

## Addressing key Trigger Points

# Public Private Partnerships (PPP) Evolve...

### PPP 1.0: Subsidies →

Grants and tax credits or feed-in tariffs – basic subsidies (“throw money at it”) with bids by private projects, demonstration phase mostly; minimal attention to regulatory issues or risk analysis.

**Built around tax policy or feed-in tariffs.**

**R&D supported.**

### PPP 2.0: Subsidies + Regulatory Reform →

Grants and subsidies coupled with regulatory reform (e.g., site characterization, emissions rules, long-term liability rules, CO2 injection regulations).

Debt investors, in particular, demand regulatory clarity.

**Engages parliaments and regulatory agencies.**

**Demo projects funded.**

### PPP 3.0: Risk-based Subsidies + Regulatory Reform, Negotiated

Enough support to enable financing: Subsidies + Regulatory measures + Risk analysis with credit support (loan guarantees; government preferred equity possibly; insurance or transferrable trust funds).

Requires more in-depth negotiation between public agencies and private projects and investors on specific risk-oriented instruments.

System performance guarantees remain a crucial mechanism, which requires public sector support for early projects to address key “trigger points”.

**Engages parliaments and requires training with energy and regulatory agencies (federal, local).**

**Commercial scale projects.**

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## FIGURE 7: IMPLICATIONS OF ALTERNATIVE ENGAGEMENT MODELS

Mixed Funding Model (public-private partnership) is currently the most prevalent or viable.

FIGURE 7: IMPLICATIONS OF ALTERNATIVE ENGAGEMENT MODELS

DEFAULT PROPERTIES OF THESE MODELS					
RISK	PUBLIC OWNERSHIP OF IP AND EXPERIENCE <sup>1</sup>		ABILITY TO SHARE RISKS WITH PRIVATE SECTOR <sup>2</sup>	DEMAND ON GOVT CAPABILITY BUILD <sup>3</sup>	SCENARIOS SUITABLE FOR ADOPTION
1 <b>PUBLIC UTILITY MODEL</b>	All experiences captured by govt, with high potential to share globally	TECH	Govt holds all risks (subject to insurance contracts with private co)	<b>High</b> – significant technical capability build/ acquisition necessary	FOAK demo projects where govt, rather than private co, has sufficient capability and experience
		MGT			
		CONTROL			
2 <b>OUT-SOURCING MODEL</b>	Technical IP held in private co, govt to gain project mgt learnings	TECH	May offload individual execution risks to private sector (design/build/ops)	<b>Medium-high</b> – procurement and mgt expertise required	FOAK demo projects, where private sector holds some adjacent experience
		MGT			
		CONTROL			
3 <b>OWNER / FINANIER MODEL</b>	Tech IP and mgt exp in private, but govt keeps control as active owners	TECH	May offload overall project risks to private, bears the ultimate risk as financier	<b>Medium</b> – capability in controlling fund release, monitoring progress and providing oversight	Projects where private sector can bear some overall project risk, but not willing to risk significant \$
		MGT			
		CONTROL			
4 <b>MIXED FUNDING MODEL</b>	Almost all IP/exp in private, govt plays passive financier/monitor role	TECH	Potential to share the ultimate project risk with private sector	<b>Medium-low</b> –strategic and monitoring capability to steer and evolve funding model over time	Currently unprofitable projects with high risks
		MGT			
		CONTROL			
5 <b>PRIVATE SECTOR MODEL</b>	All IP and exp rests with private co	TECH	Potential to have private sector bearing and managing all risks	<b>Low</b> – regulatory capacity to design, enforce legal rights, and securing operational safety	Projects with demonstrated (profitable) economics and manageable risks (not available in demonstration phase)
		MGT			
		CONTROL			

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} POSSIBLE

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Finance Roundtable Dialog (Oct. 2010, Warsaw)

# Public-Private Funding Models: Key Elements

Policy & Regulations

## Government

- GHG policy
- Siting regulations
- Performance Standards

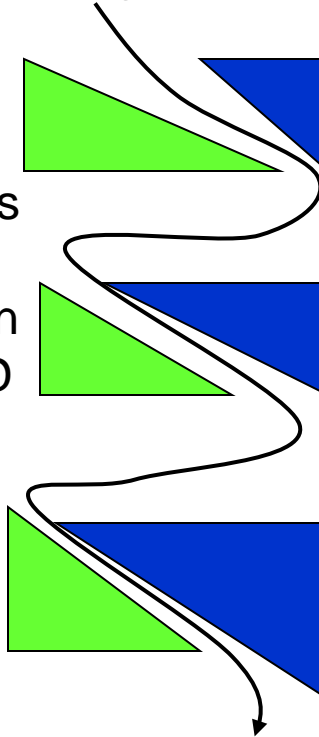
Technology Deployment

- R&D / Tech cooperation
- Demonstration & FEED

Market & Finance

- Monetary incentives
  - Tax measures, FITs
  - Allowances
  - Green bonds
- Energy/Elec. rates

Trigger points ["Go / No Go"]  
for mobilizing capital



## Industry & Investors

- Property investment
- Feedstock & infrastructure
- Monetizing cost / benefit
- Engineering & Innovation
- System integration
- Training, education
- Debt / Equity financing
- Insurance; trust funds
- Market presence
- Sectoral factors

Public Policy Goal:  
"Reliable energy from  
secure supply with  
environmental  
stewardship"

## FUNDING MODELS

- Public utility
- Private project
- Hybrids... others







**CSLF**

(+other forums)

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## FIGURE 7: IMPLICATIONS OF ALTERNATIVE ENGAGEMENT MODELS

FIGURE 8: FUNDING MODELS EMPLOYED IN SELECTED MAJOR CCS PROGRAMS

JURISDICTION	PROGRAM	FUNDING MODEL	COMMENTS
 Alberta	Alberta CCS Fund (4 projects)	Capital Grant w/ milestones + Opex subsidy	<ul style="list-style-type: none"> <li>Up to 75% pf pre-agreed incremental CCS costs</li> <li>&lt; 40% capex at achievement of milestones</li> <li>&lt; 20% on commencement of operations</li> <li>&gt; 40% during operation, over 10 years</li> </ul>
 Australia	CCS Flagships	Information not available - funding model to be negotiated	
 EU	European Energy Programme for Recovery (6 projects)	Capital Grant w/ milestones + Sequestration payment	<ul style="list-style-type: none"> <li>Up to 80% pf eligible costs</li> <li>Pre-financing</li> <li>&lt; 40% as interim payment</li> <li>Balance on completion</li> <li>Additional funding per tonne abated in first 5 yrs</li> </ul>
 Norway	Gassnova (1 project)	Government Equity	<ul style="list-style-type: none"> <li>Establishment of state-owned company Gassnova, responsible for CCS projects, including Mongstad</li> </ul>
 UK	CCS Demonstration Completion (1 project)	Capital Grant w/ milestones + Sequestration payment + Claw-back mechanisms	<ul style="list-style-type: none"> <li>Capex support at achievement of milestones</li> <li>Operational support per tonne of CO<sub>2</sub> abated</li> <li>'Claw-back' / CFD mechanism</li> </ul>
 USA	DOE Clean Coal Power Initiative Round 3 (6 projects)	Capital Grant w/ milestones + Opex subsidy	<ul style="list-style-type: none"> <li>Up to 50% pre-agreed incremental CCS costs</li> <li>No more than 50% contribution during each phase of project</li> </ul>

### Funding mechanisms for CCS

For each engagement model, the parties must consider a range of funding mechanisms to allocate risks and cash flows between them. At a high level, these funding mechanisms can be categorised as either outcome-based or input-based.

*Outcome-based funding mechanisms* (or unitary mechanisms) pay for successful CO<sub>2</sub> sequestration or for generating electricity while sequestering CO<sub>2</sub>. They eliminate some pricing and volume uncertainty but do not address execution risk. Examples of outcome-based funding include:

- sequestration payment: payment per unit of CCS sequestered;
- CCS feed-in tariff: n additional fixed price payment for CCS-generated electricity;
- 'contract for difference' mechanism: a swap arrangement where a fixed 'strike' price is paid, less the prevailing carbon price; and
- capacity-based payment: payment for infrastructure capacity, regardless of utilisation.

*Input-based funding mechanisms* directly offset the cost of setting up and running CCS infrastructure. They provide more immediate funds but do not guarantee outcomes. The most common input-based funding mechanisms include:

- capital grants: monetary grants with release conditions typically tied to milestones at different stages of execution;
- operating expenditure subsidies: ongoing government subsidies based on operating costs; and
- equity investment and concessional loans: government investment in a CCS funding vehicle with no expectation of return for a fixed period (or in the case of loans, no repayment for a specified period).

## CSLF Financing Roundtable

# Societe Generale: Financing Challenges (Apr 2010)

### Conclusions: Key Financing Challenges to be Addressed

<p><b>Projects are fundamentally uneconomic</b></p>	<ul style="list-style-type: none"> <li>■ EOR provides the only positive cashflow to the Projects – no alternative market for product</li> <li>■ Where is the value if no EOR?</li> <li>■ How to recover significant investment on the CCS infrastructure – particularly for “multi-user” schemes</li> <li>■ Economic subsidy and/or guarantee will be required for the Project to be bankable</li> </ul>
<p><b>Risk Allocation &amp; Interdependent Infrastructure</b></p>	<ul style="list-style-type: none"> <li>■ Integration of this Project with several independent operating businesses give challenges to risk allocation</li> <li>■ Failure in any part of the chain may have knock on effect to the whole Project</li> <li>■ Emission level of the flue gas / processing gas is outside the control of the Project</li> <li>■ Termination Regime to be considered carefully due to single ender user for the Project</li> </ul>
<p><b>Technology</b></p>	<ul style="list-style-type: none"> <li>■ CCS technology has not been tested for large scale commercial use – Particularly Post Combustion</li> <li>■ Construction and operation experience is limited</li> <li>■ Difficult to find a traditional EPC Wrap with warranty and damages provisions at economic cost</li> <li>■ Lenders likely to require higher performance guarantees on early projects due to uncertainties</li> </ul>
<p><b>Environmental Compliance</b></p>	<ul style="list-style-type: none"> <li>■ CCS technology to be used for enhanced oil recovery could become NGOs’ target</li> <li>■ Questioning of benefits of new coal fired generation even with CCS</li> <li>■ Credible monitoring and certification of sequestration crucial</li> </ul>
<p><b>Un-tested in the Finance Market</b></p>	<ul style="list-style-type: none"> <li>■ Large financing needs call for diverse funding sources to secure largest possible financing component</li> <li>■ Lenders have not been tested on the above risks</li> <li>■ “First of its Kind” risk</li> <li>■ Until there is confidence in Government policy and technology there will be no project finance</li> </ul>
<p><b>Key Message</b></p>	<ul style="list-style-type: none"> <li>■ Currently no comprehensive legal and regulatory framework exists for CCS</li> <li>■ Legal issues (CO2 network and storage liabilities &amp; monitoring are not clear</li> <li>■ Policy and regulatory framework remains unclear</li> <li>■ NO LONG TERM CLARITY = NO PROJECT FINANCE</li> </ul>