

Financing Pathways for CCS in Emerging Economies

Shannon Cowlin
CSLF Annual Meeting
Tokyo, 7 October 2016



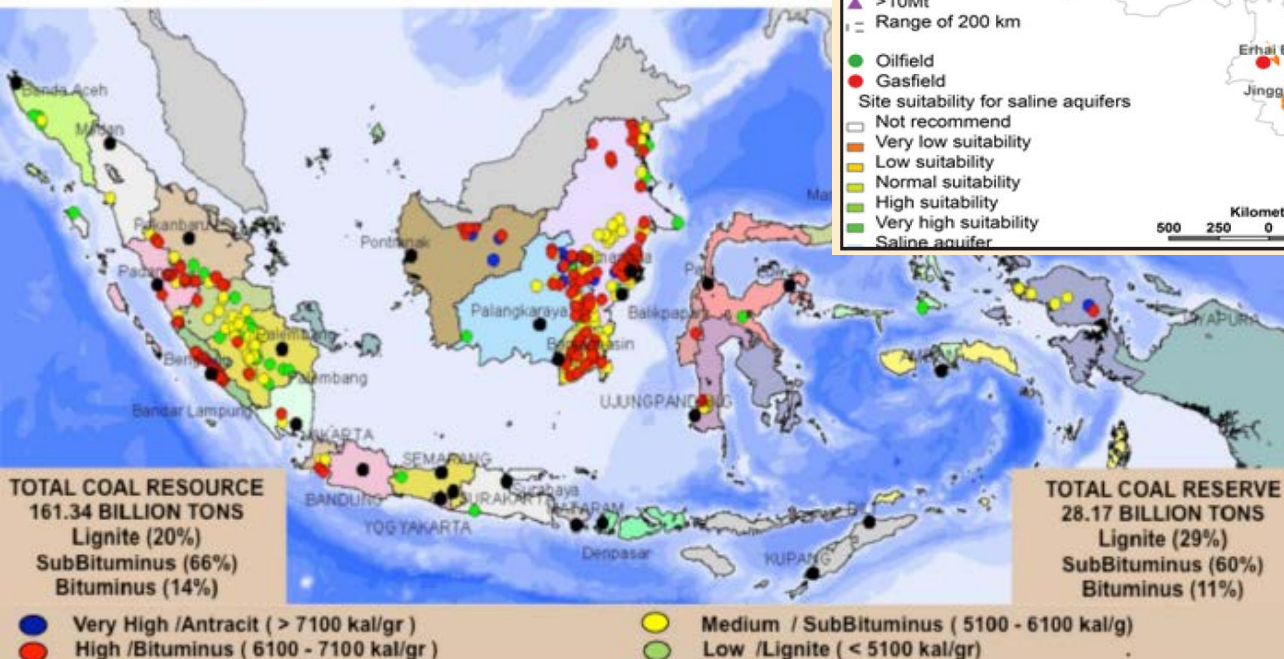
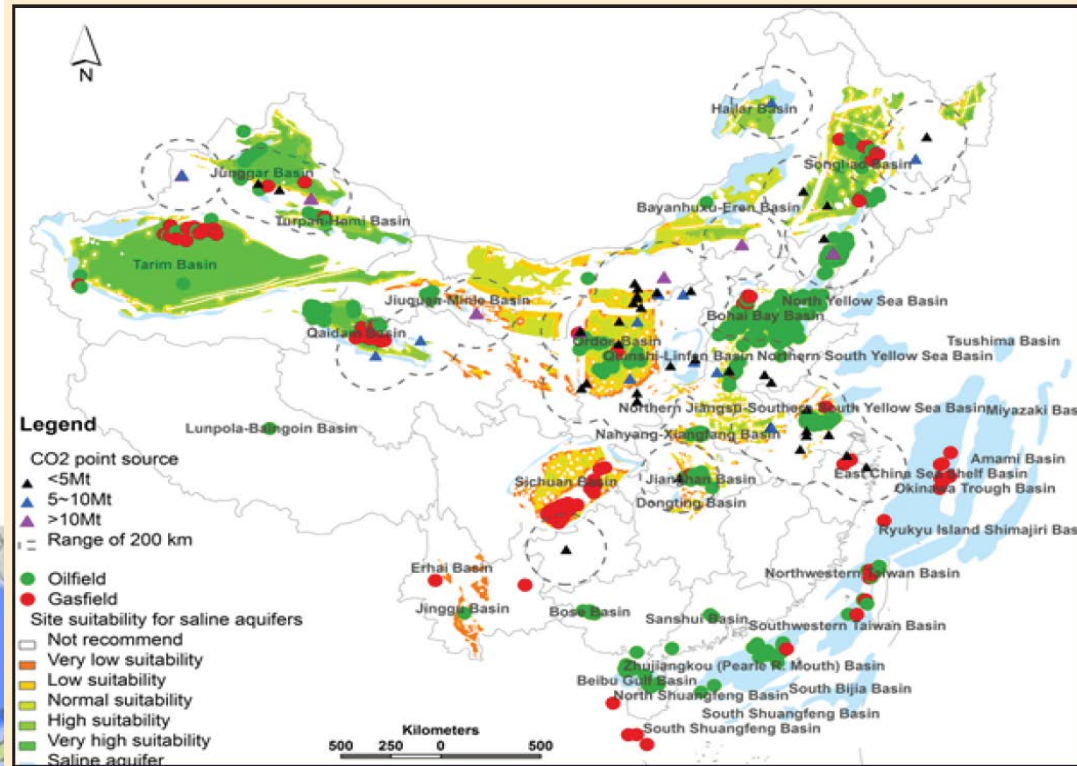
ADB Mission & Energy Approach

- **Mission:** To help its developing member countries reduce poverty and improve the quality of life of their people
- **Energy Policy Pillars:**
 - Promoting energy efficiency and renewable energy
 - Maximizing access to energy for all
 - Promoting energy sector reform, capacity-building & governance
- Support for CCS to be provided as it becomes technically feasible and economically viable.



CCS in ADB DMCs

- Fossil heavy future
- Good source/sink opportunities



CCS Financing Trajectory

● **Pilot**
-grant
-small scale
-simple

● **Demonstration**
-lower complexity and cost
-state owned enterprises
-concessional financing

● **Early Commercial**
-private sector and SOEs
-ADB non-sovereign/IFC
-commercial cofinancing and B-loans

● **Late Commercial**
-standard project finance models

← **Climate funds** →



Must Address Risks

Risks

Comment

Lack of Commerciality

- Large capital expenditure
- Often pure cost proposition

Regulatory Risk

- Regulatory regimes immature/ under development

Technical Risk

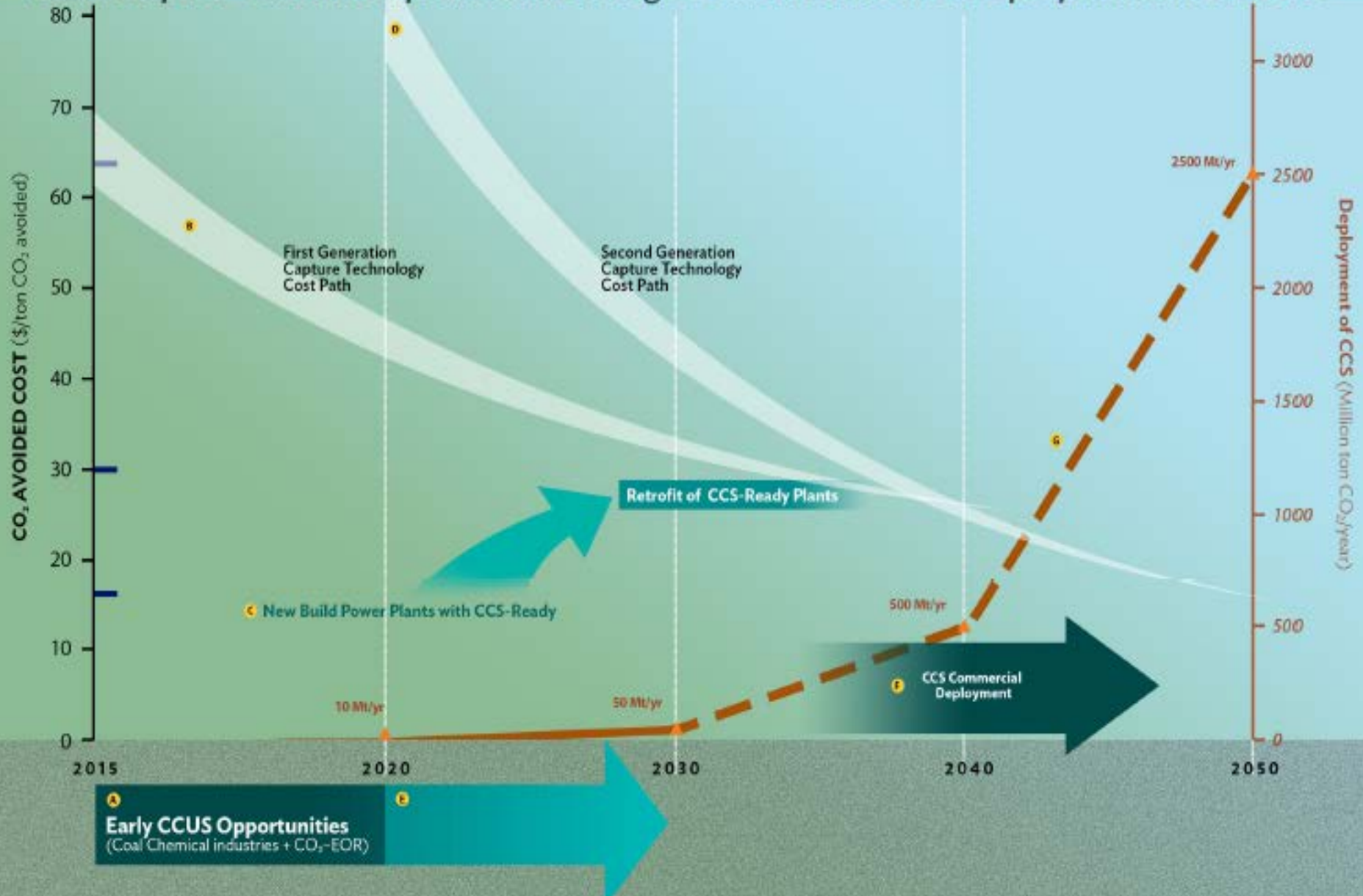
- Technologies often unproven at scale or still immature
- Differing risk perceptions along CCS chain
 - Capture
 - Transport
 - Storage

Revenue/ Offtake Risk

- EOR not applicable in all cases
- Carbon market uncertain
- No regulator-approved cost-recovery



Roadmap for Carbon Capture and Storage Demonstration & Deployment in the PRC



Widespread commercial deployment of CCUS technologies in the PRC is anticipated to take about 10 to 15 years. For this commercial deployment to happen, it is critical to demonstrate large-scale CCS projects now.

Improving Risk Profile

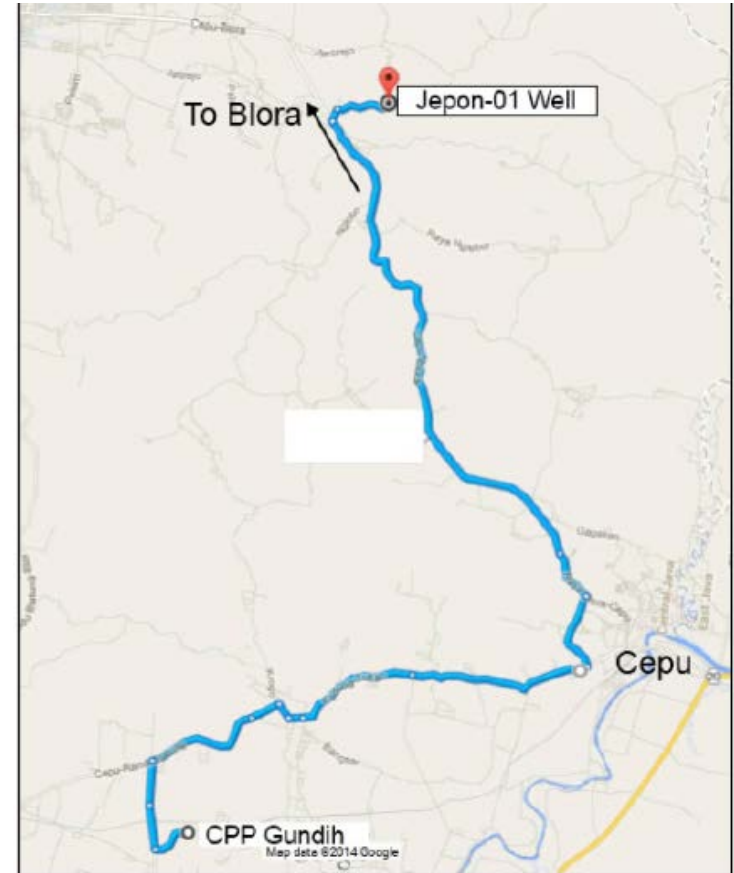
- Establish clear regulatory regime and refine and improve after early projects
- Early projects should focus on “easy” capture and use in EOR
- Provide grants for feasibility/FEED studies to lower development costs and risks
- Provide fiscal incentive

ADB Activities

- ADB established a dedicated CCS Fund with contributions from the Global CCS Institute (AUD 21.5 m) and UK Government (£ 35 m)
- Has supported upstream analyses and capacity development activities to build a case for CCS demonstration
- Supported development of CCS roadmaps
- Establishing Centers of Excellence in China and Indonesia
- Aims to support pilots



Gundih Pilot



- CO₂ purification from NG processing facility
- Truck transport ~44 km
- Injection at suspended exploration well
- 30 tons per day, 2 years

Early Lessons and Questions

- Transaction cost
- Lack of regulation
- Technical challenges
- Monitoring and verification
- Operation timeframe

Questions for/from CSLF

- How to translate site-specific to general guidance
 - Storage characterization
 - Monitoring and verification
 - Risk assessment
- Strategic role for government
 - Policy recommendations?
 - Hubs/common infrastructure?
 - Risk bearing/sharing?

Shannon Cowlin

scowlin@adb.org

Annika Seiler

aseiler@adb.org

Ashok Bhargava

abhargava@adb.org

