

MPRA

Munich Personal RePEc Archive

Reconstructing climate policy: how best to engage China and other developing countries?

Zhang, ZhongXiang
East-West Center

September 2003

Online at <http://mpra.ub.uni-muenchen.de/12830/>
MPRA Paper No. 12830, posted 18. January 2009 / 07:57

September 2003

**Reconstructing Climate Policy:
How Best to Engage China and Other Developing Countries?**

ZhongXiang Zhang
Research Program
East-West Center
1601 East-West Road
Honolulu, HI 96848-1601
USA
Tel: +1-808-944 7265
Fax:+1-808-944 7298
Email: ZhangZ@EastWestCenter.org

Abstract

Duke University organized the International Conference on Reconstructing Climate Policy: Moving Beyond the Kyoto Impasse, May 2003. The organizer invited me to specifically address the following two issues at the conference: 1) Whether is the proposal for joint accession by the U.S. and China in the interest of China?, and 2) Even if participating a global cap-and-trade regime is so beneficial to China as many economic studies suggest, why has China consistently refused in international negotiations even to discuss its participation in it?. In this paper, we look at the first issue from the following perspectives: a) how does China value importance of maintaining unity of the Group of

77?; b) what lessons has China learned from bilateral negotiations with the U.S. to work out the terms for China to get accession to the WTO?; c) what is the legitimacy of the U.S. insistence that it re-joins the Kyoto Protocol only if major developing countries join?; d) what are implications of the U.S. strikingly reversed position on the commitments of developing countries in New Delhi for initiating discussions on joint accession by the U.S. and China?; and e) how would joint accession by the U.S. and China be perceived?. We then address the second issue from the following perspectives: a) from the point of view of fairness, how do developing countries including China and India perceive emissions caps in the first place?; b) why have China and India been sceptical to international emissions trading?; c) how is an inflow of CDM investment in China perceived politically in comparison with the exports of emissions permits to the U.S.?; d) what are the implications of “lock in” to emissions cap, in particular no rules and principles for setting emissions targets for the commitment periods subsequent to Kyoto?; e) how to address the complex undertaking of setting emissions caps for developing countries, which must be linked to future, unobserved levels in comparison with the historically observed levels for industrialized countries?. Finally, the paper touches on the likely path forward.

Keywords: Cap-and-trade regime, Clean development mechanism, International climate negotiations, Kyoto Protocol, China, United States

1. Introduction

In conjunction with the release of the book titled *Reconstructing Climate Policy: Beyond Kyoto* by Stewart and Wiener (2003), Duke University organized the International Conference on Reconstructing Climate Policy: Moving Beyond the Kyoto Impasse, 11-12 May 2003. The organizer invited me to give an lead speech, specifically asking me to address the following two issues:

- Whether is the proposal for joint accession by the U.S. and China in the interest of China?
- Even if participating a global cap-and-trade regime is so beneficial to China as many economic studies suggest, why has China consistently refused in international negotiations even to discuss its participation in it?

In this paper, we will look at the first issue from the following perspectives: a) how does China value importance of maintaining unity of the Group of 77?; b) what lessons has China learned from bilateral negotiations with the U.S. to work out the terms for China to get accession to the WTO?; c) what is the legitimacy of the U.S. insistence that it re-joins the Kyoto Protocol only if major developing countries join?; d) what are implications of the U.S. strikingly reversed position on the commitments of developing countries in New Delhi for initiating discussions on joint accession by the U.S. and China?; and e) how would joint accession by the U.S. and China be perceived?. We will then address the second issue from the following perspectives: a) from the point of view of fairness, how do developing countries including China and India perceive emissions caps in the first place? Is it perceived an issue of “what is” in positive economics or an issue of “what

ought to be” in normative economics?; b) why have China and India been sceptical to international emissions trading?; c) how is an inflow of CDM investment in China perceived politically in comparison with the exports of emissions permits to the U.S.?; d) what are the implications of “lock in” to emissions cap, in particular no rules and principles for setting emissions targets for the commitment periods subsequent to Kyoto?; e) how to address the complex undertaking of setting emissions caps for developing countries, which must be linked to future, unobserved levels in comparison with the historically observed levels for industrialized countries?. Finally, the paper touches on the likely path forward.

2. Joint accession by the U.S. and China

For quite some time, the U.S. and China have pointed at the other as the culprit who is blocking the climate negotiation process. This leads to a dilemma. On the one hand, the U.S. rejects the Kyoto Protocol because it exempts major developing countries like China, Mexico and India, and thus it is conceivable that the U.S. would not re-join the international climate regime without more specific commitments than those general commitments from major developing countries. On the other hand, the U.S. withdrawal from the Kyoto Protocol leaves plenty of excess hot air of zero costs (Löschel and Zhang, 2002). This will substantially reduce incentives to invest in clean development mechanism (CDM) projects that imply reduced financial flows channelled to developing countries through CDM. Given that China is widely regarded as the dominant host country of the CDM projects (Zhang, 2000a and 2004), the significant decrease in

demand for permits as a result of the world's largest single buyer remaining outside the international market of tradable permits would lower the gain of China substantially. Against this background, some American analysts (e.g., Stewart and Wiener, 2003) suggest joint accession by the U.S. and China. This proposal does have the merit of enhancing environmental effectiveness of the Kyoto Protocol and helping stabilize the price of permits on the international market. It is certainly in the interest of the U.S. because the participation of China would substantially reduce the U.S. compliance costs and increase the environmental effectiveness. The question then is whether the joint accession proposal is in the interest of China. I doubt the prospects for China's interest in the joint accession proposal for the following reasons.

First, although broad discussions and cooperation in the field of climate change continue between China and the U.S., it is doubtful that China would be willing to discuss joint cap-and-trade arrangements with the U.S. For historical reasons, China attributes great importance to maintaining unity of the Group of 77 (G77), and engaging in discussions on joint cap-and-trade arrangements with the U.S. may well be perceived as threatening the solidarity of that Group. Developing countries, including China, insist that industrialised countries should demonstrate taking the lead in reducing their greenhouse gas emissions before developing countries even consider taking on such commitments. With the U.S. withdrawal from the Kyoto Protocol and a very low scale of overall emissions reductions in the industrialised countries during the first commitment period (2008-2012), it is unclear whether developing countries would regard their wealthy counterparts as having taken the lead by the time of the second commitment period. This

leaves it open to even get launching a dialogue on broadening future commitments on the negotiating agenda. One thing is clear, though, that when it comes to negotiating developing country commitments, it is in the interest of China to join with other developing countries and negotiate developing country commitments under the United Nations Framework Convention on Climate Change (UNFCCC). This will give China much more clout in the final collective bargaining to determine its emissions commitments.¹ International climate negotiations in Bonn and Marrakech clearly demonstrate China's devotion to the Kyoto Protocol. Table 1 shows the positions of China and the final decisions in the Marrakech Accords. It clearly shows that China is willing to give on many issues in order to keep the Kyoto Protocol alive and that China continues to aspire to be recognised as a responsible member of the international community.

¹ It is worthwhile mentioning that China had made a concession to U.S. demand for the extent of openness for markets of many products and services when undertaking a number of rounds of bilateral negotiations with the U.S. to work out the terms for China to get accession to the WTO. The reason why China gave in a great deal is because China faces both obligations and benefits from getting accession to the WTO. But the situation is quite different in case of implementing joint accession by the U.S. and China where China may well perceive only costs.

Table 1 China's Compromises in the Marrakech package

Issue	China's position	COP Decision
Fungibility between the three Kyoto mechanisms	No fungibility	CERs, ERUs, AAUs fungible
Sink provisions under Articles 3.3 and 3.4 of the Kyoto Protocol	No additional sinks credits to Annex 1 countries	Additional sinks credits given to Russia, Japan and Canada
Share of proceeds	All three Kyoto mechanisms	Only CDM
Composition of CDM Executive Board	Geographical representation	Give Annex 1 countries more representatives
Unilateral projects under CDM	Not allowed	Allowed
Nuclear projects under CDM	Allowed	Refrain from using nuclear power to generate CERs

Second, the legitimacy of the U.S. insistence that it will re-join the Kyoto Protocol or a follow-up regime only if major developing countries join as well is questionable. Given that the U.S. is the world's largest economy and emitter of greenhouse gases, it has both the responsibility for the global climate problem and the ability to contribute to solving it. To have a significant long-term effect on global greenhouse gas emissions, a global climate regime eventually must include substantial participation by developing countries. But the U.S. conditioning its commitments on developing countries' commitments is unlikely to induce participation by developing countries. In my view, unless the U.S. has made credible commitments itself, it does not have the moral right to persuade developing countries to take meaningful abatement actions. International climate negotiations prior to the U.S. withdrawal from the Kyoto Protocol suggest that U.S. taking on the commitments first and then jawboning developing countries including China had some impact on the position of developing countries and the timing of their commitments (Zhang, 2000b).²

² Prior to Kyoto, developing countries' demand for the U.S. to demonstrate the leadership and the EU proposal for a 15% cut in emissions of a basket of three greenhouse gases below 1990 levels by 2010 put collective pressure on the U.S., which leads the world in greenhouse gas emissions. At Kyoto, the U.S. had made legally binding commitments. The Kyoto target is seen as not enough but yet not unreasonable given that the U.S. economy would not be disrupted unreasonably. After Kyoto, the ball was kicked into China's court. The U.S. had made it clear that bringing key developing countries, including China, on board had been and would continue to be its focus of international climate change negotiations. According to some U.S. Senators, it will be countries like China, India and Mexico that will decide whether the U.S. will ratify the Kyoto Protocol. It is therefore conceivable that the pressure will mount for China to make some kind of commitments at the negotiations subsequent to Buenos Aires. The world's media will undoubtedly bring attention to China's non-participation, which will be seen as holding up the ratification of the Protocol by the U.S. Senate and possibly even be blamed for "blowing up" subsequent negotiations aimed at dealing with developing countries' commitments. The U.S. commitments at Kyoto and diplomatic and public pressure on China had put China in a very uncomfortable position. It looked like China would be

Third, developing countries have been sensitive to commitment issues, and the U.S. position at the eighth Conference of the Parties to the UNFCCC in New Delhi makes the launching of a dialogue on broadening future commitments difficult, not to mention to ask developing countries to take on commitments. The U.S. strikingly reversed the position on the commitments of developing countries in New Delhi in comparison with the position at Kyoto. At Kyoto, the U.S. called for stronger action by developing countries, but in New Delhi declared such discussion about developing country's commitments premature. This would have long-term implications because developing countries would defend their position using this argument in the future when being asked to take on commitments. This certainly complicates initiating discussions on joint accession by the U.S. and China.

Fourth, the U.S. withdrawal from the Kyoto Protocol does nothing but erode trust and reinforce the stalemate between the North and the South, and it is difficult to imagine that China and India would assume emissions targets before the U.S. re-entry into Kyoto or a follow-up regime. Doing so would be perceived as rewarding the U.S. for disregarding the Protocol.³

pressured to take on commitments at much earlier date than what China wished (Zhang, 2000b). This situation has changed once the U.S. withdrew from the Kyoto Protocol.

³ The U.S. uses its re-entry of the Kyoto regime as a leverage to take on less stringent targets in the later commitment periods.

3. Why has China consistently refused in international negotiations even to discuss its participation in a global cap-and-trade regime?

Being the world's most populous country, China is a large greenhouse gas emissions source that grows rapidly in line with its industrialisation and urbanization, and has a great deal of low-cost greenhouse gas abatement options. That explains why many economic studies by Zhang (2000a and 2004) and those examined by Stanford University's Energy Modeling Forum (Weyant, 1999) show that China would reap significant benefits from participating in a global cap-and-trade regime. Even if such a regime is so beneficial to China, why has China consistently refused in international negotiations even to discuss its participation in it? In my view, there are at least five reasons for China's stance.

First and most importantly, participating emissions trading requires countries to take on emissions caps and developing countries including China and India consider it unfair to impose on emissions caps on developing countries in the first place until Annex 1 countries give clear signs that they have taken the lead required in cutting their greenhouse gas emissions. They regard their emissions as survival emissions and those from Annex 1 countries as luxury emissions. Many economic studies (Weyant, 1999; Zhang, 2000a and 2004) premise that China would take on emissions caps and then calculate what outcomes would be for China. This is a classical way to address an issue of "what is" in positive economics. But China may not consider it as an issue of "what is". Rather China may consider it as an issue of "what ought to be" in normative economics. Moreover, more than half the G77 are even more vulnerable to climate change than the

peers in the Group and thus demand deeper cuts in emissions to prevent dangerous climate change. Given China's desire for the unity of the G77, maintaining a united G77 front would necessitate taking their interests into account. Pushing for stringent commitments by Annex 1 countries is just to that end and appears a better negotiation tactic to pursue than demanding more generous targets for developing countries themselves, in particular given that the current emissions commitments by Annex 1 countries are far short of what developing countries called for at Kyoto and had been relaxed substantially by allowing significant sinks credits in Marrakech Accords.⁴

Table 2 Quantitative Implications of the Marrakech Accords

Region ^a	Baseline emissions (MtC)		Nominal reduction (% wrt 1990)		Effective reduction (% wrt 2010)		Absolute cutback (MtC wrt 2010)	
	1990	2010	w/o sinks	w/t sinks	w/o sinks	w/t sinks	w/o sinks	w/t sinks
AUN	88	130	-6.8	-9.4	27.6	25.9	36	34
CAN	126	165	6.0	-5.2	28.2	19.7	47	32
EUR	930	1040	7.8	6.2	17.5	16.1	182	168
JPN	269	330	6.0	1.1	23.4	19.4	77	64
EEC	279	209	7.1	4.9	-24.0	-26.9	-50	-56
FSU	853	593	0	-4.2	-43.8	-49.8	-260	-296
Total w/o US ^b	2545	2467	4.3	0.9	1.3	-2.2	32	-54
USA	1345	1809	7.0	3.7	30.9	28.4	558	514
Total w/t US ^c	3890	4276	5.2	1.9	13.8	10.8	590	460

⁴ Significant sinks credits allowed in the Marrakech Accords relax the emissions targets substantially. Table 2 contains the nominal percentage reductions with respect to (wrt) 1990 emissions levels and the effective percentage reductions with respect to baseline emissions in 2010 for both the original Kyoto emissions targets and the revised targets under the Bonn Agreement and the Marrakech Accords. As a result of allowing countries to count the amount of sinks credits, the average reduction target for the Annex B countries as a whole is reduced to 1.9 percent, in comparison with the original reduction target of 5.2 percent (Löscherl and Zhang, 2002).

^a AUN – Australia and New Zealand; CAN – Canada; EUR - OECD Europe; JPN – Japan; EEC - Central and Eastern European countries; FSU - Former Soviet Union.

^b Annex B total without the U.S. ratification.

^c Annex B total with the U.S. ratification.

Source: Löschel and Zhang (2002).

Second, China and India have been sceptical to international emissions trading. First, they are not convinced that international emissions trading would lead to actual reductions in emissions; instead, it would merely shift reductions overseas and is seen to be a way for industrialized countries to avoid undertaking costly abatement actions at home.⁵ Second, China and India regard the present rather arbitrary allocation of assigned amounts to industrialised countries based on historical emission levels under the Kyoto Protocol as attempts to create new property rights for the atmosphere. At the international climate negotiations, they made it clear that any trading under Article 17 of the Kyoto Protocol does not bestow rights or entitlements to Annex B countries (UNFCCC, 1999). China and India insist that before emissions trading commences, the entitlements of both developed and developing countries have to be defined (Sharma, 1998). Third, China may consider that benefits of CDM projects are real and at the same time, may perceive the positive outcomes that have been demonstrated in domestic emissions trading elusive. In principle, greenhouse gases offer an even more attractive case for application of emissions trading than many local pollutants already well handled with emissions trading. However, at the international level, emissions trading is untested. The successful U.S. SO₂ Allowance

⁵ In his statement to the COP3, Chen Yaobang, head of the Chinese delegation, rejected emissions trading and joint implementation schemes, insisting that these schemes were unacceptable because they would allow industrialised countries to shirk their responsibilities of cutting emissions at home while disregarding the living's environment of people in other countries (People's Daily, 1997).

Trading Program cannot just be transplanted to the international terrain where legal and institutional ingredients differ substantially from those in the U.S., not to mention no institutional supports for operating emissions trading in place in the majority of developing countries. This leaves it doubtful that China would perceive that emissions trading would work in practice to its advantage.

Third, China may perceive an inflow of CDM investment in China much less politically sensitive than the exports of emissions permits to the U.S.. In practice, CDM investment is most likely to be a climate component added to existing and future FDI (foreign direct investment) projects. Even in the optimistic case where the U.S. were in the Kyoto Protocol, the total inflow of CDM investment in China in 2010 would be estimated to be a value of US\$ 1.7 billion even in the optimistic case of full global emissions trading (Zhang, 2000a). This is only few percentages of the current total FDI in China, which amounted to US\$ 52 billion in 2002. FDI has been serving as a powerful engine driving China's economic growth, and is perceived positively both inside and outside China. Binding with FDI would make an inflow of CDM investment in China become less explicit from those who regard CDM as "foreign aid".⁶ By contrast, the U.S. has already had huge trade deficit with China, and exporting a large volume of surplus permits from China to the U.S. would further deteriorate the U.S. trade balance sheet with China.⁷

⁶ Rep. Bill Archer (R-Texas), Chair of the House Ways and Means Committee, for example, said that "It is another form of foreign aid" (*Congressional Quarterly*, 29 November 1997).

⁷ McKibbin and Wilcoxon (2002) suggest that massive exports of permits would lead to appreciation of the exporting country's exchange rate and a decline in its exports other than permits. If China's exports of permits to the U.S. would counteract a decline in

Fourth, China is concerned about the implications of “lock in” to emissions cap, in particular no rules and principles for setting emissions targets for the commitment periods subsequent to Kyoto. With the EU bubble treating its poorer member countries more leniently⁸ and the Russia Federation widely perceived to have been granted generous targets at Kyoto, it is conceivable that industrialized countries will use the same tactics to bribe developing countries, giving them more generous emissions targets to enlist them to assume emissions commitments. No doubt, granting generous targets would be much less unattractive to developing countries than asking more stringent targets. Developing countries can even gain in the short term, provided that their targets are set even above their business-as-usual levels. But once developing countries assume emissions commitments, they are expected to take even more stringent targets over time, which are generally reviewed by developing countries themselves as impeding their economic development prospects. What matters is the balance between this short-term benefits and

China’s exports of goods and services to the U.S., then the U.S. trade balance sheet with China would not be deteriorated.

⁸ The 15 member countries of the EU are each listed with an 8% reduction from 1990 levels in Annex B to the Kyoto Protocol. In June 1998, the EU Council reached an agreement under which the commitments are redistributed among its member countries under the bubble provision as specified in Article 4 of the Protocol. This will now serve as the basis of EU ratification and the redefined targets will become the “quantified emission limitation and reduction commitments” for each EU member country under the Protocol. Comparing the differentiated targets with the EU common 8% reduction commitments, we can see that the redistribution of the commitments has allocated more assigned amounts to the poor countries, whose emissions are expected to rise fast, than their allowed levels under the Protocol. By permitting a 25-27% increase in emissions to Greece and Portugal, the EU internal burden sharing of its Kyoto commitments among the member countries clearly indicates that poorer countries should be treated more leniently. If Greece and Portugal can have this sort of rise, it would be very difficult for the EU to reject the demand from the really poor, that is, developing countries, for a not unreasonable leeway in emissions.

the perceived long-term costs to developing countries in terms of restrictions to future economic growth. In this regard, rules and principles for setting emissions targets for the commitment periods subsequent to Kyoto would help developing countries to make informed decision on whether to take on commitments. Unless such principles are put in place, developing countries would be reluctant to assume commitments in the first place, even if hardly challenging.

Fifth, although many economic studies show that China would reap significant benefits from participating a global cap-and-trade regime, they don't really address the complex undertaking of setting emissions caps for developing countries. Emissions targets of Annex B countries are set against their historically observed levels. But for developing countries, their living standards are still very low in comparison with their industrialized counterparts, and they have legitimate demand for further development and economic growth. Thus, unlike Annex B countries, their targets, if any, must be linked to future, unobserved levels. Moreover, developing country economies tend to fluctuate more than those of industrialized countries. This will lead to considerable uncertainties over their economic growth rates and thus emissions projections. No doubt, the uncertainties would encourage developing countries to assume very pessimistic emissions targets when they are asked to take on commitments, thus raising great concern about the danger of generating "tropical hot air".

4. The path forward

Current international negotiating process is best characterised as pledge-based: countries formulate their national positions and negotiate in their own self-interests, voluntarily making commitments at their sovereign discretion (Baumert and Kete, 2002). Consequently, the bottom-up negotiated results are mainly influenced by bargaining power and economic might rather than by objective criteria. With the Kyoto Protocol poised to enter into force, discussions of what comes next gain increasing legitimacy, given that the Kyoto targets are only the first step towards addressing long-term global climate issue. At this conjecture, it is worthwhile rethinking international negotiating process and seeing whether it should continue to follow the pledge-based approach. In my view, current allocation of assigned amounts under the Kyoto Protocol is too arbitrary and is not a promising approach to getting developing countries to assume emissions commitments for a number of reasons. First, in China and India's view, starting from the status quo is hardly seen as equitable. Second, assigned amounts of Annex 1 countries under the Kyoto Protocol were set rather arbitrarily, and it does not set a good model. Third, the current approach involves too costly negotiations and is highly sensitive to bargaining power. Fourth, even if 37 Annex 1 countries could barely agree very small reduction at Kyoto, what evidence is there that over 180 countries will be able to agree much sharp reduction to meet UNFCCC's ultimate objective? All this clearly calls for objective indicators-based (either quantitative or qualitative), fair and equitable allocation of emissions targets in the future to avoid reducing everything to politics which happened in Kyoto. These objective indicators should measure wide differences in national circumstances and avoid a stalemate in which every country claims its unique circumstances. The equity principle should also be reflected. Otherwise, the large

disparity in per capita carbon emissions between the U.S. and China becomes unimportant, while a disparity between the U.S., who would be required to reduce emissions, and China, who would not, becomes paramount. International negotiating process tends to suggest that rule-based approach works, as demonstrated in the case of differentiation of emissions targets among EU member countries. What set of rules would be adopted in the end is certainly a matter open to negotiation. For example, once a country reaches a threshold level of ability to pay or responsibility, it would be required to assume emissions limits. Once agreed, such rules would mitigate some concern about the evolution of commitments over time, and would help developing countries to make informed decision on assuming commitments. Moreover, making rules clear also helps to smooth out fluctuations in the price of permits over time. For example, anticipating accession of bigger suppliers in the later period that would reduce the future price of permits, current suppliers of permits would adapt their behaviours by selling more permits now instead of banking them for sales later in order to maximum their gains.

Moreover, in order to better reflect the specific needs and circumstances of developing countries, participation could take different forms. Although current debates on developing country commitments have overwhelmingly focused on emissions caps, other forms of commitments that are more explicitly linked to needs, responsibility and development objectives of developing countries need to be considered to enlist wider participation. In my view, other commitments than emissions caps could be a useful step towards assuming emissions caps, in particular for the majority of developing countries who are still at the low level of development. Even if these countries reach a threshold level of taking on

emissions caps, the caps could be initially made non-binding. Clearly, through a series of gradual steps, this approach encourages broad participation and builds the trust and confidence on accepting legally binding emissions targets in the future. This is probably the best way to encourage China and other major developing countries to take on increasing degree of responsibility over time, which eventually leads China and other major developing countries to assume emissions targets.

Acknowledgments

This paper was originally written as the invited lead speech at the International Conference on Reconstructing Climate Policy: Moving Beyond the Kyoto Impasse, 11-12 May 2003, Duke University, and was subsequently presented at the International Conference on Climate Policy after Marrakech: Towards Global Participation, 4-6 September 2003, Honolulu, USA. It has benefited from useful discussions with Jonathan Wiener at Duke University and Richard Morgenstern at the Resources for the Future. That said, the views expressed here are those of the author. The author bears sole responsibility for any errors and omissions that may remain.

References

Baumert, K.A. and N. Kete (2002), Introduction: An Architecture for Climate Protection, in K.A. Baumert, O. Blanchard, S. Llosa and J.F. Perkaus (editors), *Building on*

- the Kyoto Protocol: Options for Protecting the Climate*, World Resources Institute, Washington, DC.
- Löschel, A. and Z.X. Zhang (2002), The Economic and Environmental Implications of the US Repudiation of the Kyoto Protocol and the Subsequent Deals in Bonn and Marrakech, *Weltwirtschaftliches Archiv - Review of World Economics*, Vol. 138, No. 4, pp. 711-746.
- McKibbin, W. J. and P.J. Wilcoxon (2002), *Climate Change Policy After Kyoto: A Blueprint for a Realistic Approach*, Washington: The Brookings Institution.
- People's Daily (1997), Head of the Chinese Delegation Expounds China's Stance on Global Climate Change, Overseas Edition, December 9.
- Sharma, A. (1998), *Climate No Headway. Down to Earth 7*, Centre for Science and Environment, New Delhi.
- Stewart, R.B. and J.B. Wiener (2003), *Reconstructing Climate Policy: Beyond Kyoto*, American Enterprise Press, Washington, DC.
- UNFCCC (1999), Mechanisms Pursuant to Articles 6, 12 and 17 of the Kyoto Protocol: Synthesis of Proposals by Parties on Principles, Modalities, Rules and Guidelines – Note by the Chairman, United Nations Framework Convention on Climate Change (UNFCCC), FCCC/SB/1999/INF.2/Add.2, Bonn.
- Weyant, J.P. (ed., 1999). The Cost of the Kyoto Protocol: A Multi-model Evaluation. *Energy Journal*, Vol. 20 (Special Issue on the Cost of the Kyoto Protocol), pp. 1-398.

- Zhang, Z.X. (2000a), Estimating the Size of the Potential Market for the Kyoto Flexibility Mechanisms, *Weltwirtschaftliches Archiv - Review of World Economics*, Vol. 136, No. 3, pp. 491-521.
- Zhang, Z.X. (2000b), Can China Afford to Commit itself an Emissions Cap? An Economic and Political Analysis, *Energy Economics*, Vol. 22, No. 6, pp. 587-614.
- Zhang, Z.X. (2004), Meeting the Kyoto Targets: The Importance of Developing Country Participation, *Journal of Policy Modeling*, Vol. 26, No. 1, pp. 3-19.