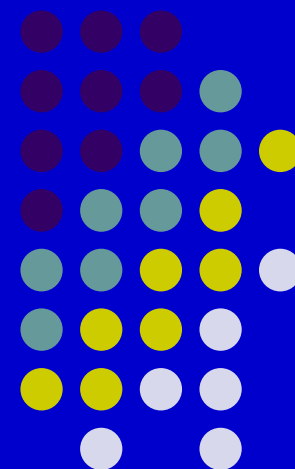


# CCS Demonstration in Developing Countries – Analysis of Key Issues and Barriers

CSLF Annual Meeting

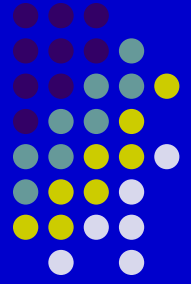
Warsaw, Poland  
7 October 2010



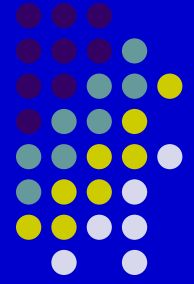
Ashok Bhargava

ADB

## Disclaimer



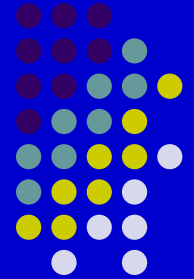
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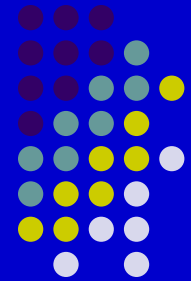
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- Conclusions and Way Forward

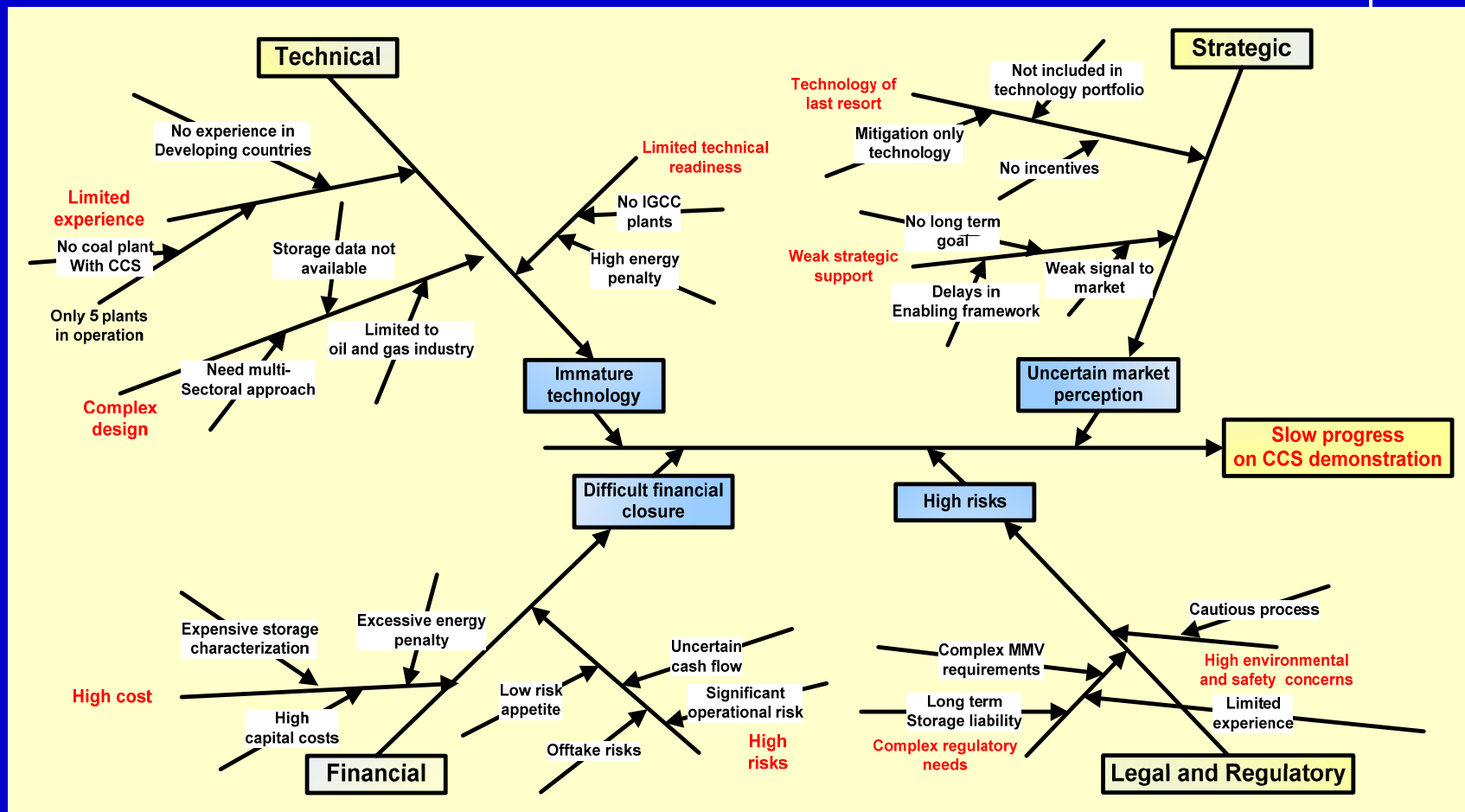
# Background

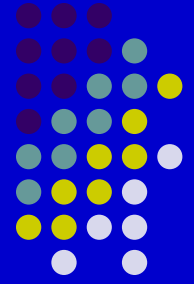


- The Regional technical assistance (\$350,000). *CCS Demonstration : Analysis of Key Policy Issues and Barriers approved in May 2009*
- The TA aims to analyze key issues and barriers, in particular, financing issues for CCS demonstration in developing countries
- *The draft final report (Sept 2010) includes analysis and recommendations*

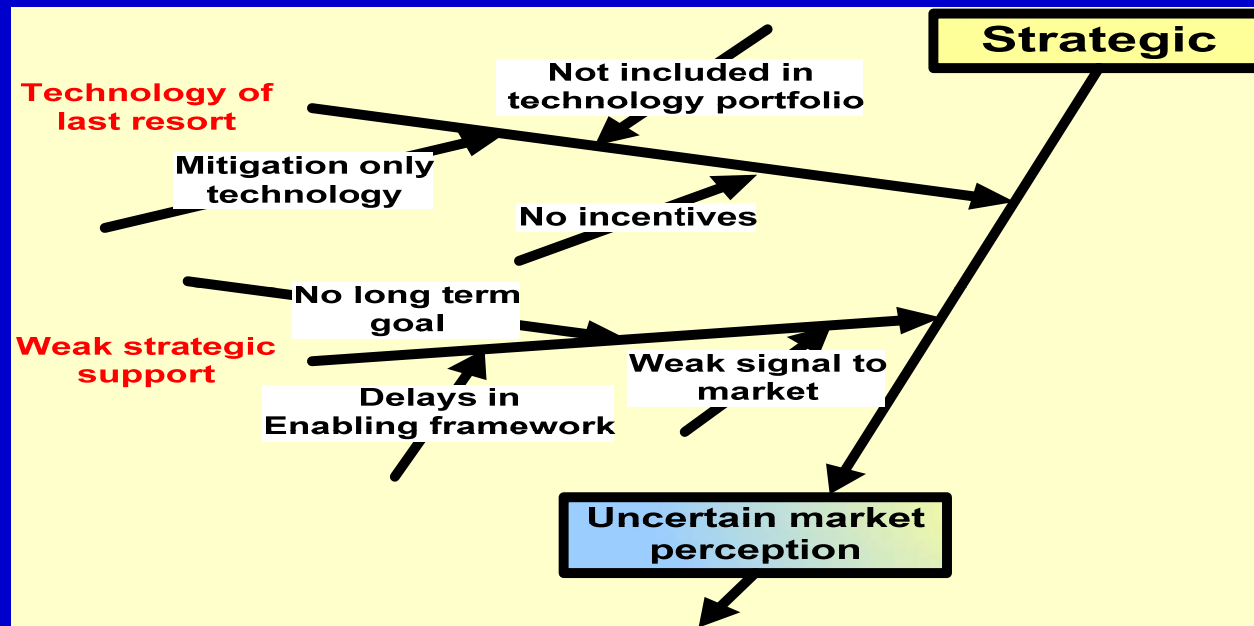


# CCS Issues and Barriers – An Overview



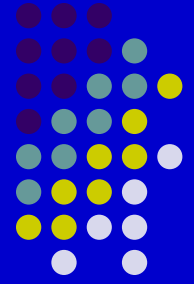


# Issues and Barriers – Strategic

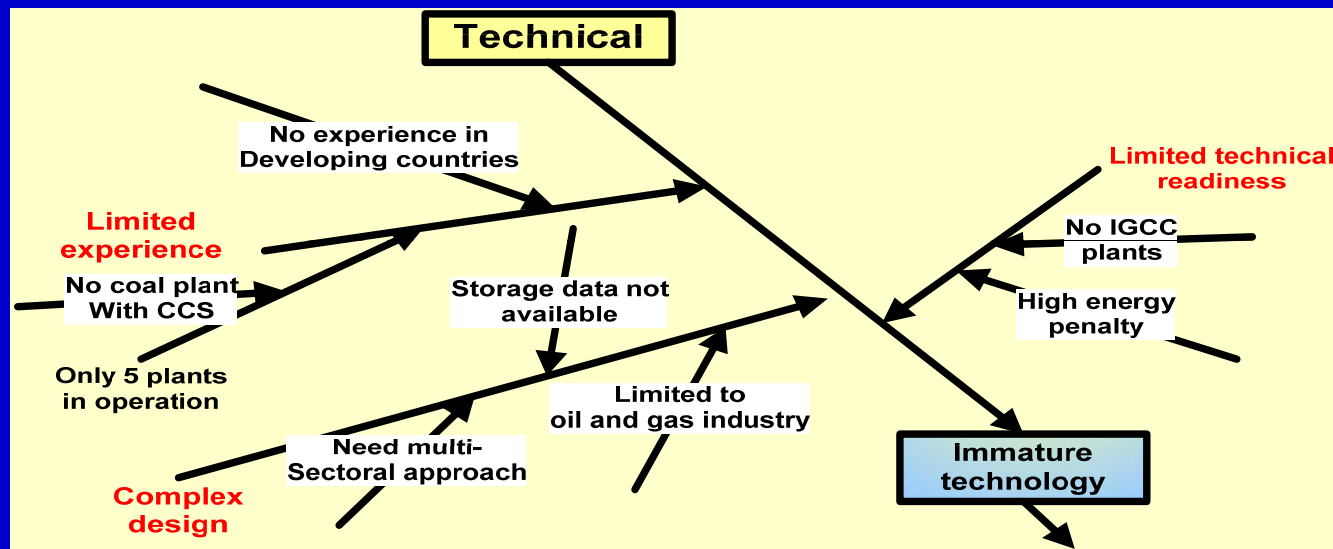


CCS is seen as a climate change mitigation technology only rather than a low-carbon or “near-clean” energy technology. It has weak support from developing countries. No program, plan or targets in place to promote CCS.

Uncertain market perception limiting investments and progress

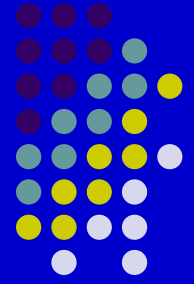


# Issues and Barriers – Technical

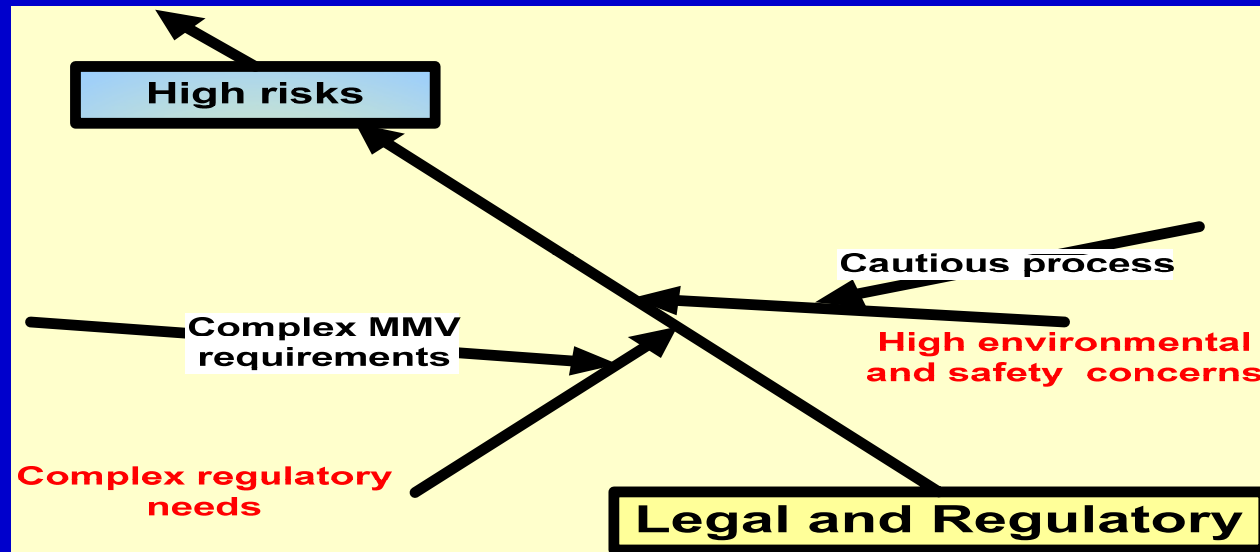


- No coal-based power plant with CCS; no experience in developing countries; complex design; no IGCC power plants in developing countries; high energy penalty

Immunature technology - high technical risks



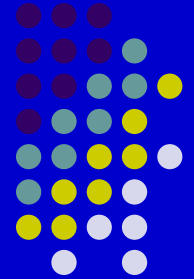
# Issues and Barriers – Legal and Regulatory



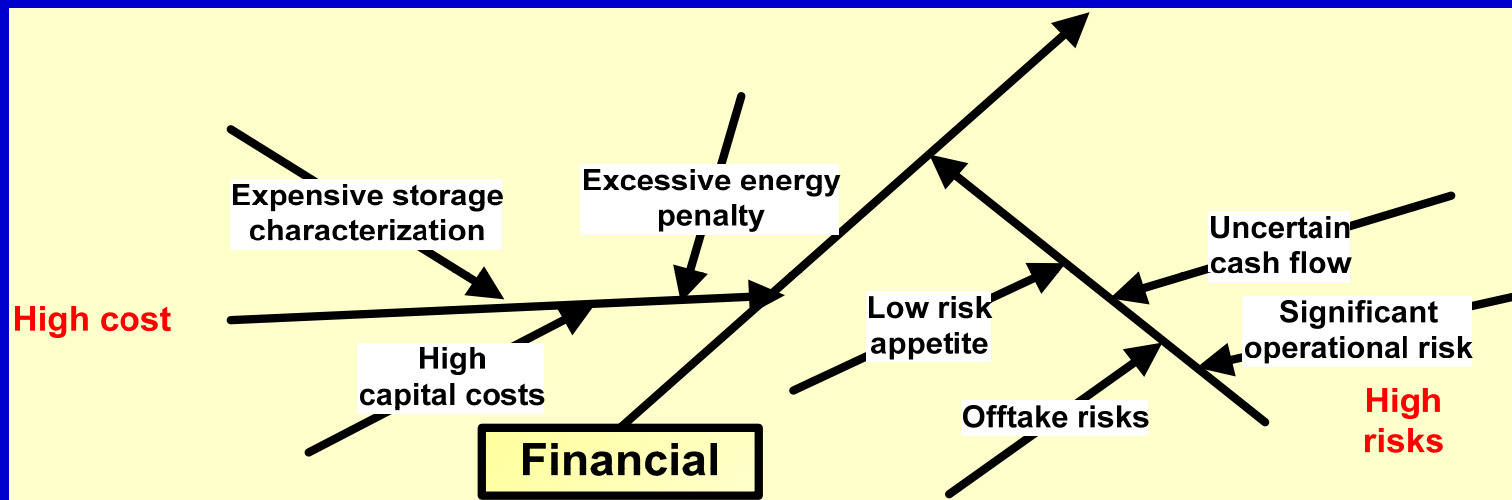
Critical issue for environmental health and safety. Domestic regulatory framework not fully developed. Long-term stewardship rules are key element for CCS demonstration and deployment.

High perceived risks due to long-term liabilities





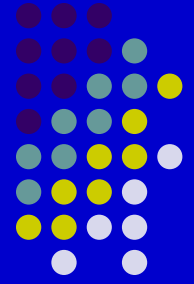
## Issues and Barriers – Financial



High costs, excessive energy penalty, no incentives which make CCS a high cost-high risk investment decision.

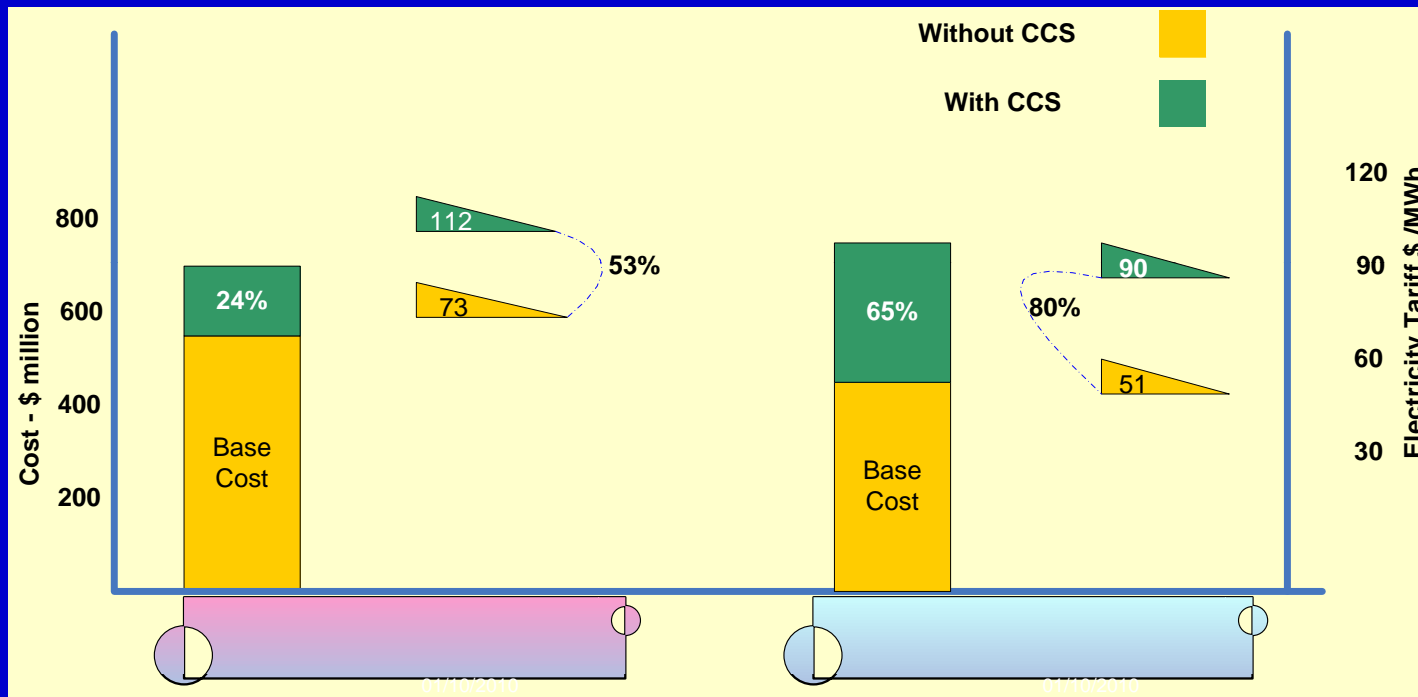
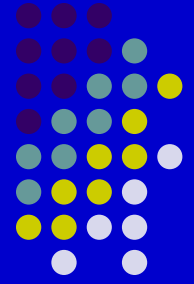
Public funding is essential for initial demonstration projects.

# Coal-fired Power Plants with CCS – Financial Analysis



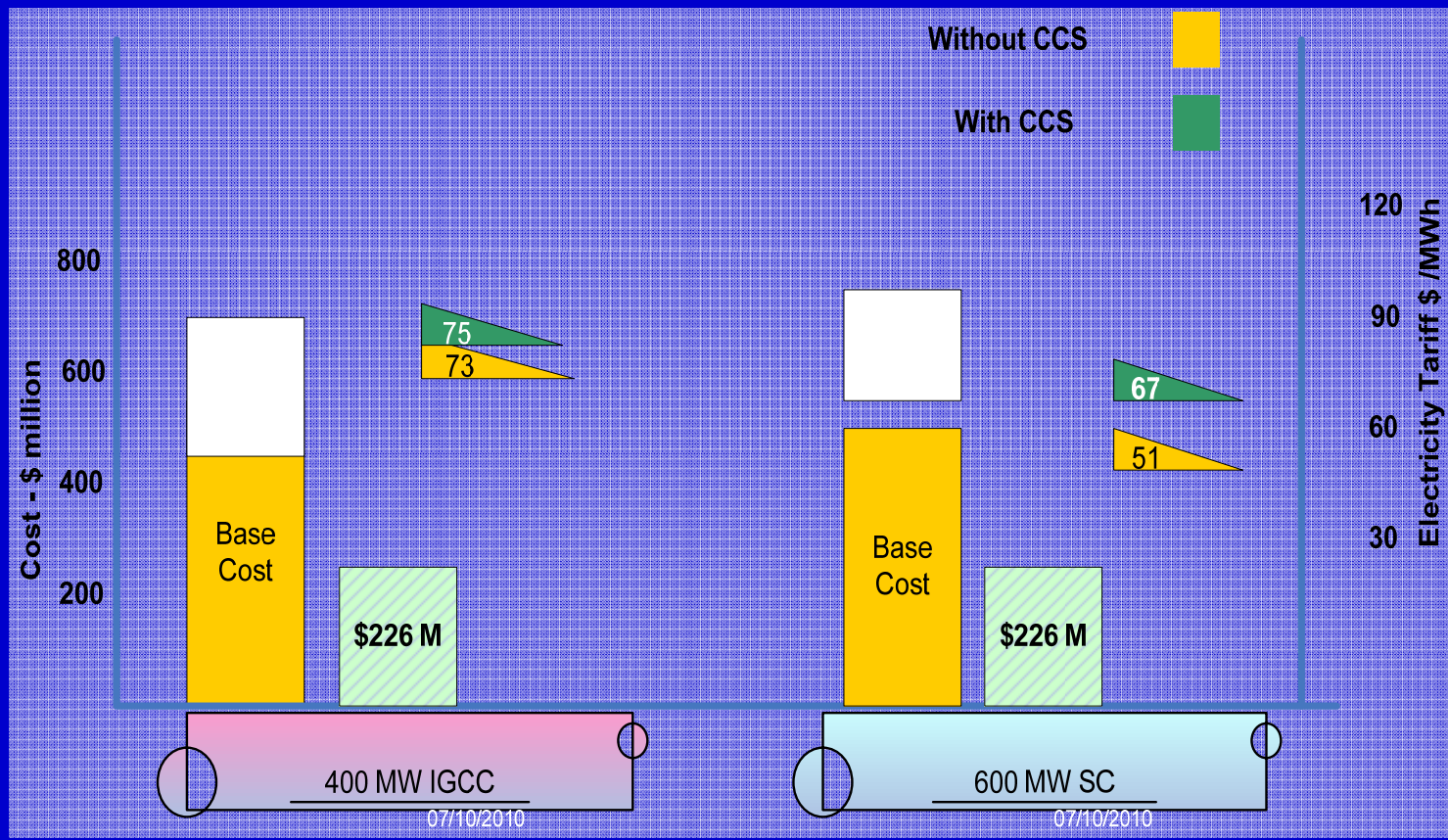
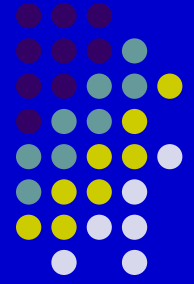
- The analysis aims to capture the impact of equipping a coal-based power plant with CCS
- 400 MW IGCC and 600 MW Supercritical (SC) plants were considered based on cost estimates in PRC
- Captured and stored CO<sub>2</sub> is about 1.8 – 1.9 million t (Mt)
- The base cost for IGCC plant is \$1.6 million/ mega watt compared to \$ 0.7 million / MW for SC

# Coal-fired Power Plants with CCS – Financial Analysis.....Contd

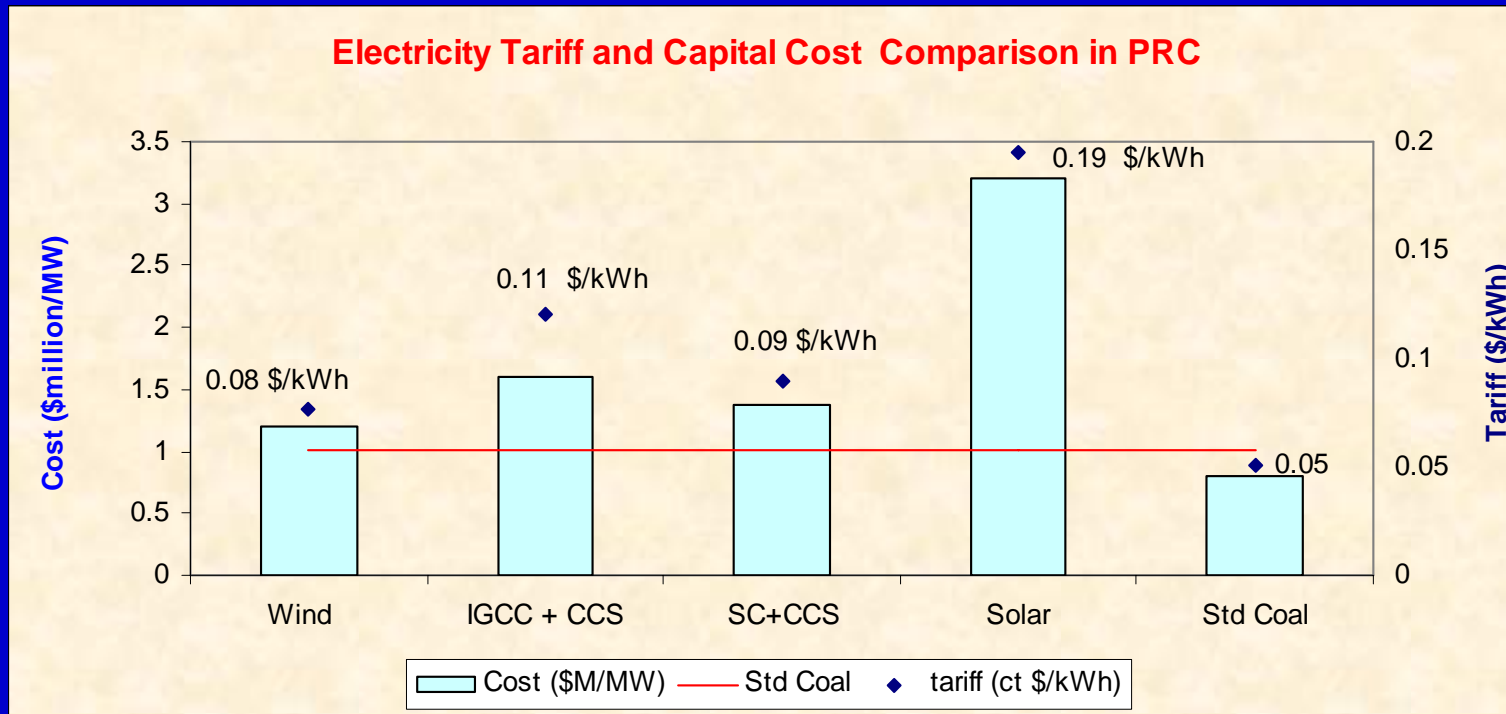
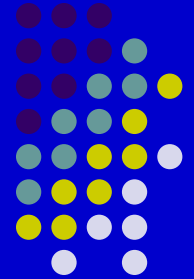


With CCS coal-fired power plants are financially unviable with the existing tariff.

# Coal-fired Power Plants with CCS – Financial Analysis.....Contd

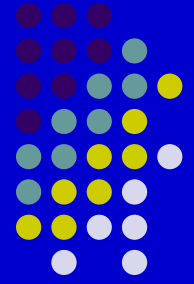


# Coal-fired Power Plants with CCS – Financial Analysis.....Contd

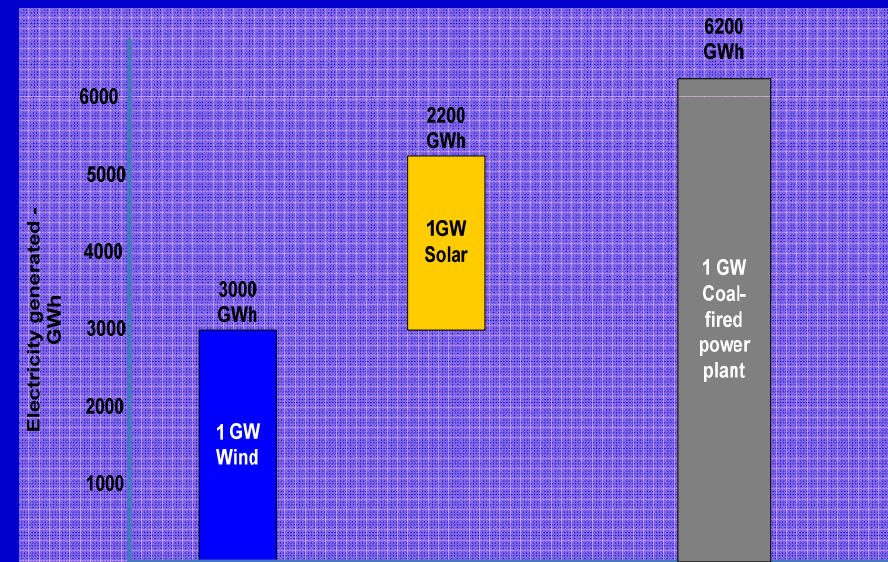


Comparing “with CCS” coal-fired power plants with only coal-fired power plant without CCS is not a fair comparison

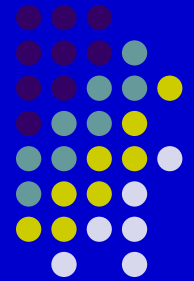
# Rationale for CCS Demonstration in Developing Countries




- Very good fit with the targeted carbon intensity
- Large-coal-fired capacity addition (without CCS) will undermine the impacts of wind and solar plants
- Energy security solution
- At the moment, CCS is the only technology to reduce CO<sub>2</sub> emissions from fossil fuel power plants

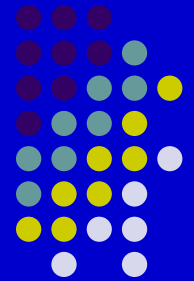


# Fast Track CCS Demonstration – Recommended Actions



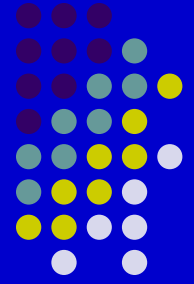
Action	Purpose	By
Establish CCS Demonstration Fund of billion dollar scale	Overcome near- to medium-term commercial/economic gaps (up to 2020)  Provide positive incentives for CCS demonstration  Reduce time lag for CCS demonstration between developed and developing countries	Contributions from developed countries  Multilateral development banks to actively work with the donor governments and developing countries in setting up the fund
15		

# Fast Track CCS Demonstration – Recommended Actions.....contd



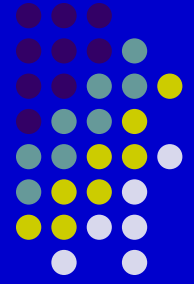
Action	Purpose	By
<p>Provide complementary policy support</p> <p>✓country-specific pilot regulatory framework</p> <p>✓Provide suitable financial incentives—tax relief, tariff premiums for carbon-free electricity, incentives, loan guarantees, etc. for “with CCS” demonstration projects</p>	<p>Encourage energy and power companies in developing countries to move forward with CCS demonstration</p>	<p>Governments in relevant developing countries</p>





## Role for CCS Demonstration Fund

- A \$5 billion fund to support CCS demonstration in developing countries up to 2020
- The Fund to lower risk profile for CCS demonstration projects
  - Capital subsidy to offset incremental cost
  - Compensate energy penalty
  - Complement traditional project financing
- It will motivate accelerated actions on other barriers put the CCS demonstrations on the expected trajectory
- It may incorporate smart incentive mechanisms to encourage early movers, higher rate for capture etc



## Conclusions and Way Forward

- CCS faces formidable challenges and barriers especially at its demonstration stage in developing countries
- CCS will remain at high end of the risk spectrum of the technologies and requires targeted financing and incentives
- Early demonstration through CCS demonstration fund in developing countries can accelerate its wider deployment
- ADB analysis has brought forward some pertinent issues within the uncertainties of costs and technologies.
- If there is sufficient interest, a follow on study can be commissioned to refine analysis and recommendations

**For further details**

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