

**Air Flows & Impact on 2008 Olympics:
Beijing, China**

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In preparation for the upcoming 2008 Summer Olympics, the city of Beijing has undertaken a massive initiative to not only prepare themselves for the influx of foreign tourist, but also to portray Beijing as a progressive and developed metropolis. One of the major criticisms that Beijing is facing from both athletes and policy makers, is the poor air quality that is inflicting the city. The majority of this air quality degradation can be attributed to the economic boom that China has experienced in the past three decades and the absence of environmental regulations. The aim of this paper is to assess the activities that created this environmental instability, the initiatives that the city of Beijing has implemented, and how the air quality issue will impact the 2008 Summer Olympics and the global community's perception of Beijing.

China's economy is the fourth largest in the world, and is expected to move into third place early next year based on GDP forecasts. Currently, China's real GDP is a very robust 11.5% compared to approximately 3.5% in the United States. Since the early 1980s, the Chinese government has put a significant amount of effort in reforming their economy from a communist-like system to more of a market-based economy. These reforms led to the poverty rate of the country decreasing from 53% in 1981 to 8% at the turn of the century. In addition, China recently signed and entered into the World Trade Organization (WTO), and this entrance led to exports and foreign direct investment increasing 32% and 36% respectively. However, one of the unintended consequences of all of this growth has been the massive amount of air pollution.

Limited regulation by the Chinese government throughout the country's economic expansion has led to China becoming the pollution capital of the world. According to the World Bank, China is the world's second largest producer of GHG and home to 16 of the world's 20 most air polluted cities. Using satellite enhanced data, the Environmental Protection Agency estimates that the pollution in the skies of China have increased by more than 50% in the past 10 years and that pollution levels could quadruple within the next 15 years if unregulated industrial expansion continues as forecasted. Another study in 2003 by the Chinese Academy on Environmental Planning, directly linked air pollution to 411,000 premature deaths from lung and heart-related diseases.

Such health concerns regarding cancer and birth defects are thought to be caused by chemical factories and a number of conservation groups have also claimed that acid rain has made 70% of China's rivers and lakes unsuitable to be used for drinking water.

In Beijing specifically, the three primary reasons for the poor air quality are the increasing number of new vehicles on the road, polluting industrial facilities, and the geographic location in which Beijing lies. The number of cars owned in China is increasing by 26 percent a year, and automobile sales are forecasted to reach 10 million by 2010. The Wall Street Journal recently reported that Beijing alone has been adding some 1,000 new cars a day to the road. Automotive particulate emissions result in high levels of lead in one's bloodstream, and it is now believed that 7 percent of Beijing's children have dangerously high levels of lead in their blood. Lead poisoning amongst children has been attributed to causing serious developmental problems in intellect, speech, learning, and memorization. Unfortunately, the deteriorating air quality in Beijing is still not impacting car ownership. Beijing's transportation bureau reported last year that there are more than 2.46 million vehicles on the road, and this amount is expected to grow 14 percent a year and reach 3.5 million by 2008.

In addition to the vast number of cars on the road that emit particulate matter, Beijing (until recently) has the most amount of energy consumption for any city in China. Beijing, like most emerging economies experiencing an economic explosion, is characterized by having an infrastructure that is heavily reliant upon coal-fired power plants. As anyone knows who has watched Al Gore's "An Inconvenient Truth" or simply picked up a newspaper in the past few years, coal-fired plants are the world's number one emitter of carbon dioxide as well as sulphur dioxide and other particulate matter. At the end of last year, Chinese officials claimed to have converted over 90% of Beijing's power plants to cleaner natural gas-based fuel. However, these facts are inconsistent with the recent UNEP report from earlier this year that states particulate pollution from construction sites, coal-fired boilers, and dust storms is at the same concentration as it was in 2000. At certain periods, these levels are three times above what is considered safe by the World Health Organization (WHO).

The last major driver of Beijing's smog and polluted airways is the mere geographic location of the city. For one, the topography of Beijing exacerbates the air pollution problem as mountains to the west and north impede air flow patterns. The mountains to the north are actually the reason why the Great Wall of China was built where it is, to take advantage of the added protection from invaders. In addition to being captive to a pocket of stagnant air flow, during certain times of the year dust storms from the deserts on the other side of these mountains contribute to the air pollution within the city. In fact, pollution from these dust storms can be so extreme that the Beijing Weather Modification Office sometimes has to artificially induce rainfall to fight and mitigate these dust storms. Compounding the situation, a recent study by a joint team of Chinese and U.S. scientists concluded that emissions from outside of Beijing impact Beijing's air quality. They found that emissions in Tianjin, China's third largest city, contribute 10 to 33 percent of Beijing's smog, while the Hebei Province contributes 6 to 13 percent of Beijing's smog. The reason for this is that particulate matter can travel several hundred kilometers from industrial, coal-burning cities to Beijing, and shockingly these cities have less stringent regulations than Beijing.

In hopes of getting the 2008 summer Olympic bid, Beijing outlined a number of initiatives that they would undertake in preparation for hosting the Olympics. A number of these initiatives were part of the Environmental Master Plan that was developed in 1997 by the Municipal Government and World Bank, but they were integrated into the Olympic bid and deadlines were accelerated. The activities range from expanding natural gas pipelines to incorporating renewable fuel into transportation fleets to relocating industrial parks. In addition, the Olympic planning committee set forth commitments that included supporting environmental education and awareness raising, cooperation with environmental NGOs, instituting environmental management systems, sustainable transportation during the Games, eco-design for the venues, green procurement, green accommodation, tree planting and green marketing. The "Green Olympics" concept was designed to greatly improve the environmental conditions of Beijing and while not necessarily Olympic specific improvements, the Olympics has served as a major impetus for increasing awareness and implementing change. Thus far they are on schedule or

ahead of schedule on all of these initiatives expect air quality. Last year for the first time in eight years, Beijing experienced a record number of “blue sky” days (241) as classified by the UNEP. However, their target of 65 percent “blue sky” days is relatively low compared to the rest of the world and does not really meet the expectations for a “livable” city as defined by the UNEP.

As mentioned previously, poor air quality has always been a major issue in China and Beijing, but only recently have complaints been heard from the sports world. Earlier this month, defending gold medalist and number 1 ranked female tennis player in the world, Justine Henin, announced that she might not be able to compete in the 2008 Olympics, fearing that the city’s air pollution could trigger her asthma. She was already forced to miss the China Open held this past September due to air quality issues. Even greater concern revolves around endurance sports, as some experts are speculating whether it is even feasible for Olympic athletes to run a marathon in Beijing. In February of this year, 22 runners competing in the Hong Kong marathon were taken to the hospital with breathing related complications. International Olympic Committee President, Jacques Rogge, recently said that some events may be postponed if pollution was too bad and that air pollution remains a "legitimate concern".

In the past year, city officials of Beijing have conducted a number of tests to assess the impact that some temporary measures could have on limiting air pollution during Olympics. Beijing city officials have already taken over 5,000 old buses and 20,000 taxis and other highly polluting off the roads, while putting into operation 4,000 natural gas fueled buses. In 2005, all of China adopted automotive emissions that are on par with emissions standards set forth by the European Union in the 1990s. They have also decided to limit traffic in the days and weeks leading up to the competition. There has actually been a precedent set for such a policy, as during the 2001 World University Games (hosted by Beijing) factories were shut down and driving restrictions were imposed. Participants from this competition have stated that there was a noticeable difference in skyline visibility and air quality after these initiatives. Olympic planners are also in the process of relocating more than 200 of the most polluting factories out of the city. While I applaud the plan to switch generation fuels and limit the number of cars

leading up to the Olympics, more sustainable initiatives should continue take place to address long term trends as the country and city continues to grow (i.e. sustainable building design, long term commitment to renewables, mechanisms in place to oversee and regulated energy intensive industries).

This is the first time that China has been on the world-wide stage. While I believe that economically they have made great strides in the past few decades and the future of business lies in China, the recent publicity and importance that environmental issues are playing in the political landscape necessitate Beijing showing that their economic development has not come at the expense of the environment. If this is indeed the case, then they must show that they are committed to solving the problems and having sustainable development into the future.

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