



Editorial

Editorial to the special issue “Sustainable energy policies in Northeast Asia”



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ABSTRACT

Paris agreement in 2015 made a great milestone toward the sustainable development worldwide. Based on the bottom-up, market- and performance-oriented mechanism, new climate regime on the Paris agreement provides the optimal path control for toward the below 2 °C target from pre-industrial levels by decreasing substantial GHG emissions. Unfortunately, the withdrawal of the USA from Paris Agreement may result in 13 GtCO₂ higher than its original 56 Gt target (23% increase). Nonetheless, the strong commitment by China and pro-active participation of the Northeast-Asian countries made a new hope against the global warming. This special edition shall shed the light on the efforts by these countries based on the comparative analysis to result in the “Oriental Model” for the sustainable development and its energy policies. Especially, urbanization became one of the hottest issues for the special issue and the differentiated diverse efforts by the governments are much emphasized in this issue.

1. Introduction

At Marrakech, Morocco, 197 countries of the United Nations Framework Convention on Climate Change (UNFCCC) proclaimed the time for action by all countries to make visible efforts toward a post-Kyoto, ‘new climate regime’ in November 2016. Among 197 members, 113 Conferences of the Parties (COP) ratified the Paris Agreement until the November 27th of COP22 meeting, implying that 79% of global greenhouse gas (GHG) emissions will be sustainably managed under the post-2020, new climate regime. Compared with the Kyoto Protocol's 22% coverage for GHG emissions, it was an outstanding achievement in terms of its quantitative as well as qualitative approaches for global climate change (Lee, 2016). The Paris Agreement clearly specified that all countries, without exception, should make efforts toward the below 2 °C target from pre-industrial levels by decreasing substantial GHG emissions. The International Energy Agency (IEA) has projected that global GHG emissions will increase very rapidly, up to 70 Giga tons of carbon dioxide equivalent (Gt CO₂^e) by 2030 under BAU terms (reference). To get below 1.5 °C, all countries should make collaborative efforts to decrease this level of GHG emissions by at least half, saving 38 Gt CO₂^e per year till the year 2030. However, it is not easy; just imagine that one Gt CO₂^e reduction may require no transportation at all for one year in all European countries (Miller, 2012). During the period from 2013 through 2025, world carbon emissions from fossil fuel consumption are expected to increase by 9% only in developed countries, while developing countries will increase their emissions by more than 50% in the same period (McKinsey and Company, 2009). This means the global GHG emission will more than double over the next 12 years by the developing countries. China alone needs to decrease projected emissions for the period from 2015 through 2035 by 30 Gt CO₂^e or 50% of its projected volume, to stay at the level of 2013, the initial year (Liu et al., 2015).

By the year 2030, with the best policies and appropriate technical measures in practice, the world could and should decrease emissions up to 38 Gt CO₂^e per year. Among this reduction, 75%, or 28 Gt CO₂^e, should come from developing countries because developed countries already have peaked and began to decrease their emissions. The Paris Agreement is based on the most optimistic pathways for global carbon dioxide levels at its peak of 480 PPM around the year 2016. Unfortunately, the world already passed its historical peak of 400 PPM in 2015 and thus, the pathway toward lowering average global temperature by below 2 °C became very time-sensitive. Unfortunately, the withdrawal of the USA from Paris Agreement may result in 13 GtCO₂ higher than its original 56 Gt target (23% increase) in the global perspective. Nonetheless, the strong commitment by China, EU and all other signatory governments of Paris Agreement shall promote the optimal path control. To achieve the goal, we may need more proactive efforts with the high-cost technical measures as well as the behavioral changes of the private sector such as green consumption and green campaign by the green prosumer for the remaining parts.

This is the background of this special edition, because the strong participation of the developing countries such as China is so crucial for the success of New Climate Regime. Since the Northeast Asian countries are the most dynamically changing its economic atmosphere, especially in the most dynamically promoting the sustainable energy policies, the outstanding efforts toward the sustainable development in the region will shed a great milestone for the global perspectives. At the Paris Conference on Climate Change in December 2015, President of China, Xi Jinping, proposed to “achieve CO₂ emission peak by around 2030 and strive to peak early, and by 2030 CO₂ emissions per unit of GDP will fall by 60–65% compared to that in 2005” (Xie et al., 2017). Likewise, the other northeast Asian countries have pro-actively promoted the sustainable development or green growth policies. In this special edition, we shall compare these green energy policies in this region to find out the ‘Oriental Model’ for the other

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developing countries to catch on this new trend more efficiently and effectively.

2. Comparison on the sustainable macroeconomic issues of the local energy policies

2.1. Background of the sustainable energy policies

As shown in the papers of our special edition, all the countries in Northeast Asia has made great progress along with the annual COP meetings of UNFCCC. The most representative one by the UNFCCC is the Kyoto Protocol, which brought new approaches of the market-oriented platform with flexible mechanisms, such as Emissions Trading Scheme (ETS), the Clean Development Mechanism (CDM), and Joint Implementation (JI). With these flexible mechanisms, the public and private sectors became aware that the Measurable, Reportable, Verifiable (MRV) measures for carbon emissions reductions could lead the reduced- or zero-carbon society. However, the Kyoto Protocol could not be sustainable because it has three bottlenecks in promoting sustainable success in the world. First, it covered only 22% of global GHG emissions by the Annex I developed countries. However, this limited participation could not effectively be operable due to free-rider issues: “Everybody’s work is nobody’s work.” During the first commitment period from 2008 through 2013, while other Annex I countries made their best efforts to decrease levels of GHG, China increased emissions by 7% per year and became the largest emitter in the world. Moreover, the non-ratification of the United States discouraged other countries from participating, resulting in the lack of governance on Kyoto protocol. Second, the Kyoto Protocol was based on a top-down approach in its basic framework. Due to the top-down approach, most participating public and private sectors were not willing to invest in green technology development. Third, the Kyoto Protocol is too market-oriented and, thus, could not bring the win-win game of sustainable performance. For example, the benefits of CDM went to the investors of the developed countries and, thus, there was little incentive for the developing host countries unless investors successfully transferred green technology and/or managerial know-how to the host countries. The Kyoto Protocol gave the world a great cornerstone to take off toward reduction of GHG emissions, but it failed in terms of sustainable performance due to these critical issues.

To overcome these bottlenecks, several efforts have been added over time toward the optimal pathway on COP meetings. Finally, based on the non-differentiated, voluntary actions by all the countries, COP21 resulted in the new climate regime of Paris Agreement. This new climate regime is very different from the Kyoto Protocol in terms of its three basic platforms for GHG emissions reduction. The most outstanding feature is the Intended Nationally Determined Contributions (INDC), a compromise between quantified emissions commitment and voluntary Nationally Appropriate Mitigation Actions (NAMAs). INDC is based on the bottom-up approach for countries to put forward their voluntary agreements in the context of their own national circumstances. All countries that signed the UNFCCC were asked to publish INDC voluntarily with the first global stocktaking in 2018 and every five years thereafter. Based on these five-year plans of member countries, UNFCCC will evaluate the performance of the global efforts on the optimal pathways. There is no obligation on violations of INDC, and thus not all voluntary participating entities of INDC may be effective and efficient to reduce GHG emissions (Wang and Deng, 2017). In order to promote the performance of INDC, Green Climate Fund (GCF) and other green-financing instruments shall take the most important impetus for the mitigation and abatement projects of GHG emissions in terms of transparency. The 2020 climate change regime is based on a win-win type of credit sharing for internationally transferrable mitigation outcomes. All the participants in the mitigation or abatement projects will share benefits of GHG emission allowances among the partners (benefit-sharing system).

In the COP22 meeting of 2016, the Marrakech Proclamation emphasizes the gap in the global goal between its mission and possible efforts for Action; additional emission gaps for 2030 required a reduction of 12–14 GtCO₂^e more than what was suggested in the Paris Agreement. In order to fill this gap as well as the total evaluation on the optimal pathways, they made a route to 2018 and 2020: the CMA1 meeting will be held in 2017 for review of all the possible alternatives, and CMA2 in 2018 for conclusions.

2.2. Sustainable issues of the energy policies in general

Since 2007, China has become the largest contributor of CO₂ emissions to the world. Because of this unexpected environmental crisis, China has promoted an energy-efficient and low-carbon economy, from the 11th five-year economic plan (2006–2010). China’s 12th Five-Year Plan (2011–2015) emphasizes a “green, low-carbon development concept”, the first efforts to include a commitment to the gradual introduction of market mechanisms to control carbon emissions (Zhang et al., 2017). China has announced several new carbon and energy targets to be fulfilled by 2015 with a benchmark of 2010 levels and assigned the targets for each province, including the following agendas (Yu et al., 2017). Using a sequential meta-frontier Luenberger productivity index (SMLPI), Yu et al. showed an increasing trend of carbon productivity growth by the technological improvement such as the “replacing small units with large ones” policy, but the technological gaps become larger and larger, implying the bipolarization of the technical gap. To evaluate China’s renewable energy development policy, Lin and Wu estimated the long distance electricity transmission (LDET) cost and concluded that planning the layout of the electricity generator, not only the resources endowment but also the transmission and distribution cost of grid should be taken into account (Lin and Wu, 2017). Shao et al. analyzed the determinants of the crude oil imports to China from 55 countries and found that China’s crude oil trade policy concerning different regions should be diversified by deploying differentiated policies after investigating their determining factors in detail. Moreover, the geographic proximity to the Asia-Pacific can be translated into a more affordable source of oil only through bilateral trade contacts (Shao et al., 2017). In all these arguments, the regulation policies of China is absolutely important to promote the sustainable development.

It seems the regulatory policies certainly promoted the eco-friendly productivities in China (Yu et al., 2017; Xie et al., 2017), and in Taiwan (Hu et al., 2017). In Taiwan, the development of administration regions could maximize the energy efficiency, while it may not satisfy the target of overall energy efficiency nationwide. It is urgent for Taiwan government to implement integrated policies to help administrative regions improve energy efficiency and reduce energy congestion (Hu et al., 2017).

However, the superiority of market competition over regulated monopolies may bring the better solution to enhance the eco-friendly productivities in Korea (Choi et al., 2017) and in Japan (Shin and Managi, 2017). Using computable general equilibrium (CGE) model, Choi et al. analyzed the sustainable policy feasibility on the Emission Trading Scheme (ETS) and concluded that ETS in Korea definitely requires governance factors for sustainable development, because the government is too generous in leading the market in the initial stage. Nonetheless, the government wants to intervene in the market. The intervention of the government in the market-oriented paradigm should be more transparent; its role should be “a partner” instead of “the big brother” or a helper (Choi et al., 2017).

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