Analyzing Shale Gas Exports from the U.S. to Foreign Markets and the Potential of Natural Gas Supply Network Expansions

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As shale gas potential grows in the U.S. the exports of natural gas from the U.S. to the rest of the market become more and more attractive. To analyze the potential of exports from the U.S. to Asian and European markets, considering the potential effect of carbon policies, some additions and modifications were made to the World Gas Model developed at the University of Maryland. The exports from various locations would be possible after supply network expansions. For analyzing of the most favorable expansion capacities of natural gas supply, another model was developed as a two level leader-follower problem known as Stackelberg game formulated as mathematical program with equilibrium constraints (MPEC). Case studies were conducted for possible export scenarios from the U.S. to the United Kingdom, Spain, China and Japan and for supply network expansion from Russia to China.

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