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Measuring China's regional energy and carbon emission efficiency with DEA models: A survey

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HIGHLIGHTS

- China's regional efficiency studies using data envelopment analysis are reviewed.
- The main features of 46 studies published in 2006–2015 are summarized.
- Six models are compared from the perspective of methodology and empirical results.
- Empirical study of China's 30 regional efficiency assessment in 1995–2012 is presented.

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ABSTRACT

The use of data envelopment analysis (DEA) in China's regional energy efficiency and carbon emission efficiency (EE&CE) assessment has received increasing attention in recent years. This paper conducted a comprehensive survey of empirical studies published in 2006–2015 on China's regional EE&CE assessment using DEA-type models. The main features used in previous studies were identified, and then the methodological framework for deriving the EE&CE indicators as well as six widely used DEA models were introduced. These DEA models were compared and applied to measure China's regional EE&CE in 30 provinces/regions between 1995 and 2012. The empirical study indicates that China's regional EE&CE remained stable in the 9th Five Year Plan (1996–2000), then decreased in the 10th Five Year Plan (2000–2005), and increased a bit in the 11th Five Year Plan (2006–2010). The east region of China had the highest EE&CE while the central area had the lowest. By way of conclusion, some useful points relating to model selection are summarized from both methodological and empirical aspects.

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