Analisis potensial CO2 sequestration meningkatakan produksi coalbed methane pada high prospective basins di Indonesia

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Abstrak

ABSTRAK
Salah satu inovasi menciptakan sumber energi alternatif baru (unconventional gas) secara bersih dan mengurangi emisi CO2 dengan menginjeksi CO2 ke dalam coalbed. Keuntungan yang akan diperoleh yaitu mengurangi emisi CO2 dan meningkatkan produksi metana (CH4) ke dalam coalbed. Coalbed methane (CBM) merupakan unconventional gas yang dikembangkan di Indonesia khususnya pada kategori high prospective basins yaitu Sumatera Selatan (183 TCF), Barito (101,6 TCF), Kutei (89,4 TCF) dan Sumatera Tengah (52,5 TCF). Penelitian ini mengkaji potensi kelayakan ekonomi CO2 sequestration secara overall. Nilai probabilitas yang diperoleh berdasarkan potensi market, produksi, CO2 storage, supply CO2 dan biaya infrastruktur pada Sumatera Selatan 88,11%, Sumatera Tengah 78,66%, Kutei 78,2% dan Barito 73,94%. Dengan merancang model optimum untuk perhitungan CAPEX dan OPEX, perhitungan analisis ekonomi Sumatera Selatan basin menghasilkan nilai net present value (NPV) $ 523 juta, rate of return (IRR) 22,86% dan Payback period (PB) 8,38 tahun. Sedangkan Sumatera Tengah basin menghasilkan NPV $ 247 juta, IRR 18,08% dan PB 10,77 tahun. Barito basin menghasilkan NPV $ 318 juta, IRR 19,24 % dan PB 9,77 tahun dan Kutei basin menghasilkan NPV $ 2.012 juta, IRR 46,51 % dan PB 5,77 tahun. Model ini didisain dengan harga gas $ 2,57/MMBtu, regulasi Product Sharing Contract (PSC) pengembangan CBM yang berlaku di Indonesia dan life project 24 tahun.
<hr>Abstract
One of the innovations to create new alternative clean energy sources (unconventional gas) and to reduce CO2 emissions is injecting CO2 into coalbed. The advantage will be obtained by reducing CO2 emissions and by increasing the production of methane (CH4) into coalbed. Coalbed methane (CBM) is an unconventional gas and it is developed in Indonesia. Particularly high prospective basins are : South Sumatra (183 TCF), Barito (101.6 TCF), Kutei (89.4 TCF) and the Central Sumatra (52.5 TCF) . This study assesses the overall potential and the economic feasibility of CO2 sequestration. The probability to develop the basins is influenced by the following indicators: market potential, production potential, storage of CO2, CO2 supply and infrastructure costs, amounts to 88.11% in South Sumatra, to 78.66% in Central Sumatra, to 78.2% in Kutei and to 73.94% in Barito. By designing an optimum model to substantiate CAPEX and OPEX calculation, economic analysis demonstrates that an NPV of $ 523 million, which is equal to an IRR of 22.86% and a PB of 8.38 years, is obtained for the Sumatra Selatan basin. Whilst an analysis for Sumatra Tengah basin resulted in an NPV of $ 247 million, equal to an IRR of 18.08% and a PB 10.77 years. The Barito basin generates an NPV of $ 318 million, an IRR of 19.24 % and a PB of 9.77 years and for the Kutei basin an NPV $ 2.012 million, equal to an IRR 46.51 % and a PB 5.77 years is obtained. This model is designed based on a gas price of $ 2.57 /MMBtu, compliant with a regulation of the Product Sharing Contract (PSC) about CBM development policies in Indonesia. The project life considered in the model amounts to 24 years.