CCUS tec for a green future

Advancing green technology for a net-zero future

Introduction

- As ***the only*** green technology capable of reducing carbon emissions in major industrial sectors as well as in newly built coal-fired power plants, CCUS technology is an important means for the global to ensure ***energy security***, build an ***ecological civilization***, and achieve ***sustainable development*** in the future.
- Currently, CCUS technology and industrial development are ***still in the R&D stages***, with relatively weak fundamental research.

Background

- The excessive emission of greenhouse gases leads to the increasing greenhouse effect. Carbon dioxide is regarded as one of the most important way to solve the climate problem. ***How to reduce carbon emissions has also become a global issue***
- In terms of emitting sectors, the ***power, transport and industrial*** sectors are the top three emitting sectors.

Global greenhouse gas emissions

Energy-related CO2 emissions

Abstract

- **set a clear direction for post-2020 global cooperation on climate change**

SDG13 — the Paris Agreement — the "two carbon" goal

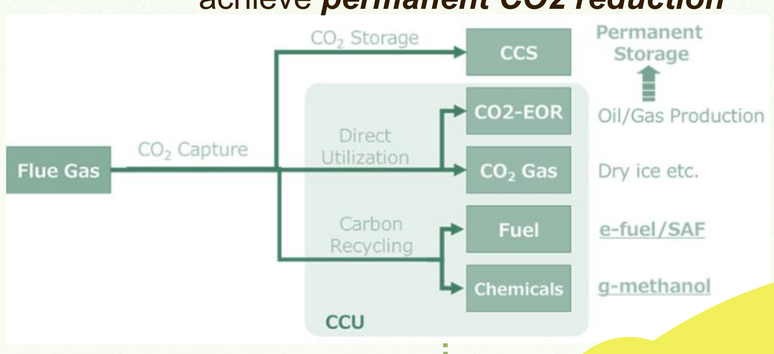
Take urgent action to address climate change and its impacts. .

China's action:
Carbon dioxide emissions strive to peak before 2030, and strive to achieve carbon neutrality before 2060

What is the CCUS technology?

- **C**arbon
- **C**apture
- **U**tilization
- **S**torage

CCUS is the process of ***removing*** carbon dioxide (CO2) from industrial processes, energy use, or the atmosphere and ***using*** it directly or injecting it into the ground to achieve ***permanent CO2 reduction***



CCUS

an emerging technology

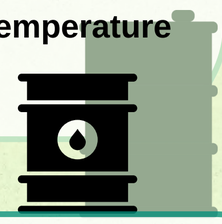
- **large-scale low-carbon use of fossil energy**
- **reduce CO2 emissions**
- **ensure energy security**
- **achieve sustainable development in the future.**

The technical principle of CCUS

CO2-EOR operates through two different mechanisms

- Miscible displacement
- Immiscible flooding

Increase the solubility of CO2 in crude oil:
1.Raise the pressure
2.Lower the temperature



Key points of our proposal

1. CO2 Utilization
2. CO2 Corrosion
3. cost and investment
4. industrialization mechanisms and commercial operational models
5. national policies

Outlook of the Model: solutions → scheme → optimization → obstacles

Solutions

physical mean: silicate resin
chemical mean: gas-soluble foam
→ corresponding sealing systems

Policy&Law

- establish an accounting method and verification mechanism
- referring to the more mature policy incentives and institutional frameworks of Europe and America
- fully combining China's specific national conditions

1. **steadily raising carbon prices**
2. **clarify technical standards for all processes**
3. **distribute long-term safety monitoring responsibilities**

Obstacles

- pressurized oil driving can increase the risk of **gas breakthroughs**
- the current **global carbon price** is low, far from reaching the ideal level to trigger large-scale CCUS investment
- **policy environment and information transparency** still need to be improved
- limited past experience in the **legislative field**

Proposal Measures

technological improvement (enterprises)

CO2 utilization :
high-pressure miscible flooding and sequestration

CO2 Corrosion:
1.corrosion monitoring mechanisms
2.anti-corrosion measures

industrial application (Goverment& enterprises)

1. opening the carbon trading market
2. develop new commercial business models
3. advancing policy and regulatory system

Conclusions

our proposal's effects

- cost reductions and efficiency improvements
- establish a more mature policy and market environment

comprehensively deploying and advancing the implementation of CCUS technology