CARBON CAPTURE AND STORAGE

International Energy Agency

A policy strategy for carbon capture and storage

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Context

- Significant work on economic instruments since 1980's to support GHG emission reduction objectives
- Used to assess support policy for renewables
- Limited application to CCS
- IEA work focus on overall policy framework for CCS – from demos to commercial deployment

www.iea.org/papers/2012/policy_strategy_for_ccs.pdf

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This talk is about…

- Feed-in tariffs
- Emission trading
- Portfolio standards
- Feebates
- Carbon tax
- Grants
- Investment tax credits
- Performance standard
- Credit guarantees

… but not only

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Policy choices

1. What is encouraged?
   - Operation or investment support
   - Subsidizing the cost of abatement or increasing the cost of emissions
2. Who pays or bears the risk?
   - Public resources or mandates placed on private sector?
3. Explicit targeting of CCS or technological neutral?

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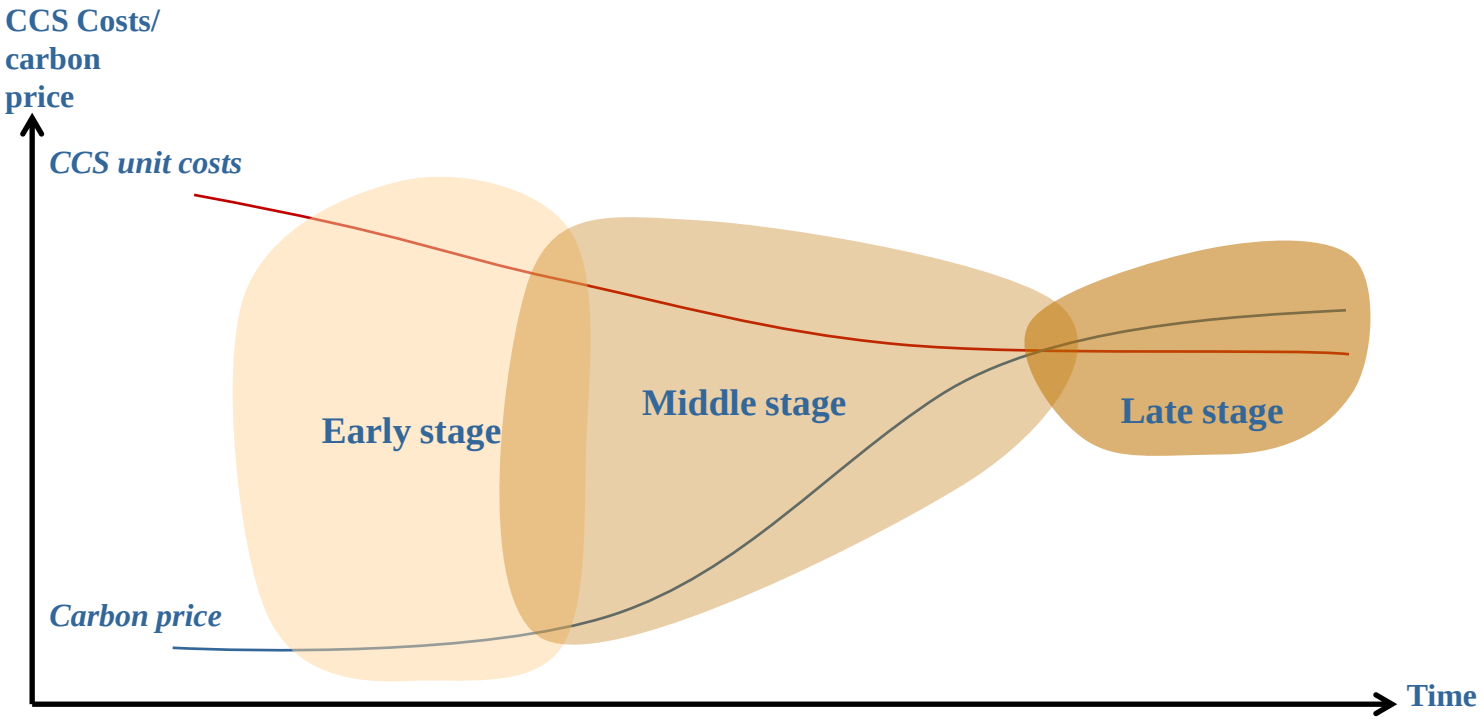
Changing characteristics

- CCS is an evolving pre-commercial technology
- The cost of CCS is currently significantly above carbon prices - where they exist



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Some reasons to intervene

- Controlling emissions
  - Polluter pays
- Promoting learning
  - Learning by doing
  - Learning from diversity
- De-risking
  - Unequally distributed information on cost and performance

Policy evolves with technology

No single one-fits-all instrument

	Early stage	As technology matures	Late stage
1	Supporting capital deployment and operations	Greater willingness to invest by capital markets	Incentivising operations
2	Costs and risks shared by public and private sector	Reduced learning spill-overs and better knowledge of risks	Costs and risks mainly borne by private sector
3	Subsidising abatement	Polluter pays	Penalising emissions
4	CCS-specific support	Achieving least-cost abatement	Technology-agnostic policy

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Matching policies to objectives

Reducing emissions	Technology learning	Access to capital markets
Cap and trade	Capital grant	Co-investment equity
Carbon tax	Production subsidy	Provision of debt
Baseline and credit	Investment tax credit	Credit guarantees
Feebate	Production tax credit	Insurance products
Emissions performance standard	Feed-in tariff	
CO2 purchase contract	Premium feed-in tariff	
	Portfolio standard	

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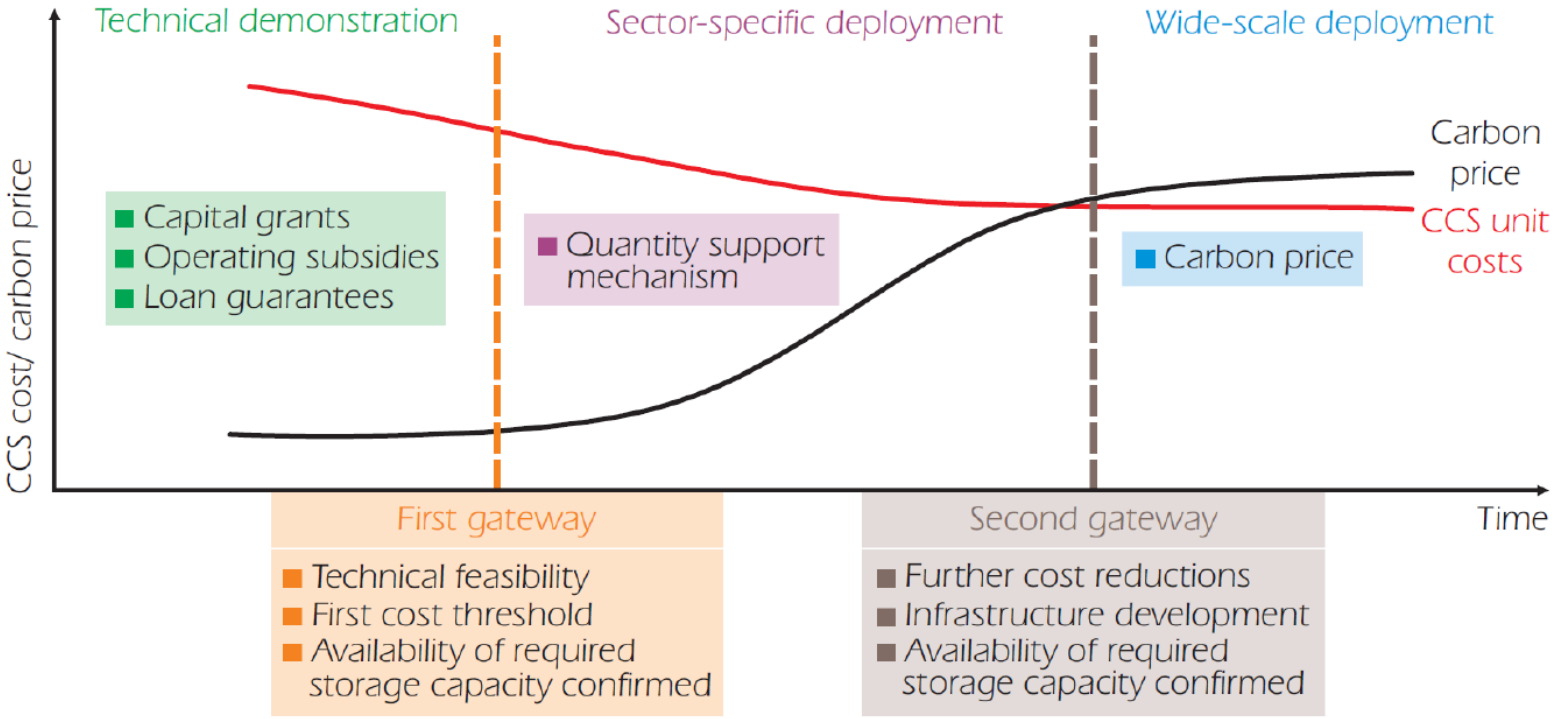
Policy gateways

- 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 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

Policy gateways



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BECCS can create 'negative emissions'

- should be reflected in incentive policy
- BECCS is the use of CCS to capture emissions from biomass processing or combustion
- has the potential to reduce atmospheric concentrations of CO_2
  - CO_2 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

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Incentives for BECCS

- At point of combustion/fuel transformation, the same benefit is realised - prevention of CO_2 emission - and so whatever applies to CCS should also apply to BECCS
- An additional incentive should also be provided
  - Could be achieved through providing credits for biological sequestration of CO_2
- Cultivating, harvesting, transporting and processing of biomass all result in emissions that may reduce the emissions reduction potential of BECCS
  - Emissions from indirect land-use change as result of cultivating biomass need to be monitored
- These need to be accounted for to provide correct strength of incentives for BECCS

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Thank you

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www.iea.org/ccs

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Incentivising CCS in the developing world

- IEA Roadmap anticipates 55% of CCS investment to 2050 to be outside of the OECD
- to incentivise this investment
  - baseline and credit scheme (CDM and/or others)
  - Nationally Appropriate Mitigation Actions (NAMAs)
  - important role for IFIs in
    - providing concessional funds,
    - risk mitigation instruments
    - supporting development of market in carbon credits from CCS,
    - technical assistance