THE ECONOMICS OF SHARED CCS INFRASTRUCTURES

The conditions for the deployment of Carbon Capture & Storage technologies

Olivier MASSOL





CHAIR "THE ECONOMICS OF NATURAL GAS"

CO₂ pipeline deployment



Barriers to the adoption of CCS 1 – the lack of clarity in the regulatory (tariff) policy governing CO₂ pipelines

2 – CCS deployment faces a "chicken & egg" problem

Candidate network for California example.



Source: Kuby et al. (2011)

=> Question: Is the "central planning" approach realistic to model the emitter's decisions to adopt that technology?

We propose an alternative approach based on <u>a club theoretic</u> perspective



ource: Morbee et al. (2011)

Questions

- I What are the conditions for the creation of a vertically integrated club of CO₂ emitters who share the CO₂ pipeline infrastructure?
- 2 Are they related to the conditions needed for an independent pipeline operator to decide the construction of an infrastructure?
- 3 What is the break-even CO₂ price capable to trigger the adoption of the CCS technology?
 - 4 Is that break-even CO₂ price affected by the obligation to use non-discriminatory TPA tariffs?



Application: A N-W-E CO₂ pipeline project



Results

- Average cost of the entire CCS Chain 59.9 ∉tCO₂
 - The pipeline component amounts for 6.0 €/tCO₂
- Break-even value for joint CCS adoption 66.8 ∉tCO₂

Non-discriminatory pipeline tariffs at each location

- Case 1: a price per tCO₂
 Ø
- Case 2: a price per capacity Ø
- Case 3: a fixed term & a price per tCO₂
- Case 4: a fixed term & a price per capacity 78.0 ∉tCO₂

(

Finding : The obligation to implement non-discriminatory prices can either hamper the adoption of CCS or substantially raise the break even value for joint CCS adoption