World Federation of Engineering Organisations (WFEO)
Commission on Engineering and Environment (CEE)

ENVIRONMENTAL IMPACTS OF OLYMPIC GAMES INFRASTUCTURE – ATHENS 2004 SUMMER GAMES

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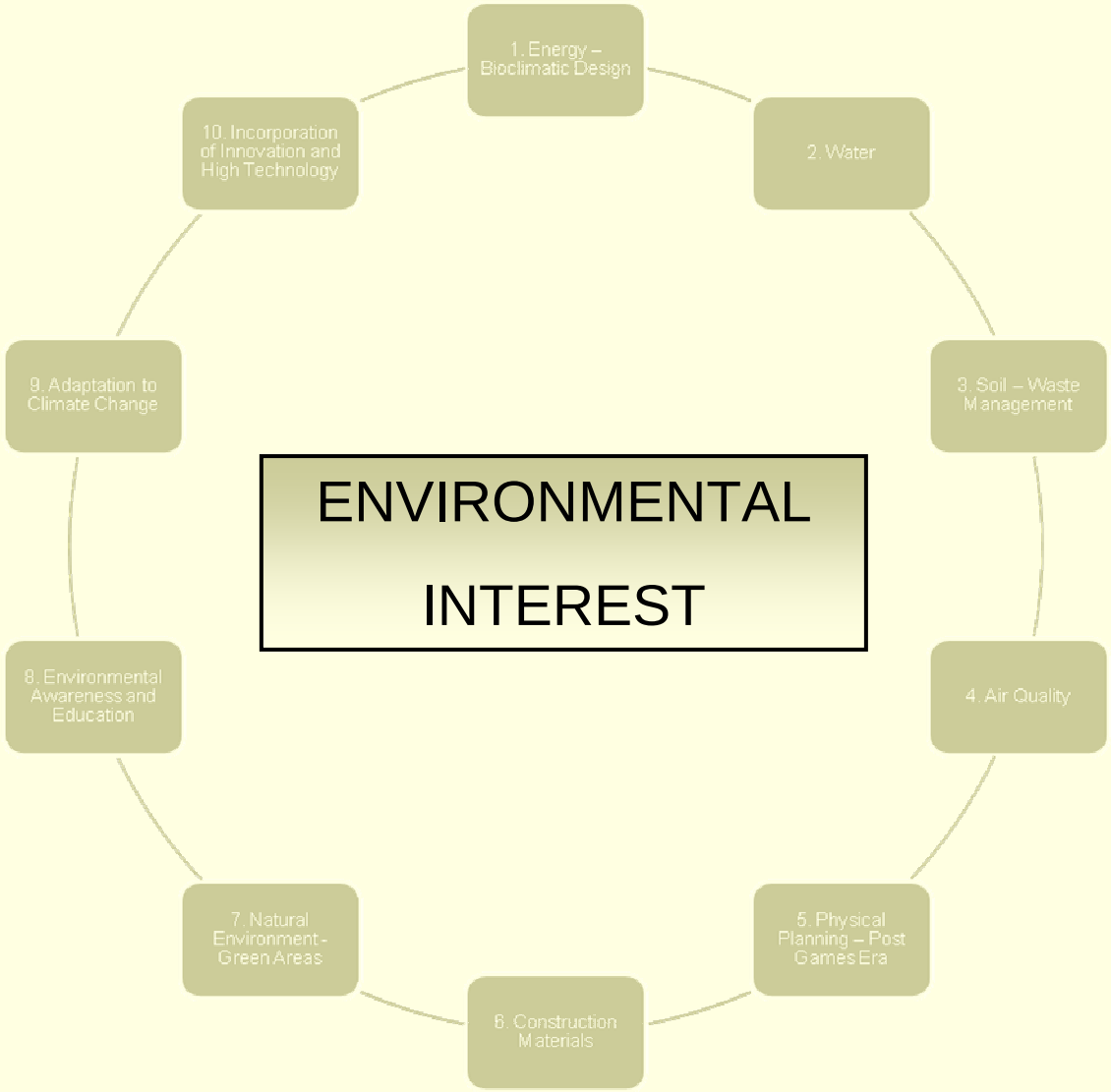
Aiming Towards Sustainability:
An Engineering Perspective on Major Sporting Events

The organisation of big sport events, such as the Olympic Games, gives the host city and country the unique opportunity to combine major city planning changes and new infrastructure with an environmental reform or upgrade almost to all domains.

- The principles of sustainable development should be strictly followed and convincingly satisfied showing to the whole world that the respect to the environment can and must step side by side with a major and rather quick expansion of a human created system.
- The organisation of the Olympic Games or any other major sport event can function as a role model of a similar effort at a global scale: to work hard in order to achieve growth that can eradicate poverty and make peace prevail, and at the same time, through the advance of technology, minimize the waste of resources, reduce the effects of pollution and protect the environment.
- Tailoring of sport requirements to everyday city needs should be given a high priority, making the heavy cost burden of the organisation be better justified and more easily accepted.
- As far as communication is concerned, the power of the message should be exploited for the promotion and proliferation of the principles of sustainability, advancing environmental standards for a better quality of life in harmony with nature.

AREAS OF ENVIRONMENTAL INTEREST



1. Energy – Bioclimatic Design – Transportation

Basic Principles:

- Take all measures to minimize energy use in the overall eco-cycle of the development project at all stages.
- Solar passive design, insulation, natural ventilation and energy saving materials should be given preference.
- Eliminate the use of fossil fuel energy sources (coal, oil, gas) and replace them with renewable energy sources such as solar, wind, hydro, wave, geothermal and bio-energy.

2. Water

Basic Principles:

- There should be no pollutant emissions to surface or ground waters during construction or the ecolifecycle of the building or venue.
- Landscape programmes should minimize impacts on the aquatic environment. Chemical pest controls should be banned.
- Use sustainably managed water management techniques, practices and products to avoid the exploitation of new water sources.
- Restore natural water cycles in the development area, minimize run-off and storm water by establishing systems that retain, re-use and recycle water on-site.

3. Soil - Waste Management

Basic Principles:

- Take advantage of Olympic Games or other major sporting events and allocate venues on brownfield areas, for which large scale remediation and restoration is required.
- Planners should know the history of the land and the specific hazards present before design and construction begin.
- Ban the burial of hazardous wastes as part of any Olympic development or construction. Any toxic materials should be treated on-site using appropriate non-incineration destruction technologies.
- Avoid products that pollute the environment when they are eliminated as waste in the demolition process.
- Apply an integrated waste management programme based on waste avoidance and minimization.
- Establish a 100 per cent closed-loop recycling system for packaging, temporary structures and other shortlife products, and ban all non-recyclable and non-compostable materials.
- Use systems to minimize waste generation to the fullest extent.

4. Air Quality

Air quality is closely related to broad issues of atmospheric pollution that are more generic in their origin and concern wider environmental policies such as:

- Renewable Energy Resources
- Environmental Friendly Transport System
- Improvement of Fossil Fuel Quality
- Drastic Control of Industrial Pollution

The Games themselves can play a triggering role to tackling air pollution problems through the adoption and implementation of cleaner technologies and methods.

For the indoor air quality relevant concern has to be put forward.

5. Physical Planning – Post Games Era

Parameters: Sustainable use of infrastructure by setting “acceptable” limits to sporting federations’ requirements, exploitation and expansion of temporary facilities, restoration and/or remediation of degraded or contaminated areas, expansion and improvement of open spaces and urban green areas.

Recent IOC Guidelines:

- The staging of a major event such as the Olympic Games and the media coverage it generates can act as catalysts for accelerating the implementation of new urban plans or for re-launching projects brought to a standstill for political or financial reasons.
- In specific terms, the scope of all permanent construction projects should extend beyond the provision of facilities for the Olympic Games and encompass and fit into the short-term and long-term needs of the host city (and should not destabilize the existing housing / hotel / event market).

5a. Physical Planning – Post Games Era (The Athenian Experience)

Athens 2004

Summer Olympic Games

Failure Stories:

The after-utilization of Athens Olympic sport facilities – opening of the city to the sea front

Success Stories:

The Schinias Olympic Rowing and Canoeing Centre in Marathon

5b. Physical Planning – Post Games Era
Athens' Failure Story

The after-utilization of Athens Olympic sport facilities – opening of the city to the sea front

- Athens has been criticized on many occasions for the management of Olympic sport facilities as well as the significant shortcomings in achieving on a permanent basis the long awaited opening of the city to the sea front of Saronicos gulf.

- Most of the facilities remain today (6 years after the Games) abandoned and wait for a proper new management scheme involving the private sector. The serious delays are caused by incomplete post Games planning before the Games and underestimation of legal and permitting issues that may arise. It is worth mentioning as an indication of the post Games lack of efficient planning that one of the few "successful" examples of added value of the Games is the transformation of the "temporary" badminton venue to an all around permanent theatre, which filled a gap in the Athens similar venues.

- The sea front opening deficiency is mainly caused by lack of necessary investments mainly by the public sector and by shortages in the overall design of the post Games era. A more "prudent" fiscal policy was adopted viewing the Olympic facilities as "grey elephants" that should not burden any more the sensitive Greek economy. It is also true that the international economic recession combined with the state of the Greek economy did not help.

5c. Physical Planning – Post Games Era
Athens' Success Story

The Schinias Olympic Rowing and Canoeing Centre in Marathon

A Short Description:

The Olympic Rowing and Canoeing Centre lies in the area of Schinias, Marathon, 42 km from the centre of Athens. The facilities are located in the western part of a previously degraded wetland. The Olympic Centre covers less than 10 percent of the Schinias plain, an area burdened in the past by an airport, military facilities, a moto-cross race track, thousands of tons of debris and a plot belonging to an active Building Associatiation, ready to be developed.

5c. Physical Planning – Post Games Era
Athens' Success Story

The Schinias Olympic Rowing and Canoeing Centre in Marathon

The Strategic Planning and The Project's Design adopted the following basic points:

- The restoration of the area's original hydrology. This mainly refers to the abolishment of the current drainage network and the redirection of the Makaria spring's freshwater supply to the wetland (previously channeled to the sea), through the new lake of the Olympic Centre.
- Physical as well as functional allocation of the Rowing and Canoeing Centre on land previously occupied by the airport and rubble deposits and to a small percentage by bare ground or reedbeds.
- Removal of uses or settlements incompatible to the landscape or the ecosystem's natural functioning (Marathon airport, abandoned military facilities, motor-bike track, etc.).
- Restoration of landscape and soil (currently suffering from extensive rubble and trash deposits, chemical pollution by the military facilities etc.).
- High protection regime for the area's prominent ecological features and habitats. In fact the whole area was declared as a National Park.
- Adjustment of land uses, normative and prohibitive regulations for the western part of the wetland, the sea coast and the marine area.
- Establishment of the necessary infrastructure for environmental education and raising of public awareness on the western part of the wetland, construction of footpaths and bird-watching hides.

6. Construction Materials

Basic Principles:

- Use only environmentally-safe building materials and products that minimize pollution of the environment throughout their entire lifecycle. Ban polyvinyl chloride-based (PVC) and other organochlorine materials and use more environmentally acceptable materials.

- Ban persistent, bioaccumulative and/or toxic substances and materials which incorporate them in Olympic construction or merchandising. Ban persistent organic pollutants (POPs) such as organochlorine-based chemicals.

7. Natural Environment – Green Areas

Basic Principles:

- Preserve global, regional and local biodiversity. An assessment of habitat and species with special attention to endangered species and ecosystems that are subject to international conservation treaties, must be made before design and construction begin.
- Protect all wild species and populations in development areas. In addition, identify opportunities to preserve or extend pockets of biodiversity, particularly if these link to or are important for the conservation of ecological corridors.
- Promote the creation of substantial green areas in and around venues using tree and other flora species adequate for the climatic conditions.
- Plan early enough the necessary plantations so that there is time for the trees and shrubs to adapt and reach the level required.
- Avoid the extensive use of hard surfaces and prefer soft pathways where possible.
- Adequate measures should be taken for the conservation of the planted areas far beyond the Games period, securing the necessary resources required.

7a. Natural Environment – Green Areas (Failure Stories)

Green Areas in Athens and Olympic Games

- A very ambitious plan of planting millions of trees and shrubs has been elaborated before the 2004 Olympics. Unfortunately significant delays in the development of different Olympic facilities did not provide the necessary time for materializing the plan. Another important factor was the excess cost of most of the Olympic projects, which did not allow for the funding of the plan. At the end a few thousand trees and shrubs were planted some of which died after the Games due to lack of adequate conservation.

- A success story in the general failure was the successful transplantation of many century old olive trees from their original site in the land taken by the Equestrian venue to different parts of the city.

8. Environmental Awareness and Education

Basic Principles:

- Full, comprehensive and publicly accountable independent auditing of all environmental data for all aspects of the Olympics must be mandatory.
- Set specific environmental goals to fulfill these environmental guidelines at the outset of Olympic or other projects. Ensure that these goals are real, measurable and achievable and make them publicly available.
- Consistent and high level consultation with community, environmental and social groups and the public is essential from the start.
- Independent auditing of environmental information on all aspects of a development project is essential to ensure credibility.
- Plan and budget early to provide public education materials about the environmental aspects of your project.

9. Adaptation to Climate Change

Basic Principles:

- Infrastructure projects and especially hydraulic and marine works should take into account both extreme weather conditions and increasing scale in dimensions and complexity for the anticipated duration of the projects.
- Risk analysis should always be carried out at an early design phase of projects focusing on worst case scenarios that might be caused by climate change induced extreme phenomena.
- General public warning systems and management of possible disaster events should be in place and tested from an early phase.
- Public awareness should be raised through extensive consultation and participation.

10. Incorporation of Innovation and High Technology

Basic Principles:

- Promote innovation and high technology applications and exploit major sport events as a show case for the proliferation of environmentally friendly implementations.
- Mobilise and incorporate in the main planning fora scientists and researchers of universities and institutes that do not have usually the chance of expressing their views in business as usual conditions.
- Search for new ideas and build upon innovative methods and techniques adopted in previous Games.

Aiming Towards Sustainability:
With Whom and How?

The Stakeholders:

- The Government (Central, Regional or Local)
- The International Authority that awards the event (International
- Olympic Committee – IOC – in the case of the Olympic Games)
- The Event's Organising Body
- Professional – Scientific Associations
- NGOs and Society

The Methods:

- Setting Clear Environmental Objectives
- Collaboration between Stakeholders
- Dissemination of International
- Compliance with Legislation
- Strategic Environmental Assessment
- Environmental Impact Assessment
- Monitoring
- Interim Assessment and Reporting
- Communication
- Environmental Evaluation Matrix (EEM)