

The Environmental Limits of Emergence

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Emerging countries arouse fascination. Since the famous but also debatable¹ study published by the Goldman Sachs investment bank² the BRICs are everywhere. In the IMF's latest growth forecasts, published in October 2007, growth in the Eurozone (2.5%), even if it is expected for the first time in a long time to exceed US growth (1.9%), remains considerably lower than that of Brazil, Russia or India (4.4%, 7% and 8.9% respectively). China's growth (11.5%) dominates the world economy in pace and in scope. In 2006, 30% of the world's growth could be attributed to emerging economy dynamics.

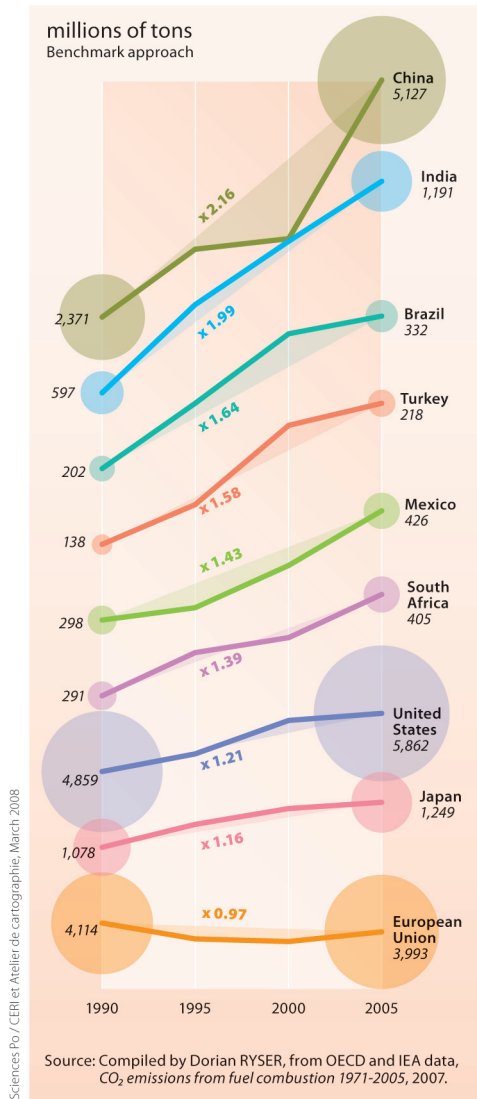
But emerging countries are also a source of anxiety. Not only because their growth is responsible for a fundamental redistribution of power across the global space, shaking up the existing international order, but also because the environmental cost of their growth poses threats to all. Although the environmental damage caused by such growth is primarily a national problem (20 of the world's 30 most polluted cities are in China),³ it also spills widely beyond their borders, making it a regional problem, (the US Environmental Protection Agency has found that nitrogen and sulphur oxides in China produce acid rain on the US west coast), and even a global one.

1 J.J. Boillot, "La 'grande transformation' de l'économie indienne et ses paradoxes." Paper given at the Futuribles Symposium: "Inde 2025. Scénarios possibles et enjeux pour la France et l'Europe" in 2007; forthcoming in a special issue of *Futuribles*.

2 Goldman Sachs, *Dreaming with BRICs: The Path to 2050*, Global Economics Paper no. 99.

3 World Bank, *China Quick Facts*, 2007.

figure 96: CO₂ emissions by country, 1995-2005



The global nature of environmental risk

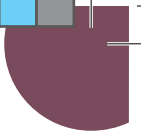
The impact of emerging country economic growth on the world's natural resources—energy, mineral raw materials, agricultural and forest products—is obvious and on the rise. China and India already represent 20% of the world's energy consumption. Twenty years from now, these two countries will be the largest importers of oil and coal. China is the second largest importer of timber after Japan.

Beyond the damage related to the rapid industrialization of emerging countries, it is the mass effect linked to their population that makes the environmental question all the more acute. Suffice it to recall Gandhi's famous words: "It took England half the resources of this planet to achieve its prosperity. How many planets will a country like India require?" Access of 2 billion people to a standard of living comparable to that in developed countries will lead to an impasse if the growth and development model relying on the intensive use of natural resources remains unchanged.

Yet not everyone shares this perception of the global nature of environmental risk. Since the Stockholm conference in 1972, developing countries have constantly opposed any definition of environmental policies that would infringe their right to economic growth and prevent their societies from attaining a standard of living equal to the Western world. This position was confirmed at the Rio conference in 1992, leading to the

notion of common but differentiated responsibilities. Emerging countries jumped on this bandwagon, but their position has reached its limits. We now know that if the most serious effects of climate change are to be avoided, world greenhouse gas emissions must be halved by 2050 in relation to their 1990 level. This goal means that even if developed countries assume their historic responsibility and cut their emissions by four, emerging countries will also have to make substantial efforts.

China and the other LDCs assembled in the Group of 77 (G77) have so far refused to take part in the international effort to make quantitative emissions



reductions, considering with good reason that their development will require increasing them, at least temporarily.

The difficulties of undertaking collective action to protect the environment with emerging countries are related to their intermediary position on the development scale. In fact, although a large segment of their populations is still far from sharing the lifestyle of developed countries, another significant portion lives by European standards.

All emerging countries have ratified the Kyoto Protocol but have not made binding commitments to reduce their greenhouse gas emissions. What we call emerging countries do not form a unified bloc. The very nature of the stakes involved in climate change vary considerably from one country to the next: Brazil for instance faces the problem of protecting the Amazon Forest, whereas China and India have to deal with the problem of industrial and agricultural pollution and rising population pressures which require the development of infrastructure (transport, etc.). In combating climate change, all efforts matter because greenhouse gas emissions have the same impact whatever their source, but they cannot be seen in isolation. They are linked to industrial and energy production systems, means of transport, forms of land use, etc. The highest producers of greenhouse gas emissions thus have a decisive impact on the modification of emissions trajectories for two reasons: first, because much of their infrastructure investment remains to be made and can thus be reoriented, and second, because an agreement on policies to apply in 15 countries (South Africa, Germany, Australia, Brazil, Canada, China, South Korea, France, India, Indonesia, Italy, Japan, Mexico, the United Kingdom, and Russia) could lead to the stabilizing of emissions in the next 15 years.

However, the perceptions of climate risk vary according to country. For the Indian political authorities, climate risk today remains an element of the diplomatic arsenal to claim their country's right to develop. Added to that is the possibility of using this risk as a bargaining chip to attract international investment. Conversely, Indian scientific and non-governmental circles have long been concerned about the negative impacts of climate change. According to IPCC (International Panel on Climate Change) scenarios, India's agricultural revenue could fall by at least 10% in the event of moderate warming (+2° C) and 25% with more pronounced warming (Kumar and Parikh 2001).

Furthermore, the country is particularly exposed to the risk of population displacement due to rising ocean levels as well as climate-related disasters. And drought is now one of the main causes of poverty. So far, Indian civil society has not managed to raise consciousness among the political class of the magnitude of the risk and the need for action on a nationwide scale.

In Brazilian political circles, there is more heightened awareness of the problem. Although 70% of this country's greenhouse gas emissions come from deforestation,





only recently has real action been undertaken to fight this process. On the other hand, Brazil's energy model—electricity generation and transport—produces very little greenhouse gas, owing to the intensive use of hydroelectricity and biomass, including alcohol and charcoal.

Brazil has played a constructive role since negotiations for the Kyoto Protocol began. It instigated the proposal to create a fund for clean development in Kyoto, which has become the Clean Development Mechanism (CDM), and it continues to be very active in the G77. The fight against climate change also mobilizes civil society, often consulted by the government to define international policy directions and local policy choices.

China: the stumbling block

If action in all the emerging countries is needed to combat climate change effectively, the international dynamics can only be relaunched if China is prodded to shift into motion.

For the IPCC, China is the second largest producer of greenhouse gas emissions in the world. According to the Netherlands Environmental Assessment Agency, it even became the world's largest producer of CO₂ in 2006.⁴ Hence nothing can be done without China's participation. However, the problem is not so much to obtain binding commitments from China as to construct realistic scenarios for transforming its model of development.

In the context of the Kyoto Protocol, negotiations hinged around the central issue of fairness in setting greenhouse gas emissions reduction targets. Kyoto established the principle of binding commitments for developed countries. These targets were relaxed by allowing recourse to market mechanisms. Developed countries could use Kyoto mechanisms to buy carbon credits from developing countries. In practice, this quest for fairness led to a deadlock: the largest greenhouse gas emissions producer, the United States, did not ratify the Kyoto process and refuses to be party to it unless the new framework contains obligations for emerging countries. The international climate change regime thus rests on integrating the two largest producers of greenhouse gas emissions: the United States today and China tomorrow.

The Kyoto rationale, founded on the idea of burden-sharing, will therefore have to be replaced by a partnership on a new development and growth model and investment to make in order to achieve it. Without eluding the question of fairness, the debate today must be refocused on financing this reorientation and especially the energy transition.

4 Netherlands Environmental Assessment Agency (2006). China is now number one in CO₂ emissions, the United States in second position.



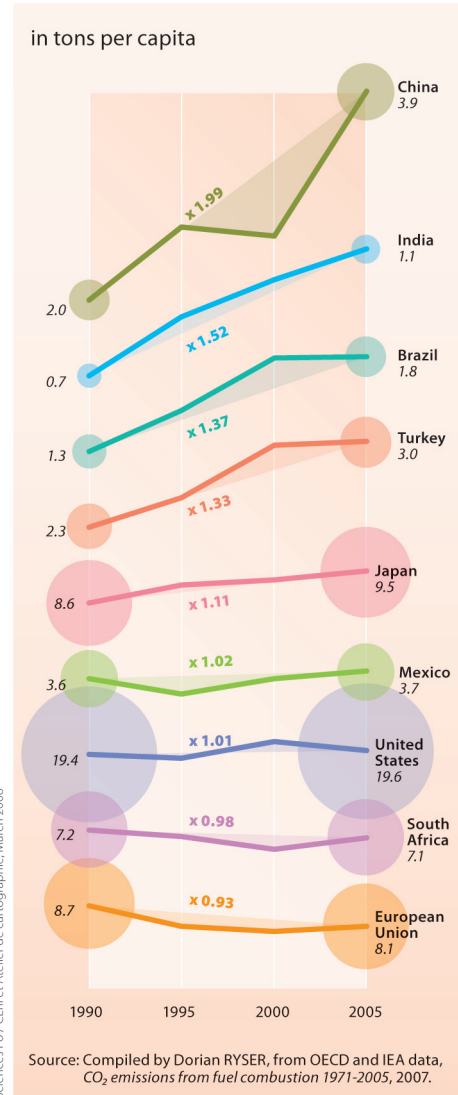


In this context, China is the essential link in the next climate agreement in the framework of a post-Kyoto regime. China is hungry for energy. The portion of coal in its energy mix is the primary factor explaining its level of CO₂ emissions. Coal represents 63% of its energy consumption, far ahead of oil (19%). It is mainly used to fuel power plants (55%), but it is also used as an energy source in the industrial (26%) and residential (4%) sectors. It accounts for 82% of Chinese CO₂ emissions.⁵

The population mass of China, a continent-sized country (1.3 billion inhabitants, or one-fifth of the world's population), corresponds to different economic and hence energy realities. On the one hand, China's economy is already the fourth largest in the world (5% of the world GDP) and already second in purchasing power parity (PPP) (14.5% of the world GDP).⁶ China is also the world's third largest trading power (9% of its exports and 6% of its imports).⁷ But per capita GDP is still low (about one-fourth of the OECD average in PPP) and China still has 105 million people (8% of its population) living below the extreme poverty threshold (one dollar per day), as well as 340 million people (26% of its population) living below the poverty threshold (less than two dollars a day).⁸ We can therefore only anticipate an increase in the demand for energy and natural resources.

China's demographic weight also accounts for a wide gap between its absolute and relative emissions levels. China produces 3.9 tons of energy-related CO₂ emissions per capita (compared with 7.5 in the European Union and 19.5 in the United States).⁹

figure 97: **Per capita CO₂ emissions, 1995-2005**



5 International Energy Agency (IEA) data.
 6 IMF data.
 7 WTO data.
 8 World Bank data.
 9 IEA data.



Last, the country's current contribution to climate change should be seen in the light of its historic responsibility for climate change. Although, according to one estimate, China has become the largest producer of energy-related CO₂ in terms of flows,¹⁰ in terms of stock, climate change remains largely the historic responsibility of OECD countries. The United States and the European Union represented 53% of the total energy-related stock of CO₂ emissions between 1990 and 2005, compared with "only" 8% for China.¹¹

These three remarks are important. They will not prevent China from having to offer a certain number of solutions to the question of climate change and its participation in the post-Kyoto regime. Indeed, if nothing is done to stop the current trend, the country will reach a per capita CO₂ emissions level equal to the European Union in 2030 (7.9 tons), and at that time, its total stock of CO₂ emissions between 1990 and 2030 will be close to that of the European Union (about 350 billion compared to 360 billion tons).¹²

By breaking down IPCC greenhouse gas emissions forecasts into subregions, it is possible to compare two scenarios. In the first, the benchmark reference, all states continue to apply the same policies in the fight against climate change. In the second, "alternative" scenario, all states participate in an international effort to reduce emissions according to their level of development. By comparing these two scenarios, we note that even in the event that all other states commit themselves, if China does not, it alone can make the level of emissions rise above what IPCC experts deem an "acceptable" (i.e. emissions leading to a moderate warming of + 2°C).

Sustainable world development is not compatible with extension to China of the energy paradigm that enabled OECD countries to develop. This observation, when made by industrialized countries, is sometimes misunderstood by the Chinese as an attempt to prohibit them from achieving the same standards as developed countries. But deploying the same development model on a world scale based on abundant use of fossil fuels and intensive consumption of natural resources will lead to an impasse. The point is that all countries must adopt another development model that is less energy-driven.

To convince oneself of this, a quick forecasting exercise will suffice.¹³ Assuming that Chinese growth stabilizes at an average of 8% per year (knowing that its growth in 2007 was 11.5% and that the IMF predicts a 10% growth in 2008), then China will have caught up with the current level of American per capita GDP in 2031. At that date, if the Chinese economy consumes as many resources per capita

10 IEA data.

11 IEA data.

12 IEA data.

13 Earth Policy Institute, *Eco-Economy Update. Learning From China: Why the Western Economic Model Will not Work for the World*, 2005.





as the American economy, China will need 99 million barrels of oil per day (20 million barrels more than the current world production of 79 million); it will also need 2.8 billion tons of coal per year (again above the current world production, 2.5 billion tons).

Chinese introspection: the internal levers for change

Until today, it has been possible to see China as one of the “weak links” in the fight against climate change. The Kyoto rationale artificially assumed two opposed categories of countries, those of the OECD and the LDCs, whereas in 1997 the geometry of negotiations was already triangular. But China could also, paradoxically, be the catalyst for unblocking climate talks. The perception of climate change is in fact changing in China. A conjunction of internal and external factors has placed the question of climate change and environmental protection on the Chinese government’s political agenda. The nascent desire to shift goals from maximizing growth rates to striving for more balanced growth patterns could lay the foundation for China’s renewed engagement in the post-Kyoto regime.

A new awareness of climate change

The country is undergoing increasing domestic pressure that is making the Chinese authorities aware of the economic and social costs of environmental degradation and prompting them to reassess the potential consequences of climate change.

Water pollution is the primary problem confronting China. Nearly half the major cities do not comply with national standards of drinking water quality.¹⁴ The water is basically contaminated by faecal matter but also by industrial and agricultural pollutants. 110 cities have serious drinking water shortages.¹⁵ According to Chinese experts (Ma Jun 1999),¹⁶ several cities in the northeast of the country could experience a complete shortage in the five coming years. About one-third of China’s rivers and streams are very polluted (level 5 or higher); three-quarters of its water bodies and one-quarter of its coastal waters are extremely polluted as well.¹⁷

Air pollution is also a serious problem in China. Only 60% of Chinese cities larger than the county level comply with national ambient air quality standards. Furthermore, owing to the 13% rise in SO₂ emissions between 2000 and 2004, the proportion of cities subject to very acid rain (pH lower than 4.5) went from 2% to 10%. Coal is responsible for about 70% of SO₂ emissions.¹⁸ According to a

14 SEPA, *State of the Environment Report*, SEPA, Beijing, 2006.

15 “Chinese mayors urged to better serve people”, *People’s Daily*, 24 June 2001.

16 Author of *China’s Water Crisis*. China Environmental Sciences Publishing House, 1999.

17 OECD, *Environmental Performance Review of China*, 2007.

18 Ibid.



study conducted in 1997 in 11 large Chinese cities,¹⁹ suspended coal particles are responsible each year for 50,000 premature deaths and 400,000 cases of chronic bronchitis.

In China, these environmental problems were long considered secondary, the absolute priority being given to economic growth. But the effects of environmental damage today largely surpass the limits of “mere” ecological issues. The repercussions on growth prospects and the state’s authority have turned the question of the environment into a major governmental concern.

As regards the economy, according to an official report published by the Chinese State Environmental Protection Administration (SEPA) and the National Bureau of Statistics (NBS), pollution problems cost China 3.05% of its GDP in 2004.²⁰ And this is a conservative estimate: according to a statement by Zhu Guangyao, former deputy director of NEPA, the figure is more likely 10% of the GDP.²¹ Water pollution is what has the heaviest negative impact on the economy (about 56% of the total cost), ahead of air pollution (43%) and that of solid waste (1%).

The Harbin catastrophe is an example of how environmental problems can have repercussions on the state’s authority.²² In November 2005, a petrochemical plant accidentally released a large quantity of benzene into a river near the city of Harbin. Local officials at first tried to minimize the importance of the environmental damage, but in the face of sometimes violent public protests, Beijing had to step in to bring about the “resignation” of Xie Zenhua, then director of NEPA. The particularly large popular demonstrations provoked by the scale of the catastrophe were not, however, isolated events. Zhou Shengxian, the new NEPA director, counted 51,000 demonstrations related to pollution issues in the country in 2005.²³

Given the economic consequences of environmental negligence and their impact on the state’s authority, Beijing is gradually becoming aware of the need to take action. In 2005, Pan Yue, deputy director of the NEPA, cautioned that “the economic miracle will soon be over because the environment will soon be unable to keep up.”²⁴

Internal dynamics in favor of the environment

The 17th Chinese Communist Party (CCP) Congress, held on 16 October 2007, showed that the environment has become a priority on the political agenda. In the

19 Beijing, Chengdu, Chongqing, Guangzhou, Harbin, Jinan, Shanghai, Shenyang, Tianjin, Wuhan, et Xi’an.

20 SEPA and NBS, *China Green National Accounting Study Report 2004*.

21 “Pollution costs equal 10% of China’s GDP”, *China Daily*, 6 June 2006.

22 For a detailed report, see Neil Carter and Arthur Mol, “China and the Environment: Domestic and Transnational Dynamics of a Future Hegemon”, *Environmental Politics* 15 (2006), 2.

23 “Wen sets out strategy to tackle environmental protection”, *Xinhuanet* 23 April 2006.

24 Interview with China’s Deputy Minister of Environment, *Der Spiegel*, 7 March 2005.





speech he gave on this occasion,²⁵ Hu Jintao, China's head of state and secretary-general of the CCP Central Committee, described in great detail the notion of "scientific development outlook" and managed to get it mentioned in the Constitution. The concept of "scientific development", which has become integrated into the party line, has three main characteristics: it should be balanced, sustainable and human. Hu Jintao has since expounded the idea of harmonious growth and circular economy on numerous occasions.

This new orientation indicates a major shift in the policy followed up to now. However, despite the centralized nature of the government, measures are not easy to implement and there is a growing gulf between the central government and local officials as to the importance that environmental questions should be given.

Quantitatively, China has made considerable efforts to protect its environment, as can be seen in the increase in environmental investments both in absolute value and in percentage of GDP. These went from about 500 billion RMB (0.4 % of GDP) in 1998 to about 2,000 billion RMB (1.4% of GDP) in 2005.²⁶

Qualitatively, China has set up tools for a national governance of the environment. It is progressively moving away from a "command and control" environmental policy and is increasingly making more room for economic instruments and nonstate actors.²⁷ China does not merely put OECD environmental governance models into practice, it also sometimes comes up with innovative solutions.

The country introduced a "green GDP" index in the city of Chongqing in 2001, and released the aggregated national results for the first time in 2006.²⁸ The green GDP index has a number of flaws (particularly the limitations inherent in its method of calculation), but it can be a useful instrument to integrate the economic and environmental dimensions of development. If the media are in a position to fulfil their information function properly and the green GDP is published on a regular and transparent basis, then it can be considered as an interesting tool to evaluate the performance of government bodies by comparing economic and environmental criteria. However, the strict control exercised by the CCP over the media does not yet enable the green GDP to fully play this role.

China is the world's largest producer of sulphur dioxide (SO₂), at the rate of 25 million tons per year. According to SEPA, these emissions are more than double the environment's absorption capacity. Since 1998, the Chinese government has established a nationwide threshold for SO₂ emissions: the ceiling sets emissions quotas

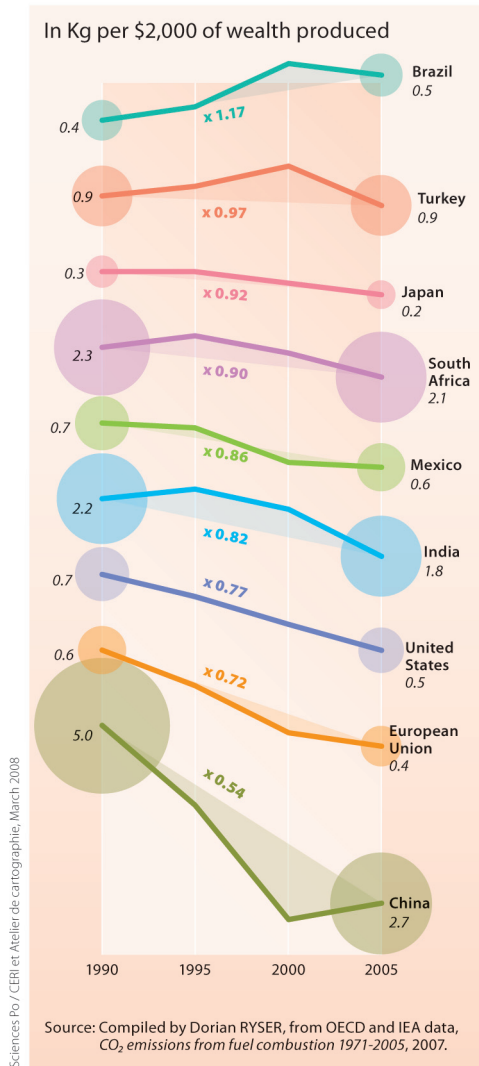
25 Xinhua English. Full text of Hu Jintao's report at 17th Party Congress 25 October, 2007.

26 Mol and Carter, *China's Environmental Governance in Transition*, 2006.

27 Economy, Elizabeth, "Environmental Governance: the Emerging Economic Dimension", *Environmental Politics*, 2006, vol.15, no. 2, pp. 171-189.

28 World Watch Institute, "China Releases Green GDP Index, Tests New Development Path", 28 Sept. 2006.

figure 98: **CO₂ emissions for \$2,000 of wealth produced, 1995-2005**



for each province. Given the relative ineffectiveness of the system, the government has decided, in addition to the quota system, to institute a market for emissions permits. Two pilot projects are currently the subject of experiments in Taiyuan and in Jiangsu province and should lead to setting up emissions permits throughout the country.

Lastly, the development of energy self-sufficient eco-cities modelled on the city of Dongtan (400 projects are on the drawing board) demonstrates China's innovative capacity as regards development and growing recourse to renewable energy sources. China today is the largest producer of solar and wind power.

These domestic pro-environmental dynamics provide important leverage for China to participate in the international emissions reduction effort. In the current context, they are even the best guarantee for an effective commitment.

International levers to engage emerging countries

In the struggle against climate change, better results are to be expected from changes in domestic development models, and thus from policies founded on domestic choices, than from the signing of global and binding agreements. But there are also international levers for change which, owing to the outward-looking nature of economic growth in emerging countries, are potentially very powerful.

The first lever relates to energy security. Growth in emerging countries has been accompanied by a rise in raw materials prices of which they are currently large consumers. This rise in prices has slowed growth in most OECD countries that also import raw materials and particularly fossil fuels, but it doubly penalizes China and India which, because of their relative energy inefficiency, consume more of the expensive energy resources such as oil. The energy intensity of industrial production in China is 20% higher than that of OECD countries.²⁹ Improved energy efficiency in China and India

29 OECD (2007), op. cit.



would entail a decrease in energy-related CO₂ emissions. OECD countries thus have a vested interest in seeing China and India improve their efficiency. They have started contributing to this progress through investment and technological cooperation via carbon markets. This trend will be more pronounced in the future.

Raw materials, once processed, are often re-exported. To justify its emissions levels, China argues that it has gradually become “the world’s factory”.³⁰ Developed countries have in fact transferred part of their “ecological footprint” to China. If the share of the total energy consumption devoted to producing goods for export is 6% in the United States and 7% in the European Union, it is 28% in China.³¹ Among these exported goods, various industrial products account for 40% of this energy, textiles and clothing for 12%, and chemical products for 10%. Data on the energy intensity reveal that goods exported by China encompass 34% of its energy-related emissions.³²

A positive image is a considerable asset for emerging countries and their multinational companies; it is all the more important for China since its MNCs conduct most of their activity for export. They therefore cannot take the risk of losing market shares, and seek to protect themselves against environmental catastrophes. The number of ISO 14001 certified Chinese companies³³ rose from nine in 1996 to about 500 in the year 2000 and over 8,800 in 2004.³⁴

Meeting international standards

International pressure is also applied in certain sectors via the demand to harmonize technical norms. In Europe, the introduction of greenhouse gas emissions policies has spawned fears of a loss of competitiveness, causing leaders to worry about possible de-localization of industries. In this context, industrialists and governments are considering measures to offset the disadvantages generated by carbon restrictions through border adjustments. Sectoral agreements are being discussed which concern the sectors most vulnerable to international competition, and which are the biggest polluters: cement, steel and aluminium. They should bring together companies in emerging countries and OECD countries as well as the governments of the most affected countries. Several versions are under study. In some of them, the adoption of more demanding technical norms, to be gradually harmonized on a world scale, should lead to the granting

30 See Yang Ailun, Greenpeace China climate change specialist, in *USA Today*: “Group: China tops world in CO₂ emissions.”

31 IEA data.

32 Gill and Kharas, *An East Asian Renaissance: Ideas for Economic Growth: Overview*, 2007.

33 Environmental management standard for organizations.

34 www.iso.org.



of carbon credits that can be traded on the market. Others have examined the possibility of developed countries funding sectoral public policies in emerging countries, resulting in mutual environmental benefits.

This prospect may help the Chinese and Indian leaders to modernize their industrial apparatus while reaping the benefits of a cooperative attitude that will be rewarded by technological cooperation and financing for this modernization.

On 1 July 2007, moreover, China cancelled export credits for 2,800 very polluting or high energy-consuming products³⁵ (including cement and steel), representing about 40% of the country's total exports.³⁶ The normalization stimulated by international demands can become an integral part of domestic policy. Indian companies, and particularly Arcelor Mittal, see in this unification of standards a way of escaping the constraints of European carbon regulations.

Protection for market access

The quantitative effects of emerging country participation in world trade are not easy to establish. In most sectors the growing participation of China, India and Brazil in trade liberalization has produced an increase in production, leading to an increase in pollution.³⁷ But the ecological relocation by OECD countries to countries such as China has not occurred on the same scale.³⁸ The WTO, via the Dispute Settlement Body (DSB), can provide incentive in cases of environmental disputes. The European Union has for instance imposed trade sanctions on Chinese aquatic products because of antibiotic residuals in the food.³⁹ These sanctions have forced the Chinese authorities to measure the cost of their environmental negligence and take steps to protect the environment.⁴⁰

Beyond that, the rise of protectionism in most developed countries can instil fear that barriers to the importation of certain products may be raised in both the European Union and the United States in the name of environmental protection. That is the crux of the debate surrounding US and French proposals to make "border adjustments" to even out competition conditions between countries that tax carbon emissions and the others. Protection of market access is thus an element that can modify environmental policies.

35 "China cuts export-tax rebate", *Wall Street Journal*, 20 June 2007.

36 "Tax rebates removed, cut to curb exports", *China Daily*, 20 June 2007.

37 OECD (2007), op. cit. Box 7.1: Ecological consequences of WTO accession: CCICED's assessment.

38 World Bank (2005), "Are Foreign Investors Attracted to Weak Environmental Regulations? Evaluating the Evidence from China." *Policy Research Working Paper Series*, 3505.

39 WTO.

40 SEPA.





Towards a global deal?

Emerging countries are more inclined than in the past to engage in the international emissions reduction effort. But China, whose participation is a condition for India's, would only agree to be party to a post-Kyoto regime if a certain number of conditions are met. And the participation of the United States is an essential prerequisite. The two countries together represent more than 40% of greenhouse gas emissions. Beyond the reality of figures, China is engaged with the United States in a power game.

Next, economic incentives must be clear. Indeed, the reorientation of China and India's growth trajectory, and in particular the financing of their energy transition, is costly, at least for the moment, since the benefits will not be reaped for a long time to come. There are solutions, particularly in terms of improving energy efficiency, even if its potential should not be exaggerated. If the fruits of efforts to preserve the environment are to benefit all, it is normal that all, emerging and developed countries alike, bear the costs.

The Clean Development Mechanism (CMD) can no longer remain the only instrument that encourages LDCs to adopt clean technologies in the post-Kyoto regime. Today, about 70 projects are being developed in China, which counts with India among the main beneficiaries of the CMD. The effort is appreciable, but the real impact of projects remains marginal. The CMD hinges on the idea of technology transfer from OECD countries to LDCs. This transfer is no longer sufficient to counter the current crisis and we must consider reforming the CMD to make it a programmatic or sectoral mechanism that could be useful in defining and applying public policies in LDCs. The reasoning in terms of technology transfer must thus be discarded in favour of another, in terms of technology co-development and dissemination.

Lastly, a "global deal", taken as a package that links China and emerging countries to the international emissions reduction effort, is necessary. This package includes a trade aspect: it is by guaranteeing emerging countries that environmental norms are not protectionist measures in disguise that this "deal" can be reached. It is by sharing the costs of energy transition in emerging countries towards clean energy sources that they will become positive actors for the world environment.



Bibliography

- Boillot J.-J., "Inde 2025, les paradoxes de la grande transformation". *Futuribles*.
- Carter, N. and A. Mol (2006). "China and the Environment: Domestic and Transnational Dynamics of a Future Hegemon". *Environmental Politics*, vol.15, no. 2, pp. 330-344.
- (2006), "China's Environmental Governance in Transition", *Environmental Politics*, vol.15, no. 2, pp. 149-170.
- Chinese Council on International Cooperation for Environment and Development (CCICED) and International Institute for Sustainable Development (IISD) (2006). *One Lifeboat: China's and the World Environment and Development*.
- Dean, J., Lovely, M. and W. Hua (2005). *Are Foreign Investors Attracted to Weak Environmental Regulations? Evaluating the Evidence from China*, World Bank Policy research working paper series no. 3505.
- Earth Policy Institute (2005). *Eco-Economy Update. Learning From China: Why the Western Economic Model Will not Work for the World*.
- Economy, E. (2006). "Environmental Governance: the Emerging Economic Dimension", *Environmental Politics*, vol.15, no. 2, pp. 171-189.
- (2004). *The River Runs Black: The Environmental Challenge to China's Future*, Ithaca, NY: Cornell University Press.
- Gill, I. and K. Homi (2007). *An East Asian Renaissance: Ideas for Economic Growth*, Washington DC, World Bank.
- Ma J. (1999). *China's Water Crisis*, Beijing, China Environmental Sciences Publishing House.
- Goldman S. (2003). "Dreaming with BRICs: The Path to 2050", *Global Economics*, Paper no. 99.
- OECD (2007). *Environmental Performance Reviews: China*, July.
- World Bank China quick facts <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIA-PACIFICEXT/CHINAEXTN/0,,contentMDK:20680895~pagePK:1497618~piPK:217854~theSitePK:318950,00.html>, <<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIA-PACIFICEXT/CHINAEXTN/0,,contentMDK:20680895~pagePK:1497618~piPK:217854~theSitePK:318950,00.html>>.
- Netherlands Environmental Assessment Agency (2006). China now no. 1 in CO2 emissions; USA in second position: <http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html> <<http://www.mnp.nl/en/dossiers/Climatechange/moreinfo/Chinanowno1inCO2emissionsUSAinsecondposition.html>>.
- SEPA (2006), State of the Environment Report, SEPA, Beijing <http://english.zhb.gov.cn/ghjh/index.htm> <<http://english.zhb.gov.cn/ghjh/index.htm>>.
- People's Daily*, "Chinese Mayors Urged to Better Serve People", June 24, 2001. http://english.peopledaily.com.cn/english/200106/24/enG20010624_73398.html.
- Xinhuanet*, "Wen sets out strategy to tackle environmental protection", April 23, 2006. <http://au.china-embassy.org/eng/xw/t248304.htm>.
- Xinhua English*, "Hu Jintao's report at 17th Party Congress, October 25, 2007", <http://www.china.org.cn/english/congress/229611.htm>.
- China Daily*, "Tax rebates removed, cut to curb exports", June 20, 2007 http://www.chinadaily.com.cn/china/20006/20/content_897889.htm.

