
Is China doing enough to protect the environment? (ARI)

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Theme: Following the recent worsening of problems linked to pollution, it is worth looking at the measures implemented so far by the Chinese government in order to safeguard the environment.

Summary: Some news in recent weeks has brought China's grave environmental situation back into the spotlight. This analysis looks, first, at the main causes of the sharp deterioration in the country's environmental conditions. It then sets out some figures illustrating what might be described as a genuine 'environmental nightmare'. Thirdly, the main policies for environmental protection are listed and assessed, to conclude that, with a few exceptions, they are actually quite ambitious and, at all events, much stricter and more numerous than is generally believed in the West, although evidently there is still a long way to go.

Key words: China, environment, pollution, air, water, soil, environmental policies, energy, greenhouse gas emissions.

Descriptors: China, environment, 11th Five-Year Plan, energy, pollution, greenhouse gas emissions, CO₂, SO₂ and NO_x.

Analysis: Although China's significance in environmental issues on a global scale is well known and has been discussed at length recently (for example, during climate change talks), some news in the last few weeks has brought the issue back into the spotlight. At the end of July, the Ministry of Environmental Protection (MEP) revealed, in a rare show of transparency, that environmental accidents had soared by 98% in the first half of the year, that air quality in China's main cities had deteriorated for the first time in five years, that more than a quarter of the country's water courses were unusable as sources of drinking or industrial water and that acid rain had become a serious problem in more than 180 cities. In early August, the National Bureau of Statistics announced that the country's energy intensity remained practically constant in the first half (after growing 3.2% in the first quarter). Since energy intensity had fallen by 16% between 2005 and 2009, this calls into question China's ability to attain the target set under the Five Year Plan (2006-10), consisting in a 20% cut over the period. Furthermore, in the last few weeks, reports (apparently more reliable than the initial news) have been published regarding recent

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accidents, which include a major crude oil spill in the north-eastern port of Dalian, serious pollution from a copper mine in Fujian Province and the grave lead poisoning of dozens of children from illegal gold mining in Yunnan Province.

The reports have reignited the important debate on the real environmental situation in China and on whether the Chinese authorities are doing enough to properly protect the environment.

Economic Growth, Urbanisation and Energy

The three main causes of the rapid deterioration in the environment in China are well known. In the first place, the country has posted 10% average annual GDP growth for the last 30 years, a performance unequalled and unprecedented anywhere in the world. Secondly, urbanisation has spiralled, especially in the last few years: between 1990 and 2009 the urban population increased from 27% to 46% of the total (and the figure could reach 52% in 2015 and 65% in 2030, according the Chinese Academy of Social Sciences). Thirdly, the country's energy system is still based on coal, which, despite the efforts to foster hydroelectric and nuclear energy, still accounts for two-thirds of primary energy consumption and no less than 80% of electricity generation.

The results of these three factors are also widely known: in the second quarter of 2010 China became the world's second-largest economy, ahead of Japan; its energy consumption is on the verge of becoming the world's largest, edging ahead of the US (it almost did in 2009, according to Chinese sources, despite estimates suggesting otherwise by the International Energy Agency); in 2006 China became the world's biggest producer of carbon dioxide (CO₂) emissions and it has been the leading producer of sulphur dioxide emissions (SO₂) and nitrous oxide (NO_x) emissions for years. The air in Chinese cities is especially dense with particles in suspension. In addition to the serious water pollution, there is a problem of drought, especially in northern China. Desertification and pollution have triggered a grave degradation of soil in much of the territory. To make matters worse, given China's sheer size, the deterioration of its environment threatens the planet as a whole, since, based on economic growth, urbanisation and energy consumption forecasts for the next few decades, the underlying factors in this deterioration can only get worse.

The Environmental Nightmare

The environmental situation in China is a real nightmare (experts sometimes refer to a dystopia or perverse utopia).

In the first place, this is because of how serious the situation is. Suffice to briefly overview some striking additional data. With regard to air pollution, 13 of the 20 most polluted cities in the world (by PM10 particles) are Chinese, with Tianjin, Chongqing, Shenyang, Zhengzhou and Jinan worth a special mention, although the three cities with the worst air quality in the world are not Chinese: they are Cairo, Delhi and Kalkotta. Thirteen per cent of urban mortality is premature and due to air pollution (causing 750,000 deaths per year). And this without including the pollution inside homes in rural areas, due to the burning of solid fuels, which is thought to shorten the life of more than 3 million people. Greenhouse gas emissions (especially CO₂, SO₂ and NO_x, as well as methane), due, above all, to coal consumption and cement production, as well as unleashing serious effects in global warming, have triggered changes in the country's climate, increasingly violent storms and the worrying thawing of the glaciers in the Tibetan plateau, which supplies more than a billion people with water.

The pollution of water courses with heavy metals because of the activity of refineries and furnaces is no less significant: according to official figures, half of the water in China's rivers and 75% of the water in its lakes is of very poor quality (suitable for industrial consumption at best); according to these figures, a quarter of China's water resources are so gravely polluted as to be unfit for any purpose; it is thought that 190 million people drink water that makes them ill (and that 60,000 children die every year from diarrhoea due to consuming poor-quality water) and 30% of the cities have no urban waste treatment plants. It is also estimated that pollution already affects 90% of China's underground water sources.

The global impact of pollution in China is huge, in light of the country's massive economic and demographic scale, its rapid economic growth and the precarious situation of the global climate and global resources. China now accounts for almost a quarter, not only of global energy consumption, but also of global CO₂ emissions, although per capita emissions remain low (in 2009, according to figures from the Dutch Environment Agency, which tend to be higher than the rest, per capita emissions were 6.1 tonnes, vs. 7.9 tonnes in the EU-15 and 17.2 tonnes in the US, higher than those of France). China's environmental impact on eastern Asia is, clearly, huge: cross-border pollution leads to, among other things, acid rain in Korea and Japan, a significant presence of mercury in the Gulf of Thailand and the broad dissemination of particles in the area (which even cross the Pacific to the US).

The forecasts for the next few decades suggest that the pace of urbanisation in China is set to continue increasing. A report published in 2009 by the consultants McKinsey & Co. projected that migration from rural areas to cities will involve 350 million people from now until 2025, thereby doubling the country's built-up surface area; huge sums will continue to be invested in infrastructure development, and the time will come when there will be 200 cities with more than a million inhabitants. According to the forecasts in the report, the number of automobiles (31 million in 2005 and 70 million in 2010) could reach 182 million in 2020 and 337 million in 2030.¹

Environmental Protection Policies

Among the main policies launched by the Chinese government in the last few years are the following:

- A 20% reduction in energy intensity (the amount of energy per unit of GDP) during the period covered by the 11th Five-Year Plan (2006-10).
- A 10% cut by 2010 the emissions of the main air and water pollutants, measured by chemical oxygen demand (COD, in other words, the amount of water-dissolved oxygen consumed by contaminants) and by SO₂ emissions.
- A 15% increase in the part of primary energy consumption obtained from non-fossil sources by 2020.
- A 20% increase in electricity generated by renewable energy sources by 2020.
- A 40%-45% reduction in carbon intensity (CO₂ emissions per unit of GDP) by 2020 with respect to 2005.

¹ *China's Green Revolution: Prioritizing Technologies to Achieve Energy and Environmental Sustainability*, McKinsey & Co., 2009.

To meet these targets, the Beijing authorities have implemented a long list of measures aimed at fostering energy efficiency, promoting the use of green technology in automobiles and energy sources and developing a smart power grid, among other actions.

In particular, the government has provided incentives for the manufacturing and purchase of electric cars, hybrids and vehicles with smaller engines. It has provided commercial, fiscal and tariff facilities for wind and solar energy. It has launched three major clean-energy R&D programmes. It has closed factories in highly energy-intensive areas. It has issued regulations on energy savings in constructions, automobiles and electrical appliances. It is studying the possibility of introducing a coal tax and setting up an emissions exchange market, which could be launched in 2014.

Overall, in 2009 the investment in clean energy (renewables, biofuels, energy efficiency) is estimated to have exceeded US\$34.6 billion, twice the amount invested in the US, and not far off the EU total (US\$41.1 billion), according to a report by the Pew group. As a proportion of GDP, this investment was 0.39% in China, a percentage exceeded only by Spain (0.74%) and the UK (0.51%) and much higher than in the US (0.13%).² Similarly, of the US\$586 billion fiscal stimulus plan approved at the end of 2008, US\$221 billion is thought to correspond to spending linked to protecting the environment.

By creating the Ministry of Environmental Protection (MEP) in 2008 (formerly the State Environmental Protection Agency – SEPA), the central government has tried to override the powerful interests of local governments (provincial, regional and municipal), sometimes opposed to Beijing’s environmental policies.

Furthermore, in February 2010 the MEP, the National Bureau of Statistics and the Ministry of Agriculture published the first major pollution census, in an unprecedented exercise of transparency. Equally new is the fact that the authorities are beginning to report on public protests relating to environmental issues: the Environment Minister last year said that public protests had increased at a rate of 30% per year.

The Results and an Assessment

In 2009, China became the world’s biggest wind-power market and the leading solar panels manufacturer and builder of nuclear plants. It is thought that the installed capacity of renewable energies in China is now the world’s largest, ahead of the US (52.2GW, vs. 49.7GW, of the global total of 250GW), although it is still well below that of the EU as a whole (87.6GW). Excluding hydroelectric power, China’s capacity doubled that of the US at the end of 2008.

As for the degree of compliance with quantitative objectives, the official figures indicate that energy intensity had decreased by 16% at the end of 2009, with respect to 2005. The slight increase (0.9%) in this indicator during the first half of 2010, due to the development of heavy industry under the fiscal stimulus plan, could make it miss its target 20% reduction. However, according to MEP data, at the end of 2009 COD was down 9.66% and SO₂ emissions had fallen by 13.14%, with respect to 2005.³ Between 2000 and 2009, according to figures from UNDP and BP, the part of primary energy consumption not

² *Who Is Winning the Clean Energy Race? Growth, Competition and Opportunity in the World Largest Economies, The Clean Energy Economy & The Pew Charitable Trusts*, Washington DC, 2010.

³ ‘Explore a New Path to Environmental Protection and Promote Green Development’, speech by the Environment Minister Zhou Shengxian (MEP) on Environment Day, 4/VI/2010.

originated by fossil fuel sources (hydroelectric and nuclear) increased from 6.7% to 7.1%, a small advance, so more efforts will be needed to attain 9% in 2015 and, in particular, 15% in 2020. In contrast, in 2007 hydroelectric and nuclear electricity accounted for 16.7% of the total, so it looks on track to reach 20% in 2020. Lastly, with regard to CO₂ emissions, between 1990 and 2007 they increased from 11% to 21% of the worldwide total, while the US's emissions decreased from 23% to 20% of the total and the EU's from 19% to 13%. The experts consider that Chinese emissions will continue to increase at least until 2030. In the McKinsey report, the best-case scenario puts emissions 10% higher in 2030 than in 2005, but this is less than half what the figure would be without China's ambitious energy savings and emissions control measures. Carbon intensity in China's GDP will depend on the general economic performance in the next 10 years, so it is still too soon to make forecasts.

Apart from quantitative results, other studies show that greenhouse gas emissions have worsened, air quality (PM10) has remained more or less constant, river water quality has improved slightly and drinking water access has improved substantially.⁴

There are still serious problems in various sectors: there is unused surplus wind power capacity; so far, the development of solar energy has been scant; there is still no tax on coal and no emissions market; local governments still wield too much power, which could jeopardise the central government's initiatives, etc. In particular, the opposition of local administrations is a major obstacle. Some analysts even advocate directly placing the provincial and municipal environmental protection agencies under the control of the MEP.

Conclusions: China's central government appears to have finally realised that progress towards a low-carbon consumption economy is not only necessary to reduce pollution but will actually be useful to guarantee energy security and create jobs. Furthermore, Beijing is now aware that, if environmental accidents continue to increase and at least the most serious problems are not dealt with firmly, the increasing pollution may become a serious trigger of social unrest.

Accordingly, the measures implemented in the last few years to curb the deterioration in the environment are, generally speaking, quite ambitious and much stricter and more numerous (especially in light of the degree of economic development in China) than is usually thought in the West.

However, considering the huge environmental problems in the country and the expected economic growth, urbanisation and energy consumption in the next few decades, these measures may seem insufficient. At least that is the widespread view among environmental analysts. Nevertheless, what we have seen here appears to suggest that China is on the right track and that its short- and medium-term objectives will likely be met, although some of them may require additional efforts.

To those who say that the objectives proposed by China are, in fact, rather modest, it is worth recalling that the country's per capita income in 2009 was US\$3,100 (vs. US\$40,000 in high-income countries). And, in particular, its per capita greenhouse gas emissions are one-third of those of the US and are still much lower than those of Japan or Western Europe. Indeed, its cumulative CO₂ emissions between 1850 and 2005 were 8%

⁴ See, for instance, H. Vennemo *et al.* (2009), 'Environmental Pollution in China: Status and Trends', *Review of Environmental Economics and Policy Advance*, vol. 39, No. 2, pp. 209-30.

of the worldwide total (vs. 29% in the US and 27% in the EU). Furthermore, we should not be surprised that China has caught up with the US in total energy consumption: what should be surprising is that 310 million Americans consume the same as 1.34 billion Chinese.

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