

# SIMULATION OF NATURAL GAS PRODUCTION FROM SUBMARINE GAS HYDRATE DEPOSITS COMBINED WITH CO<sub>2</sub> STORAGE

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## INTRODUCTION

In recent years, the interest in submarine gas hydrates as an energy source has increased around the globe. To develop a sustainable hydrate-based energy supply system CO<sub>2</sub> storage has to be coupled with methane production from hydrate deposits.

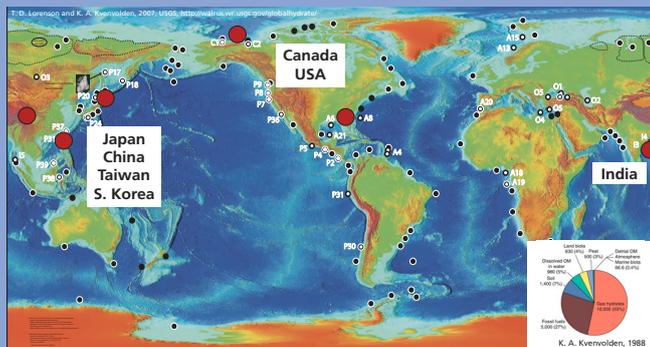


Figure 1: Natural methane hydrate deposits

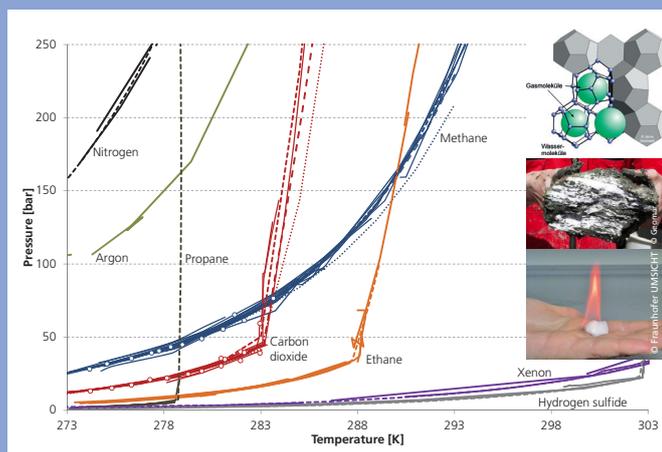


Figure 2: Stability curves of various gas hydrates

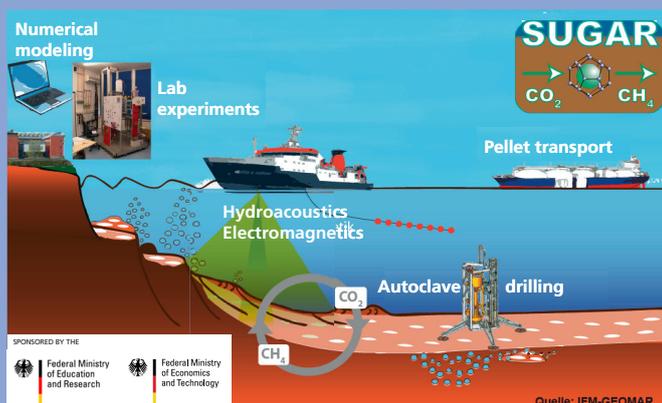


Figure 3: Chart of the SUGAR project ([www.sugar-projekt.de](http://www.sugar-projekt.de))

## SIMULATION

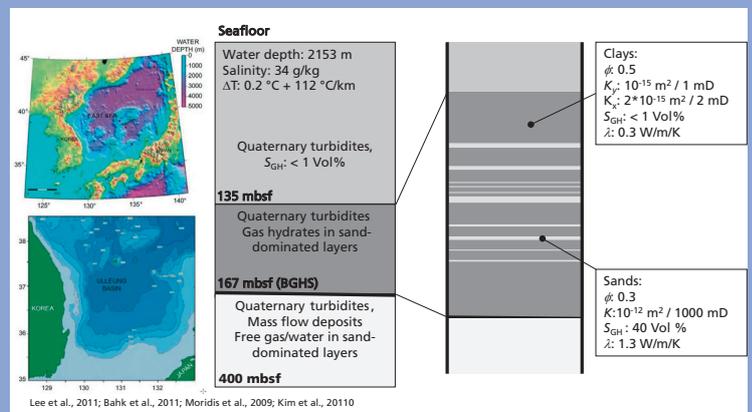


Figure 4: Natural hydrate deposits offshore South Korea (Ulleung Basin)

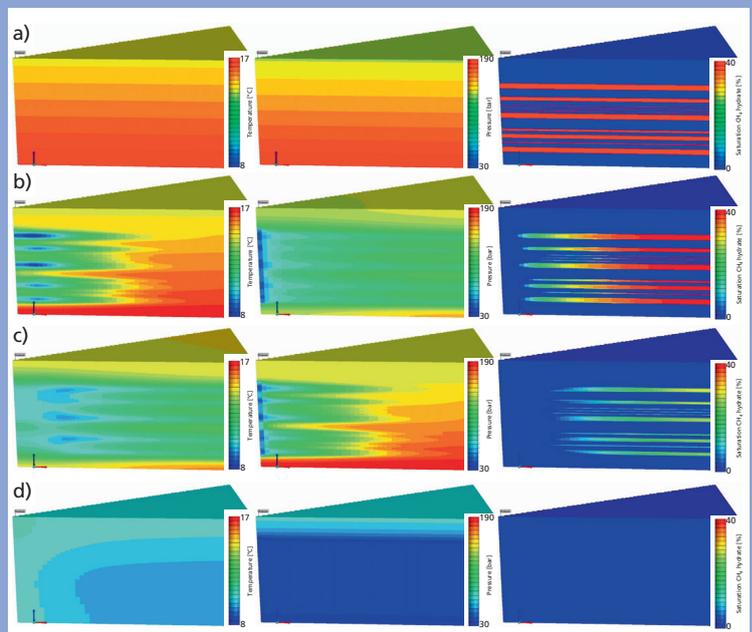


Figure 5: Single well depressurization to 30 bars

a) initial, b) after 4 days, c) after 1 month and d) after 15 months

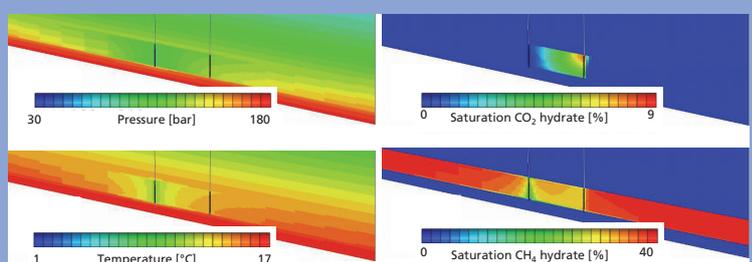


Figure 6: Simultaneous depressurization ( $P_{well} = 90$  bars) and CO<sub>2</sub> injection (10,000 STD m<sup>3</sup>/day @ 35°C) after 1 month; homogenous hydrate layer