

Advances in Climate Change Research

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International Adaptation Activities and Considerations for China

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Abstract: Bali conference, the 13th Conference of the Parties (COP13) under the United Nations Framework Convention on Climate Change (UNFCCC), indicated that both mitigation and adaptation are key issues for climate change combating, and decided to carry out a series of plans to implement adaptation actions and to improve adaptive capacity. The development and understanding of adaptation issues are introduced based on the progress of the UNFCCC conference. The COP13 negotiation related to adaptation activities is mentioned. China's future considerations for adaptation are discussed as well. The analysis indicates that taking adaptation action is more urgent for developing countries. However, how to collect and allocate the adaptation fund may need a difficult and long time negotiation between developed and developing countries, and among developing countries.

Key words: climate change; adaptation; progress; suggestion for action

A Review and Analysis of International Technology-Oriented Agreements

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Abstract: International technology-oriented agreements (TOAs) gain more and more attention, through promoting technology transfer and raising technology level to deal with climate change problems. Based on the brief introduction to TOAs, this paper evaluates its value and limitations. Finally, the paper gives the prospects of TOAs, and points out that TOAs should focus on environment-friendly technology transfer from developed countries to developing countries in order to promote the North-South cooperation to a higher level and to realize the sustainable development of developing countries. Some suggestions for China to participate in TOAs are also given.

Key words: international technology-oriented agreements; climate change; sustainable development

Key Elements of the New Stern Report and Their Implications

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Abstract: In October 2006, the UK published “Stern Review: The Economics of Climate Change”, in which the authors (Stern et al.) highlight the urgency of global actions to address climate change, emphasize that the early and deep reduction of greenhouse gas (GHG) emissions is necessary to avoid the large economic losses resulted from the global temperature rising over 2°C, and state that the costs of reduction are moderate. In April 2008, Stern put forth a new report to discuss the elements of the global climate regime beyond 2012 to achieve the above objective, which could be influential to subsequent international negotiations. In this paper, based on the comparison of characteristics of the two reports and their linkages, some key elements of the new report, such as basic principles for the design and evaluation of international climate regime, the long-term objective of global emission reduction and burden sharing, the participation of developing countries, and international policy incentives related to finance, technology, market and adaptation, the emissions reduction from deforestation, and policy implementation and institutional construction, are reviewed and analyzed in more details. The insights from the new report could illuminate the further research work in this field and the China’s strategy to participate in the international climate negotiations.

Key words: Stern report; international climate regime beyond 2012; international climate negotiations

Energy Policy and Climate Change Strategy in UK——From Energy White Paper in 2003 to White Paper on Energy in 2007

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Abstract: From Energy White Paper: Creating a Low Carbon Economy (2003) to Meeting the Energy Challenge: a White Paper on Energy (2007), climate change policies in UK changed subtly. The position changed from focusing on domestic reduction to emphasizing internationally joint action to combat climate change. The reasons for this change are: 1) greenhouse gases, especially carbon dioxide emission in UK was rebounded due to various reasons, and the further reduction is ambiguous; 2) UK becomes increasingly dependent on imported fuel; 3) UK worries about that the effectiveness of its domestic reduction might be offset by additional emission from the developing world. As for energy policies, UK becomes more practical.

Key words: UK; energy policy; climate change strategy

Parties Views and Suggestions for Land Use, Land-Use Change and Forestry Rules for the Second Commitment Period

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Abstract: Enhancing carbon sequestration in land use, land-use change and forestry (LULUCF) is

one of the most important means to reduce the growth rate of greenhouse gas concentrations in the atmosphere. It took 4 years (1997-2001) to reach agreement on definitions, modalities, rules and guidelines related to LULUCF activities under the Kyoto Protocol. In 2008, international community began to negotiate how to treat LULUCF rules for the second commitment period. The views on means to achieve mitigation objectives of Annex I Parties are summarized. The main position from developed countries is to offer more incentives to reduce emissions and enhance removals, to reduce the complexity of LULUCF rules and the costs, and to include more eligible activities under Article 3.4 of Kyoto Protocol. The aim is to utilize more carbon sinks generated by LULUCF activities to fulfill the emission reduction commitment. The main position from developing countries is to consider the emission and uptake from LULUCF activities symmetrically. At the end of this paper, suggestions on the development of LULUCF rules for the second commitment period are proposed.

Key words: the second commitment period; LULUCF; rules; policy suggestions

Soil Organic Carbon Stock, Dynamics and Climate Change Mitigation of China

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Abstract: This paper overviews the studies on soil organic carbon (SOC) stock and dynamics of China's soils since the fulfillment of the second national soil survey, and focuses on the significance of climate change mitigation in China. The status of SOC stock and the dynamics of China are characterized of a relatively low C storage with a large regional variability, a definite overall trend of C enhancement, and a significant sequestration potential in the future, which can be realized through a sound climate policy and the adoption of the best management practices in agriculture. Increasing investment in C sequestration research and technology development, improving policies and incentives for enhancing C sequestration, and the innovation and extension of climate-friendly agricultural systems should be pursued for a win-win effect in enhancing both the productivity of China's agriculture and climate change mitigation.

Key words: China; soil organic carbon stock; climate change; carbon sequestration; croplands

The Possible Impacts of Climate Change on Water Security in China

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Abstract: Global warming has become an important environmental issue, and the water resource is the most direct sector affected by climate change. Global warming will alter the spatial distribution of water resources through accelerating hydrological cycle. In further, shortage in water resources would become more obvious, aquatic environment systems would be more

deteriorated, and flood threats would be aggravated as well. Possible impacts of climate change on water security are discussed in this paper from the aspects of flood-prevention, water supply, aquatic environment, and water engineering security.

Key words: climate change; water security; impact

China's Energy Demand and Greenhouse Gas Emission Scenarios in 2050

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Abstract: Mid- and long-term energy demand and greenhouse gas (GHG) emission scenarios in China were analyzed using the IPAC model. The main parameters and results for the scenarios are introduced, and policy options assessed in the model are also presented in this paper. At the same time, the emission mitigation technologies are reported. With the rapid development of economy in the future, energy demand and CO₂ emission in China will also increase quickly. Compared with 2005, energy demand may increase by 1.4 times in 2030 and by 1.9 times in 2050. However, we do see ample opportunities for China to make the emission stable after 2020 without large increase, and even begin to decrease after 2030.

Key words: emission scenarios; energy; climate change; model

Energy Saving and Emission Reductions: Their Significance to China's Transition to a Low-Carbon Economy

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Abstract: China has taken a catching-up-type or rapid industrialization road since the reform and opening in 1978. With rapid economic growth, all kinds of resources and environmental problems, which normally arose in various phases over a 100-year course of industrialization in developed countries, have concentratedly appeared in China. Facing the bottlenecks of economic growth—the shortage of resources, environmental pollution, and climate change etc., China put forward specific targets of energy saving and emission reductions in the 11th Five-Year Plan. The article firstly outlines the background of setting energy saving and emission reductions targets in the 11th Five-Year Plan and analyzes the significance of controlling greenhouse gas emissions, then sums up achievements and difficulties in current energy conservation and emission reductions work, and finally puts forward policy suggestions for the development of a low-carbon economy in China.

Key words: energy saving and emission reductions; climate change; low-carbon economy

Provincial Climate Change Program: Hubei Case Study and Its Policy Implications

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Abstract: Addressing climate change requires local actions. Climate change vulnerabilities in Hubei and the growth of energy demand along with economic development were investigated in this study, in line with the 11th Five-Year Plan for economic and social development in Hubei Province and China's National Climate Change Programme. A provincial level program was proposed for climate change adaptation and mitigation. Three emission scenarios were considered for understanding the potential of emission reductions up to 2020, with 2005 as the base year. As an integral part of the national energy and economic pattern, actions in Hubei on climate change should be concerted with national plans and strategies to maximize emission reduction potential not only for the Hubei Province itself but also for the country as a whole.

Key words: addressing climate change; regional climate change program; Hubei Province

The Important Support Role of NSFC in Promoting the Climate Change Research in Atmospheric Science

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Abstract: Climate change has become a major global issue of common concern to the international community. As a national institution financing basic research and some applied basic research, the National Natural Science Foundation of China (NSFC) has not only participated in the formulation of a series of policies to address climate change, but also supported the research in the key scientific fields of climate change. In this paper, the statistic analysis on the climate change research supported by NSFC in atmospheric science from 1986 to 2007 is introduced in four levels (General Program, Key Program, Major Program, Major Research Plan). Since 1986, NSFC has funded 506 projects related to climate change research and 243.043 million RMB yuan. This reflects the important support role of NSFC in promoting the climate change research to some extent. The further investment on climate change research is also prospected.

Key words: NSFC; atmospheric science; climate change