

Engaging China on Climate Change: Opportunities and Challenges

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1) At revolutionary speed towards modernization

In the second half of the 19th century, Germany caused turmoil in Europe with the speed by which it embraced the process of modernization: it built an industrial, urban and politically centralized society with growing ambitions. In the last three decades China seems to have done something similar, but at a substantially different scale, with 1.3 billion would-be-consumers and a development path that have global implications.

The rise (or return, depending on the perspective) of China as a major global player is attracting attention, admiration and fear in equal measure. In all cases, the adjectives used are always superlatives. The reforms – and the opening-up of China - started by Deng Xiaoping in 1979 have lifted hundreds of millions of people out of poverty, and are creating a new middle class of between 150-200 million. Economic growth over the past three decades has been ‘the fastest among major nations, with an almost 10 percent annual increase in gross domestic product’ (Liu and Diamond 2008:37). According to Li Deshui, China’s top statistician (in: Liu 2007:256), the country produced ‘only 4.4 percent of the world’s total GDP in 2004, yet the crude oil it devoured accounted for 7.4 percent of the world’s total; coal, 31 percent; iron ore, 30 percent; rolled steel, 27 percent; and cement, 40 percent’. This is the price of rapidly becoming the world’s manufacturer of energy intensive industrial commodities, while struggling to improve efficiency.

According to the International Energy Agency (IEA 2007) China accounted for four fifths of the growth of industrial production and CO₂ emissions during the past 25 years. Together with India, it accounts for a significant part of growth in the global fuel demand and power generation capacity: the IEA (2007) predicts that between 2004-2030 the two giants will account for approximately 75 percent of global coal demand and 35 percent of oil demand, and for 35 percent of global power generation capacity. Meanwhile, population in China and India is expected to rise to 1.5 billion in each country. A sobering set of figures, even allowing for the uncertainty of data, especially from China. The implications of the pace and scale of China’s growth for the environment and for climate change are more sobering still.

2) Environment, climate and development – hard choices

Environmental crisis

China is not only compressing six centuries of history into a few decades, it is also – and as a result – compressing all manner of environmental emergencies into one major, evolving, crisis. Natural habitats and soils have been under pressure for many centuries in China, thanks to a large population dependant upon scarce agricultural land and water, yet recent growth has led to unprecedented strain. The State Environment protection Administration’s (SEPA) *Communiqué on China’s 2005 environmental condition* (China Daily 2006), paints a grim scenario of environmental degradation, including: soil erosion affecting 37.1 percent of Chinese land area, pollution of more than one tenth of the country’s total cultivated land (around 10 million hectares), and pollution of more than 70 per cent of China’s rivers and lakes.

Sixteen of the world's twenty most polluted cities are in China, while the country – and the health of its people – are afflicted by endless incidents of chemical spills, flash floods, sandstorms and droughts (Liu and Diamond 2008).

In this context, and given the overwhelming dependence on coal for the production of energy, it comes as no surprise that China's CO₂ emissions have increased significantly (see Table 1), and that emissions 'from fuel combustion and cement production are now the world's highest' (Liu and Diamond 2008:37). According to the *World Energy Outlook 2006* by the International Energy Agency (IEA) China's CO₂ emissions might pass those from the United States as early as 2009 (and a Dutch study suggests this may already have happened). Part of the reason is the 13 percent average rise in the use of coal since 2003 (<http://earthtrends.wri.org/>), combined with inefficiencies: 1999 figures for CO₂ intensity show that China was emitting 700 metric tons per GDP (metric tons CO₂/ million \$PPP) compared to 540 for Asia (excluding the Middle East), and its emissions per total energy consumption stood at 66 metric tons of CO₂ per terajoule energy, compared to 56 for Asia (Earthtrends 2003a:1). For the period 1990 to 2006 Liu and Diamond (2008) calculated a change of *approximately* 2.3 to 5.8 billion metric tons of CO₂ emissions from fuel combustion, and an increase in GDP from *approximately* 0.3 of 2.8 trillion US\$.

Table 1 Trends in CO₂ emissions (China and the world)

CO₂ emissions	China	Asia (excluding the Middle East)	World
Per capita CO ₂ emissions, 1998 (thousand metric tons of CO ₂)	2.5	2.1	4.1
<i>Percent change since 1990</i>	<i>17%</i>	<i>19%</i>	<i>-2%</i>
CO ₂ emissions (in metric tons) per million dollars GDP, 1998	3,454	n.a	773
<i>Percent change since 1990</i>	<i>-43%</i>	<i>n.a.</i>	<i>-10%</i>
Cumulative CO ₂ emissions, 1900-1999 (in billion metric tons)	65,168	161,972	933,686

Source: (Earthtrends 2003a:1)

Unsurprisingly, rapid growth is leading to unwanted impacts, and costs. According to research by the World Bank, SEPA and a team of international experts (World Bank and SEPA 2007), the combined economic costs and human health impacts costs of outdoor air and water pollution for China's economy comes to around \$US100 billion a year (or about 5.8 percent of the country's GDP). Other estimates range from 3 to 20 percent (Bina 2007b), prompting Hu Jintao's (2007) comment that '[China's] economic growth is realized at an excessively high cost of resources and the environment. There remains an imbalance in development between urban and rural areas, among regions, and between the economy and society'. Indeed, other consequences of growth worry the Chinese leadership, possibly more than costs: severe pollution prompted 51,000 public disputes in 2005, posing a threat to social stability (Pan and Zhou 2006). However, it is precisely rapid economic growth that is seen as the principal legitimating factor of the CPC since Deng Xiaoping's reforms (Hutton 2007; Pei Minxin 2006; Seymour 2005), and under Hu Jintao's leadership, the Government is aiming for a persistently high rates of growth well into the future.

Many view political stability and the survival of the ruling order as dependent on the government's ability to deliver precisely the economic growth that is considered here as a major cause of pressure on the environment.

Trying to see climate change from Beijing's perspective

To engage constructively with China it is obviously helpful to try and see climate change from its perspective. Two recent events can provide important clues: President Hu Jintao's address to the 17th National Congress of the Communist Party of China (October 2007), and the statement by Ambassador Yu Qingtai at the Thematic Debate of the United Nations General Assembly on Climate Change (New York, February 2008). Climate change is considered closely linked to:

- The development agenda;
- Matters of energy security;
- Pollution problems; and
- Resources constraints.

Themes which most countries could arguably focus on, but which in the case of China take on an 'extreme' scale and level of urgency (Bina 2007b). Together with many developing countries, China sees climate change as a **development issue** (Feng Qinghu 2007), and despite the amazing growth rates and the layer of skyscrapers that tower over major cities, China must still battle with **poverty reduction**. But it also needs continued growth in order to maintain social **stability**, and Party **legitimacy**.

Climate change and the 17th National Congress of the CPC

All four themes above are prominent in Hu Jintao's address to the 17th National Congress. He (Hu Jintao 2007) first clarifies the undisputable aim of further 'sound and rapid economic growth' and the quadrupling of 'per capita GDP of the year 2000 by 2020', stressing that the Party 'must regard development as the top priority' and that '[d]evelopment is of decisive significance for building a moderately prosperous society in all respects and speeding up socialist modernization'. The guiding principles for how to achieve such growth include: 'optimizing the economic structure and improving economic returns while reducing consumption of resources and protecting the environment', and they relate to the highly acclaimed 'Scientific Outlook on Development' that Hu Jintao (2007) places at the heart of the country's next five years:

'We must adopt an enlightened approach to development that results in expanded production, a better life and sound ecological and environmental conditions, and build a **resource-conserving** and environment-friendly society that coordinates growth rate with the economic structure, **quality and efficiency**, and **harmonizes economic growth with the population, resources and the environment...** To thoroughly apply the **Scientific Outlook on Development**, we must work energetically to build a harmonious socialist society. Social harmony is an essential attribute of socialism with Chinese characteristics. **Scientific development and social harmony are integral to each other and neither is possible without the other...** It is through development that we will increase the material wealth of society and constantly improve people's lives, and it is again through development that we will **guarantee social equity and justice** and constantly promote social harmony. To realize social equity and justice is the Chinese Communists' consistent position and a major task of developing socialism with Chinese characteristics' (emphasis added).

He continues, reflecting on the challenge of limited resources, and the need for more responsible, efficient approaches, and for renewable energy (Hu Jintao 2007):

We must give prominence to building a resource-conserving, environment-friendly society in our strategy for industrialization and modernization and get every organization and family to act accordingly... We will implement the **responsibility system** for conserving

energy and reducing emissions. We will develop and extend advanced and appropriate **technologies** for conserving, **substituting and recycling energy and resources** and for controlling pollution, **develop clean and renewable energy** sources, protect land and water resources and set up a scientific, rational system for **using energy and resources more efficiently**... We will enhance our capacity to **respond to climate change** and make new contributions to protecting the global climate' (emphasis added).

At the 15th Economic Leaders' Informal Meeting of the Asia-Pacific Economic Cooperation (APEC) held in Sydney (January 2008), Hu Jintao made proposals for tackling climate change, including ways to strengthen cooperation, pursue sustainable development and promote scientific and technological innovation. He stressed that 'climate change is ultimately a development issue and it can only be addressed in the course of sustainable development'(cited in Feng Qinghu 2007).

Hence, there must be growth, it must be rapid and substantive, but also – it seems – growth will have to be efficient, and with an emphasis on clean technologies and renewable sources of energy.

Recent official position of China at the UN climate negotiations

The statement by Ambassador Yu Qingtai (China's Special Representative for Climate Change Talks), at the Thematic Debate of the United Nations General Assembly on Climate Change reiterates, and reinforces, the official discourse (Yu Qingtai 2008): he acknowledges that climate change 'affects not only the development of the global economy and prosperity, but also the very existence of mankind', and confirms that the Chinese Government actively supports 'the leadership role played by the United Nations in responding to climate change'. Within this framework Yu Qingtai (2008) emphasises three crucial points:

- 1) it reiterates the centrality of UN Framework Convention on Climate Change (UNFCCC) 'fundamental principle of Common But Differentiated Responsibilities' as the 'very foundation for international cooperation... Any framework for future arrangements must be firmly based on these principles';
- 2) it calls for immediate attention to all four 'building-blocks, i.e. mitigation, adaptation, technology and financing' for developing an 'effective framework for responding to climate change', and requires that 'the concerns by the developing countries over adaptation, technology transfer and financial resources should be addressed in real earnest, so that they will have the capacity to make greater contributions to confronting the challenge from climate change'; and
- 3) it warns that 'the effectiveness of participation by the developing countries [to the international effort] will, to a significant extent, depend on whether the developed countries will take substantive actions on financial and technological assistance... and capacity building, to facilitate their achievement of sustainable development'.

Of course, China is very much aware of the environmental, economic and social consequences that changing climate conditions might have within (as well as outside of) its borders. The evidence of increased vulnerability, for example in the realm of water resources dependant from the Tibetan Plateau and the Himalayas, leaves little room for optimism. Climate change is considered to have caused damage to agriculture, forests, water resources and coast areas (Feng Qinghu 2007). Thus, the Ambassador's statement (Yu Qingtai 2008) concludes with the claim that '**China takes climate change very seriously**. We have adopted a significant number of

policies and measures within our capacity to respond to the challenge from climate change, with noticeable success' and that, in addition to making its 'own due contribution' China 'will also help other developing countries to enhance their ability to adapt to climate change'.

The tension

China aims to reduce by 20 percent its energy use per unit of GDP by 2010, while increasing its GDP by four times with only twice as much energy use by 2020. This is proving to be an arduous task. There is a clear **tension** between energy saving objectives and the current dependence on heavy industry combined with the Government goal of continued rapid economic growth.

The Government has recently moved to influence **energy demand** through energy saving regulations, changes in energy subsidies and incentives structures (see below). However, the limitations of these efforts can be seen in the failure to lower overall consumption levels from one year to the next, as economic growth continues to be fuelled by ever increasing and energy intensive industries. In fact, China is now the single largest industrial producer of a wide range of **energy intensive industrial commodities** such as aluminium, ammonia, cement and steel, and there is much scope for greater efficiency in the industries' use of energy. In terms of **energy supply** the situation remains problematic. China's energy sources mix will continue to rely on 'dirty' coal reserves (currently close to 70 percent), which are seen as critical to the country's energy security.

But structural challenges are not the only area of concern. China's capacity to respond to energy and related climate change challenges is seriously undermined by its poor **governance** record. Not only has the rule of law remained weak despite evidence of the serious negative consequences of failure to implement a wide array of environmental legislation. Although much has been said and recognised in terms of the need to shift from the blind pursuit of economic growth to more balanced and sustainable development, the message on the ground – in the Provinces and Municipalities across this vast nation – is being received as a distant echo of central Government agendas. China continues to have difficulties in defining clear sectoral objectives and targets that can be pursued at the local levels, and, crucially, in defining clear lines of responsibility for their implementation.

Avoid entering the 'either or' cul de sac

One of the thorny issues of current negotiations on a post-Kyoto agreement is whether developing countries, especially large countries like China, India and Brazil, should take on more responsibility for emission reduction, in line with the developed countries. There are several problems linked to this difficult issue of responsibility.

First, based on the brief analysis of the official discourse in China, there is a real danger that the dialogue between China and rich nations, including the EU, could end up as a false choice, between **emission reduction and development priorities**. China is making it clear it will not allow climate change issues to curb development (and in this it conveniently echoes the long-standing position of the richest country in the world, the USA, but with the additional argument that it needs growth to reduce poverty for hundreds of millions Chinese citizens). Second, this difficult balance of arguments is not helped by the fact that many developed countries are seen as having

failed to fulfil their obligations towards developed countries under the UNFCCC. In the words of a Chinese government official (Feng Qinghu 2007):

‘the UNFCCC said: “The extent to which developing country parties will effectively implement their commitments under the convention will depend on the effective implementation by developed country parties of their commitments under the convention related to **financial resources and transfer of technology** and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country parties”...

It is a pity that developed countries have shown insufficient sincerity and made **inadequate efforts** to fulfil the above obligations. The United States and Australia have rejected the Kyoto Protocol with the excuse that compulsory emission reduction will obstruct economic development and research conclusions about climate change still lack credence. So far developed countries have only committed \$182 million to the adaptation fund for all poor countries. The emergency programs of the least-developed countries alone will need \$1 billion to \$1.2 billion’ (emphasis added).

3) Acknowledging progress

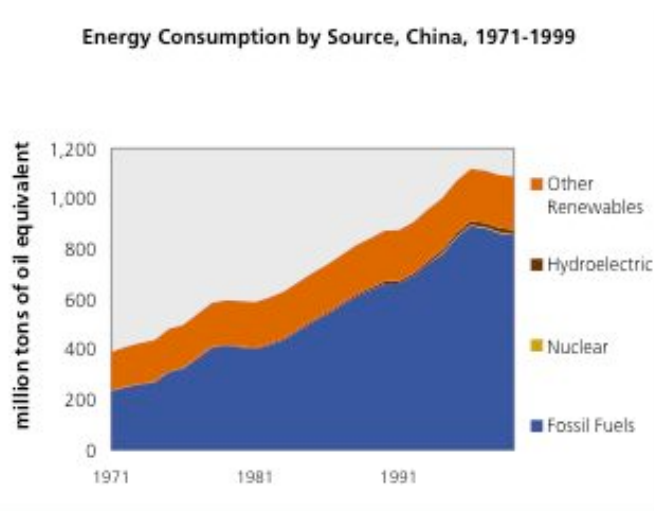
China is not alone in complaining about the lack of progress among rich nations in addressing climate change. Monbiot (2007) recently referred to a paper in the Proceedings of the National Academy of Sciences that finds that ‘no region is decarbonizing its energy supply’,ⁱ and the *2007/2008 Human Development Report* of the UNDP warns that while many rich countries have highly publicized targets and schemes for reducing emissions, only a few can claim some success in curbing emissions through specific programmes: at best, results have been mixed. For this reason it seems essential to acknowledge what the Chinese see as important progress and goodwill on their side, in addressing climate change and the central role of the energy sector in reducing China’s impact, including:

- making the pursuit of a **new development agenda** - of a new path for development, a priority of Hu Jintao’s Presidency (see above);
- linking the issues of global climate conditions to its **domestic** environmental protection policies;
- raising **energy efficiency** as one of the highest priorities of Government (with a target of 20 percent increased energy efficiency by 2010), admitting the difficulties and set-backs and renewing the Government commitments – despite the monumental challenges due to overall high levels of growth (especially in energy intensive industries);
- seeking to introduce **clean technologies** in key economic sectors, starting with energy production.

The issues of energy security and environmental pollution are turning out to be perfect allies in the search for solutions. In an attempt to address them, China has turned its attention to energy sources **diversification**, in spite of its vast coal deposits. A **Renewable** Energy Law (2005) promotes the ‘greening’ of China’s energy mix, and is expected to increase renewable energy use up to 60 GW or 10 percent in the next decade (Biller 2006).ⁱⁱ China is promoting the development of alternative energy, including nuclear energy and all kinds of renewable energy such as wind power, solar power and bio-fuels. Francois Nguyen, senior policy advisor from the IEA, or the International Energy Agency argues that China has a golden opportunity for investment in **clean and more efficient power plants**, as it prepares to invest 1.2 trillion dollars over the 2005-2030 period. Figure 1 and Table 2 show the breakdown

of sources of energy between 1971 and 1999. The current policy is to strengthen nuclear and hydro-power as part of the renewable sources agenda. The scale of hydro-power plant projects is such that it is raising significant concerns about the **impact** on biodiversity and ecosystem services, which might outweigh the benefits of ‘clean energy’ sources. Furthermore, considering that China is short of being a water-stressed country, and considering the future effects of rising population pressure and climate change impacts on these resources, the long-term implications of major hydro-power projects need careful consideration.

Figure 1 Energy Consumption by Source, China, 1971-1999



(Earthtrends 2003b)

Table 2 Energy consumption by source (columns: China, Asia – excluding Middle East, and the World)

Energy Consumption by Source, 1999 (in thousand metric tons oil equivalent)			
Total Fossil Fuels	854,743	2,175,366	7,689,047
Coal and coal products	624,117	1,013,218	2,278,524
Crude oil and natural gas liquids	189,645	829,930	3,563,084
Natural gas	26,058	277,374	2,012,559
Nuclear	3,896	117,291	661,901
Hydroelectric	17,527	44,424	222,223
Renewables, excluding hydroelectric:	212,938	578,643	1,097,889
Primary solid biomass (includes fuelwood)	211,705	561,751	1,035,139
Biogas and liquid biomass	1,234	1,276	14,931
Geothermal	0.0	14,658	43,802
Solar	0.0	865	2,217
Wind	0.0	94	1,748
Tide, wave, and ocean	0.0	0	53

(Earthtrends 2003b)

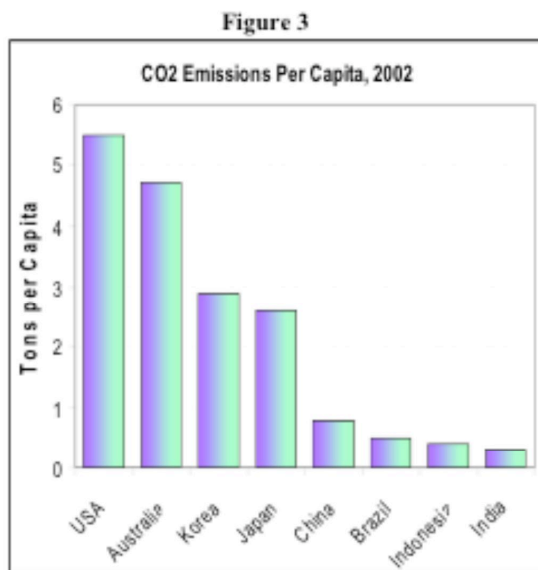
China's new *Science and Technology Plan* seeks to develop new technologies as well as search for new adaptation solutions in the light of predicted impacts from global warming. The major challenges posed by the supply side of the energy sector are also opportunities. China has taken some bold steps, for example through the HFC-23 Emissions Reductions Project (a collaboration with the World Bank), which will lead to Certified Emissions Reductions (CERs) of approximately 18 million TCO₂e. Importantly, China is planning to set aside a portion of the net revenues of this transaction in a '**clean development fund**' to promote climate change mitigation projects.ⁱⁱⁱ According to the UNDP, the National Climate Change Coordinating Committee of NDRC and local CDM market partners have been working since 2001 to design China's national CDM law and projects. This resulted in China now being able to supply over 50% of the world's CDM credit supply.

Action in the fields of **energy and transport** are clear priorities given that 70% of GHG in 2000 came from energy, transport and consumer electricity (the rest coming from industry, agriculture and waste) (Biller et al. 2006). Progress in the 1990s has led to a reduction of CO₂ intensity by more than 50% by acting on energy demand through energy saving regulations, changes in energy subsidies and incentive structures (Biller et al. 2006). The Government has promoted the closure of small, inefficient industrial plants; the improvement of energy end use efficiency and coal quality; the switching of many residential fuel users from coal to gas and electricity; and the promotion of technological progress in energy-intensive sectors (Streets et al. 2001 in Biller 2006). As for **industry**, while China has become the world's factory, recent data from the International Energy Agency shows that some of China's energy intensive industries are already adopting good technology. New plants tend to be more efficient than older ones. As a consequence, the most efficient industries can in some cases be found in emerging economies where production is expanding: some of the most efficient steel plants can be found in China. However, efficiency across the industrial production sector could learn much from the example of countries such as Japan, which has had active efficiency policies for decades (IEA 2007 *Plan of Action for Climate Change, Clean Energy and Sustainable development*). The Government is also seeking to shift towards less energy intensive industrial sectors (see Hu Jintao's speech, above), though this seems less likely in the short term.

China's Government is now focusing on **construction projects, transport and government buildings** as three areas for urgent action in terms of improved energy efficiency. It has been regulating on the energy consumption standards in the building and transportation sectors, since the latter sectors are expected to gradually increase their relative contribution to total GDP against a decreased share of the industrial sector (Feng Fei, 2006 in: Biller et al. 2006). For example, China has recently required that air conditioning should not be set at below 26 degrees in public buildings.

These examples are by no means an exhaustive list, but rather a selection of what is being done to address key challenges linked to energy and climate change. They must be considered in the light of the perspective suggested above, and bearing in mind the crucial, simple, factor of the different per capita footprint of the Chinese people (see Figure 2), compared to the average citizen of developed countries (Bina 2007b).

Figure 2 CO2 Per capita emissions, 2002



Source: (Biller *et al.* 2006:6)

4) Engaging China on climate change solutions

In the first three sections we have summarised some of the key characteristics of the China ‘phenomenon’, both in terms of its extraordinary growth, the environmental implications of this growth, the current official discourse on these themes and future priorities of the CPC, as well as some of the progress that has been made to date. We now turn to the main areas that will deserve special attention in the process of negotiating a way forward on climate change between the EU and China. We acknowledge that important recommendations for the dialogue with China were already proposed by one of the members from the Advisory Group to President Barroso on Energy and Climate Change, in the global framework of the preparation to Bali (Kemfert, 2007: 19-20). Such proposals remain to a large extent valid and useful.

Rich nations to lead by example

The recent meetings and negotiations on and around the post-Kyoto future have made it increasingly clear and explicit that developing countries are less than impressed with the results that developed countries have to show for their ‘efforts’ in dealing with climate change, and in meeting their obligations under the Kyoto Protocol. China, for one, has been making such sentiments clear – also in response to the increasing ‘attacks’ resulting from the rising awareness of the sheer size of its contribution to current and future emissions. As Harvey (1990) noted, globalisation is leading to time and space compression, and the turn of the century has been marked by a renewed awareness of the Earth as a closed system, with clear **limits** in terms of capacity and resources. These limits are made more tangible thanks to the projected population growth in China, India and Africa, and the sheer impossibility of

extending the current lifestyle of rich countries to the ‘newcomers’ (for a detailed discussion, see: Bina 2007b). The Chinese leadership seems fully aware of this, as suggested by Yu Qingtai’s declaration to *The Associated Press* (<http://ap.google.com/> (15/2/08)) just after the recent UN meeting (see above), where he explained that China would try to keep a lid on its growing gas emissions when compared to U.S. per capita emissions, stating in no uncertain words that:

‘I cannot accept the argument that I, as a Chinese, am only entitled legally to one quarter of what you are entitled to...But... being equal to an American when it comes to per capita emissions would be a nightmare for the Chinese’.

In a recent briefing on the issue of CO₂ **emission ‘ownership’**, Tao Wang and Jim Watson (2007:1) draw some important conclusions which ought to be noted here:

‘[the research] concludes that in 2004 – the most recent year in which comprehensive data is available – **net exports from China accounted for 23% of its total CO₂ emissions**. This is due to China’s trade surplus, but is also due to the relatively high level of carbon intensity within the Chinese economy’ (emphasis added).

To bring trade issues to the centre of negotiations could provide a basis for rethinking both Joint Implementation and Clean Development Mechanisms in a post-Kyoto agreement, on the ground of shared responsibility in emissions increase, both from producer and consumer countries. The implications for future negotiations could be significant, and add to the complexity of the ‘responsibility’ dimension that permeates all discussions:

‘the extent of ‘exported carbon’ from China... suggests that a **focus on emissions within national borders may miss the point**. Whilst the nation state is at the heart of most international negotiations and treaties, global trade means that a **country’s carbon footprint is international**. Should countries be concerned with emissions within their borders (as is currently the case), or should they also be responsible for emissions due to the production of goods and services they consume?’ (emphasis added).

On the basis of these preliminary results, the two scholars recommend early action by the developed countries (OECD members):

‘First... OECD countries should take the **lead in reducing emissions**. Their historical responsibility for the majority of the carbon emissions is joined by some responsibility for more recent emissions growth in the developing world. Second, [there should be an] expansion of efforts to help developing countries to reduce the carbon emissions from economic growth through **technical assistance and finance**’ (emphasis added).

Feng Qinghu (2007), official of the Central People's Government in Hong Kong Special Administrative Region, emphasises the role of the UNFCCC’s **Clean Development Mechanism** as a means for developed countries to cooperate with developing countries and help them reduce emissions.

In terms of **adaptation** strategies, Biller *et al.* (2006) mention three important areas of action, which will contribute to the MDG, as well as strengthening China’s capacity to adapt to global warming: water efficiency in agriculture, increased productivity and soil conservation.

Overall, there is a clear need for responsible action by the EU and all OECD countries, to prioritise the climate change agenda beyond rhetoric, and statements of good intention, to invest wholeheartedly and decisively in renewable energy, and in

the further improvement of efficiency. Only by leading by example can the EU hope to engage countries like China and encourage them to throw in their full weight towards the common goal of emissions reduction. A special emphasis should be given to the rapid development of Carbons Capture and Sequestration (CCS) technologies, which are crucial for a country that depends so heavily on coal reserves, as is the case of China. In order to attain that goal, a wide partnership among research institutions and financing entities from Europe, the USA, China and other emerging economies would be highly desirable.

Why ‘common but differentiated’ responsibilities

As noted above, China and developing countries in general, are adamant that the UNFCCC principle of common but differentiated responsibilities and respective capabilities should be nothing less than the ‘very foundation for international cooperation’ and any future agreement. The message could not be clearer.

There are at least three important aspects to the principle, which are especially relevant in negotiations with China. First is the argument whereby early industrialized countries bear the responsibility of GHG emissions over the last two centuries. Second is the argument of lifestyle impacts whereby rich countries continue to contribute disproportionately to climate change (see below). And thirdly comes the argument resulting from the extreme interconnectedness of our modern world: the fact that a significant part of China’s growing emissions is due to production of goods destined to markets in rich countries. As Nayan Chanda (2007) argues, China has been a major beneficiary of globalization. It is now the first destination – ahead of the USA – since 2001 for foreign investment, and has become the world’s factory, providing cheap products to the world in return. This production is fuelled by coal and chemicals. In many ways, rich countries are benefiting from the fact that most of the pollution stays within China, except for that unifying and life supporting element: air, with its capacity to absorb polluting elements and quickly distribute them to the four corners of the world (Bina 2007b).

The international system of governance lacks the capacity to address these global problems (Ayre and Callway 2005; Stiglitz 2006). Yet the root cause, as Chanda (2007) notes, is the unwillingness of key actors to empower the United Nations. In their recent statements, the Chinese authorities have given clear support to the central role of the UN in dealing with this quintessentially global problem. Providing further clear leadership within this arena by the EU seems essential – however, being able to do so from the position of having set the example would be better.

Promote a 'triple benefit' perspective: climate change, health and jobs

Liu and Diamond (2008:38) find that '[d]eveloping more environmentally friendly technologies for domestic use and export would increase employment and economic efficiency while reducing environmental damage', and argue that, although developed countries have helped China by providing such technologies and advising on raising pollutant emission standards, '[m]uch more can and should be done'. Indeed, recent statements by developing nations have echoed this verdict, loud and clear.

Discussions about the pursuit of GHG reduction targets for China could be usefully focused on improving the performance of those key – energy intensive – industries, which cause the greatest pollution within and outside China and which serve a significant part of world's consumption (Wang and Watson 2007 also, see below), rather than around national ceilings which conflict with concerns discussed above. There is a potentially large carrot attached to this particular stick.

Hu Tao, of SEPA's Policy Research Centre, has been exploring the potential of maximising net benefits (benefits minus control costs) by taking into consideration the damage caused by sulphur and carbon emissions (especially from coal fired power stations) on the environment and health, at the local and global scales (SEPA *et al.* 2005). Hu concludes arguing that eventually these considerations should be integrated in the performance evaluation system for municipalities, in order to strengthen environmental governance. Interestingly, the debate that followed all presentations (SEPA *et al.* 2005) illustrated the importance of the worldviews and conceptual frameworks of the different actors. Those who were primarily concerned with clarifying that developing countries (and thus China) have no obligation to reduce emissions appeared to quickly forget the arguments of co-benefits, which taken to its logical conclusion would suggest that it is in China's interest to pursue a reduction in emissions.

This may be an important factor in future negotiations. Our suggestion is that the **virtuous links** between emission reductions, improved air quality and health, improved efficiency of key industries, resulting cost abatement for the public (e.g. health) and private (e.g. cement) sectors, and resulting modernization of key industries (e.g. energy and steel) as well as job creation in innovative industries (e.g. solar energy) should be kept closely connected. These **virtuous links** could underpin a voluntary offer from China to reduce GHG emissions in certain critical industrial sectors, in exchange for sufficient technology transfer in the domain of energy efficiency. The same applies to agriculture, where methane emissions abatement could compensate partially for the increase in carbon dioxide emissions.

Meanwhile, China is moving rapidly ahead on innovation, as suggested by James Rose's comment (2008):

'By now, most of the world is waking up to the fact that China is set to become the **world's leading alternative energy market**. In this industry, Beijing has sought to guide rather than force. The introduction of regulations to encourage the market, such as the target of 8% renewable energy use nationally by 2020 (projections suggest the ratio will be closer to 15% by 2020, and 30% by 2050) has generated an influx of foreign investment. Soon China will overtake the European Union, the US and Japan as the centre of renewable

energy production. Last year, about 20% of global investment into the sector, about \$11.2 billion, was in China’.

Strengthen the EU presence in research – partnerships

In the medium and long-term, the EU can also make a significant contribution through the strengthening of collaboration in research. The recent EU initiative to create a network of scholars and institutions involved in research in and on China is very welcome.^{iv} Several European academic institutions have made significant progress in collaborating with Chinese partners: Wageningen University (NL), Nottingham University (UK), Instituto Superior Técnico (PT) are just a few examples. Nonetheless, Europe’s presence, contribution and influence remain well behind that of the USA. The powerful mechanisms of DG Research could be usefully employed to close this gap.

There is a need for greater visibility of Europe as a major player, not just the second choice after the North American colleagues and institutions – a typical comment of Chinese PhD students when asked where they would like to continue their studies.

Within the context of climate change and energy sector problems, the emphasis on technological transfer is a clear priority for research as well as for industrial development and collaboration. Another area, which is arguably somewhat more difficult to address – but no less critical – is that of strengthening good governance. The OECD has made this a clear priority (OECD 2005). To those who have analysed progress in environmental policy implementation, the reasons are clear: despite a remarkably strong rhetoric in favour of addressing China’s ecological crisis, the capacity, and political will, at Provincial and municipal level remains extremely poor (Bina 2007a; Economy 2004). Capacity to define and implement sustainable energy, transport and industrial plans, land-use planning theory and practice, the promotion of environmental policy integration, are just some of the areas where collaboration would be important in the medium and long term (China Daily 2007).

Impact of growth, the commons and lifestyle aspirations

If many of the issues in sections 2 and 3 above can be interpreted as positive signals of the Chinese Government taking serious steps to address the global climate crisis, a large – potentially disastrous factor – remains looming on the horizon: lifestyle aspirations and consumption patterns for 1.3 billion people, and counting. Not to mention projected population growth for India and Africa. As an indicator of magnitude: China's number of privately owned motor vehicles rose 18.8 percent to 22 million in 2006. Today, China has a middle class of between 150 and 200 million people. The list of similar statistics delivers a compelling picture of the challenge ahead.

Economic growth leads to negative externalities. In a globalized world, the tragedy of the commons attains new heights and climate change is central to this important debate. As Stiglitz (2006:162) argues convincingly: ‘The problem of the commons is easy to understand, and so, in some sense, is the solution: in one way or another, individuals have to be restricted in their use of it’. In an effort to engage China to

address its growing contribution to the air and water pollution arising from its rapid growth, the EU may have to consider the wider, underlying issue, of lifestyles and of population impact, which Jarred Diamond (2005) has identified as central to societies' survival, or collapse. It is the developed world, rather than the developing world that needs to confront the question of limits first (Bina 2007b; Brown 2006).

This debate links to that of what we mean by progress in today's world. George Monbiot (2007) notes that '[t]he real issues in Bali are not technical or economic. The crisis we face demands a profound philosophical discussion, a reappraisal of who we are and what progress means'.

The Chinese leadership has made it clear that it aspires to a 'moderately well-off society' (Hu Jintao 2007). Will 'moderate' be limited enough? And how can the developed world argue for a more contained lifestyle, when a small part of the world's population lives in highly visible (thanks for television, cinema and now internet) luxury? Should rich countries play a role in this fundamental question of quality of life, equity and limits? In many ways China is an opportunity for the whole world to take a new path.

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ⁱⁱ Other commentators argue that the increase will be more around 15%.

ⁱⁱⁱ For more information, see:

<http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P094388>

^{iv} A new network is being developed for European researchers in China. It will provide web-based and other services for researchers who want to improve their contacts with other European researchers in China and Europe. This project is supported by the European Commission (Directorate General for Research and the Delegation of the European Commission to China) in collaboration with the Embassies of the EU Member States in China and the other European countries associated with the European Research Area. See:

http://www.surveymonkey.com/s.aspx?sm=fCtOz18738_2b0M3Qc7P3q0w_3d_3d