China: The Investment Agenda for Building an Environmentally Sustainable Economy

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Association for Sustainable & Responsible Investment in Asia

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About ASrIA

ASrIA, the Association for Sustainable and Responsible Investment (SRI) in Asia, is a not-for-profit membership association dedicated to promoting and developing SRI in Asia. ASrIA's mission is to assist the financial community to understand and integrate sustainable investment criteria into investment decisions, and to empower investors by increasing the choice of SRI products available in Asia. Established in 2001, ASrIA already has more than 100 members, including investment institutions managing approximately US$2 trillion in assets in total. In order to raise awareness about SRI, ASrIA runs conferences, seminars and workshops, and publishes research on SRI issues. ASrIA's website, www.asria.org, is the primary resource for SRI in Asia, with over 1,800 page views per day and 4,600 subscribers to the regular e-bulletin. ASrIA is creating a powerful network of people and organisations committed to developing SRI in Asia.

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This paper gives an overview of the current status of environmental protection in China and considers the investment agenda for sustainable business enterprise. While the social dimension of development is just as critical to achieving sustainability, it is not the main subject of this report which focuses on the underlying environmental challenge.

- **The environmental state of the nation**
- **China's environmental policies and regulations**
- **Environmental management standards in industry**
- **Green initiatives and pilot projects**
- **An emerging agenda for investors who wish to support sustainable China**

Executive Summary

This is the 'Asia Pacific Century' and the question asked by concerned citizens worldwide is whether China, the largest economy in Asia, is able to prove that economic growth can exist in harmony with protection of the environment? Does the country have what it takes to be a world leader in green growth, living within its ecological footprint[1]? Can it afford not to?

"Harmony among the population, resources and environment is fundamental to realising a "xiaokang" – relatively affluent – society in an all round way"…

… "all government departments should have a sense of this responsibility"

Hu Jintao
10th March 2003

Output from China's 10 million industrial enterprises grew by more than 15 percent annually during the 1990s[2] and output is likely to continue to be among the highest globally especially with developments such as WTO[3] inclusion. Economic growth is frequently coupled with an increased burden on a country's ecosystem. While some environmental problems may be reduced, many are not. China's challenges are overwhelming. There is chronic air pollution from burning coal, water pollution from untreated wastes and soil erosion from deforestation. One-fifth of agricultural land is already estimated lost since 1949[4].

[1] Ecological footprints show us how much nature nations use. They are calculations based on two simple facts: first, we can keep track of most of the resources we consume and many of the wastes we generate; second, most of these resource and waste flows can be converted to a biologically productive area necessary to provide these functions. At the current rate of consumption, the ecological footprint of all humankind will reach twice the regenerative capacity of Earth by 2050.

[2] World Bank, 'Greening of Industry: Is Industrial Pollution the Price of Development.' 2002.

[3] China joined the World Trade Organisation (WTO) on November 11, 2001. There has already been a surge in investment activity following China's accession to the WTO - the Ministry of Foreign Trade and Economic Co-operation recorded 22,915 new enterprises backed by foreign direct investment during 2001 and this is expected to increase sharply over the next few years. Source: Ministry of Foreign Trade and Economic Co-operation. http://www1.moftec.gov.cn/moftec_en/ Also cited on People's Daily Newspaper, 'China More Attractive to Foreign Investors', December 2001, http://www.english.peopledaily.com.cn

[4] World Bank, 'China, Air, Land and Water – Priorities for a New Millennium.' 2001.

China has evermore sophisticated environmental legislation and substantial investments are being made in clean technologies and environmental rehabilitation programmes. Crucially these investments are being supported and championed by the World Bank, the Asian Development Bank (ADB) and other foreign investors. However, despite the level of environmental legislation in place, China's historical compliance record is poor and standards continue to be weakly enforced in some provinces, especially in rural areas. Fines are often too low or produce conflict issues by contributing more in the way of financial benefit to enforcement bodies than to mitigation of environmental impacts.

Nevertheless, the Executive is signaling its awareness of the costs of pollution and the opportunity to integrate environmental design more effectively into economic development, and decisive actions are being taken beyond the introduction of new laws. Between 1998 and 2000, heavy polluting plants in the country, including 52,500 small coal mines, 85 small iron and steel plants and 3,894 cement factories were closed down.[5] More recently the country has begun to introduce market mechanisms for environmental protection and reducing pollution. It is too early to comment on the impact of these, such as the emissions trading schemes to reduce sulphur oxides, and the Clean Development Mechanism to reduce greenhouse gas emissions. However, given the mercantile nature of Chinese people, there is a high likelihood that such measures will have broader appeal and positive impact than the stick of legislation alone.

Issues for Investors

"There is an increasing consensus in this country that Western-style modernisation is not a ready-made model for China.....

Only ten years ago, corporations and investors would have seen China as a pollution haven where environmental standards were allowed to 'let slip' and of secondary importance to rapid economic growth. However the authorities have tightened their grip and businesses setting up in China can expect growing levels of scrutiny. Nonetheless standards do vary significantly in different regions. Investors[6] hoping to participate in China's economic growth without contributing to further environmental degradation, or better, making a positive contribution to environmental protection and mitigation measures, can do so in several ways, described in Section 5 of this report. In short, they can:

..... China's ability and resolve to press ahead with its own approach to overall development should not be underestimated"
China Daily 19.7.03

Consider developing an ***Environmental Code of Conduct*** for investments in China which reinforces the effectiveness of Government programmes focused on environmental management systems, on emissions compliance, on eco-labelling, on cleaner production and on environmental accounting. If there is sufficient interest in this proposal, ASrIA is willing to work with investors and investee companies to develop such a Code.

[5] *China Daily* , 'Clear skies ahead for Chinese cities.' November 8, 2002.

[6] For the purposes of this report, the term Investors is used to describe foreign investors, stock market investors specifically, since China has yet to develop a domestic SRI industry. Nevertheless many of the recommendations made should also be considered by domestic investors and overseas investors of all types. It is also recognised that the primary concern of investors in Chinese companies is to ensure that Reports & Accounts represent a true and fair view. However environmental factors in corporate performance should not be neglected.

- Encourage companies to adopt environmental management systems such as ISO14001 and to provide independent verification of their records. Actions such as environmental training programmes for staff or championing of environment performance from senior management should be encouraged.
- Encourage greater environmental performance transparency by companies and their suppliers through environmental reporting. Standards such as those defined by the Global Reporting Initiative should be considered.
- Use the opportunity of the Beijing Olympics to push developers towards green buildings and sustainable urban design.
- Encourage the Government to foster the growth of SRI practice and corporate sustainability through measures such as Stock Exchange listing requirements.
- Support the development of benchmarks such as Sustainability Market Indices and case studies of best practice, for example in Cleaner Production, to demonstrate new management techniques and provide quantitative evidence of the commercial benefits of natural capital management.
- Support projects which foster business (and public) understanding of sustainable enterprise, global best practice and the transition strategies required for key industries.
- Support local capacity building for sustainable investment practice.
- Support supply chain measures to raise environmental standards in domestic production, especially in China's less developed areas.
- Investors must also develop wider investment capabilities, for example, their capacity to support sustainable venture finance and microfinance. Solutions for sustainability require more than stock market investment.

The international and domestic legal frameworks are in place to ensure that economic and business development can be aligned more closely with environmental protection. Stronger enforcement of these regulations is needed by government, and market forces can reinforce government action.

Stock market investors can be a strong and positive influence on companies when they analyse sustainability factors in due diligence and discuss these issues with management.

Multinationals and international investors can significantly influence best practice if they make good environmental management a pre-requisite for investment and also explain the importance of it to the investment case. This requires active engagement by investors with multinationals investing into China and requires these multinationals to be involved with education and management training of local operators. Tolerating poor environmental management and taking short cuts today will usually lead to larger costs in the future for clean-up of liabilities. International and domestic pressure to comply with regulations and requirements will continue to increase.

Much has been written about China's environmental challenge and references to more detailed accounts are given in Appendix 1. This paper aims to provide a brief overview of some of the greatest challenges and the status of legislation governing China's natural capital management. The main purpose is to identify how investors can support the integration of environmental priorities into an economy which is growing at a staggeringly rapid pace.

1. How Healthy is the Nation?

Many reports have been written about the state of China's natural capital – the ecological systems on which it depends for water, food, energy and materials[7]. The situation is still very grave. On any number of counts, the country's natural capital is being depleted at an alarming rate and consumption pressures continue to increase.

The encouraging news is that these disturbing trends are recognised by the Administration and actions are being taken in response. Since the 1980's, environmental protection has become one of the country's core national policies.[8] Over the past five years China invested 580 billion yuan (about US$70 billion) or 1.2% of its GDP in environmental protection and biological construction, of which 480 billion yuan was channelled to pollution control. The State Environmental Protection Administration (SEPA) believes a minimum investment of 1.5% of GDP is required to control pollution arising from economic development[9]. China's goal for the year 2005 is for total pollution emissions to be reduced by 10% from the year 2000 level[10]. The following section summarises the critical issues and government action.

"China is facing a tremendous challenge in conserving biodiversity due to natural factors like climate change and human-induced ecological damage, such as pollution and over-fishing"

Wang Dehui, deputy DG of SEPA's Department of Nature and Ecology Protection, October 18, 2002

1.1. Biodiversity and Forestry

Conserving biodiversity is crucial to maintaining ecological balance. The country's wildlife is continually diminishing as a result of habitat degradation and excessive exploitation. About 25 percent of the world's 640 endangered species listed by the International Endangered Species Trade Convention are in China.[11] Geographically, west China is the country's richest biodiversity area and is globally important.

China's environment is also being damaged by alien invasive species which currently cause annual economic losses of more than 50 billion yuan (US$6.1 billion). According to a preliminary survey by the International Union for Conservation of Nature & Natural Resources, half of the world's 100 worst invasive species have entered China.[12]

China ranked fourth, after the United States, Canada and Argentina, in the release of transgenic crops into the environment, including field experiments and commercial production, causing a growing potential risk to biodiversity, the environment and human health.[13]

[7] Please refer to references in Appendix 1.
[8] Information office of the State Council of the People's Republic of China, 'Environmental Protection in China', 1996. http://www.china.org.cn/e-white/environment
[9] *PeopleDaily*, 'Input in Environment to Account for 1.5 Percent of GDP.' March 17, 2003.
[10] *Xinhuanet*, 'China to enhance environmental monitoring capacity.' November 6, 2002.
[11] *Xinhuanet*, 'China facing huge challenge in conserving biodiversity.' October 17, 2002.
[12] Ibid.
[13] Ibid.

China is revising its national Biodiversity Conservation Action Plan, adding new regulations on biosafety, alien invasive species, and access to and benefit sharing of genetic resources in an effort to incorporate biodiversity conservation into the exploitation of resources and development of west China. 50 billion yuan (USD6.1 billion) has been designated for priority biodiversity and eco-environment projects in China's Current Five-Year (2001-2005) Plan[14].

China is implementing one of the world's biggest afforestation programmes, with six major projects going live in the next five to ten years. The aim is to convert slope farmland into forest and grassland, combat the desertification of Beijing and Tianjin by wind and sand, conserve wildlife, develop nature reserves, and develop forest industry centres focussed on fast-growing and high-yield timber plantations.

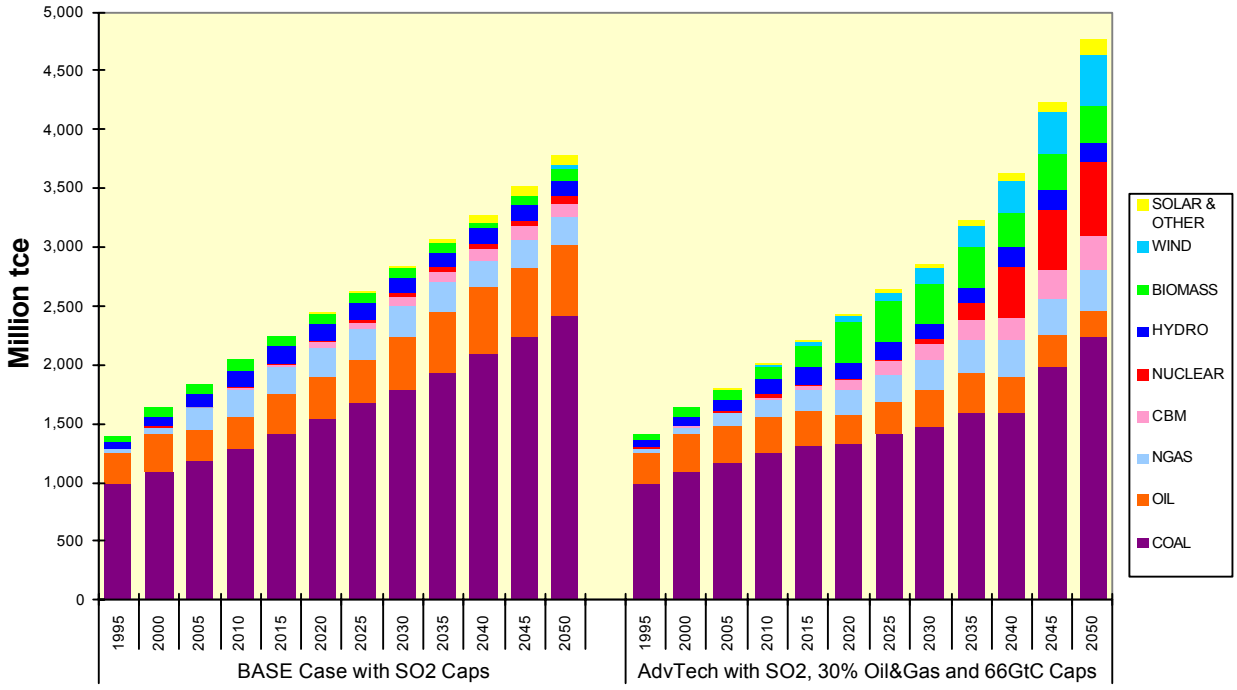
The challenge is substantial. Desert expansion has accelerated with each successive decade since 1950 largely because of overgrazing. China's cattle, sheep, and goat population tripled from 1950 to 2002. The United States, a country with comparable grazing capacity, has 97 million cattle. China has 106 million. However for sheep and goats, the figures are 8 million compared to 298 million. Overgrazing is destroying the land's protective vegetation. The wind then does the rest, removing the soil and converting productive rangeland into desert. The fallout from the dust storms is social as well as economic. An Asian Development Bank assessment of desertification in Gansu Province reports that 4,000 villages risk being overrun by drifting sands. China's neighbours, Japan and Korea, are also affected with dust storms and muddy rain. Qu Geping, the Chairman of the Environment and Resources Committee of the National People's Congress, estimates that the remediation of land in the areas where it is technically feasible would cost $28.3 billion[15].

1.2. Energy

China ranks as the second largest energy consumer and producer in the world, following the USA. On current forecasts, the country will become the world's leading energy consumer by 2050, burning 3.8 billion tons of standard coal – up to three times the amount for 2000[16]. This has grave pollution implications, especially for global warming. Figure 1 below illustrates the extent to which fossil fuels dominate China's energy mix for the next forty years, even when certain pollution caps are imposed. For China's economy to be sustainable, perceptions must rapidly change towards renewable and 'clean' energy production which must generate the bulk of overall requirements.

[14] *Xinhuanet*, 'China facing huge challenge in conserving biodiversity.' October 17, 2002.
[15] China losing war with advancing deserts http://www.earth-policy.org/Updates/Update26.htm
[16] The Committee of Population, Resources and Environment of the National Committee of the Chinese People's Political Consultative Conference (CPPCC). China Daily 26 March 2003

Figure 1. Projections for China's energy mix up to 2050[17]



China still has one of the highest energy intensities in the world, on average needing three or four times as much energy input per unit of output as developed economies. This suggests substantial scope for improving energy efficiency in industry and in consumer goods and by other means.

While the prevailing view is that hydro and nuclear power will be the main sources for increased energy demand, the country's abundant renewable energy resources should not be forgotten. Geothermal reserves are equivalent to 3 billion tonnes of coal equivalent, and only 0.01% of this resource is being tapped. Marsh gas is being promoted in place of firewood as a cleaner, cheaper fuel source in rural areas. By the end of 2001, 10 million households had converted and the target is a further 11 million to have access by the end of 2005. [18]

Energy efficiency and renewables are the future

The total wind power potential is estimated at 1600 GW, over eight times current Chinese electricity generating capacity [19]. With financial support from the German Ministry of Economic Cooperation and Development, a three-year study of wind conditions in Lichuan, Hubei Province, has resulted in plans for the construction of a medium-sized 20MW wind station, with the option for substantial expansion. The plant qualifies for CDM credits under the Kyoto Protocol. About 400MW of wind power capacity have been developed around China. By 2005, it will expand to 1.4 billion watts.[20]

The prospects for solar technology are also strong. Over the past 20 years, China has become the largest producer and user of solar energy heaters, with the

[17] China Council for International Cooperation on Environment and Development (CCICED), 'Energy for Sustainable Development in China.' 2001.
[18] *China Daily*, 'Green fuel replaces wood for rural millions', April 4, 2003.
[19] Byrne et al, 'Opportunities and Challenges for China's Power Sector', University of Delaware, May 1999.
[20] *Xinhuanet*, 'Chinese and German cooperate in wind power project', March 27, 2003.

installation of more than 30-million-square-metres of solar panels. The solar energy heater industry has been developing at a rate of 25-30% annually[21]. However, the solar energy industry is still facing major obstacles due to poor environmental awareness among the public and inadequate support on the part of the government.

In short, China, like other countries, may also find that renewable energy sources offer more scope for attracting private capital than nuclear and mega-hydro with less long-term liabilities as well.

1.3. Mineral and Agricultural Resources

China's exports and imports of mineral products now exceed US$100 billion and demand outweighs supply because growth has outpaced the discovery of new reserves[22]. China has been a net importer of petroleum for the ninth consecutive year and its imports are rising dramatically. Dependency on iron, copper, manganese, chrome and other metal mineral resources is growing along with the country's trade deficit for mineral products.

Between 1995 and 2000, imports exceeded exports of grains, feeds, cereals and food wastes, oilseeds, fats and oils, fibre, fabrics and skins, and fertilisers.[23]

1.4. Pollution

China's six most polluted rivers and lakes are on a hit list for clean up, and in October 2003, four large waste water treatment plants were put into operation. Twelve other plants are currently under construction at a total investment of nearly 2 billion yuan (US$243M).

While 16% of the fresh water used annually in China comes from underground supplies, the percentage is much higher in some regions. It reaches 52% in North China and 60% in Beijing. 60% of China's cities depend on underground water and as many as 136 of these have been polluted, mainly by residential and industrial sewage as well as chemical fertilisers. A national monitoring system for groundwater has been established in Beijing supported by the Netherlands, using worldclass technology. It will be fully operational in the next few years[24].

Between 1991 and 2000, industrial solid waste volumes fell by 69.2% and continue to do so. Re-use of industrial solid wastes increased from 43% in 1995 to 52% in 2000[25]. Urban household waste in China totals 120 million tons annually[26] and city garbage treatment facilities are now being developed.

In 2001, urban air quality in numerous cities remained almost the same as in 2000 and total suspended particulate pollution became more widespread. Acid

[21] Feng Jianhua, president of Shandong-based Ecoosolar Solar Energy Co Ltd. *China Daily*, March 26, 2003.
[22] Comment from Resources Minister, http://english.peopledaily.com.cn/200206/11/print20020611_97553.html
[23] Fred Gale, China at a Glance: A Statistical Overview of Food & Agriculture, 2002, http://www.ers.usda.gov/publications/aib775
[24] *China Daily*, 'China tapping into cleaner groundwater', March 25, 2003.
[25] The People's Republic of China National Report on Sustainable Development, 2002.
[26] *China Daily*, 'Recycling of Household Waste Urged', June 3, 2002.

rain fell on about 30% of China even though the number of cities affected was slightly reduced[27]. It is estimated that acid rain causes over US$13 billion of damage annually to the country's forests and farms, and to human health[28].

The government has approved a plan to cut sulphur dioxide emissions in the country's most heavily polluted areas. 96.7 billion yuan (US$11.7 billion) will be spent on 550 projects to cut emissions by 3.87 tons a year by 2005, alleviating 80% of the cities plagued by it. The target area accounts for 66% of the country's total emissions and includes four municipalities including Beijing, 21 provincial capital cities and 175 other cities and areas.

1.5. Rural Development

At the end of 2002, the total population of China was 1.28 billion. 782 million or 61% of the population is rural.[29] The per capita net income of rural households (2476 yuan) was 3.1 times lower than the per capita disposable income of urban households.[30] The country still has about 50 million people living in absolute poverty in rural areas, with annual income of less than 635 yuan (US$75).[31] Many people live in areas with fragile ecosystems and harsh natural conditions.[32]

China is facing mounting unemployment. At the end of 2000, there were 480 million rural workers, 328 million of them worked in labour intensive agricultural production. In addition, there were around 100 million surplus rural labourers, and the number is expected to increase by over 8 million a year over the next five years.[33] The surplus has triggered a cross-regional migration of rural labourers into cities and is putting great pressure on urban employment and support systems.

Starting in the late 1970s, Township and Village Enterprises (TVEs) in rural areas have absorbed a large number of surplus rural labourers. By 2002, TVEs employed 128 million workers or about half of the surplus labourers. While TVEs have been extremely successful in boosting local economies and creating employment opportunities, the strategy has been devastating ecologically, consuming resources – notably water and coal – very inefficiently and emitting large volumes of wastes. The TVEs account for 50% of industrial air and water pollutant emissions. [34]

In addition, environmental degradation due to unreasonable human activity has brought about more natural disasters such as drought, sandstorms, and flooding. Soil degradation is also affecting agricultural production and grazing in the west and making it difficult for local farmers to shake off poverty.[35]

[27] SEPA, 2001 Environmental Status Report
[28] Chandler et al, 1998
[29] National Bureau of Statistics of China, China Statistical Communique, 2002.
[30] Ibid.
[31] Stockholm Environment Institute, UNDP China, 'China Human Development Report 2002 – Making Green Development A Choice.' Hong Kong: Oxford University Press. 2002.
[32] *China Daily*, '"Go-west" Concerns: Poverty, Ecology', March 10, 2003.
[33] *China Daily*, 'Job Creation Promised for Rural Workers', February 27, 2002.
[34] Stockholm Environment Institute, UNDP China, 'China Human Development Report 2002 – Making Green Development A Choice.' Hong Kong: Oxford University Press. 2002.
[35] Qin Chuan, 'Ecology at risk in west of China, says survey', *China Daily*, July 01, 2002.

Agricultural pollution is a serious problem in rural China as well. The excessive and indiscriminate use of pesticides, chemical fertiliser and agricultural plastic sheeting has caused serious pollution in many places. Inappropriate disposal of animal waste in livestock and poultry breeding farms is also contributing to serious soil and water pollution.[36]

This section has given some indication of the state of the Health of the Nation, in particular the sheer scale of the challenge and China's escalating commitment to clean development. As outlined in *The Priority Programme for China's Agenda 21*[37], the priorities for sustainable development in China are:

- Capacity Building for Sustainable Development
- Sustainable Agriculture
- Cleaner Production and Environmental Protection Industry
- Clean Energy and Transportation
- Conservation and Sustainable Utilisation of Natural Resource
- Environmental Pollution Control
- Combating Poverty and Regional Development
- Population, Health and Human Settlements
- Global Change and Biodiversity Conservation

[36] Zhang Tingting, 'Severe Agricultural Pollution in China', china.org.cn, March 31, 2003.
[37] The Administrative Centre for China's Agenda 21, http://www.acca21.org.cn/indexe8.html

2. China's Environmental Policies and Regulations

2.1. Setting the Framework for Environmental Protection

On December 26, 2001, The State Council approved the *Tenth National Five-Year Plan for Environmental Protection*. The Plan requested local governments and the various departments to strengthen environmental protection in close relation to economic restructuring.[38]

The Plan summed up China's environmental protection performance over the previous five years and put forward objectives and tasks for the period 2001-2005.

The Plan requires that:

1. Discharge quantities for key pollutants such as SO_2, dust, COD, NH3-N, industrial solid waste etc. should be decreased by 10% from 2002 levels;
2. Heavy metals, cyanide, petroleum in industrial wastewater must be effectively controlled;
3. Hazardous wastes are safely disposed of;
4. SO_2 emission in SO_2 and acid rain controlled areas should be reduced by 20% from 2000 levels;
5. Water quality is improved and water pollution prevention objectives are achieved in key fresh water and marine areas;
6. Reducing groundwater pollution trends in cities; meeting water quality standards; and significant improvements in air, surface water and noise quality in large to middle sized cities;
7. Improve safety supervision and management of nuclear and radioactive materials;
8. Prevent damage to the ecological environment caused by human activities;
9. Strengthen environmental protection management in rural areas; and
10. Improve environmental regulation systems, EIA, and environmental training etc.

The Plan also listed the key projects or proposals that integrate environmental protection with economic reform during the "Tenth Five Year" period, including:

- wastewater treatment projects for the "Three Rivers and Three Lakes"
- wastewater treatment projects for Three Gorges
- pollution prevention projects for the south to north water transfer
- the "Green Sea Project" in the Bo Sea
- desulphurisation projects for power plants in SO_2 and acid rain control areas
- the "Green Water and Blue Sky Programme" in Beijing

[38] SEPA, http://www.zhb.gov.cn/english/plan/Tenth.htm, 2002.

- natural conservation area improvements
- central hazardous waste disposal projects
- the establishment of a national monitoring network and environmental innovation, and
- research

2.2. The Laws and Regulations

China has committed to or acceded to over 30 of the 216 international treaties, conventions and agreements ranging from protection of the ozone layer to the conservation of the oceans and seas. Nationally, the Chinese central government has endorsed and promulgated 36 environmental protection laws, and over 120 regulations to support sustainable development. At a regional level, the people's Governments of Provinces have established over 600 local environmental standards, and are responsible for environmental enforcement and detailed implementation of environmental legislation.

Box 1. Current Legislation:

International:

- There are 216 existing international environmental treaties, conventions and agreements covering everything from the protection of the ozone layer to the conservation of the oceans and seas
- China has concluded or acceded to over 30 of the 216 international environmental agreements

National:

- China's environmental statutory framework takes the Constitution of the People's Republic of China as the foundation:

  'ensure the rational use of natural resources and protect rare animals and plants'.
- And the Environmental Protection Law of the People's Republic of China as the main body:

  This law was formulated with the intention of 'protecting the people's environment and the ecological environment, preventing and controlling pollution and other hazards, safeguarding human health and facilitating the development of socialist modernisation'
- On a national level the Chinese central government has endorsed and promulgated 36 environmental protection laws
- The Chinese government has also introduced over 120 regulations to support sustainable development

Regional:

The people's governments of provinces have established over 600 local environmental standards in order to comply with those of the State

2.3. Meeting International Standards of Protection

China has made sustained efforts to develop policies in line with global environmental protection measures. The country has:

- Drawn up a White paper on Environmental Protection (1996) which stipulates that environmental protection will be one of China's basic national policies - formulating the guiding principles of development for economic construction, combining the economic returns with social effects and environmental benefits; promoting international co-operation in the field of environmental protection.
- Established the China Council for International Co-operation on Environment and Development in 1992, a non-governmental advisory body with the purpose "to further strengthen co-operation and exchange between China and the international community in the field of environment and development."
- Become a member state of the UN Environment Programme (UNEP)
- Joined UNEP's "Global Environment Monitoring System", "International Registry of Potentially Toxic Chemicals" and the "International Environmental Information System Group".
- Joined the UN Committee on Sustainable Development[39].

Carrier Corporation, the world's largest manufacturer of heating, air conditioning and refrigeration systems, and the State Environmental Protection Administration of China have launched China's Stratospheric Ozone Protection Award. Carrier is providing sponsorship for three years in an effort to accelerate progress on ozone layer protection. The US EPA recently recognised Carrier (and its parent company United Technologies Corporation) as the first HVAC manufacturer to participate in the EPA's Climate Leaders programme. *http://www.greenbiz.com/news/news_third.cfm?NewsID=25298*

Environmentalists often contend that multinationals create pollution havens by relocating polluting enterprises to countries in which the regulatory system is under-developed and less stringent. Yet China's policies suggest that foreign businesses must operate within environmental laws which are aligning to international standards. Nevertheless, effective enforcement of international agreements and environmental regulations is still a matter of concern. Financial constraints remain prominent, and diverse competing interests along with technological barriers have also hindered progress.

Box 2. Protecting the Ozone Layer: The Cost of Compliance

The Montreal Protocol on Substances that Deplete the Ozone Layer is an international agreement designed to protect the stratospheric ozone layer. The Protocol stipulates that the production and consumption of compounds that deplete ozone in the stratosphere - chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform - are to be phased out.

Addressing the problem of stratospheric ozone depletion is proving to be relatively straightforward, by simply replacing those chemicals which have been causing the problem with alternatives. However, after halon and CFC production stopped in all countries at the end of 1995, China had become the world's largest producer and consumer of CFC's and halons. Furthermore, environmental regulations at the time of ratifying the Montreal Protocol in China (e.g. the Law of Air Pollution Prevention and Control) did not include requirements for ODS (Ozone Depleting Substances) control or any specifications to control direct foreign investment in ozone depleting substance production.

[39] Sustainable Development and Economic Co-operation - Permanent Mission of the People's Republic of China, http://www.china-un.org/eng/c2916.html

The Chinese Government consequently established an Environmental Group for Ozone Layer Protection. More than 40 policies and regulations have now been implemented in China to control the production, consumption, import and export of ODS. Nevertheless, despite the establishment of the 'Montreal Protocol Multilateral Fund', China has experienced difficulties in implementing the Montreal Protocol due to financial constraints and technical difficulties. China is still dependant on imports of ODS substitutes.

Source: International Institute for Sustainable Development (IISD)

2.4. Managing the Conflicts in Compliance with Supra-National Policies

Implementation and enforcement of environmental regulations and international agreements are often made difficult due to the sheer volume and complexity of associated obligations and responsibilities. There is also the problem of inconsistency in implementing regimes between member states.

A common problem is the relationship between trade rules and multilateral environmental agreements

The WTO's overriding objective is to help trade flow 'smoothly, freely, fairly and predictably.'[40] Even though environmental treaties have taken years to negotiate and several multilateral environmental agreements include provisions that can prohibit trade, WTO rules can, at times, be used to revoke environmental enforcement measures because they violate free trade principles. For example, the Basel Convention was set up to prevent disposal of waste in non-OECD countries, but some contend that if the "waste" has a value and is being recycled, then it is not waste under Basel. The example below highlights how scrapping ships and electronics recycling can be seen as commercial activities and therefore follow WTO rules, not restricted under the Basel convention, despite the fact that a significant environmental issue – transboundary transfer of toxic wastes – is involved.

Box 3. Toxic Boat to China

WTO members are obliged to observe the most-favoured nation for trade, and to eliminate quantitative restrictions. These two sets of obligations may in some circumstances be in direct conflict with the obligations of multilateral environmental agreements which restrict trade, violating the underlying principles of the WTO.

For example, the Basel Convention (1989) initiated by the UN Environmental Programme, aims to minimise the generation and regulate the transboundary movement of hazardous waste. This prohibits the export of hazardous waste, including recycling, from OECD-countries to non-OECD-countries. Every country is responsible for its own waste under the Basel Convention. China specifically imposed a strict ban on the import of hazardous waste to its territory during April 1996. However, it is evident that the obligations of the WTO are overriding the obligations of the Basel Convention.

China is a major shipbuilding and shipbreaking nation, providing financial benefits, jobs and valuable raw materials. China is one of the most favoured nations for trade in ships-for-scrap, therefore supporting the WTO obligations. However, the export of toxic ships-for-scrap from OECD countries (the main fleet owners) to non-OECD countries like China constitutes a violation of the Basel Convention. According to the Basel Action Network (BAN), around 700 ships are scrapped each year many of which are scrapped

[40] Underlying principles of the World Trade Organisation, http://www.wto.org

in China. This example clearly highlights that WTO rules can be used to revoke environmental enforcement measures.

In addition to this, BAN together with the Silicon Valley Toxics Coalition and other Asian environmental groups released evidence during February 2002 that showed that the United States government, allows the exportation of hazardous electronic waste to countries like China with no controls whatsoever.

Source: Basel Action Network (BAN); http://www.ban.org/

2.5. National Law Enforcement

Box 4. Access to Information

In 2000, the environmental protection department of Tianjin, Jiangsu Province, opened up their information systems to help local businesses and other groups understand more about environmental law, who they could contact for advice, details of fining systems and approval criteria. The initiative has been so successful that SEPA has opened the system to a total of 13 provinces, 252 cities and more than 1400 counties across China.

China Daily 31.10.2002

In recent years, China's environmental legislation has been overhauled with many new regulations and technical standards. Essentially the regulatory framework is comprehensive and approaching international standards, yet because it is incomplete, inconsistencies from one region to the next arise. Regulatory enforcement is consistent in economically well-developed areas that have received significant foreign investment, such as Shanghai, Beijing and Tianjin municipalities and Guangdong, Zhejiang, and Jiangsu Provinces.

However, outside of these areas regulatory enforcement and environmental performance is often inconsistent. Whilst this might seem attractive to an investor in the short-term, choosing a location with lax standards may just be delaying environmental investment or even creating environmental liabilities when that area is forced to clean up in the future.

Strict local regulations such as those in Shanghai are not necessarily a bad omen for international investors, rather they may represent a more sophisticated and predictable regulatory setting eliminating the likelihood of costly future emission liabilities or massive new capital expenditure for compliance.

Box 5. Law Passed on Environmental Impact Assessment

Recognising that prevention is better than cure, government departments are now required by law, passed in November 2002, to consider environmental impacts in drafting and implementing plans and programmes.

It is too early yet to see how effectively this new law is being interpreted and applied.

The State Environmental Protection Administration (SEPA), formerly the National Environmental Protection Agency (NEPA), was approved by the State Council and made official on 7 July, 1998. In addition to SEPA, almost every province, city, or county in China funds its own Environmental Protection Bureau (EPB).

Local EPBs are responsible for the routine inspection of sites, including issuing waste discharge permits, checking the discharge compliance status, reviewing waste registration, transmitting regulatory information, and allocating waste mass loading targets and so on. The Environmental Monitoring Station (EMS), a subsidiary of EPB, is responsible for environmental monitoring. The monitoring data is used as evidence for the EPB to verify the discharge status of facilities. If there is a difference between the data and the registration or the data shows surplus discharge; fines and surplus fees will be charged by the EPB.

Local EPBs supplement their funding through the fines they collect from polluting entities. This can result in conflicts of interest as more funds can be generated by allowing pollution than stopping it. Whether it is for this reason, or the low level of fines or the general lack of enforcement, in some provinces polluters are not being deterred. See more about this issue in Box 6 below. However some EPB's have begun to help companies understand more about pollution abatement technologies to shift the emphasis from paying fines to making these capital improvements.

Polluting the environment is now an offence under national criminal law

In practice, the judiciary bodies infrequently enforce penalties because the judicial administrators have a great deal of difficulty in measuring the penalties against the requirements of the Criminal Law. Initially, the Criminal Law of the People's Republic of China, issued in 1979, did not contain provisions concerning environmental crimes. In a bid to strengthen the protection of the environment and penalise those individuals or organisations seriously polluting and damaging the environment, environmental laws in China were changed. Regulation on paying fines for environmental crimes came into effect on April 1, 1996.

There are now specific titles in the *Constitution of People's Republic of China* and *PRC Criminal Law* to strengthen the enforcement of environmental legislation by disciplinary sanction, civil liability, and even criminal liability. Disciplinary sanctions come in the form of a warning, a fine, a requirement to install environmental protection equipment, or a requirement to terminate operations. The severity of the sanction ordered by SEPA or local EPBs depends on the severity of the violation and the credibility of the local EPB in administering sanctions effectively. Criminal liability can also be passed on to the legal representative of an enterprise if the polluting activity caused severe damage to property, health, or interests of the state or citizens. In these cases, the individual person deemed responsible will be prosecuted. Civil liability also exists, and is aimed at activities that may result in civil dispute, i.e., noise exposure. Generally, the dispute may be settled by financial compensation.

Box 6. EPB's struggle for Local Government support.

Zhenjiang, for example, is an industrial city, with a population of approximately 3 million people. The city is directly under the leadership of the Jiangsu provincial government and like most cities in China is affected by environmental pollution. The Zhenjiang Environmental Protection Bureau (ZEPB) is legally responsible for enforcing environmental regulations. Although the Zhenjiang EPB is in a position to assess and determine the pollution levy that must be paid by each individual polluter, it lacks all necessary power to fully enforce the policies uniformly and collect the levy it has assessed. As a result, many polluters can effectively avoid paying charges, fines or other penalties[41].

Most EPB's, with the ZEPB being no exception, are totally dependent on local governments. According to the China International Centre For Economic and Technical Exchanges (CICETE), this seems to be a 'fundamental structural impediment to consistent enforcement of environmental policy as these governments continue at times to pressure them to ease regulations in the interest of economic concerns.' The CICETE also identifies that 'sources of funding for environmental protection are still inadequate. Even solutions aimed at overcoming financial shortages and dependence on local government (e.g., through the generation of outside funds) do not necessarily free environmental protection agencies from dominance by local economic interests.'[42]

[41] Development Research Group, The World Bank, 'Incomplete Enforcement of Pollution Regulation: Bargaining Power of Chinese Factories', 2001.

[42] China International Centre For Economic and Technical Exchanges (CICETE), 'Urban air pollution control in China; A Sector Review Report', 2002.

2.6. International Comparison of Legal and Administrative Frameworks

Box 7. International Comparison of Legal and Administrative Frameworks	
US, Japan and Germany	**China**
Strong legal foundation with independent judiciary and/or administrative appeals system.	Legal foundation; however the law courts are not yet playing an active role in adjudicating environmental disputes.
Strong command and control system, which usually incorporates a permitting system. Financial incentives (levies, fines) are applied effectively.	A basic command and control system is in place, but enforcement is generally weak and uneven. A pollution levy fee is in place, although it is not yet high enough to be fully effective. Also, the system creates a paradoxical situation as local EPBs rely on this income for their funding and therefore have no incentive to encourage lower pollution discharges.
INCENTIVES	
Market instruments (offsets, tradable permits) are coming into effect. For example, the Chicago Climate Exchange in the US will commence trading in October, and the European Emissions Trading Scheme in 2005.	Market instruments have started to be applied on a limited pilot scale. For example there are seven pilot emissions trading platforms in place in Chinese cities to reduce SOx. There are developed discussions underway regarding a tradeable emissions scheme for the Pearl River Delta, including Hong Kong and potentially Macau, to cover SOx, NOx and particulate matter.
Strong public demand for a cleaner environment provides positive reinforcement for environmental agencies.	Although public demand for a cleaner environment exists, it is currently restricted to developed urban areas, mostly in eastern China, due to lack of awareness of environmental rights in rural areas.
Public participation in the legislative and administrative process.	Little public participation, although it is growing.
Voluntary programmes are often precursors to laws.	Early introduction of voluntary programmes, but without strong incentives, participation is limited.
RESULTS	
Substantial environmental protection budgets.	Growing budgets for environmental protection, particularly in economically developed municipalities.
Massive clean up over the last 25 years.	EPBs are holding ground against industrial pollution, but are not getting ahead of it.
Source: Robert Hansor, ERM Shanghai, adapted by ASrIA	

3. Environmental Management Standards in Industry

Voluntary mechanisms to encourage best practice are becoming more prominent in China. These include the Environmental Management System ISO 14001 and Environmental Labelling.

3.1. Environmental Management System ISO 14001

The ISO 14000 series, set by the International Standards Organisation (ISO), focuses on encouraging corporations and organisations to establish a management system that protects the environment.

ISO 14001- authenticity of the registration procedure is critical

ISO 14001 certification procedures, which require external verification, were introduced into China in 1997 by SEPA's Office of Environmental Management System. [43] The China Steering Committee for Environmental Management System Certification was established under SEPA with two operating arms – the China Accreditation Committee for Environmental Management System Certification Bodies and the Environment Management Committee of China Registration Board of Auditors.

During the first year, 27 enterprises received ISO 14001 certification. From the end of 2001 to mid 2003, the number of certified Chinese enterprises increased from 1085 to a total of 5000.[44, 45] This is more than expected given the perceived cost barrier to implement the standard.

China has also set up several national ISO14000 demonstration zones, including the Suzhou New District in East China's Jiangsu Province and the Dalian Economic and Technological Development Zone in Northeast China's Liaoning Province.

ISO 14001 standards play an important role in improving compliance with domestic environmental law and policies and helping Chinese export industries, particularly medium and large enterprises, to deal with environmental challenges in foreign markets.

However, there has been criticism over the authenticity of the registration procedure and the actual commitment from businesses towards continual environmental improvement. If this continues, it will de-value the credibility of ISO14001. International customers are already beginning to demand more than ISO14001 for environmental management before they will do business. They are also looking for transparent verification processes.

3.2. Environmental Labeling

China's Environmental Label encourages the purchasing of domestic goods with low environmental impact. This use of market forces supplements mandatory environmental laws. The National Environmental Labelling Programme was

[43] Worldbank, China, Air, 'Land and Water – Priorities for a New Millennium', 2001
[44] The People's Republic of China National Report on Sustainable Development, 2002
[45] Jie Zhen Hua, SEPA, http://www.sepa.gov.cn/64909668945756160 0/20030707/1039388.shtml, July 5, 2003.

founded in 1993 and was partly encouraged by local business initiatives that had started to design their own environmental programmes or logos.

China Environmental Label

China's Certification Committee for Environmental Labelling Products (CCEL) was established in May 1994 and marked the official launch of China's environmental labelling. CCEL, authorised by China State Bureau of Technology Supervision (CSBTS), is the third party certification agency representing the Government to deal with environmental labelling certification as well as to administer and supervise the environmental labelling programme in China.[46]

SEPA has developed a set of technical criteria for each product category. Each product has to be independently assessed by undertaking on-site inspection and sample product testing, and the test results are subjected to review and approval by the secretariat of CCEL. Since 1994, assessments have been conducted for 305 enterprises, and 1,274 products have been awarded the environmental label.[47]

Environmental Labels help consumers to make informed decisions in choosing products with good environmental performance. As more products with Environmental Labels enter the market, Environmental Labels will play a more important role in raising public awareness and setting higher environmental standards in consumer products.

[46] International Institute for Sustainable Development, Canada and Information Institute, National Environmental Protection Agency, China, 'Ecolabelling: Its Implications for China', http://www.iisd.org/pdf/EcoChina.pdf, 1996.
[47] Green Council, 'China Environmental Labelling Scheme', http://www.greencouncil.org/web/green_label_scheme_china.php, 2003.

4. Green Initiatives and Pilot Projects

Well-implemented pilot projects can catalyse change on a larger scale. The green initiatives and pilot projects discussed in this section show China's determination to foster sustainable economic development.

4.1. Cleaner Production

'End of Pipe' thinking, focusing on pollution control will always be a costly approach to environmental protection and more often ends up being 'too little and too late'. Cleaner Production with *Integrated Design,* where toxics and pollutants are designed out of the production process or reduced to a minimum, is the only way that China can create an economy which benefits all and functions within the nation's ecological footprint.

Box 8. China's Emerging Eco-tech Industry

Since 1999, more than 4.7 billion yuan (US$575M) has been invested in the technical upgrading of Chinese producers of environmental protection equipment. Of the total, 840 million yuan (US$101M) came from treasury bonds allocated by the government, the rest was contributed by the companies themselves or local governments. More than 100 Chinese companies across the country have benefited from such projects, designed to help Chinese companies introduce and master foreign advanced techniques to upgrade their production capacity. It is estimated that the annual output of China's environmental equipment industry will reach more than 4 billion yuan (US$484M) by 2005 increasing from just over 1 billion yuan (US$120M) currently.

Source: China Daily, HK Edition 30.10.2002

In 1999, ten cities and five industrial sectors were identified as national demonstration sites for cleaner production. The cities are Beijing, Shanghai, Tianjin, Chongqing, Shenyang, Taiyuan, Jinan, Kunming, Lanzhou, and Fuyang. The sectors include petrochemical industry, metallurgical industry, chemical industry, light industry (pulp and paper, fermentation and beer-brewery), and ship building industry.[48] According to statistics from over 200 enterprises which participated in the pilot study for cleaner production, the economic benefit was more than 500 million yuan with a reduction of over 20% of the main pollutants.[49]

The China National Cleaner Production Centre (CNCPC) was established in 1994 by SEPA within the Chinese Research Academy of Environmental Sciences (CRAES) with assistance from UNEP/UNIDO National Cleaner Production Centre programme. CNCPC acts as a technical supporting institution on cleaner production for SEPA and is guiding local EPBs to develop their cleaner production programmes. CNCPC hosts a China Cleaner Production Portal - http://www.ccpp.org.cn to promote Cleaner Production policies and standards and to raise public awareness on Cleaner Production.

The State Economic and Trade Commission (SETC) has also developed a website "Cleaner Production in China" – http://www.chinacp.com which provides comprehensive information and case studies on Cleaner Production.

The challenge remains in implementing Cleaner Production on a wider scale, setting up a good mechanism for product and by-product recycling and tracking the environmental performance of industries.

[48] Qian Yi, 'Technological Innovation and Industrial Revolution for Sustainable Development in China', World Federation of Engineering Organisations. 2002.
[49] The People's Republic of China National Report on Sustainable Development, 2002.

4.2. Eco-Industrial Park

Eco-Industrial Parks (EIP) are industrial zones designed around materials and energy exchanges between enterprises to minimise overall energy and raw materials use and waste discharge. They can be considered as the application of cleaner production principles to a group of industries as a whole.[50]

Launched in March 2003, the Nanhai National Demonstration Eco-industrial Park is the first national EIP in China. It aims to be a model for eco-economic development in China. Located in Foshan City of Guangdong province, the park covers 333 hectares and has had 26.5 billion yuan (US $3.19Bn) of investment. 56 enterprises from the US, Canada, Japan, Hong Kong and Taiwan have already signed up and a total of 29 projects have been completed or are being built.[51] The construction of the Nanhai EIP is guided by the theories of cycling economy and industrial ecology and is focused on the environmental protection industry.[52]

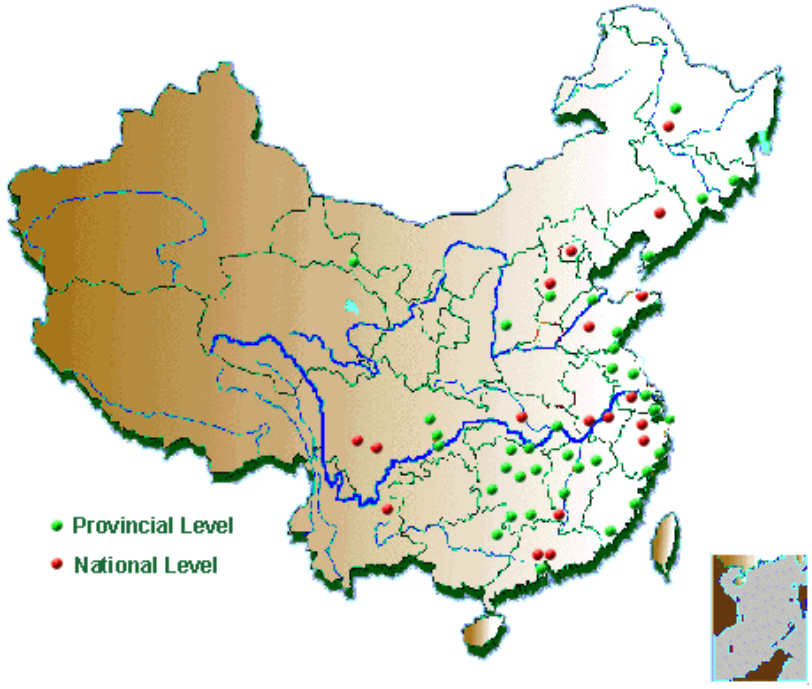
The Guigang EIP is another example. Established by the Guitang Group, a state-owned enterprise that operates the largest sugar refinery in China, the EIP includes an alcohol plant, a pulp and paper plant, a toilet paper plant, a calcium carbonate plant, a cement plant, a power plant and other affiliated units. The goal of the initiative is to reduce pollution and disposal costs and to seek more revenues by utilising by-products.[53]

Though still at a very early stage, EIPs are one way to demonstrate how ecological principles can be applied in industrial development. So far they have met with varying degrees of success and some are little more than a front for regular property developments. What is already clear is that greater environmental transparency and cooperation among industries in the supply chain/web is crucial to their success.

4.3. Experimental Sustainable Communities

Established after the Earth Summit on Environment and Development in 1992**,** China had 45 Sustainable Communities at the national level and 70 at the provincial and municipal level by 2003.[54] These communities are the core of China's Local Agenda 21 programme and are at the forefront of researching new ways of aligning environmental, social and economic priorities.

[50] Qian Yi, 2002.
[51] *Xinhuanet*, 'Environmental-friendly industrial park launched in S. China', March 30, 2003.
[52] Nanhai National Demonstration Eco-industrial Park, http://www.epvalley.com/english/introduction.htm, 2003
[53] Qian Yi, 2002.
[54] The Administrative Centre for China's Agenda 21. http://www.acca21.org.cn/local/news/20030502.html



The main objective of the experimental sustainable communities is to develop new mechanisms which will benefit economic development while keeping in harmony with social development and environmental protection; to improve the relationship between human beings and nature by increasing people's awareness of new concepts and improving their capabilities; and to "control population growth, expand job availability, improve the social security system, protect the environment; and in this way to promote social prosperity through fair, secure, civilised and healthy development."[55]

4.4. The 2008 Beijing Olympics

"*Major sporting events are a form of much sought after global endorsement. Sporting events are in themselves like corporate institutions whose organisers have to take regard as to whether or not they are being complicit in the support of behaviour which society judges to be unacceptable, and engage in dialogue around these issues*."[56]

The hosting of the 2008 Olympic Games in Beijing is the trigger for one of China's largest development projects. The government anticipates that the combination of Olympics related fixed-asset investment and foreign direct investment will add 0.3 to 0.4 percentage points to China's annual GDP growth in the six-and-a-half years leading up to the event[57].

In addition to successful completion of the project, the challenge is whether the Olympics will make Beijing, the capital of the People's Republic of China, a sustainable city. Such a role model is badly needed for the rest of the country, and also as an example for other countries in the region.

[55] The Administrative Centre for China's Agenda 21, http://www.acca21.org.cn/indexe11.html.
[56] Robert Davies, Chief Executive, The Prince of Wales International Business Leaders Forum, 'Towards a Better World', World Sports Forum, Lausanne, September 23, 2002.
[57] Andrew Ness, 'Blue Skies for the Beijing Olympics', *The China Business Review*, April 2002.

Beijing is a sprawling municipality. It is the 10th largest city in the world where 13 million people live on 16,800 square kilometers of land[58]. To prepare for the Olympics, Beijing plans to spend much of the 147.8 billion yuan (USD 12.2 billion – the total pool of capital allocated to development for the Olympics)[59] on infrastructure and environmental projects. While some of the projects are continuations of city improvements that have been planned for years, others are entirely new. Environmental and sports experts from the International Olympic Committee, including experts from the Sydney Olympic committee and the Environmental Programme of the United Nations, have been advising the Beijing committee on sustainable sporting practices[60].

Beijing's intention to be a world class 'pollution free' city is guided by the Government's *Air Pollution Prevention Programme.* This focuses on the renovation of coal burning boilers, eliminating old vehicles, cutting down industrial air emissions, moving enterprises with heavy pollution, and afforestation projects. These measures will do a great deal to improve air quality. They are not sufficient in themselves for making Beijing a sustainable city. The following analysis points to additional challenges.

Too much rubber hits the road. By 2000, the number of cars in the city reached 1.57 million[61]. Vehicle emissions are so much of a concern that the Public Security Bureau's (PSB) Communication Department will no longer issue licenses to drivers who possess a car exceeding certain pollution limits[62]. Although the Government is trying to reduce air pollution emissions, it is the sheer volume of cars which is the problem. Numbers are reportedly already similar to the levels of cars used in the U.S. during the late 1960s and early 1970s. The Government plans to raise public awareness by encouraging green consumption and involvement in activities aimed at improving the city's environment. Beijing plans to have an extensive, highly efficient and co-ordinated transport network in place by 2008. There are more than 20,000 buses and 67,000 taxis currently operating in Beijing. According to the Beijing Olympics organisers, by 2007, 90% of the buses and 70% of the taxis will use natural gas and old, inefficient cars will be taken off the road. Nonetheless the car numbers challenge still remains.

Shifting the smoke zone. Beijing is also a major industrial area, home to textile mills, iron- and steelworks, chemical plants and heavy manufacturing industries which all contribute to anthropogenic emissions.

Part of Beijing's Tenth Five-year Action Plan (2001-2005) for environmental protection[63] involves meeting World Health Organisation standards on SO2, NOx and Carbon Particulate emissions. The aim is for Beijing to reach similar air quality standards to other major cities in developed countries. In order to achieve this, Beijing will restructure its industry, calling for the relocation of 200

[58] Worldbank, 'China, Air, Land and Water – Priorities for a New Millennium', 2001
[59] New Beijing, Official Olympic Games Website - http://www.beijing-olympic.org.cn/eolympic/xbj/lsbj/lsbj.htm
[60] Ibid.
[61] Ibid
[62] New Regulations and Standards, Environmental Health and Safety Review, ERM China, 2001
[63] Ibid

factories, including moving 20 of the heaviest polluters to sites outside the city[64]. Under the plan, enterprises that are relocated to the suburbs will receive compensation from land transfer so they can afford technological transformation. All key enterprises will be required to practice clean production and are being encouraged to adopt ISO14001 environment management systems. Procedures for independent verification of these systems have yet to be established.

Concerns have been expressed that simply relocating the 20 worst polluting industries to the suburbs is not addressing the real pollution problem. It remains to be seen how close to a zero emissions policy these facilities manage to achieve.

Building the New. Beijing is also developing some 25 million m^2 of property including the business district, sports venues, commercial malls, high-rise dwellings and hotels. It is part of Beijing's objective to develop the city whilst protecting the city's eco-system and historical relics. However, 'old and dangerous' housing, including many of Beijing's historic courtyard houses are being demolished to make way for the new developments[65]. Many people are being displaced to the suburbs with inadequate compensation[66] and the cost of new housing is likely to rise making it harder for people to return to the inner city once the Olympics are over.

In addition to this concern over property rights, the big question for the new build is whether it is being designed with environmental and health objectives in mind. There are critical questions to be asked about infrastructure planning, for example, whether mass transportation or car use dominate designs, and also about the nature of the buildings themselves. Will developers draw on the latest in sustainable architecture such as energy self-sufficiency, or use of natural lighting and ventilation systems? Or will they repeat the mistakes of the past and construct buildings with high energy maintenance costs, where inhabitants are more vulnerable to problems such as sick building syndrome? The experience of the SARS outbreak this year underlines the disbenefits and health threats of low quality buildings and poor design.

[64] Ibid

[65] Planners should look to the commercial successes of restoring historic districts in other cities such as Shanghai and London.

[66] *LatelineNews*, 'Hundreds protest bulldozing of old Beijing homes', April 26, 2002. http://latelinenews.com/ll/english/1206856.shtml

5. The agenda for investors who want to support Sustainable China

5.1 Making Economic Development Sustainable: The Challenges

Are international standards for environmental regulation the answer?

In much of the commentary about sustainable development, there is an implicit assumption that so long as China rapidly escalates to international standards of law and enforcement, then all will be well. There can be no doubt that effective enforcement of environmental controls in industrial production will feed directly and positively to the bottom line of the country's pollution tally. However a cursory glance at the relative successes (or not) of OECD countries to transform to sustainable economies suggests that other policies are also required.

China and other emerging economies enter the industrialisation process at a very different time in history. Due to issues of information, technology and global understanding, it is possible to tackle 'natural capital management' in many new ways. For example, information technology has revolutionised mobility needs – it is no longer necessary to have the car as an engine of economic growth and for China to continue along this route is a recipe for devastating pollution, increasing economic cost and dysfunctionality.

No country anywhere can yet be called 'developed' from a sustainability point of view…

China's regulators and business leaders still have a choice. This will not always be the case as the momentum given to economic priorities can become unstoppable, ruling out consumer choice and other options. Do China's business and provincial leaders want the country to be a 'catch-up' economy, simply copying the formula of western industrialised countries and ending up with the same problems and costs? The Chinese leadership makes it very clear this is not their intention despite the development pressures faced. Can the country build on the steps it has already taken and aggressively pursue a modern, sustainable economy path, setting the pace globally?

Policy Emphasis?	
▲ ***Sustainable Success***	▼ ***Sustainable Disaster***
Energy Infrastructure Flexible grid network [67] allowing for many 'clean' energy IPPs; focus on demand-side management and storage as well as supply.	Inflexible centralised grid system; large-scale fossil fuel and nuclear power generation.
Built Environment People-centred planning; emphasis on zero energy building stock, use of building materials with low environmental impact, integrated solar electric design in all types of construction; integrated and ecological management of water and waste, urban gardening.	Car-centred planning; 'business as usual' approach to construction and urban development.
Mobility Infrastructure[68] Mass transit; healthy mobility (bicycling, walking etc); information highways; restrictions and penalties on road vehicle use.	Highway construction; suburbs and urban design which creates car dependency; digital divide.

[67] http://www.energyfuturecoalition.org/about/work_groups/smart_grid/index.shtm
[68] See Appendix III

Consumer Goods: microproduction, recyclability, non-toxic	Disposable, non-reusable, resource intensive
Food and Water Sustainable agriculture; focus on improving local production and distribution to increase nutrition for China's poor; strict controls on national and multi-national food companies with lax policies on sustainable agriculture, animal welfare and nutrition; water catchment protection.	Continuing use of farming techniques which reduce biodiversity and increase pollution; profligate water use and pollution.
People Participation: Participation, accountability, per capita allowances.	Increasing wealth gap, lack of information, disenfranchised.

The role of SRI must surely be to support China and all emerging economies on their path to sustainable success. In addition to supporting measures such as those listed above, this also requires a focus on *international integration and sharing of best practice* and common values. Exchange programmes, focussed on these issues, between companies and investors will greatly assist understanding and effective action.

5.2. Issues for Investors

Legislation and basic infrastructure is already in place at multi-levels to encourage economic growth with reduced environmental impacts

Significant effort, especially in recent years, has been made by the People's Republic to ensure that appropriate infrastructure is in place to control pollution. This is a first essential step to integrating natural capital management with economic growth. However, enforcement of legislation is weak and plagued with conflicts of interest and inconsistencies. Companies that ignore the legal regime or bypass it will likely lose in the longer term once stricter enforcement procedures are inevitably established triggering environmental liabilities and other longer term impacts.

International companies and investors can have a significant, positive impact. They can encourage best practice and adherence to appropriate standards given that the framework is already largely in place

Economies can grow at rapid levels with greatly reduced environmental impacts when market mechanisms are also employed. The Clean Development Mechanism and emissions trading schemes are ways of fostering this. Investors should realise that as these schemes take effect, they are likely to have increasing material significance especially for some companies.

As stated at the start of this report, these recommendations focus on the environmental dimension of sustainability. Further work is required to define the social dimension to sustainable investment in China. ASrIA's report 'Labour Standards in China' provides some initial guidance on these matters.

The most effective ways for investors to support environmentally sustainable business enterprise in China are:

- Consider developing an ***Environmental Code of Conduct*** for investments in China which reinforces the effectiveness of Government programmes focused on environmental management systems, on emissions

compliance, on eco-labelling, on cleaner production and on environmental accounting. If there is sufficient interest in this proposal, ASrIA is willing to work with investors and investee companies to develop such a Code.

- Encourage companies to adopt environmental management systems such as ISO14001 and to provide independent verification of their records. Actions such as environmental training programmes for staff or championing of environmental performance from senior management should be encouraged.
- Encourage greater environmental performance transparency by companies and their suppliers through environmental reporting. Standards such as those defined by the Global Reporting Initiative should be considered.
- Use the opportunity of the Beijing Olympics to push developers towards green buildings and sustainable urban design.
- Encourage the Government to foster the growth of SRI practice and corporate sustainability through measures such as Stock Exchange listing requirements.
- Support the development of benchmarks such as Sustainability Market Indices and case studies of best practice, for example in Cleaner Production, to demonstrate new management techniques and provide quantitative evidence of the commercial benefits of natural capital management.
- Support projects which foster business (and public) understanding of sustainable enterprise, global best practice and the transition strategies required for key industries.
- Support local capacity building for sustainable investment practice.
- Support supply chain measures to raise environmental standards in domestic production, especially in China's less developed areas.
- Investors must also develop wider investment capabilities, for example, their capacity to support sustainable venture finance and microfinance. Solutions for sustainability require more than stock market investment.

The tables which follow provide additional guidance to investors who wish to support China's environmentally sustainable economic development. They build on the recommendations from the World Bank's landmark report *Clear Water, Blue Skies: China's Environment in the New Century*, 1997. Please note that not all the recommendations listed by the World Bank might be supported by social investors.

ENERGY **Summary of World Bank policy recommendations**[69] **Harnessing markets**	
Short term	**Medium term**
Encourage more efficient use, remove remaining controls on coal prices and begin phasing out planned coal allocation. Encourage shipment of high-quality coal, phase out coal transport subsidies and reduce the administrative allocation of railway capacity. Develop alternative to coal, establish a transparent pricing framework for oil and gas and ease entry to all parts of the oil and gas industry for domestic as well as foreign investors. Spur clean fuel use, reduce price discrimination and increase market allocation of natural gas, and allow prices to reflect consumers' willingness to pay. Allow for full cost recovery, remove subsidies for coal, gas, and district heating and adjust tariffs. Internalise health costs, introduce a pollution tax based on sulphur and ash content of coal in experimental provinces. Apply "polluter pays" principle to car use by increasing gasoline and diesel taxes.	Complete phase out of coal-based plants. Establish a rational pricing framework for coal transport and distribution services. Fully deregulate natural gas production and supply to encourage wider use of natural gas in residential as well as industrial applications. Generalise sulphur tax based on experiment. Complete increase in gasoline and diesel taxes, possibly to levels approximating those in Japan and the Republic of Korea.
Summary of World Bank policy recommendations[63] **Harnessing growth**	
Remove obstacles to commercial investment, particularly from nonstate firms, in coal washing. Set emission standards for small coal-fired power units at the same levels as for 200 megawatt units and tighten enforcement through factory certification and onsite inspection. Increase natural gas supply by developing domestic reserves and investing in infrastructure for importing piped natural gas and liquefied natural gas. Begin to phase out coal-based fertiliser plants by importing fertilisers, investing in natural gas – or petroleum-based plants, and removing incentives for building and operating coal-based plants. Increase investment in research and development for clean coal technologies and their commercial application.	Complete phaseout of coal-based fertiliser plants Increase investment in research and development for renewable energy sources and their commercial application.
SRI Action	
It is estimated that China's power sector will need almost US$315billion in capital expenditure to meet expansion plans, between 2000-2010. China assumes that 20% of this will be provided by foreign funds, amounting to an annual flow of US$4.2billion in foreign investment between 2000-2015 [70] *. This presents an unprecedented opportunity to influence the shape of China's energy industry.* Social investors should ask companies, domestic and foreign: * About their energy intensity.. push for greater efficiencies per unit of production. * To disclose their greenhouse gas emissions and plans to reduce these. Ask energy companies about their plans for building renewable energy capacity and push for extended programmes. Challenge continued investment in coal (and oil) infrastructure and where this is necessary push for clean coal technology. Support companies in the renewable energy industry, and those	Consider collective action and submitting shareholder resolutions if companies do not improve performance on emissions reductions and energy efficiency. Cease investments in fossil-fuel burning (especially coal and oil). Support R&D and transition/phase out strategies for coal and oil industry in fixed carbon products and technology.

[69] World Bank, 'Clear Water, Blue Skies: China's Environment in the New Century', 1997.
[70] Chandler et al, 1998

providing energy efficiency technology and power storage.	

INDUSTRY AND URBAN TRANSPORTATION **Summary of World Bank policy recommendations[63]** **Harnessing markets**	
Short term	*Medium term*
To control sulphur in acid rain regions, implement sulphur emission levies for large point sources (such as power plants) and allow adjustment of electricity prices. To increase abatement, redesign pollution levies based on volumes of discharges (rather than concentrations). To induce abatement levels in line with regional pollution control goals, raise pollution levies. To reflect the real cost of automobile transport, apply infrastructure charge to car ownership through sales and licensing taxes.	Establish tradable sulphur emission permits for medium-size and large coal users in acid rain regions. Develop tolls, parking fees, and other mechanisms to price car infrastructure use in heavy-traffic urban areas.
Summary of World Bank policy recommendations[63] **Harnessing growth**	
Strengthen programmes to promote high-quality and high efficiency pollution control equipment, especially for particulate control and wastewater treatment. Formulate a public transit-based urban transport investment strategy and create incentives for private participation in the construction and operation of public transit systems. Establish general framework for financing long-term municipal investments, including water and public transport, through bonds and build-operate transfer (BOT) schemes. Investments should be limited to creditworthy municipalities with comprehensive public transit strategies.	Implement public transit-based urban transport plans. Expand municipal government access to the domestic bond market based on creditworthiness.
SRI Action	
Promote environmental management and ISO14000 standards. Encourage companies to set targets to reduce emissions and wastes, design out toxics and use raw materials more efficiently. Support alternatives to the car economy: invest in mass transit, IT and telecommunications. Support property developers who design sustainable urban infrastructure and buildings, and encourage all developers to do so. Look favourably on companies participating in eco-industrial parks. Challenge over dependency by companies in road-based logistics.	Consider collective action and submitting shareholder resolutions if companies do not improve their environmental performance. Make provision to invest in municipal bonds, financing the construction of sustainable infrastructure. Cease investments in property developers who do not design sustainable infrastructure and buildings. Consider limitations and strict guidelines on investments in the auto-industry and highway construction.

WATER **Summary of World Bank policy recommendations[63]** **Harnessing markets**	
Short term	*Medium term*
To reflect the marginal cost of supply, increase water prices, especially for industrial and commercial users, with compensatory measures for low-income households.	Adjust prices to encourage water conservation.

To protect water resources from overexploitation, introduce regulations on a raw water extraction tax. To match the costs of self-supply with municipal water supply, raise fees for self-extraction. To cover the full costs of construction and operation, increase sewerage charges and wastewater treatment fees. To improve collections, integrate collection of water and sewerage tariffs.	
Summary of World Bank policy recommendations Harnessing Growth	
Increase investment in water supply and sewerage systems in both rural and urban areas to meet basic drinking and sanitary needs. Provide technical and financial assistance to disseminate water-saving technologies for agriculture and industries.	
SRI Action	
Promote environmental management and ISO14000 standards. Encourage companies to set targets to use water more efficiently and reduce water pollution. Invest in water service companies and encourage high standards of water catchment management, potable water supply and waste-water treatment. Invest in water conservation and wastewater treatment technology companies.	Consider collective action and submitting shareholder resolutions if companies do not improve their environmental performance. Make provision to invest in municipal bonds, financing the construction of sustainable water infrastructure.

Appendix I – Reference List and Further Reading

As previously stated, this report is only a brief overview of an extensive subject and there are some excellent, more detailed reports on the State of China's Environment which have been referenced in the footnotes. In particular, readers may wish to refer to:

The People's Republic of China National Report on Sustainable Development, 2002

Prepared for the World Summit on Sustainable Development held in Johannesburg. The Chinese Government reviewed and summarised the progress made in implementing sustainable development strategy from 1992 to 2001.
Further information on http://www.acca21.org.cn

Environmental and Trade Implications of China's WTO Accession – A Preliminary Analysis

Prepared for The Working Group on Trade and Environment China Council for International Cooperation on Environment and Development by Hu Tao, Policy Research Centre for Environment and Economy (China), and Wanhua Yang, International Institute for Sustainable Development, (Canada) September 2000.

'WTO membership will have long-term historic impacts on China's environmental quality, environmental management and environmental industry at large. It will become a major milestone in China's environmental history. Some of these impacts are short-term direct impacts, while most of others are long-term and indirect. It is not only a historic opportunity to redistribute its industrial structure, but it also adds more pressure on the environment in some aspects. It challenges the environmental industry and raises new requirements for environmental management.'

The report identifies the potential environmental impacts of China's accession to the WTO – highlighting both the domestic environmental impacts and the trade-related environmental impacts.

China, Air, Land and Water – Environmental priorities for a new millennium, World Bank 2001

China: Air, Land, and Water presents the results of a two-year effort to reassess the environmental situation in China. The research was a collaborative effort involving the World Bank, the China State Environmental Protection Administration, and a wide range of other technical and research institutions within China. Based on this research and extensive consultations, the World Bank proposes a wide range of programmes and policies that will help improve environmental quality despite new and emerging sources of pollution and challenges to natural resource management.

China Human Development Report 2002, Making Green Development a choice

The United Nations Development Programme (UNDP) China commissioned Stockholm Environment Institute, Oxford University Press 2002.

The report describes the physical and geographical challenges that China faces. It describes the threat of the current state of the environment including status of land, water, air and biological resources. It examines the associated impacts of development on human health and welfare. It provides an assessment of the drivers and linkages between society and environment, and two scenarios – one based on current trends and one based on a greener future.

The International Organisation for Standardisation (ISO) Survey of ISO 9000 and ISO 14000 Certificates Tenth cycle: up to and including 31 December 2000

This survey does not claim to be exhaustive. ISO does not itself issue certificates of conformity to ISO 9000 or ISO 14000. This is carried out independently of ISO by certification bodies in different countries. Therefore, there is no "official" central database of ISO 9000 and ISO 14000 certificates.

Towards a Better World, Sport, Citizenship and Development - challenges and opportunities for sports sponsors

World Sports Forum, Lausanne, 23 September, 2002 Robert Davies, Chief Executive, The Prince of Wales International Business Leaders Forum.

'In this opening speech to the World Sports Forum in Lausanne, Robert Davies makes the case for a more high profile role for sport and the sporting industries in tackling global and community challenges of health, peace, development and ethics. The 'business of sport' is a massive industry with the biggest customer and participant base, and the most influential communications medium. New expectations are emerging in the world for corporate citizenship which the sporting industry and sports events will need to respond to as an opportunity, including the special challenge of the China hosted Olympics. He makes the case for industry leaders and sports stars to act as role models and engage in these challenges for mutual benefit and sustainability in a troubled world with increasing threats and opportunities.'

Green Olympics

Greening Beijing's Industry for the 2008 Olympics - Prepared for Peter Salmon-Cox, DOE/OIT by Jonathan Sinton, David Fridley, and Debbie Brockett, Lawrence Berkeley National Laboratory 11 January 2001.

China's Electric Power Options: An Analysis of Economic and Environmental Costs

Chandler, William, Zhou Dadi, Jeffrey Logan, Guo Yuan and Shi Yingyi 1998. Washington, DC: Pacific Northwest National Laboratory. The paper was frequently refered to in another paper.

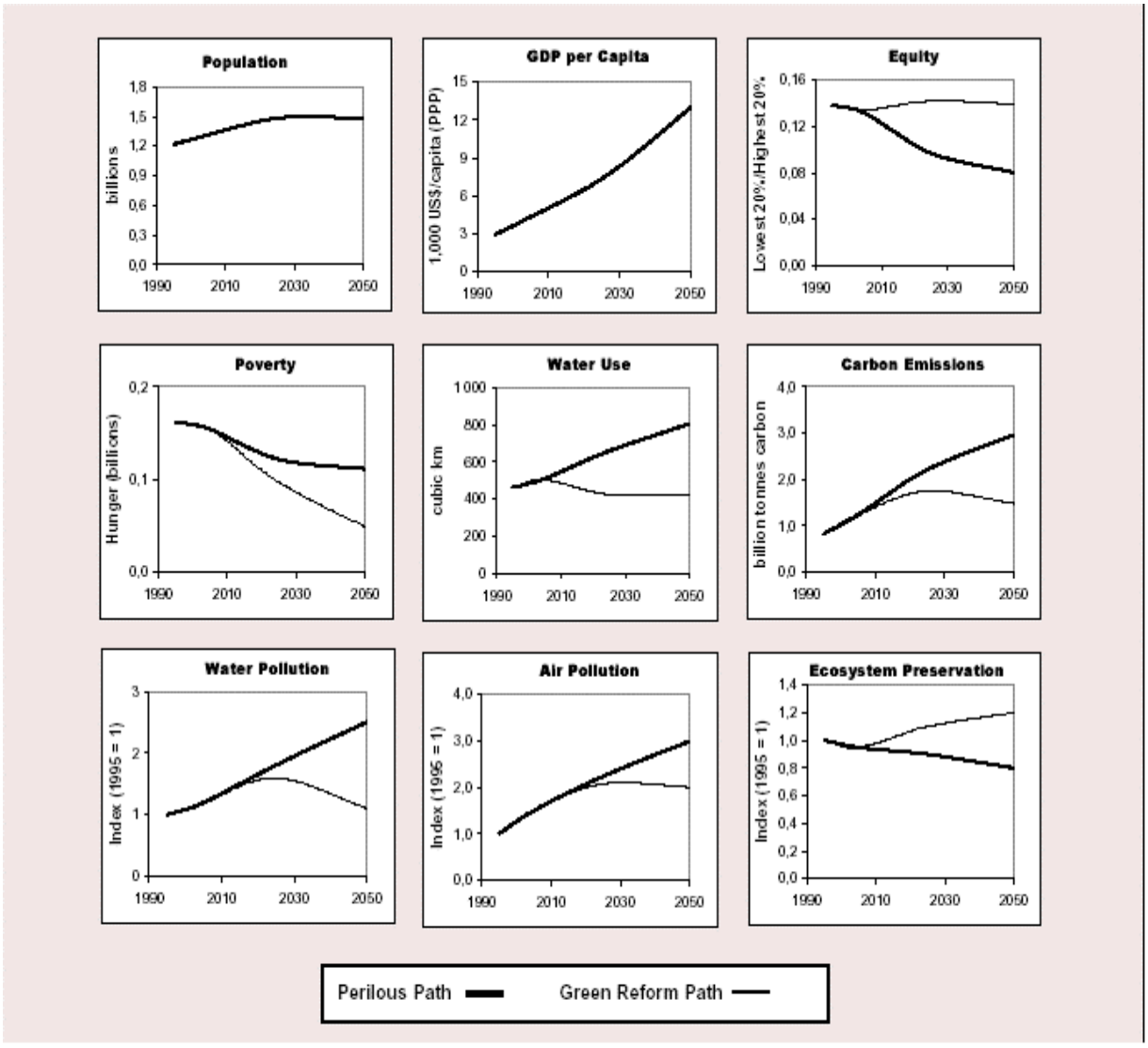
Opportunities and Challenges for China's Power Sector

John Byrne, Bo Shen and Zihong Zhao, Centre for Energy and Environmental Policy, University of Delaware, May 1999.

Appendix II UNDP 2002 China Scenario Forecasts

7 INDICATORS FOR TWO DEVELOPMENT SCENARIOS

In UNDP's 2002 China Report (see references), two scenarios were outlined for the way the country's development might proceed. The scenarios were called the *Green Reform Path* and the *Perilous Path*. A large deviation exists between these two scenarios for the quality of life in the future.



Both scenarios start with the same population projections, based on mid-range projections of the United Nations (1998 revision). GDP per capita assumptions are consistent with mid-range economic scenarios from the World Bank and OECD. The fact that the GDP per capita is the same for the two scenarios can be misleading however, because the simple financial calculation of GDP does not address issues of *quality of life*, which is dramatically different between the two scenarios. This is illustrated in the remaining plots, beginning with equity. The "equity" indicator reported is the ratio of the average income of the lowest-earning 20% of the population to that of the highest-earning 20%. As income distribution becomes more equal, the equity indicator increases.

Both the equity and hunger indicators can be taken as indicators of the potential for social instability. Hunger in the scenarios is determined by population, income and the distribution of income. The effects over the course of the scenarios are counteracting, in that while the number of hungry increases with population growth and as income distributions become less equitable, it decreases as incomes rise.

Current water patterns are taken from the Pacific Institute (2000). Water use and water pollution in the scenarios are driven by changes in activity (e.g. population, irrigated agriculture, economic output and power production) and water use intensity (e.g. use per capita for the household sector, use per hectare of irrigated land, use per value added in industry, power plant water cooling requirements, etc.). While water use efficiencies are assumed to increase in the scenarios, the *intensity* of water use, which is affected by both efficiencies and consumption patterns, grows in some sectors. Thus, in the household sector, increasing affluence is associated with higher water intensities, while in the agriculture sector higher-yielding crop varieties require more water per hectare (although the "crop per drop" is higher). In the *Green Reform Path* scenario, water-use intensities tend toward "best practices" in order to meet environmental targets.

Current air emissions are estimated by multiplying energy use by emission coefficients. They are therefore affected by changes in fuel mix, as well as total fuel consumption. Note that the estimated emission levels are consistent with standard sources. Scenario emissions from fuel combustion are affected by consumption patterns and the efficiency of use. Scenario energy requirements are the sum of sectoral contributions (households, industrial sub-sectors, transportation modes, services, and agriculture). Total requirements are therefore affected by both the increasing scale of the economy and the changing mix of economic activity. This contributes to differences that can be seen between the scenarios. For example, there is a greater contribution from services, and less from agriculture in the *Green Reform Path* compared to the *Perilous Path*, while there is more heavy industry in the *Perilous Path*. Electrification increases in both scenarios, but more rapidly in the *Perilous Path*. Energy efficiency improves in both scenarios, but more rapidly in the *Green Reform Path* in order to meet environmental targets. In the *Green Reform Path* scenario, there is more fuel switching to low-carbon fuels (such as natural gas and renewables) and greater efficiency improvements. *Note: Only carbon emissions from fossil fuels are reported.*

Ecosystem preservation relates to general impacts of pollution and natural resource use that affect the air, land and water, biodiversity and forest area. In the *Perilous Path* scenario, forest area declines due to conversion to agricultural land and the built environment, while it increases in the *Green Reform Path*, due to expansion of plantations and reforestation, and greater reliance on agriculture imports. Due to the considerable uncertainty and controversy regarding the complex relationships in ecosystems, these figures should be taken only as approximate trends.

Appendix III: Newly Increased Production Capacity Through Investment in Capital Construction in the Past 5 Years

Item	Unit	1998	1999	2000	2001	2002	Total
New trunk railway put into operation	km	1105	1242	655	1246	1696	**5944**
Double-track railways put into operation	km	590	1311	698	1504	500	**4603**
Electrified railways put into operation	km	988	616	554	2680	866	**5704**
Newly constructed highways	km	45677	41978	48069	35855	30796	**202375**
Of which: Express highways	km	1663	2639	4467	3149	5545	**17463**
Newly installed capacity of telephone switchboards	10,000 gates	2554	1523	2480	4997	2792	**14346**
Newly increased length of optical-fiber cables	10,000 km	16	11	43	61	63	**194**
Newly increased capacity of digital cellular mobile phone switchboards	10,000	1969	3426	6033	9097	5205	**25730**

Source: Chinese Statistical Communique 2002
www.stats.gov.cn/english/newrelease/statisticalreports/1200303120088.htm

Appendix IV: Sustainable and Responsible Investment (SRI)

People wishing to invest in sustainable and responsible investment (sometimes called socially responsible investment) do so not only because of financial returns, but also because of social and environmental considerations. Many people nowadays want more from their investments than a healthy financial yield. A growing number want their investments to reflect their concerns about the environment, social justice, economic development, and world peace, which are not necessarily met by traditional investment practices. On the back of these concerns, SRI funds have grown dramatically over the last decade, particularly in Europe and the UK, North America, Australia, and elsewhere. Currently, there are US$2.3 trillion invested in SRI funds in North America, and an estimated US$600 billion in Europe. ASrIA, the Association for Sustainable & Responsible Investment in Asia, is working hard to ensure that the same options now taken for granted in those countries will be made readily available to investors in Asia and the Pacific.

Very briefly, there are three major strategies for investors wanting to invest in a sustainable and responsible manner, and we can group them as[71]:

- *Portfolio screening* (the inclusion or exclusion of stocks and shares on ethical, social and/or environmental grounds);
- *Shareholder engagement* (investors using their status as shareholders to improve a company's ethical, social and/or environmental behaviour); and
- *Community investing* (investors supporting a particular cause or activity by financing it by investment or loans).

As more companies move into Asia – and China in particular – the question of how to balance social and environmental concerns with financial objectives will become ever more critical. This report provides information on key environmental issues that confront people wanting to invest money in an ethical manner in China, and seeks to stimulate discussion on how principles of engagement or screening might work. Few have yet travelled this path in China, and this report does not pretend there are easy answers.

[71] For more on SRI and ASrIA in general, see http://www.asria.org/sri/whatis/intro