Supplementary Table S1. The comparison of various geological storage technology

	Depleted oil and gas reservoir	Coal seam	Salt cavern	Saline aquifer	Basalt
Capacity	390-750 Gt	225 Gt	\	10000 Gt	13800– 127800 Gt
Main trapping mechanisms	Cushion gas trapping	Adsorption trapping	Structural trapping	Structural trapping; solubility trapping; mineral trapping	Mineral trapping
Challenges	1) Small storage capacity; 2) Limited quantity of depleted oil and gas reservoirs	1) Permeability decrease due to adsorption swelling 2) Three-dimensional spatial heterogeneity	1) Economic benefits lower than salt cavern gas storage; 2) Without project cases	1) High operation and monitoring costs; 2) Complex geological characteristics	1) Lack of effective methods to control mineralization rate; 2) Mechanical property changes caused by basalt carbonation
Advantages	1) The low leakage risk; 2) Enhance the recovery of oil and gas	1) High adsorption sequestration efficiency; 2) Enhance coalbed methane recovery	1) Low permeability and excellent damage self-healing properties; 2) High storage efficiency	1) Global widespread distribution and great storage potential; 2) Conducive to mineral trapping and high storage safety	1) High porosity and permeability 2) Abundant calcium and magnesium elements
Cases	1) Weyburn oilfield in Canada; 2) K–12B gas field in the Dutch sector of the North Sea	1) Qinshui basin in China; 2) Appalachian basin in United States	/	1) the Sleipner in Norway; 2) the Shenhua in China	1) Wallula in the United States; 2) the CarbFix in Iceland