UNLOCKING PRIVATE FINANCE TO SUPPORT CCS INVESTMENTS

DOMINIC RASSOOL
Senior Consultant – Policy and Finance

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THE NEED FOR CCS AND BARRIERS TO INVESTMENT IN CCS

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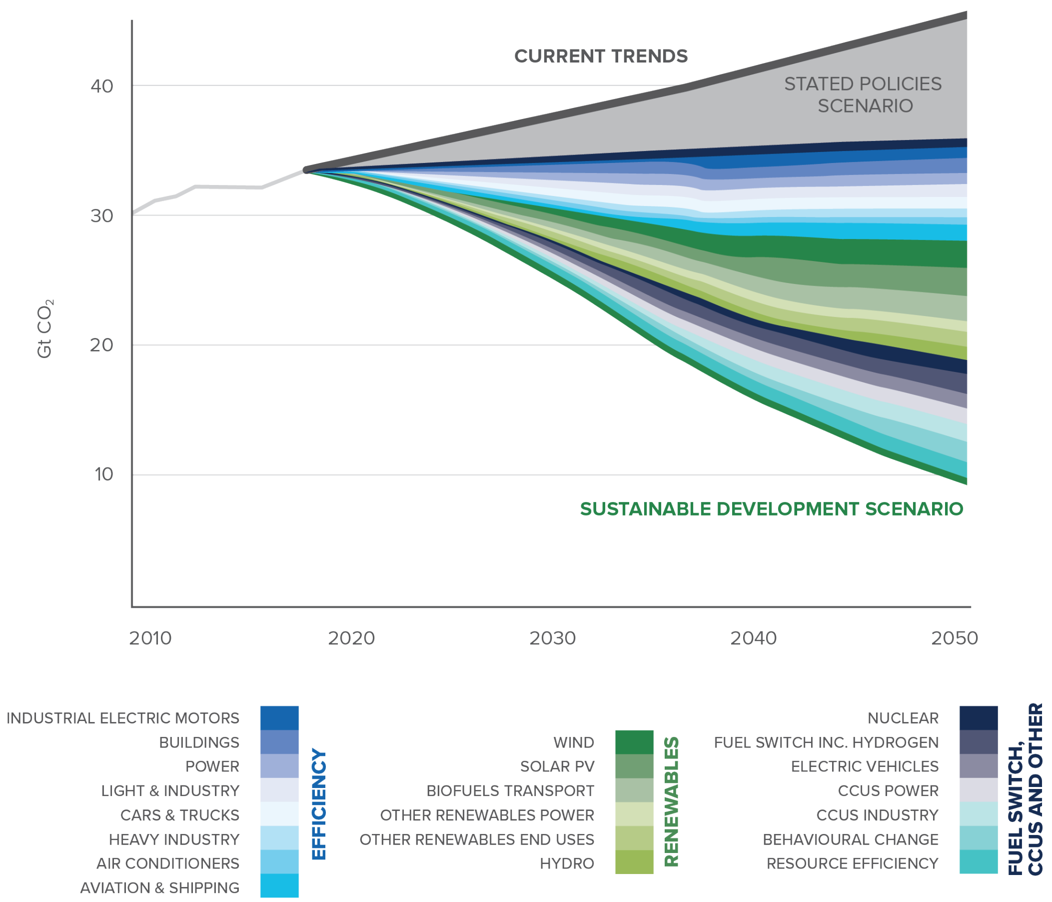
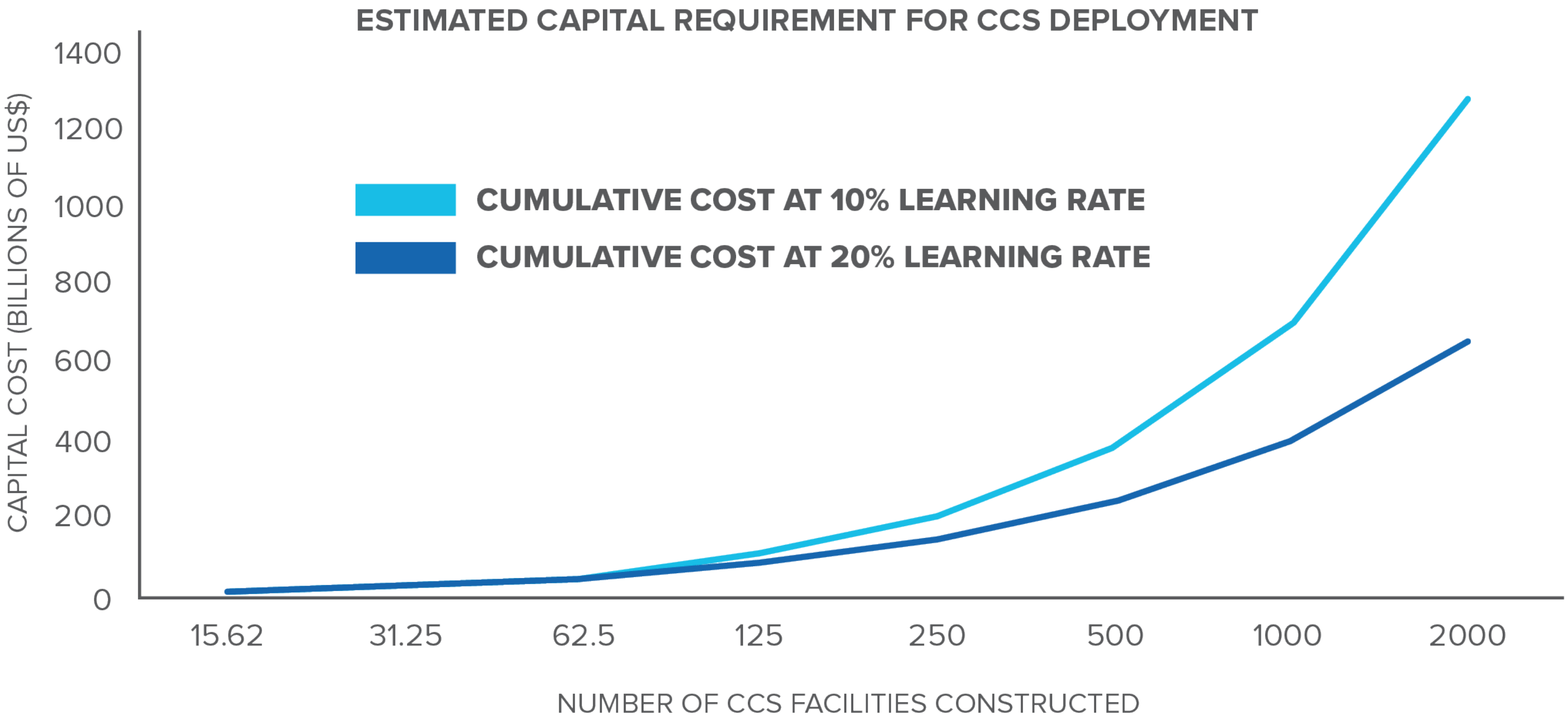
THE NEED FOR CCS



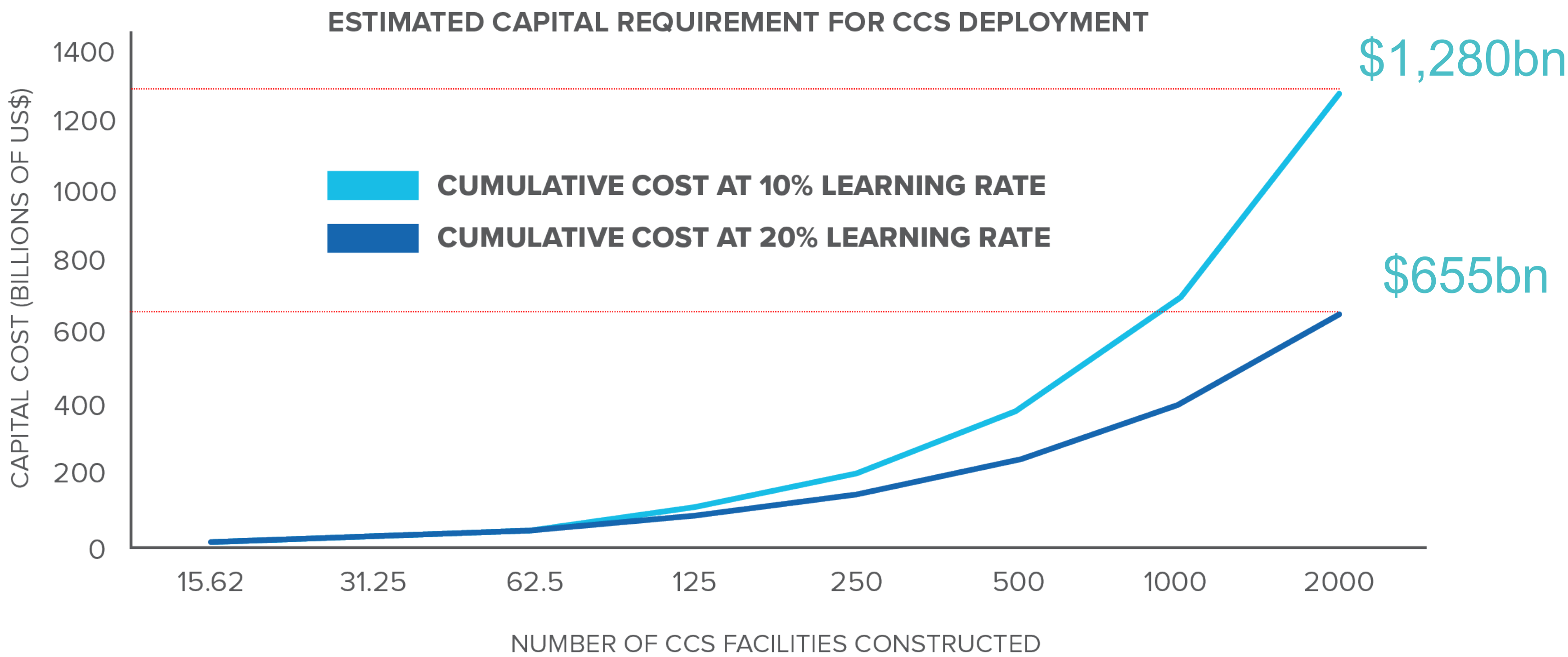
THE NEED FOR CCS

- Latest figures show that the IEA-SDS requires that 15% of the world's emissions reductions is to be achieved using CCS
- Equivalent to about 5.6 GT of CO_2 per year
- Estimated number of CCS facilities is around 2000 in operation by 2050
- CCS facilities are capital intensive

THE NEED FOR CCS



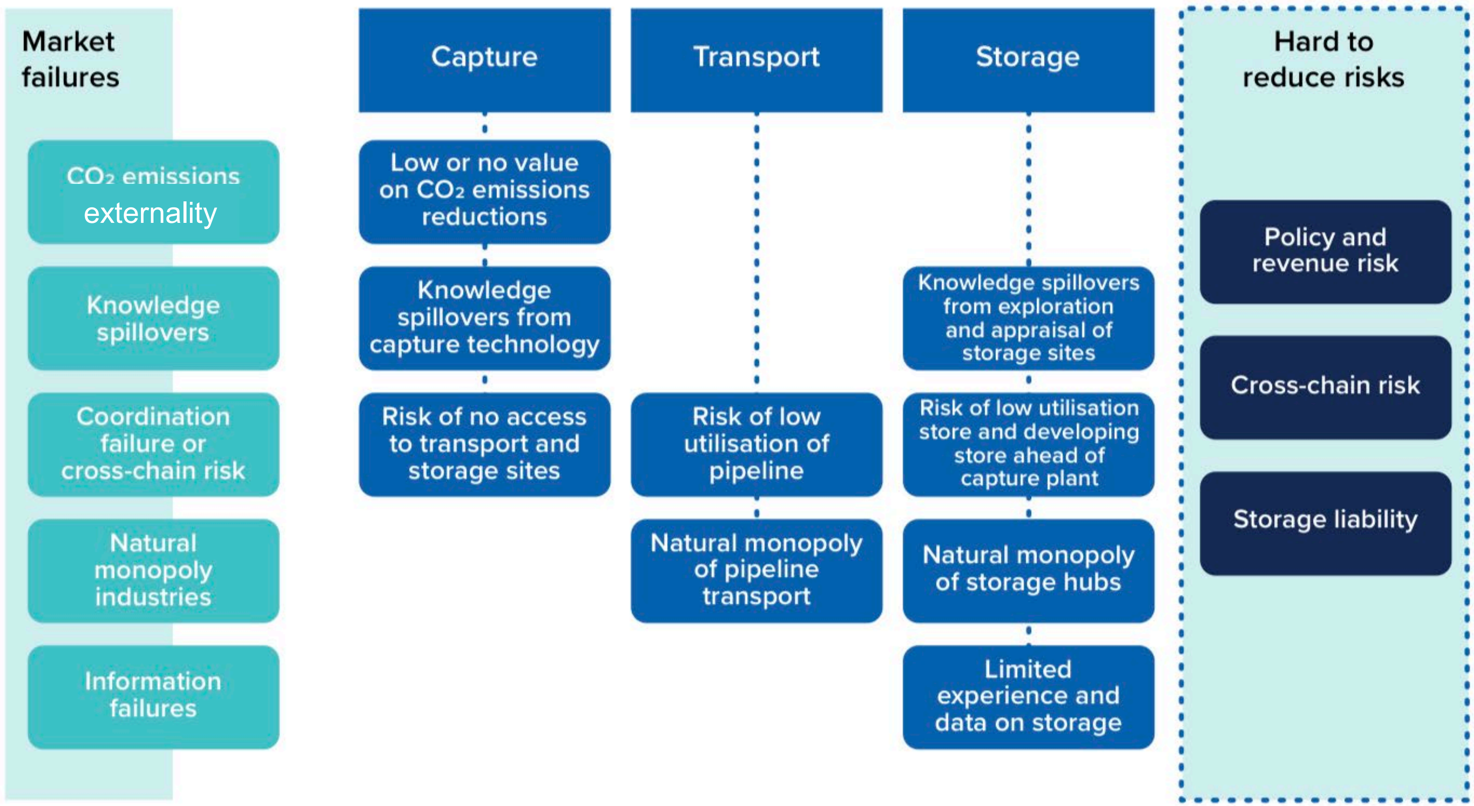
CAPITAL REQUIREMENT



PRIVATE INVESTMENT FOR WIDESCALE DEPLOYMENT OF CCS

- Capital requirement outstrips what governments are willing to provide
- Trillions of dollars locked up in the private sector
- Unlocking private capital is essential if the world is to meet the deployment target for CCS

CCS MARKET FAILURES LEAD TO HARD TO REDUCE RISKS



… BUT SOME RISKS ARE REDUCED THROUGH DEPLOYMENT

- General project risks – these come down through learning by doing
- Hard-to-reduce risks – these require government intervention:
  - Revenue risk
  - Cross-chain risk
  - Long-term storage liability

LESSONS LEARNED FROM EXISTING CCS FACILITIES

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POLICIES & PROJECT CHARACTERISTICS	Carbon tax	Tax credit or emissions credit	Grant support	Provision by government or SOE	Regulatory requirement	Enhanced oil recovery	Low cost capture	Low cost transport & storage	Vertical integration
US									
Terrell						●	●	●	
Enid Fertiliser						●	●	●	
Shute Creek					●	●	●	●	
Century Plant		●				●	●		
Air Products SMR		●	●			●			
Coffeyville		●				●	●		
Illinois Industrial		●	●				●	●	●
Lost Cabin**		●				●	●		
Petra Nova**		●	●			●			
Great Plains						●	●		
ZEROs Project*						●	●		
Arkalon			●			●	●		
Bonanza						●	●	●	
Core Energy						●	●		
PCS Nitrogen						●	●		
CANADA									
Boundary Dam			●	●	●	●		●	
Quest		●	●						●
ACTL Sturgeon Refinery			●			●	●		
ACTL Nutrien			●			●	●		
BRAZIL									
Petrobras Santos				●		●	●	●	●
HUNGARY									
MOL Szank						●	●		●
NORWAY									
Langskip CCS, Brevik Norcem*		●	●						
Sleipner	●			●			●	●	●
Snøhvit	●			●	●		●		●
UAE									
Abu Dhabi CCS				●		●		●	
SAUDI ARABIA									
Uthmaniyah				●		●	●	●	●
QATAR									
Qatar LNG CCS				●		●	●	●	●
CHINA									
CNPC Jilin				●		●	●	●	●
Sinopec Qilu*				●		●	●	●	
Karamay Dunhua						●		●	
Sinopec Zhongyuan				●		●			
Taizou*			●	●		●			
AUSTRALIA									
Gorgon			●		●		●	●	●

*In construction

**Operation suspended.

KEY TRENDS FROM EXISTING FACILITIES

- CCS deployment has occurred chiefly across low-cost capture opportunities
- Most of the world's CCS facilities rely upon revenue generated from the sale of CO_2 for enhanced oil recovery (EOR) purposes
- Most CCS facilities have been developed on the books of large corporations or state-owned enterprises (SOEs)

BARRIERS TO UPSCALING CCS

- Meeting climate targets requires the application of CCS to a broad range of industries
- Sale of CO_2 for for usage does not scale with requirement; logistically challenging
- Most companies not be able to fund CCS projects on their balance sheets – project finance is needed

ENABLING PROJECT FINANCE

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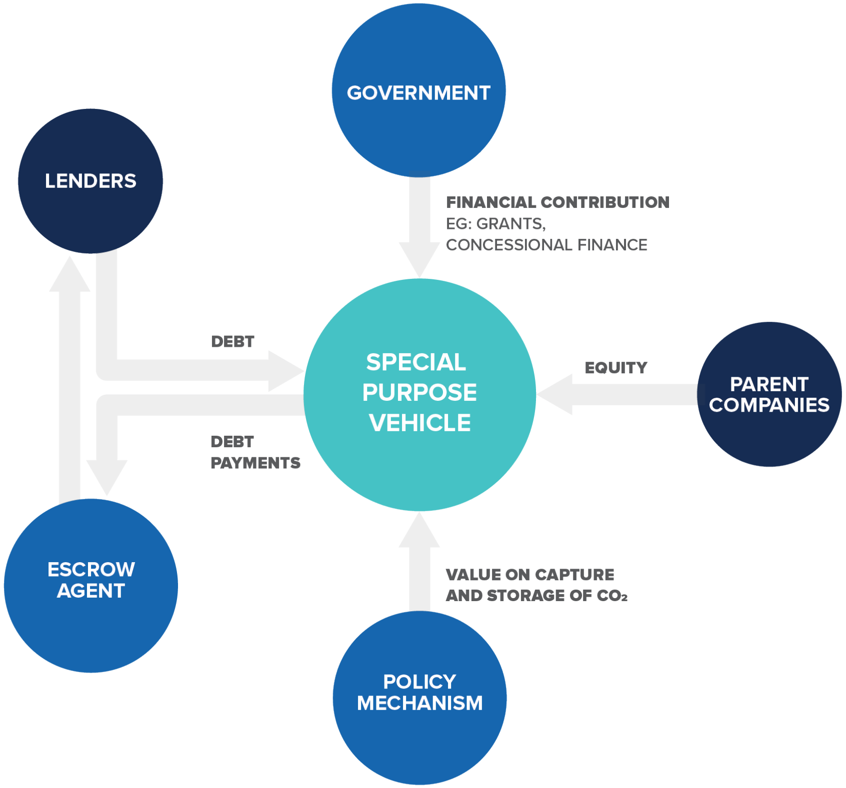
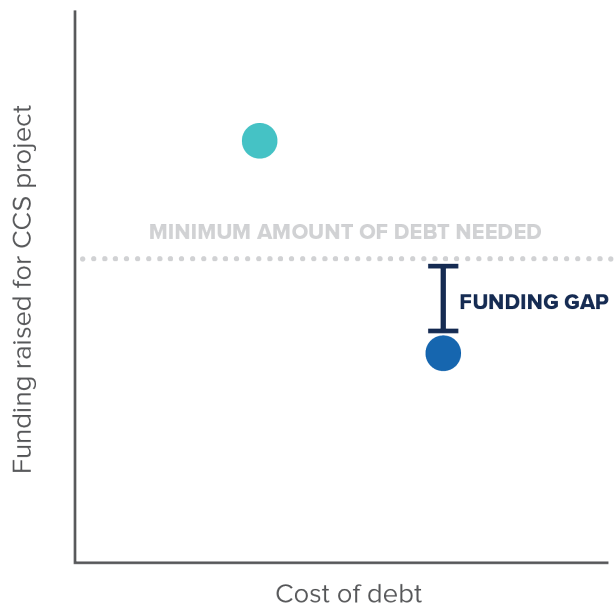
ENABLING PROJECT FINANCE

- Capital raised based on future cashflows;
- Financiers have no recourse to the assets of project owners;
- Lenders are exposed to uncertainties – higher cost of debt;
- Allows multiple equity investors and suits smaller companies



ENABLING PROJECT FINANCE

- Risks lead to higher cost of debt, increasing project costs
- This can limit the amount of debt applied to a CCS project, creating a funding gap
- Governments can help close such funding gaps through specialist financiers



Risks that are adequately managed will lead to improved terms of lending, including lower lending rates. This allows the project to meet (or surpass) the minimum level of funding required.

Risks that are not adequately managed will drive up lending rates. This reduces the amount of debt that the project can sustain, creating a funding gap.

LENDERS AND FINANCIAL INSTRUMENTS

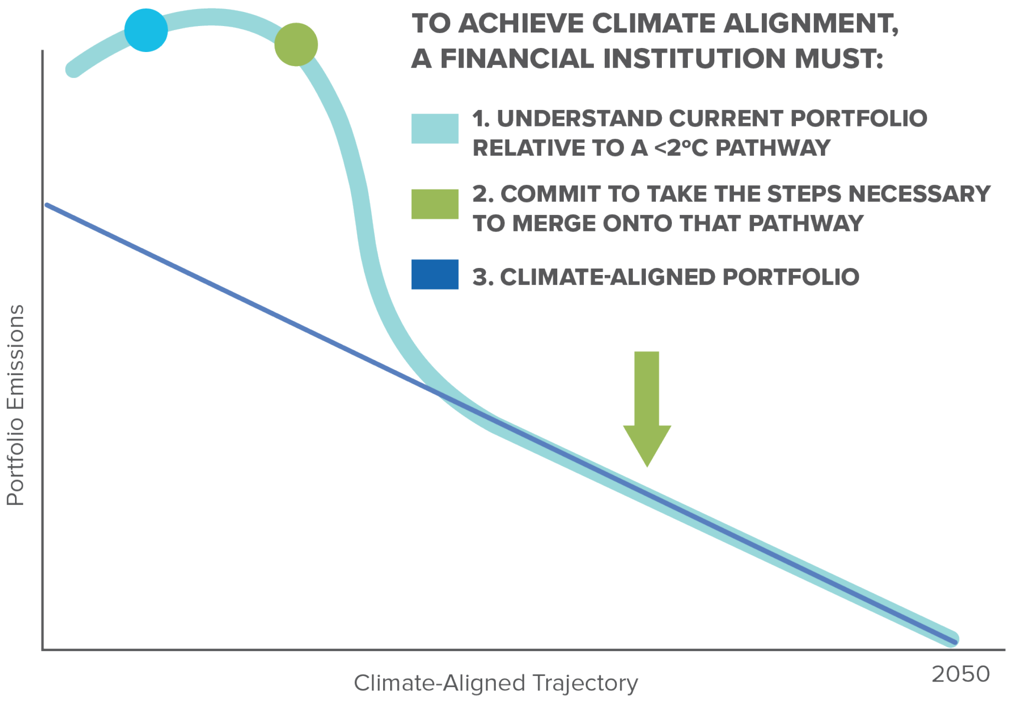
FINANCING TYPE OR SOURCE	EXAMPLES OF FINANCIAL INSTITUTIONS	ROLE	EXAMPLES OF SPECIALIST AREAS OF FINANCING
Commercial Banks	HSBC, Wells Fargo. BNP Paribas	Experts at pricing term debt to projects. Commercial banks are sensitive to risks.	Long-term debt, Medium-term debt
Export Credit Agencies (ECAs)	NEXI, UK Export Finance	ECAs provide risk guarantee to cover a significant proportion of a transaction. They also provide improved terms and conditions.	Medium-term debt, Political or commercial risk insurance, Guarantees, Concessional financing
Multilateral Agencies (MLAs) and Development Financial Institutions (DFIs)	World Bank Group, Asian Development Bank, Inter-American Development Bank, UK Infrastructure Bank[3] and the European Investment Bank.	Term debt providers that promote sustainable economic and social development in low-income member countries.	Equity, Long-term debt, Medium-term debt, Political or commercial risk insurance, Guarantees, Concessional financing
Developmental Financial Institutions (DFIs)	FMO (Netherlands), DEG (Germany), Proparco (France), UK Infrastructure Bank[3] and OPIC (USA).	DFIs are owned by singular governments and are tasked with promoting sustainable economic and social development	Equity, Long-term debt, Medium-term debt, Political or commercial risk insurance, Guarantees, Concessional financing

KEY

- EQUITY
- LONG-TERM DEBT
- MEDIUM-TERM DEBT
- POLITICAL OR COMMERCIAL RISK INSURANCE
- GUARANTEES
- CONCESSIONAL FINANCING

TRANSITION RISKS HELP DRIVE INVESTMENTS IN CCS

- Operational and **portfolio emissions** must be covered
- For some investors, climate risk is best managed by active engagement with businesses.
- This means supporting CCS investments.



FINANCING CCS IN DEVELOPING COUNTRIES

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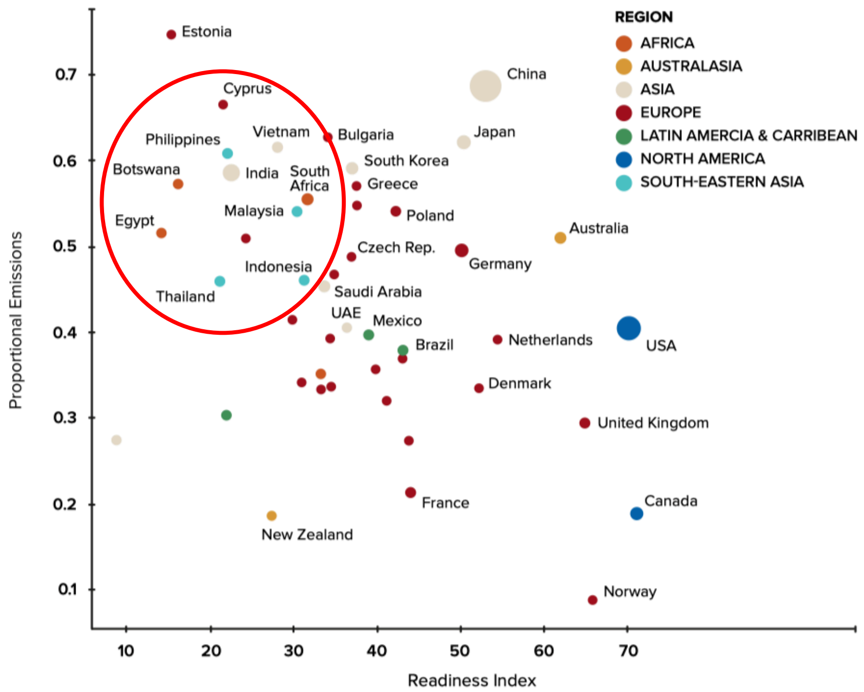
A LACK OF CCS DEPLOYMENT IN DEVELOPING COUNTRIES



- Many developing countries have a high need for CCS
- Many of these have low levels of CCS readiness in relation to their CCS need
- For the world to meet the climate challenge, this must change

FINANCING CCS IN DEVELOPING COUNTRIES

	INDC	1ST NDC	1ST NDC UPDATE	2ND NDC
Australia	—	✗	✓	
Bahrain	—	✓		
China	✓	✓		
Egypt	—	✓		
Iran	✓			
Iraq	✓			
Malawi	✓	✓		
Mongolia	✗	✗	✓	
Norway	—	✓	✓	
Saudi Arabia	✓	✓		
South Africa	✓	✓		
UAE	—	✓		✓
United States	✗	✓		

KEY

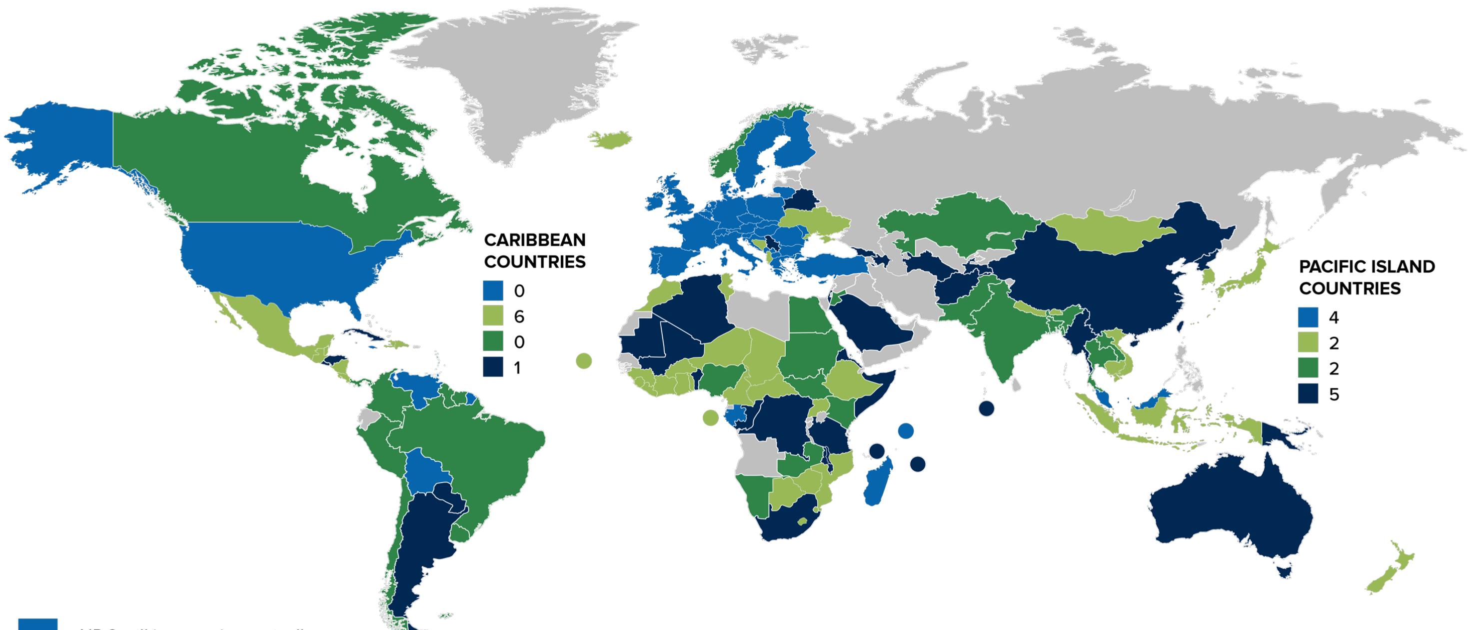
✓ NDC MENTIONS CCS ✗ NDC DOES NOT MENTION CCS — NOT AVAILABLE

Some developing countries have explicitly or implicitly included CCS as a technology required to meet their Nationally Determined Contributions (NDC) under the Paris Agreement.

HOW CAN CLIMATE FINANCE HELP?

- Specialist financiers and the UNFCCC financial mechanism (GCF) can come together to support the development of CCS projects in developing countries
- Non-market-based mechanisms
- Green Climate Fund
- Market-based mechanisms
- Carbon crediting and Article 6

MARKET FRIENDLY NDCs



NDC will be met domestically

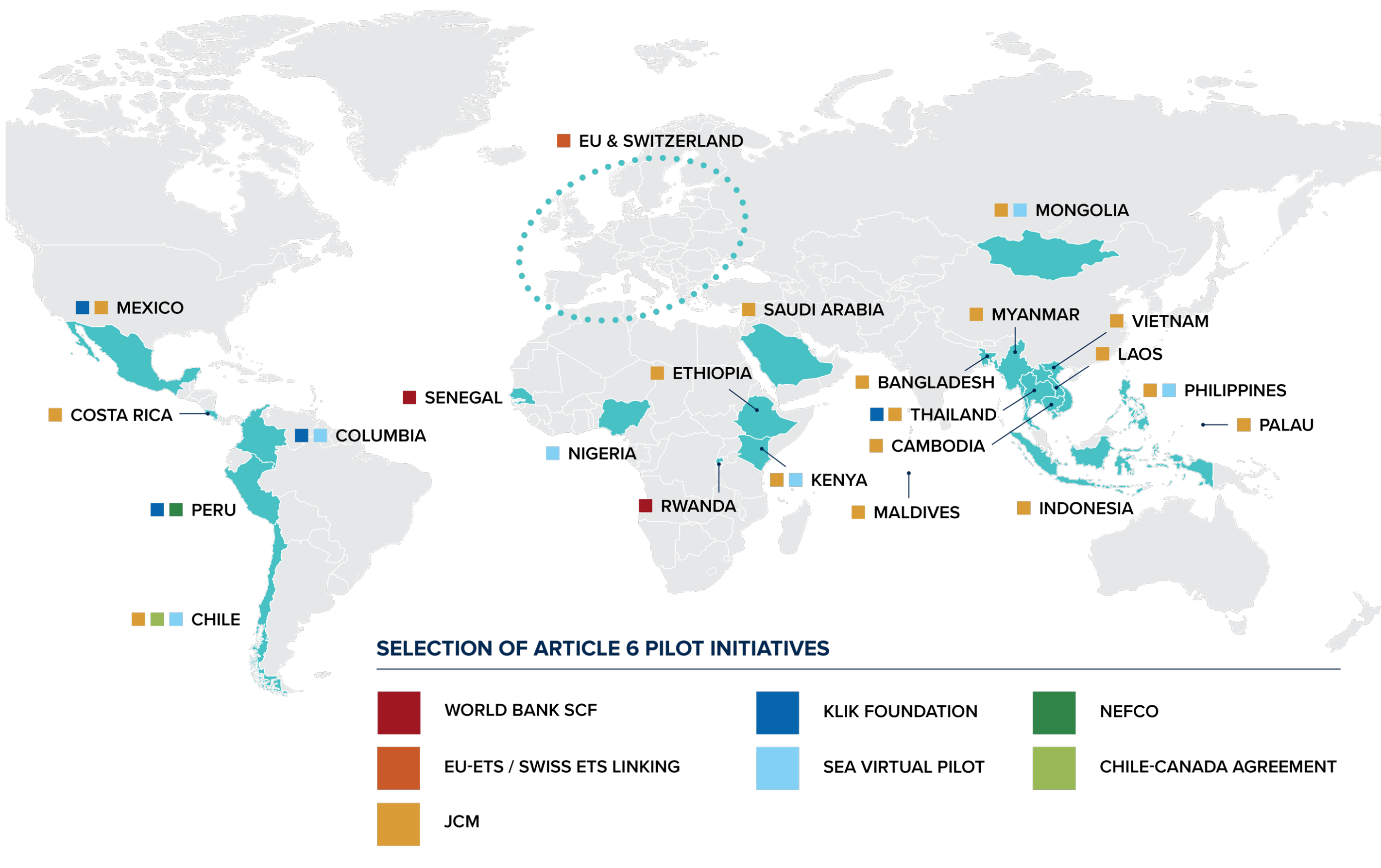
NDC includes the use of international markets

Country will maybe make use of international markets

Not Specified

NDC Not Submitted

ARTICLE 6 PILOT INITIATIVES



SUMMARY

- CCS is currently at a critical stage in its deployment
- Governments must adopt and implement enabling policies between now and 2030
- Some of these policies will lead to significant transition risks, and it is through them that incentives to drive private investments in CCS will occur
- The role of specialist financiers will be crucial in supporting emitters that are unable to fund their CCS investments on their balance sheets
- Actions to support early deployment in developing countries will have to increase dramatically over the coming years

AREAS OF RESEARCH

- The need for CCS in the APAC region is high – how high is it, and where is this need highest?
- What does this mean for the role of CCS across financial portfolios – i.e., climate risks that are mitigable through CCS.

THANK YOU

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