

Incentive Policy Mechanisms and Strategy for CCS – Current Practice and Future Options

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Policy is critical if CCS is to play a role in future

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

Incentives and financing are a particular type of policy

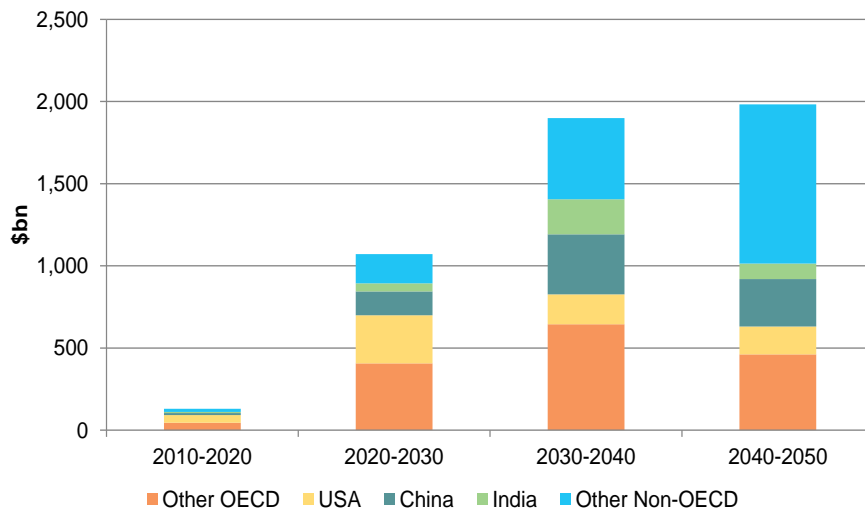
INCENTIVE

Policy push or market pull mechanism that provides an earning logic for CCS projects (“ensures bankability”)

FINANCING

The way funds are provided for a specific project—where the “bankers” become involved. Becomes possible when incentives are established

Incentives play a role at two levels



1. ECONOMY / SOCIETY:

To meet the IEA CCS Roadmap ambitions, almost USD 5 trillion will need to be invested in CCS installations.

Fuel	Coal (similar for all capture routes; relative to a pulverized coal baseline)	Natural gas (post-combustion)
Efficiency penalty	10 %-points	8 %-points
Capital costs	3 800 USD/kW (74% increase)	1 700 USD/kW (82% increase)
Cost of CO ₂ avoided	55 USD/tCO ₂	80 USD/tCO ₂

2. PROJECT / COMPANY:

Investment in early CCS facilities represents prohibitive capital cost and decreases efficiency leading to increased operating cost.

Incentive policy objectives must be clear

- Reducing **emissions**
- **Ensuring technology learning**
- Ensuring access to **capital** markets

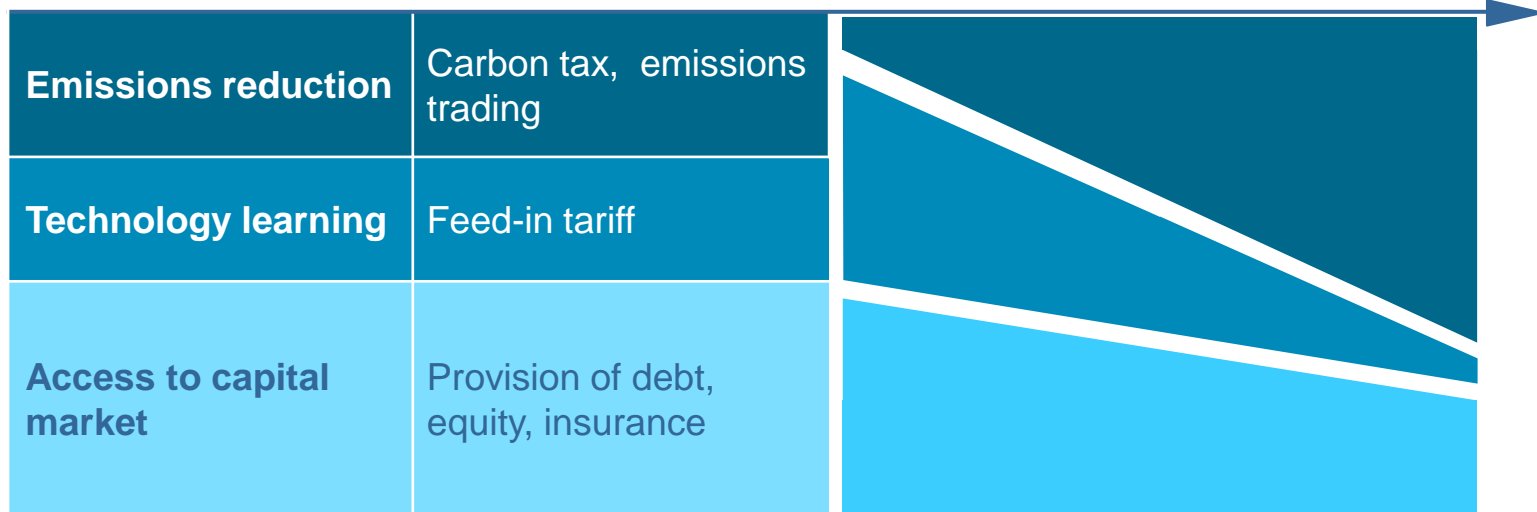
Different types of policies address different objectives

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	
CO ₂ purchase contract	Premium feed-in tariff	
	Portfolio standard	

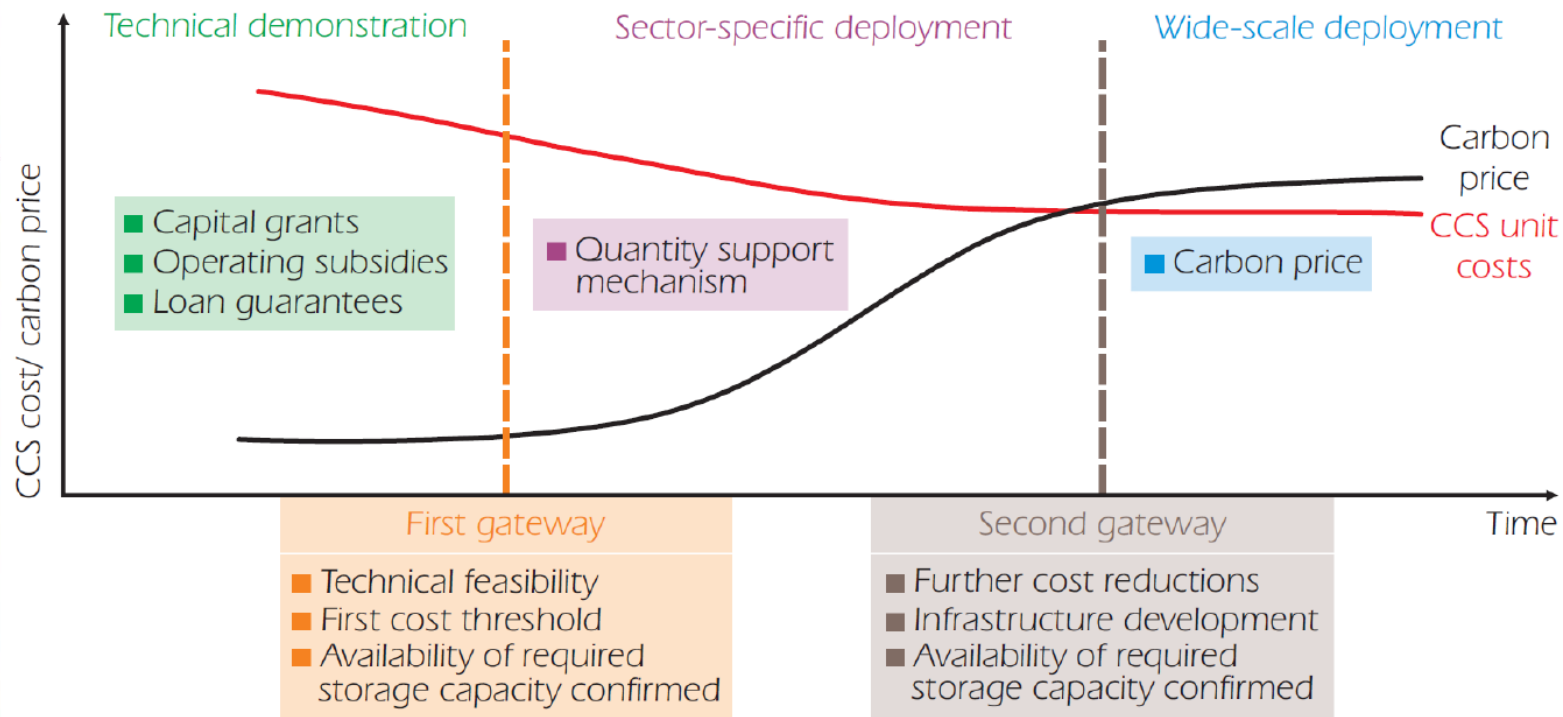
CCS policy objectives should evolve over time

- Short to mid term focus on learning and access to capital
- Long term focus shifts towards emissions cuts
- Different objectives – different policy tools

Policy objective Example policies Importance over time



Policy architecture and possible policy gateways



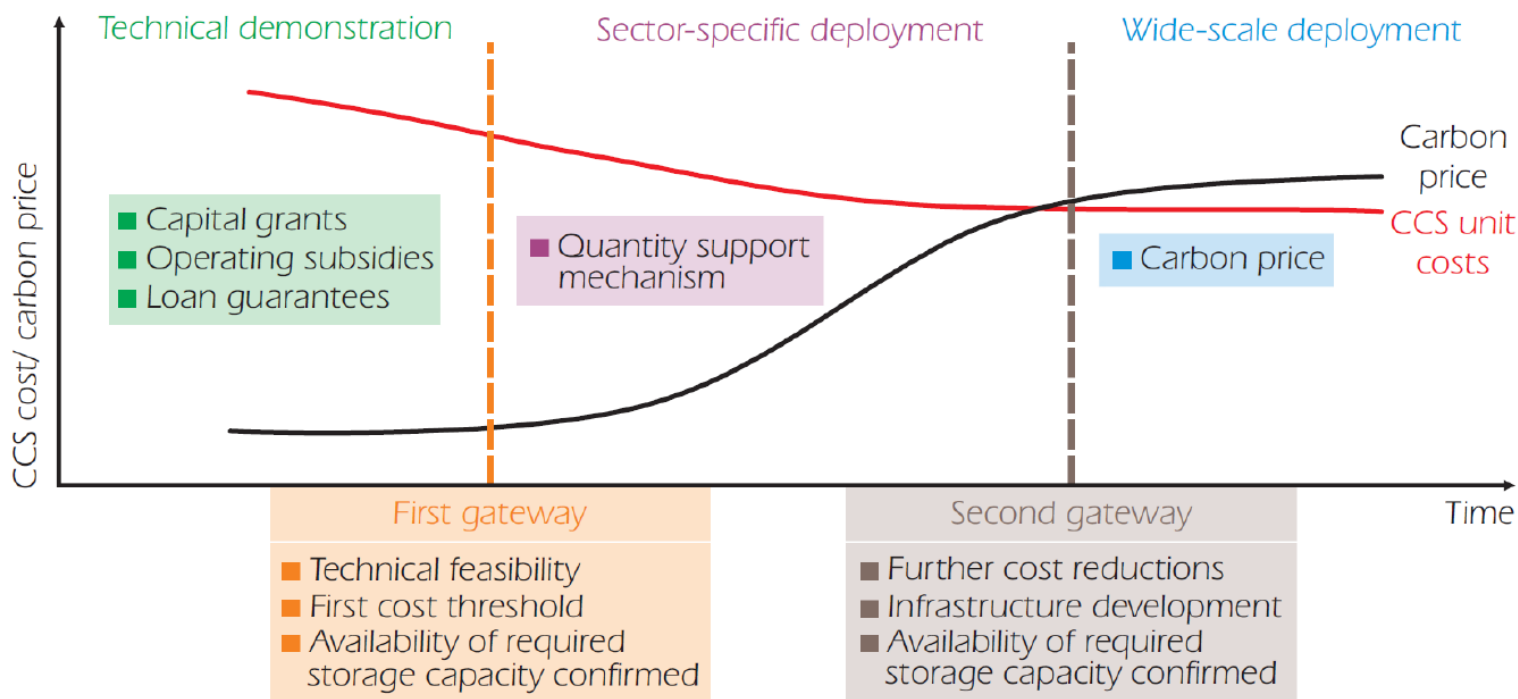
Long-term policy architecture can enhance credibility and effectiveness

Examples of incentive policies today

US: Demo funding
EU: NER300, EEPR
AUS: Flagship pr.
UK: CCS competition
NO: Mongstad
Etc..

UK: 2011
 Electricity
 Market Reform

NO: Carbon tax
US: EOR projects



Incentivising CCS in non-OECD countries

- IEA CCS Roadmap scenario requires 55% of CCS investment to 2050 to be outside of the OECD
- These investments could be incentivized by:
 - carbon price may through baseline and credit scheme (CDM and/or others)
 - public-sector support from developed countries through Nationally Appropriate Mitigation Actions (NAMAs)
 - IFIs/MDBs through provision of concessional funds, risk mitigation instruments (possibly tailored to risks unique to CCS i.e. environmental liability, stewardship of storage sites), supporting development of market in carbon credits from CCS.

Reccomendations for development of incentive policy

1. Be clear about policy objectives
2. Suit incentive policy to technical maturity
3. Plan incentive strategy long-term
4. Plan for a coherent mix of incentives, not just one
5. As much as is possible, create certainty!

Thank-you!

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