CARBON CAPTURE AND STORAGE

International Energy Agency

Incentive Policy Strategy for CCS

Carbon Capture and Storage: Regaining Momentum
Sydney, 21 February 2012

Juho Lipponen
Head of Unit, Carbon Capture and Storage
International Energy Agency

CARBON CAPTURE AND STORAGE

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

CARBON CAPTURE AND STORAGE

INCENTIVES?
FINANCING?

INCENTIVE

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

FINANCING

Becomes possible when the earning logic or bankability is established

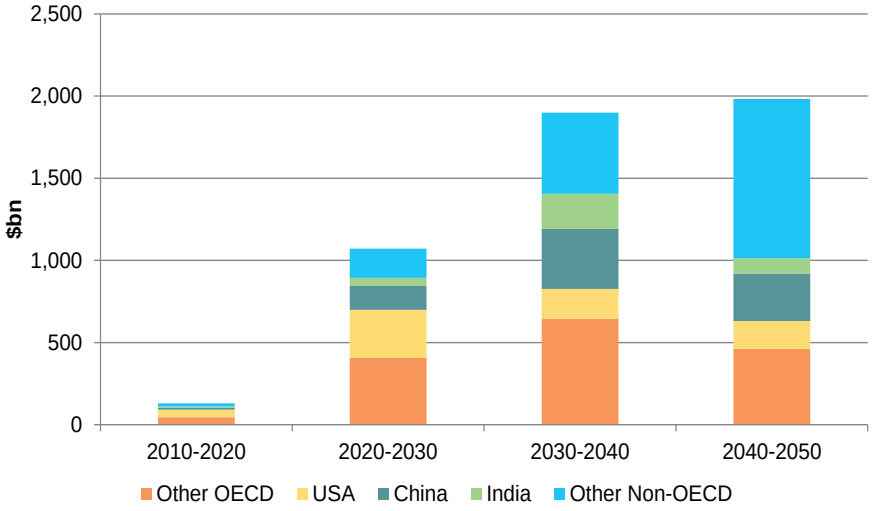
CARBON CAPTURE AND STORAGE

Business

Government

CARBON CAPTURE AND STORAGE

WHY DO WE TALK ABOUT INCENTIVES?



1. LEVEL OF 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 LEVEL:

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

ARE INCENTIVE POLICY OBJECTIVES CLEAR?

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

CARBON CAPTURE AND STORAGE

POLICIES TO 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	
CO2 purchase contract	Premium feed-in tariff	
	Portfolio standard	

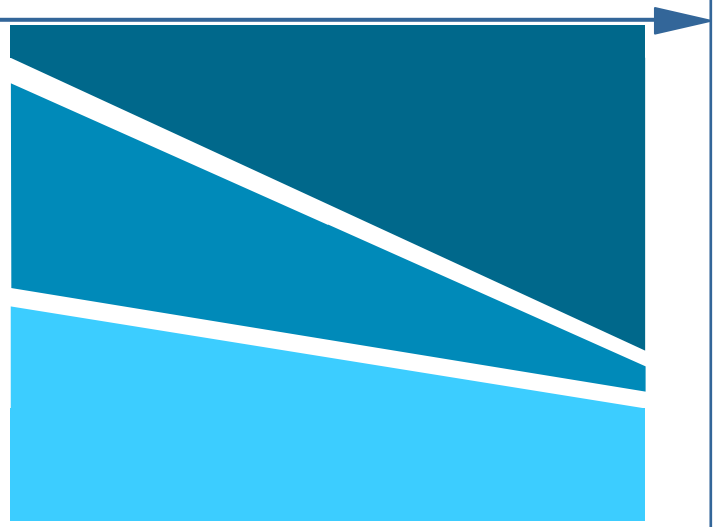
CARBON CAPTURE AND STORAGE

CARBON CAPTURE AND STORAGE

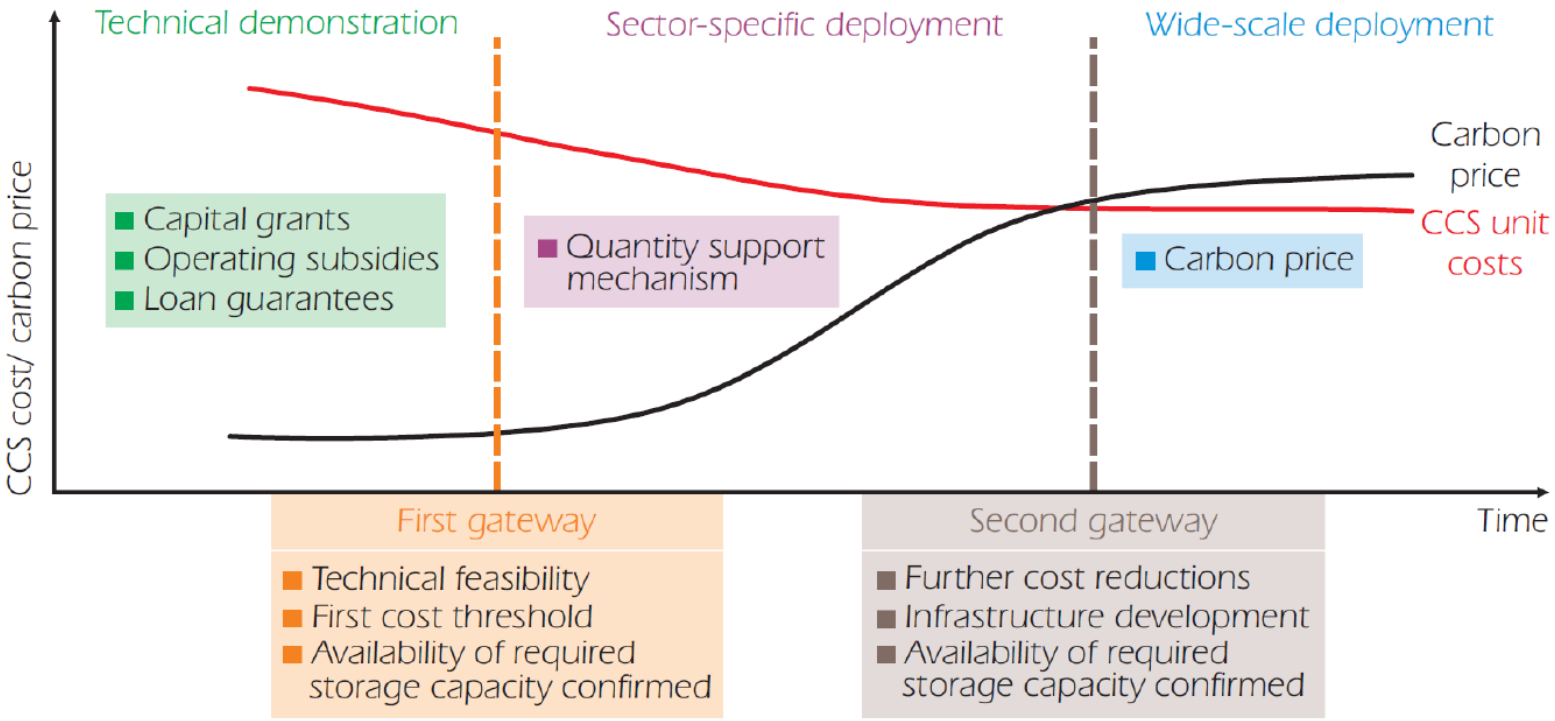
CCS POLICY OBJECTIVES WILL EVOLVE

- 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
Emissions reduction	Carbon tax, emissions trading
Technology learning	Feed-in tariff
Access to capital market	Provision of debt, equity, insurance



POLICY ARCHITECTURE AND GATEWAYS



Long-term policy architecture can enhance credibility and effectiveness

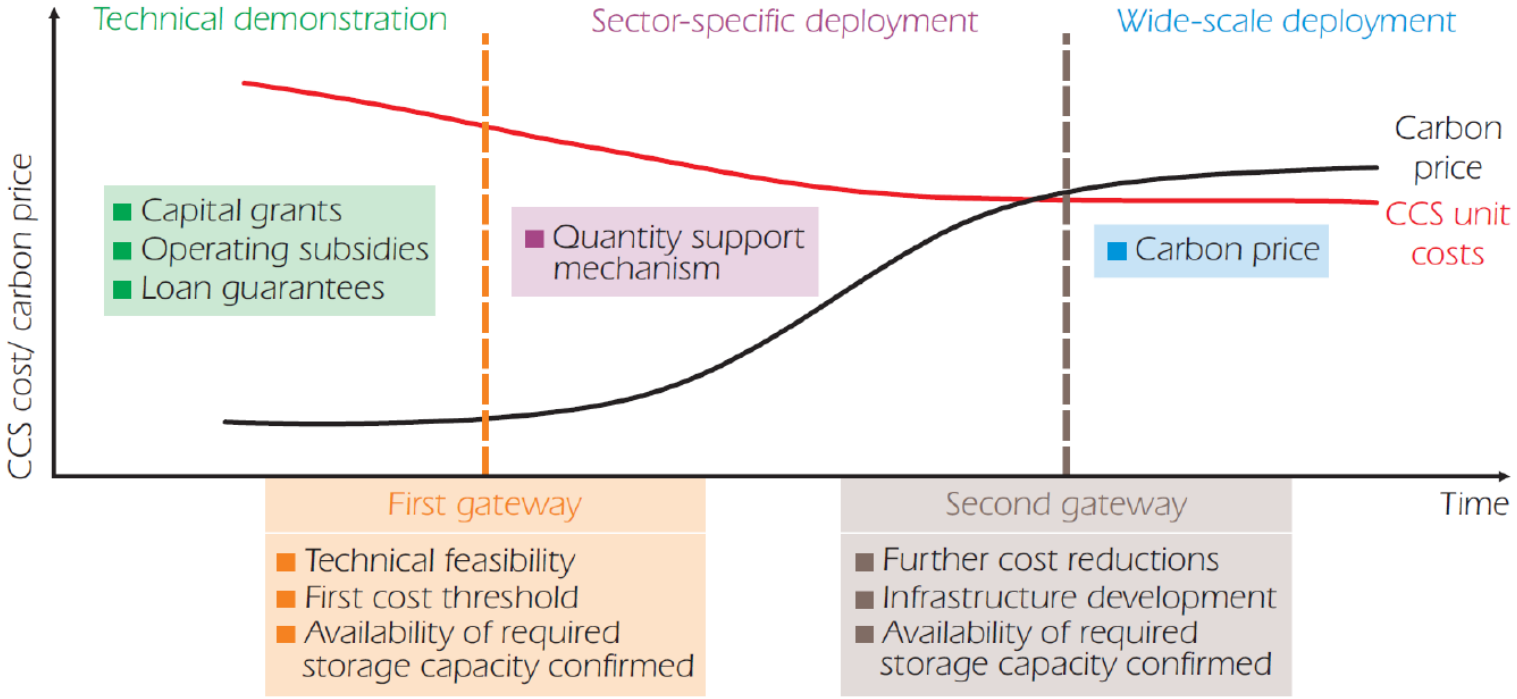
CARBON CAPTURE AND STORAGE

EXAMPLES OF CURRENT INCENTIVE POLICIES

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



CARBON CAPTURE AND STORAGE

CARBON CAPTURE AND STORAGE

AREAS OF FURTHER ANALYSIS

- Incentives suited for industry-CCS
- Quantifying the value of transferring long-term liability
- Extra incentives for biomass-CCS (”valuing a ton *removed* vs. *reduced*”)
- Innovative solutions esp. for developing countries
- Role of EOR

CARBON CAPTURE AND STORAGE

RECOMMENDATIONS

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. Create certainty!

CARBON CAPTURE AND STORAGE

Thank you!

juho.lipponen@iea.org

www.iea.org/ccs