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Exploring an optimal synergy between regional energy security and carbon emission mitigation: A review

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Under the objectives of sustainable development, regional energy security (RES) and carbon emission mitigation (CEM), in theory at least, should have significant synergetic benefits. In practice, however, many cases in regard to trade-offs and even conflicts are always found due to the variations in the interest orientation of energy service subjects. And thus the current solution to the conflicts between RES and CEM still lack of a comprehensive and systematic planning. This paper aimed to explore a roadmap for chasing the optimal synergy between RES and CEM. The analysis verified the findings of recent studies that both synergies and conflicts between RES and CEM have significant impacts, and we also established a framework for positioning the basic objectives with core elements of RES and CEM (see Figure 1). This framework was designed with a concern on the multi-scale combining the short- and long-term perspectives in related to national, sub- national and micro-behavior levels: in national level, the energy supply security should be still treated as the core issue, and then the carbon mitigation goals derived from international climate negation could be followed up; in sub-national level, more attention should be paid on the inter-regional cooperation of energy efficiency along with the regional planning of carbon mitigation; in micro-behavior level, the changes in the patterns of energy use and carbon mission should be discussed based on the interactions between macro-policy and micro-behavior. Several solutions for optimizing synergic benefits and resolving conflict problems should be placed from macro- to micro-scales with the perspectives from short-term to long-term: in national-scale, an optimal interval for energy supply to integrate the targets should be provided; in sub-national scale, an optimal interval for synergetic planning should be arranged; in micro-behaviors scale, a roadmap chasing the lowest levels of energy use and carbon emission should be proposed.

Biography

Lei Shen is currently a Professor and Director of Key Lab for Resources Use and Environmental Restoration (RUER), Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences (CAS). He was the Consultant of the World Economic Forum in Minerals and Metals Council in 2010 and the World Bank in 2006, and the academic committee of Word Mine Ministry Forum in 2008. He was the Excellent Scientist by China Society of Natural Resources in 2012 and 2013. His expertise is focused on energy policy and mineral economics, involving the areas of regulatory systems surrounding resource extraction, energy intensive industry, cement manufacturing and regional development planning in China, resources-based city transformation and sustainable development, and energy and mineral security and multi-lateral resource cooperation. He also has particular experience in policy for small-scale mining in China.

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