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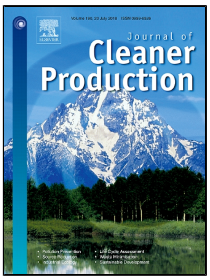

Ownership unbundling of natural gas transmission networks in China

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Ownership unbundling of natural gas transmission networks in China

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Abstract: The vertically integrated operation system of natural gas transmission has led to lagging pipeline network construction, low transmission network utilization rates, and high consumer prices in China. This paper proposes a combination of multi-agent and input-output models to outline natural gas transmission regime programs and examines the effects of mandatory separation of transmission networks from production and services, based on available data from 2014 to 2016. Three scenarios are set up including the basic condition (BAU) and two types of reforms, namely ownership unbundling (STRIP) and internal reform at company level (INTREF). Then a set of evaluation indicators are established, namely profit changes of three large oil companies, investment in pipeline networks, and user prices, as well as total output, added value, and price changes in related industries. The results show that, by 2030, the relative change rate of investment for STRIP will increase by 93.45% while the change in INTREF is -33.49%. Moreover, natural gas price under STRIP will decrease 27.12%, which is a decrease almost three times that under INTREF. It can be concluded that STRIP is more conducive to promoting the efficiency of natural gas transmission compared with INTREF. However, it may be time consuming for natural gas companies to introduce competitive social capital and gradually diversify their investments.

Keywords: Natural gas transmission network; Enterprise internal reform; Ownership unbundling; Agent-based simulation; Input-output approach

1. Introduction

The consumption of natural gas in China exceeded 230 billion cubic meters and increased by 17% in 2017 due to its relatively low carbon emissions (He and Lin, 2017). Currently, China has established gas pipeline networks covering the entire country, devising and implementing plans for regional and national natural gas pipelines from west to east and north to south (Fig.1). Total urban pipeline length in China has also reached 551 thousand kilometres by the end of 2016, registering a growth rate of 10.6%

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