



# R&D on carbon dioxide capture and storage technology

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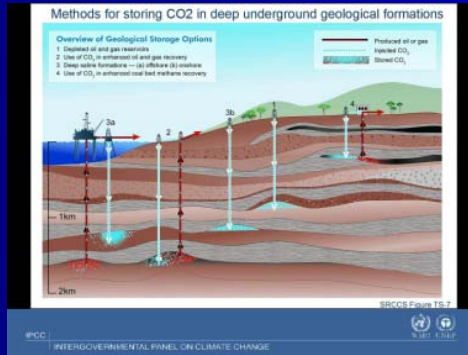
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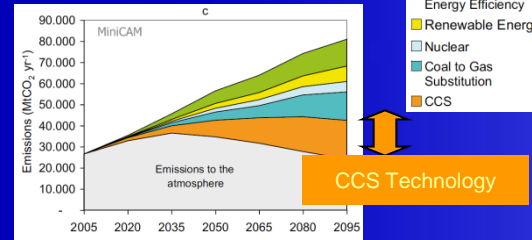
## Equipment



Micro-focused X-ray CT scanner



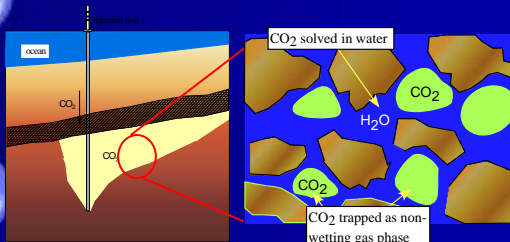
CO<sub>2</sub> geological storage



To mitigate global warming, CCS is one of the possible options.

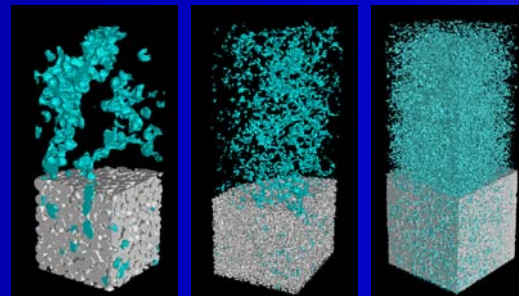
taken from IPCC Special Reports on Carbon Dioxide Capture and Storage

## Trap Mechanism

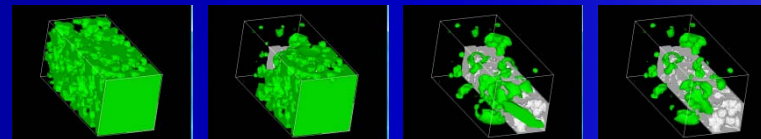


## Two-phase flow in porous media

glass beads sand Berea sandstone

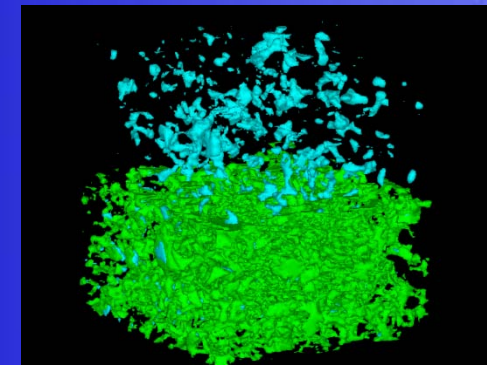


Modeling of flow and trap mechanisms of two-phase flow of supercritical CO<sub>2</sub> and water in porous rock based on in-situ visualization by means of X-ray CT.



Numerical analysis of two-phase flow in porous media by means of the lattice Boltzmann method considering interfacial tension, wettability, viscosity, and density.

Microscopic visualization of trapped gas bubble in Berea sandstone at the resolution of 5 $\mu$ m/pixel.



Reconstructed 3-D image of pore structure of Berea sandstone, and the distribution of trapped bubble after the spontaneous imbibition.

Based on solubility and residual gas trapping, 71.6 Gt CO<sub>2</sub>, which corresponds to the emission in Japan for 53.6 years, can be stored in aquifers around Japan.