



CCS Regulatory Cooperation between the EU and China - China Dimension

ACCA21, IET, CAS, IPM, CAS, DS

Lin Na

DEVELOPMENT Solutions



STRACO₂ - Objectives

- support the development of a regulatory framework for CCS in the European Union
- research the possibility of applying the EU and international CCS regulation for CCS regulation development in China
- China Dimension partners: ACCA21, IET, CAS, IPM, CAS



Policy Context in China

Climate change policy framework

- National Strategy and Actions towards Climate Change (Chinese Climate Change Whitebook, 2008)
- China's National Climate Change Programme
- Technical Actions to combat Climate Change in China: R&D, technology development roadmap, and capacity building and demonstration.

Relevant energy policies

- Key priorities: New and Renewable Energy, Energy conservation
- Regulations of coal industry and power industry



CCS regulatory status in China

- Absence of CCS regulatory framework
- Lack of institutional arrangement
- Lack of available financing mechanism and economic incentives
- Difficulties to define the ownership and liability of the storage sites
- No unified technical standard and specific clarifications on CCS



STRACO₂ - Key Regulatory Issues

- Safety and liability
- Site qualification and certification
- Financing and economic incentives
- Cross-cutting issues



CCS regulatory issue (1) - Safety

- Key risks identified: Leakage, Ground movement, Displaced fluids
- Risk assessment and management
 - Site selection technical criteria;
 - Risk assessment process;
 - Risk scenarios;
 - Monitoring;
 - Prevention, protection and corrective measures;
 - Site abandonment technical criteria



CCS regulatory issue (1) – Safety

EU CCS Directive (Daft) (Oct 2008)

- Possible injection rates and CO₂ properties; Reactive processes; Short and long-term simulations; Potential leakage pathways
- HSE impact assessment
- Policy coordination: Water Directive, Waste Directive, etc



CCS regulatory issue (1) – Safety Implications to China

- Regulatory issues to be considered under different timeframes
 - R&D phase: Technology development goes along with policy and regulatory development
 - Demonstration phase: Amend existing safety regulations to support CCS demonstration
E.g. EIA Law; Law on Safe Production; Law of Prevention and Control of Water Pollution ; Law of the People's Republic of China on Prevention and Control of Radioactive Pollution;
GB6025-93: Liquid carbon dioxide for industrial use in chemical industry, cooling, shaping, etc.
The standard of composition of CO₂ steam for CCS process should be established.
 - Deployment phase: a comprehensive regulatory framework for CCS



CCS regulatory issue (2) – Liability

Three phases: operational phase, closure phase and post closure phase

Key issues:

- Financial liability – financial security instrument, financial responsibility share
- Monitoring and corrective measures – noncompliance and leakage
- Withdrawn permit (closure phase)
- Post-closure: transfer of responsibilities



CCS regulatory issue (2) – Liability

- Implications to both Europe and China:
 - Innovative/Market financing scheme required
 - Define responsibility transfer point between private and public sector
 - Guideline for long-term responsibilities



CCS regulatory issue (3) – Site Qualification and Certification

□ Key issues

- Site Screening – standardized methodology
- Site investigation/characterisation – data collection and access (investigation permit)
- Well drilling and testing – standard and guideline
- Site development plan – Storage license
- Site operation
- Closure – best practice guideline to ensure storage integrity
- Post-closure – monitoring plan and reference, timescale
- Certification? (Validation of key milestones by third parties)



CCS regulatory issue (3) – Site Qualification and Certification

Implications to China

- Define Property rights/ownership: land-uses, resources, underground spaces
- Adopt existing regulations and best practices in oil and mining industries, and other existing permitting and management system, e.g. hazardous waste, nuclear waste
- Establish CCS project approval procedure and the institutional arrangement



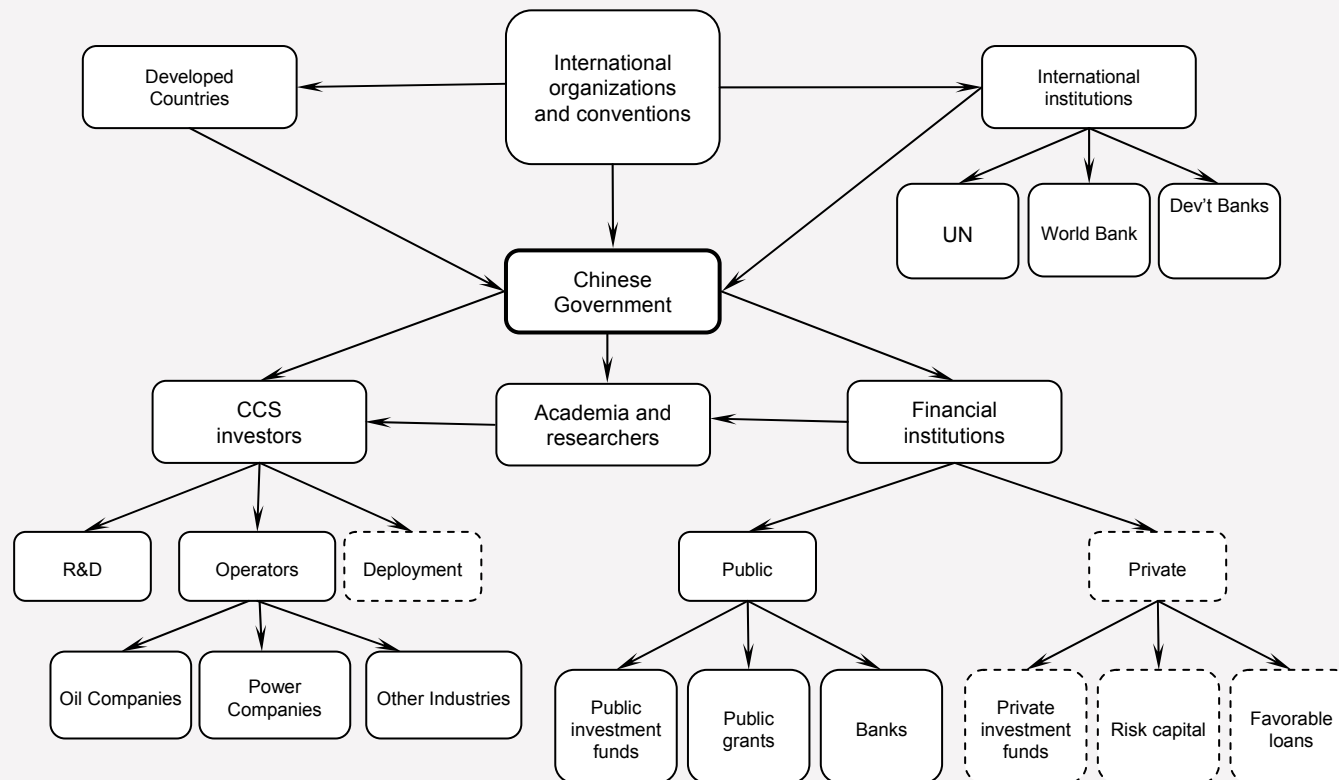
CCS regulatory issue (4) – Incentivisation and Financing

- Leveraging lessons learned from international first-movers is useful for evaluating potential application of CCS in China
- Timeframe: Short-term (present-2012/2015) explores financial incentivisation to establish demonstration CCS projects in China, long-term to focus more on financial requirements for CCS deployment/commercial application in China.
- Stakeholder Structure



CCS regulatory issue (4) – Incentivisation and Financing

Chinese Stakeholder Structure





CCS regulatory issue (4) – Incentivisation and Financing

Relevant financial schemes in China

- Subsidies , e.g. Feed-in tariff for REs
- Taxation – small hydro, PV, wind power
- Pricing – key utilities
- Banking and International Financing
- Existing Technology Platform – National High Technology Programme (also known as 863 Programme) The National Basic Research Program (also called 973 Program)
- China CDM Fund
- Public Private Partnerships (SICAV)



CCS regulatory issue (5) – Cross-cutting issues in China

Awareness of CCS regulation

- Necessity of CCS regulation in China currently
- Timing of CCS regulation
- Demonstration projects – to develop the technology and regulatory issues

Impact Assessment

- Impact on relevant industries, e.g. coal & power
- CCS vs. other mitigation options

IPR and Technology Transfer

- IPR system and laws
- Acceptance of new technologies



Conclusions

- ❑ Regulation development is an integrated part of CCS demonstration and early deployment practices.
- ❑ International regulatory activities and best practices, including EU CCS regulation, can provide reference for Chinese regulation.
- ❑ STRACO2 and other regulatory researches serve as an important basis of future EU-China cooperation on CCS regulation.
- ❑ More specific and in-depth China CCS regulatory research and cooperation needed to develop CCS D & D roadmap



Final Report

Support to Regulatory Activities for Carbon Capture and Storage



Thank you for your attention!

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