentage and Frequency of Documents reflecting IOC Corporate Environmental Management Paradigms

CEM Dimensions		IOC				IOC (Percentage)			
		Detrimental Paradigm	Incremental Paradigm	Adaptive Paradigm	Radical Paradigm	Detrimental Paradigm	Incremental Paradigm	Adaptive Paradigm	Radical Paradigm
Framing the Issue	N	0	0	1	0	0	0	100%	0
Thought Process	N	0	1	17	8	0	3.8%	65.4%	30.8%
Challenge for the Firm	N	4	2	0	0	66.7%	33.3%	0	0
Representation of the Natural Environment	N	0	1	4	0	0	20%	80%	0
Illustrations from the Data	N	4	1	3	0	50%	12.5%	37.5%	0
Total Number of Data Sources:		8	5	25	8	17.4%	10.9%	54.3%	17.4%

Note: The frequencies indicated in the table represent specific data sources derived from the sample of 134 documents. It is possible that more than one data source can be coded within the same document.

The OCOGs' Interpretation of ES in the Declared Phase

A shift in the data analysis now moves from the IOC to the OCOGs. Although each OCOG is a separate entity, they have many similarities and the cases from 1994 - 2008 are considered as one unit of analysis in this study. The OCOGs' data emerged in two phases, the declared phase (including the bid and pre-event phase data) and enacted phase (including the preparation, event, and post-event phase data). The analysis began with the OCOG declared phase data and then was followed by the data analysis of the enacted phase data.

The analysis of the OCOGs' declared phase data was used to develop a response to Research Question Two: How has the concept of ES been defined by the OCOGs from 1994 to 2008? The findings that provided insight concerning the Research Question are now presented.

An application of the first dimension of the CEM by Raufflet (2006) to the OCOGs' declared data involved considering the way the ES issue was framed. The findings revealed that the OCOGs fit predominately in the adaptive paradigm in this dimension (see Table 1.5 and Appendix A). In an adaptive paradigm the organization was seen as striving to design their operations of that of an ecosystem. A total of 50% of the OCOG declared data was represented with this dimension. There were multiple examples that illustrated this paradigm as all candidate cities post 1994 Lillehammer Games provided an environmental component within their bid document. The following examples are from these OCOGs' bid documents. The 2002 Salt Lake City Organizing Committee stated that the "Environment is the third principle of Olympism along with sport and culture, and environment will be a major focus of the 2002 Games" (D2002:9,

p.1). Also, according to the 2006 Torino Organizing Committee, the provincial authorities sanctioned drainage and waste water systems, and planned to manage and monitor waste processing and treatment plants (D2006:9). Further, the Beijing Organizing Committee created a number of ES programs, including: the provision of Beijing Municipality Methods of Reinforcing Energy Conservation, the provision of Beijing Municipality Methods of Energy Saving Supervision, the provision of Beijing Municipality Guidelines on Implementation of Trial Methods on Clean Production Audit and the Beijing Programme of Circular Economy Development (D2008:4).

In addition, a total of 35.7% of the data in this dimension displayed the radical paradigm. The radical paradigm consisted of improvements that required a change in processes to reform the organization's operations to satisfy customer needs (Siebenhuner & Arnold, 2007). For example, the 2002 Salt Lake City Games goal included hosting the first Olympic Games that caused no net increase in air pollution emissions (D2002:10).

Also, the Beijing Organizing Committee's goal was to

deliver a successful Games without impacting negatively on ecosystems, and to stage a truly 'Green Games'. The commitment included supporting environmental education and awareness raising, cooperation with environmental NGOs, instituting environmental management systems, sustainable transportation during the Games, eco-design for the venues, green procurement (environmental-friendly purchasing of materials), green accommodation, tree planting and green marketing (D2008:4, p.29).

Overall, the OCOGs framed the ES issue predominately with the adaptive paradigm lens, punctuated with the radical paradigm lens followed by the incremental paradigm (see Table 1.5).

An application of Raufflet's (2006) second CEM dimension involved the OCOGs' thought processes. The findings revealed that in this dimension the OCOGs

predominately utilized the adaptive paradigm lens (85.5%) (see Table 1.5 and Appendix A). This paradigm was illustrated within several examples as OCOGs discussed adjustments and adaptations to allow for ES. In these responses, the OCOGs exhibited an understanding that they are unable to tackle the environmental issue alone and they solicited support to aid their ES success. For example, the Torino, Sydney, Salt Lake City, Athens, Nagano and Beijing Olympic Games stated ES initiatives in their bid documents that tended to follow the IOC's lead in terms of ES policies and programs. Also, each OCOG partnered with an environmental organization to enable them to achieve what they called the "Green Games" status. For example, the 1994 Lillehammer Organizing Committee met regularly with representatives of the Norwegian Society for the Conservation of Nature and the Ministry of the Environment and environmental authorities of the Olympic municipalities as mutual co-operation was a precondition for successful environmental protection (D1994:2). Also, the 2002 Salt Lake City Organizing Committee (SLOC) partnered with seven Federal Environmental and Health Agencies, five local agencies, five state agencies and two private agencies (D2002:8). Two major goals for SLOC was zero waste and zero emissions (D2002:25). Further, TOROC's environmental policy data outlined goals that involved minimum negative impacts, an environmental legacy, and the annual publication of an environmental statement (D2006:11). In addition, TOROC's Bid Committee set up an Environmental Action Plan to improve environmental quality throughout the area and sought to provide detailed analysis in order to draw up an accurate environmental balance sheet (D2006:9).

In addition to this dimension, the OCOGs exhibited some indications of the incremental paradigm (7.2%). The incremental paradigm encompassed limited

adaptations in ES processes. Examples involved basic ES activities, such as planting trees, preserving natural habitat and setting goals to avoid negative environmental impact at the incremental level. This was exemplified as Sydney's Millennium Parklands project at Homebush included the planting of two million plants and 65,000 native trees (D2000:15). Also, TOROC's goals included the halting of urban expansion, the upgrade and reuse of facilities, the conversion of unused industrial areas and the use of a natural urban design system (D2006:5). There was no indication of the radical paradigm whereby the OCOGs integrated ES within all thought processes. Overall, the OCOGs' thought processes predominately fit the adaptive paradigm as illustrated by the examples above.

An application of the third CEM dimension by Raufflet (2006) to the OCOGs' declared data involved challenges for the firm. The majority of data (46.9%) fit the adaptive paradigm; this was closely followed by the incremental paradigm (43.8%). The analysis revealed that the OCOGs aimed to emulate an ecosystem's production mode of functioning. Generally the OCOGs indicated that they would meet this aim by utilizing renewable energy, managing waste and pollution and adhering to environmental protection laws. For example, the 2004 Athens Organizing Committee's investment in renewable energy source was underscored by the Energy Programme of the Community Support Framework and expressed within the Development Law No. 1892/90 (D2004:6). TOROC considered the eco-friendliness of products, such as the quantity and quality of packaging (PVC, tetrapak, aluminum, waste management, choice of materials and supplier selection) (D2006:4). The 2008 Beijing Organizing Committee indicated that they would have clean fuels in 90% of public buses and 70% of taxis (D2008:4). The 2008 Beijing Committee stated that 85% of Olympic venue air-conditioning would

involve ozone-friendly refrigerants and that all Olympic-related building projects would include 40-50% green space (D2006:3). Also, the 2008 Beijing Committee stated that they would adhere to the Environmental Protection Law of the People's Republic of China and "the pollution prevention facilities of a construction project must be designed, constructed and put in use in sync with the main body of the project" (D2008:12, p.1).

Within the application of the third dimension, the incremental paradigm was found to follow closely behind the predominant adaptive paradigm. The findings revealed that the OCOGs indicated that they would adhere to the challenges of environmental protection laws and have Games' sponsors conform to the OCOGs environmental standards. The following examples fit within the incremental paradigm (and not a higher level paradigm) because the OCOGs did not provide a target number to minimize the environmental impact. For example, companies involved with the 1994 Lillehammer Organizing Committee had to deliver environ-friendly products, such as having very little packaging and not containing any harmful substances (D1994:2). Also, the Atlanta Committee stated a commitment to interconnect IOC policies and municipal laws as shown by the following statement:

The Atlanta Committee for the Olympic Games (ACOG) has risen to the challenge of supporting IOC environmental policy and will establish some new environmental benchmarks during the staging of the Games.....ACOG will comply with all environmental laws and regulations and will be sensitive to the protection of our natural resources (D1996:9, p. 1).

Additionally, challenges from environmental groups indicated some utilization of the detrimental paradigm lens (9.4%). For example, during the 2004 Athens bid there were expressed fears that the Games would be boycotted by athletes because of the air pollution levels (D2004:5). Also in Athens, protesters rallied against the construction of

venues because of its contribution to air pollution, damage to the mountains and downgrading of the environment (D2004:3). Further, in the Beijing metropolis of 13 million people, severe air pollution issues were feared due to the coal-fired factories and boilers, vehicular emissions and the use of low-grade coal as the main energy source in private homes (D2006:10). However, although there were some detrimental paradigm indications, the OCOGs predominately indicated the adaptive paradigm, strongly punctuated with the incremental paradigm when it came to ES challenges for the firm. Therefore, the OCOGs reacted to the challenges by implementing ES strategies.

An application of the fourth CEM dimension by Raufflet (2006) to the OCOGs' declared data involved the representation of the environment as an ecosystem. In this dimension the OCOGs' declared data predominately fit within the adaptive paradigm (see Table 1.5 and Appendix A). A total of 82.2% of the data in this dimension illustrated the adaptive paradigm lens. For instance, the 1994 Lillehammer Organizing Committee:

Encouraged the use of public transport system during the Olympics and had asked the Norwegian authorities to facilitate the production and sale of less environmentally harmful fuels. As 1,500 buses were used to transport spectators and athletes during the Olympics, one goal was to reduce the harmful effects to the environment caused by this activity (D1994:2, p. 259).

Also, in Sydney, the energy demands were reduced with the use of natural lighting, ventilation, insulation, motion detector lighting, day light sensors and solar panels. The Athlete's Villages, which consisted of 665 houses, were supplied with electricity and hot water from photovoltaic solar panels on each house (D1996:1). In addition, over 100,000 trees were planted along with 350,000 shrubs (D1996:1). At the 2004 Athens Games, solar energy and wind energy was used to heat water and provide electric lighting and air conditioning. Buildings were designed with energy saving and bioclimatic considerations

(D2004:6). At the 2006 Torino Games, renewable energy using solar energy systems and active heat recovery systems were installed (D2006:5). Additionally, heat generators fuelled with chips and refrigerating machinery aided to reduce energy demands (D2006:5). The 2008 Beijing Organizing Committee initiated a campaign called “For our Natural Splendor” in partnership with the China Environment Culture Promotion Association and affiliated with State Environmental Protection Association (D2008:4). Also in Beijing, emphasis was placed on energy efficient-buildings, the adoption of water-conserving devices, along with solar and geothermal resources (D2008:12).

In addition, a total of 15.6% of the OCOGs’ declared data represented the environment using the incremental paradigm. For example, the OCOGs focused their ES commitment on reducing emissions by banning cars on the roads and implementing recycling systems (D2002:11). Also, during the 2002 Salt Lake City Games, spectators parked their vehicles within two 7,000-space car parks and the SLOC provided shuttle service. The city of Turin electric car program was organized so that the environmentally friendly fleet of cars and minibuses were available for tourist transport after the Games (D2006:9).

The OCOGs’ declared data also illustrated the detrimental paradigm (2.2%) in the fourth dimension. For example, it was stated that:

When the IOC awarded the Olympic Games to Atlanta in 1990, the sound environmental planning and management in the staging of the Games was not a component of the Olympic bid process (D1996:9, p. 1).

Also, in 2008, the Beijing Organizing Committee allowed waste water to be admitted to the central urban sewage treatment that could not be treated by biological and chemical

techniques to meet the pre-established environmental standards set by the Beijing Bid Committee (D2008:12).

During the declared phase, the OCOGs' predominant paradigm strongly represented the environment with the adaptive paradigm lens. The OCOGs generally demonstrated a comprehensive environmental management commitment, as illustrated with the examples above. However, the incremental and detrimental paradigm lens punctuated the OCOGs' interpretations as they represented the environment in the declared phase of the Games.

An application of the fifth CEM dimension by Raufflet (2006) to the OCOGs' declared data involved illustrations from the literature. Based on this component, the OCOGs fit the adaptive paradigm (47.8% of the data) as they conceived the Games to have "organic" elements. This was illustrated as the OCOGs created environmental committees, set environmental objectives, and promoted environmental awareness within the host communities. For example, the 2000 Sydney Organizing Committee's five environmental objectives included: energy conservation and the use of renewable sources, water conservation, waste reduction, safeguards for human health with appropriate standards for air, water and soil, and the protection of significant natural and cultural environments (D2000:3). Sydney's Olympic Organizing Environmental Committee consisted of four permanent employees and two on loan from the U.S. The committee presented a plan to meet the Kyoto Protocol, an international agreement meant to reduce the emission of greenhouse gases and cut emissions by seven percent (D2002:4; D2002:21). The Torino regional government of Italia Nostra, ProNatura, Legambiente and World Wildlife Federation (WWF) set up the Olympic Games Watchdog Committee

to evaluate projects involved in the organization of Games (D2006:4). In addition, the government of the People's Republic of China set up a committee called Unilever Century Woods to create a green bid for the 2008 Games and launched a five-year program called *Clean Water Green Mountains for China Programme* (D2008:8).

However, the OCOGs' declared data indicated that assurances were not always upheld and 26.1% of the data was found to fit the detrimental paradigm. For example, Atlanta citizens protested against the radioactive material utilized within the Athletes Village as it posed a risk for the more than 14,000 athletes and officials (D1996:7). Also, Sydney protestors, the 'Bondi Warriors', threatened violent protests against the building of a temporary 10,000 seat stadium for Beach Volleyball and the area had to be closed to the public for six months (D2000:27). In addition, the Australian Conservation Council, the New South Wales Nature Conservation Council and the Total Environment Centre that initially participated in the bid then distanced themselves due to misrepresentations concerning the environmental plans (D2000:1). Further, within the 2004 Athens Games: "The city's bid proposals to the International Olympic Committee (IOC) fail to assess any damage to the environment or long-term effect on life there, the international group Greenpeace said" (2004:6). Although the Athens Olympic Committee promised to expand and renovate the subway system by 2000 to reduce air pollution caused by vehicles (D2004:10), Athens' citizens believed there would be a repeat of the 1984 Los Angeles Olympic Games where there were smog problems (D2004:8).

Additionally, 17.4% of data identified the OCOGs with the incremental paradigm within the fifth dimension. This was shown as the 2008 Beijing Organizing Committee established 'Green Olympics' mascots, including The Beibei (flying fish – which

represented clear water), the Jingjing Panda (which represented environmental protection and ‘Green Hills’), Yingying (a Tibetan that protected antelope – which represented the concept of ‘Grass-covered ground’), Nini (a flying swallow – which represented the ‘Blue Sky’) and the Huanhuan (which represented the Olympic flame) (D2008:4). However, the use of mascots was interpreted as not actually making an impact on the ES of the Games, but providing ES awareness.

There was a limited use of the incremental paradigm within the fifth dimension of the incremental dimension (17.4% of the data). An example included, during the 2002 Salt Lake City Games, spectators were told to park their vehicles at two 7,000-space car parks, and SLOC stated they will ensure shuttles will be available, and once the Games are finished the parking lots will be removed and returned to its natural state (D2002:11).

Also, there was very limited evidence of the radical paradigm as only 8.7% of the data described an organization replacing their mode of production and consumption with a healthier one (Raufflet, 2006). Sydney’s Olympic Games exemplified this dimension. The 2000 Sydney bid was considered a green bid with environmental guidelines (D2000:8) environmental initiatives replaced production with a healthier system as they promoted themselves as the “Green Games” (D2000:26).

The OCOGs’ predominant paradigm in the declared phase within the fifth component was adaptive (47.8%). However, the OCOGs’ interpretations of ES were punctuated with other paradigms. There was limited use of the detrimental paradigm (26.1%), incremental paradigm (17.4%) and radical paradigm (8.7%).

Overall, in the declared phase, the OCOGs displayed an interpretation of ES with an adaptive paradigm lens. This finding was supported as 71.3% of the OCOGs data in

the declared phase demonstrated an adaptive paradigm (see Table 1.5). In addition, the analysis found that 52% of this data was coded within the SE-EPM environmental management performance indicators themes and sub-themes. This meant that during 1994–2008 the OCOGs emphasized the establishment of ES committees and targets. The findings show that during this time the OCOGs did not emphasize environmental operational performance indicators, such as tracking and quantitatively measuring the comprehensive environmental impact of the Games.

Table 1.5: Percentage and Frequency of Documents reflecting OCOG Declared Phase Corporate Environmental Management Paradigms

CEM Dimensions		OCOG-Declared (Bid Phase)				OCOG-Declared (Bid Phase) (Percentage)			
		Detrimental Paradigm	Incremental Paradigm	Adaptive Paradigm	Radical Paradigm	Detrimental Paradigm	Incremental Paradigm	Adaptive Paradigm	Radical Paradigm
Framing the Issue	N	0	2	7	5	0	14.3%	50%	35.7%
Thought Process	N	0	5	59	5	0	7.2%	85.5%	7.2%
Challenge for the Firm	N	3	14	15	0	9.4%	43.8%	46.9%	0
Representation of the Natural Environment	N	1	7	37	0	2.2%	15.6%	82.2%	0
Illustrations from the Data	N	6	4	11	2	26.1%	17.4%	47.8%	8.7%
Total Number of Data Sources:		10	32	129	12	5.5%	16.6%	71.3%	6.6%

Note: The frequencies indicated in the table represent specific data sources*derived from the sample of 134 documents. It is possible that more than one data source can be coded within the same document.

The OCOGs' Interpretation of ES in the Enacted Phase

The analysis now shifts to the OCOGs' enacted phase data as the researcher sought to develop a response to Research Question Three: How has the concept of ES been enacted by the OCOGs from 1994 to 2008? To begin, an important interpretation was made as the OCOGs' enacted phase data illustrated a paradigm shift. This shift occurred as the OCOGs' declared phase data predominately utilized the adaptive paradigm lens from 1994 to 2008; then, the OCOGs' enacted phase data regressed as it predominately utilized the incremental paradigm from 1994 to 2008. The following findings demonstrated this paradigm shift by the OCOGs.

An application of the first CEM dimension by Raufflet (2006) involved the way the ES issue was framed by the OCOGs during the bid enacted phase. A total of 100% of the OCOGs' data in this dimension framed the ES issue with the incremental paradigm lens. For example, during the 2006 Torino Games, domestic waste in the city increased to 5.85 million tons with 16,000 tons developed daily. The 2008 Beijing Organizing Committee set goals to separate garbage and to build six recycling plants in Beijing (D2008:4). Also, the Industrial Development Bureau partnered with the Beijing Organizing Committee to ensure the industries incorporated with the Games reused, reduced, recycled and established new sustainable industrial projects (D2008:4). It was noted that an adaptive or radical paradigm was not exhibited in this dimension as there was no indication that the OCOGs established the means to ensure the ES policies were achieved.

An application of the second CEM dimension by Raufflet (2006) involved the OCOGs' thought process during the enacted phase. The thought processes were found to

fit within the incremental paradigm. Examples included that the 1996 Atlanta Games and 2008 Beijing Games focused on recycling and transportation systems. Also, the 2002 Salt Lake City Games created partnerships to maximize ES awareness. Further, the data indicated that during the 1996 Atlanta Games, the thought processes involved environmental impact reductions as:

Environmental impacts have been minimized wherever possible, reuse and recycling will play a central role in post-Games restoration efforts and Olympic development can be viewed in many cases as urban revitalization (D1996:9, p.1).

Also, the Atlanta Organizing Committee for the Olympic Games (ACOG) created a system to run 2,000 buses on 1,300 routes daily and another 4,200 cars and vans shuttled people to and from the Olympic Village. Also, the ACOG sent announcements to local citizens, instead of going to work to either telecommute or go on vacation during the Games (D1996:13). Further, the 2000 Sydney Organizing Committee, along with the OCA, the National Parks and Wildlife and Bicentennial Park created the Millennium Parklands project at Homebush. This project included the planting of two million plants and 65,000 native trees and developed up to 40 km of cycle trails (D2000:15).

Environmentally friendly transportation included the use of compressed natural gas rather than gasoline in Salt Lake City (D2002:11). Beijing scrapped 3,926 diesel buses and 30,000 taxis and updated all vehicles to their National Third Stage Emission Standard (D2008:2). Further Beijing used low emissions (low, zero or electric) vehicles, reinforced public transportation, and offered free rides to Olympic ticket holders for a total of 51 days (D2008:4).

These examples illustrated that the thought processes of the OCOGs during the enacted phase concerned the implementation of ES strategies. However, the thought

processes did not move to develop comprehensive strategies to ensure ES was fully implemented. Thus, examples were also found whereby the OCOGs misjudged the ES issue and did not ensure the successful implementation of ES. For example, in Atlanta hundreds of trees were planted to make the Games more scenic; however, they were planted in a hostile urban environment and left them neglected and the consequence was that one-fourth of the 3,000 trees died by the end of the summer (D1996:6). Also, protestors in Atlanta declared that radioactive cobalt, and other material were stored in a nuclear reactor at Georgia Institute of Technology, a serious security risk to the Games (D1996:7). Further, NAOC's announced plan to utilize 400 buses fuelled by compressed natural gas in fact only resulted in the manufacturing and availability of 83 buses before the Games began (D1996:8). In addition, ACOG made an agreement to only use snow-packing vehicles between 5:00am and 6:30am and from 3:30pm to 5:00pm during the Olympic Games. However, the snow-packing vehicles were used outside of the designated hours. Also, the NAOC agreements on lighting were violated and the Environment and Nature Conservation Division of the Nagano prefectural government provided notification of the violations; however, no measures were taken to correct this situation (D1998:2).

The examples above illustrated that in many instances the OCOGs did not successfully follow through with their environmental plans in the enacted phase and therefore the thought processes were punctuated with the detrimental paradigm (8.7% of the data). As a result, at a number of Games, the natural habitat was destroyed and pollution was generated during the two week period of the Games. While the majority of

the paradigm lens used in this second dimensions was incremental (64.1%), this lens was punctuated with both the adaptive lens (27.2%) and detrimental paradigm (8.7%).

An application of the third CEM dimension by Raufflet (2006) involved challenges for the firm. In this dimension the OCOGs fit within the incremental paradigm. The challenges that the OCOGs faced involved pressures for ES. Examples of legal pressures include:

The Atlanta Committee for the Olympic Games (ACOG) recognizes the importance of incorporating environmental considerations into its overall planning for the 1996 Centennial Olympic Games. Consistent with this recognition, ACOG will comply with all environmental laws and regulations and will be sensitive to the protection of our natural resources – The Atlanta Committee for the Olympic Games Environmental Policy Statement (D1996:9, p.1).

Norwegian Government will agree to abide by, as a priority, the IOC Rules and by-laws throughout the duration of the Olympic Winter Game. There are no laws or regulations or customs in Norway that might limit, restrict or interfere with the Games in any way (D1994:1, p.148)

Further, the 2006 Torino Organizing Committee's environmental plans indicated that all relevant structures would be planned and built in accordance with national laws and regulations (D2006:9).

An example of ES pressures that involved a sponsor included that when 2008 Greenpeace ran a high-profile campaign against Coca-Cola's use of climate changing hydrofluorocarbons refrigerators at the Games, Coca-Cola subsequently phased out the use of those refrigerators in Olympic venues (D2008:4). Also, Coca-Cola and Samsung pulled their vehicles from the torch relay due to protests from environmentalist groups (D2006:15).

Further, environmental groups took OCOGs to court to prohibit them from describing the Games as "green" or to use legal action to access environmental

information. The lawsuits indicated that the OCOGs' interpretation of ES was punctuated with the detrimental paradigm (see Table 1.6). For example Greenpeace took SLOC to Federal Court in an effort to stop them from describing the Games as being 'green friendly' (D2000:9; D2000:11). Also, Greenpeace took legal action under S.52 of the Trade Practice Act (1974) against the Sydney's Organizing Committee and OCA for utilizing ozone-depleting substances (D2002:23). In addition, Green Games Watch 2000 had to use the freedom of information laws to get government documents, which was noted as bringing into question their environmental integrity (D2002:23).

There were also examples whereby the OCOGs punctuated the ES challenges dimension with the adaptive paradigm (see Table 1.6). For example, one challenge involved the 1998 Nagano Organizing Committee and the lack of guidance received from the IOC. The NAOC was asked by the International Ski Federation to raise the start of the men's downhill race further up the mountain. However, the NAOC denied the request because their environmental concerns outweighed the course requirements. The IOC did not enforce the concept of ES, but left the final decision to be made by Japan (D1998:4) and in the end the course was adapted. In addition, the 2008 Beijing Organizing Committee announced a 10-year plan to make improvements in air and water quality and to increase the sanitation in the streets as, according to World Bank, Beijing has the most severe air pollution in the world (D2008:7). The 2008 Beijing Organizing Committee also attempted to achieve an adaptive paradigm by implementing technology so that the Games could operate with similar functions of an ecosystem. BOCOG reduced illegally logged timber and food pesticide use (D2008:4), and developed solar-café's with state-of-

the-art climate-friendly refrigeration and cooling technology, an energy-saving light bulbs project and non-disposable chopsticks promotion project (D2008:4).

Overall, the OCOGs' dominant paradigm within the third dimension of challenges to the firm was incremental (47.8% of the data). This lens is punctuated with both the detrimental paradigm (41.3%) and the adaptive paradigm (10.9%).

An application of the fourth CEM dimension by Raufflet (2006) involved the representation of the natural environment. In this dimension, during the enacted phase, the OCOGs predominantly fit the adaptive paradigm (80.6%) (see Table 1.6).

Illustrations of this paradigm lens were made as the OCOGs focused heavily on minimizing the environmental impact with strategies such as solar energy and other ES technologies. An example would be the 1998 Nagano Organizing Committee implemented a new method to freeze the ice for the luge and bobsled tracks to reduce the amount of chlorofluorocarbons (D1998:4). The 2000 Sydney Organizing Committee ensured water was heated by solar energy and the media centre used a ventilation system applying solar technology (D2000:3). The 2006 Torino Games verified adoption of bio-architectural criteria and the use of eco-compatible materials free of polluting substances (D2006:6). Also, the 2008 Beijing Organizing Committee utilized beam-pipe illumination technology that guided the sun's rays into underground facilities (D2008:4). In addition, the Beijing Olympic Village included a vacuum glass tube solar collection system installed on the buildings roofs to heat the tap water and save 2,400 tons of coal per year (D2008:4).

The OCOGs also represented the environment with the incremental paradigm (12.9%) as well as the detrimental paradigm (6.5%). This is illustrated as the OCOGs

represent the environment with what Raufflet (2006) called a supply depot and a waste repository remote from the firm. For example, the environmental group Green Games Watch 2000 indicated that 200 cubes of contaminated soil were stored under plastic sheeting at the Sydney Games Newington site and a 50 cm layer designed to form a protective barrier over toxic waste was also contaminated (D2000:13).

Lastly, the OCOGs provided detrimental paradigm examples within the fourth dimension. One instance included that from 1996 to 2002 the urban development surrounding the mountain areas in Salt Lake City increased by approximately 50% (D2002:26). Also, during the 2008 Beijing Games, 40,000 tons of steel scrap waste was made during the construction of the National Indoor Stadium (D2008:2).

So far, the enacted OCOGs' data represented the environment predominately with the adaptive paradigm lens, punctuated with the incremental and detrimental paradigm (see Table 1.6). However, this lens changed in the fifth CEM dimension. An application of the fifth CEM dimension by Raufflet (2006) to the OCOGs' enacted phase data involved illustrations from the literature. In this dimension, the literature indicated that the coordination and control to implement the ES promises was enacted predominately with the detrimental paradigm lens (63.2%) (see Table 1:6). The data demonstrated examples whereby the OCOGs were unable to follow through with their environmental initiatives. For instance, the U.S. Environmental Protection Agency recorded a 15% decline in air pollution levels in Atlanta during the Olympic year (D1996:5). Also during these Games, proper ventilation in indoor facilities was lacking and the heat caused athlete dehydration (D1996:4). Environmentalists referred to the Atlanta Games as the disposable Games, because most structures were dismantled, which fails to qualify as

ecologically sustainable (D2002:27). Greenpeace monitored the Sydney Games preparations closely and denounced it as an environmental disaster (D2000:35). The International Ecological Monitoring Group, Guard Fox Watch, stated that the post Olympic Games resulted in an increase in pollution, disruption of wildlife, greater greenhouse emissions and energy wastes (D2006:1). The 2006 Torino Organizing Committee concluded with a 7.1% increase in waste from 2000 to 2005 as 1,212 tons of waste was collected, 566,010 waste was produced in the communes with competition venues and the total of 103,516 tons of CO₂ for the Olympic Games and 15,000 for Paralympics Games were measured (D2006:9). There were also 118 tons of paper waste, 29 tons of plastic, 115 tons of organic fraction, 10 tons of glass and cans, 21 tons of wood, and 920 tons of non-recyclable fraction during the 2006 Torino Games (D2006:1). Environmental groups, such as Greenpeace, protested the OCOGs' ES procedures or lack thereof as the natural environment was negatively impacted or destroyed for a two week sporting event. Despite the Beijing Organizing Committee's work to minimize the environmental impact and comply with applicable laws, regulations, and improve environmental performance (DIOC:2), the "Beijing air quality probably is still not what the world is expecting from an Olympic city," said Greenpeace campaign director Lo Szeping. "The athletes will be breathing 150 liters of air per minute. So for athletes this is a particular concern." (D2008:10, p.1).

In addition, the OCOGs' literature was punctuated with the incremental paradigm (25.4%). For example, the OCOGs followed the IOC's lead and obtained ISO certification 14001. ISO is a nongovernmental organization that set standards for products and processes. The ISO 14,000 series assists businesses and industries in

meeting environmental challenges (Raufflet, 2006). For instance, Torino was certified to ISO 14001, an environmental management system. The Torino environmental results were published annually in the “environmental statement” and made available to those required by the EMAS (Regulation No. 761/2001/EC) (D2006:6). This status was commendable; however, Raufflet (2006) identified ISO certification as the starting point for a firm; not a means to achieve an ES adaptive or radical paradigm.

Lastly, the OCOGs demonstrated the adaptive paradigm (11.4%) within Raufflet’s fifth dimension. Examples indicated that the 2006 Torino Organizing Committee and 2008 Beijing Organizing Committee followed through with many environmental initiatives, issued ES reports and received ES awards. For instance, the UNEP and TOROC jointly developed an annual sustainability report based on the Global Reporting Initiative (D2006:1). In addition, according to BOCOG:

Measures taken for the Olympics – in conjunction with weather conditions in August – led to reductions in carbon monoxide (CO) by 47 per cent; nitrogen dioxide (NO₂) by 38 per cent; volatile organic compounds (VOC) by 30 per cent; particulate matter (PM₁₀) by 20 per cent; and sulphur dioxide (SO₂) by 14 percent (D2008:1, p.1).

Overall, in the OCOGs’ enacted phase, the predominant paradigm utilized was the incremental paradigm, punctuated with the adaptive and detrimental paradigms (see Figure 1.0). There were no radical paradigm examples found within the OCOGs’ enacted phase. More importantly, the OCOGs repeatedly did not successfully follow through to fully enact their ES commitments.

Based on the analysis of the data above, the IOC’s and the OCOGs’ interpretation of ES during the declared phase predominately utilized the adaptive paradigm lens. Then, a paradigm shift occurred as the OCOGs’ enacted phase regressed

to the predominate use of the incremental paradigm, punctuated with the detrimental paradigm (see Table 1.6). Further analysis of the OCOGs' data involved the performance indicators established by the SE-EPM. Here the researcher found that the OCOGs' management performance indicators involved 42% of the data and the operational performance indicators were revealed in 45% of the data. The findings are now interpreted by the research and responses to Research Questions one to four provided.

Table 1.6: Percentage and Frequency of Documents reflecting OCOG Enacted Phase Corporate Environmental Management Paradigms

CEM Dimensions		OCOG-Enacted (Staging Phase)				OCOG-Enacted (Staging Phase) (Percentage)			
		Detrimental Paradigm	Incremental Paradigm	Adaptive Paradigm	Radical Paradigm	Detrimental Paradigm	Incremental Paradigm	Adaptive Paradigm	Radical Paradigm
Framing the Issue	N	0	5	0	0	0	100%	0	0
Thought Process	N	8	59	25	0	8.7%	64.1%	27.2%	0
Challenge for the Firm	N	19	22	5	0	41.3%	47.8%	10.9%	0
Representation of the Natural Environment	N	2	4	25	0	6.5%	12.9%	80.6%	0
Illustrations from the Data	N	72	29	13	0	63.2%	25.4%	11.4%	0
Total Number of Data Sources:		101	119	68	0	44.3%	52.2%	29.8%	0%

Note: The frequencies indicated in the table represent specific data sources derived from the sample of 134 documents. It is possible that more than one data source can be coded within the same document.

CHAPTER FIVE: DISCUSSION AND CONCLUSION

The purpose of this qualitative multi-case study was to examine the concept of ES in the context of the Olympic Movement; specifically the examination focused on the interpretations of ES by the IOC and OCOGs from 1994 to 2008. This chapter will now discuss the IOC interpretation of ES (to act responsibly and to do no harm to the earth), and the OCOGs' interpretation of ES. Then, the focus will consider any incongruencies between the IOC's and OCOGs' interpretations of ES. This is followed by the conclusions for this thesis.

IOC's Interpretation of ES

The findings are initially used to develop a response to Research Question One: How has the concept of ES been defined by the IOC from 1994 to 2008? To answer this Research Question, the data illustrated that the IOC predominantly defined ES with the adaptive paradigm lens (54.3% of the data) from 1994 - 2008, punctuated with the radical paradigm (17.4% of the data) the detrimental paradigm (17.4% of the data), along with the incremental paradigm (10.9% of the data). The predominant use of the adaptive paradigm indicated that the IOC situated ES as a fundamental component within the Olympic Movement. Illustrations included that the environment was positioned as the third pillar of Olympism (Frey, Iraldo, & Mesis, 2007; IOC, 2005; IOC, 2007), and the IOC developed ES policies, an Agenda 21, and hosted conferences and seminars designed to advance the concept of ES within the Olympic Movement. However, it is the researcher's interpretation that the IOC's ES strategies were weak based on the fact that they were not mandatory. Thus, the IOC's interpretation of ES is a voluntary option with

the Olympic Movement (BOCOG, 2007). This means that the IOC predominately positioned ES with an adaptive lens, yet the IOC does not ensure the OCOGs enact the concept of ES.

More importantly, the findings indicated that a new fourth paradigm was needed in conjunction with the three CEM paradigms offered by Raufflet (2006). This new paradigm, *the detrimental paradigm*, came into play as the data illustrated that the IOC allowed the natural environment to sustain damage. Even though the IOC faced public scrutiny and challenges from environmental groups due to the negative impact of the Olympic Games on the natural environment, the IOC did not enforce the successful implementation of the IOC's ES initiatives.

Thus, although, the findings indicated that the IOC interpreted ES predominately with the adaptive paradigm, this lens is punctuated with other paradigms. This punctuated situation is interpreted as compromising the IOC's ability to guide the Olympic Movement, including the OCOGs, with respect to ES. Shafer (2006) indicated that ES was an evolving process; yet, this situation allowed the level of ES to fluctuate without ensuring an upward evolution of the baseline level of ES. This is because no established baseline of ES was instituted within the Olympic Movement. Also, a baseline is not strategically advanced by the IOC over time. The IOC's ES strategy allows the evolving process of ES to spiral up and down from the detrimental to radical paradigm with no expected baseline growth over time. How can organizations within the Olympic Movement be encouraged to comprehensively institute ES within decision making when the IOC still utilizes the detrimental paradigm? Further, although a platform for ES has been articulated by the IOC, no sense of urgency is made as no penalties are instituted for

not safeguarding the natural environment. Thus, despite well over a decade of ES involvement, the detrimental paradigm can be expected to continue to punctuate the IOC interpretation of ES.

Yet, the researcher of this paper believes that there is potential for the IOC to move beyond the current punctuated paradigm lens towards the radical paradigm in the future. The IOC is the circuit breaker with the ability to influence OCOGs and other sport organizations to implement ES successfully. The IOC can utilize this power by building a concrete foundation of ES. For example, the OGGI study can be used if established required benchmarks are instituted to advance a foundation level of ES by each subsequent Olympic Games. This type of strategy follows in step with the Kaspar (1998) recommendations that the IOC should implement ES standards and legislation that all OCOGs must surpass. In addition, there is hope that with the addition of required benchmarking, the OGGI study reports can be used to establish a comprehensive baseline for ES in the future. The movement towards required benchmarks that must be surpassed also requires the IOC to establish additional ES strategies. One such strategy involves ES enforcement with the institution of penalties for OCOGs that do not fulfill ES bid promises. This strategy could include withholding IOC funding if promised ES initiatives are not followed through. These funds could be used to repair any environmental degradation and organizations such as Greenpeace could be assigned to oversee the restoration of the natural areas. In addition, the IOC needs to establish a mandatory external third party ES assessment body to confirm the IOC and OCOGs' ES data. This body could aid to overcome some of the self reporting issues.

The IOC's ES plan should encourage symmetry of changes that encourages an upward spiral of ES progress towards the radical paradigm. As ES has been instituted within the IOC as a pillar of Olympism, every IOC decision should be underscored with ES. This means the IOC's ES platform should be established, built upon, and best practices put into effect. To meet an upward progression of ES success, the IOC needs to emphasize an environmental operational performance perspective that includes monitoring, tracking, and measuring ES. This is a change of focus from the current environmental management performance perspective of policy distribution, the creation of environmental committees and the setting of ES goals. The OGGI study may already be assisting with this adaptation; but the results are not yet available.

Currently, the IOC faces ES challenges as their interpretation of ES allows an ES spiral that is sporadic. There is a need to move permanently away from the detrimental paradigm. In addition, there is a need to establish a foundational baseline and then to move that baseline upwards with each Games. These suggestions are made in the hopes that in twenty years time the IOC will not still be interpreting ES with the detrimental paradigm lens and that there has been solid advancements towards the radical paradigm lens with an upward spiral effect.

OCOGs' Interpretation of ES

The findings are now used to develop a response concerning Research Question Two: How has the concept of ES been defined by the OCOGs from 1994 to 2008? And Research Question Three: How has the concept of ES been enacted by the OCOGs from 1994 to 2008? The findings indicated that the majority of the OCOGs data in the declared

phase fit within the adaptive paradigm (71.3% of the data), but this was punctuated with the incremental paradigm (16.6% of the data), along with the detrimental paradigm (6.6% of the data) and the radical paradigm (5.5% of the data).

The OCOGs' declared phase paradigm was interpreted as being encouraged by the IOC's environmental guidelines during the bid process. ES was introduced within the IOC bid procedures following the 1994 Lillehammer Games. Since this time, the OCOGs have demonstrated a commitment to ES within their bid documents. The researcher of this paper interprets the OCOGs commitments to ES during the declared phase as being generally stated in order to win the bid. This is illustrated as the OCOGs' predominant paradigm in the enacted phase regressed to the incremental paradigm (52.2% of the data), punctuated with the detrimental paradigm (44.3% of the data), followed by the adaptive paradigm (29.8% of the data), with no radical paradigm examples in the data. This finding is interpreted to mean that there is a paradigm shift between the OCOGs' declared and enacted phase. This paradigm shift means that the OCOGs/Declared Phase establish a commitment to ES within elements such as bid documents; yet, do not fully enact these commitments to ES. In the end, each OCOG/Declared Phase in this study declared themselves "green" based on self-reported data.

According to Mallen and Adams (2008), a sports event consisted of three important phases – the development phase, the event operational planning phase, and the implementation, monitoring and management phase. The first phase is where the sport event established activities to facilitate ES. However, it is in the second phase when the OCOGs are faced with ES challenges. This is because the OCOGs/Declared Phase established high ES plans to win the bid and yet in the face of planning a tremendous

number of competition and other activities to stage the Games, the OCOGs/Enacted Phase regress in establishing the requirements to fulfill the ES commitments. In the third stage the findings indicate that the OCOGs/Enacted Phase did not establish monitoring and management strategies to ensure the implementation of the ES promises; and thus, regress further in their ES success.

The OCOGs' primary mandate is to produce the Games; however, the author of this thesis argues that the IOC must intricately integrate this mandate to include Games production strategies to monitor and to act to manage and ensure the implementation of the ES strategies. The two concepts, ES and Games production, need to be linked into one mandate for the sake of future sporting generations. Sport today should provide a high level of ES legacy to the future sport community; therefore, the IOC should act to lead all OCOGs to successfully integrate ES within their hosting actions.

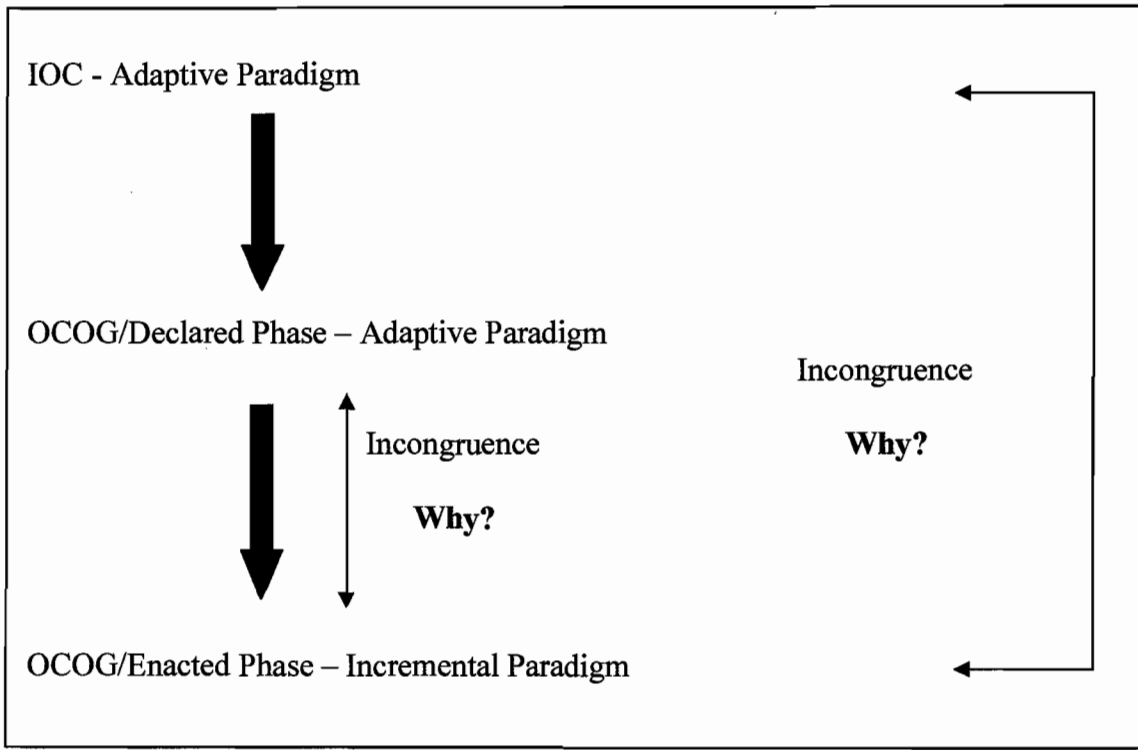
Paradigm (In)Congruence

The findings are now used to develop a response to Research Question Four: How does the IOC's definition of ES compare to the OCOGs' definition and enactment of ES from 1994 to 2008? The findings indicated that the IOC interprets ES predominately with an adaptive paradigm lens from 1994 to 2008. More specifically the IOC enforced policies, held conferences and created documents focusing on ES; however a monitoring program did not exist to ensure the IOC's ES initiatives were followed through within the OCOGs. While the IOC stated the protection of the natural environment was an important component to the Games, their actions indicate the lack of a full commitment to ES.

The findings also indicated that the OCOGs' interpret ES predominantly with an adaptive paradigm during the declared phase and an incremental paradigm in the enacted phase. The OCOGs' paradigm in the declared phase meshed with the IOC's adaptive interpretation of ES. This is interpreted to be due to the OCOGs/Declared Phase working to align with the IOC in order to win the bid to host the Games. Considering the IOC stressed the environment as a vital component, the OCOGs/Declared Phase made the environment a key aspect within the bid document. However, an interpretation is that due to the size of the Games and the workload to host the Games, it is difficult for the OCOGs/Enacted Phase to follow through with their initial ES plans. As there are no mandated ES requirements, the OCOGs simply do not completely implement their ES promises.

Thus, the findings indicated that incongruence occurs between the OCOG declared phase predominant use of the adaptive paradigm and the OCOG enacted phase predominant use of the incremental paradigm. In addition, incongruence occurs between the OCOG enacted phase predominant use of the incremental paradigm and the IOC predominant use of the adaptive paradigm (see Figure 1.0). This finding is interpreted to mean that a gap exists between environmental policy and implemented practice.

Figure 1.0: Paradigm (In)Congruence between IOC and OCOGs



To move forward, congruence theory proposed by Ghobadian, Vieny & Holt (2001) and Grant (1998) is used to provide insights into the reasons for the incongruence gaps in ES. Although explaining the ‘why of incongruence’ is beyond the scope of this thesis, some data provided general clues of areas to explore in this regard. Congruence theory applies “the suitability or appropriateness of the chosen policy given the external and internal operating pressures experienced by the company” (Ghobadian et al., 2001, p. 387). There are multiple decision-making factors that can affect the ES strategy formulation process; in addition, the implementation of ES is dependent upon the congruence of the environment, values, and resources (Ghobadian et al., 2001).

Ghobadian et al. (2001) utilized congruence theory to consider “the suitability or appropriateness of the chosen policy given the external and internal operating pressures experienced by the company” (p. 387). According to Ghobadian et al. (2001), congruence in environmental performance was achieved if there was a fit between the objective and implementation in the strategy development. The successful implementation of an ES policy was depicted as being dependent upon the congruence between three key areas: the environment, values, and resources. Also, a successful implementation of a formulated ES strategy was seen as dependent upon such factors as appropriateness, feasibility and the desirability of the strategy.

According to Ghobadian et al. (2001), the drivers, influence and the process of ES decision making “act to shape environmental strategies and within them, specific operational policies and practices” (p. 390). This shaping is impacted by important external factors and internal factors. According to Ghobadian et al. (2001), external factors included the behavior of the market, the legal and regulatory bodies, and expectations from society. Meanwhile, internal factors are subdivided into mediating and moderating factors. The mediating factors include elements such as operating costs and human, physical, technological, and capital resources, along with the ability of the organization to adapt. The moderating factors include such elements as the impact of the leadership, traditions, and the market. In addition, ES decision making implementation is noted as dependent upon such factors as appropriateness, feasibility and the desirability of the strategy (Ghobadian et al., 2001). All organizational actors must commit to the mutual environmental strategy to deem the implementation successful. Ghobadian, et al. (2001) suggests that a systems based approach should be initiated within an

organization's strategy to ensure gaps do not exist between the intent and outcome of the environmental policy.

Further, Grant (1998) identified three characteristics of congruence theory that are established within a firm. These characteristics included: goals and values, resources and capabilities, and organizational structure. According to Grant (1998), the ES strategy must take into account the demands of an organizations internal environment; this included the production of the values and goals that must simultaneously fit the resources available to the organization. Congruence is determined if there is a fit between the organization's objective and implementation in the strategy development (Ghobadian et al, 2001).

In this study, incongruence was found in two sites - between the OCOGs' declared and enacted phase and also between the IOC and the OCOG enacted phase (see Figure 1.0). An interpretation of the reason for the incongruence between the OCOGs' declared and enacted phase is that the demands for resources to implement ES, including human, physical, technological and capital, are strained by the requirements to host the Games. The size of the Games hinders the ability of OCOGs to find appropriate ES resources to implement the declared ES promises. There simply are not enough resources to ensure ES implementation. Etzion (2007) stated that, "there is positive and significant correlation between firm size and environmental performance" (p. 642). This research interpreted that the sheer size and growth of the Games made it difficult to enact all plans for hosting during a confined time period, including the ES plans. The Games, if they remain at the current size, need to find a means to obtain the resources to enact ES. This may be found if the Games spread the impact over a greater area with the use of larger

regional hosts or country hosts that utilize more cities for competition sites. This could assist in accessing the resources necessary to ensure ES implementation and could reduce the environmental impact of the Games on one city or small region by potentially reducing the need to build new venues.

An interpretation of incongruence between the IOC and the OCOGs' enacted phases is that the Olympic leadership, tradition and ethics fail to ensure the transfer of the ES promises from the OCOGs' declared phase are fully implemented in the OCOGs' enacted phase. During the bid process, bid committees conformed to the ES guidelines; however, in the OCOGs' enacted data there are no required guidelines or baseline that must be met, and there is no required enforcement of the ES promises. In addition, the movement to ES for "a significant number of personnel, departments and locations [that] need to be involved in the change process, ... usually takes time and meets resistance" (Siebenhüner & Arnold, 2007, 345). Time constraints are interpreted as creating pressures that prevent OCOGs from implementing many of the formulated environmental initiatives as there are pressures to enact critical elements for producing the competitions. Also, the large number of committees, staff and volunteers used to stage a Games, offers multiple areas where incongruence can arise. This interpretation is based on external factors that the stakeholders' priority is the staging of the Games and the principles of ES are secondary priorities. Based on the interpretations above, the Games negative environmental impacts are consistently greater than initially envisioned.

In addition, the IOC leadership has not put into place the requirement that the OCOGs must fulfill the IOC's ES platform or the OCOGs' declared phase ES promises. This is shown as the IOC does not lead by establishing consequences, such as imposing

penalties for not fully enacting ES promises. Also, the OCOGs do not have a tradition of fully implementing the ES promises and are not currently ethically guided to do so. The three organizations, including the IOC, Olympic bid committees and OCOGs' enacted committees act as separate entities and the integrated transition of ES from one to another is not fulfilled. To overcome this gap, it is again the opinion of this researcher that the IOC should impose penalties for not implementing ES promises. In addition, it is recommended that the IOC ensures the institution of an integrated systems based approach between the bodies to ensure the transfer of ES promises and knowledge from the IOC and the Olympic bid committee to the OCOGs. The aim of the penalties and system would be to establish a tradition of fully enacting ES promises.

In addition, the IOC's data revealed that 77.8% emphasized the management performance indicators and only 22.2% emphasized the operational performance indicators. The tradition of emphasizing management performance indicators consisted of the existence of policies and its distribution, as well, the environmental activities, stakeholders and the creations of ES relationships. The IOC emphasized their ES commitment publicly through various seminars, conferences and ES reports. Unfortunately, the tradition undervalued the operational indicators, such as identifying the countermeasures within a host city, tracking ES initiatives, and ensuring OCOGs engaged in their green processes. This means that there is a lack of monitoring, measuring, and responding to measured feedback to ensure that the ES declared plans are achieved. Thus, the researcher of this paper identified a lack of emphasis on ES operational performance by the OCOGs/Enacted Phase as a reason for incongruence between the IOC and the OCOGs' enacted phase. It is suggested that in order to minimize

the incongruence gap, the IOC and OCOGs could further implement environmental operational indicators to ensure the protection of the ecosystem.

Overall, the incongruence between IOC and OCOGs' enacted phase is interpreted as causing concern for the future of ES within the Olympic Games. There is a tremendous lack of follow through between the IOC's ES platform and OCOGs' implementation of ES. An upward spiral of ES based on a platform of consistent and comprehensive ES has not been established to grow over time. Each set of Games has established their own ES initiatives and the platform of success have not always spiraled upwards as the Games have progressed from 1994 to 2008. Therefore, the IOC needs to establish common basic platforms of required ES for each set of Games. This platform establishes a baseline of required ES. The baseline should be raised for each subsequent Games in order to ensure an ES upward spiral effect of consistent ES that expands over time.

There is hope that the incongruence gap can be reduced. The OGGI study may be the element that provides the impetus to close the incongruence gap. However, the reports from the OCOGs participating in the OGGI study will not be fully available for years to come as they require over 11 years of study. Also, the open distribution of the data in the reports is yet to be seen. In addition, the reliability of the data has yet to be determined as the OCOGs self-report on ES. Yet, the OGGI study has the potential to aid a movement that closes the incongruence gap between the IOC and the OCOGs and to push the Olympic Games closer to the radical paradigm for ES. This can be achieved through suggested actions that have been previously stated, for example financial penalties for OCOGs that do not fulfill ES bid promises and the establishment of a required external third party ES assessment body to confirm the resulting ES data.

CONCLUSION

This research examined interpretations of ES by the IOC and the OCOGs from 1994 to 2008. An important conclusion in this study is that a fourth paradigm is needed in conjunction with the three CEM paradigms (incremental, adaptive, and radical) by Raufflet (2006) in order to fully represent the IOC and OCOG data. The new paradigm is the *detrimental paradigm*. According to Avis, Drysdale, Gregg, Neufeldt and Scargill (1983) detrimental activities can be damaging; injurious; and/or harmful. The addition of this paradigm followed the opinion of Gladwin, Kennelly, and Krausse (1995) that: “New paradigms tend to emerge from entirely new fundamentals and, at first, without a full set of concrete rules or standards” (p.877). Data that indicated the use of this paradigm indicated that the IOC and OCOGs continue to harm the natural environment. Further support indicating that this detrimental paradigm was found to be used in sport was offered by Cantelon and Letters (2006) as they indicated that mega sport events can cause short term and long term damage to the environment. In this study, examples abounded as OCOGs/Enacted Phase illustrated detrimental decisions such as having car emissions impact athlete’s breathing, and the heat from poorly ventilated housing causing athlete dehydration (Stamping out Fumes, 1997); knowingly using ozone harming gas (Bita, 1999); cutting down trees in sensitive areas (Bita, 1999); and burying mountainsides in cement (MacMohan, 2006). All occurred without sanctions from the IOC.

Another important conclusion is that this research identified two areas of ES paradigm incongruence. The first area of paradigm incongruence lies between the OCOG declared ES and enacted ES. The second area of paradigm incongruence lies between the IOC’s declared ES and the OCOGs’ enacted ES. This means that promised ES is not fully

enacted. This study finds that paradigm incongruence can be explained, at least partially, based on factors from congruence theory established by Ghobadian et al. (2001) and Grant (1998).

In light of the findings, this study recommends that the IOC institute strategies to overcome the use of the detrimental paradigm and to offset the ES paradigm incongruence. To this end, strategies are needed to ensure the OCOGs' declared ES is fully enacted. Suggestions include the IOC institution of penalties, such as financial penalties, for not fully enacting ES promises. Also, an external third party evaluator is recommended to bring reliability into the ES measures as Games declare their event as "green" based on self-reporting – even when the ES policies and initiatives from their declared phase has not been enacted. In addition, there is a need for a system based approach to seamlessly integrate ES between the IOC and the OCOGs during the declared and enacted phases. Also, a platform of required ES that can be built upon for an upward spiral of ES over time is needed. Finally, an emphasis on environmental operational performance indicators, such as the tracking, can provide timely feedback concerning ES for management to act upon.

Future research is needed to fully understand how to overcome ES paradigm incongruence. Suggestions include research on the ES reporting relationship between the IOC and the OCOGs, as well as potential strategies for instituting a third party ES evaluator. Also, this study holds hope concerning the newly instituted OGGI study that includes 11 years of ES evaluation for each Games starting with the 2008 Olympic Games in Beijing. This OGGI study may aid, at least partially, to close the ES paradigm incongruence. Future research is needed to examine and verify the full results of the

OGGI studies once they are released. However, the potential promise for the OGGI study may fade if the IOC cannot ensure ES commitments are fully enacted. Thus, future research is also needed on strategies, including penalties, for not enacting declared ES promises. It will be interesting to examine the Olympic Movements response over the next ten years to see if they can achieve the declared capacity for ES and move to a consistent and comprehensive ES radical paradigm lens.

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Appendix A

Paradigm Results Chart

IOC Data

Detrimental Paradigm

Ways of Framing the Issue	
Assumptions/Thought Processes	
Challenge for the firm	<p>Greenpeace suggests: IOC makes stringent environmental standards a requirement rather than an option and incorporated into all aspects of the Games. IOC punish violators who do not meet the required environmental standards, whether it involves the host city themselves, contractors or sponsors. IOC and host cities reward sponsors and contractors who have the best environmental practices. IOC and host cities make environmental data publicly available Success is determined if it brings forth a long-term environmental legacy (D2008:4, p. 149).</p> <p>The Olympic Coordination Authority earmarked US \$70, 000 to cover parts of the costs of the world conference. Olympic Solidarity paid the expenses of the three NOC delegates (DIOC:6).</p> <p>IOC, IF, NOC, OCOG, athletes, clubs, managers and all individuals and enterprises associated with sport (DIOC:6)</p> <p>Sports equipment produced from non-polluting or recycled materials (DIOC:6).</p>
Representation of the natural environment	
Illustrations of the Data	<p>The problems associated with the Green Games concept was directly attributed to the OCA, this is why environmental groups have problems with the OCA taking over the environmental management of the Games. The 12 million project to prevent the contamination of the Olympic sites have not started. Failure to meet the environmental guidelines for refrigeration and air-conditioning (D2000:5).</p> <p>The OCA has ignored to undertake 100% renewable energy under Energy Australias Pure Energy scheme. According to Ian Kiernan, Clean Up Australia chairman was part of the Olympic bid and feels the OCA has diluted Sydney's initial environmental guideline (D2000:5).</p> <p>The IOC requested for a Dioxin Review Report by the CH2M Hill. According to Peggy James the co-ordinator of Green Games Watch 2000 is her fear that they will be taking "a public relations approach to managing the issue rather than a scientifically credible approach" (D2000:21).</p>

	AOC decided to cut the number of cross country courses to three from four, because of the goshawk nests in that area. "NAOC also moved some of the Alpine skiing events from Mt. Iwasuge in Shiga Kogen to existing courses at other locations; after environmental monitors recommended that new courses at other locations, after environmental monitors recommended that new courses should not be built for the downhill" (D1998:6; D1998:7).
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Incremental Paradigm

Ways of Framing the Issue	
Assumptions/Thought Processes	IOC, IF, NOC, OCOG, athletes, clubs, managers and all individuals and enterprises associated with sport (DIOC:6)
Challenge for the firm	<p>The Olympic Coordination Authority earmarked US \$70, 000 to cover parts of the costs of the world conference. Olympic Solidarity paid the expenses of the three NOC delegates (DIOC:6).</p> <p>Sports equipment produced from non-polluting or recycled materials (DIOC:6).</p>
Representation of the natural environment	Avoiding practice that runs risk to contaminating underground or service waters, not jeopardizing general water supplies and minimize all forms of pollution (DIOC:1).
Illustrations of the Data	IOC encourages sports industry to obtain ISO certification for quality purposes (DIOC:6).

Adaptive Paradigm

Assumptions/Thought Processes	<p>Commitment to the protection of the environment and sustainable development, "place sport everywhere at the service of the harmonious development of man, with a view to encouraging the establishment of a peaceful society concerned with the preservation of human dignity" (DIOC:1, p. 24).</p> <p>"Integrate the principles of sustainable development into country policies and programmes; reverse loss of environmental resources. Reduce by half the proportion of people without sustainable access to safe drinking water. Achieve significant improvement in lives of at least 100 million slum dwellers, by 2020 (DIOC:1, p. 36).</p> <p>In the Fall of 1991, the International Olympic Committee (IOC), in partnership with the United Nations Environment Programme (UNEP), amended the Olympic Charter to highlight the importance of environmental stewardship in the staging of the Olympic Games" (D1996:9).</p> <p>The IOC came into importance following the Lillehammer Games. The IOC and UNEP signed a cooperation agreement, determining their</p>
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	<p>common goals and actions set in place for sport and the environment. Thereafter, the IOC searched for a host city that had environmentally friendly venues and environmental protection (DIOC:10).</p> <p>“The IOC’s main educational exercise, is of course, running environment-friendly Games” (DIOC:10).</p> <p>IOC will conduct an environmental impact assessment after the Games (DIOC:2).</p> <p>“NOCs particularly involves environmental aspects linked to sport were able to attend two regional seminars organized by the IOC in 2006” (DIOC:4).</p> <p>The seminars helped to raise awareness on sustainable development issues in sport, to strengthen participants’ knowledge of the methods and activities of sporting communities and to create partnerships and include action plans.</p> <p>Olympic Solidarity assisted with two of the IOC Sport and Environment Commission seminars (DIOC:6).</p> <p>A regional seminar on sport and the environment organized by the IOC. Their initiative is to promote a true policy of nature protection in all areas associated with the Olympic Games (DIOC:6).</p> <p>The IOC Sport and Environment Commission, Olympic Solidarity collaborated on the organization of the 3rd World Conference on Sport and the Environment held in Rio de Janeiro in October (DIOC:5)</p> <p>Olympic Solidarity’s collaboration in 1997 with the IOC Commission for Sport and Environment (DIOC:6).</p> <p>The Olympic family partnered with Ifs, some NOCs and many national federations have adopted environment policies (DIOC:6).</p> <p>“The OGIS was expected to quantify as comprehensively, accurately and robustly as possible the net benefit streams that would arise from hosting the Olympics in 2012 in London based on a comparison of two scenarios: with and without the Olympics. It was also intended to inform the development of strategies to ensure that the full potential benefits of hosting the Olympics can potentially be realized and any risks mitigated.” (D2002:17).</p> <p>“In 1992, for the first time in the history of the Olympic movement, the International Olympic Committee asked cities bidding to host an Olympic Games to say how they proposed to address environmental issues” (D2002:23).</p> <p>The IOC has accepted the environment as a third dimension of Olympism. At the 1996 Centenary Conference, President Samaranch noted that environmental responsibilities must be a key tenet of the Olympic Movement (D2000:26).</p> <p>“Any building or conversion work will have to take into account the principles of environmental protection and ideally be the subject of a prior</p>
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	environmental impact” (D2000:26)
Challenge for the firm	
Representation of the natural environment	<p>Olympic Games should not:</p> <ul style="list-style-type: none"> pollute water Discharge solid wastes Emit toxic gases which destroy the ozone layer or greenhouse gases Pollute or damage the soil Contribute to deforestation Reduce biodiversity Harm the landscape either physically or aesthetically Reduce renewable resources Waste resources, whether raw materials, energy or water Marginalize a group or section of the population Undermine culture and beliefs Damage local economic activities (DIOC:1). <p>Rules to be respected for events held in the natural environment:</p> <ul style="list-style-type: none"> Areas that contain special ecological, historical or cultural value should be avoided. Trees should not have to be cut down, if so should be planted elsewhere or after the event. Choose solid ground in order to ensure stability and a secure base for installations Clear vegetation from as small area as possible Provide a suitable number of water supply points, portable toilets and bins for the number of people attending the event It is vital to avoid white elephants Facilities should have a variety of uses, preference should be given to installations that can be dismantled (DIOC:1).
Illustrations of the Data	<p>“In 1992, for the first time in the history of the Olympic movement, the International Olympic Committee asked cities bidding to host an Olympic Games to say how they proposed to address environmental issues” (D2002:23; DIOC:9)</p> <p>Following the 1994 Games, the bidding process included the IOC looking for cities that had environmental stewardship by conducting impact analyses, re-using facilities; minimize pollution, avoiding disrupting wildlife and destroying land (DIOC:10).</p> <p>Hodler, an IOC member stated that “Japanese authorities will decide the starting point, although they will also have to take the blame for their decision. (D1998:5).</p>

Radical Paradigm

Ways of framing the issue	
Assumptions/Thoughts	<p>The Impact Assessment must be submitted 4 years prior to the Games (1), a year later OCOG must submit a Report of initial conclusions and three years later the OCOG or NOC must submit a final OGI with assessment data, analysis and interpretation (DIOC:2).</p>

	<p>“The positioning of environmentalism amongst other Olympic ideals – sports, culture, and a humanistic concern for the health and well-being of all people – was the catalyst for sound environmental management becoming an integral component of the host city bid process.” (D1996:9, p. 1).</p> <p>“The new Olympic environmental ethic or ideal matured through the <Green Games> in Lillehammer, where for the first time, environmental interest groups played an active role in the planning and staging of the Games. Olympic environmentalism will flourish and evolve in Atlanta, Nagano, Sydney, and Salt Lake City as host cities respond to the IOC/UNEP call to stage the Games in an environmentally friendly manner and focus world attention on the importance of protecting and preserving the earth’s resources for future generations.” (D1996:9, p. 1).</p> <p>Developed Olympic Games Impact in 2003, 125 different factors that affect sustainable development in the host city. The three different impacts are economic impact, socio-cultural impact and environmental impact. Twenty of those factors include air quality, land usage trends and greenhouse gas emissions (DIOC:9).</p> <p>Partnership with UN, during the UN Conference on Environment and Development adopted by 182 government heads and UNEP UN Environmental Program (DIOC:4).</p> <p>The IOC will introduce an impact monitoring and evaluation system. According to the IOC “The IOC’s environmental expertise brings in experience, knowledge as well as an expert network from past Games and events (D2006:10).</p> <p>“The Olympics Games impact Study (OGIS) is the result of work undertaken by Price Waterhouse Coopers (PwC) on behalf of the DCMS and the LDA. The study is an attempt to analyse the likely economic, social and environmental impacts of hosting the Olympic and Paralympic Games in London in 2012.” (D2002:17).</p> <p>“The OGIS has used the framework of sustainable development to structure the analysis. Thus, it has examined three categories of impacts: economic, social and environmental” (D2002:17).</p> <p>“Environmental impact studies should be carried out before and after most major events. It is important to be able to base decisions on clear indicators which make it possible not only to evaluate the impact, but also to monitor progress where events that are held regularly are concerned (DIOC:1).</p>
Challenge for the firm	
Representation of the Natural Environment	
Illustrations from data	

IOC Data Results

	Number of Detrimental statements	Number of Incremental statements	Number of Adaptive statements	Number of Radical statements
Way of framing issue– what questions are being asked by the firm	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 3 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 1	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Thought process – What is the type of response from firm members?	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 1 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 15 2 - 5 3 - 4 - 5 - Other -	SEEPM Categories 1 - 1 2 - 2 3 - 4 - 5 - Other -
Challenge for the firm – What are the expectations with regard to the firm's behaviour	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 1	SEEPM Categories 1 - 1 2 - 1 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Representation of the natural environment - To what extent is the natural environment represented as a waste repository, a pool of natural resources, or a living habitat	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 2 4 - 5 - Other -	SEEPM Categories 1 - 2 2 - 3 - 2 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Illustrations from the literature - What is content of firm's communication	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 4	SEEPM Categories 1 - 1 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 3 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Total SEEP Categories	SEEPM Categories 1 - 2 - 3 - 4 -	SEEPM Categories 1 - 6 2 - 1 3 - 2	SEEPM Categories 1 - 20 2 - 5 3 - 2	SEEPM Categories 1 - 1 2 - 2 3 -

	5 – Other - 5	4 - 5 – Other -	4 - 5 – Other - 1	4 - 5 – Other -
Total Statements - 45	5 – 11.1%	9 – 20%	28 – 62.2%	3 - 6.7%
Management Performance Indicators – 35 – 77.8%				
Operational Performance Indicators – 10 – 22.2%				

OCOGs Declared Phase (Bid Phase)

Detrimental Paradigm

Way of framing the issue	
Assumptions/Thoughts	
Challenge for the firm	<p>Atlanta 1996</p> <p>For the bid there was fear that the Games would be boycotted by athletes because of the pollution, an athlete believed while competing his lungs would burst and needed every breath of air possible (D2004:5).</p> <p>Beijing (metropolis) 13 million people, has severe air pollution problems, acting in old-fashioned coal-fired factories and boilers, vehicular emissions, private homes of low-grade coal as main energy source (D2006:10).</p> <p>Athens 2004</p> <p>The bidding committee failed to consult with Greenpeace before their proposal (D2004:6). Protests were made on the construction of venues because of its air pollution, damage to the mountains and downgrading of the environment (D2004:3).</p>
Representation of the natural environment	<p>Atlanta 1996</p> <p>“When the IOC awarded the Olympic Games to Atlanta in 1990, demonstrating sound environmental planning and management in the staging of the Games was not a component of the Olympic bid process.” (D1996:9).</p>
Examples of the data	<p>Atlanta 1996</p> <p>Atlanta citizens protested against the radioactive material that is planted within the athlete’s village, which poses a risk for Olympic athletes, (th village will house more than 14,000 athletes and officials (D1996:7).</p> <p>Sydney 2000</p> <p>Protestors ‘Bondi Warriors’ threatened violent protests against if the plans continued to build a temporary 10,000 seat stadium for the Beach Volleyball and was closed to the public for six months (D2000:27).</p> <p>Australian Conservation Council, the New South Wales Nature Conservation council and the Total Environment Centre distance themselves from participating with the bid and has been misrepresented (D2000:1)</p> <p>Athens 2004</p> <p>“The city’s bid proposals to the International Olympic Committee (IOC) fail to assess any damage to the environment or long-term effect on life there, the international group Greenpeace said” (2004:6).</p>

	<p>Athen citizens believed there would be a repeat of the 1984 Olympic Games where there was smog problems (D2004:8).</p> <p>The problem for the Athens Olympic appeal is the pollution and traffic. Athens promises to expand and renovate the subway system by 2000 (D2004:10).</p>
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Incremental Paradigm

Way of framing the issue	<p>Salt Lake City 2002</p> <p>The Utah Environmental and Public Health Alliance ensure a safe and healthy Olympic Games during and after (D2002:8).</p> <p>Environmental and Public Health planning Summit discussed drinking water, emergency response, solid waste, wastewater, disease and injury prevention, surveillance and response, food service, housing and mass gatherings and lastly interagency coordination and logistics (D2002:8).</p>
Assumptions/Thoughts	<p>Sydney 2000</p> <p>Millennium Parklands project at Homebush included planting 2 million plants and 65,000 native trees, which included 450 hectares of landscape and up to 40 km of cycle trails the plan was developed by Olympic Coordination Authority and National Parks and Wildlife and Bicentennial Park (D2000:15).</p> <p>Salt Lake City 2002</p> <p>A month before the Games SLOC will announce plans for the “Olympic Forests” – increase trails, expanding transit and preserving open space and more (D2002:7).</p> <p>Environmental Emergency Response – to coordinate the nine Alliance agencies and federal agencies in response to an environmental emergency (D2002:8)</p> <p>Athens 2004</p> <p>AIOC partnered with local government, NGO’s, World Health Organization, the Ministry of Research and Technology and Federal Republic of Germany (D2004:13).</p> <p>Torino 2006</p> <p>Goals – halt urban expansion, upgrade and reuse facilities, reconvert unused industrial areas, design natural urban systems, improve the outskirts and improve architectural resources (D2006:5)</p>
Challenge for the firm	<p>Lillehammer 1994</p> <p>All contracts with sponsors and suppliers included environmental clauses. This means that all companies dealing with Lillehammer Olympics had to deliver products that minimize the adverse effects to the environment, for</p>

example, by having very little packaging and not containing any harmful substances (D1994:2).

All the Norwegian Olympic arenas conformed to the latest environmental standards. Consideration for the environment has been taken into account in the choice of materials, location, energy consumption, architecture and transport (D1994:2).

The Lillehammer committee received pressure from the legal system and the IOC. The committee agreed to abide by the law and IOC Rules (D1994:1).

“Norwegian Government will agree to abide by, as a priority, the IOC Rules and by-laws throughout the duration of the Olympic Winter Game. There are no laws or regulations or customs in Norway that might limit, restrict or interfere with the Games in any way” (D1994:1)

Atlanta 1996

The committee stated they will adhere to IOC policies and municipal laws during the following statement “The Atlanta Committee for the Olympic Games (ACOG) has risen to the challenge of supporting IOC environmental policy and will establish some new environmental benchmarks during the staging of the Games.....ACOG will comply with all environmental laws and regulations and will be sensitive to the protection of our natural resources” (D1996:9).

Nagano 1998

“The IOC is recognized under Japanese income tax law as a foreign public service corporation, and is therefore not liable to income tax. In accordance with tariff law, items imported into Japan for use in the Games will be exempt from customs duties on condition that they are re-exported within a specific period of time.” (D1998:1)

Sydney 2000

Greenpeace, created guidelines for SOCOG to follow to ensure environmental initiatives (D2008:4).

Athens 2004

All materials will be selected on the basis of how eco-friendly their products are. Quantity and quality of packaging will be taken into account (which should be free from PVC, Tetrapak, aluminum, etc.) recycling potential and the absences of gases which might be harmful to the ozone layer. 40% of purchases TOROC represented environmental criteria (D2002:2).

In terms of environmental value, scenery and water resources, the whole of the mountain protected by national and regional laws. All relevant structures will be planned and built in accordance with national laws and regulations (D2006:9).

The mountain area involved in the Games is protected by national and regional laws (D2006:4).

	<p>Beijing 2008</p> <p>BOCOG will adhere to the Environmental Protection Law of the People's Republic of China. The Law states "the pollution prevention facilities of a construction project must be designed, constructed and put use in sync with the main body of the project" (D2008:12).</p> <p>Vehicle emissions standard which is equal to Euro 2 by 2004. Prohibition of open air incineration. Reduce flying dust in the agricultural sector (D2008:4).</p> <p>increase air pollution – trucks are forbidden to litter, use of water sprinkling on roads. Roads have been widened, overpasses and underground passageways built to reduce emissions from slow driving and idling. Automobiles exceeding emission standards are not allowed to be manufactured and vehicles on the road must take anti-pollution measures as intra-engine purification, and positive crankcase ventilation (D2008:12).</p> <p>"Natural gas and liquid petroleum gas (LPG) supply in the city of Beijing" (D2008:4).</p>
Representation of the natural environment	<p>Salt Lake City 2002</p> <p>Spectators will park their vehicles at two 7,000-space car parks, and SLOC stated they will ensure shuttles will be available, once the Games are finished the parking lots will be removed and return to its natural state (D2002:11).</p> <p>Sydney 2000</p> <p>The bid was considered as the green bid which includes environmental guidelines (D2000:8).</p> <p>Waste avoidance, will be recycling receptacles and on-site composting of kitchen waste, crockery and cutlery will be reusable (D1996:1).</p> <p>Salt Lake City 2002</p> <p>Appropriate standards of air, water and soil quality (D1996:1).</p> <p>Torino 2006</p> <p>City of Turin Electric Car – environmentally friendly fleet of cars and minibuses, will afterwards be available to tourists (D2006:9)</p> <p>Life cycle assessment of the structural components of the Olympic Games – applied to buildings and operating stages of the Village (D2006:5).</p> <p>Within their Agenda 21 which includes refuse, renewable energy, water resource management (D2006:4)</p>
Examples of the data	<p>Torino 2006</p> <p>Environmental management system certified to ISO 14001, results published each year by the EMAS (D2006:12).</p>

	<p>Environmental Management System – according to international standards ISO 14001 and European Commission’s Regulation no. 761/2001(D2006:11).</p> <p>The Environmental Policy – (D2002:12) The committee’s activities oriented towards environmental certification (D2006:6)</p> <p>Beijing 2008</p> <p>BOCOG has established ‘Green Olympics’ mascots which include: The Beibei (flying fish – represents clear water), the Jingjing Panda (environmental protection and ‘Green Hills’), Yingying a Tibetan endemic to protect antelope ‘Grass-covered ground’ idea), Nini (a flying swallow, represents the ‘Blue Sky’) and the Huanhuan (represents the Olympic flame (D2008:4).</p>
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Adaptive Paradigm

Way of framing the issue	<p>Lillehammer 1994</p> <p>The Olympic organization was participating in the development of comprehensive European environmental projects and has also introduced smaller environmental projects, such as system for collecting lead bullets at the Olympic biathlon stadium (the biathlon competition resulted in 500 kg. of lead waste) (D1994:2).</p> <p>Salt Lake City 2002</p> <p>“Environment is the third principle of Olypianism along with sport and culture, and environment will be a major focus of the 2002 Games” (D2002:9).</p> <p>Torino 2006</p> <p>Provincial authorities authorize drainage and waste water systems, plan waste management, monitor waste processing and treatment plants (D2006:9).</p> <p>Any new facilities or structures will be constructed in accordance with the sustainable development programs already set up by the local authorities, and will also be subject to evaluation in terms of their impact on the environment. This will comply with any temporary structures and any existing structures which undergo structuring (D2006:9).</p> <p>The provincial authorities were responsible for monitoring the environment and environmental policy and a plan waste management to monitor waste processing and treatment plants (D2006:9).</p> <p>The local Council authorities are responsible for monitoring and managing various (D2006:9).</p> <p>Beijing 2008</p> <p>BOCOG created the following programs to initiate environmental</p>
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	<p>sustainability: Provision of Beijing Municipality Methods of Reinforcing Energy Conservation, Provision of Beijing Municipality Methods of Energy Saving Supervision, Provision of Beijing Municipality Guidelines on Implementation of Trial Methods on Clean Production Audit and the Beijing Programme of Circular Economy Development (D2008:4).</p>
Assumptions/Thoughts	<p>Lillehammer 1994</p> <p>Lillehammer officials met regularly with representatives of the Norwegian Society for the Conservation of Nature, the Ministry of the Environment and environmental authorities of the Olympic municipalities. Mutual co-operation was a precondition for successful environmental protection (D1994:2).</p> <p>Salt Lake City 2002</p> <p>SLOC partnered with seven Federal Environmental and Health Agencies, five local agencies, five state agencies and two private agencies (D2002:8). SLOC's goal is to host the first Olympic Games causing no net increase in air pollution emissions (D2002:10) and is going to recycle and compost everything (D2002:5; D2002:21). SLOC initiated a healthier lifestyle by creating "A Healthier You 2002" in partnership with coalition of Utah health organizations (D2002:2). SLOC consulted with NASA for the "urban heat islands" to discuss the most beneficial areas for tree planting (D2002:10).</p> <p>SLOC partnered with NASA to use heat-sensitive equipment to map spots which are targeted for tree planting (D2002:9).</p> <p>Partnership with seven Federal Environmental and Health Agencies and 5 local agencies, 5 state agencies and 2 private agencies (Intermountain Health Care and Red Cross) (D2002:8)</p> <p>Utah Department of Environmental quality (ensure protection of air quality). Focused on telework, carpooling, busing of visitors to venues and reduce idling of buses (D2002:8).</p> <p>Pollution prevention worked on sustainable building, re-use, and pollution prevention policies (Procurement, design etc) (D2002:8).</p> <p>Their goal is a zero-emissions Games and is going to recycle and compost everything (D2002:5; D2002:21).</p> <p>Two major goals 1) zero waste and 2) zero emissions. Organizers estimated Games would produce (D2002:25).</p> <p>Torino 2006</p> <p>Bid committee has set up an Environmental Action Plan which aims to improve environmental quality throughout the area. The environmental impact of the Games will be subject to detailed analysis in order to draw up an accurate environmental balance sheet (D2006:9). Other action plans such as the Protection of Land and Biodiversity, Construction Installations and Infrastructures, Reduction of Pollution and Traffic Control, Environmental</p>

	<p>Awareness Program, Green Belt Project, The “Turin the Water City” Project. Create a Multi-Purpose Nature and Landscape Centre Initiatives – localization of Olympic Venues, management of environmental systems, post-Olympic use of structures (D2006:11).</p> <p>TOROC implemented the following programs: Environmental Monitoring Plan, which includes assessing negative and positive impacts in all activities (water cycle, air quality, soil use, energy consumption, waste production, ecosystems, landscape, urban development) (D2006:2).</p> <p>The Sponsors and Sustainability Program, this program includes protecting the territory, reduce environmental impact, educate environmental protection and international collaboration. Strategic Environmental Assessment (SEA) – evaluate programs and plans and reduce environmental impact (D2006:2).</p> <p>TOROC’s Goals consisted of halt urban expansion, upgrade and reuse facilities, reconvert unused industrial areas, design natural urban systems, improve the outskirts and improve architectural resources (D2006:5).</p> <p>TOROC’s Environmental Policy includes minimize negative impacts, environmental legacy, published each year in an environmental statement (D2006:11).</p> <p>TOROC’s Environmental Policy consisted of the committee’s activities oriented towards environmental certification (D2006:6).</p> <p>In accordance with international agreements and protocols concerning the environment (D2006:9).</p> <p>Goals – control environmental impact, reuse facilities, and upgrade construction of the city (D2006:5).</p> <p>Environmental Policy - minimize negative impacts, environmental legacy, published each year in an environmental statement (D2006:11).</p> <p>Green procurement policy Environmental Report and Social Report – for stakeholders (D2006:11).</p> <p>Bid committee has set up an Environmental Action Plan which aims to improve environmental quality throughout the area. The environmental impact of the Games will be subject to detailed analysis in order to draw up an accurate environmental balance sheet (D2006:9).</p> <p>Protection of Land and Biodiversity: Includes introducing several threatened ecotypes into the area. Water Resource Management, the plan will include programs regarding local reservoirs, and the individual capacity will be assessed and an environmental impact of modern snow management systems (D2006:9).</p> <p>Construction Installations and Infrastructures: New construction or sport facilities will be sited according to authority planning procedures. The authorities will include post-Olympic use of all installations. The temporary structures will utilize environmental restoration programs (D2006:9).</p> <p>The Olympic villages and media villages and all new installations will be</p>
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	<p>planned to ensure they are environmentally friendly. Bioclimatic, eco-friendly systems with high energy efficiency will be used in construction. Location of building and energy efficiency will be carefully considered at the planning stage. (D2006:9).</p> <p>Reduction of Pollution and Traffic Control: Planning and implementing a special monitoring system for checking – and preventing factors that are a risk to the environment (D2006:9).</p> <p>Concerning traffic and transport, the public is encouraged to use public transportation and special low fares will be introduced during the duration of the Games. Trains and shuttles will be the only means of transportation to sport events held in mountain areas; interchange parks will be set up (D2006:9).</p> <p>Waste Management and Choice of materials. Correct procedures regarding waste disposal (D2006:9).</p> <p>Environmental Awareness Program Foster respect for the mountain environment. Leaflets giving information on waste disposal procedures will be distributed in hotels, sports facilities, tourist information offices and reception centers. Advertising campaigns to encourage disposal, collection and energy saving (D2006:9).</p> <p>Environmentally friendly technology. “Progetto Lupo – the monitoring of mountain rivers and water sources; the monitoring of urban and rural ecosystems” (D2006:9).</p> <p>Green Belt Project – set up by local authorities and the Turin Park Management Commission. Linking parks and green areas around Turin with the palaces of the House of Savoy (D2006:9).</p> <p>Environmental project – for every tree cut down, 10 trees will be built (D2006:9).</p> <p>Construction is based on eco-sustainability: Study will be promoted on the impact of sports and recreational activities. The “Turin the Water City” Project, – improvement of rivers, monitoring quality of water, running a check-up on civil waste water (D2006:5).</p> <p>The Programme for Upgrading Public Space, Urban Traffic Plan, - emission free mobility, the Turin “Agenda XXI” – designing ecological urban systems , reduce air pollution (D2006:5). Reinstating the Turin-Ceres railway</p> <p>Green Belt project – protect nature and historical architecture, increase green areas, promote culture and tourism (D2006:5).</p> <p>Create A Multi-Purpose Nature and Landscape Centre Initiatives – localization of Olympic venues, management of environmental systems, post-Olympic use of structures (D2006:11).</p> <p>Environmental Monitoring Plan – negative and positive impact, all activities (Water cycle, air quality, soil use, energy consumption, waste production, ecosystems, landscape, urban development) (D2006:2).</p>
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	<p>Sponsors and Sustainability Programme – protect territory, reduce environmental impact, educate environmental protection, international collaboration (D2006:2).</p> <p>Strategic Environmental Assessment (SEA) – evaluate programs and plans and reduce environmental impact environmental Management System – Environmental Advisory Assembly discuss environmental policies (D2006:2).</p> <p>Hector Project (Heritage Climate Torino) (D2006:2) compensating for the greenhouse gases emissions during the Games</p> <p>By 2010: 38.8% reduction in the consumption of fossil fuels (D2006:9).</p> <p>9% of total energy consumption to come from the use of renewable energy sources 450 billion per year (D2006:9). The amount of solid urban refuse produced must be reduced by between 2% and 7.5% in relation to the amount produced in 1996. (D2006:9).</p> <p>Separate refuse collection and recycling must account for between 35% and 50% of total amount of solid urban refuse produced (D2006:9).</p> <p>Goal to substitute 15% of fossil fuels with renewable sources of energy by 2010 (D2006:5).</p> <p>Regional Authorities have set up Regional Plan for the Environment also responsible for implementing programs for minimizing environmental damage (D2006:9).</p> <p>The Ministry for the Environment responsible for environmental impact (D2006:9).</p> <p>Provincial Authorities are in charge of monitoring the environment (D2006:9).</p> <p>The Local Council Authorities are responsible for monitoring and managing various policies regarding pollution (D2006:9).</p> <p>The Authorities in mountain areas draw up charters regarding land use and supply services for the village in their area (D2006:9).</p> <p>The public authorities are responsible for specific policies throughout the area regarding care of the environment and the maintenance of public health and civil protection (D2006:9).</p> <p>Local and Provincial authorities facilitate traffic control and mobility (D2006:11).</p> <p>Within the Action Plan TOROC is to institute correct procedures regarding waste disposal Programs implemented to limit noise, atmospheric pollution and specific policies regarding waste management and energy savings (D2006:9).</p> <p>Develop a program aimed at the reduction of noise pollution, banning the use of material and substances in refrigeration installations (D2006:9).</p>
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	<p>Redefine the urban identity of the host city, aiming at positioning the city beyond its “its heavy industrial past” focused on the territory, both in the organizing phase and during the event – “Guaranteeing the sustainability of the Olympic System also after the games time” (D2006:6)</p> <p>The Green Card – the document presents that it must guarantee real benefits, recognized by all parties (athletes, organizers, spectators, public authorities, associations, sponsors, suppliers, local communities) (D2006:6).</p> <p>Charter of Intents – (April 2002) sets forth principles that constituted the basis for TOROC’s activities, representing its commitment in dealing with ethical, environmental and social issues (D2006:6).</p> <p>Environmental Awareness Programme: Promoting the rational, economic use of energy, adequate waste disposal and use of public transport, distribution of leaflets, advertising campaign to encourage separate refuse disposal and collection and energy saving, environmentally friendly technology, public will be informed of environmental Action Plan. Green Belt Project, linking all parks and green areas around Turin (D2006:4).</p> <p>The Mandria Environmental Centre: (project) improve the Reggia Reale and the Borge Castello (D2006:4).</p> <p>Olympic Games Watchdog Committee – updated on projects aims of the Action Plan for the Environment, WWF Piedmont suggests that an environmental impact of modern ski-slope and snow management techniques be followed through (D2006:4).</p> <p>The Ministry for the Environment on behalf of the Italian State evaluates the environmental impact (Associazione Tornio 2006, year, p. 66). Regional authorities in charge of setting up a Regional Plan for the Environment, programs to limit noise, and pollution, and specific policies for waste management and energy saving. Provincial Authorities, authorize drainage and water systems, plan waste management and monitor waste processing and treatment plants. Olympic Village and Media Village will be an example of environmentally friendly construction (D2006:4).</p> <p>Organizations have been consulted: WWF Piemonte, ProNatura Piemonte, Italia Nostra Interrregionale Piemonte de Valle d’ Aosta and Club Alpino Italiano (D2006:4).</p> <p>Include improving road systems and public transport, does not entail any expansion of the road network other than already planned. City of Turin’s Electric Car Project will be offered to participants and visitors of the Games which will then be available to tourists and inhabitants of Turin (D2006:4).</p> <p>Beijing 2008</p> <p>Olympic Logistics centre (green procurement problem) – materials planning, procurement, storage, distribution, tracking management and disposal</p> <p>Between 1998 – 2007 Beijing spent US\$ 12.2 billion on 20 projects, US\$118 million for environmental measures (D2008:4).</p>
Challenge for the	Atlanta 1996

firm	<p>AOOC invested in renewable energy a source which was promoted by the Energy Programme of the Community Support Framework and within the Development Law (1892/90) (D2004:6).</p> <p>Sydney 2000</p> <p>Olympic Co-ordination Authority to provide Olympic venues and facilities and internal monitoring and auditing (D2000:1).</p> <p>Torino 2006</p> <p>TOROC would build relevant structures in accordance with national laws and regulations that have been co-signed by the IOC (D2006:4).</p> <p>The official documents giving these guarantees have already been consigned to the IOC (D2006:9).</p> <p>Implementation of a project for European Eco-Label for hotel tourists (D2006:1), 30% of facilities adopted Eco-label (D2006:5). Eco-labelling to select suppliers and products. European Eco-label (D2006:2).</p> <p>TOROC adopted the Olympic values in defining sustainability policies (D2006:6)</p> <p>Relevant structures will be built in accordance with national laws and regulations, have been co-signed by the IOC (D2006:9).</p> <p>Waste Management and Choice of Materials, suppliers will be selected on the basis of how friendly their products are, quantity and quality of packaging (no PVC, tetrapak, aluminum etc.), absence of gases. Co-existence and Compatibility of Sports Events and Tourism, respect the countryside, local traditions, setting up ecotourism itineraries, projects designed to safeguard local traditions and economic activity, management and maintenance of ski slopes and other sport events (D2006:4).</p> <p>Beijing 2008</p> <p>BOCOG will have clean fuels in 90 percent of public buses and 70 percent of taxis (D2008:4).</p> <p>BOCOG stated 85 percent of Olympic venue air-conditioning will use ozone-friendly refrigerants, all Olympic-related building projects include 40-50% green space (D2006:3).</p> <p>Provision of Beijing Municipality Methods of Reinforcing Energy Conservation Provision of Beijing Municipality Methods of Energy Saving Supervision Provision of Beijing Municipality Guidelines on Implementation of Trial Methods on Clean Production Audit Beijing Programme of Circular Economy Development and Energy Saving during 11th Five Year Plan (D2008:4).</p> <p>2006 Speeding Circular Economy and Establishing Energy Saving Act Beijing Programme of Buildings Energy Saving During 11th Five Year Plan Guidelines of Heat Pump System Development (D2008:4).</p>
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	<p>Environmental Protection Law of the People's Republic of China "the pollution prevention facilities of a construction project must be designed, constructed and put use in sync with the main body of the project" (D2008:12).</p> <p>Phase out Ozone-depleting Substances by 2005, The density of dust decreases every year (D2008:4).</p> <p>Decrease noise pollution – airlines have curbed the use of jet planes that create sonic booms, an urban railway is being built underground, low-noise horns have been installed, honking is prohibited in areas within the third ring road; and tractors are prohibited in residential areas (D2008:12).</p>
Representation of the natural environment	<p>Lillehammer 1994</p> <p>"LOOC encouraged the use of public transport system during the Olympics and had asked the Norwegian authorities to facilitate the production and sale of less environmentally harmful fuels. As 1,500 buses were used to transport spectators and athletes during the Olympics, one goal was to reduce the harmful effects to the environment caused by this activity". (D1994:2).</p> <p>Sydney 2000</p> <p>Energy will be saved through natural lighting, natural ventilation, insulation, efficient appliances motion detector lighting, day light sensors and solar panels. The athlete's village contains 665 houses supplied with electricity and hot water from photovoltaic solar panels on each house. Waste avoidance, expected waste is to be 5,000 tons (D1996:1). The state embraced a tree planting excursion over 100, 000 trees planted and 350,000 shrubs (D1996:1).</p> <p>SLOC plans to plant 200,000 trees and 5 million shrubs and native grasses around Sydney's Games venues by September 2000. OCA will be planting 80,000 trees and 100,000 square meters of turf areas will be developed by the time the Games begin (2000:7).</p> <p>SLOC will adopt the High Performance Building Initiative to require that all future city buildings to be energy efficient (D2002:7).</p> <p>SLOC hired a company to dispose 2,500 to 3,000 tons of Olympic waste, and at least 85 percent of the trash will be recycled or turned into compost (D2002:9).</p> <p>Energy conservation, use of renewable interest (D1996:1) Ozone depletion biodiversity, pollution and resource depletion (D1996:12).</p> <p>Packaging will be recyclable, and information will be presented electronically to minimize paper waste (D1996:1).</p> <p>Energy will be saved through natural lighting, natural ventilation, insulation, efficient appliances motion detector lighting, day light sensors and solar panels. The athlete's village contains 665 houses supplied with electricity and hot water from photovoltaic solar panels on each house (D1996:1).</p>

	<p>Waste avoidance, expected waste 5,000 tons (D1996:1).</p> <p>The state embraced a tree planting excursion over 100, 000 trees planted and 350,000 shrubs (D1996:1).</p> <p>Athens 2004</p> <p>Solar energy and wind energy will be used to heat water and provide electric lighting and air conditioning. Buildings will be designed with energy savings and bioclimatic considerations in mind. AOOC will conduct atmospheric testing to monitor quality of air, which will include pollution control measure pollutants such as VOC, airborne pollution, the greenhouse effect and climatic changes (D2004:6).</p> <p>Torino 2006</p> <p>Energy from fossil fuels, used renewable energy solar energy systems, massive and active heat recovery systems (D2006:5). Building Energy Management System – monitor energy consumption (D2006:5).</p> <p>Heat generators fuelled with chips and refrigerating machinery (D2006:5). High-efficiency artificial lighting systems (D2006:5).</p> <p>Use of eco-friendly vehicles will be promoted in urban areas and a means of transportation from the interchange carparks to sports events (D2006:1)</p> <p>The use of cars and shuttles with low or zero emissions will be a priority. Electrically powered cars will be the only vehicles in use in the Olympic Village.</p> <p>Vehicles powered by eco-balance and minimal resort to costly transport methods (D2006:5)</p> <p>Building materials with reduced pollutant emissions, from recycling processes, Eco-compatible waste management (D2006:5).</p> <p>Solid urban refuse produced must be reduced by 2% and 7.5%, refuse collection and recycling must account between 35% and 50% of total amount solid urban refused produced.</p> <p>Renewable Action Plan – 38.8% reduction in consumption of fossil fuels, 9% of energy consumption is to come from renewable energy resources (D2006:4).</p> <p>The Ministry for the Environment, on behalf of the Italian State evaluates the environmental impact on the public. Regional authorities set up a Regional Plan for the environment and responsible for implementing program to minimize environmental damage, limit noise, atmospheric pollution and implement policies regarding waste management and energy saving (D2006:4).</p> <p>Beijing 2008</p> <p>BOCOG is to showcase conservation treatment and promote carbon neutral Olympics. They initiated a campaign called “For our Natural Splendor” civil society support for 2008 Games in partnership with China Environment Culture Promotion Association affiliated with State</p>
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	<p>Environmental Protection Association (D2008:4).</p> <p>BOCOG stated they will utilize coal burning boilers to increase the use of clean fuels and energy structure and the heating supply will be over 50 percent of residential area and the electricity will cover up to 16 million m squared (D2008:4).</p> <p>BOCOG's conservation of energy will include, energy efficient-buildings, selection of energy-efficient buildings, adoption of water-conserving devices and utilize solar energy and geothermal resources (D2008:12). Garbage will be transported by Beijing Municipal Environmental Sanitation Bureau for incineration, landfill or dumping as compost. Waste water will be admitted to the central urban sewage treatment and cannot be treated by biological and chemical techniques to meet the standards (D2008:12).</p> <p>BOCOG agreed to protect 8 percent of natural habitat (D2008:4). BOCOG also agreed to plant trees in 28 percent of the land in urban and suburban areas, averaging 6.14 m(squared) for each resident. The length of the road 2,000 km is lined with trees. More than 80 afforested areas and the 30-odd major competition sites are covered by green foliage and flowers (D2008:12). BOCOG's goal by 2008 is to process 98 percent waste in central area and 80 percents in suburbs (D2008:4).</p> <p>Construction of the Shan-Jing, natural gas pipe-line with a transport capacity of 4-5billion m cubed/year by 2007 (D2008:12).</p> <p>Conversion of coal burning boilers to increased use of clean fuels and energy structure readjustment District heating supply to over 50% of residential area. Electricity and geothermal heating coverage up to 16 million m squared (D2008:12).</p> <p>Green Lighting Program – 1.8 million energy-efficient lights in use, estimated 39 million kilowatt hours of electricity can be saved (D2008:4).</p> <p>By 2006, 15,200 coal-fuelled boilers out of 16,300 had been converted to natural gas and the rest by 2007 (D2008:12)</p> <p>Conservation of energy will include energy efficient-buildings, selection of energy-efficient buildings, adoption of water-conserving devices and utilize solar energy and geothermal resources (D2008:12).</p> <p>Construction of hazardous waste disposal facilities for a total capacity of 10,000 tons/year which includes medical and radioactive wastes (D2008:4).</p> <p>Garbage will be transported by Beijing Municipal Environmental Sanitation Bureau for incineration, landfill or dumping as compost. Within facilities, non-hazardous waste in suburban area (D2008:12).</p> <p>Sealed stations for collecting and transporting non-industrial garbage 'may' be ranked the best in the world (D2008:12).</p> <p>Implementation of silt elimination and water clarification project in Guanting reservoir. Transformation and renovation of Jingmi canal for water quality and flow. Improve city sewage network and wastewater treatment, 2.8 million meter cubed/day waste water treatment (D2008:4).</p>
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	<p>Waste water will be admitted to the central urban sewage treatment and which cannot be will be treated by biological and chemical techniques to meet the standards (D2008:12).</p> <p>Trichogramma and thuringiensis bacillus have been used in water resources to prevent plant diseases and insect pests, AO sewer treatment method has been employed (D2008:12).</p> <p>There is 40% of green cover in urban area, establish a greenbelt alongside the Fourth Ring Road (D2008:4).</p> <p>Manage key conservations areas such as wetlands, forests and bird habitats, protect 8% of natural areas. "Preservation during the construction of Olympic Venues of indigenous vegetation and ecological ecosystems" (D2008:4).</p> <p>There is 28% of the land in urban and suburban areas has been planted with trees, averaging 6.14 m(squared) for each resident. The length of the road 2,000 km is lined with trees. More than 80 afforested areas, 4 concentric green belts, dozen buffer woods covering 1,000 hectares. The 30-odd major competition sites are covered by green foliage and flowers (D2008:12).</p> <p>Olympic Green Project contains 14 venues, the Olympic Village and Forrest Park. Closing down polluting and resource-wasteful enterprises, as well relocating 200 industrial enterprises from within the Beijing Fourth Ring Road. Construction of roads, underground rail and transport hubs (D2008:4).</p>
Illustrations of the data	<p>Sydney 2000</p> <p>Sydney's five environmental objectives include: energy conservation and the use of renewable sources, water conservation, waste reduction, safeguards for human health with appropriate standards for air, water and soil and the protection of significant natural and cultural environments (D2000:3). SLOC announced they would supply 300 environmentally friendly natural-gas buses expected in 2000 (D2007:17).</p> <p>The environmental committee consists of four permanent employees and two on loan from the U.S. The committee presented a plan for the Kyoto Protocol an international agreement meant to reduce the emission of greenhouse gases and cut emissions by 7 percent (D2002:4; D2002:21).</p> <p>Torino 2006</p> <p>TOROC stated they will use eco-friendly vehicles, which will be promoted in urban areas. They declared the use of cars and shuttles with low or zero emissions as a priorit and electrically powered cars will be the only vehicles in use in the Olympic Village (D2006:4).</p> <p>The regional branches of Italia Nostra, ProNatura, Legambiente and WWF have set up the Olympic Games Watchdog Committee. It evaluates projects involved in the organization of Games (D2006:4)</p> <p>Construction, Installations and Infrastructures, any construction will be sited in accordance with normal local authority planning procedures and post-Olympic use, in regards to temporary structures the surrounding area</p>

	<p>will be set up to its original state after the Games (D2006:4).</p> <p>Beijing 2008</p> <p>BOCOG had 3,926 diesel buses and 30,000 taxis and updated all vehicles to the National Third Stage Emission Standard (D2008:2). BOCOG will utilize low emissions vehicles and reinforcing public transportation, free rides to Olympic ticket holders for 51 days (D2008:4).</p> <p>Most of the environmental initiatives were created by the Beijing Government rather than BOCOG. 4,000 mines were closed, 100 oil storages and petrol stations have been upgraded or shutdown, 400 graves and 150 polluting enterprises were relocated from the 8th water-source protection zone (D2008:2).</p> <p>Headquarters Office oversees safety, quality and environmental standards, and requirements set by the IOC and International Sports Federations (D2008:12).</p> <p>Has entrusted the municipal environmental science research institutions with a study on this subject, and results will be provided by environmental specialists in Beijing and the Municipal Environmental Protection Bureau (D2008:12).</p> <p>China set up a committee called Unilever Century Woods to create a green bid for the 2008 bid. There was also a five-year program launched called “Clean Water Green Mountains for China Programme” to protect the environment (D2008:8).</p> <p>The Resolution on Creating a Good Environment for Bidding the Olympic Games through Mobilizing and Further Improving the Quality of the Capital’s Environment – a plan for education and publicity to enhance environmental awareness and includes: set up an environmental protection group under BOBICO or OCOG to build awareness, with mass media and various activities related to environmental protection (D2008:12).</p>
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Radical Paradigm

Ways of framing the issue	<p>Sydney 2000</p> <p>Sydney’s concerns arose whether SLOC is doing enough. To counterclaim these accusations, SLOC is planting 100 trees, adopting Decker Lake and has water conservation videos with Bill Nye the Science Guy (D2002:21).</p> <p>Salt Lake City 2002</p> <p>SLOC’s goal is to host the first Olympic Games causing no net increase in air pollution emissions (D2002:10).</p> <p>Torino 2006</p> <p>The local and regional authorities have given specific guarantees regarding urban and rural planning for the Games (D2006:9).</p>
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	<p>Beijing 2008</p> <p>BOCOG's goal is to "deliver a successful Games without impacting negatively on ecosystems, and to stage a truly 'Green Games'. The commitment included supporting environmental education and awareness raising, cooperation with environmental NGOs, instituting environmental management systems, sustainable transportation during the Games, eco-design for the venues, green procurement (environmental-friendly purchasing of materials), green accommodation, tree planting and green marketing (D2008:4).</p> <p>"deliver a successful Games without impacting negatively on ecosystems, and to stage a truly 'Green Games'. The commitment included supporting environmental education and awareness raising, cooperation with environmental NGOs, instituting environmental management systems, sustainable transportation during the Games, eco-design for the venues, green procurement (environmental-friendly purchasing of materials), green accommodation, tree planting and green marketing" (D2008:4).</p>
Thought Processes	
Challenge for the firm	
Representation of the natural environment	
Examples of communication	<p>Lillehammer 1994</p> <p>The bid was considered as the green bid which includes environmental guidelines (D2000:8).</p> <p>Sydney 2000</p> <p>The Sydney Games align themselves as the "Green Games" (D2000:26).</p>

OCOG Declared Phase Results

	Number of Detrimental statements	Number of Incremental statements	Number of Adaptive statements	Number of Radical statements
Way of framing issue– what questions are being asked by the firm	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 2 3 - 3 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Thought process – What is the type of response from firm members?	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 2 3 - 2 4 - 5 - Other -	SEEPM Categories 1 - 36 2 - 12 3 - 9 4 - 1 5 - Other -	SEEPM Categories 1 - 5 2 - 3 - 4 - 5 - Other -
Challenge for the firm – What are the expectations with regard to the firm's behaviour	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 2	SEEPM Categories 1 - 4 2 - 1 3 - 9 4 - 5 - 1 Other -	SEEPM Categories 1 - 2 2 - 6 3 - 6 4 - 3 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Representation of the natural environment - To what extent is the natural environment represented as a waste repository, a pool of natural resources, or a living habitat	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 1	SEEPM Categories 1 - 2 - 3 3 - 3 4 - 5 - Other - 1	SEEPM Categories 1 - 4 2 - 6 3 - 18 4 - 12 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Illustrations from the literature - What is content of firm's communication	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 6	SEEPM Categories 1 - 4 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 3 2 - 1 3 - 6 4 - 5 - Other - 1	SEEPM Categories 1 - 1 2 - 3 - 4 - 5 - Other - 1
	Total - SEEPM Categories	Total - SEEPM Categories	Total - SEEPM Categories	Total - SEEPM Categories

	1 - 0 2 - 0 3 - 0 4 - 0 5 - 0 Other - 9	1 - 10 2 - 6 3 - 14 4 - 0 5 - 1 Other - 1	1 - 45 2 - 27 3 - 42 4 - 16 5 - 0 Other - 1	1 - 6 2 - 1 3 - 0 4 - 0 5 - 0 Other - 2
TOATL – 181	9 – 5 %	32 – 17.7%	130 – 71.8%	9 – 5%
Management Performance Indicators – 95 - 52%				
Management Operational Indicators – 73 – 40%				

OCOGs Enacted Phase (Staging Phase)

Detrimental Paradigm

Questions by the firm	
Assumptions/Thoughts Processes	<p>Atlanta 1996</p> <p>Hundreds of trees were planted to make the Games more scenic, however, they were neglected and were in a hostile urban environment. One-fourth of the 3,000 trees planted were estimated to die by the end of the summer. (D1996:6).</p> <p>Protestors: Declared radioactive cobalt and other material stored in a nuclear reactor at Georgia Institute of Technology posed a serious security risk to the Games (D1996:7).</p> <p>ACOG announced with Federal Transit to utilize 400 buses fuelled by compressed natural gas in the Atlanta committee, however during the Games only 83 were manufactured (D1996:8).</p> <p>Nagano 1998</p> <p>The thought processes was incomplete because the Olympic organizers made an agreement to only use snow-packing vehicles between 5:00am and 6:30am and from 3:30pm to 5:00pm during the Olympic Games. However, the snow-packing vehicles were used outside of those hours. The agreements on lighting were also violated, the Environment and Nature Conservation Division of the Nagano prefectural government notified NAOC of the six day violations but not measures were taken (D1998:2).</p> <p>Salt Lake City 2002</p> <p>Tried to promote environmentally change through public statements of recycling (D2002:23).</p> <p>Environment Management Industry Association of Australia (EMIAA) aid in the environmental promotions (D2000:27).</p> <p>To clean the parks, the city created the Take Pride in Utah initiatives which the boy scouts have also joined (D2002:15).</p> <p>Beijing 2008</p> <p>Construction of 77 roads and bridges. Construct disposal facilities for hazardous waste for 10,000 tons of waste a year by 2006, 23 domestic waste disposal facilities with a capacity of 16,210 tons of waste/day (D2008:4).</p>
Challenge for the firm	<p>Lillehammer 1994</p> <p>Because of the mass size of the Games, it was impossible to be completely ecologically friendly. The Games left an ecological footprint, and green space was lost in Lillehammer (D1994:2).</p> <p>Sydney 2000</p>

	<p>The Dames and Moore report showed that State authorities did not test for contamination in up to 10 metres of household and industrial waste buried under Bicentennial Park. (D2000:13).</p> <p>Greenpeace took legal action under S.52 of the Trade Practice Act (1974) against the OCA for not utilizing the ozone-depleting substances. Green Games Watch 2000 had to use freedom of information laws to get government documents, which questions their environmental integrity (D2002:23).</p> <p>Greenpeace Australia, had evidence that dioxin contamination within the Olympic site levels of toxic ratings were 15,000 times higher in the US (D2002:2). The Homebush site resulted in toxins that seeped into the groundwater and potentially blew into the air as dust (D2002:2).</p> <p>Greenpeace has taken SLOC to the Federal Court in an effort to stop them describing the Games as being 'green friendly' (D2000:9; D2000:11).</p> <p>There was public concern over the contamination of the site such as arsenic, chromium, copper, iron, magnesium and zinc medals (D2000:1), reports were never published by the Sydney Olympic</p> <p>Bidding Limited (SOBL). Environmentalists concerns were not published due to political reasons, however, was published three years later in the Current Affairs Bulletin after Sydney had won the bid</p> <p>(D2002:2). Greenpeace refuted the Olympic Co-ordination Authority because of their plans to use HCFC 123a gas in the air-conditioning system at the ice=skating venues, which destroys the ozone layer</p> <p>(D2000:9; D2000:11). SOOC are using steel and concrete instead of wood, which requires more fossil fuels which causes more greenhouse gases to be emitted (D2000:12).</p> <p>Coca-Cola and Unilever announced they were going to convert to eco-friendly refrigerants world-wide and also pressure supplier-distributors to do the same. And now Greenpeace is waiting upon McDonalds participation (D2002:18).</p> <p>Greenpeace took legal action under S.52 of the Trade Practice Act (1974) against the OCA for not utilizing the ozone-depleting substances.</p> <p>For the Green Games Watch 2000 had to use freedom of information laws to get government documents, this questions how well it has been cleaned (D2002:23).</p> <p>"In 1992, for the first time in the history of the Olympic movement, the International Olympic Committee asked cities bidding to host an Olympic Games to say how they proposed to address environmental issues" (D2002:23)</p> <p>"Between 1949 and 1976, state government documents show the Olympic venue at Homebush Bay was used as dumping ground for the deadly poison dioxin, a key ingredient of the Agent Orange defoliant used in the Vietnam War" (D2002:23)</p> <p>Storm water was collected from the roof and stored in tanks to irrigate the pitch and gas-fired co-generators will be back up to the electricity supply. The Stadium Australia grand stands will be removed after the Olympic Games (D2000:24).</p>
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	<p>Greenpeace ran a high-profile campaign against Coca-Colas use of climate changing hydrofluorocarbons refrigerators. Which committed coca-cola to phase out the use of those refrigerators in Olympic Venues (D2008:4).</p> <p>McDonalds, Unilever and Coca-Cola were accused of contravening environmental rules. McDonalds used refrigerants such as butane and propane in only two outlets and did not use it in its other seven sites, Coca-Cola used the new refrigerants in only 100 of its 1,800 units (D2000:4).</p> <p>Unilever (world's biggest ice cream maker) did not follow through with their refrigerant initiatives and only utilized a tenth of the freezer cabinets in Sydney (Olympic Torch: Eco dispute ignites Games row, 2000 1997 – 2000 Press Review).</p> <p>The Olympic venue was built on a toxic waste dump "Olympic Landcare" 3 year program more than 1,000 volunteers planting 2 million trees and shrubs nationwide (D2000:1).</p> <p>Homebush had extensive environmental contamination problems, metals such as arsenic, chromium, copper, iron, magnesium, zinc existed above normal backgrounds levels (D2000:1)</p> <p>The countermeasures against the home bush were silenced by the Sydney Olympic Bidding Limited (SOBL). There was public concern over the contamination of the site, reports were never published. Environmentalists concerns were not published due to political reasons the editor of the New Scientists did not want to be scrutinized for Sydney losing the bid, therefore, it was published 3 years later in the Current Affairs Bulletin after Sydney had won the bid. (D2002:2)</p> <p>Torino 2006</p> <p>Torino environmental group protested the hundreds of trees that were cut down for the bobsleigh, event and mountainsides were buried in cement (D2002:26).</p> <p>Coca-Cola and Samsung pulled took out their vehicles from the torch relay due to the protest from environmentalist groups (D2006:15).</p>
Representation of the natural environment	<p>Salt Lake City 2002</p> <p>From 1996 to 2002 the development surrounding the mountain areas has increased by approximately 50% (D2002:26).</p> <p>Beijing 2008</p> <p>40,000 tons of waste steel scraps within the National Indoor Stadium (D2008:2).</p>
Examples of communication	<p>Atlanta 1996</p> <p>Hundreds of trees were planted to make the Games more scenic, however, they were neglected and it is estimated one-fourth of the 3,000 trees planted were to die by the end of the summer (D1996:6).</p> <p>Declared radioactive cobalt in the Georgia Institute of Technology posed a serious security risk to the Games (D1996:7). ACOG announced with Federal Transit to utilize 400 buses fuelled by compressed natural gas in the Atlanta committee; however during the Games only 83 were manufactured (D1996:8).</p>

A scientist argues that the Olympic Games is causing a risk to visitors due to the higher-than-normal doses of ultraviolet radiation (D1996:6).

The environmental group, *The Georgia Conservancy* has growing concerns over the environmental impact on the city during the Games. The Priest Landing in Savannah as the back-up sailing venue the group believes it is a poor decision because it will cause an increase in human damage, threaten the wood stork and impact the marine species (D1996:11).

The increase of security caused the organizers to trim and/or cut down trees. The Georgia Tech students were not keen on the newly renovated campus of security fences and shortened school year (D1996:14).

The U.S. Environmental Protection Agency recorded a 15 percent dip in air pollution levels for that time of the year, the opposite of what was anticipated (D1996:5).

Recycling and composting initiatives resulted in a 50 percent diversion level during the 16 days of the Games, and a remarkable 82 percent diversion during the best 8 days (D1996:5).

Too many cars on the road and athlete's breathing were affected by the emissions from the amount of vehicles. As well proper ventilation in indoor facilities needed to be more efficient, needed to have more natural light and too hot caused dehydration (D1996:4).

The Olympic Games failed to take sufficient environmental safeguards (D2000:3).

After the Atlanta Games were not as ambitious as they set out to be, "it has fallen to Sydney to provide the first full environmental "Benchmarking" exercise (establishing an initial measure or standard against which to measure future events) for any sports event (D1996:5).

"Visitors of Atlanta were exposed to higher-than-normal doses of ultraviolet radiation" (D1996:6).

Sydney 2000

Olympic organizers Polyvinyl (PVC) products will not be sued during the construction of games venues (Sports, Olympics, Sydney, Greenpeace, 1998), However the toy mascots are made from PVC according to Greenpeace (D2000:19).

The problems associated with the Green Games concept was directly attributed to the OCA, this is why environmental groups have problems with the OCA taking over the environmental management of the games. The 12 million project to prevent the contamination of the Olympic sites have not started. Failure to meet the environmental guidelines for refrigeration and air-conditioning (D2000:5).

The OCA has ignored to undertake 100% renewable energy under Energy Australia's Pure Energy scheme. According to Ian Kiernan, Clean Up Australia chairman was part of the Olympic bid and feels the OCA has diluted Sydney's initial environmental guideline (D2000:5).

<p>Olav Myrholt (IOC's environmental consultant) did not adhere to its original plan of using ozone-friendly air-conditioning in the main stadium because of the difficulty to retrieve the appropriate technology(DIOC:10).</p> <p>“Greenpeace the environmental group that helped Sydney win its Olympic bid by endorsing the Green Games, has taken Olympic organizers to the Federal Court in an effort to stop them describing the Games as green friendly” (D2000:9; D2000:11).</p> <p>Greenpeace is also fighting the Olympic Co-ordination Authority plans to use HCFC 123a gas which is used in the air-conditioning system in the Olympic stadium which destroys the ozone layer (D2000:9). – It was implemented in the Nagano Games in the ice skating rinks (D2000:11)</p> <p>The OCA's commitment set out in the environmental guidelines for the Summer Olympic Games (D2000:10)</p> <p>Dr. Patrick Moore the co-founder of Greenpeace said it was a joke calling the games the Green Olympics (D2000:12).</p> <p>SOOC are using steel and concrete instead of wood, which requires more fossil fuels which causes more greenhouse gases to be emitted (D2000:12)</p> <p>Environmental group Green Games Watch 2000 there was a few contaminated sites included the Newington Arms depot, Bicentennial Park and Homebush Bay. 200cu contaminated soil was stored under plastic sheeting at the Newington site and a 50 cm layer which was to form a protective barrier over toxic waste and was also contaminated (D2000:13)</p> <p>The soil underneath the Olympic site are contaminated for eternity which will be turned into parklands and recreation areas (D2000:14)</p> <p>The Dames and Moore report showed that State authorities did not test for contamination in up to 10 metres of household and industrial waste buried under Bicentennial Park. (D2000:13).</p> <p>The old hospital site which will house 6,000international media and technical officials have indicated potential soil contamination including toxic chemicals and heavy metals (D2000:13).</p> <p>The IOC requested for a Dioxin Review Report by the CH2M Hill. According to Peggy James th co-ordinator of Green Games Watch 2000 is her fear that they will be taking “a public relations approach to managing the issue rather than a scientifically credible approach” (D2000:13).</p> <p>Human Health and ecological risk assessments were undertaken in 1992 which led to site-wide remediation works (D2000:26).</p> <p>Greenpeace applauded the contamination clean up of the Sydney organizers at the Homebush site, however still believe there is a lot to be done in regards to the cleaning of toxins and chemicals in the Sydney Bay (D2000:6).</p> <p>SOCOG did not adhere to its original plan of using ozone-friendly air conditioning in their main stadium. Took them to federal court b/c of describing them as green friendly (D2000:9).</p>
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	<p>Five full time administrative positions make up the SOCOG environmental committee (D2000:31).</p> <p>The Environment Protection Authority refused to provide environmental information to clean up before the Games (D2000:32).</p> <p>A further request by GGW 2000 for an internal review was also dismissed (D2000:32).</p> <p>Sydney's school participate in environmentalism as part of a Department of Education Olympic Schools program (D2002:2).</p> <p>In 1992 a local survey went out 71 % stated they were not publicly educated with the environmental impact and believe that the information was not adequate enough to make people feel safe to live and work in the Homebush Bay area. The access to information was denied. In 1997 Greenpeace Australia had evidence that dioxin contamination on the Olympic site levels of toxic ratings were 1500 times higher n the US (D2002:2).</p> <p>SLOC hired a company to dispose 2,500 to 3,000 tons of Olympic waste which will fill the official venues which will make at least 85% of the trash will be recycled or turned into compost (D2002:9).</p> <p>3,000 tons of waste and aimed at only using materials that could be recycled. Stated will meet Kyoto Protocol, to reduce emissions of greenhouse gases to cut emissions by 7% (D2002:18).</p> <p>The Olympic Park is going to leave a permanent scar and estimate that 50% of acreage is going to increase from 1996 to 2002. Environmentalists also argue that how, 2,500 to 3,000 tons of Olympic waste was expected to pile up, venue organizers promised 85% of trash will be recycled or turned to compost (D2002:18).</p> <p>SLOC's recycling initiatives are far behind the 2000 Summer Games recycling initiatives (D2002:9).</p> <p>The 6,000 car parking lot at the Utah Olympic Park will re-vegetated after the Games and will be monitored two years later to ensure the survival of plants (D2002:24). However, the Snyderville Planning Commission raised concerns about because UDOT declined to prove financial; bond guarantees (D2002:24).</p> <p>SLOC bent environmental rules by conducting a land swap that gave environmentalists concern because SLOC stated it would be too early to take environmental action, however later one say it is too late. Such as lighting up Salt Lake's mountains above the Avenues where the Olympic rings would burn 360,000 watts and SLOC argued it was too late to vote on the matter (D2002:14).</p> <p>SLOC will restore areas during the Games is disappointing as well the loss to the open space in the mountain range, irreversible damage to watersheds and wildlife habitat (D2002:18).</p> <p>Protestors against the construction of a temporary stadium for the Beach Volleyball by group "Bondi Warriors" threatened violent protests if the plans continued to build a 10,000 seat stadium on the beach may 1, 2000 and closed to the public for 6 months Sept. 15 – Oct. 1. (D2000:27).</p>
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Twenty wildlife and conservation groups to stop predator control activities, 80,000 coyotes and 300 black bears are killed which is hypocritical to the two mascots the black bear (Coal) and coyote (Copper) (D2000:27).

The 6,000 parking lot at the Utah Olympic Park has received a guarantee it will be re-vegetated to its natural condition and monitored two years after, however, concerns proclaimed as UDOT declined financial bond guarantee (D2002:24).

Boycot the coyote bounty program. It is hypocritical Utah is promoting Copper the coyote however authorizing money to kill coyotes which included 20 environmentalists (D2002:9).

Protestors called the Games, the "Corporate Games" and were criticized for asking local Utahns to make sacrifices so the international community doesn't have to and the construction projects created damage to the city's open space (D2002:5).

During the Salt Lake City Games, there was sooty, smoggy air hanging over the city (D2002:10).

Unlike the 1984 Olympics, Salt Lake is unable to use exhaust fans or the widespread cloud seeding to help clean the skies (D2002:3).

The largest environmental problem is the use of private automobiles (D2002:21).

Tom Price stated "SLOC dropped the ball when it came to figuring out how to move fans to the venues with minimum of auto pollution, Not just dropped it, but kicked it out the window, then burned and buried it" (Price, 2002).

SLOC's environmental problem was a transportation plan that relies heavily on private automobiles" (D2002:21).

GrassRoots Recycling Network said SLOC lags behind the recyclable and compostable system (D2002:25).

Tom Price, chairman of the Olympics environmental advisory committee, stated SLOC should have gone beyond recycling and tree planting, he was also disappointed in the transportation planning from moving fans to venues (D2002:25).

Environmentalists in Utah announced the Olympics were not a green success and have instead inflicted permanent damage on the Utah area (D2002:25).

Athens 2004

Athens is known for its air pollution, damage to the mountains and downgrading of the environment. Protest by a university professor on the construction of venues (D2004:3).

Michael Bland who is in charge of Greenpeace Australia stated that Athens is taken one step closer to be a greener Olympics. Instead of using chlorine, Bland said they were to use ozone, because chlorine weakens the immune system (D2004:3).

There was plans to expand the subway, although the plans persisted there were

delays and was not complete by its 196 deadline (D2004:3).

Greenpeace has rated Athens of only achieving 1 star out of 10 for upholding the third pillar status (D2002:27).

Athens went as far as installing transportation systems. Solar power systems were not used, recycling and waste management programs were put in place (D2002:27).

Environmentalists referred to the Atlanta Games as the disposable Games, because most structures were dismantled, which fails to qualify as ecologically sustainable (D2002:27).

Torino 2006

The International Ecological Monitoring Group, Guard Fox Watch, stated the post Olympic Games resulted in an increase in pollution, disruption of wildlife, greater greenhouse emissions and energy wastes (D2006:1).

TOROC concluded with 7.1 percent increased in waste from 2000 to 2005, 1,212 tons of waste was collected, 566,010 waste was produced in the communes with competition venues and the total 103,516 tons of CO₂ for the Olympic Games and 15,000 for Paralympics Games were measured (D2006:9). There was also 118 tons of paper waste, 29 tons of plastic, 115 tons of organic fraction, 10 tons of glass and cans, 21 tons of wood, and 920 tons of non-recyclable fraction (D2006:1).

International Ecological Monitoring Group: Guard Fox Watch – post Olympic Games increase in pollution, disruption of wildlife, greater greenhouse energy wastes, (D2006:1).

Increase in BOD₅ pollution in the inflow and outflow of sewerage (D2006:1).

Activists and residents of Val di Susa valley protest the high speed rail that cuts through their valley (Italy on guard but no evidence of Olympic threat, 2006)

Torino environmental group protested, Legambiente – hundreds of trees cut down for bobsleigh, mountainsides have been buried in cement (D2006:13).

- 7,1% increased in Waste from 2000 – 2005 (D2006:1)
- 1,212 tons of waste was collect
- 566,010 was produced in the Communes with Competition Venues
- Quality of ecosystems became impoverished
- Deforestation from construction sites
- Ecological network demonstrated low connectivity and small decrease” p. 111
- Gradual deterioration in naturality affected by construction
- Total 103,516 tons of CO₂ for the Olympic Games and 15,000 for Paralympics Games were measured (D2006:1)

Paper 118 tons of waste – plastic 29 tons, Organic fraction 115 tons, glass and cans 10 tons, wood 21 tons, non-recyclable fraction 920 tons (D2006:1)

Overall success, however, considering the extent of the infrastructure raises questions for sustainability (D2006:8).

	<p>Subject to Standard II National Ambient Air Quality Standards – set limits for pollutants such as sulphur dioxide, carbon monoxide, nitrogen dioxide and particulate matter (D2008:4).</p> <p>Most of the environmental initiatives were created by the Beijing Government rather than BOCOG (D2008:2).</p> <p>In UNEP’s view, this is an achievement in itself, especially considering that the Organizing Committee of the previous Olympic Summer Games failed to follow up on their environmental promises.” (D2008:2).</p> <p>Comments: Air quality has failed to reach national standards for four of the seven days since the city took more than 1m cars off the roads and shut hundreds of factories.</p> <p>According to the Beijing authorities, the amount of particulate matter in the air did not reach the national benchmark of 100mg a cubic metre for the past four days. Today, it rose to 113, more than double the far tougher standard of 50 set by the World Health Organisation. Environmental groups applauded the measures, but said they were unlikely to satisfy global expectations (D2008:2).</p>
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Incremental Paradigm

Questions by the firm	<p>Torino 2006</p> <p>The Local Council Authorities are responsible for monitoring and managing various policies regarding pollution (D2006:4). The public authorities are responsible for specific policies throughout the area regarding care of the environment and the maintenance of public health and civil protection (D2006:4). Activists and residents of Val di Susa valley protested the high speed rail because it cuts through the valley (D2006:14).</p> <p>Beijing 2008</p> <p>Three core concepts of 2008 Olympics – Green Olympics, High-tech Olympics and People’s Olympics. China and the world (D2008:4).</p> <p>New process and disposal facilities, recycling programs (D2008:2).</p> <p>Industrial Development Bureau – Industries are to reuse, reduce, recycle and new sustainable industrial projects (D2008:4).</p> <p>In 2006, domestic waste in the city was 5.85 million tons, and daily 16,000 tons. Goals by 2008 process 98% waste in central area, 80% in suburbs, 6 recycling plants in Beijing. Recyclable domestic garbage is separated by residential communities and by sorting transfer stations (D2008:4).</p>
Assumptions and Thought Processes	<p>Atlanta 1996</p> <p>“Environmental impacts have been minimized wherever possible, reuse and recycling will play a central role in post-Games restoration efforts and Olympic development can be viewed in many cases as urban revitalization” (D1996:9).</p> <p>Within Atlanta created a system to run 2,000 buses on 1,300 routes daily and another 4,200 cars and vans will shuttle people from and to the Olympic village, another solution for ACOG is sending announcements to local citizens to either</p>

	<p>telecommute or go on vacation during the Games (D1996:13).</p> <p>Uniforms worn by staff members are made of fully recyclable materials (D1998:4).</p> <p>Olympic organizers made an agreement to only use snow-packing vehicles between 5am and 630 am as well from 330 pm to 5 pm. However the snow-packing vehicles were used outside of those hours. The agreements on lighting and broadcasting were also violated the Environment and Nature Conservation Division of the Nagano prefectural government notified NOOC of the six day violations but not measures were taken (D1998:3).</p> <p>Sydney 2000</p> <p>Millennium Parklands project at Homebush included planting 2 million plants and 65,000 native trees, which included 450 hectares of landscape and up to 40 km of cycle trails the plan was developed by Olympic Co-ordination Authority and National Parks and Wildlife and Bicentennial Park (D2000:15).</p> <p>There are 300 environmentally friendly natural-gas buses expected in 2000 (D2007:17).</p> <p>PVC has been kept to a minimum at the Stadium Australia within the plastics (D2000:24).</p> <p>The Olympic Hotel will reduce energy by 40% (D2000:8).</p> <p>There were 200,000 trees and 5 million shrubs and native grasses will be planted around Sydney's Games venues by September 2000 (D2000:7).</p> <p>Salt Lake City 2002</p> <p>SLOC partnered with the Olympic Coordination Authority to achieve the 'greenest games ever' status, however, Maurice Strong's Earth Council and Greenpeace put forward eight key areas OCA has failed (D2000:5).</p> <p>SLOC bent environmental rules by conducting a land swap that gave environmentalists concern because SLOC stated it would be too early to take environmental action, however later on stated it was too late. SLOC also argued it was too late to vote on the matter of the mountains above the Avenues, where the Olympic rings would burn 360,000 watts (D2002:14).</p> <p>SLOC Committee Director of Environmental Programs, Dian Conrad stated "one-tenth of one percent of 2002 Olympic budget (1.5 million) will be spent on the environment (D2002:21).</p> <p>Created a forum called " Social Values, Environment, and Sustainable Development" (D2002:1).</p> <p>SLOC is consulted with NASA for the "urban heat islands" to discuss the most beneficial areas for tree planting (D2002:10).</p> <p>"Cleaner and Greener Program", asking community to decrease their energy use during the Games to counterbalance the emissions from events and venues (D2002:5).</p>
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	<p>Present a plan for the Kyoto Protocol an international agreement meant to reduce the emission of greenhouse gases and cut emissions by 7% (D2002:7).</p> <p>Will adopt the High Performance Building Initiative to require that all future city buildings to be energy efficient (D2002:7).</p> <p>Partners with Leonardo Academy and produced an emission-reduction checklist and organizations who earn 200 points for example 5 points if a family uses a microwave instead of a stove, receives the “Cleaner and Greener Environment Champion” (D2002:5).</p> <p>SLOC worked with NASA to use heat-sensitive equipment to map spots for the Wasatch Front which are targeted for tree planting (D2002:9).</p> <p>Environment Management Industry Association of Australia (EMIAA) aid in the environmental promotions (D2000:27).</p> <p>Olympic Coordination Authority have partnered with SLOC so they can be the greenest games ever, however, Maurice Strong’s Earth Council and Greenpeace put forward eight key areas OCA has failed. According to Greenpeace’s Corin Millais has been the obstacle for staging a truly Green Game (D2000:5).</p> <p>Spectators will park their vehicles at two 7,000-space car parks, a few miles from venues, and shuttles will be available. Expected 60,000 people transported daily to Olympic venues, once finished the parking lots will be removed and return to its natural state (D2002:11).</p> <p>The road to Alpine Area at Snow basin has been altered, the new site will be monitored sedimentation.</p> <p>Environmentally friendly transportation, utilize compressed natural gas rather than gasoline to reduce emissions (D2002:11).</p> <p>Utilize natural gas-powered vans and motor coaches for athletes (D2002:10).</p> <p>Decrease pollution by getting the large companies to reduce their emissions “We expect we will get all of our emissions fully offset” Diane Conrad (D2002:3).</p> <p>To combat air pollution has improved the mass transit, encouraged the use of buses which many are fuelled by compressed natural gas and promote carpooling and telecommuting (D2002:3).</p> <p>Americas Public Lands will have a variety of booths at 125 S. Main (D2002:15).</p> <p>The trees planted are called “champion” trees which include quaking aspen, white and red ash, and black locust varieties from ancient giants (D2002:9).</p> <p>During the Games the environmental and health alliance will convene surveillance teams for each Olympic venue, ensure food vendors have the right permits and cook with the proper temperatures (D2002:12).</p> <p>Environmentalists stated SLOC only allocated 0.1 percent of their budget towards environmental projects (D2002:26).</p> <p>SLOC will host the North American Conference on Sport and the Environment Sept. 17-19 (D2002:21).</p>
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	<p>Plan to plant 100,000 trees (D2002:10).</p> <p>Environmental Education Summit – Environmental Education Steering Committee will demonstrate projects to SLOC. Sport and Environment curriculum will take place during and after the Olympic Games. Determine partnerships among a variety of groups (D2002:7).</p> <p>Utilize internet and media. A month before the Games SLOC will announce plans for the “Olympic Forests” – increase trails, expanding transit and preserving open space and more (D2002:7).</p> <p>“While SLOC’s environmental programs is a branch that specifically works on keeping the Games’ environmental impacts to a minimum, questions arose whether it is doing enough. To counterclaim these accusations, SLOC is planting 100 trees, adopting Decker Lake and has water conservation videos with Bill Nye the Science Guy. Environmental Advisory Committee member for SLOC stated that it all may be message and marketing (D2002:21).</p> <p>Partnership with UNEP, Partnership with European Commission. IOC, IF, NOC, OCOG, athletes, clubs, managers and all individuals and enterprises associated with sport (promoting sustainable development) (DIOC:13).</p> <p>100 audits of Olympic buildings from Spring 2003 (D2006:1) Partnership with UN, during the UN Conference on Environment and Development (DIOC:13).</p> <p>Torino 2006</p> <p>UNEP and TOROC developed a publication of annual sustainability report based on the Global Reporting Initiative and a partnership with European Commission (D2008:6).</p> <p>Meetings and relations with local institutions such as the local region, province and municipalities Meetings and relations with the environmental Advisory Committee. Relations with Trade Associations and the Chamber of Commerce IOC – Transfer of Knowledge Program (TOROC will aid upcoming host cities) (D2006:6).</p> <p>Orienting TOROC’s conducts and future actions towards an improvement of performances, through the identification of organizational, structural and relational working methods. Providing a reference for the dissemination of ‘best practices for the sporting world environmentally and reporting of sporting events. Utilized Strategic Environmental Assessment: Tool designed to evaluate programs and eliminate or reduce the potential environmental impacts (D2006:6)</p> <p>Sustainability Report to Assess environmental impact (communication tools) (D2006:6).</p> <p>Utilized Mountain Olympic Spine during the peak flows of the Games, also utilized ring roads and tunnels to minimize the pressures on population centers (D2006:1).</p> <p>Verifying the design of indoor environmental quality and the outdoor spaces</p>
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	<p>quality (D2006:6).</p> <p>Implemented a Prevention and Management Plan for waste. Waste Prevention and Management Plan (D2006:1).</p> <p>Water Plan, Natural Risk Prevention Plan, Construction Site Safety Plan, Landscaping Plan (purpose of plans for saving water resources for drinking and sport events), interacted with hydrographic network. Sewage system was affected which had direct affects on large bodies of water, therefore The flow rates decreases during the monitoring of the Games, however can be established if directly affected by the Olympic Games. Water systems in the valley were improved Projects included: sewerage system was completed, Upgrade purification plant (D2006:1)</p> <p>Water consumption limiting devices (D2006:5)</p> <p>On-site information – Volunteers and TOROC staff set up an environmental booth on environmental activities (D2006:8).</p> <p>Beijing 2008</p> <p>Construction of sewage treatment plants In 2005 812 hectares greening area (D2008:2).</p> <p>Launching Event (November 15, 2006), support for the pride campaign to uplift public awareness of a green lifestyle Ecotourism Standard Workshop Travel Green Campaign – nature-friendly travel Green Olympics and Public Participation workshops Carbon/Tree Calculator and Climate Change Campaign – convert carbon to trees, educate on climate change (D2008:4).</p> <p>Conservation Internationals – include national and international conservation messages, reduce harm to wildlife, showcase conservation treatment and promote carbon neutral Olympics. Initiated a campaign called “For our Natural Splendor” civil society support for 2008 Games in partnership with China Environment Culture Promotion Association affiliated with State Environmental Protection Association (D2008:4). Created the Carbon Neutral Olympian, companies, travelers – the Climate Change education – to offset carbon-emissions (D2008:4).</p> <p>Huaxia Geographic, local partner for the National Geographic Magazine</p> <p>Scrapped 3,926 diesel buses and 30,000 taxis and updated all vehicles to the National Third Stage Emission Standard (D2008:2).</p> <p>Implemented the national third stage emission standard of automobiles (reduce pollutant emission by over 50% and equipped with on-board diagnostics which signals the owner to comply with the standard for pollutant emission (D2008:2).</p> <p>Taxis have been replaced by Compressed Natural Gas or comply with municipal vehicle emission standards. New buses were powered by Compressed Natural Gas (3,795 buses) Low emissions (low, zero or electric) vehicles and reinforcing public transportation, free rides to Olympic ticket holders for 51 days. Olympic vehicles 3, 060 (D2008:4).</p>
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	<p>National Fourth-Phase Emission Standards, will be launched in 2008 (D2008:4).</p> <p>100 petrol stations have installed recycling refuel nozzles. Municipal Government implemented gas recirculation devices in urban filling stations in 2001. Installing systems for fuel storage tanks and furl unloading systems. Process pollution from petrol stations, oil storage centers and oil carriers (D2008:4).</p> <p>Bus Rapid Transit Lines – 100,000 passengers 16 km long Transportation Hubs (3), 70,000 passengers, 60,000 passengers and 1,500 passengers (D2008:4).</p> <p>Torch is made out of recycled materials Guide to Environmental Protection for Beijing Olympic Torch Relay (D2008:4).</p>
Challenges for the firm	<p>Atlanta 1996</p> <p>“The Atlanta Committee for the Olympic Games (ACOG) recognizes the importance of incorporating environmental considerations into its overall planning for the 1996 Centennial Olympic Games. Consistent with this recognition, ACOG will comply with all environmental laws and regulations and will be sensitive to the protection of our natural resources. – The Atlanta Committee for the Olympic Games Environmental Policy Statement.” (D1996:9).</p> <p>Five lines of metro and an efficient bus system, the ring road which was built around the city reduced traffic by 15%. Two thirds of the media village and Olympic village were dismantled and are now university housing (D2004:3).</p> <p>Sydney 2000</p> <p>Cola tested 100 Coca-cola for 100 of their refrigerating machines to be environmentally friendly, supplied 400 electric vehicles. Shell donated low emissions diesel for buses. BHP supplied steel which met environmental standards. Ramler furniture tables and shelving from biodegradable boards. Lindemans supplied recyclable plastic wine bottles. Samsung supplied green freeze refrigerators. Xerox supplied 50% recycled paper. Mizuno supplied clothing from recycled materials. Visy, CleanEvent, Waste Service, Pacific Waste Management provided staff for recycling (D2000:6).</p> <p>Clean-up of 400 tonnes of dioxin-contaminated soil (D2000:6).</p> <p>Salt Lake City 2002</p> <p>Territorial stakeholders, local institutions and local communities, Italian National Olympic Committee and Italian Federations are effected by SLOC’s ES progress (D2006:6)</p> <p>Local authorities, local media, schools and universities (development of sport activities post-Olympic games) (D2006:6).</p> <p>Sport system (local and international level) – members of Olympic Movement,</p>

	<p>International Federations, National Federations and territorial sport systems (D2006:6).</p> <p>Local consultative assembly – municipality representatives of the Consortium of Mountain Communities (met every two months to discuss Olympic procedures) (D2006:6).</p> <p>Environmental consultative Assembly- Environmental and social NGOs (bimonthly meetings discussed Environmental Monitoring Plan) (D2006:6).</p> <p>Torino 2006</p> <p>Promote European Eco-label for hotel tourist services, the media village was awarded the Eco-label trademark in 2005 (D2006:6)</p> <p>40% of products purchased complied with Eco-friendly criteria laid out by Eco-label (DIOC:2).</p> <p>Suppliers must sign an agreement to promote the green procurement system within public authorities and local economic actors (D2006:6).</p> <p>40% of the purchases of TOROC were made respecting environmental criteria (D2006:7).</p> <p>Beijing 2008</p> <p>Greenpeace – monitors and comments on host cities' environmental initiatives while advocating environmental solutions – The Greenpeace Olympic Guidelines (3rd party stakeholder), BOCOG asked Greenpeace any suggestions to increase their environmental initiatives (D2008:4).</p> <p>WWF China – 20 ways to 20 percent of energy efficiency (2 year public plan), Forest Stewardship and the sustainable kindergarten – boost eco-labeling and forest certification of sustainable timber (D2008:4).</p> <p>Healthy athletes for a healthy planet – investing carbon emissions from planes to Gold Standard Climate change offset project, 10,000 athletes by air from over 200 countries and regions which will cause thousands of tons of carbon into the atmosphere (D2008:4).</p> <p>Sponsors (COCA-Cola) use ozone-friendly carbon dioxide as refrigerant (DIOC:2).</p> <p>85% of Olympic venue air-conditioning will use ozone-friendly refrigerants, all Olympic-related building projects include 40-50% green space (IOC:2).</p> <p>Suppliers must comply with environmental laws and regulations and preference to ISO 14001 companies (D2008:4).</p> <p>Greenpeace, Olympic Sponsors 1. Use products and technologies that do not harm the environment 2. Promote environmental protection. Natural refrigeration (D2008:4).</p> <p>A national Environmental Protection Law to reduce pollution caused by coal burning (D2008:5).</p> <p>By 2006 20 nature reserves were constructed covering 8.18 percent of land area.</p>
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	<p>(D2008:4).</p> <p>Twelve newly built venues, 11 renovated and expanded venues and 8 temporary venues which will be dismantled (D2008:2).</p>
Representation of the Natural Environment	<p>Nagano 1998</p> <p>Where new facilities and roads were built topsoil was scraped off before construction to be restored in for later use (D1998:3).</p> <p>Beijing 2008</p> <p>Instead of formaldehyde materials, alternative materials such as wooden and plastic composites in Olympic Village and Olympic Green (D2008:4).</p> <p>174 new geothermal wells in Beijing (D2008:4).</p> <p>Water is recycled in an irrigation area of 100,000mu and 23 sewage treatment projects were completed, water that was recycled annually reached 260 million cubic meters (D2008:2).</p>
Examples of Communication	<p>Atlanta 1996</p> <p>“The 1996 Atlanta Summer Games, though not particularly ambitious in the scope of its environmental initiatives, did monitor and release figures for waste diversion.” (D1996:5).</p> <p>Sydney 2000</p> <p>SLOC cleaned up 400 tonnes of dioxin-contaminated soil (D2000:6).</p> <p>Environmental management system certified to ISO 14001, results published each year by the EMAS (Torino Olympic Policy, 2006). EMAS Regulation (Eco-Management and Audit Scheme) (D2006:6). The environmental results will be published annually in the “environmental statement” and made available to those required by the EMAS (Regulation No. 761/2001/EC) (D2006:6).</p> <p>ISO 14001 certified to minimize environmental impact, such as air, waste and water, comply with applicable laws regulations and improve environmental performance (IOC, 2007).</p> <p>OCA has caused the environmental struggle in which they need to live up to Sydney’s environmental guidelines, for example the 12 million dollar plan to fix the contamination still has not started in February 2000 (D2000:5).</p> <p>“Local residents and environmentalists are protesting against projected restrictions on beach access, safety issues, increased traffic and road closures in the Bondi area, plus degradation of the beach and discoloration of the sand.” (D2004:9).</p> <p>During the Games OCA is to plant 6,000 Australian native plants (D2002:2).</p> <p>“the ‘green games’ has left a legacy where, in their immediate vicinity, the toxins remain in home bush Bay’s sediments, seep into the groundwater of consolidated</p>

<p>landfills and are potentially blown into the air as dust.” (D2002:2).</p> <p>Greenpeace gave Sydney 6 out of 10 on the environmental efforts to be considered as the greenest games ever (D2000:7).</p> <p>Salt Lake City 2002</p> <p>The environmental committee consists of 4 permanent employees and two on loan from the U.S. Forest Service with a budget of \$1.5 million (D2002:4; D2002:21).</p> <p>Donated to environmental program, Anheuser Busch, Utah Power and the U.S. Forest Service (D2002:5).</p> <p>Students at the University of Utah and Olympic bobsledder Mark Hoaglin planted trees around University of Utah’s campus Utah Power donated the trees (D2002:9).</p> <p>Diane Conrad environmental coordinator for SLOC and stated SLOC encourages hotels and restaurants to go green by awarding green medals. However, for hotels going green it could be simple as installing low-flow toilets and showers or soap dispensers rather than bars of soaps (D2002:9).</p> <p>With the 100,000 trees to be planted, homeowners will save \$213 annually in cooling systems and in 20 years can be \$ 230 annually (D2002:9).</p> <p>“Reberg said he environmental issues SLOC is emphasizing are relatively minor, urban and controversial. He wishes the Olympics could have provided more of a forum for a debate about how public lands should be used.”...the big emphasis is on tree planting and recycling is emphasized as well (D2002:9).</p> <p>Torino 2006</p> <p>ISO 14001 Certification (D2006:6).</p> <p>EMAS Registration (D2006:6).</p> <p>Certified Environmental Management System (D2006:6). Certified ISO 14001</p> <p>EMAS Regulation (Eco-Management and Audit Scheme) (D2006:6).</p> <p>UNI EN ISO 14001 and EMAS Regulations (D2006:1); EC Regulation no. 761/2001 and ISO 14001 – a twin system (D2002:2).</p> <p>TORINO completed an environmental assessment for venue design and location decisions and a comprehensive environmental management system based on ISO 14000 standards (D2006:1).</p> <p>The environmental results will be published annually in the “environmental statement” and made available to those required by the EMAS (Regulation No. 761/2001/EC).</p> <p>Environmental Action Plan (Green Card), Charter of Intent, Environmental Policy Document (D2006:1).</p>

	<p>Attended 2 international conferences organized by IOC/UNEP “Sport Summit for the Environment” (D2006:1).</p> <p>Created “Green Dinner” – Communication event. Attended “Global Forum on Sport and Environment” In Lausanne Switzerland, 5 coordinating and update meetings. “Memorandum of Understanding” between UNEP and TOROC. Green Ring Project “Sport, Mountain and Olympic values” (D2006:1).</p> <p>Beijing 2008</p> <p>ISO 14001- minimize environmental impact, such as air, waste and water, comply with applicable laws regulations and improve environmental performance (DIOC:2).</p> <p>"Despite the efforts of the government, Beijing air quality probably is still not what the world is expecting from an Olympic city," said Greenpeace campaign director Lo Szeping. "The athletes will be breathing 150 litres of air per minute ... So for athletes this is a particular concern." (D2008:10)."</p> <p>“The report, The Beijing 2008 Olympic Games: Final Environmental Assessment, concluded that although more could have been done to work with non-governmental organizations (NGOs) and cutting the Olympic and Paralympic Games’ carbon footprint, the Games marked a step forward for environmentally-conscious large-scale sporting events” (D2008:1)</p>
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Adaptive Paradigm

Ways of framing the issue	
Assumptions and Thought Processes	<p>Atlanta 1996</p> <p>Utilizing polyester wood opposed to rain-forest wood for the portable Velodrome (D1996:1).</p> <p>Sydney 2000</p> <p>Sydney’s five environmental objectives include: energy conservation and the use of renewable sources, water conservation, waste reduction, safeguards for human health with appropriate standards for air, water and soil and the protection of significant natural and cultural environments (D2000:3).</p> <p>“Sydney created a document that addressed energy conservation, water conservation, waste reduction, air, water, soil quality and protecting natural and cultural environments” (D2000:3).</p> <p>SOOC spent \$157 million, \$137 spent on cleaning up and \$20 million on toxic sediments in Homebush Bay (D2000:14)</p> <p>\$95 million on Olympic Park Railway at Homebush OCA is spending \$137 Australian dollars to clean the home bush site (D2000:18).</p> <p>Olympic Coordination Authority will put \$22.5 million for the first development stage of the Millennium Parklands at Homebush (D2000:15).</p>

Salt Lake City 2002

Promoting a healthier lifestyle “A Healthier You 2002” in partnership with coalition of Utah health organizations. Community event “Gold Medal Mile” (D2002:2).

SLOC will host the North American Conference on Sport and the Environment from Sept. 17 – 19 2001 (D2002:21).

Salt Lake City Green Team – collection of environmental advocates, open-space watchdogs – their ideas range from encouraging businesses to replace high-watt light bulbs to energy efficient ones to protect the city’s canyon watershed from development (D2002:7).

Create the “Olympic Forrest” – increase number of city trails, expand transit options, preserve open space – “Zero Waste” (D2002:7).

Torino 2006

The activities of the Committee could be analyzed: The organization relating to internal activities and processes such as employee management, procurement activities and legal affairs. The Volunteers Programme of Torino 2006 recruited, trained and managed over 20,000 volunteers (D2006:6).

Analysis of results were presented twice a year on energy consumption (D2006:6).

Analysis of results were presented twice a year on water cycle (D2006:6).

Refurbishment of existing buildings – 11 facilities (D2006:8).

Construction of a new structure - 14 facilities (D2006:8).

Torino’s media village was turned into a student’s residence (D2006:8).

Beijing 2008

China’s green future an environment program estimated at US \$11.5 billion (D2008:6).

Green Construction Guidelines for Olympic Projects

Environmental- safe Well Lid

Solar Energy Bathrooms for Builders

Solar Energy Lighting devices (D2008:2).

BOCOG launched website “Green Olympics”

Created the “Love for the Olympics, Care for the Environment – to promote peace, advancement, harmonious development

Signed the Memorandum of Understanding - allows to share information between BOCOG and UNEP

Dust pollution – public report system to supervise dust pollution at construction sites (D2008:2).

Environmental Protection Guidelines for the Olympic Projects

Environmental Protection Guidelines for the Renovated or Expanded

	<p>Olympic Projects Environmental Protection Guidelines for the Temporary Projects Construction and Environment Department – The venue and Waste Management Cleaning Plan, The Venue Cleaning and Waste Management Operation Outline, The Demonstration Venue Virtual Plan (D2008:4).</p> <p>However estimated 3.3 million vehicles by 2008 (major source of carbon monoxide and nitrogen oxide emissions). Urban railway network – 8 lines will have a capacity 3.9 million passengers a day by 2008 (D2008:4).</p> <p>The Beishenshu Landfill created in 1997 has a capacity of 980 tons/day and expected service period is 13 days. Bentonite and clay line the bottom of the landfill and have a pipe system to store reservoir where it is treated and discharged, where is converted into gas and then into electricity - The Water-Biogas Associated Treatment System. Eliminate 300,000 motor vehicles with high emissions (D2008:4).</p> <p>From 2003 to 2006, 37,006,192.78 dollars was spent on dust control (D2008:2).</p> <p>17.9 Yuan billion on environment (D2008:2).</p> <p>From 2001 – 2005 Beijing increased its green area by 130,000 ha by the end of 2007 proposed 51.6 % (forest coverage ratio). The 2007 plan is to increase the total coverage to 70.49 %. Rehabilitating the Beijing Chengde Highway is to be completed by 2007 (D2008:4).</p>
<p>Challenge for the firm</p>	<p>Nagano 1998</p> <p>NAOC challenge was the lack of guidance they received from the IOC, therefore had to make a decision that opposed the International Ski Federation request. The NAOC was asked to raise the start of the men's downhill race, to make it more challenging. However, the NAOC denied the request because the environmental concerns outweigh the challenging course. The IOC stated the final decision would be made by Japan (D1998:4).</p> <p>Torino 2006</p> <p>Strategic Environmental Assessment provided under the Constitutional law of the Torino Olympic Winter Games (D2006:1)</p> <p>Beijing 2008</p> <p>Guidelines – use of illegal logged timber , timber procurement, highest quality of food (pesticide use) (D2008:4).</p> <p>Projects such as solar-café for state-of-the-art climate-friendly refrigeration and cooling technology, an energy-saving light bulbs project and non-disposable chopsticks promotion project (D2008:4).</p> <p>BOCOG announced a 10-year plan to meet the IOC's standards by 2007, which includes improvements in air and water quality and increasing the sanitation in the streets, and according to World Bank Beijing has the most severe air pollution in the world (D2008:7).</p>

Representation of the natural environment	<p>Nagano 1998</p> <p>NAOC implemented a new method to freeze the ice for the luge and bobsled tracks to reduce the amount of chlorofluorocarbons (D1998:4).</p> <p>Atlanta 1996</p> <p>Georgia Tech built an hydrogen fuelled, electric powered bus and produced zero emissions (D1996:1)</p> <p>The state embraced a tree planting excursion over 100,000 trees planted and 350,000 shrubs (D1996:1)</p> <p>Nagano 1998</p> <p>New method to freeze ice for the luge and bobsled tracks which will reduce the amount of chlorofluorocarbons (D1998:4).</p> <p>Salt Lake City 2002</p> <p>Verify adoption of bio-architectural criteria and the use of eco-compatible materials free of polluting substances (D2006:6).</p> <p>Sydney 2000</p> <p>Water is heated by solar energy and the media centre will use a ventilation system applying solar technology (D2000:3).</p> <p>Energy Australia – stadiums generated by renewable sources (solar, hydroelectric, biogas and wind) (TOROC, Sponsors and Sustainability).</p> <p>Beijing 2008</p> <p>Beam-pipe illumination technology, guides the sun's rays into underground facilities (D2008:4)</p> <p>Efforts such as GreenGen bode well for resolving those complaints, but China is also moving ahead with efforts to turn coal into liquid fuel—a costly transformation that emits twice as much CO₂ as does simply burning the black rock and consumes yet more energy (D2008:9).</p> <p>Ceilings and walls are made of translucent membrane. Transparent polycarbonate panels with insulating, age-resistant and anti-ultraviolet capabilities for the structure within the Water Cube. Solar power devices to light lawns, streets and venues. Solar panels to heat up water (D2008:4).</p> <p>The Olympic Village includes a vacuum glass tube solar collection system installed on the buildings roofs to heat the tap water which will save 2,400 tons of coal per year (D2008:4).</p> <p>Heat-pump systems two-fold for environmental protection and energy conservation (D2008:4).</p> <p>Reduce dependence on coal, Olympic Village will use 6,000 square metres of solar heat to supply hot water (D2008:4).</p>
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	<p>4.13 million tons were produced in 2006, and overall processing capacity was 3.98 million tons, results in a process rate of 96.5% . After the World Softball Championships (to test the venues) 48,734 kg of waste was produced, 88.7% was recycled (D2008:4).</p> <p>Solar energy hot water system of 140 square (D2008:2).</p> <p>Within pools anti-penetration concrete, to prevent water from leaking out and being wasted (D2008:4).</p> <p>Olympic Green – 144,000 m2 area has been equipped with rain water collection materials</p> <p>National Aquatic Centre – 10,500 m3 of rain water will be collected every year through the 29,000 m2 collection area designed on the building rooftop</p> <p>Media Village 3,000 m3 of rainwater will be captured by using permeable bricks, pipes and wells on the roofs, roads and green areas, 3,600 tons of coal will be saved each year with the energy use that is offset through the sewage pump technology (D2008:4).</p> <p>Beijing built 600 km of new sewage pipe, in total 2,500 km. Treat on-site waste-water at 53 pollution sources, 90% of waste water is to be improved (IOC, 2007).</p> <p>Improved sewage network, 2.8million m cubed/day (D2008:4).</p> <p>Nagano 1998</p> <p>Hodler, an IOC member stated that “Japanese authorities will decide the starting point, although they will also have to take the blame for their decision. (D1998:5).</p> <p>NAOC decided to cut the number of cross country courses to three from four, because of the goshawk nests in that area. “NAOC also moved some of the Alpine skiing events from Mt. Iwasuge in Shiga Kogen to existing courses at other locations; after environmental monitors recommended that new courses at other locations, after environmental monitors recommended that new courses should not be built for the downhill” (D1998:6; D1998:7).</p> <p>NAOC employed construction methods for the new facilities that they would avoid detrimental impact on the environment (D1998:6).</p> <p>NAOC fought to ensure the men’s downhill skiing event did not go through Nagano’s National Park. However International Ski Federation (FIS) had been pushing for the other way, the Japan Olympic ski federation also agreed with the FIS (D1998:7; D1998:8, 1997; D1998:4; D1998:5; D1998:9).</p> <p>The construction of the ski hill in the natural habitat goes against the IOC Charter and the Nagano Olympics (D1998:5).</p> <p>The final decision is to be made by Japan and NAO decided to leave the start line where it is at 1,680 meters of height (D2002:12; D1998:5).</p>
Examples from the	Sydney 2000

literature	<p>Greenpeace, which monitored preparations for the 2000 Olympics were closely, denounced it as an environmental disaster (D2000:35, p. 133).</p> <p>Torino 2006</p> <p>Commitment to the protection of the environment and sustainable development (Olympic Movement's Agenda 21, p. 13). Every member of the Olympic Movement play an active role in promoting sustainable development (D2006:6)</p> <p>Sustainable development has been a fundamental objective of the Olympic Movement (D2006:6).</p> <p>Project Ethical and Social Values in Sport, adapt environmental principles. Within Charter of Intents sponsors and partners must sign to ensure improving environmental performance (D2006:1).</p> <p>Environmental Management System (EMS) TOROC developed. Eco-Management and Audit Scheme – continuously improving environmental performance – first organization to involve EMAS (D2006:1).</p> <p>TOROC must supply feasibility studies for each project, which defines location, technical and functional characteristics and timeline.</p> <p>Environmental Advisory Assembly - discusses Environmental Programme (21 meetings in 5 years) (D2006:1).</p> <p>Hector Programme (Heritage Climate Torino) focus on climate change and greenhouse gas emissions (D2008:6).</p> <p>UNEP and TOROC developed a publication of annual sustainability report based on the Global Reporting Initiative</p> <p>Organizing committee's environment staff works with the European Commission to establish a system and standard to environmental management system (D2008:6).</p> <p>The Games were awarded the European Eco-Label for the facilities. Publication of annual reports (D2006:8).</p> <p>Beijing 2008</p> <p>Runner, Ethiopian Haile Gebrselassie he did not compete in the marathon due to the pollution in the air which will damage his lungs and since he already has asthma he does not want to make it worse (D2008:3).</p> <p>4,000 mines were closed, 100 oil storages and petrol stations have been upgraded or shutdown, 400 graves and 150 polluting enterprises were relocated from the 8th water-source protection zone (D2008:4).</p> <p>"Measures taken for the Olympics – in conjunction with weather conditions in August – led to reductions in carbon monoxide (CO) by 47 per cent; nitrogen dioxide (NO₂) by 38 per cent; volatile organic compounds (VOC) by 30 per cent; particulate matter (PM₁₀) by 20 per cent; and sulphur dioxide (SO₂) by 14 per cent" (D2008:1).</p>
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OCOGs Enacted Phase Results

	Number of Detrimental statements	Number of Incremental statements	Number of Adaptive statements	Number of Radical statements
Way of framing issue– what questions are being asked by the firm	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 2 - 1 3 - 3 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Thought process – What is the type of response from firm members?	SEEPM Categories 1 - 2 2 - 1 3 - 1 4 - 5 - Other - 4	SEEPM Categories 1 - 15 2 - 16 3 - 21 4 - 5 - Other - 2	SEEPM Categories 1 - 11 2 - 9 3 - 2 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Challenge for the firm – What are the expectations with regard to the firm's behaviour	SEEPM Categories 1 - 2 - 1 3 - 3 4 - 5 - Other - 16	SEEPM Categories 1 - 7 2 - 8 3 - 8 4 - 5 - Other -	SEEPM Categories 1 - 2 2 - 2 3 - 4 - 5 - Other -	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Representation of the natural environment - To what extent is the natural environment represented as a waste repository, a pool of natural resources, or a living habitat	SEEPM Categories 1 - 2 - 3 - 1 4 - 5 - Other - 1	SEEPM Categories 1 - 2 - 1 3 - 3 4 - 5 - Other -	SEEPM Categories 1 - 2 - 2 3 - 16 4 - 5 - Other - 4*	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
Illustrations from the literature - What is content of firm's communication	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other - 78	SEEPM Categories 1 - 15 2 - 9 3 - 1 4 - 5 - Other - 2	SEEPM Categories 1 - 10 2 - 1 3 - 1 4 - 5 - Other - 2	SEEPM Categories 1 - 2 - 3 - 4 - 5 - Other -
	SEEPM Categories 1 - 2 2 - 2 3 - 5 4 - 0 5 - 0	SEEPM Categories 1 - 39 2 - 35 3 - 36 4 - 0 5 - 0	SEEPM Categories 1 - 23 2 - 14 3 - 19 4 - 2	SEEPM Categories 1 - 0 2 - 0 3 - 0 4 - 0

	Other - 98	Other - 4	5 - 0 Other - 6	5 - 0 Other - 0
TOTAL – 275 Management Performance Indicators – 115 = 42% Operational Performance Indicators – 124 = 45%	99 – 35.8%	114 – 41.6%	62 – 22.6%	0

Appendix B

Document Inventory

Case: Lillehammer 1994 Olympic Games

1994:1 Lillehammer Organizing Committee (1985). Lillehammer 1994 Candidate City: Bid Document. University of Western Ontario.

1994:2 Haugsjaa, (1997). In Da Costa, L. (Ed.), *Environment and Sport: An International Overview*, Faculty of Sport Sciences and Physical Education: Porto, 259- 260.

1994:3 *TED Case Studies: Olympic Games*. Retrieved on June 18, 2009 from <http://www1.american.edu/TED/LILLE.HTM>

Case: Atlanta 1996 Olympic Games

1996:1 Brown, W. (December, 1999). Societal Values, Olympic Values: Technology and the Environment in the 1996 and 2000 Olympic Games. ASSH Bulletin, Issue 31, 13 – 20.

1996:2 Ferreira, L.(nd). The Third World Conference on Sport and the Environment, 1997 – 2000 Press Review

1996:3 Lehourites, C. (January, 1998). Sports-Greece-Olympics-Environment. Associated Press. Centre for Olympic Studies International Olympic Committee. Press Review. (1994- 1997). vol. 1. University of Western Ontario

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