

Dutch Continental Shelf Aquifer Storage

Publieke samenvatting / Public summary

Aanleiding

The capacity of offshore deep aquifers to store CO₂ is expected to be much larger than that of depleted fields, worldwide, and also in the North Sea. Storage projects in Norway and the UK are developing large aquifer structures with total capacities in the hundreds of megatonnes, or even gigatonne range. A key element of aquifer storage is that the pressure in the aquifer is increased over its initial value to create storage capacity for CO₂. This is in contrast with storage in depleted fields, where natural gas production has created pressure space for CO₂. Current policy in The Netherlands is to limit the pressure after injection into a gas field to hydrostatic pressure which reduces the risk of leakage out of the reservoir. This approach cannot be used for aquifer storage, as that relies on pressure increase above hydrostatic. To enable future aquifer storage projects in The Netherlands, new policy which allows for pressure build-up above hydrostatic is to be developed, which should be based on a study of the relation between pressure limits, storage capacity and risks of leakage, for the typical conditions in aquifers, with most of the emphasis on the Dutch offshore.

Doelstelling

The purpose of this project is to provide the basis for new policy that is needed to enable storage in offshore deep aquifers. In addition, the potential of increasing capacity of depleted fields by increasing pressure limits will also be examined. The relation between pressure, capacity and risk will be explored in an innovative way, resulting in a quantitative assessment. This project will not develop such

Projectinformatie / Project information

Projectnummer / Project number

TKITOETKI_CCS_2024-13_DCSAS

Subsidiebedrag / Grant amount

€ 465.000,00

Algemene informatie / General information

Penvoerder / Secretariat

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policy, nor will it formulate policy recommendations.

Korte omschrijving

- Case study definition. A number of synthetic cases will be defined, to capture typical subsurface structures and conditions. The cases will not represent specific offshore storage sites. - Collate information on how pressure limits are set in neighbouring countries. Contact will be made with relevant government bodies and their view on limits in the case of aquifer storage and depleted hydrocarbon fields will be collected. - Numerical simulation of the storage process. Using state-of-the-art software, the impact of injection of CO₂ on the reservoir, caprock, faults and wells is assessed. - For each storage case analysed, simulation results will be interpreted to arrive at conclusions regarding the relation pressure – capacity – risk. - A Stakeholder Board will be installed, for which invitations will be sent to regulators from governments, as well as knowledge providers, around the North Sea. Input from the Board will help reach results that are widely accepted. - The results from this project will be disseminated through dedicated webinars, through presentations at conferences and workshops, and through peer-reviewed publications.

Resultaat

The most important results from this project will be the following. - Insight in the relation between maximum pressure in a CO₂ storage site, risk of leakage, and storage capacity, in a quantitative sense, for a number of aquifer storage (synthetic) cases and depleted fields typical for the Dutch North Sea. This result is to form the basis for the development of new policy that is needed to enable storage in offshore aquifers. - A workflow, aimed at storage developers, to analyse stress limits for storage in aquifers and depleted fields. The workflow takes into account limits imposed by the reservoir, caprock, faults and wells. - An important, non-technical, result of the project will be the dialogue between operators and regulators. In the case of The Netherlands, such dialogue will take place well before the development of first aquifer storage

projects, allowing both sides to exchange views. The results from this project will equally inform both sides, in preparation for potential future projects. The dialogue with regulators from other countries will help reach a common understanding of the approach to be taken towards aquifer storage projects.

De data in deze applicatie is afkomstig van de Rijksdienst voor Ondernemend Nederland (RVO) en wordt in samenwerking met de Topsector Energie ontsloten.

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