

Assessment of Korea's Natural Gas Portfolio Considering Panama Canal Expansion

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Abstract : South Korea cannot import natural gas in any form other than LNG because of the division of South and North Korea. Further, the high proportion of natural gas in the national energy mix makes this resource crucial for energy security in Korea. Expansion of Panama Canal will allow for reducing the cost of shipping between the Far East and U.S East. Panama Canal expansion can have significant impacts on South Korea. Due to this situation, we review the natural gas optimal portfolio by considering the uniqueness of the Korean Natural gas market and expansion of Panama Canal. In order to assess Korea's natural gas optimal portfolio, we developed natural gas portfolio model. The model comprises two steps. First, to obtain the optimal long-term spot contract ratio, the study examines the price level and the correlation between spot and long-term contracts by using the Markowitz, portfolio model. The optimal long-term spot contract ratio follows the efficient frontier of the cost/risk level related to this price level and degree of correlation. Second, by applying the obtained long-term contract purchase ratio as the constraint in the linear programming portfolio model, we determined the natural gas optimal import portfolio that minimizes total intangible and tangible costs. Using this model, we derived the optimal natural gas portfolio considering the expansion of Panama Canal. Based on these results, we assess the portfolio for natural gas import to Korea from the perspective of energy security and present some relevant policy proposals.

Keywords : natural gas, Panama Canal, portfolio analysis, South Korea

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