

MAASTRICHT GRADUATE SCHOOL OF GOVERNANCE

As Green As It Gets

**A critical assessment of the long-term impacts of London's Sustainability
Strategy for the Olympic Games 2012**

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1. Introduction

“Olympic Games, by their multidimensional nature, epitomise the notion of a truly global event and may therefore represent a very interesting investigative field to shed a new light on the debate over sustainable development in the urban milieu of post-modern cities” (Furrer, 2002: 2)

The issue of sustainability has been drawing more and more attention within the past few years, and it even made its way onto the agenda of mega-event organizers, like the International Olympic Committee (IOC). “After the International Olympic Committee (IOC) chose to make the environment the third strand of Olympism in 1994, cities have been expected to deliver cleaner and greener Games” (Cashman, 2002: 5). In line with these newly emerging demands and interests, the city of London has ambitious plans for the Olympic Games in 2012, demonstrating its strong commitment to sustainability. The goal is to organize the most sustainable Games in history. For this purpose, the Olympic Delivery Authority (ODA) has developed a Sustainable Development Strategy for the event. Among others, this strategy is meant to set out more appropriate principles for sustainability measures and intends to organize and perform the Games in a way that promises a positive legacy for London (London, 2012).

When reviewing the existing literature about the impacts of the Olympic Games on the respective host city or region, it becomes obvious that most of the material focuses merely on the short-term, often positive, economic effects. This often diminishes the comprehensiveness of conducted analyses. Truly comprehensive analyses must include long-term impacts, particularly when examining sustainability. Evaluating these long-term impacts also requires recognition of potential unforeseen and unexpected effects, which can be both positive and negative (Hiller, 1998). For these reasons, this paper pays the well-deserved attention to the long-term¹ consequences and aims at answering the following:

What long-term impacts can or must be expected for London after hosting the Olympic Games in 2012? Will the Games initiate a sustainable legacy or rather impose a long-lasting burden for the city of London and the London area?

¹ Long-term is to be understood here as a time period of 20+ years.

In order to answer these questions, a case study about the long-term effects of the Olympics 2012 in London will be conducted. After a brief description of London's own Sustainability Strategy, the assessment will first make use of the Pressure-State-Impact-Response (PSIR) model. This conceptual model is a useful means to assist the structuring of scientific knowledge gained from desktop analysis. It will be used, inter alia, to identify and clarify the different driving forces (Pressure) that come with hosting the Olympic Games and most importantly the impacts that possibly result from it. Organizing the gathered information and different factors in this framework facilitates the development of scenarios, which will be the next step in the assessment. The qualitative, narrative scenarios aim at illustrating and elucidating the possible future effects that cannot be known or calculated at this point in time. By this, scenarios allow the portrayal of different possible future end-states and the respective paths towards them, which in turn enables the development of improved strategies (Response).

Overall, the paper is divided into two main parts. Preceding the actual assessment of the long-term impacts for London in Part II, Part I provides a more general overview of important concepts and descriptions and is mainly based on literature review. After defining the concept of sustainability in relation to mega-events and evaluating what is generally regarded as a 'good' sustainability strategy, a more detailed description of the methodology is given. It is elaborated why it has been decided to use scenarios and the Pressure-State-Impact-Response (PSIR) model in the case study of London 2012, how to build, and how to use them. Beyond that, the economic, social, and environmental impacts of a mega-event like the Olympic Games on the host city or region are portrayed. In this context, the past and present Games of Sydney (2000) and Beijing (2008) are used as examples, as the transfer of experiences gained from these Olympic Games might help future generations of mega-events' organizers to improve their performance. The Olympic Games in Athens in 2004 are not evaluated here, since the Games in Sydney and Beijing are more useful examples for this paper's purpose. Sydney is commonly regarded as a highly positive portrayal of sustainable Games and gained lots of appraisal. Hence, it provides a 'success-story' against which following Olympics are often measured. Beijing, being a country in transition and experiencing an economic boom, it could be the case that the Olympic organizers face challenges that are not expected to this level in cities like Sydney or London. However, it is also possible that Beijing will prove to be more successful than expected, since there are theoretically more possibilities for improvement. These very different potential outcomes make Beijing an interesting example.

As closure of Part I, a brief overview of the Olympic Games' history in the context of sustainability is given.

The case of London is of particular interest for this topic, because the event is still more than four years ahead. Thus, London is in a crucial phase of the planning and developing process, where it is still able to ensure that "the Games concept be integrated into an overall sustainable strategy for the development of the host city and region [which] fits into their long-term strategies" (Furrer, 2002: 27-28).

2. Defining sustainability and 'good' sustainability strategies

As difficult as it might be, it is of course crucial to identify the concepts of sustainability or sustainable development when conducting an assessment like the one at hand. Also, when examining whether a sustainability strategy can be expected to be successful or not, one first needs to agree upon what is understood as a 'good' sustainability strategy. Here, it is understood as an efficient and feasible strategy which best produces far-reaching and long-lasting improvements. This in turn requires the differentiation between 'strong' and 'weak' sustainability. Is a strategy to be considered efficient already if it leads to a relative improvement of the status-quo or does it have to be more concrete, for instance by setting specific targets?

2.1 Defining sustainability

There exists a multitude of definitions of sustainability and sustainable development and the concept is still only vaguely defined at best. The most commonly cited definition, however, is the so-called Brundtland definition, which the United Nations' World Commission on Environment and Development (the Brundtland Commission) adopted in 1987. It states that "*sustainable development [...] implies meeting the needs of the present without compromising the ability of future generations to meet their own needs*" (UN, 1987). Additionally, the Declaration of Rio on Environment and Development (established during the so-called Rio Conference in 1992) acknowledged the three-dimensional character of sustainable development, implying the interrelation between the economic, social, and environmental dimensions (UN NGO, 2007.). Sustainable development and sustainability are very complex concepts, which include the notion about developments across several scales, like time and geography.

Noting that the concept of sustainability in general applies to wide-ranging, or even global issues, it is now interesting to establish a connection between sustainability and the particular case of mega-events, like the Olympic Games. At first sight, this seems to be a clear contradiction in itself. The Olympic Games, being a rather commercially oriented event of a global dimension, seem to leave little room for sustainability concerns. However, as mentioned before, the compatibility between the Olympic Games and sustainability is nowadays regarded as important. But are they compatible? Global mega-events like the Olympics need to incorporate issues like social responsibility, just like globalization needs to incorporate more sensitivity for the equilibrium between economic growth and environmental protection (Milton-Smith, 2002). This lack of social and environmental concerns within mega-events has led to something that the author Milton-Smith called “disillusionment with the Olympics” (ibid: 132). This disillusionment, together with the overall increased concerns about sustainable development, might be one of the driving forces behind the augmented attention for sustainability issues on the side of mega-event organizers, like the IOC. This recently emerging ambition to ensure sustainably responsible Games is reflected in the establishment of Olympic sustainability strategies.

2.2 ‘Good’ sustainability strategies

Before assessing a particular sustainability strategy like the one of London 2012, it is necessary to define what makes a sustainability strategy a ‘good’ and desirable one. According to the definition as stated by the Sustainable Europe Research Institute (SERI), “*Sustainability Strategies are integrated frameworks for policy development*” (SERI, 2007). What can be considered as a basic condition for a sustainability strategy is the inclusion and balanced combination of all three dimensions of sustainable development, i.e. social, environmental, and economic.

In order to obtain a general idea about what sustainability strategies entail, two brief examples are provided. One is the revised Sustainability Strategy of the European Union from 2006. In comparison, an example for a strategy on the local level is given. The Sustainability Strategy of the City Council of Birmingham (2000-2005) has been chosen for this purpose. It is important to notice that these examples will be extended by concrete cases of strategies of former Olympic Games later on in this paper. The EU and Birmingham strategies are meant to present merely an overview of general key objectives and challenges that are commonly included in sustainability strategies.

2.2.1 EU's Sustainability Strategy

The first sustainable development strategy of the EU was formulated in 2001 during the Gothenburg European Council. However, after the actual implementation of sustainable development on a European level proved to be problematic, the European Council agreed upon a revised version in 2006 (EurActiv, 2007), which is meant to set out “*a single, coherent strategy on how the EU will more effectively live up to its long-standing commitment to meet the challenges of sustainable development*” (Council of the European Union, 2006). Although this strategy is designed for a multinational arena (i.e. the European Union), there are several key objectives that can be applied to the local level and it provides a useful idea about the general ambition of most sustainability strategies. The key objectives of the EU Sustainable Development Strategy, which are very characteristic for sustainability strategies, are:

1. “Environmental protection
2. Social equity and cohesion
3. Economic prosperity
4. Meeting our international responsibilities” (ibid.)

When looking at these four key objectives, it is noticeable that the first three are directly applicable to local- or community level strategies, like the one for London 2012. The importance to include environmental protection in a sustainable development strategy is self-explanatory and can be regarded as a basis or a starting-point for any such strategy on any level. In the case of a local strategy for a mega-event, environmental concerns evolve mainly around the building of huge venues, increased waste during production, and an increase in traffic. Social equity and cohesion does take a different form, depending on the scale of a strategy. However, social equity, or the equal distribution of benefits, is an important issue in most mega-events strategies. Social cohesion deserves attention in this matter, since an event like the Olympic Games is expected to increase social identity and even pride amongst the citizens of the host city or region. Economic prosperity evidently plays an important role on any scale and in any context and is usually the main argument in favour of hosting the Games. This is because hosting the Games, or any mega-event, undoubtedly brings economic benefits to the respective city or region. The fourth objective, meeting international responsibilities, can easily be reformulated to national responsibilities and then fits into a local strategy as well. Additionally, in the case of the Olympic Games one can even state that there is an international responsibility for the host city, because the Olympic Games are a truly global

event. Promoting Olympic values like fairness and peaceful competition between peoples and nations constitutes a socially positive consequence that must not be undervalued.

2.2.2 Birmingham's Sustainability Strategy

The Sustainability Strategy established by the City Council of Birmingham, England, which is part of Birmingham's Local Action 21, is considered a useful example in this paper, since it illustrates sustainability efforts on a local level. The ambitious strategy was developed, because "We [the city of Birmingham] recognise that simply trying to protect the environment will not succeed in the long term" (Birmingham, 2007). These aspirations led to a list of goals, according to which the City of Birmingham intended to, among others²:

1. "use its legal powers and influence to limit the pollution of the air, land and water.
2. minimise waste, and maximise reuse and recycling.
3. develop transport systems to provide access to services and jobs and to meet the people's needs whilst causing least damage to the environment.
4. provide access to the skills, knowledge and information which would enable people to play a full part in society.
5. create opportunity for culture, leisure and recreation for all.
6. co-operate with regional, national, European and International efforts towards Sustainability" (ibid.).

The above mentioned points could all be applied to a local mega-event strategy. In this case, such measures would at first most likely be designed with regard to the short-term effects of the event, but would also be transferable to the long-run. The minimization of waste (2.) and the development of transport systems (3.), for instance, can indeed be found in already existing mega-event strategies, namely also in London's strategy for 2012. The goals stated in points 4. and 5., seem to fit into the general idea about the Olympic Games' social impacts on the citizens of the respective host city. Improved access to skills and knowledge is often mentioned as a result from the intensive training that is provided for citizens who work for the development and performance of the Olympic Games, like volunteers. Increased opportunity for leisure and recreation is expected to result from the building of new sport facilities. The aiming for cooperation on a regional, national, European, and international level also fits into

² For the entire list, see <http://www.birmingham.gov.uk>

the global nature of the Olympic Games, and therefore its potential influence on other sustainability initiatives.

As has been shown by the two examples, there are specific recurring issues and goals concerning all three dimensions of sustainable development that most sustainability strategies have in common, be it on the local or the international level. However, what makes a strategy a truly effective and successful one is how it works in practice. The objectives in both the EU's and Birmingham's strategies are rather general without specific targets or precise suggestions for action. The question appears, whether a sustainability strategy should be more accurate about its aims and intentions. Setting concrete targets and conditions to fulfill would allow determining standards against which the efficiency of strategies could be measured. On the contrary, strategies like the one from the EU, which only provide very broad statements about goals and objectives, require a different approach in assessing its efficiency. One could then only evaluate the relative improvement after the application of the strategy in question. This is more difficult to measure and it could even result in an over- or understatement about the changes and effects.

Hence, in order to assess a specific strategy for a locally confined mega-event like the Olympic Games in London 2012, it first needs to be examined how specific its objectives are formulated, because this determines how to measure and value the changes it brings about. This will be done in chapter 6 in more detail. Such an evaluation requires a well-considered methodology. The methodology used in this paper is described in the following chapter.

3. Methodology

Part I of this paper provides, among others, a description of important concepts, an examination of general impacts of mega-events, and a brief introduction of other cases, in order to provide a well-founded basis for the assessment of the Olympic Games in London 2012. This was done by means of a literature review, which provides qualitative knowledge on which the case study can be grounded. Part II, using the main concepts and examples as described in Part I, contains a Pressure-State-Impact-Response model and scenarios. The PSIR model is a conceptual model which frames and portrays "the cause effect relationships of phenomenon and of the cross-linkages and interactions between sub-systems" (Valkering,

2007). Scenarios are tools which estimate possible developments and outcomes according to different future conditions and occurrences.

3.1 Pressure-State-Impact-Response model

The United Nations describe the Pressure-State-Impact-Response (PSIR) model as one that “categorizes socio-economic, environmental and natural resource information under four headings:

- 1. stressors or agents of environmental change,
- 2. resource assets,
- 3. environmental quality, and
- 4. societal response” (UNEP-SCOPE, 2002: 4).

Figure 1 illustrates the four stages and their interrelation:

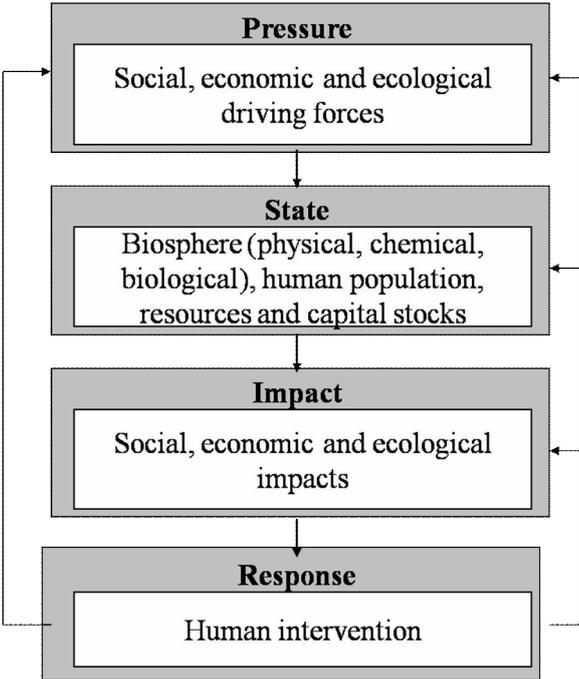


Figure 1: PSIR model (Valkering, 2007)

Within the model, one can differentiate between exogenous and endogenous pressures, and between quantitative and qualitative impacts (Valkering, 2007).

In the case at hand, the PSIR model is expected to be useful in organizing and structuring the information as gathered throughout Part I. It facilitates the identification of all forces that act

upon the host region and it helps to categorize the significance of the different pressures, i.e. which ones affect the region most and most seriously. Although the term ‘pressure’ is in general negatively coined, it might still be interesting to examine the impacts which result from positive influences as well. Overall, ‘Pressure’ implies the influences stemming from the Olympic Games, e.g. the building of new venues, increases in traffic, waste, and pollution, etc. Identifying the pressures enables a clear portrayal of the transformed state of the host region. The model illustrates each change in the state that results from the respective pressure. ‘State’ refers to the conditions in London after measures related to the Games have been taken, i.e. after the pressures have interfered with the original state of the region. This includes among others levels of pollution, number of accommodations and other facilities, state of infrastructure, etc. This then allows a comprehensible understanding of the impacts the region experiences. To be clear about the impacts, e.g. their gravity and whether they are positive or negative, is crucial for an assessment like the one at hand, since they determine to a large extent what measures need to be taken in order to strengthen positive, and minimize negative impacts. ‘Impact’ refers here to the consequences that can be observed, or expected, as a result from the pressures. This could include, for instance, any economic, i.e. financial, consequences, long-term disturbances of the local environment, etc. Potential measures are illustrated by the response-section of the model. In this paper, response represents human intervention in form of the specific parts and subjects of London’s sustainability strategy, like action plans, regulations, etc. The response can be either designed to prevent certain occurrences or to react to incidents and outcomes.

3.1.1 Expected advantages and difficulties with PSIR

Conceptual models, and with this also the PSIR model, have several advantages for conducting an impact assessment. They are, for instance, consistent frameworks that can be used to structure scientific knowledge. Therefore, in this paper the model will be used to organize the background information from the literature review which is given in Part I to prepare for the case study in Part II. Another advantage is that the model is a rather flexible tool which facilitates the exploration of critical uncertainties (Valkering, 2007).

Nevertheless, there are also some challenges to be expected when working with a PSIR model. One challenging characteristic is the model’s high level of abstraction and aggregation. Also, the model has only limited capacity to treat uncertainties in an adequate way. This, together with a restricted level of validation, leads to an imperfect predictive value (ibid.). Those disadvantages as described above are quite common in most methods of impact

assessments and will also be found in the work with scenarios, as described in the following sections. These challenges must be kept in mind when conducting the assessment of London's strategy. However, it is important to understand that this model is not mainly designed to actually predict future developments. It is rather meant to facilitate the understanding of the entirety of a system and to provide a clear portrayal of important factors at different stages of a development or incident, as well as the interrelations and dependencies between these factors. Hence, it is important to recognize the fact that conceptual models like PSIR and qualitative scenarios do not intend to provide a clear image of 'the truth'. They do not, nor claim to, prove what is going to happen, but rather explore what might.

3.2 Scenarios

“Scenarios - stories of the future that inform decision-making today - are tools for policy making. Because sustainability and sustainable development strategies explicitly require a long-term perspective, scenarios are a natural choice for decision-makers at all levels interested in sustainability issues”

(Scenarios for Sustainability, 2007)

Scenarios are widely used tools in several scientific fields. They have proven to be valuable and efficient also in sustainability science. As stories, consisting of words and/or numbers, they draw pictures of possible evolutions and developments under different future conditions. However, they must not be understood as equal to forecasts or predictions, due to the uncertainties inherent in such scenarios. In general, a scenario is expected to include:

- “a definition of the system and problem boundaries;
- a characterization of current conditions and trends and the processes driving change in the system;
- an identification of the key driving forces, critical uncertainties, and system relationships;
- a coherent and internally consistent set of assumptions about driving forces, critical uncertainties, and system relationships;
- conditional projections of the behaviour of the system based on these assumptions on the rest of the system; and

- an image of the future” (CSIN, 2007).

There are different types of scenarios. It can be differentiated, for instance, between solely imaginative narratives and scenarios which include a combination of narratives and computerized models (Butler, 2005). Narratives are used to build and describe certain assumptions. Scenarios which include also computerized models apply such assumptions to data that allow the construction of quantifiable forecasts (ibid.). The two different types of scenarios also differ in what they can provide as an outcome. Qualitative scenarios, i.e. solely imaginative narratives, can be used to investigate tendencies and interactions for which only little or no numerical data are accessible, like shocks, discontinuities, and subjective knowledge (UNEP, 2002). Quantitative scenarios, i.e. narratives combined with numerical data, are better suited to provide a more specific and consistent idea of possible future developments. The assumptions of these scenarios are more useful in providing “order-of-magnitude estimates of past, present and future trends” (UNEP, 2002: 321). However, numerical data can provide certainty only about short-term effects and developments, because there are usually no numerical proofs of long-term occurrences. Hence, in this paper, imaginative narrative scenarios will be used. A narrative and a focus on qualitative data is better suited and more feasible here, because it enables the inclusion of uncertain long-term impacts and by this might facilitate the validation of the assessment’s results. The intention behind using scenarios in this paper is to evaluate what needs to be done in order to achieve the goal of hosting truly sustainable Games. Scenarios help to portray diverse possible developments during the implementation of the sustainability strategy as to examine how the strategy functions under different circumstances, which measures can be expected to work out well, and which might fail. There is another differentiation that is important to make here, namely the one between forecast and backcast scenarios. Both types focus on the future end-state and the path to achieve it as a final result, but they apply different processes to do so. “A forecast starts with the current situation and possible future paths, and then deduces an end-state. A backcast starts with the current situation and an end-state and then deduces possible future paths” (Scenarios for Sustainability, 2007). According to this definition, the assessment at hand will make use of backcast scenarios, in order to estimate the best possible way to ensure the sustainability of the Olympic Games. The evaluation of potential success and failure will, therefore, be done by two scenarios. One scenario is expected to result in a successful future path that will lead to the described desirable end-state, i.e. a truly sustainable event. The other scenario is supposed to lead to an unsuccessful path, describing an

undesirable end-state. The former portrays measures that can be expected to be successful. This will help to estimate and evaluate specific processes with regard to their efficiency, feasibility, etc. from the onset. The latter, on the contrary, provides the opportunity to identify possible flaws and weaknesses of the strategy and to clarify what can go wrong during its implementation. These findings can be used to identify and avoid harmful incidents beforehand. It will also help to identify certain incidents that cause chain reactions. By identifying such incidents, one might be able to determine which particular action needs to be altered or avoided in order to break a chain reaction and by this improve the entire path of developments. Additionally, backcast scenarios typically include a validation of a desirable end-state, which clearly is the case for the assessment as well.

3.2.1 Expected advantages and difficulties with scenarios

Scenarios can enhance debates by bringing in new concepts and understandings. They may also provide more transparency by identifying risks and opportunities and may help with the creation and the assessment of possible alternatives and solutions. Beyond that, they may generate a “strategic planning process, including the assessment of existing strategies and plans” (WBCSD, 1997: 5). This quote portrays very nicely that one of the main advantages of scenarios suits the intention of the assessment perfectly. Also, since the main focus here is on the long-term impacts, scenarios have the advantage that they “can catalyze and guide appropriate action today for a sustainability transition” (Swart et al., 2004: 141).

There are, however, also some limitations that must be expected. The Canadian Sustainability Indicators Network (CSIN) summarized the main challenges of building and using scenarios under three main points:

1. “Ignorance: Our understanding is limited
2. Surprise: The unexpected and the novel
3. Volition: Human choice matters” (CSIN, 2007)

Point one is self-explanatory. Scenarios are about the future and our understanding of what can or will happen can never be complete and impeccable. This is directly related to surprise (2.). Because we can never understand every possible condition of the future, there is always a high possibility that something unanticipated occurs. In accordance with those challenges, the accurate determination or forecast of many social, environmental or economic conditions and occurrences can be expected to be incorrect (Butler, 2005). This will, however, not lead to a

diminished credibility of the scenario, since it does not claim to present a definite and ‘provable’ truth, but rather possible future developments and end-states. This is particularly the case with quantitative scenarios, because certain conditions and threshold events are difficult to factor and incorporate properly. This may lead to an either too pessimistic or a too optimistic result. Surprise is, however, a challenge that both types of scenarios have to face. Nevertheless, it must not be expected to invalidate the use of scenarios. Volition is a crucial issue in the preparation and presentation of the Olympic Games. Human choice implies a considerable degree of uncertainty and unpredictability and is at the same time of crucial importance for the accomplishment of a desired goal. In the case of London’s sustainability strategy, cooperation and agreement between the different stakeholders and parties involved are needed in order to achieve preferred outcomes. The reluctance to cooperate or disagreements about specific measures and targets from only one party or individual might hinder the entire process.

4. General impacts of mega-events on the host city or region

This section provides an overview of the general effects, both positive and negative, that mega-events like the Olympic Games can be expected to have on the respective host city or region. Those impacts are usually differentiated according to different time periods. The author Harry Hiller, for instance, differentiates between the pre-event, event, and post-event period (Hiller, 1998). Other authors like Richard Cashman make a distinction even between four periods: the bidding process, the seven years organizing phase right before the Games, the two weeks during which the event actually takes place, and the post-Games period. For the purpose of this paper, these minor differences in the division of time periods do not matter, since the focus is not on all possible effects, but specifically on the long-term impacts, i.e. the post-event (Hiller) or post-Games (Cashman) period. Nevertheless, in order to provide a more complete depiction, a brief overview of general benefits and costs to the host city or region is given, including some short-term effects as well. Then, in order to turn the focus back to the long-term impacts, a brief explanation of the distinction between permanent and temporary effects is given.

4.1 Benefits

Probably the first category of benefits that comes to mind when thinking about hosting the Olympic Games is the economic one. This is not a surprising association, considering that the

city or region which is hosting the Games receives more than US\$ 1 billion of funding from the IOC alone (Furrer, 2002). The IOC's contribution then draws even more investments from both private and public sources. Hence, the Games provide a possibility for the host city or region to improve its entire infrastructure and to establish new financial relations. Another benefit that is expected to result from the Games is an increase in employment. In the short-run, this results from the raise in tourism, and in the long-run from the management of the new established facilities and hotels. Overall, it is reasonable to expect economic benefits, since it has been seen in the past that mega-events like the Olympic Games generate economic development within the respective region (ibid.).

As has been mentioned before, the increased investment is to a large degree used to improve the city's or region's infrastructure. This leads to an important long-term benefit, namely urban renewal. This commonly implies the development, building, and improvement of new venues, facilities, and infrastructures (ibid.). These improvements benefit the citizenry of the respective host city and region in their every-day lives and make the stay of future tourists more attractive.

An additional category of benefits that often founders in comparison to the economic gains although being closely interrelated with them is the social one. A considerable amount of new employees and volunteers are being trained in different fields in order to ensure a proper organization and performance of the Games. By this, hosting the Olympics provides an opportunity to improve people's skills and capabilities. Besides, the Olympic Games and the global attention coming with it may be used as a demonstration of technological advances and expertise of local authorities and companies (ibid.).

The last important type of benefits is about environmental benefits. As has been mentioned before, this category did not receive much attention until recently. However, with sustainable development on the global agenda in almost all fields of interest now, it also made its way into the organization of the Olympic Games. At first sight, hosting a mega-event puts lots of pressure on the environment in the host city or region, like the construction of huge venues, increased traffic, additional waste production and water consumption. However, there are also some environmental benefits to be expected. The additional financial means can be used, for instance, for new standards within the building industry, an improved access to renewable energy sources, new developments of environmentally friendly technologies and waste management systems, etc. (Furrer, 2002).

4.2 Costs

One must, however, not forget that there are also some negative impacts resulting from the Olympic Games and that there are numerous pressures on the host city or region, for instance, on its waste and energy supply management, its transport system, etc. (Furrer, 2002). One of the most serious negative impacts is the phenomenon of the so-called ‘white elephants’, which “refers to over-sized venues and facilities that were planned with Olympic-size crowds and ticket sales in mind” (ibid: 6). The problem with the ‘white elephants’ is that they are initially planned according to the short-term presentation of the local capacities and competencies. They are not at all prepared to fit into the long-term urban policies and citizen’s needs. This often leads to a downright desertification of the enormous sport venues and, therefore, imposes a financial challenge on the host city (ibid.).

Another negative effect that might follow the short-term benefits is the unequal distribution of the benefits resulting from the Games. Such inequality in distribution occurs on a social level, i.e. between different layers of society. Hence, the responsible authorities are required to ensure that benefits are distributed among all local citizens, irrespective of class-related conditions (ibid.).

The costs and benefits resulting from the Olympic Games are manifold and difficult to estimate, leave alone to calculate. Costs are so difficult to estimate partly because the constitution of the Olympic budget commonly lacks transparency. Olympic organizing committees often ‘adjust’ the statements about expenditures by veiling or shifting certain parts of the budget, for instance, to proclaim some expenditures as being part of the public budget rather than part of the Olympic one. This shall ensure the maintenance of the public support which could be in jeopardy if it became official how expensive hosting the Olympic Games really is (Cashman, 2002). The benefits are usually calculated only vaguely as well. This is, most likely, because the advocates of hosting the Games generally argue that the benefits outweigh any costs and negative impacts by far. Hence, it does not come as a surprise that despite all efforts to do so, it remains “virtually impossible to know the true cost to a city of hosting an Olympic Games because there is no accepted way of assessing expenditure” (Cashman, 2002: 7). This indicates once more that a quite high level of uncertainty is inevitable when it comes to the assessment of long-term impacts.

4.3 Permanent and temporary impacts

When evaluating the impacts of a mega-event like the Olympic Games on its host city or region, it is essential to differentiate between short-term, i.e. temporary, and long-term, i.e. permanent impacts. In this paper the permanent impacts are, of course, of bigger interest.

A general change in attitude which is worth noticing is the increasing recognition of the concept of ‘Olympic legacy’, which is defined as being “multidisciplinary and dynamic - changing over time - and is affected by a variety of local and global factors. Therefore, [...] it is a local and global concept, existing within cities, regions and nations, as well as internationally” (IOC, 2003). Apparently, the narrow focus on the short-term impacts is starting to vanish, as the IOC takes more and more actions to deal with the important long-term impacts, i.e. the legacy (Olympic Charter, 2007). These actions and the overall recognition of the issue of sustainability show that the Olympic legacy has gained considerably in importance (Furrer, 2002). This growth in importance became official in the latest edition of the ‘Host City Contract’³, where the significance of a positive Olympic legacy was codified by the IOC for the first time. This new awareness of the importance of making the Olympic Games more sustainable implies the acknowledgement that a mere short-term focus is not enough, but that there is also the necessity for a sustainable legacy covering all dimensions of sustainable development (ibid.). Often, Olympic legacy is still simply understood as the existence of landmarks like the Olympic stadia, which may become a new symbol of the respective city. Nowadays, there is more profound understanding of the legacy and the fact that much more needs to be taken into account. There is an increased acknowledgment of the fact that these new symbols also have the potential to become ‘white elephants’, constituting a burden rather than a gain for the host city. Beyond this, there are more issues to be considered, like intellectual property and the proper management of the newly emerged benefits from increased tourism and businesses, among others. “This can only be accessed with a well-developed plan [...] which enables a city to gain ongoing benefits and to reduce possible ongoing burdens” (Cashman, 2002: 13). Hence, it becomes obvious that the long-term impacts do deserve particular attention, since hosting a mega-event with the magnitude of the Olympic Games clearly must be expected to leave some lasting marks on its host city or region (Furrer, 2002). The PSIR model is a helpful tool here once again, to structure and elucidate the different aspects of temporary and permanent effects. In the case study which will follow later in this paper, the model will be used to examine which pressures

³ “a tripartite contract signed between the IOC and the host city when it is selected and then by the organising committee” (Furrer, 2002: 18).

lead to which long-term effects. Due to the additional distinction between positive and negative pressures (see chapter 3.1), this is expected to provide a clearer idea about what the 'Response', i.e. the human interventionist measures or strategies, must look like. A proper and structured understanding of the interrelations between pressures and long-term impacts will help to assess the potential efficiency of London's sustainability strategy.

5. The Olympic Games and Sustainability

Sustainability has not always been part of the Olympic Games' organizers and responsible authorities' agenda. Only in recent years, one can recognize increased efforts to mind sustainable impacts and consequences, mainly on the side of the IOC. Some concrete action programmes have been established and there is also an enhanced concern about the long-term effects, so-called legacy of the Olympic Games, which clearly portray the newly emerging interest in making the Games 'green'.

5.1 The Olympic Movement's Agenda 21

In 1999, the IOC approved the adoption of the Olympic Movement's Agenda 21⁴. This action programme has an actual influence in the process of planning the Olympic Games and attempts to promote the cooperation between sustainability and the mega-event (Furrer, 2002). The IOC intends to control and minimize potential harm caused by the event by recommending:

1. the use of fewer non-renewable resources
2. the adoption of energy-saving solutions
3. the use of fewer dangerous products
4. the release of fewer pollutants into the air, water and soil
5. the need for an environmental impact assessment to be conducted before and after the event
6. the creation of infrastructures that are safe in terms of the quality and durability of materials and resistant to attack or natural disaster
7. the establishment of accommodation that is suitable for healthy living and allows economical use of natural resources (IOC, 1999).

⁴ Developed on the basis of the general United Nations' Agenda 21. For more detailed information see: http://www.greengold.on.ca/newsletter/nl1999_12.html#feature

The intentions of the Olympic Movement's Agenda 21 are reaching beyond mere environmental protection. An essential part of the programme is dedicated to the social consequences that affect people in general and the citizenry of the host region in particular. Some of those 'social aims' are:

1. to increase involvement of the local population
2. to improve the socioeconomic and health benefits they derive from it
3. to strengthen international cooperation projects for sustainable development
4. to help combat social exclusion
5. to encourage new consumer habits (IOC 1999).

These socially inspired goals result from the acknowledgement that concentrating exclusively on environmental issues is simply not enough. Appropriate social and economic conditions must be provided in order to achieve any efficient outcomes. However, it is important to understand the Olympic Movement's Agenda 21 only as a stimulating strategy, since it is not legally binding. Like it is the case with most sustainability strategies, it does not provide specific targets, but merely demands relative improvements in the field of sustainability. This becomes obvious when looking at certain formulations used in the Agenda, where it says, for instance, that the members of the Agenda "should be invited to comply with the recommendations" (Sourceline, 2007). Hence, the efforts of the Olympic Movement's Agenda rely exclusively on voluntarily implemented measures and function only as an incentive, based on moral rather than legal obligations.

5.2 Olympic Games Global Impact

Only one year after the approval of the Olympic Movement's Agenda 21, the IOC developed another programme, called the 'Olympic Games Global Impact' (OGGI) study. The aim of this study was to provide an improved method to evaluate "the overall impacts of the Games on the host city, its environment and its citizens, as well as to propose a consistent methodology to capture the Games effects" (ibid: 17). Literally, the main objectives of the OGGI are:

1. "to measure the global impact of the Olympic Games
2. to create a comparable benchmark across all future Olympic Games editions

3. to help bidding cities and future organizers identify potential legacies to maximise the Olympic Games' benefits" (Olympic Movement, 2007).

The OGGI study is built around the three dimensions of sustainable development, social, environmental, and economic, which shows the strong commitment to sustainability principles. Within these three dimensions, the OGGI differentiates between two types of activities. To the first type belong activities that are directly related to the event, e.g. the building of Olympic venues like sport facilities and the Olympic village. The second type of activities includes those, which characterize the context, like the improvement of infrastructures (ibid.). "Ultimately, it is hoped that a better understanding of the Games impacts will help future host cities plan Games which are integrated into a successful long-term and balanced urban development, thus leaving the most appropriate legacy for the citizens" (Furrer, 2002: 17).

5.3 Examples of 'Green Games'

The following section provides two brief examples of Olympic Games which presented or present themselves as 'green Games': Sydney (2000) and Beijing (2008). Sydney is often used as a shining example of 'green Games' and is understood as a trendsetter for sustainable Olympics. Beyond this, Sydney provides the possibility to examine some Post-event impacts already, which is an essential asset for the assessment of London's sustainability strategy. Beijing is now showing strong efforts to host environmentally sound Games, too, but seems to face some difficulties to combine China's rapid and immense economic development with sustainable measures. In any case, both of these Olympics incorporated the issue of sustainability in their bidding and planning process and are, therefore, a useful means to illustrate and evaluate past attempts and discover potential challenges for Games yet to come, like the ones in London in 2012.

5.3.1 Sydney 2000

The Olympic Games in Sydney in 2000 are often presented as defining in the emerging debate about sustainable Games. In 1993, Sydney presented a strategy paper, called the 'Environmental Guidelines for the Summer Olympic Games'⁵. Partly due to this portrayed concern about sustainability, it is said, Sydney won the bid to host the Olympic Summer

⁵ For a more detailed description of the guidelines, see the 'Sydney Olympic Park' website.

Games in 2000. The guidelines turned out to play an essential role during Sydney's planning and preparatory process, raised the 'environmental bar' for future Olympics, and led to the appraisal of the Sydney Games as the most sustainable ones until then (Furrer, 2002). The environmental guidelines included measures like the usage of 'cleaner' technologies and production- and operation processes, for instance, an increased use of solar energy and low-emission transport (ibid.). Another important measure was the modification of the Homebush Bay area, where most of the Olympic venues and facilities were located. The overall idea of the New South Wales government was from the beginning to develop an area which would constitute a positive legacy after the Games. The area contains some new high-level industrial properties and there is still room for the development and construction of additional projects. The main achievement, however, are the so-called 'Millennium Parklands', which are supposed to be completed only in the year 2010 and will include huge park areas of roughly 450 hectares. According to the Sydney authorities, 180 hectares of the park areas will come from the regeneration of degraded land by restoring its initial conditions, like wet-, wood-, and grassland (ABC, 2007). This clearly seems like an impressive achievement from an environmental point of view. Nevertheless, nowadays it becomes evident that it is not easy to fulfill all promises that were made during the bidding process. The maintenance of the Olympic venues implies large costs and especially the main stadium turned out to be in danger of becoming a 'white elephant'. The reconfiguration of its capacity from 120,000 to 80,000 proved to be more expensive than expected and it is difficult to find sport teams that are willing to use the stadium instead of their old ones, because of the higher rental prices. The Aquatic Centre, on the other hand, is considered a successful dual purpose venue, as it has been transformed into a well-used every-day facility (Cashman, 2002).

Another noticeable procedure that was followed in Sydney was the extensive consultation of numerous environmental organizations and other concerned groups (Furrer, 2002). Environmental organizations like Greenpeace and Green Games Watch 2000 were consulted already from the bidding process onwards and even participated in the formulation of the guidelines. Additionally, an attempt to involve investors and sponsors in the 'greening' of the Games was undertaken, which eventually worked out as many investors took the opportunity to present environmentally friendly developments and programmes during the Games (Furrer, 2002). All these successfully performed measures earned Sydney the United Nations' Global 500 Award for environmental excellence in 2001 and "established a new and high standard of environmental performance for future major events" (ibid: 13). However, this Award was granted only one year after the Games. Today, some challenges and problems

can be seen that were unknown in 2001. Hence, although Sydney is, and justifiably so, regarded as a positive example for the short-term developments resulting from the Olympic Games, its long-term legacy seems to be less clear-cut positive.

5.3.2 Beijing 2008

The case of the Olympic Games in Beijing in 2008 already proved to be somewhat more problematic than the one of, for instance, Sydney. This does not come as a surprise, as China is just experiencing an enormous economic development. Economic growth, however, often challenges the possibilities for sustainable advances, because they commonly imply a limitation of unconfined economic achievements. Besides, Beijing is considered one of the 'dirtiest' cities in the world. These factors seem to make the hosting of 'green' Games a true challenge when talking about absolute improvement, i.e. meeting specific targets. However, if improvement is understood in relative terms, Beijing might even have an advantage. Since the city does not yet meet certain standards which go without saying in other, more developed cities like Sydney, they could comparatively easy make use of already existing technologies and achieve a relative improvement of their current situation. Nevertheless, Beijing's air pollution levels frequently hit alarming limits, the public transport system is still underdeveloped, and there is a lack of proper 'clean' power and sewage plants (Landwehr, 2007). Nevertheless, Beijing faced this challenge and made considerable progress within the past years by developing numerous strategies for the 2008 Olympic Games, for which the authorities planned on a budget of roughly US\$ 12.5 billion for a period of ten years until 2008 (Furrer, 2002). The sport venues and the athletes' accommodations are equipped with lighting and warm-water-installations generated by solar energy, rainwater is being collected, and the Olympic Park receives its energy from two modern power plants that still are carbon based, but do at least live up to higher standards (Landwehr, 2007). Another noticeable effort that was taken by the municipal government was the submission of an early Environmental Impact Assessment during the bidding process. The assessment contains the demand for a number of indicators, including, for instance, energy and water consumption levels and the use of environmentally responsible materials (Furrer, 2002). Hence, Beijing still has a lot of work to do, but it is undoubtedly on the right way not only to host sustainable Olympic Games, but also to establish a general awareness of the importance of sustainability within the country. But general expectations are high. Economic growth is expected to be around 11.5% in 2007 and Chinese authorities are now worrying about possible inflation and an 'overheating' of the economy. Concerning sustainability, the targets are rather demanding as

well. China is expected to lower its energy use per unit of GDP by 20% by the end of 2008 and to reduce pollutant emissions by 10% until 2010 (Beijing 2008, 2007). Thus, the Olympic Games represent both a chance and a challenge for China. They will possibly boost the Chinese economy even more, for instance, the tourism industry. With regard to sustainable development, increased tourism and transport will stress the not fully developed infrastructure of Beijing and will cause further pressures on the environment. Hence, additional stimuli for the Chinese economy must not be regarded as automatically positive, since there is already the danger of overheating. However, additional investment resulting from the event can be a help to improve technological and environmental standards, if used wisely.

What can examples of past or current Olympic Games' sustainability initiatives teach us? If nothing else, they can provide future Olympics' organizers with valuable experiences, which can then be used to establish general frameworks against which the sustainability of mega-events can be measured. The IOC did so by creating the Olympic Games Knowledge Services, a knowledge transfer system that allows transferring data, experiences, etc. from former host cities to current or future candidates (IOC, 2005). It is highly useful for future host cities to be able to revert⁶ to others' experiences and already existing data, in order to learn how to maximize benefits and minimize risks, and by this make their own event as sustainable as possible.

6. The case of London 2012

“The London Games represents a change for the Olympic movement towards staging the Games in more sustainable ways. A new approach to maximise long-term social, economic and environmental gains from staging the world's biggest and most important sporting and cultural event for the benefit of local and international communities, as well as athletes”

(Coe, 2007)

The city of London established a 'Sustainable Development Framework for London'⁶ already in 2003, which demonstrates that it has been occupied with the issue of sustainability for

⁶ For more detailed information see:

http://www.london.gov.uk/mayor/sustainable-development/susdevcomm_framework.jsp

some time even before its bid for the Olympic Games in 2012. In line with these earlier objectives, London also put high emphasis on its commitments to sustainable development in its Candidate File during the bidding process for 2012. This emphasis on hosting sustainable Games was crucial to London winning its bid. After London was elected host for the Games in 2012, the Olympic Delivery Authority (ODA) has developed a Sustainable Development Strategy for the event. This strategy shall establish new requirements for the sustainability of the Olympic sports venues and the city's infrastructure. It also implies high standards for issues like sustainable transportation, the minimization and recycling of waste, etc. Beyond this, the strategy intends to guarantee a positive social and environmental legacy for London after 2012 (London 2012, 2007). A more detailed description of the strategy is provided in the following section, wherein explicit attention is paid to the issue of the Games' legacy.

6.1 London's Sustainability Strategy

In 2006, the Olympic Board launched a Sustainable Development policy statement, called 'Towards a Sustainable Games'. It includes five main areas related to sustainable development, which are made key priorities of the programme (Commission for a sustainable London 2012, 2007; hereafter: Commission). The Commission for a sustainable London 2012 provided a list of findings and recommendations surrounding those five key themes in its Governance Review in November 2007. This report offers a valuable overview of the current status quo and is, therefore, used here as an addition to the description of London's sustainability strategy.

1. Climate Change:

The Olympic Games shall be used as a platform to promote long-term solutions for a more sustainable way to manage energy and water resources. The goal is to improve the region's and the Games' ecological footprint and to reduce carbon emissions. This shall be done by, for instance, the increased use of renewable energies and an overall optimization of energy efficiency (Commission, 2007).

The findings and recommendations of the Commission for a sustainable London 2012 regarding climate change include the particular issues of *carbon* and *energy*. One important issue in the programme is the Games' carbon footprint, which contains all sources of emissions that result from the Games and are able to be influenced by the programme. The Olympic authorities make a distinction between different types of activities that need to be

included in the footprint. These types are *direct*, *shared*, and *associated* activities⁷. Direct (e.g. venue construction) and shared (e.g. jointly funded transport infrastructure projects) activities fall entirely under the measurement of the carbon footprint. The associated activities are divided into two sub-categories. The first one includes activities related to the Games of groups like sponsors and spectators. The second category contains mainly global activities on which London has no influence, like pre-Games preparations of Olympic teams. The latter category is not included in the footprint, since they cannot be influenced by the programme (London 2012, 2008). The Commission's report states that the Games' carbon footprint constitutes an appropriate basis for the Games' carbon strategy which implies the development of specific contracts concerning, for instance, requirements and regulations for carbon emissions and energy use. This strategy shall be reevaluated on a regular basis in order to ensure that newly emerging best practices can be adopted (Commission, 2007). The energy strategy is part of the further-reaching carbon strategy and implies, among others, a 20% Games time renewable energy target. However, the specifics of the strategy are not clearly defined yet, as the targets set so far are only applying for permanent venues, while targets for temporary venues still need to be classified. Additionally, the strategy lacks clarifications about issues like Games time energy supply and a scheme to ensure the maximized use of renewable energy sources during and after the Games (ibid.).

2. Waste:

The programme shall act as an incentive and a starting-point for improved waste management measures within the host region. Such measures will include, among others, the overall reduction of waste and the diversion of construction- and Games-time waste away from landfill as far as possible. Beyond that, the programme is expected to set off to a long-term behavioural change among the citizenry (ibid.).

The sustainability strategy states the striving target of diverting 90% of waste by weight from landfill. Further objectives deal with the increased use of recycled materials, sustainably produced basic materials (e.g. timber), and the use of environmentally harming materials like PVC. An overall aim of the programme is to provide a basis for an improved waste management strategy for the host region. However, the targets and standards as set out so far, only refer to permanent venues and there is no coherent Waste and Resource

⁷ For a detailed description and illustration see:
<http://www.london2012.com/documents/locog-publications/london-2012-sustainability-plan.pdf>

Management Strategy in place yet. Hence, clear-cut strategies need to be developed within the framework of the programme. Recommendations from the Commission for a sustainable London 2012 further include the establishment of an improved waste management infrastructure for the host region, the increased use of waste as a source of energy (e.g. biofuel), and the inclusion of waste disposal in the Games' carbon footprint, in order to promote the reuse of materials (ibid.).

3. *Biodiversity:*

The ecology of the host region shall be augmented and the strategy shall help to promote nature conservation among the sport sector (ibid.).

There is no specific biodiversity strategy yet. However, the issue of biodiversity, mainly with regard to the Olympic venues, is stated as a key objective of the sustainability strategy. Particularly when it comes to the legacy of the Games, biodiversity receives attention within the strategy. It is recommended by the Commission for a sustainable London 2012 to develop plans concerning, for instance, habitat inclusion into the design and development processes of the Olympic venues and habitat restoration during the post-Games period (ibid.).

4. *Healthy living:*

The Games shall function as an incentive for people to improve their lifestyles by engaging in sport activities and, therefore, living more active and healthy lives (Commission, 2007).

The intention is to develop a 'Healthy and sustainable food strategy', which shall facilitate the promotion of healthy nutrition already during the pre-Games period as well as during the Games themselves. This requires a close cooperation with food suppliers in order to make sure that the supply chain is capable to adjust to those new requirements already under short-term conditions. The strategy shall also address the issue of health benefits related to increased long-term employment and additional skills as obtained due to hosting the Olympics. In order to measure health impacts on those involved in and affected by the Games, the sustainability strategy intends to establish a list of health indicators. Another crucial issue for the theme of healthy living is the air quality in greater London. In order to avoid, or at least minimize negative impacts of the Games on London's air quality, standards for air quality conditions during the Olympic Games shall be established, which shall even exceed the requirements of a regular Low Emission Zone (LEZ) (ibid.).

5. *Inclusion:*

The Games shall lead to a physical, economic, and social improvement of the host region and its surroundings, by providing better infrastructures, increased employment opportunities, as well as additional training and education. The aim is to promote equal access to those new facilities, infrastructures and services across the entire London area and even the UK (Commission, 2007).

In line with the Olympic idea as well as the social and economic dimensions of sustainable development, *equality and diversity* receive particular attention in London's sustainability strategy. A 'London 2012 Diversity Statement' and an 'Equalities and Diversity strategy'⁸ have already been set up and diversity shall constantly be addressed forcefully by several ODA-led projects (ibid.). *Social and economic sustainability* shall also be achieved by supporting the increase of employment and the development of local businesses. The increase in employment shall be tested, for instance, against clear targets concerning the amount of people who are trained for both short- and long-term employment (ibid.). Another important part of the theme of inclusion is *access and mobility*. Challenges concerning access to Olympic venues are expected during the Games as well as during the post-Games period. Once more, the challenges apply mainly to temporary venues, as certain standards for access and mobility exist only for permanent venues. There is no coherent strategy in place yet, but its importance is acknowledged and it is given high priority on the work plan for the years closer to the event (Commission, 2007). Another part of the theme of inclusion within the sustainability strategy, which is of particular interest for this paper, is the issue of *legacy and wider benefits*. London is facing a true challenge here, considering that its bid for hosting the Games in 2012 mainly relied upon its commitments to a sustainable legacy and long-term benefits. In order to fulfill the promises, concrete plans, programmes, and standards need to be provided. Therefore, three main documents are being developed:

1. The 'Legacy Action Plan from GLA':

This plan is being developed by the Greater London Authority (GLA) and lays out potential long-term policy impacts on the London area and possible ways to incorporate them.

2. The 'Legacy Action Plan from GOE':

This plan is being developed by the Government Olympic Executive (GOE) and has a similar function to the Legacy Action Plan from the GLA, applied to the UK as a whole.

⁸ For the full text of the strategy, see:

www.london2012.com/documents/oda-equality-and-diversity/equality-and-diversity-strategy.pdf

3. The 'Legacy Masterplan Framework':

This framework is being developed by the London Development Agency (LDA) and is meant to specify necessities concerning the establishment of physical infrastructures and socio-economic programmes which are needed to guarantee a positive legacy for the host region, its citizenry, local businesses, and the UK (Commission, 2007)⁹.

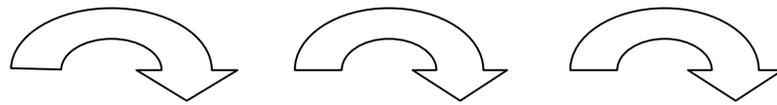
According to the Commission's recommendations, these documents will be supported by constantly altered delivery reports and risks analyses, which shall guarantee the delivery of the required results (ibid.).

When examining London's sustainability strategy for the Olympic Games in 2012, it becomes obvious that it does not contain very specific or even numerical targets. It shall be acknowledged, however, that the design process is still in a quite early stage and further concretizations and improvements can be expected in due time. Hence, at this point in time, the strategy can only be tested according to whether there are relative improvements, or even only against whether the current status quo can be restored after the Games. This makes a clear evaluation of the impacts vaguer in so far as they could be over- or underestimated. As has been explained earlier in this paper, this differentiation is important to make, since such a rather broad approach requires a particular way of assessing the strategy's efficiency. This will be accounted for in the following model and the scenarios.

6.2 The PSIR model for London 2012

The Pressure-State-Impact-Response model for London's sustainability strategy provides a brief overview of the main impacts that result from hosting the Olympic Games and the city's response to those impacts. Since no quantitative data is available at this moment, the model can only hint at relative changes and broad descriptions of the authorities' reactions. Hence, the table below must not be understood as an exhaustive report of all possible effects and measures, but rather as an illustration of the main trends that can be expected. Also important to notice is that the pressures might be negative or positive and that they are not always clearly part of only one category, but might affect the host region, for instance, economically as well as environmentally.

⁹ For detailed information about the structures and the functioning of the different institutions and agencies, see: www.cslondon.org/documents/2007_Governance_Review.pdf



	Pressure	State	Impact	Response
Economic	- construction (+- / +- / -)	- new venues	- costs (e.g. maintenance) - attractiveness	- resizable venues / transformation of existing venues
	- investment and funding (+- / +- / +-)	- additional financial means	- 'white elephants' - increased amount of money available for host region	- 'wise' use of investment (e.g. clean technologies)
	- tourism (+ / + / -)	- increased tourism	- increase in transport and accommodation facilities	- improved transport system - sustainable accommodation
Social	- investment and funding (+ / +- / +-)	- additional benefits	- gain for entire local population or danger of unequal distribution	- ensure equal distribution of benefits
	- employment and training (+ / + / +)	- additional employment and training provided	- potential for increased long-term employment	- enable long-term employment and use new skills of citizens
	- infrastructure (+ / + / +-)	- improved infrastructure	- urban renewal	- plans for sustainable urban renewal
	- global attention (+- / +- / +-)	- new focus on and awareness of sustainable development	- initiative to improve sustainability performance	- use global attention to promote a sustainable legacy for the host region
Environmental	- traffic and pollution (- / - / -)	- lower air quality	- less attractiveness - harmful to health	- clean technologies - improved public transport system

- waste (- / - / -)	- increased waste production	- costs - less attractiveness - harmful to health and environment	- improved waste management
- water and energy (- / - / -)	- increased water and energy consumption	- costs - harmful to environment	- improved water management - renewable energies
- construction (+ / - / -)	- biodiversity challenged	- habitat loss	- creation of parklands etc.
- carbon (- / - / -)	- increased carbon use	- foster climate change	- improve carbon footprint



Legend:	+ = pressure that is expected to be positive
	- = pressure that is expected to be negative
	+ - = pressure that can be positive or negative
	● economic
	● social
	● environmental

The table above illustrates the amount and the diversity of pressures that the Olympic Games will impose on the host region. Although some of these pressures have the potential to initiate positive outcomes (e.g. worldwide attention to be used to promote sustainability and healthy living), most of them constitute severe challenges. It also becomes obvious that pressures must be expected in all three dimensions of sustainable development. Therefore, it does not come as a surprise that the state of the host region undergoes numerous changes. These changes bring about considerable impacts, which, again, can be expected to be positive or negative. As explained in the legend above, the expected nature of the different pressures are marked by a '+' or a '-', respectively. This illustrates the interconnectedness of the three domains. Economic pressures can have not only economic impacts, but also social and environmental ones and vice versa, as can be seen, for instance, with construction. What also becomes apparent is that one pressure can be both positive and negative, according to the

domain. Tourism, for instance, can be expected to have rather positive consequences for the local economy and negative ones for the environment. Some pressures cannot be clearly said to be positive or negative ('+-'), since their outcome depends on numerous other factors, like the response. This is the case for investment and funding. Additional financial means can bring benefits in all three domains, if used wisely. In case money is only used to support short-term economic activities, for instance, the outcome could be harmful to the environment or society (e.g. unequal distribution). The model also portrays the pressures that are most harmful. Pollution, waste, water, and carbon all are expected to have exclusively negative consequences in all three domains and can therefore be regarded as the most crucial pressures the strategy has to incorporate. The overview of the chain of pressures, the altered state, and impacts facilitates the decision-making about what response is needed in order to strengthen the positive aspects and minimize the negative ones. What also can be seen is that the main challenges result from the construction and the maintenance of new venues. The considerable increase in waste production and water and energy consumption are the most important impacts that the city of London will be facing. Hence, the main issue that the London and Olympic authorities have to manage is the provision of measures for handling these impacts. As can be seen in the description of London's strategy, the authorities are aware of those potential impacts and already acknowledged the importance of specific strategies to minimize negative consequences. The strategy mentions the intended creation of several documents (e.g. Legacy Action Plans, Carbon- and Energy Strategy, etc.), which shall facilitate the minimization of negative impacts, or even enable an overall improvement. However, at this point there are not many of such specific plans in place yet (Commission, 2007). Therefore, at this point there remains some space for interpretation and speculation about how the measures and strategies will play out in the future. Will they be efficient enough to improve the state of the host region compared to the time before the Games? Will they be efficient enough to at least restore the state as it was before the event? Or will they be rather inefficient, leaving the host region worse off and with additional problems that would not have occurred without hosting the Games? Such different potential outcomes will be portrayed by means of scenarios in the following section.

6.3 Scenarios for London 2012

“Scenario planning derives from the observation that, given the impossibility of knowing precisely how the future will play out, a good decision or strategy to adopt is one that plays out well across several possible futures” (Wilkinson, 2008)

According to the quote above, London’s Sustainability Strategy would be a ‘good’ strategy, if it turned out to be efficient in minimizing or even avoiding negative impacts and improving the host region’s overall situation, comparatively independent from what course the developments surrounding the hosting of the Games might take. This reminds of the concept of ‘good governance’. Although this is usually associated with large-scale national and even international issues, it can nevertheless be applied to a local strategy like the one at hand. According to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), good governance has to fulfill eight main characteristics. It has to be *participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive* and has to follow the *rule of law* (UNESCAP, 2007). It also has to be “responsive to the present and future needs of society” (ibid.), which is clearly in line with the aims of sustainable development.

It is commonly agreed upon that providing three scenarios usually leads to biased conclusions, since the ‘medium’ scenario is then automatically regarded as the most likely one to occur. Therefore, two qualitative backcast scenarios will be given here, in order to illustrate two possible future paths. Two extreme but still plausible scenarios have been chosen in order to illustrate the best and the worst case that can possibly result from the Games. This choice is in line with the overall research question of this paper, whether the strategy will succeed in improving the region’s status quo by initiating a sustainable legacy or if it will rather fail and by this worsen the current state by imposing a long-lasting burden. Hence, the scenarios shall examine what can happen during the implementation process of the strategy and whether the strategy will be able to deal with unanticipated high disturbances effectively and compensate for them in such a manner that the end-state would still be desirable with regard to sustainable development.

6.3.1 The best-case scenario

Today, many years after the Olympic Games took place, London can proudly present immensely improved conditions throughout the region and even in other parts of the UK. Compared to the region's state before the hosting of the Games, it now can adorn itself with, for instance, improved urban infrastructures, waste management systems, public transport networks, and an overall increased awareness of and commitment to sustainable development. Ever since the Olympics in 2012, London is used as a role-model and a point of reference for other mega-event organizers. The fact that London achieved this impressive end-state and such a positive legacy as we can see today is because of its sustainability strategy which proved to be highly efficient and which fulfilled everything that was promised during London's bidding process. Looking back now, it can be seen how well the authorities handled all the different challenges they had to face during the pre-event period, the actual Games phase, and after the event took place.

One of the most important factors that influenced the success of the strategy was that all necessary measures were initiated already very early in the preparatory process. From the beginning onwards, i.e. during the preparation of the bid, the Olympic authorities and the creators of the strategy were well aware of the fact that a mega-event clearly poses considerable pressures upon the respective host-region. In the case of the Olympic Games in London, these pressures were rightly anticipated to be economic, social, and environmental as has been shown in a PSIR model that was conducted early in the planning process. The necessity to be able to respond to pressures and to avoid harmful incidents and disturbances was the main intention and a key objective of the sustainability strategy. The most crucial challenges for the Olympic authorities were the increased amount of waste production and water and energy consumption. Hence, they focused on these issues already at the very beginning, acknowledging that increases in waste etc. would jeopardize a sustainable future for the region. However, early estimates revealed that some increase in waste, water, and energy would be inevitable during the construction phase. The authorities acknowledged this challenge and managed to set such high standards for building industries, energy suppliers, etc. that the additional amount of waste, water and energy remained impressively small. Nowadays it is visible that the standards and requirements even led to an overall improvement, as they fostered the use of renewable energies, clean technologies, and improved waste and water management systems. This is one factor that brought London to the top with regard to sustainable development and which made it a shining example for the rest

of the UK, for future host cities around the world, and for the general global view on sustainable development.

Another difficulty that the Olympic authorities successfully solved was the issue of the Olympic venues. Lessons from former mega-event host regions showed that the oversized venues often turned into ‘white elephants’ in the years following the actual event. Such a desertification of mega-venues has a quite negative effect on the attractiveness of the respective area and involves high amounts of maintenance costs without bringing any additional value. This potential problem in mind, the authorities worked closely together with architects and the building industry and came up with sophisticated plans for re-sizable venues. According to these plans, the venues were constructed in a way that allows them to be downsized to non-Olympic amplitude after the event. The plans also included a clause that the construction of entirely new venues was reduced to a minimum. Rather, existing venues were extended, enlarged, and improved as far as possible. All this reduced negative consequences from construction, like additional waste and energy and water consumption and it circumvented the unnecessary emergence of ‘white elephants’. The Olympic authorities went even one step further than merely avoiding negative outcomes. They developed specific legacy plans which included, for instance, the transformation of former construction areas into parklands which till today provide a habitat for a diversity of domestic species and which improved the quality of life for the local citizens.

What proved to be essential for the success of the strategy was the close cooperation between the Olympic authorities and other stakeholders, like industries and local businesses. Experts pointed out the importance of volition, meaning that human choice matters. The Olympic authorities understood that the reluctance of only one important stakeholder could have hindered the entire strategy. Partly based upon the global interest in the issue of sustainable development, which was currently increasing at the time the Olympics were prepared, the authorities managed to foster an overall consensus about the importance of a sustainable legacy resulting from the hosting of the Olympic Games, as well as about what needed to be done to ensure such a positive legacy. Nowadays, it is obvious that the authorities did extraordinary in convincing other parties to commit to the aim of a sustainable legacy and to get involved in necessary measures and actions. This led to a common understanding of the Games as a crucially important platform to promote sustainability and to raise awareness about renewable energies and cleaner technologies. Thanks to the convincing plans and campaigns of the Olympic authorities, all stakeholders and other parties concerned agreed upon the necessity to assign main priority to the Games’ legacy, rather than to

potential short-term effects. This implied that industries and local businesses were willing to abstain from specific financial gains, in case, for instance, these gains required undertakings that could potentially harm the environment in the long-run.

Equally important was the support of the public within the host region. The Olympic authorities spent much effort in campaigning already very early during the planning and preparatory process. These campaigns resulted in an unprecedented public interest in sustainable development, which exceeded a mere passive acceptance. This new awareness developed into a general mood which was deeply committed to use the Games as a platform to foster and promote a healthy life style and sustainable Olympics. Due to the campaigns and specific plans offered by the authorities, the citizenry was well aware and strongly in favour of a sustainable legacy for their home town and people valued the opportunities provided by, for instance, additional employment and training. Therefore, the aim for a sustainable legacy was predominant throughout the citizenry already from the beginning and got support from individuals as well as local businesses. This high rate of participation and support also enabled the inclusion of all citizens and an equal distribution of benefits amongst them. Specifically because London made sustainability the core issue of its candidate file, it was crucial for the city to live up to the expectations and to create a positive image. This also facilitated the inclusion of industries and local businesses, as nobody wanted to be perceived as the 'black sheep' when it came to hosting the most sustainable Olympic Games. Participation and support by the public were crucial for the success of London's sustainability strategy also because of the image that was portrayed during and after the event. People who visited or attended the Olympics experienced an unparalleled cooperation between sports and sustainable development. Those visitors, athletes, businessmen, etc. took the ideas and concepts with them to their home-countries and by this enabled a further extension of the successful implementation of sustainable development in new areas.

Concerning pollution, an issue with which London has been struggling already for a long time, the strategy led to a noteworthy long-term improvement. The public transport system was extended and improved in order to compensate for increased traffic during the Games. Since this new transport infrastructure is still used today, it facilitated the promotion of the use of public transport and laid the foundation for further anti-car measures. Hence, the pollution levels are lower today than they have been before the event took place.

Investments like the ones for public transport and new technologies would not have been done at that level if not for the Olympic Games. The authorities managed to ensure that investment was used exclusively for measures and facilities which enhanced and benefitted

the sustainable legacy of the Games, and they hindered investment to benefit any individual or company other than the ones who strived for the goal of a sustainable legacy.

In order to regulate and initiate all these measures, the Olympic authorities provided numerous specific documents which set out standards and targets for all areas affected by the Games. These documents covered all imaginable challenges and difficulties that had the potential to harm the environment and they provided extensive action plans for responding to those challenges. Since these documents were being codified already in 2008, there was adequate time to implement them and to lead all developments in the right direction from the beginning onwards.

The main challenge for the sustainability strategy was, however, to deal with unanticipated disturbances. These could have been occurrences that have not been expected at all, or difficulties that proved to be more crucial than expected. The authorities were well aware of this possibility and included those inevitable uncertainties in their strategies and action plans, by enabling fast and un-bureaucratic reactions. The documents allowed the authorities to aggravate measures, to punish undesirable behaviour, and to enforce ad hoc procedures if necessary, in order to counteract and compensate for harmful incidents.

One example of such an unanticipated disturbance was the entirely surprising reluctance of Ken Livingstone, who was Mayor of London during the preparation period of the Games. Livingstone was actually known as a man who strongly supported and developed several sustainability initiatives for London, already before the Olympic Games were an issue. Therefore, the Olympic authorities had counted on the full support of the London authorities. During the preparatory process, when it came to convincing leading industries and suppliers to support the sustainability strategy, it became apparent that the Mayor was not as committed to the sustainability goals as he had claimed to be. Some industries were reluctant at first to commit entirely to the long-term vision of the strategy, fearing to lose some short-term benefits. While the Olympic authorities stood strong and pushed the negotiations in the desired direction, the Mayor proved to be willing to make compromises. He seemed to fear that major suppliers or business partners would back out entirely, jeopardizing the Games as a whole. The Olympic authorities anticipated that giving in with one stakeholder would tempt others to try the same. This would then have led to an overall compromising stance, which would clearly weaken the outcome of the strategy. Realizing that they nevertheless needed the unconfined support of the city, the Olympic authorities reacted quickly and used the public support to put pressure upon the Mayor. They initiated additional ad hoc campaigns, quoting statements and promises the Mayor had made before about hosting the most sustainable

Olympics in modern times. Being a public figure whose career depended solely on public good-will, the Mayor recognized that he had to stand to his former promises and statements. Especially with a mega-event like the Olympics, which draws global attention, he could not risk to be perceived as the one who does not support the strategy whole-heartedly. This, together with the Olympic authorities' ability to convince the reluctant stakeholders, persuaded him to return to his former stance and he did become a committed supporter of the strategy. This would not have been possible if the Olympic authorities had not managed to involve the public at that early stage and if the authorities themselves had not been as convinced about the rightness and feasibility of their goals.

6.3.2 The worst-case scenario

Today, many years after the Olympic Games took place, it is obvious that London's sustainability strategy did not work out as planned. Although it cannot be said that London is worse off than it was before the Olympic Games in 2012, it clearly failed to host the most sustainable Games in history. This still sheds a negative light on the city, since the Olympic authorities claimed during the bidding process to set new standards for technologies and energy use and to become a role-model for future mega-events. This is clearly not the case, since London is left today with 'white elephants', a disturbed environment within the former construction areas, and a rather disappointing image throughout the world. London cannot adorn itself with originally intended improvements, like more long-term employment, an improved public transport system, newly created parklands, etc. What can also be perceived is a negative effect that this has on the general perception of sustainable development. The failure of London's sustainability strategy brought forth a mental attitude across the UK and even the world that, for instance, sustainable development and mega-events are not compatible after all. Till today, this leads to less effort and commitment among other mega-event organizing authorities, involved industries, and a general lack of enthusiasm for and confidence in the concept of sustainable development around the world. Looking back now, one can clearly identify the flaws and weaknesses of London's sustainability strategy and where the Olympic authorities failed to act and react appropriately.

One aspect which the Olympic authorities failed to recognize was the importance of an early implementation of measures. It is clear now that measures should have been taken already early during the preparatory process, which the authorities did not manage. This proved to be one main reason for the strategy's failure. There had been acknowledgement of potential economic, social, and environmental pressures that the event would pose upon the

region and the Olympic authorities clearly realized the necessity to be able to respond to such pressures and to avoid harmful incidents and disturbances, but it turned out that the Olympic authorities underestimated these pressures and did not establish sufficient plans on how to handle them. This became specifically apparent with the issues of waste production and water and energy consumption. Although early estimates revealed a considerable increase in waste, water and energy to be expected due to constructions, the authorities' demand for improved waste and water management systems went mostly unheard. The creation of such systems would have required additional financial means, which the respective suppliers were reluctant to provide. Besides, the Olympic authorities failed to establish binding standards and requirements for those suppliers, which left them with not much power to influence the suppliers' decisions. Hence, the Olympic authorities failed to convince the majority of the stakeholders of the importance of sustainable development and its deserved priority over short-term economic benefits.

Another main problem that was encountered by the Olympic authorities was the failure to prevent the building of huge new venues, or at least to build them in a sustainable way. The construction of the Olympic Park, for instance, caused an immense amount of waste to be produced and water and energy to be consumed. Worse even, after the actual Games period it turned out to be impossible to down-size the facility to non-Olympic amplitude. This proofed that the authorities did not show sufficient foresight during the planning process with regard to what to do with the Olympic mega-venues after the actual event. High investments had been made for the construction, but none were planned in for the post-event period. Hence, the result was that the city is left today with 'white elephants': deserted mega-venues which require high maintenance costs but do not bring any considerable profit. Therefore, London is left today with deserted venues which even worsened the attractiveness of the respective areas. Now it becomes clear that the authorities should have cooperated more closely with architects and the building industry in order to develop plans for down-sizable venues, or, even better, plans to use already existing venues. The authorities should have insisted on transforming those facilities by improving and enlarging them, which would have avoided at least some of the harmful construction activities and would have reduced negative impacts like increases in waste production and water and energy consumption. Also, the originally planned transformation of the Olympic Park area into parklands after the Games failed due to a lack of investment and commitment. These Parklands would have been an important improvement for the city's legacy, since it would have provided a habitat for a

diversity of domestic species and would have improved the quality of life for the local citizens.

Despite London's ambitions to host the most sustainable Olympic Games in time, the Olympic authorities faced severe difficulties to get other parties and stakeholders on board. The city authorities did indeed declare to favour a sustainable event, but in the end proved to be rather reluctant to push certain industry sectors and businesses to support the strategy. Due to this rather compromising stance, the city did not provide sufficient support for the Olympic authorities. This lack of support from the city authorities came absolutely unexpected and constituted a major problem for the Olympic authorities. Also industries and local businesses did claim to be in favour of sustainable measures and technologies, but were nevertheless not willing to give up short-term benefits for the sake of a positive legacy. This lack of support from the industry and local businesses resulted in an insufficient engagement in the development of 'clean' technologies and the use of renewable energies. Such developments would also have required a certain amount of commitment and money. The industry and local businesses involved in these areas were reluctant to provide this commitment and financial means to the degree that the Olympic authorities had expected. Unfortunately, the authorities did, again, not have the means or the legal basis to force those parties to comply with the intended standards. Hence, the Olympic authorities underestimated the force of volition. The reluctance of certain stakeholders proved to be considerably harmful to the implementation of the strategy and the authorities were unable to solve this issue. Today it is, therefore, commonly acknowledged that more efforts should have been put into campaigning amongst industry leaders, in order to get their full support for the aim of a truly sustainable legacy.

The same was true for the citizens of the host region. The desperately needed support and participation of London's citizenry did not arise despite the authority's attempts to engage the people. This was particularly disturbing as public support would have been extremely helpful in convincing industries and local businesses to engage in the implementation of the strategy. This lack of public support and participation resulted mainly from the Olympic authorities' failure to put sufficient effort into the promotion of sustainable development amongst the local population. Awareness-raising campaigns would have been needed already during the preparatory process, in order to convince London's citizenry of the importance of a sustainable legacy. The Olympic authorities did not manage to raise sufficient public interest or to gain the citizens' active support. Although most citizens claimed to be generally in favour of a sustainable event, their approval did not exceed mere passive agreement, meaning that commitment commonly ended where concrete actions were required. In retrospect, it can

be seen that this lack of public support and involvement had devastating effects on the implementation of the strategy, which the Olympic authorities did not incorporate properly in their planning process. Specifically because London made sustainability the core issue of its candidate file, it would have been crucial for the city to live up to the expectations and to create a positive image during and after the event. As it was, visitors, athletes and businessmen experienced a rather sluggish cooperation between sports and sustainable development. Hence, the impression that mega-events and sustainability are not truly compatible was fuelled once more and was transported to other countries around the world. By this London missed its chance to influence the perceptions of other mega-event organizers concerning a further extension of the concept of sustainable development in new areas.

Two other problems that concerned the public were the issues of employment and training and public transport. Although numerous citizens had additional training prior to the Games and found employment during the event, the authorities did not manage to provide a considerable increase in long-term employment. This constitutes an important failure of the strategy, as long-term employment is what was promised to the host citizenry and the failure to fulfil this promise shed an extremely negative light on the authorities' abilities. The public transport system did not improve to the degree that the Olympic authorities had planned for. This was mainly due to disagreement about its importance and, therefore, a lack of investment into the public transport infrastructure. Hence, today there is no added value from public transport for London's legacy with regard to decreased car-use. Because the public transport network was not considerably enhanced for the Olympic Games, there was no basis for further anti-car measures after the event. This must be regarded as a crucial loss to the intended long-term benefits, like a decreased level of pollution, for the city of London. The public transport infrastructure could have been improved, if more investment had been assigned to this issue. Unfortunately, investments and funding, which were received by the city, were not channelled wisely. The Olympic authorities did not manage to direct a sufficient amount of the Olympics' financial resources towards programmes that would foster the Games' legacy. Due to a lack of transparency and proper preparation, the largest share of the money went to activities that surrounded short-term effects.

Many of the flaws and failures as experienced by the Olympic authorities resulted from a lack of specific documents. The Olympic authorities failed to set up enough coherent and binding strategies and action plans in several sectors, like energy use, waste production, etc. Most of the documents that have indeed been set up before the event were too broad as they lacked specific targets and requirements. This approach left too much space for interpretation and

compromises, which in turn led to an inefficient outcome. Besides, the documents were codified too late, many of them only shortly before the Games took place. Therefore, there was not sufficient time for many developments to be channelled in the right direction from the beginning. Hence, the combination of reluctance from industries and businesses, the too compromising stance of the city authorities, and the Olympic authorities' failure to establish concrete documents led to an insufficient implementation of the strategy's most important issues, namely the promotion of renewable energies and 'clean' technologies.

However, nowadays it is commonly agreed upon that the main problem that led to the insufficient implementation of the sustainability strategy was the inappropriate manner the Olympic authorities accounted for potential disturbances. The authorities should have paid more attention to those uncertainties and should have tried to incorporate them into their strategy, for instance, by enabling fast and un-bureaucratic reactions. Unfortunately, there were no documents or action plans available which could have provided a basis for ad hoc procedures or punishments for undesired behaviour. Therefore, the authorities were unable to compensate for unanticipated and harmful occurrences. Additionally, the broad scope of the few programmes in place left too much space for reluctant stakeholders to bargain for compromises at the expense of a sustainable legacy.

The most harmful and surprising disturbance, however, came from Ken Livingstone, Mayor of London during the preparatory phase of the Olympics. Livingstone was actually known as a man who strongly supported and developed several sustainability initiatives for London, already before the Olympic Games were an issue. Therefore, the Olympic authorities had counted on the full support of the London authorities. However, when some stakeholders, mainly industries and local businesses, showed reluctance to fully support the long-term objectives of the sustainability strategy, the Mayor proved to be less stern about requirements and targets than he had announced to be. He was willing to make compromises in order to please industry leaders and businessmen out of his fear these stakeholders could back out entirely when asked to commit to some inconvenient measures. The Olympic authorities did not dare to push the Mayor and reluctant stakeholders, and they realized too late which effects this had on the entire process of negotiations. After the Mayor gave in with one major company, others expected the same treatment. This set off a chain reaction amongst industries and businesses which all started to bargain for exceptions concerning regulations and requirements. The Olympic authorities were taken by surprise and lost ground rapidly. In the end they found themselves giving in over and over again, watching their ambitious objectives being watered down. In retrospect, they could have avoided this, if they had managed to

involve the public beforehand. Had they campaigned successfully earlier in the process, and by this fostered overall commitment from the local population, they could have used this support to put pressure upon the Mayor. Ad hoc campaigns, quoting statements and promises the Mayor had made before about hosting the most sustainable Olympics in modern times, would have left him with no choice but to fulfill his promises, as a mega-event like the Olympic Games draws so much global attention. Also, a public figure like the Mayor of the host city could not have backed out if his citizens had monitored him closely and demanded him to do what he promised to. Still, since the public was not fully convinced of the Olympic strategy and was not sufficiently informed, they trusted their Mayor's decisions blindly.

7. Conclusion

This paper showed that a mega-event like the Olympic Games puts enormous pressures on the respective host region. However, it also can be a unique opportunity to promote and initiate sustainable development on a local, national, and even international level. There is an opportunity to show that the Olympic Games and sustainable development are compatible and can even mutually support each other. If London manages to host truly sustainable Games, this will bring additional positive attention to the event as well as to the concept of sustainable development.

Achieving such a positive outcome requires specific and well-planned strategies which cover all dimensions of sustainable development and include numerous issues. This is a huge challenge which the organizing authorities have to face. To incorporate and manage all challenges appropriately seems to require numerous changes in the planning and performance of mega-events. What seems to be of crucial importance when implementing a comprehensive strategy, is the involvement and commitment of all stakeholders. This paper also showed that volition must not be underestimated. The reluctance of some key figures or parties can hinder the implementation and performance of a strategy. Hence, the Olympic authorities in London should put much effort in their attempts to get all important parties on board and to reach a general consensus about necessary measures as early as possible. Human choice and the behaviour of individuals can also be used to promote sustainability objectives. There is, for instance, a current debate about the marathon world-record holder Haile Gebrselassie, who announced lately that he might not participate in the Olympic Games in Beijing in 2008, because of the bad air quality in the city (DPA, 2008). Such incidents can and should be used by the event-organizers and sustainability advocates to promote their cause. London should in

general keep an eye on the upcoming Games in Beijing in 2008 and should evaluate other past events in detail, in order to learn from those experiences and to avoid making mistakes others have made before.

Concerning the methodology used in this paper, the PSIR model proved to be very useful in organizing and structuring the quite large amount of information. Without the model it would have been rather difficult to gain an overview of the numerous different pressures and the resulting consequences. Therefore, I consider it indispensable to develop such an outline, in order to fully understand the cross-linkages in their entirety and to evaluate whether all necessary responses are included. The scenarios that are provided in this paper give an idea about what might happen during the implementation period of the strategy and which course the developments might take. The scenarios portrayed in a plausible way which challenges the Olympic authorities can expect and which actions and reactions might be needed in order to ensure a positive long-term outcome. It shall be clearly understood here that the scenarios are imaginative narratives and that the example of the Mayor's reluctance is purely fictional. However, I consider the scenarios as generally absolutely plausible. In my opinion, it is very likely, or at least not impossible, that some stakeholders will show some degree of reluctance. This can be expected as soon as it comes to financial issues, for instance, when potential short-term gains must be denied for the sake of the long-term outcome. 'Going green' is usually not the easiest or most convenient way to go and requires a considerable amount of commitment and organization.

Overall, I am convinced that it is still too early to make clear statements on whether the sustainability strategy of London will lead to an improvement and a truly sustainable legacy as intended by the Olympic authorities. In my opinion, the basic objectives of the strategy are honourable, determined, and theoretical feasible. At this point, however, they are way too vague. Much clearer and firmer statements, regulations, etc. will be needed to live up to the ambitious objectives. This will, most likely and hopefully, be done during the upcoming years. Beyond this, I would advise the Olympic authorities to put much effort in promoting sustainable Games early and sternly. From the scenarios I got the impression that consensus about necessary measures amongst all parties involved will prove to be crucial for the success of the strategy. The authorities should use the currently increased global concern about climate change and sustainable development to put pressure upon possibly unenthusiastic stakeholders, because I think that no company or business can afford nowadays to ignore or even oppose this issue. It would be interesting and useful to closely monitor London's

advances in the upcoming years, in order to identify factors and issues that might get overlooked in the excitement about the glory of the upcoming event.

All in all, London resolved to achieve something truly ambitious. In how far the strategy will be a success and how sustainable the Games' legacy will turn out to be will depend on numerous factors which I would not dare to predict with certainty today. What I do dare to predict, however, is that the Olympic authorities will do their best to make the event 'as green as it gets'.

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