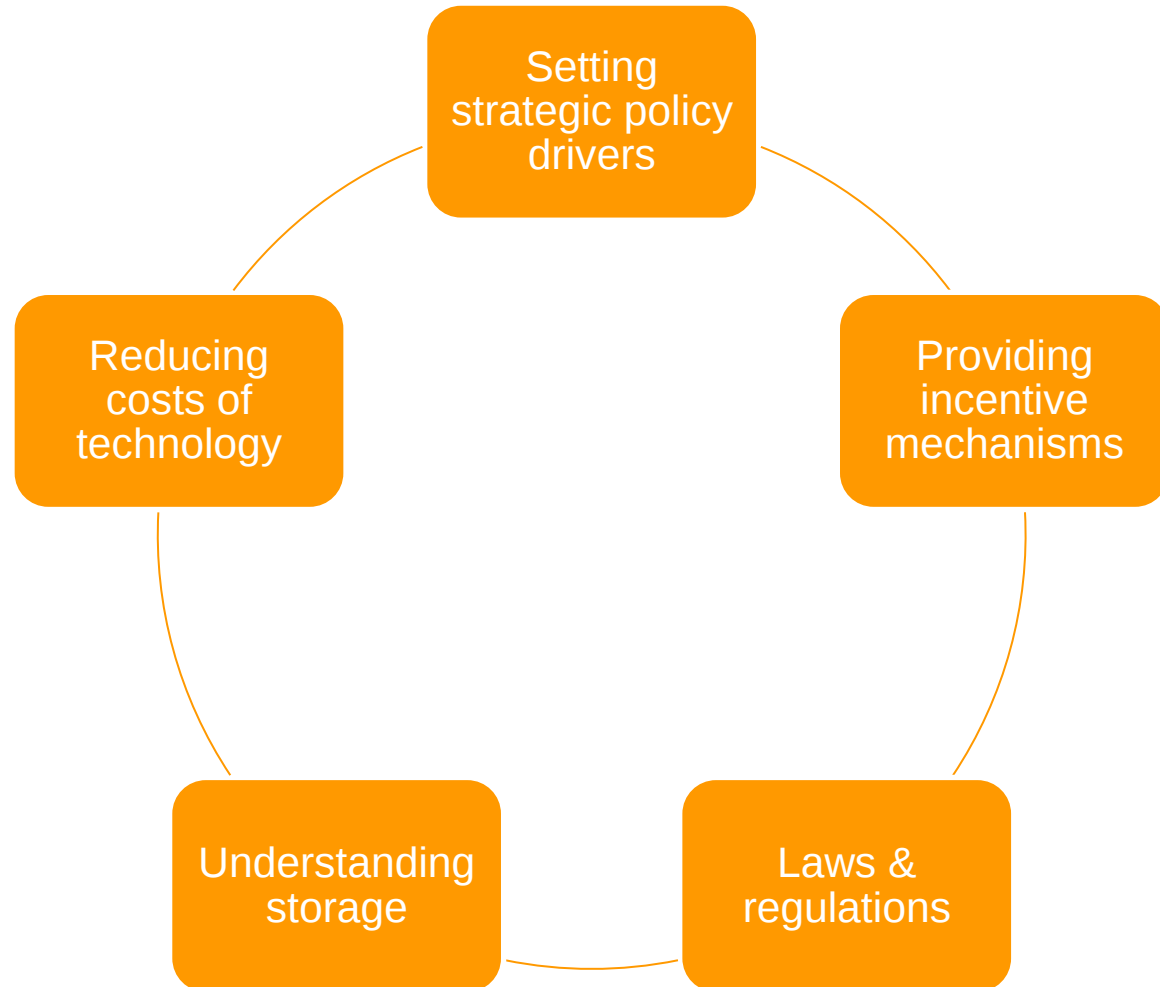


A policy strategy for carbon capture and storage

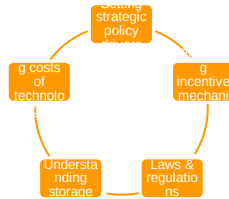
18 September 2011

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POLICY IS CRITICAL FOR CCS



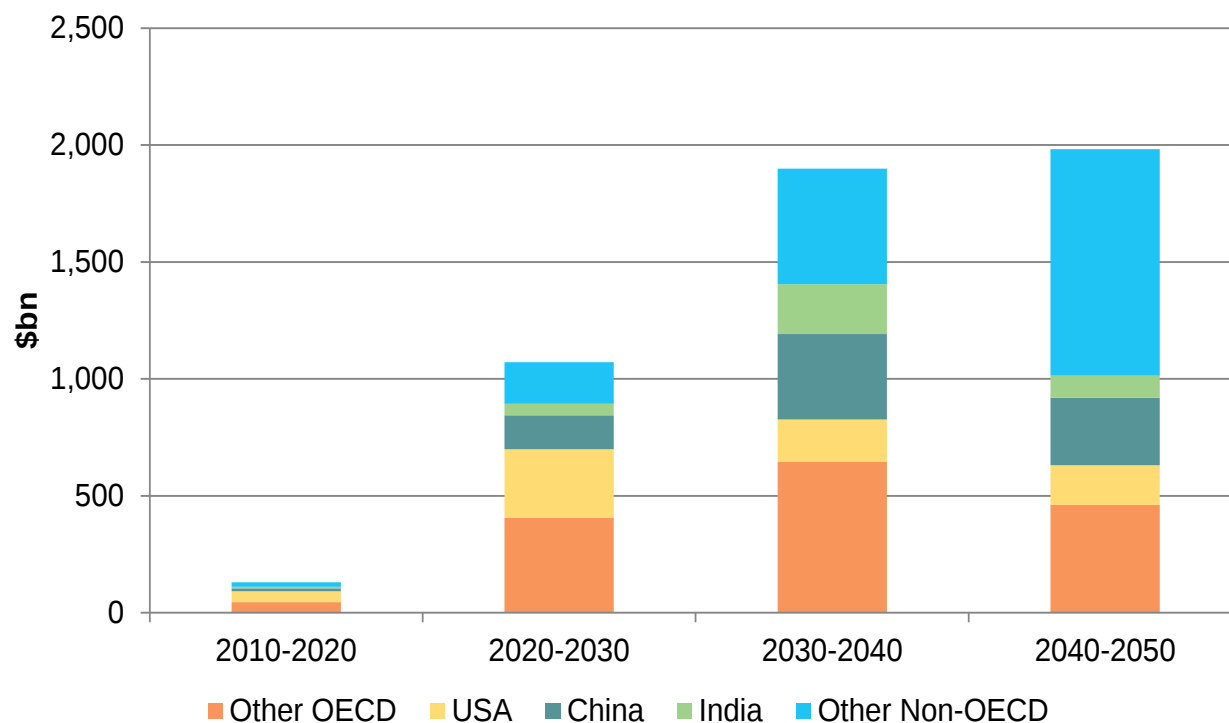
POLICY IS CRITICAL FOR CCS



1. Enabling CCS as part of energy portfolio
2. Making CCS a legal activity & clarifying responsibilities
3. Ensuring safety and environmental viability of operations
4. Providing incentives for demonstration and deployment
 - Business models & financing of projects
5. Contributing to public acceptance

Significant amount of capital needs to be attracted

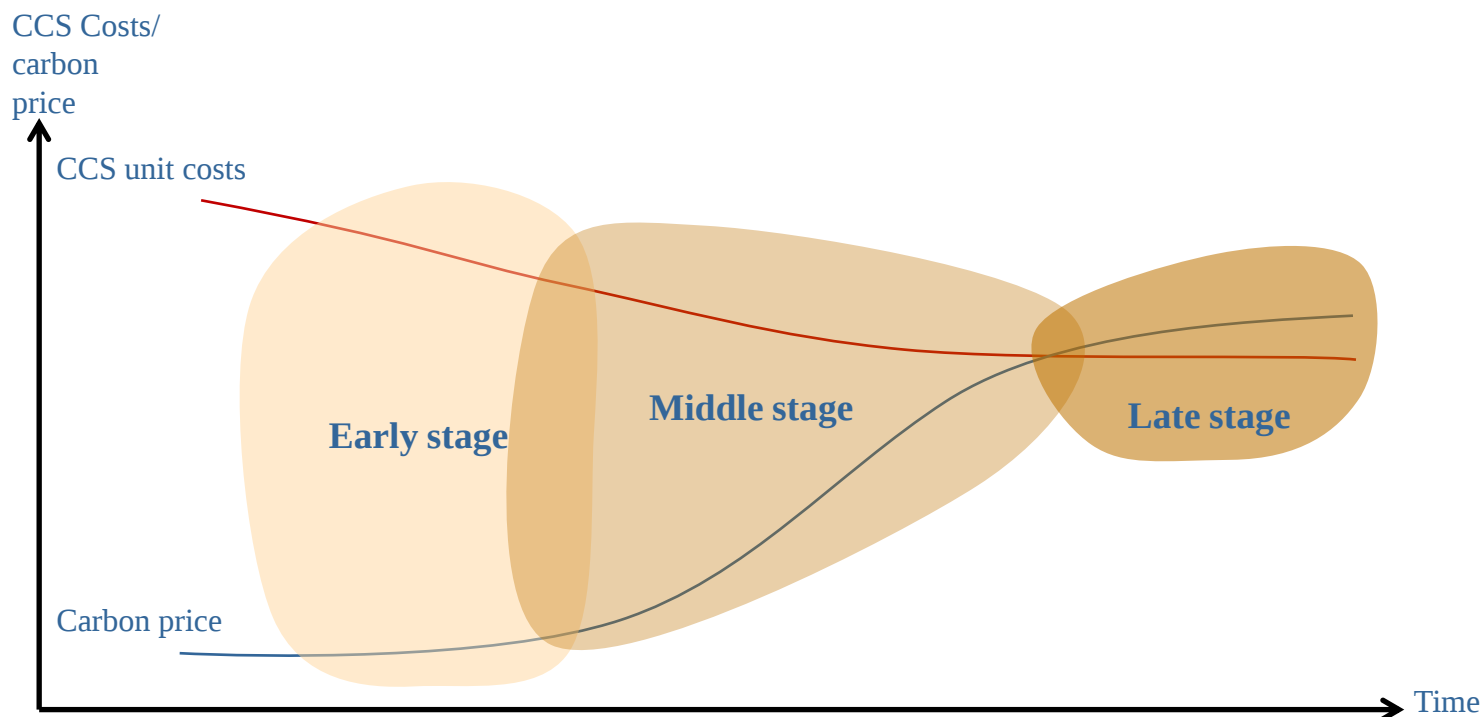
To meet the IEA Roadmap ambitions almost \$5 trillion will need to be invested in CCS installations



Notes: excludes transportation and storage investment; includes investment in both base plant and capture

The economic characteristics of CCS technology are expected to fundamentally change

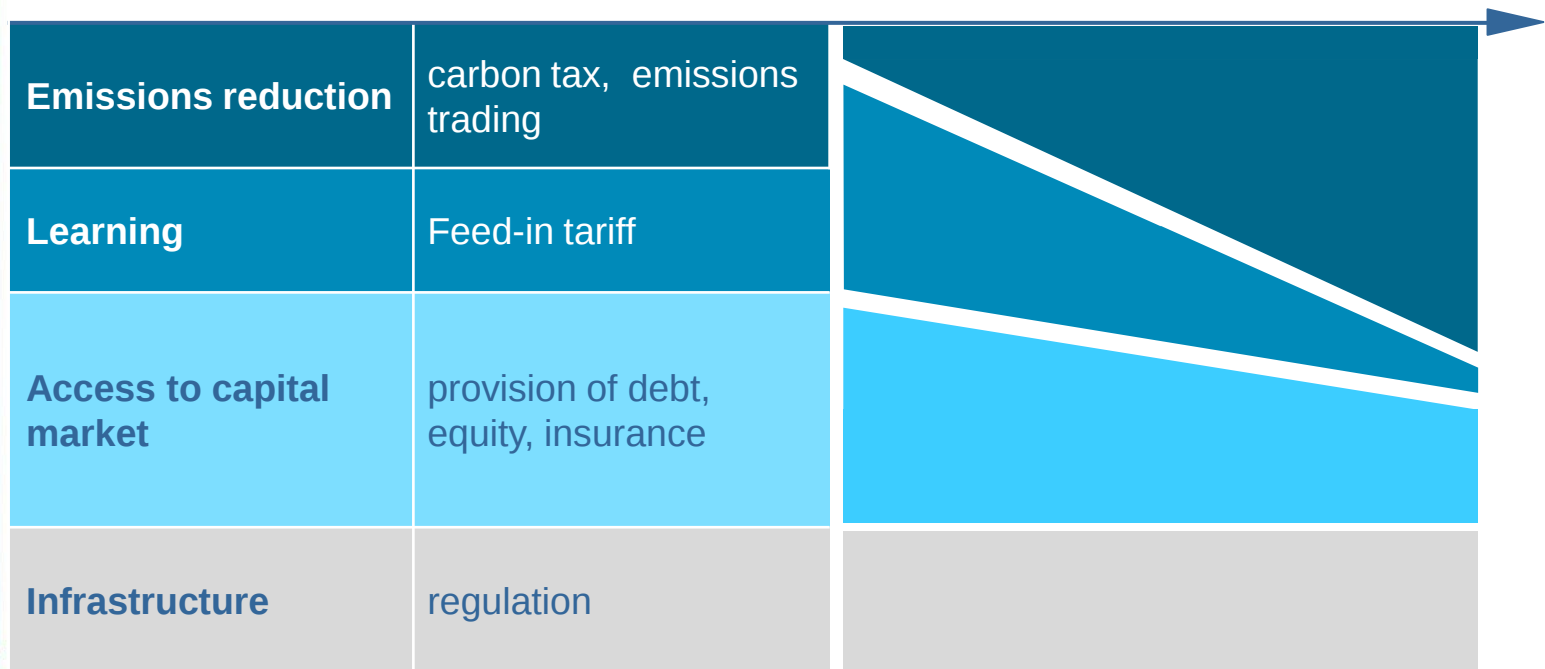
The cost of most applications of CCS is currently significantly above carbon prices (where they exist); by 2050 it is expected that this will reverse



The evolution of policy largely reflects a change in the relative balance of market failures holding back CCS investment

The relative importance of different market failures will change over time

Policy objective Example policies Importance over time



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Multiple policy objectives justify a suite of interventions

- as CCS development is affected by multiple market failures, multiple support policies can be justified
- a principle of good policy design is that no more than one policy instrument should be used to tackle each market failure
- also need to take careful account of interactions between policies, for example
 - in the short term, mechanisms to support CCS in installations which are covered by an emissions trading scheme (ETS) will generate no additional reduction in emissions
 - however, CCS support mechanisms do generate learning benefits
 - which in the medium/longer term can be taken into account by adjusting the ETS cap

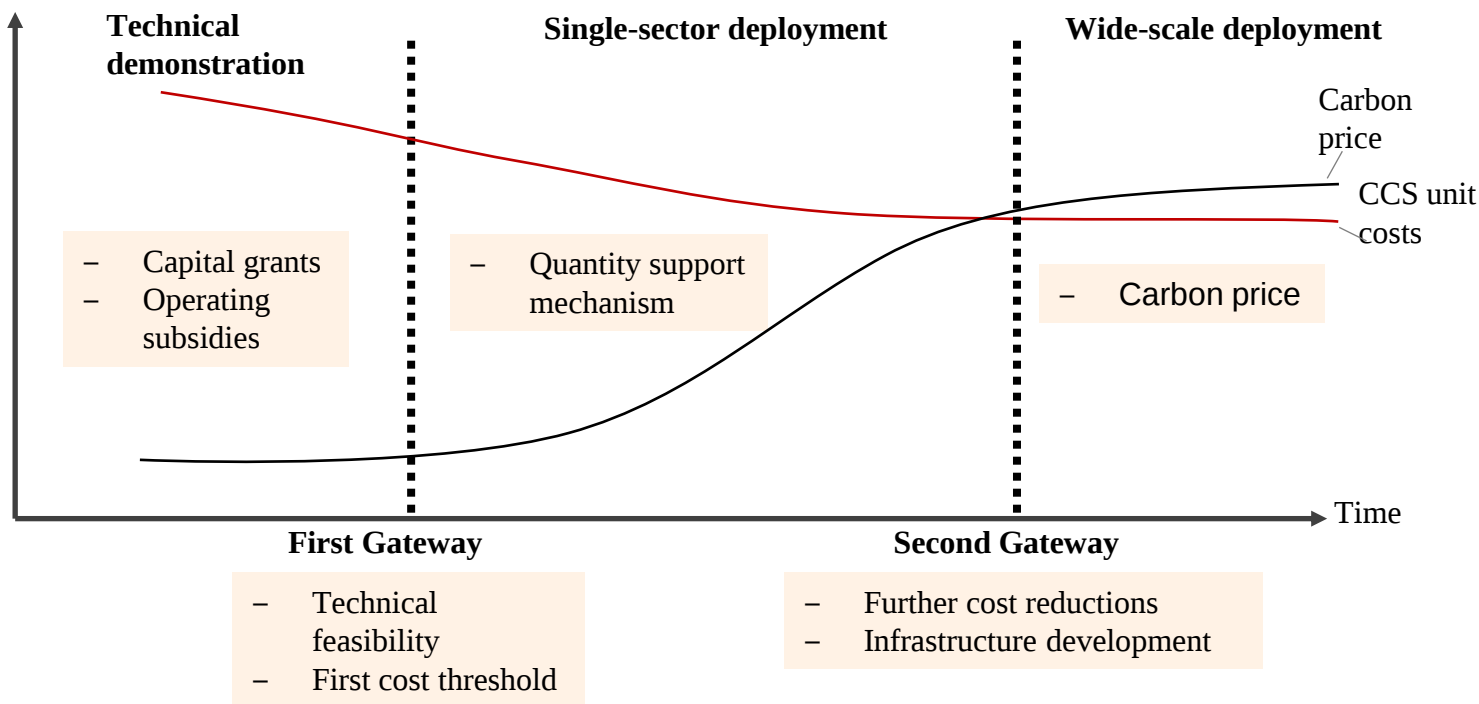
Policy gateways

- expected change in the characteristics of CCS, and associated focus of incentive policy, creates a challenge for policy-making
 - on the one hand, want to be able to adapt and modify policy as technology changes or new information comes to light
 - on the other hand, the (perception of) changing policy may damage investment
- ‘policy gateways’ might help overcome this challenge
- gateways would consist of three components
 - policies that will be used in each stage
 - criteria that will define when or if policy will move to the next stage
 - an outline of the reaction if gateways are missed
- Protects government from overstretching resources, from imposing poor value for money, and lowers policy risk for investors

An illustrative example of policy gateways in action

An example of a policy framework enhancing credibility and effectiveness

CCS Cost/
carbon price



Bioenergy and CCS can reduce atmospheric concentrations of CO₂

- This should be reflected in incentive policy

- BECCS is the use of CCS to capture emissions from biomass processing or combustion

- it has the potential to reduce atmospheric concentrations of CO₂

- CO₂ sequestered from air as biomass grows is not returned to atmosphere
- may well be needed for climate stabilisation

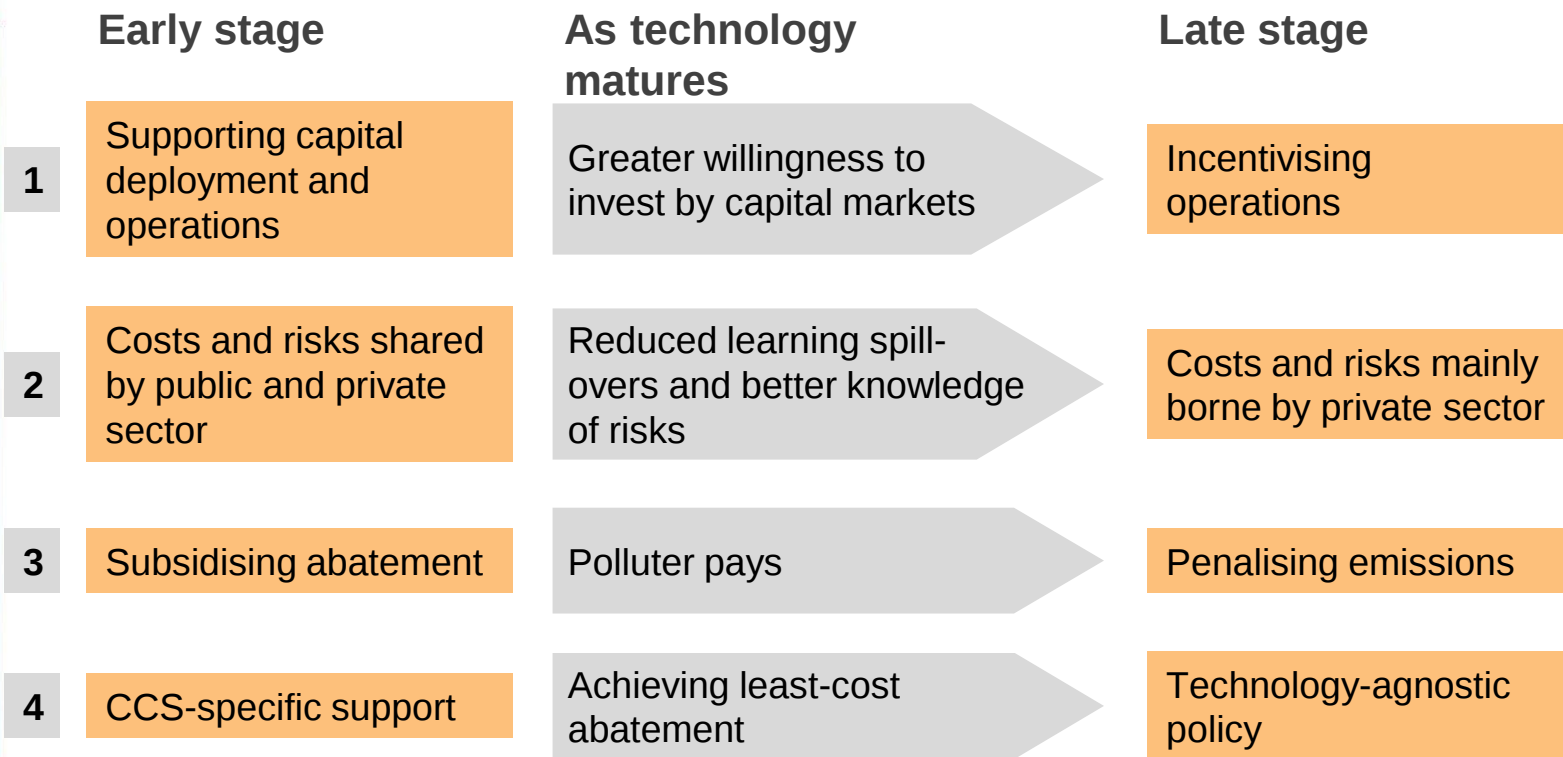
Stylised comparison of conventional CCS and BECCS lifecycle emissions

Process	CCS	BECCS
Biological sequestration		-1
Combustion	+1	+1
Storage	-1	-1
Lifecycle emissions	0	-1

Should be reflected as extra incentive

As the technology matures, so the characteristics of policies to incentivise CCS may change

Incentive policy might evolve along four dimensions



TOWARDS COMPREHENSIVE NATIONAL POLICY

1. Enact decisions to combat climate change
2. Analyse the role and enable CCS as part of energy portfolio
3. Enact laws & regulations to govern safety of operations & to clarify responsibilities across the chain (make CCS legal)
4. Provide incentives for demonstration and deployment (basis of business models)
5. Ensure research as necessary
6. Enact strategy to ensure public acceptance



Thank you

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www.iea.org/ccs

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