SUSTAINABLE CEMENT MANUFACTURING: CARBON INJECTION INTO SOILS TO REDUCE FOOTPRINT

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INTRODUCTION

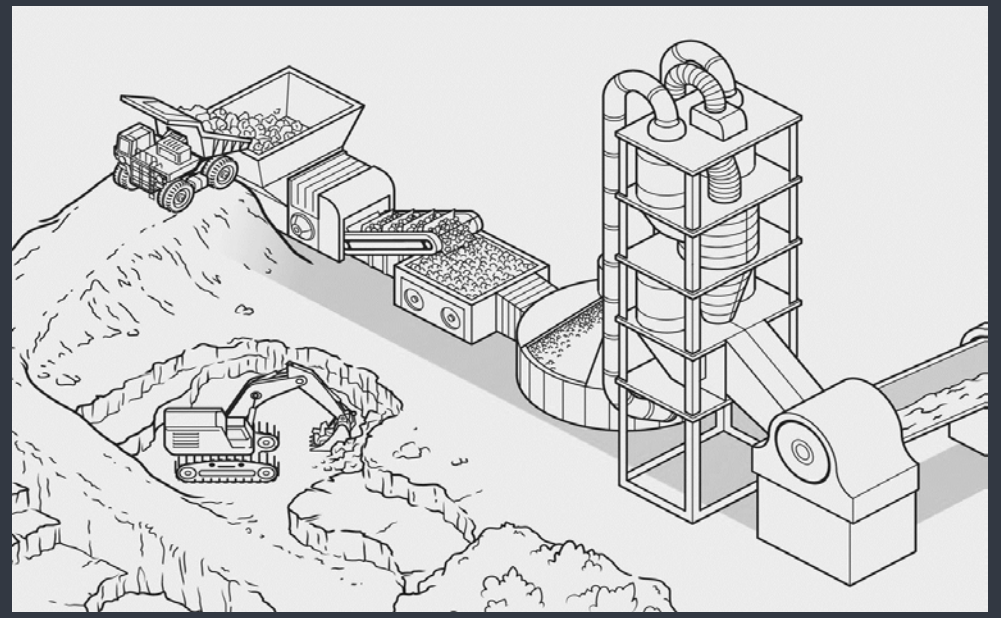
- INTRODUCTION

THE CEMENT INDUSTRY

- It ranks as one of the largest industries on the planet
- It is essential for global construction and infrastructure
- It produces over 2.8 billion tons annually

MANUFACTURING PROCESS

- It relies primarily on heavy machinery
- It consumes large amounts of energy, primarily from fossil fuels



• INTRODUCTION

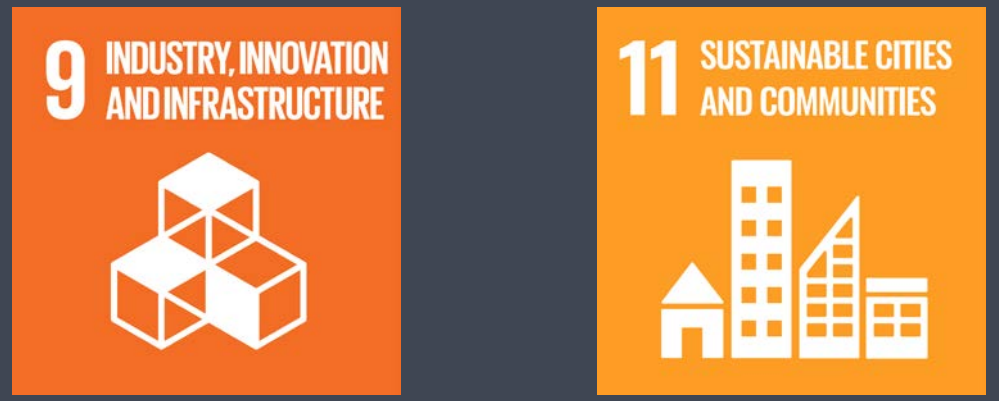
CARBON DIOXIDE EMISSIONS IN CEMENT MANUFACTURING

THE ISSUE

THE PRESENTATION AIM

Carbon footprint in the cement manufacturing industries can be reduced

Involving the Sustainable Development Goals



THE PROPOSAL

Capturing the CO_2 from the cement industries

Analysing the soil carbon injection technique

EXPECTED IMPACT OF THE PROJECT

This project seeks to raise awareness and contribute to mitigate the negative effects of CO_2 emissions in the cement manufacturing industry.

- INTRODUCTION

MAP OF THE PRESENTATION

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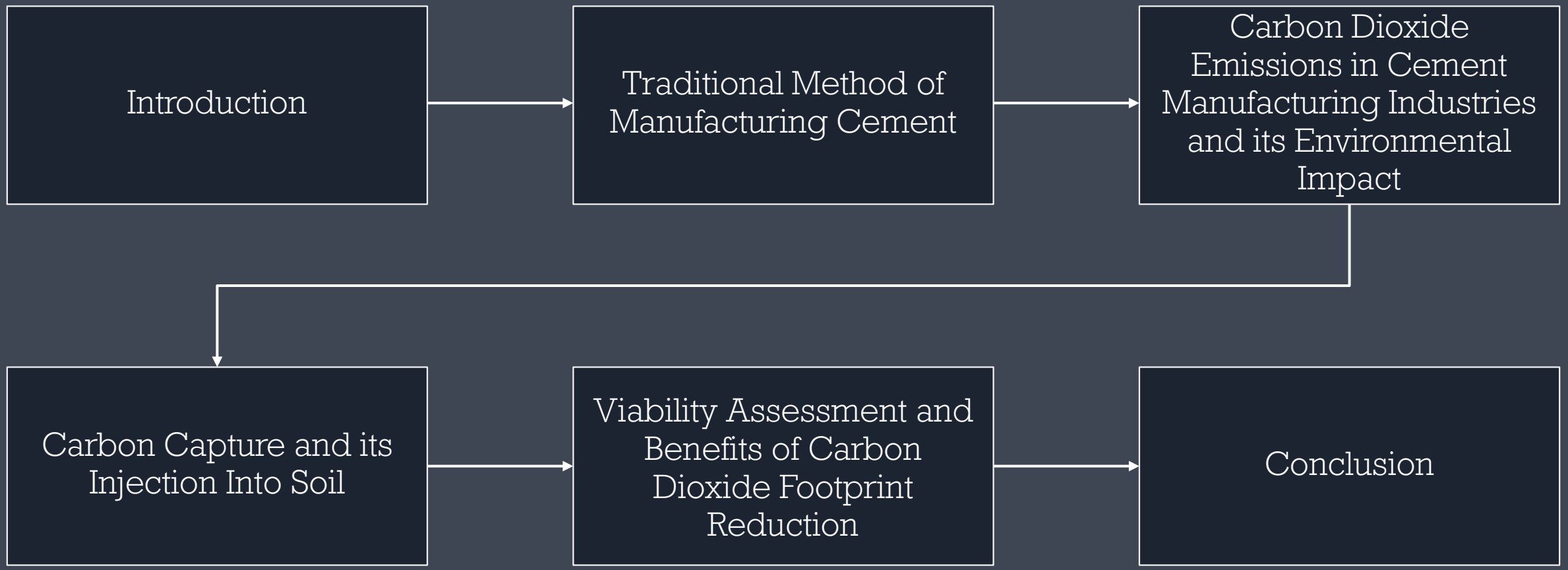

TRADITIONAL METHOD OF MANUFACTURING CEMENT

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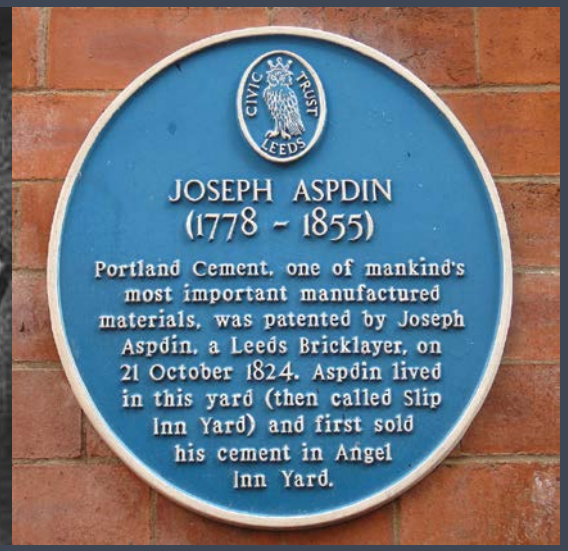
THE TRADITIONAL METHOD

Cement is an essential material in construction

This invention revolutionized construction by providing a stronger and more durable material, fundamental for modern infrastructure.



• TRADITIONAL METHOD OF MANUFACTURING CEMENT

MANUFACTURING PROCESS

1° Raw Materials Extraction

2° Crushing Extracted Materials

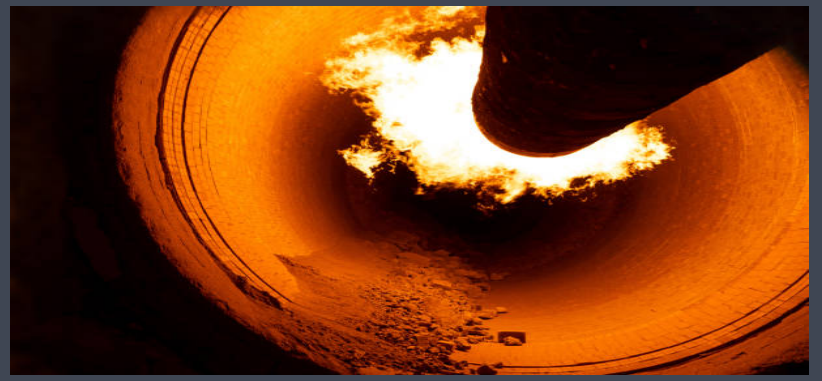
3° Mixing of Crushed Materials

4° Preheated of Raw Mixture

• TRADITIONAL METHOD OF MANUFACTURING CEMENT

MANUFACTURING PROCESS

- 5° Calcination
- 6° Rotatory Kiln
- 7° Clinker Cooling



CARBON DIOXIDE EMISSIONS IN CEMENT MANUFACTURING INDUSTRIES AND ITS ENVIRONMENTAL IMPACT

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Primary Forms of Emissions in the Cement Industry

Power Source

Calcination

• CARBON DIOXIDE EMISSIONS IN CEMENT MANUFACTURING INDUSTRIES AND ITS ENVIRONMENTAL IMPACT

Polluting industry

Climate Change

Altered precipitations

Extreme weather events

Rise of sea levels

CARBON CAPTURE AND ITS INJECTION INTO SOIL

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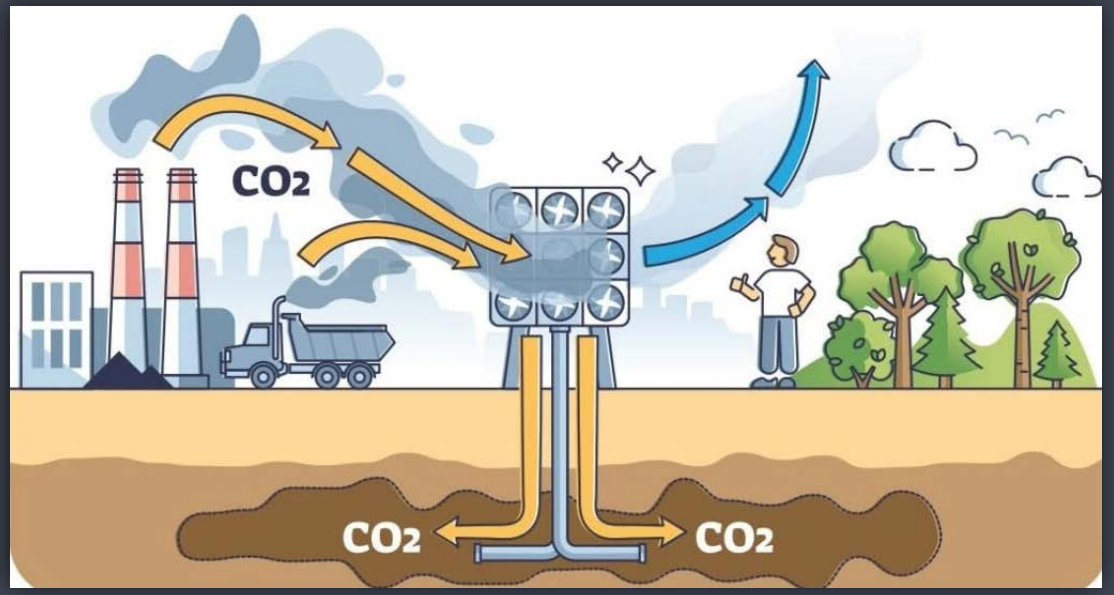
Carbon Capture and Sequestration

CCS refers to a method that captures CO2 emissions from large industrial sources

1. Pre-combustion
2. Oxy-combustion
3. Post-combustion



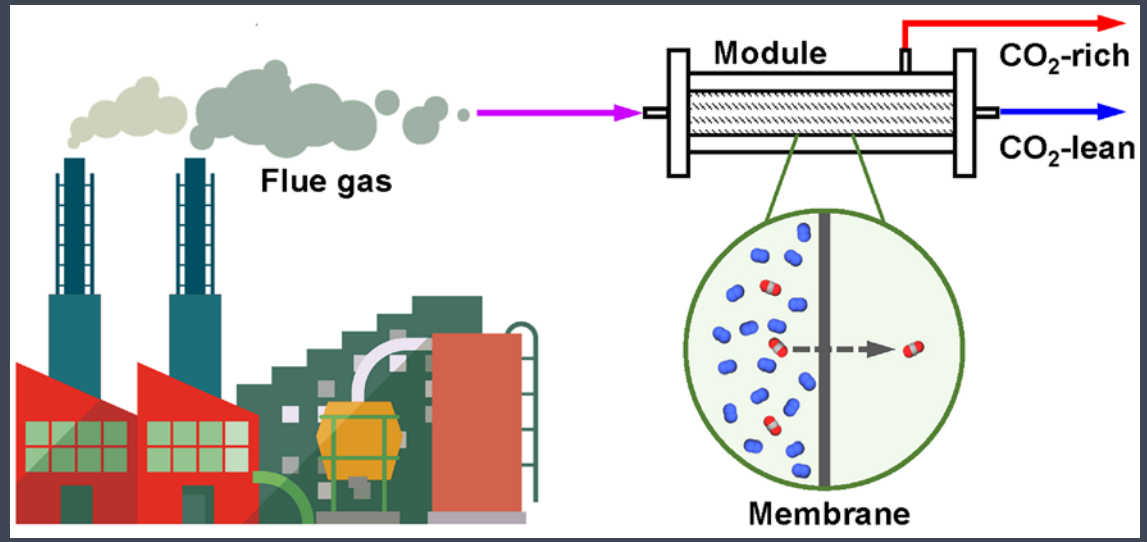
• CARBON CAPTURE AND ITS INJECTION INTO SOIL

Carbon Capture and Sequestration

Post - Combustion

Emphasis on the use of membranes made of polymers

- Low Capital and Operating Costs
- Low Energy Consumption
- Low Space Requirements

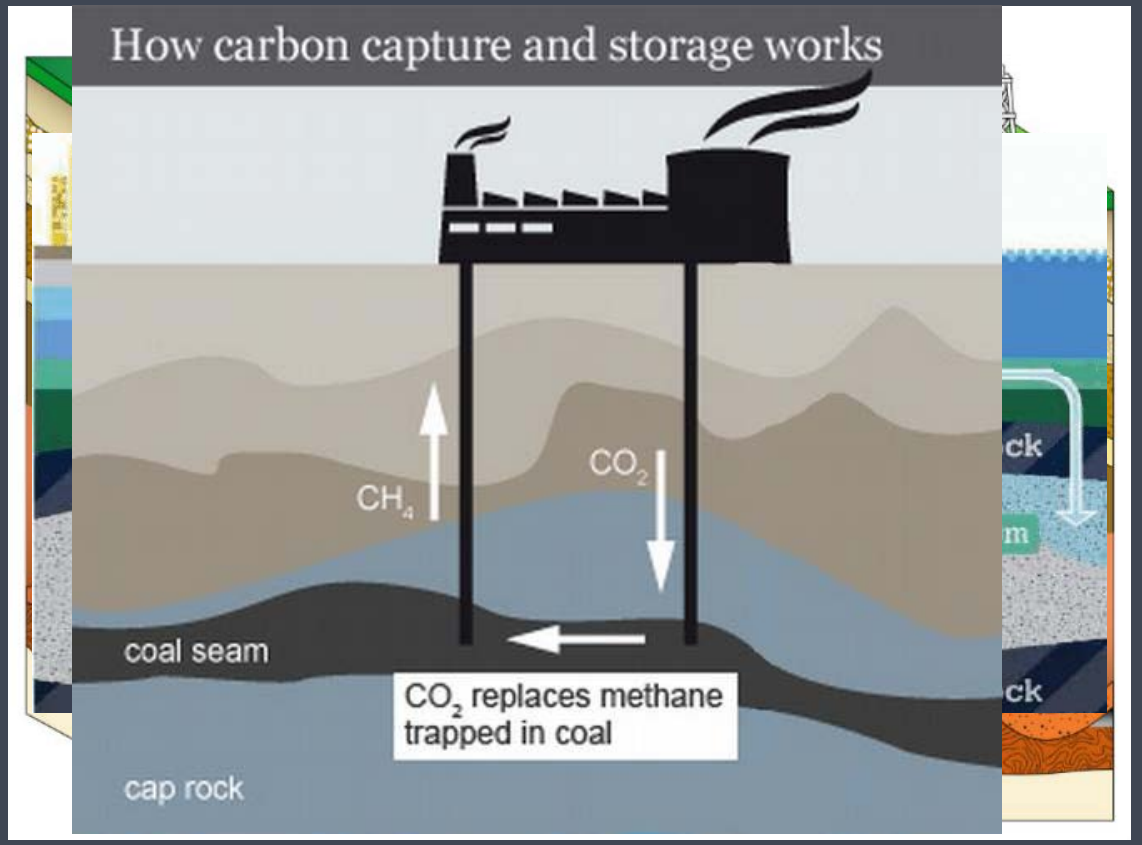


• CARBON CAPTURE AND ITS INJECTION INTO SOIL

Carbon injection into geological formations

The places where this technique is usually used and evaluated

1. Oil and gas reservoirs
2. Unmineable coal seams
3. Deep saline formations



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Carbon injection into geological formations

Deep saline formations

VIABILITY ASSESSMENT AND BENEFITS OF CARBON DIOXIDE FOOTPRINT REDUCTION

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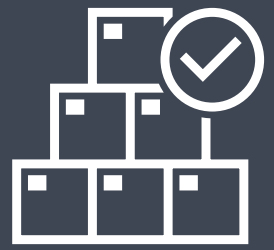
Benefits



- Reduction of greenhouse gas emissions
- Innovative methods
- Decrease in the CO2 footprint
- Minor modifications in cement plants

Limitations

- Economic possibilities
- Geographical locations
- Materials availability
- Qualified labour

CONCLUSION

CONCLUSION

- Raise social awareness
- Mitigate CO2 emissions
- Achieve SDG #9 and #11

Thanks for your attention

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