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综述与专论

液化天然气、管道天然气与煤制天然气的比较分析

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摘要

采用LCA方法对煤制天然气方案及其替代方案（俄罗斯进口管道天然气以及澳大利亚进口液化天然气）进行了评价，揭示了煤制天然气全生命周期各环节的环境效应。3种方案中，煤制天然气的CO_2等环境排放最高。煤制天然气对原材料价格的承受能力低下，随着褐煤价格的上涨，煤制天然气项目的经济性将受到较大的挑战。

关键词

煤制天然气 液化天然气 管道天然气 环境排放 经济效益

分类号

Comparison between liquefied natural gas，pipe natural gas and substitute natural gas

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Abstract

Coal based substitute natural gas industry is advocated to develop on a large scale with the aim of reducing gas supply gap in China.Compared with natural gas coming from other approaches，will coal based substitute natural gas show environmental and economic advantages? Therefore life cycle assessment is adopted here.Coal based substitute natural gas is compared with pipe natural gas imported from Russia and liquefied natural gas imported from Australia in term of energy consumption，environment emission and economic benefit.In the calculation，the related items in gas consumption link are omitted.Included industry links are construction link，mining link，production link and transportation link. Environment emission from production link of substitute natural gas project is serious.Although CO_2 produced from coal transform process can be compressed and used in oil field to increase oil yield，substitute natural gas project still shows the highest $CO_2$and SO_2 emission.As admitted，coal mining regions have already involved severe ecology destroy.It is no doubt that coal based substitute natural gas industry which always develops in coal mining regions will sharpen environment deterioration there.Construction link of pipe natural gas project involves the largest amount of emission in the whole industry chain.So does the liquefied natural gas project.But Russia and Australia possess excellent environment capacity.The same amount of emission will produce less damage in Russia and Australia than in China.Therefore pipe natural gas project and liquefied natural gas project show advantages in term of environment emission.Energy efficiency of coal based substitute natural gas industry is about 35%.If the final gas burning efficiency is computed too，then it can be concluded that the efficiency of the whole industry chain will lower than that of coal power industry， which is the general coal consumption routine in China.The price of wood coal，the raw material of substitute natural gas industry，grows fast nowadays.The economic benefit of coal based substitute natural gas industry is sensitive to the price of wood coal.As a result，economic prospect of coal based substitute natural gas industry is suffering challenge in term of economic benefit.

Key words

substitute natural gas liquefied natural gas pipe natural gas environmental emission economic benefit

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