

Beijing 2008 Olympic Games

Economics &
business

Environment

Geography

History &
culture

An AFSSSE Project funded by the Australia-China Council



Australian Government



Acknowledgments

The financial support provided to AFSSSE by the Australia-China Council for the writing and publishing of these units is gratefully acknowledged.

All reasonable attempts have been made to obtain permission for the use of material from other publications. If the owner of any material published in these resource materials believes that such permission has not been granted they are requested to contact the Executive Officer, AFSSSE, PO Box 1029, New Farm QLD 4005.

Copyright

© Australian Federation of Societies for Studies of Society and Environment (AFSSSE), 2007

This work is copyright. It may be reproduced in whole or in part for study or training purposes, subject to the inclusion of an acknowledgement of the source and this copyright notice. No commercial use, including offering the work for sale, may be made and this work must not be altered in any way.

Reproduction for the purpose other than for those indicated above requires the written permission of the Australian Federation of Societies for Studies of Society and Environment (AFSSSE).

Requests and inquiries concerning this publication should be addressed to the Executive Officer, AFSSSE, PO Box 1029, New Farm QLD 4005.

AFSSSE Australia-China project

Beijing 2008 Olympic Games resource

Environment unit

Introduction

In more recent times with a greater appreciation by nations of environmental matters and a move to a more sustainable society, the International Olympics Committee now requires countries hosting the Games to implement strategies to protect the environment, observe concepts of equity and social justice and, where possible, minimise consumption of energy and water. The minimisation of waste and ensuring it is recycled as much as possible are also critical factors for selection when a country bids for the Games.

This unit provides students with an opportunity to look at the sustainability activities that the Beijing Organising Committee Olympic Games (BOCOG) has introduced and will introduce for the Beijing Olympic Games in 2008. Students will be given the opportunity to examine the quality of the site, judge the capacity for crowds to move safely within the Park, investigate the sustainable qualities of the venues and buildings and to make contact with Chinese Green Schools during the Games.

The unit also provides an opportunity for schools to integrate environmental education objectives and outcomes with existing state and territory curricula and to appreciate the value of sustainable initiatives in a practical setting. The unit also supports *Educating for a Sustainable Future: a National Environmental Education Statement for Australian Schools*, the nationally agreed description of the nature and purpose of environmental education for sustainability through all years of schooling.

1. Focus questions

1.1 What environmental factors had to be taken into account when constructing the stadium and other venues for all the events at the Beijing Olympic Games?

- Students will investigate the terrain and former settlement pattern that existed on the present Beijing Olympic site and note the changes that had to take place to enable construction to occur. What precautions were taken into account to minimise any deterioration of the natural environment and what changes had to occur to people's lives because of the construction?

1.2 What steps have been taken in the planning of the Games to minimise crowd damage to the environment, to facilitate huge movements of people each day and to maximise the use of sustainable public transport to the Games?

- Students will investigate the transport system in Beijing and decide how sustainable it will be in time for the Games. They will investigate the level of public transport, the minimisation of motor vehicle use and the facility to move large numbers of people economically and efficiently to the Games including the transport of foreigners from airports and train stations.

1.3 What plans have been made to ensure the Beijing Olympics are a sustainable event?

- Students will investigate the management systems the Beijing Olympic Committee will put in place during the games- waste management, crowd management, use of energy, water recycling, sustainable building designs and reduction of the event's ecological footprint.
- Students will compare the environmental challenges that Sydney faced in 2000 to those challenges of Beijing in 2008. Students will offer suggestions on why each country dealt with the issues in different ways and describe the outcomes of each of the issues they choose.

1.4 What other things are the Chinese doing to make their society more sustainable?

- Students investigate the daily life of a Beijing family and how they try to live more sustainably.
- Students investigate the actions that the Chinese Government have undertaken to make their nation more sustainable

1.5 How do the Olympic Games teach us to live more sustainably?

- Schools will be assisted to enable their students to link with a sister English speaking school in China. Each school will select an environmental or sustainability issue in its region and develop a plan to manage their issue. Alternatively they can both compare their environmental strategies that they took to manage and prepare for their Olympic Games: Sydney 2000 and Beijing 2008. Both the Australian and Chinese schools will then seek guidance and advice from each other on how they would go about dealing with each of their issues. At the same time they will discuss with each other the outcomes and advantages of previous Olympic Games, including the 2000 Olympics in Sydney and 2004 in Athens.

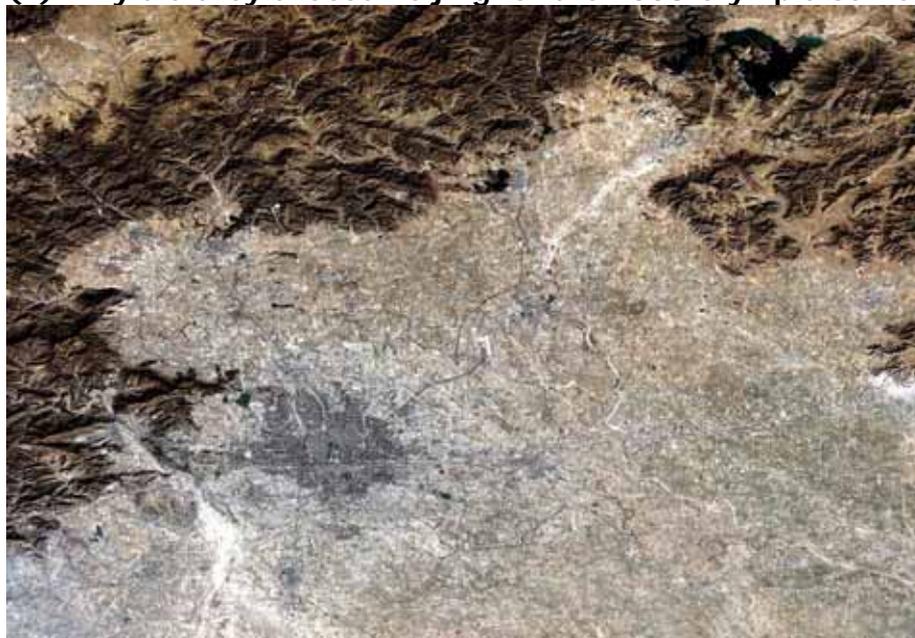
1.1 What environmental factors had to be taken into account when constructing the stadium and other venues for all the events at the Beijing Olympic Games?

(i) Choosing the best month to visit Beijing

Beijing is an ancient city with over 14 million people living in it. That is 3.5 times more people than those living in Sydney! Most people live on the outskirts of Beijing. Beijing has cold dry winters and warm to hot summers. The hottest month is July but the Games will be held after that in August 2008. Here are the climate statistics for Beijing in August and for some months in winter, spring and autumn. After you have studied them write a short note to say why the Olympic committee chose August for the Olympic Games.

Season and month	Winter January	Spring April	Mid Summer July	Olympics Month August	Autumn October
Average Temperature o C	-4.3	19.9	30.8	29.5	19.0
Minimum Temperature o C	-7.2	7.2	20.4	20.4	7.3
Average Rainfall	2.6mm	26.4mm	175.6 mm	182.2 mm	18.8mm
Number of Rainy Days	1	3	10.3	9.4	2.8
Average hours of sunshine	6.5	8.2	7.2	7.4	7.3

(ii) Why did they choose Beijing for the 2008 Olympic Games?



(NASA IMAGE)

Here is a satellite image of Beijing taken by NASA. It shows the city in a dark grey colour on a wide plain surrounded by mountains in the west and north. Can you see the Great Wall to the north of the image? Why would a flat plain be an advantage if you wanted to build an Olympic stadium there?

(iii) In what way have the organisers considered the environment when building the stadium?

If you go to the following web site you will see some information on how the Chinese built the stadium and some of the other buildings for the Olympic Games:

http://www.thebeijingguide.com/olympic_stadium_1.html

When they were planning the stadium they thought of the environment in a number of ways.

These are listed below.

Beside each idea and construction activity here describe how this would have been protecting the environment.

- (a) Collecting rainwater from all buildings
- (b) Using solar power for lighting
- (c) Using natural ventilation and installing window shades
- (d) Using geothermal water (heated water from deep underground) for heating
- (e) Heating and air conditioning computer controlled
- (f) No Freon gas is to be used in fire extinguishers.

(iv) At the same web site and further down the page there are photos of the building of the stadium and swimming centre.

The soil is very fine, yellow and powdery in one of the pictures. This soil is called loess. It is easily picked up, blown by the wind and can fill the air with fine suspended dust particles. This causes low visibility and air pollution.

(a) What precautions would the builders have to take to minimise this air pollution?

(b) After completing the building how can the soil be protected so that it will not be blown away by wind or trampled by thousands of people walking through the Olympic site?

(c) Click on to the following web site which shows you how the Beijing Olympic site looked like before construction took place.

http://www.beijingbeforetheolympics.com/olympic_construction/beijing_olympic_construction.html

Looking at this photo can you see any factories that had to be moved? Were there any homes that would have had to be destroyed or moved? Are there any landmarks or other places that might have had to be rehabilitated? Write a short story about the problems and challenges the planners might have had to consider in order to minimise the impact on the environment there.

1.2 What steps have been taken in the planning of the Games to minimise crowd damage to the environment, to enable huge movements of people to visit each day and to encourage the use of sustainable public transport to the Games?

- (i) **Beijing plans to make it much easier to get around its city when the Games begin in 2008.**

Go to the web site:

http://english.peopledaily.com.cn/english/200102/20/eng20010220_62866.html

(ii) You will see some of the changes that have been made to the transport system already in Beijing and some of the things they will do before August 2008. Look at each one of these plans and give your opinion on how successful each one will be.

Comment on whether each plan is sustainable? Will it help save fuel? Will it avoid delays and traffic jams? Here are some of the plans for transport.

- A fourth ring road 65 kms long has been completed with 147 overpasses. About \$2.3million Australian has been spent on traffic systems, including road, subways and light rail facilities.
- Nine major roads in downtown Beijing have been rebuilt and widened.
- 82 kms of new subway have been added to the existing 53 kms by the end of 2007.
- A light rail system has been built across the city
- 10 000 buses will operate in Beijing, half of them are powered by natural gas
- 67 000 taxis will be available; all of them with wireless communication

- (ii) Look at the map of the subway system in Beijing. You will find it at this web site:

http://www.drben.net/ChinaReport/Beijing/Beijing-City_Public_Transportation_System/BeijingSubway1.html

- (iii) The builtup area around the city is coloured on the map and the subway lines overlay the coloured area. How well do you think the subway covers all areas of the city and do you think it helps people to travel to most areas easily?

(iii) The Olympic site is located 14kms north of the city centre. See if you can locate where it might be on the map. There will be several subway stations at Olympic Green and Forest Park. Why do you think there is more than one subway station for the Olympic Games?

(iv) Which transport system would you use to get to the Olympic venue and what is your reason?

(v) Have a class discussion about how the Sydney Olympics in 2000 considered transport to Olympic Park at Homebush. Could some of these ideas be used by Beijing?

1.3 What plans have been made to ensure the Beijing Olympics are a sustainable event?

- (i) **The stadium** is like a bird's nest with intertwining twigs using modern technology. It allows for space for people to stroll around easily. The roof catches water for recycling and large clear pillows are placed between the intertwining twigs. This allows for natural light to enter the stadium and help the lawn to grow. It has an open feel about it and the roof can be manipulated to allow for natural ventilation.

You can see pictures of the stadium by clicking on:

<http://www.wirednewyork.com/forum/showthread.php?t=3756>

How do the plans show maximum opportunities to use natural light?

How do the open spaces help crowd movement considering that over 100 000 people will be seated in this stadium?

How might they use the recycled water that they collect?

Over \$6.6US billion will be spent on the site to improve the environment.

(ii) On the plains and in the mountains surrounding Olympic Green, forests will be planted. How will this help the environment around the Olympic centre?

(iii) Plans are in hand to improve waste and sewage systems. Waste and sewage will be recycled and reused. Why is this a good idea?

(iv) Many factories around Beijing will be moved out of the city. Why have the Chinese done this?

The Aquatic Centre

The second most impressive building on the Olympic site is the Aquatic Centre or the Water Cube.

You can see a picture of what it will look like below. To remind people of the need to look after the environment the centre is a large cube with a huge membrane of bubbles covering it. You can see more pictures of the water cube where swimming, water polo and diving events will take place at:

<http://en.beijing2008.cn/46/39/WaterCube.shtml>



(Picture from Beijing 2008 web site)

- (i) How will a building like this save energy?
- (ii) How could it continue to be used after the Olympics? This is one way we can make these buildings more sustainable by making them useful for many years after the Games.
- (iii) The outer shell has 634 air cushions made of a polymer substance. What are the advantages of using this material in terms of the environment? Are there any disadvantages of using this product? Its full name is ethylene tetra fluoride ethylene (ETFE). Do a Google search on ETFE and see what it says about it.

Comparing Sydney 2000 with Beijing 2008

In 2000 Sydney held its Games in Homebush. Compare some of the things that Sydney introduced to make its Games more sustainable with those that Beijing is to introduce. Here are some headings for you to work with.

Environmental Activity	Sydney 2000 Olympic Games	Beijing 2008 Olympic Games
Water		
Energy		
Transport		
Waste		
Land Reclamation		
Air Pollution		
Revegetation		
Buildings/ Architecture		

Two websites to help you with this information are;

Sydney 2000 Olympics:

http://www.gamesinfo.com.au/site_map.html

Beijing Olympics

<http://en.beijing2008.cn>

1.4 What other things are the Chinese doing to make their society more sustainable?

(i) Read the paragraphs about China's environmental problems from the website below and find out what the Chinese are doing about them. Here is a chart to help you do your summary.

http://en.wikipedia.org/wiki/Environment_of_China

Environmental Problem	What is being done about it
Air Pollution	
Water Pollution	
Waste Disposal	
Dust storms and encroaching deserts	
The 3 Gorges Dam	
Burning of brown coal	
Health problems	

(ii) Environmental problems are caused mainly by humans but sometimes they may be caused by natural events. Another website to help you understand this more is: <http://www.eia.doe.gov/emeu/cabs/chinaenv.html>

On the table below pick the main cause of each environmental problem. Some of the causes you can pick are:

- The growth of new heavy industry or **industrialisation**
- The removal of vegetation and forests or **deforestation**
- The **burning** of dirty brown coal or **air pollution**.
- The dumping of **waste**
- Air pollution causing **health problems**
- Loss of species and farming land due to **the building of huge dams**

Description of the problem	Main cause of the problem
Heavy air pollution	
Water pollution	
Deserts expanding and near to cities	
Plant and animal species disappearing	
Floods and mud slides	
Dust storms	
Heavy carbon emissions	

(iii) Chinese families themselves are also learning to protect their environment. Discuss some of these issues below with your friends or as a class discussion.

- China now has a law which says a husband and wife can have only one child. Why did the Government introduce this law and how might it affect the environment? Many families also prefer to have a boy rather than a girl. If boys outnumber girls to a large extent in the future how might this affect future generations of Chinese?
- Most Chinese families do not have a freezer, a microwave or a washing machine but mobile phones, radios and TVs are becoming very popular. As Chinese people become wealthier

and buy more appliances how might this affect their environment?

- Many international companies are now locating in China. A Swiss company designed the Olympic Stadium for example. Will foreign companies change Chinese culture perhaps?

1.5 How do the Olympic Games teach us to live more sustainably?

For a nation to win the privilege of launching an Olympic event the International Olympic Committee demands that the Games must be green or environmentally friendly. The International Olympic Committee (IOC) has made a set of rules in which the host country must follow very strict rules to ensure each sport does not harm the environment and sustainability is encouraged by the organising committee.

(i) In the table below there is a list of some of these rules. Give an example of each one in how it applies to your favourite Olympic sport. Shows how your sport can observe and respect the rule. You can find the answers and clues at the following website: http://multimedia.olympic.org/pdf/en_report_113pdf

The Rule Set by the IOOC to Protect The Environment By Each Sport	How my Sport Can Observe the Rule Set by the IOOC. The Sport I have Chosen is
It should not pollute the water	
It should not discharge solid waste	
It should not emit toxic gases to destroy the ozone layer	
It should not reduce animal or plant life in the area	
It should not harm the landscape	
It should not harm resources that can be renewed	
It should not cause unnecessary waste such as water, energy and raw materials	
It should not undermine cultural beliefs of others	
It should encourage the enjoyment of nature	
It should promote transport types that reduce pollution	
It should help prevent damage to health because of pollution	
It should protect people from violence	
It should include disadvantaged people in the Games and those people with disabilities	
It should not damage local ecological systems (like clearing forests)	

(ii) You can find out more about the Chinese way of life and make friends with students from schools in China. In that way you can keep track of what is happening up to and during the Beijing Olympics. Here is a website where you can get a contact for a Green School in China

Centre for Environmental Education and Communication (CEEC)
 No.1 Yu Hui Nan Lu
 Chaoyang District
 BEIJING 100029
 CHINA
 FAX +88 1084646361
 webmaster@chinaeol.net

In your contact with a Chinese school you may wish to share some ideas about the Olympic Games and receive more details about the environmental issues they have considered in the planning and running of the Games. Here are some suggested topics you can raise:

- What are the major environmental issues you face in your district?
- What are you doing about it?
- Have you had any successes?
- How much are your environmental problems due to the amount of building taking place?
- Do you try to save water and energy and prevent waste? How?

Key terms and meanings

Australian Chinese

Chinese people who were born in Australia or became Australian citizens are often known as Australian Chinese. They are like all Australians except they may speak a second language and often observe some Chinese cultural customs.

Carbon trading

Most growing plants absorb carbon dioxide from the atmosphere so a good way to reduce greenhouse gas emissions is to plant more trees. One global arrangement has been introduced to reward those with money for planting trees and to allow those who produce greenhouse gases to pay for it. This is called carbon trading. Tree planting is traded for those producing greenhouse gases. It is not certain if this arrangement really works but at least it is an attempt to plant more trees to absorb carbon dioxide.

Climate change

Climate change and global warming are interrelated. Climate change occurs when greenhouse gases accumulate in the atmosphere and inhibit solar radiation returning from Earth into space.

Crowd management

Whenever major events like Olympic Games are held it is necessary to ensure the crowd is safe and the movement of large numbers of people are carefully planned and coordinated. Plans are put in place to ensure systems of safe crowd movements

Ecological

Ecological refers to the variety of biological communities or ecosystems in a given area. Ecology refers to the relationship between living things and their environments.

Economic Development

Sustainability involves 3 major related areas; economic, environmental and social. All these have to be taken into account if we want a more sustainable society. Economic issues involve improving the efficiency of our use of resources so that the same or greater output of goods and services is produced with smaller throughputs of natural, manufactured and human capital.

Environment

Environment includes ecosystems and all the parts that make them up; natural and physical resources, the qualities and characteristics of locations, places and areas, the heritage value of places, and the social and cultural aspects of these things.

Environmental conservation

Environmental conservation is maintaining the existing ecosystems on our planet but not necessarily leaving them exactly as they appear now.

Environmental preservation means leaving them exactly the same as they are but when we talk about conservation we mean that while the ecosystems are preserved the interrelationships within those ecosystems can be modified without destroying them.

Environmental Impact Statement

Whenever groups or individuals wish to change the natural environment by building new industries or redeveloping an area for housing or commerce an Environmental Impact Statement (EIS) is prepared to assess the impact that the proposed change will have on the natural environment. If the impact is very serious the development may not take place

Fossil fuels

Coal and oil are the two major fossil fuels. They are those energy sources that give off carbon dioxide and other gases when burnt to generate electricity, warm buildings or power engines and vehicles. They are called fossil because oil and coal is a product left by ancient plants when they died and broke down and then buried deep underground.

Google Earth

Google Earth is a satellite service where by using the Internet people can see most satellite images of the Earth.

Green Games

Since the 2000 Olympic Games in Sydney Olympic Games have tried to introduce sustainable management strategies to minimise waste, reduce greenhouse gases, conserve energy and water, introduce better public transport systems and minimise human impact on the local environment

Greenhouse gases

When coal is burned or petrol is used in engines they give off gases, the main one being carbon dioxide. Carbon dioxide is locked up in what we call fossils or ancient plants that died and were buried millions of years ago. Another greenhouse gases is methane. Unfortunately when too much of these gases enter the atmosphere they build up and help prevent the Earth's heat being reflected back into space. In time the trapped heat warms the atmosphere and world temperatures increase. This affects our climate and can involve the melting of the ice caps at the Poles, the rising of sea level and a change in rainfall and the intensity of cyclones

Intergenerational equity

Intergenerational equity refers to the present generation managing its resources carefully and making sure there is a similar amount of resources available for the next generation. In other words we should not take away from or use up everything that our children and grandchildren will need in years to come.

International Olympic Committee

The International Committee is the central group that organises the Olympic Games. The Olympic movement consists of the International Olympic Committee, the Organising Committees of Olympic Games, National Olympic Committees, International Federations, national associations, clubs and athletes

Kyoto Protocol

The Kyoto Protocol is an international agreement among most countries in the world to set targets for reducing greenhouse gases over the next few years. It

is an attempt by countries to cooperate in reducing global warming and the effects of climate change.

Non – Government Organisations

Many organisations play a role in conserving and enhancing the environment. Those organisations that are not government run often receive funding or work as volunteers to do these tasks. They are known as non-government organisations or NGOs. Examples are World Wide Fund for Nature (WWF), Greenpeace and Keep Australia Beautiful.

Partnership

To achieve a sustainable society people need to work together, cooperate with each other and make long term plans to improve their environment. Partnerships are arrangements in which different groups come together to share their skills and work constructively for common goals.

Political

Politics refers to how we make important decisions in our society and how these decisions affect our environment and way of life. Politics also refers to how we decide or not decide on who our leaders are and how power operates in our society.

Satellite images

Satellites orbiting the Earth can record images of the surface of land and oceans. There are different sorts of images. Some are simply air photos taken from a great height above the Earth while others may be taken to search out mineral deposits, note changes in agriculture and settlement or used for defence and security reasons.

Settlement pattern

Settlement pattern refers to how people occupy the surface of the Earth. It may take the form of large cities, small towns spaced apart, towns that join each other or maybe simply isolated farm houses or ruins of old settlements from the past.

Social

Social issues include the concept that all people have equal access to services and goods produced in a global community. It also includes ideas of environmental health, and gender, religious, sexual, racial and ethnic equality.

Solar power

The energy produced by sunlight can be converted to electricity. Solar cells collect the energy from the sun. At this stage solar cells can produce only a relatively small amount of power, for a home or small unit but not for a whole town or city.

Sustainable building design

This refers to the design of new buildings which allow maximum light to come in and hence reduce energy for lighting and heating. It also refers to a building shape that allows air to circulate and to cool the inside in summer, hence reducing the need for costly air conditioning, It will often allow for grey water to be recycled and solar panels to be installed on the roof. Sustainable buildings have eaves that prevent the hot sun entering in summer but stop it

entering in winter. The direction buildings face also allows for maximum warming in winter and cooling in summer.

Sustainable Future

We can guarantee a sustainable future when we meet the needs of people today without compromising the ability of future generations to meet their needs. To be sustainable, any use of our resources needs must take account of the stock of resources and the impacts of their utilisation on the ecological, social and economic context of people today and in the future. A sustainable future also relates to bringing a better quality of life while minimising the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product.

Terrain

Terrain refers to the shape and features of the land whether it is flat, hilly, steep, swampy, sandy, covered in vegetation or simply bare and treeless

Waste management

Again nature is the best manager of waste because in the natural world nothing is wasted. Waste management refers to the recycling, reusing and the refining of waste to be used for other purposes. This avoids the dumping of excess waste in landfill sites. Green waste and worm farms help to produce compost to be used on gardens for soil enrichment and added organic matter. seating, adequate protection from the sun, clear walking areas, safe traffic flows to avoid crowding and blockages and areas set aside for special purposes.

Water recycling

Nature recycles water naturally but water recycling can be managed by people as well. Normally it involves collecting rainwater, harvesting stormwater for gardens and industry or treating used water and sewerage for household use.

Wind power

Electricity is produced by a rotating generator. To make a generator rotate we can use the power of falling water (hydro), heating water to make steam (thermal) or using wind to turn a large windmill (wind power).

Resource list



An artist's view of the inside of the Beijing Olympic Stadium

(Source Beijing 2008 Web Site)

Selected websites

International Olympic Committee (IOC)

http://www.olympic.org/uk/organisation/ioc/index_uk.asp

Sydney 2000 Games

<http://www.gamesinfo.com.au>

http://www.sydneyolympicpark.com.au/developing_sydney_olympic_park/the_vision

2008 Beijing Games

<http://2008gamesbeijing.com>

http://www.olympics.org/uk/games/beijing/index_uk.asp

Google Earth images

<http://maplandia.com/china/Beijing>

Panorama of Olympic Games Site

http://www.beijingbeforetheolympics.com/olympic_construction/beijing_olympic_construction.html

Sustainability in China and influence of the 2008 Games

<http://www.rmi.org/sitepages/pid662.php>

Other resources

- Map of Beijing highlighting transport routes to the Olympic site.
- Page 108 Lonely Planet *China* (First published 1984)
- Press clippings from Chinese English speaking papers and Australian articles.
- Photos of stages of construction of the Beijing site and comparative photos taken at Homebush in the 1990s

Acknowledgments

The financial support provided to AFSSSE by the Australia-China Council for the writing and publishing of this unit is gratefully acknowledged.

All reasonable attempts have been made to obtain permission for the use of material from other publications. If the owner of any material published in these resource materials believes that such permission has not been granted they are requested to contact the Executive Officer, AFSSSE, PO Box 1029, New Farm QLD 4005.

Copyright

© Australian Federation of Societies for Studies of Society and Environment (AFSSSE), 2007

This work is copyright. It may be reproduced in whole or in part for study or training purposes, subject to the inclusion of an acknowledgement of the source and this copyright notice. No commercial use, including offering the work for sale, may be made and this work must not be altered in any way.

Reproduction for the purpose other than for those indicated above requires the written permission of the Australian Federation of Societies for Studies of Society and Environment (AFSSSE). Requests and inquiries concerning this publication should be addressed to the Executive Officer, AFSSSE, PO Box 1029, New Farm QLD 4005.