Deepsea Impact Initiative (DI²)  
Sravya Nadella, Purva Pawar, Ella Quiambao, Abigail Rajagopal  
Dulles High School

Introduction

- Atmospheric CO₂ 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 CO₂ and injecting it back underground or underwater.

Deepsea CCS Methods

Chemical Storage
- CO₂ hydrates: store CO₂ in isolated hydrate form underwater
- Carbon mineralization: Store CO₂ in a stable, solid form
- Permanent option
- Lacks proper testing

Geological Storage
- Depleted oil & gas reservoirs: Inject CO₂ into depleted reservoirs
- Saline Aquifers: CO₂ 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 CO₂; risk from the use of high pressure pipelines
Environmental Risks: Ocean acidification which has an adverse effect on marine life; CO₂ leakage could greatly affect local ecosystems
Economic: Based on current and past global CCS projects, the cost associated with CCS is $35 per ton CO₂ stored

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

Deepsea Impact Initiative

- Deepsea Impact Initiative: US net-zero CO₂ emissions project with contribution from leading CCS companies
- Carbon storage facility that utilizes depleted oil and gas reservoirs to inject CO₂.
- Investigates new means of storing CO₂ in the deepsea to avoid harming marine life and conduct in-depth analysis of geographical location to ensure safety of employees.

Sources

- On-Shore collection of CO₂ from various power plants.
- Offshore transport of CO₂ pipelines with compression pumps.
- Injection of CO₂ into depleted oil and gas reservoirs using compressors and injectors.

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 DF cost will be less than the $35 per ton CO₂ stored due to reduced production costs through use of pre-existing infrastructure.
- US Government subsidies for CCS amount to $50/ton CO₂
- R&D costs not taken into account