Deepsea Impact Initiative (DI ^{2})

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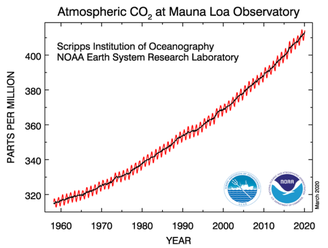
Introduction

- Atmospheric CO_2 levels have been on the rise, and we will soon cross the 1.5°C threshold for global temperature increase.
- Carbon capture and storage is a promising solution which consists of capturing the atmospheric CO_2 and injecting it back underground or underwater.



Deepsea CCS Methods

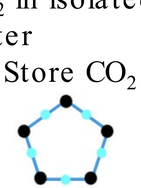
Chemical Storage

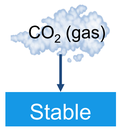
➔CO_2 hydrates: store CO_2 in isolated hydrate form underwater

➔Carbon mineralization: Store CO_2 in a stable, solid form

➔Permanent option

➔Lacks proper testing





Geological Storage

➔Depleted oil & gas reservoirs: Inject CO_2 into depleted reservoirs

➔Saline Aquifers: CO_2 injected into saline aquifers

➔Well-developed technology and reliable

➔More complex system

CCS Drawbacks

Health & Safety Risks: Seismic activity and risk of asphyxiation from injected CO_2; risk from the use of high pressure pipelines

Environmental Risks: Ocean acidification which has adverse effect on marine life; CO_2 leakage could greatly affect local ecosystems

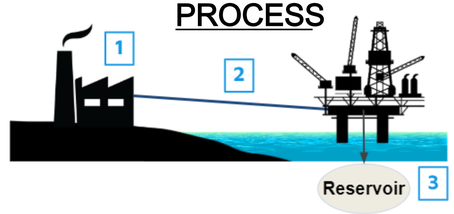
Economic: Based on current and past global CCS projects, the cost associated with CCS is **$35 per ton CO $_2$** stored

Overall, CCS has not progressed due to the high costs associated with it.

Deepsea Impact Initiative

- **Deepsea Impact Initiative** : US net-zero CO_2 emissions project with contribution from leading CCS companies
- Carbon storage facility that utilizes depleted oil and gas reservoirs to inject CO_2.
- Investigates new means of storing CO_2 in the deepsea to avoid harming marine life and conduct in-depth analysis of geographical location to ensure safety of employees.

PROCESS



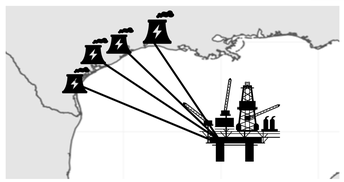
1: On-Shore collection of CO_2 from various power plants.

2: Offshore transport of CO_2 pipelines with compression pumps.

3: Injection of CO_2 into depleted oil and gas reservoirs using compressors and injectors.

Sources

LOCATION



Gulf of Mexico will be an ideal location due to proximity to power plants and abundance of depleted oil and gas reservoirs.

COST-BENEFIT ANALYSIS

- Expected DI^2 cost will be **less than the $35 per ton CO $_2$** stored due to reduced production costs through use of pre-existing infrastructure.
- US Government subsidies for CCS amount to $50/ton CO_2
- R&D costs not taken into account