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Technology Valuation of Unconventional Gas R&D Project Using Real Option Approach

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Abstract : The adoption of information and communication technologies (ICT) in all industry is growing under industry 4.0. Many oil companies also are increasingly adopting ICT to improve the efficiency of existing operations, take more accurate and quicker decision making and reduce entire cost by optimization. It is true that ICT is playing an important role in the process of unconventional oil and gas development and companies must take advantage of ICT to gain competitive advantage. In this study, real option approach has been applied to Unconventional gas R&D project to evaluate ICT of them. Many unconventional gas reserves such as shale gas and coal-bed methane(CBM) has developed due to technological improvement and high energy price. There are many uncertainties in unconventional development on the three stage(Exploration, Development, Production). The traditional quantitative benefits-cost method, such as net present value(NPV) is not sufficient for capturing ICT value. We attempted to evaluate the ICT valuation by applying the compound option model; the model is applied to real CBM project case, showing how it consider uncertainties. Variables are treated as uncertain and a Monte Carlo simulation is performed to consider variables effect. Acknowledgement—This work was supported by the Energy Efficiency & Resources Core Technology Program of the Korea Institute of Energy Technology Evaluation and Planning (KETEP) granted financial resource from the Ministry of Trade, Industry & Energy, Republic of Korea (No. 20152510101880) and by the National Research Foundation of Korea Grant funded by the Korean Government (NRF-205S1A3A2046684).

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