
Editorial

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Biographical notes: Lan-Cui Liu is a Professor at the Chinese Academy for Environmental Planning. She holds the PhD in Management Science & Engineering from University of Science and Technology of China in 2006. Her main research interests are carbon emissions evolution characteristics, environmental impacts of household consumption, co-benefits of air pollution and greenhouse gases emissions reductions, and energy security challenges to tackle with climate change.

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China has become the largest energy consumer in the world (BP, 2013), and energy consumption highly relies on coal due to the lack of oil and gas resources. When fossil fuel certainly supports China's rapid economic growth, it has also caused severe air pollutions and CO₂ emissions.

Now China is experiencing the serious air pollution crisis, and most areas of northern China have been covered by the persistent deep thick fog haze since 2013, and millions of people are exposed to it. China's polluted air rank the 'fourth biggest threat to the health of Chinese people' behind heart disease, dietary risk and smoking (Chen et al., 2013). Study of Chen et al. (2013) shows that China's air pollution was responsible for 350,000 to 500,000 deaths in 2013.

Nevertheless, China surpassed the USA in 2006 to become the largest CO₂ emitter in the world. China released nearly 1.92 billion tons of carbon into the atmosphere in 2008,

which is twice as much as it emitted in 2002; China accounts for nearly 20% of global CO₂ emissions and 50% of the global increase from 2002 to 2008 (Boden et al., 2012). According to the IEA, China's CO₂ emissions will equal the sum of the emissions of the USA and the countries comprising the European Union in 2015 and is expected to surpass the total emissions of the OECD countries in 2030 (IEA, 2011).

Chinese environmental problems related to energy consumption pose a serious threat to the quality of life and the wellbeing of the country's present and future generations. Understandably, China faces a significant challenge in dealing with these problems. It is the purpose, therefore, of this special issue to assist global readers of *International Journal of Global Energy Issues* to better understand the challenges that the Chinese government faces in implementing air pollution and carbon emissions reduction policies.

The first paper, 'A weighted Gini coefficient and Theil index-based approach for estimating the spatial disparity in energy efficiency in China' by Chao Feng et al., examines China's spatial disparity in energy efficiency based on the Gini coefficient and Theil index, and discusses the contributions of inter- and intra-regional disparities through a decomposition model of the Theil index. They found that the disparity in regional energy efficiency in China has decreased steadily since 2004.

In China's 12th Five Year Plan (FYP), Chinese government set bounded targets for emissions reductions of SO₂, COD, NO_x, ammonia-nitrogen and the decline of energy intensity and CO₂ emissions intensity. Ke Wang and Yingnan Liu analyse the situations of energy conservation and emission reduction in both China and its provinces. They found that in spite of the accelerating decrease in 2013, the task for 2014–2015 is still challenging. At the provincial level, situations in different regions vary significantly. The other paper, 'Coordinated development of energy-saving and emission-reduction evolution systems in the Yangtze River delta' by Min Fu et al., studies the coordinated development of energy saving and energy reducing systems by using adaptive pulse control.

The rest five articles focus on China's carbon emissions and related policies. The fourth paper, 'An assessment of CO₂ emissions: is China's tertiary industry environmentally friendly?' by Wen-jing Yi et al., uses an input-output model to assess the direct and indirect CO₂ emissions caused by the production behaviours of tertiary industry. Their results showed that 17.4% of national CO₂ emissions in 2007 were from tertiary industry, and just 3.02% of this was direct emissions, so they conclude that it is not environmentally friendly with respect to CO₂ emissions. Zhansheng Zhang and Jianhua Ping discuss the importance of greenhouse gases control conducted in environmental impact assessment of construction projects.

Chinese government pays great attention to carbon trading market; 'Gradually promote the establishment of a carbon trading market' was proposed firstly in China's 12th FYP. In November 2011, seven carbon trading market pilots were determined based on the requirement of National Development and Reform Commission (NDRC). Yue-Jun Zhang reviews current related research progress on carbon trading market mechanisms, mainly including carbon emissions allowance allocation, carbon asset pricing and carbon price risk measurement. Mingrong Wang et al. examine the allocation efficiency for carbon emission rights. Zhen-Hua Feng et al. analyse optimal hedge of EU ETS using non-expected utility model and hedging cost model. Their results show that investors prefer to hold spot goods in carbon market in 2008–2012 than in 2005–2007, and the optimal hedging ratio in carbon market is lower than general market.

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