EXECUTIVE SUMMARY

Challenge and opportunity characterize the award of the 2008 Olympic Games to Beijing. China's rapid economic development, with GDP growing at more than 11 per cent per year, has generated widespread concern about the environmental implications for China and the world, both within China and throughout the international community. In response, the Government of China has instituted a growing number of environmental initiatives and legislation designed to promote environmental sustainability as part of the country's ambitious growth strategy. With world attention increasingly on China, the staging of the 2008 Olympic Games in Beijing has given China an opportunity to showcase its commitment and ability to grow in an environmentally sustainable manner.

The challenge lies in the fact that Beijing's successful bid not only raised the city's profile internationally, but highlighted a number of environmental issues, not least the city's poor air quality, which remains a major concern for the Olympic Movement less than one year before the Games are due to commence.

The 'Green Olympics' initiative

Notwithstanding concerns over air pollution, this review is able to conclude that considerable effort has gone into fulfilling the letter and spirit of the promise by the Beijing Olympic Games Organizing Committee (BOCOG) to deliver a 'Green Olympics'

During the candidature phase in 2000, Beijing set ambitious environmental goals to show the world its commitment to sustainable development. Beijing's Municipal Government and the Government of China outlined 20 key projects to improve Beijing's environment, and an overall investment of US$ 12.2 billion to improve sustainability (US$ 5.6 billion over the period 1998-2002 and US$ 6.6 million between 2003-2007) under the Beijing Sustainable Development Plan. The project areas range from addressing air and water quality and waste management to including environmental considerations in new infrastructure development.

In order to speed up the environmental sustainability process, Beijing also decided to move forward the deadlines of several existing environmental targets in the Beijing 'Environmental Master Plan' (an environmental protection programme developed by the Municipal Government for 1997-2015). The results of these initiatives are now visible around the city. New wastewater treatment plants, solid waste processing facilities, increased forestation and green belt areas, and an improved public transportation fleet are now features of the new pre-Olympic Beijing.

In addition to the initiatives undertaken by the Municipality of Beijing, the Beijing Organizing Committee for the Olympic Games (BOCOG) is implementing several projects to deliver a sustainable Olympic and Paralympic Games in 2008. These initiatives range from waste management at the venues and sustainable transport during the Games, to cooperation with sponsors on environmental sustainability and dialogue with environmental NGOs.

However, one area where UNEP feels BOCOG could do more, especially in collaboration with local and international NGOs, is in promoting environmental awareness and action, especially during the Games themselves. Much of the outreach is focused on consumption and production related issues, in particular water, waste and pollution. UNEP feels more could be done to promote the broader framework of ecosystem protection, both among the Chinese public and among visitors to the Games. Given that it is likely that visitors to Beijing will be aware of the city's air quality issues, as well as other negative coverage of China's environmental problems, it makes sense to use the opportunity of their presence to try to highlight China's work to preserve and improve environmental conditions and protect ecosystems. This, in turn, may provide a useful tool to further educate and mobilize civil society and the private sector throughout China.

Greening the games

The city of Beijing has achieved significant progress in planning and building the required 31 competition venues for the Olympic Games, including 12 newly built venues, 11 renovated and expanded venues, and 8 temporary venues which will be dismantled after the event.

In accordance with its bid commitments, BOCOG has taken steps to build sustainable venues, paying particular attention to energy efficiency, use of eco-friendly materials, water conservation, and environmental management and control of building sites. An interesting innovation is the widespread use in the venues of ground, water or air source heat pump systems to provide buildings with heat in winter and air conditioning in summertime.

The excellent results achieved by BOCOG and the city of Beijing in phasing out ozone-depleting substances (ODS) well ahead of the deadline set at national level are also noteworthy. At the end of 2004, ODS, apart from HCFC and HFC (which are still used in the car air conditioning sector), were completely phased out in the city of Beijing, six years ahead of China's Country Programme deadline, and air conditioning and fire extinguishing systems in the Olympic venues are all ODS-free. In recognition of its achievement, the Secretariat of the Vienna Convention for the Protection of the Ozone Layer presented BOCOG with a public awareness award on the occasion of the 20th anniversary of the Montreal Protocol in September 2007.

There is, however, one area of concern. While BOCOG has established guidelines to encourage sustainability in most aspects of the Games, many of its requirements are not mandatory or enforceable. Final decisions on the environmental aspects of, for instance, transport, construction, accommodation and catering, are being taken on a voluntary basis by the actors involved in staging the Games. UNEP feels this reliance on goodwill and trust, while admirable, leaves too much leeway for taking shortcuts at the expense of environmental sustainability in the case of potential conflicts related to deadlines and budget overrun.

Another aspect that is absent from BOCOG's commitments and actions is a specific undertaking to offset the added carbon dioxide emissions created by staging the Games. This is increasingly a feature of high-profile events, and is an initiative being adopted by a growing number of sports organizations and private sector entities. Excellent examples include the HECTOR project devised by the organizing committee of the XX Olympic Winter Games in Torino, and the Green Goal programme of the 2006 FIFA World Cup.

Construction and air pollution define many people's image of Beijing, but the city authorities hope that after the Olympics the world will have a new view of Beijing as a dynamic and environmentally progressive city.

Although many of the initiatives undertaken by both BOCOG and the city of Beijing have been designed to reduce energy use and, hence, greenhouse gas emissions, both during the Games and beyond, it is not too late for BOCOG to openly declare a commitment on climate change and carbon offsetting.

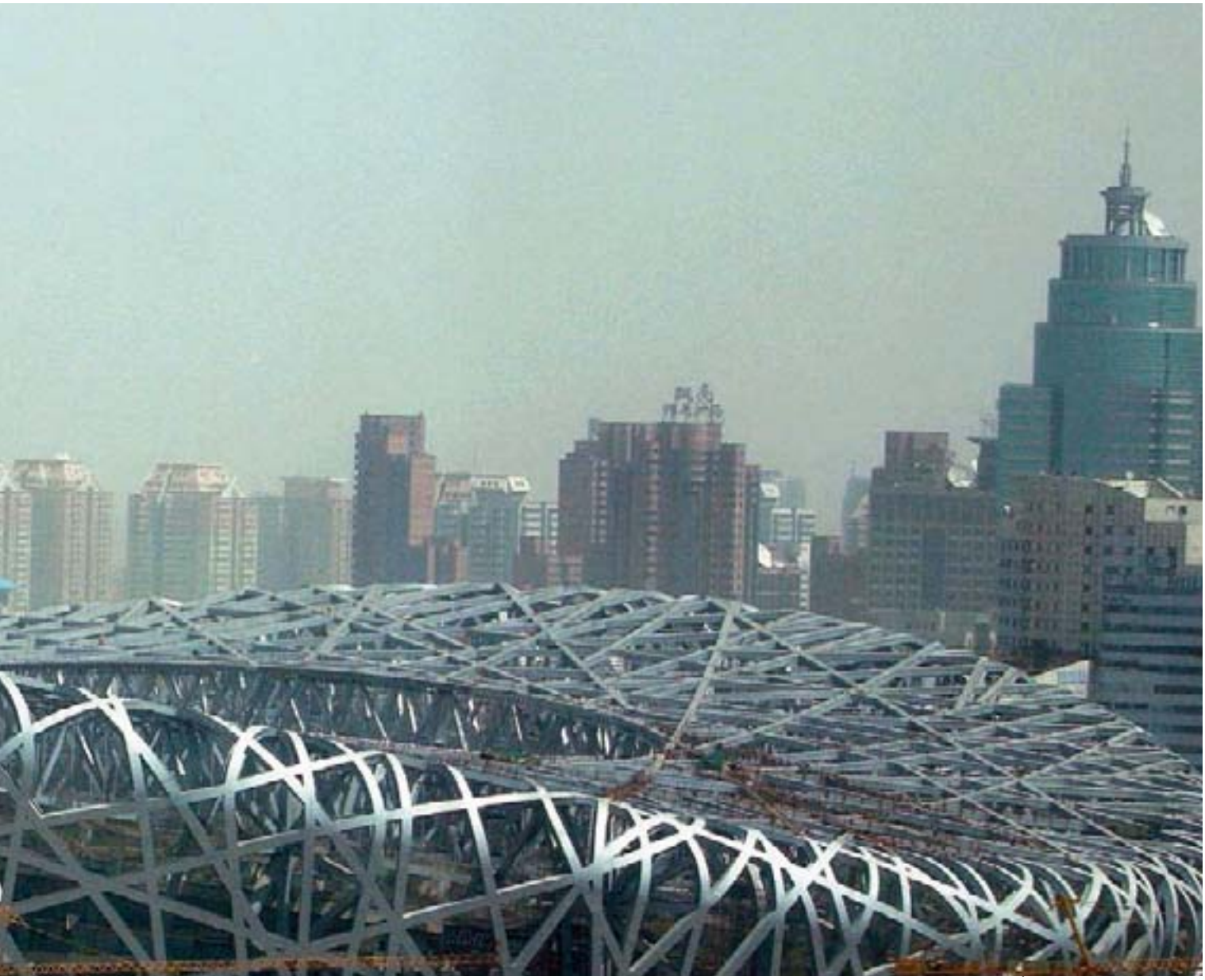
Air quality

Beijing has implemented a number of initiatives to improve its air quality and reduce its air pollution. From the relocation and refitting of major polluting industries, to the conversion of coal burning boilers to cleaner fuels and the implementation of vehicle emission standards, the city can boast significant achievements. Most of these initiatives will benefit the citizens of Beijing long after the Games have closed, provided that the impetus brought about by hosting the Olympics is continued, with Games-related measures being adopted and implemented on a long-term basis by the authorities.

While it cannot be denied that the Beijing Municipal Government has made, and continues to make, strenuous efforts to improve air quality through addressing emissions from the transport, energy and industrial sectors, air pollution is still the single largest environmental and public health issue affecting the city.

The extensive use of coal and the growing number of motor vehicles, has contributed to the slow pace of improving air quality. The city's geographical location exacerbates the problem. The mountain ranges that surround Beijing block air circulation and prevent the dispersion of pollutants and natural cleansing of the air.

Particularly worrying are the levels of small particulate matter (PM_{10}) in the atmosphere, which is severely deleterious to public health. While the concentration of pollutants such as sulphur dioxide (SO_2), carbon monoxide (CO) and nitrogen dioxide (NO_2) dropped between 2000 and 2006, levels of PM_{10} remain well above World Health Organization Air



Quality Guidelines, sometimes by as much as 200 per cent or more. Compounding the problem is the high number of dust storms that plague the city, especially during the spring. For example, in the spring of 2006, the city endured 18 dust storms.

It is commonly accepted that improving air quality cannot be accomplished in a short period, or even over a period of a few years. Thus, while UNEP applauds Beijing's efforts, including initiatives to limit traffic volumes on specific days, it has to be recognized that only long-term planning, and the enforcement of measures over time will show significant results. On the basis of the data, especially PM_{10}, and despite the relatively positive trends of recent years, air quality remains a legitimate concern for Olympic organizers, competitors and observers, as well as for the citizens of Beijing.

Transport

The city has achieved results both in the area of new transport infrastructure and in renovating the public transportation fleet. New lines on the underground rail network are planned to open prior to the Games, public transportation hubs have been put into operation to serve ground lines and new roads and bridges constructed to relieve the heavy Beijing traffic.
However, it is worth noting that, as well as the attendant environmental impacts, building new roads generally only serve to encourage more traffic. UNEP would encourage Beijing to avoid primarily dealing with traffic congestion problems by building more roads, as has often happened in western cities. More effective and sustainable is improving the scope, capacity and efficiency of the public transport system, and also better encouraging the public to use that system through affordability and other incentives. BOCOG's own statistics indicate that Beijing's public transport system, which is due to be expanded, is already undersubscribed. This therefore begs the question of what the city can do to further encourage uptake of public transport options and cut down car use.

Many older buses and taxis have been scrapped and replaced with new ones that run on Compressed Natural Gas (CNG) or comply with the municipal vehicle emissions standards, enforced in the recent years by the city of Beijing. Out of a total operating fleet of 60,000 taxis and 19,000 buses, more than 47,000 old taxis and 7,000 old diesel buses had been replaced or refitted by the end of 2006. New buses powered by Compressed Natural Gas (CNG) were introduced to replace old buses: 3,795 CNG buses are now running in Beijing, one of the largest fleets of this kind operating in any city in the world. The Municipal Government has also implemented local standards for vehicle emissions equal to Euro I, Euro II and Euro III, to match internationally recognized vehicle emission limits. It is hoped that the Central Government will consider adopting such standards outside Beijing in the near future.

Private vehicles have to comply with the new regulations. More than 1,000 new vehicles are registered every day in Beijing and traffic is one of the main environmental issues in the city. Nonetheless, data provided by the authorities appears to show that air pollution directly attributable to vehicle emissions is being addressed by initiatives such as emissions control and monitoring and a vehicle environmental labelling system put in place by the Municipal authorities in 2001.

Energy and industry

Although many of Beijing's environmental commitments are not specific to the Olympics, the Beijing Games has undoubtedly provided a strong catalyst for many environmental measures. For example, Beijing's energy infrastructure is undergoing massive restructuring, with a gradual transition from heavy dependence on coal to cleaner energy sources, such as natural gas, as well as geothermal energy and, to a lesser extent, wind energy. The purchase of natural gas in the city increased tenfold between 1998 and 2006, from 320 million m^3 to 3,520 million m^3 and many coal-fired boilers and other appliances have been switched to less polluting energy sources or have been technically renovated to reduce pollution.

Reducing dependence on coal will help Beijing to improve energy efficiency and air quality. Nonetheless, the city remains heavily reliant on coal, with its associated environmental consequences, ranging from local air pollution to the long-range transport of toxic elements such as mercury.

The environmental impacts of the industrial sector have also decreased, due to the closure or relocation of some of the most polluting industries within the city's area and the development of new industrial areas in the city's suburbs. Other developments include the adoption of advanced environmental technologies, and the implementation of new pollution standards and an industrial pollution control system. The relocation of Capital Steel and Iron Group to a new more efficient plant outside of Beijing is an example of Beijing's efforts to reduce industrial pollution within the city's boundaries.

Water

Beijing has achieved substantial results in improving wastewater management, with many new wastewater treatment plants being built, along with an improved sewage network, and is on track to achieve its bid commitment of a total 2.8 million m^3/day wastewater treatment capacity. City administrators have also made significant efforts to save and recycle water resources, which is increasingly important as the city has been affected by years of enduring drought. A variety of water saving schemes and rainwater collection and re-use systems have been designed and implemented in the Olympic Village and several competition venues.

Beijing has also made efforts to improve the quality and availability of drinking water, placing the protection of drinking water reservoirs and improving water quality high on the agenda. Nonetheless, there remains considerable room for improvement in the drinking water distribution network and in water quality at the user-end. At the source, water is in compliance with the quality standards set by the World Health Organization but, because of the antiquated distribution network, by the time the water arrives at the consumer's tap it is not the same quality as when it left the treatment plant.

Waste

Beijing has made considerable progress in the field of solid waste management. Using the general '3-R' circular economy principles of 'reduce, reuse, and recycle', Beijing has implemented a systemic approach to managing urban, industrial and hazardous waste, involving improving waste processing in the city, with new processing and disposal

facilities for urban and hazardous waste (industrial and medical) being built around the city. As a result, Beijing is close to achieving its goals for waste management set during the candidature phase. According to official data, 4.13 million tons were produced in 2006 in the eight central districts, while the overall processing capacity was close to 3.98 million tons, giving a processing rate of 96.5 per cent.

Beijing is also working to improve education and awareness among its citizens about the importance of separating waste for recycling and reuse. Recycling programmes are now visible in some residential areas in the central districts of the city. One of UNEP's concerns related to the Olympic Games, however, is that there is more emphasis on waste processing than on minimizing waste. A number of programmes have been developed for other major sporting events to reduce waste. UNEP feels this is an area where BOCOG could devote more attention.

Forestation and protected natural areas

A key area outlined in the bid commitments is forestation and developing new protected areas to improve green coverage in the city and its surroundings. Since winning the bid to host the Olympic Games, green coverage in Beijing, defined as the area covered by lawns and the shadow of trees and bushes, has expanded to more than 50 per cent of the city's area. Beijing has created three different green ecological zones in the mountain, plains and urban areas to create a green shelter for the city. At the end of 2006, the three ecological zones were nearly completed, including a total of 20 natural reserves to protect forests, wild plants and animals, wetlands, and geological formations.

Conclusion

Beijing has already achieved many of its bid commitments, for example on waste water treatment, water source protection and waste management, and appears to be well on the way to fulfilling all of them. In UNEP's view, this is an achievement in itself, especially considering that the Organizing Committee of the previous Olympic Summer Games failed to follow up on their environmental promises.

Beijing's old or nonexistent infrastructure, rapid development and geographical constraints mean the city still has considerable challenges to overcome, especially in the areas of air and water quality. Nonetheless, there is no doubt that the environmental projects developed in Beijing prompted or accelerated by the award of the Olympics represent a long-term positive legacy for the city, both in terms of new infrastructure and implementing new environmental technologies.

At the moment, some of these initiatives, such as vehicle emission standards, remain exclusive to Beijing. If the new environmental standards and measures taken in Beijing for the Olympics are adopted countrywide, and help to influence China's development, the award of the 2008 Olympic Games can be counted, from the environmental point of view, as a success.