

# **The missing “T” in CCS: Emerging regulatory issues of CO<sub>2</sub> (pipeline) transport in the CCS chain**

**BGR Side Event  
"The role of Geological Surveys in CCS regulation"  
SBI/SBSTA-30 / AWG-LCA-6 / AWG-KP-8**

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Bonn, 4 June 2009**

# CCS – CO<sub>2</sub> Capture and Storage

## Different challenges to the CCS chain

- **CO2 capture**
  - Technologies (process innovations vs. pure end-of-pipe)
  - Costs (investment & operation)
  - Commercial plant operation requirements
  - Retrofit vs. new-built
- **CO2 transport**
  - Public acceptance
  - Costs (depending on distances)
  - Transport corridors
  - Roll-out of infrastructure and regulation under uncertainty
- **CO2 storage**
  - Public acceptance
  - In-depth knowledge on storage sites, long-term modeling
  - Regulation under uncertainty

- **German CO<sub>2</sub> Storage Act (recent legislative proposal)**
  - Assessment of storage sites and capacities (nationwide)
  - Licensing of CO<sub>2</sub> pipelines (case-by-case)
  - Licensing of investigation of storage sites (case-by-case)
  - Licensing of building, operating and decommissioning of storage facilities (including provisions on liabilities, financial securities, etc. – case-by-case)
  - Regulation of non-discriminatory access to CO<sub>2</sub> infrastructure
- **Further needs for an advanced regulatory framework**
  - A more systematic approach to manage rivaling plans on the use of the underground – beyond a case-by-case approach
  - A broader approach to identify transport needs and corridors
  - A proactive approach to deal with the different dimensions of a (potential) infrastructure roll-out (network design, sizing, financing, ownership, etc.)

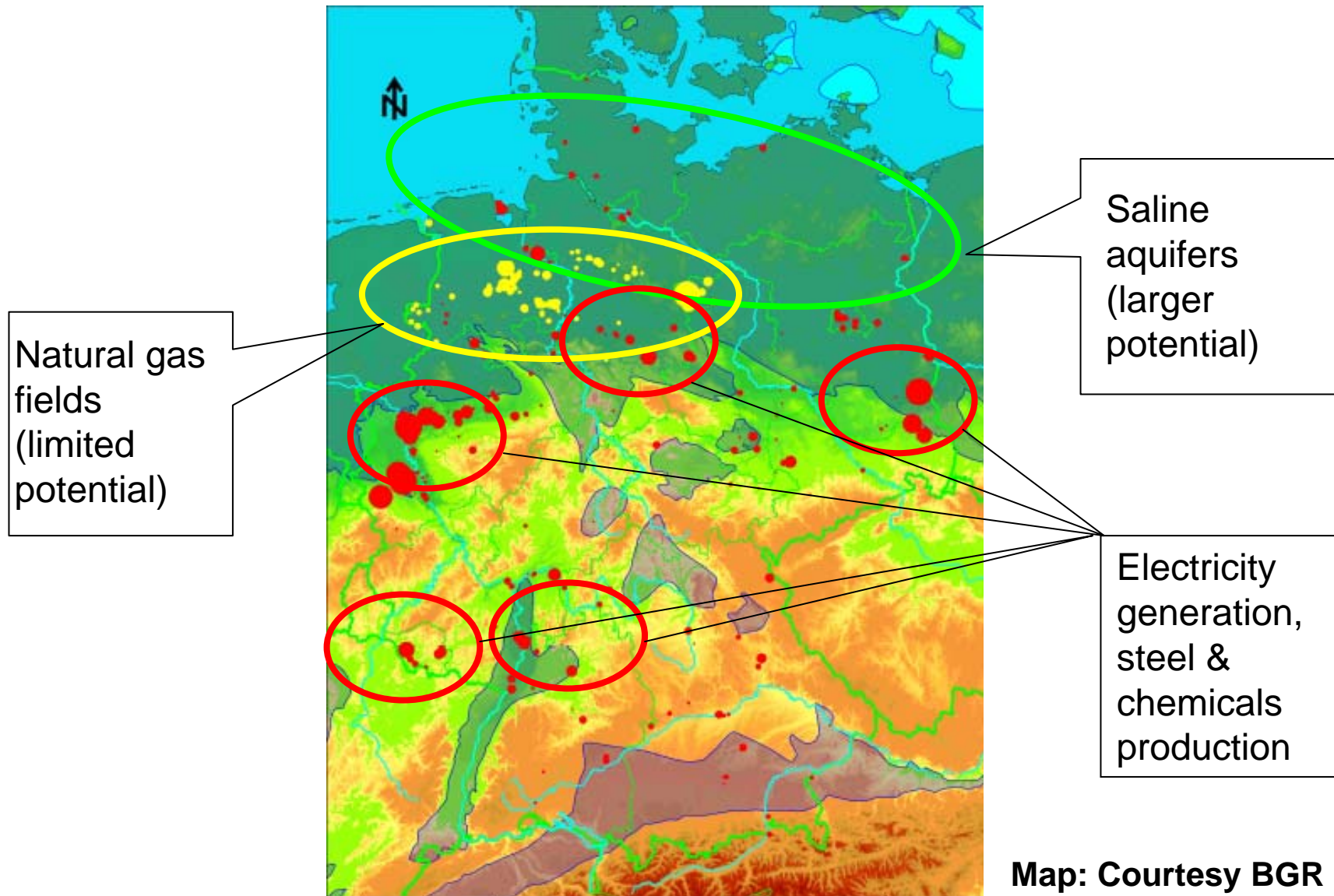
# CCS – CO<sub>2</sub> Capture and Storage

## The role of transport infrastructure

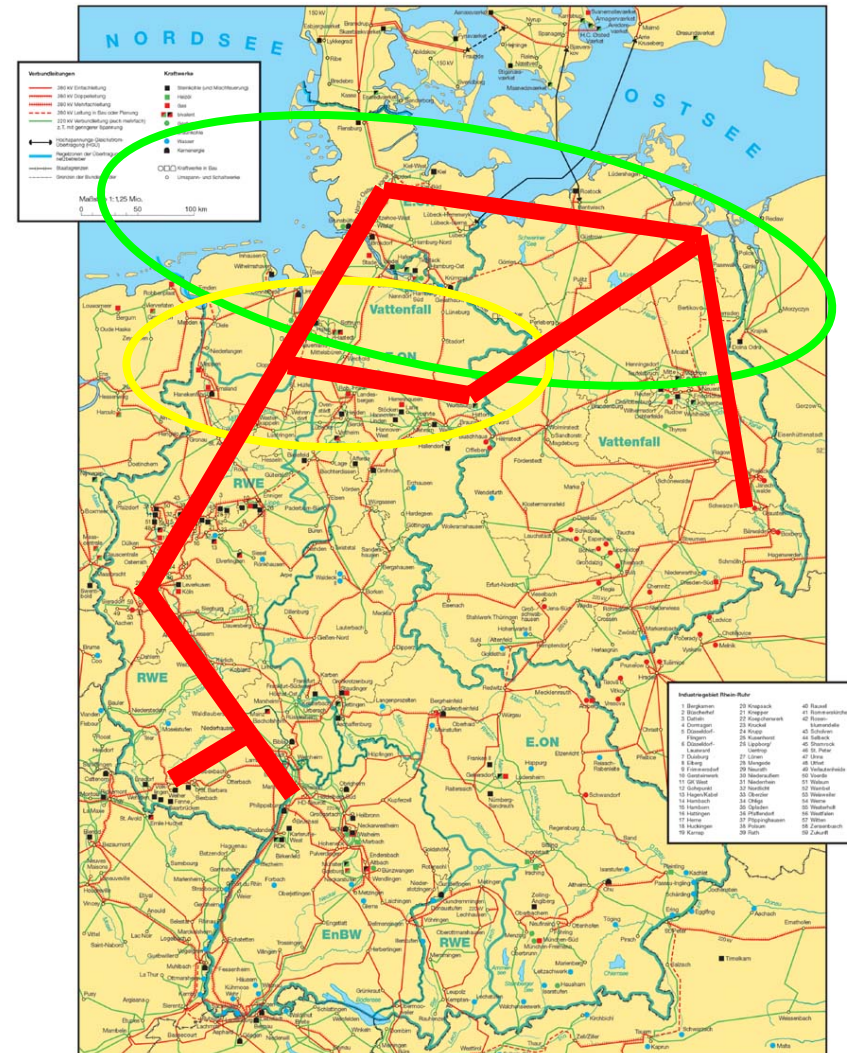
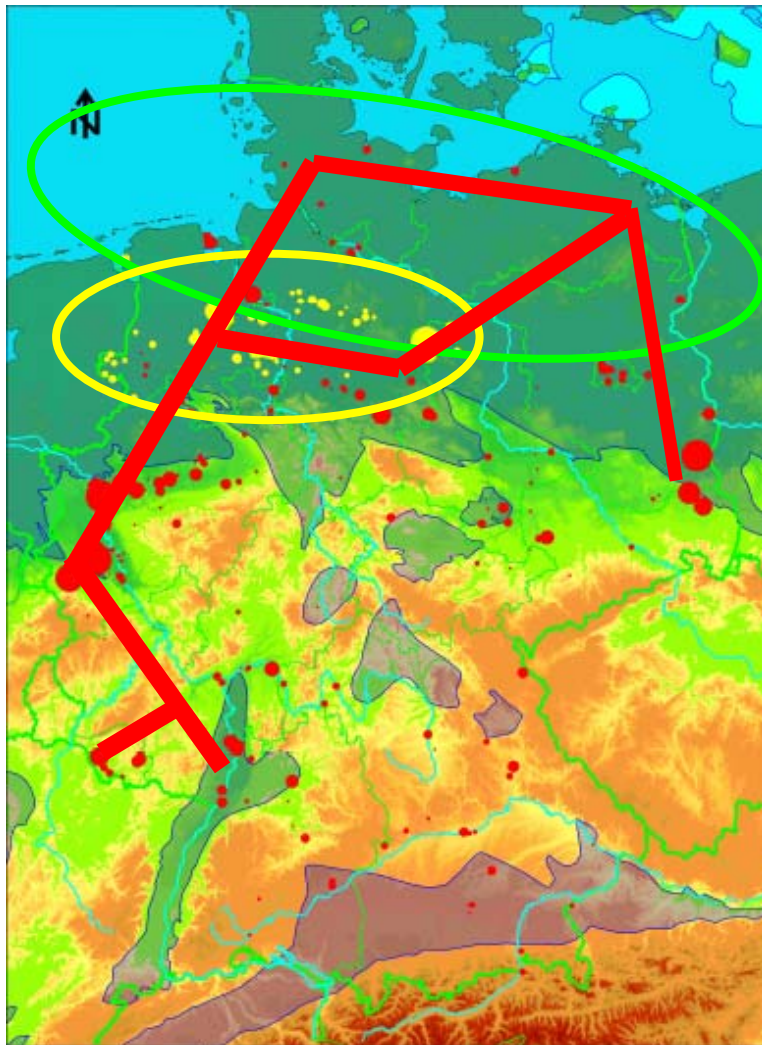
- **CO<sub>2</sub> transport is one of the vulnerable parts of the CCS chain**
  - Public acceptance
  - Costs and financing (transport distances could be significant)
  - Complex regulation (regional planning and licensing with many stakeholders, financing, non-discriminatory third-party access)
  - Significant lead-times for planning, licensing and roll-out
- **Infrastructure issues must be addressed at an early stage**
  - A broad and early vision is needed to create a reference for the necessary debates on the advanced regulatory approaches
  - In the pilot/demonstration phase this is difficult to communicate (at least politically) – but inescapable
  - Cost-effective infrastructure roll-out approaches must be assessed versus significant uncertainties (fourfold capacity of a demonstration project pipeline for 50% additional cost is significant for the longer-term economics of CCS – but is there a reliable future need for this capacity?)

# Planning a CCS infrastructure

## Mismatch of capture & storages sites



# A long-term view on CCS infrastructure Electricity-/steel-CO2 storage network?!



Planned capacity 100 mln t CO2. For illustration purposes only.

# CO<sub>2</sub> transport in the CCS chain

## Key issues from the planning perspective

- **Developing an early and robust vision on the necessary/potential CO<sub>2</sub> transport infrastructure is important (even parallel to the CCS demonstration phase)**
  - Transport corridors will be a scarce resource (at least in countries like Germany), careful and early planning will be necessary, strong links to the emerging analysis on storage capacities and sites must be established
  - Uncertainty management will be an overarching issue: Who carries the (economic, regulatory) risk of decisions on (long-term) cost-effective roll-out strategies for CO<sub>2</sub> infrastructures?
  - State planning and pre-financing of infrastructures could emerge as a complementary option to support CCS
- **Running into regulatory infrastructure problems could create major problems/delays for CCS to deliver the necessary CO<sub>2</sub> abatement on time (the bizarre experience from the energy market liberalisation in the EU is a negative blueprint!)**

## CO<sub>2</sub> transport in the CCS chain Beyond the technocratic approach

- **Public and political acceptance is a scarce (but potentially renewable/expandable) resource**
- **Acceptance can only be raised within an accountable framework and with a new quality of stakeholder involvement**
  - Clear and ambitious long-term climate targets/visions
  - Defining CCS as an (interim) part of the necessary, climate policy-driven changes, neither BAU nor BAU-BNWS\* is an option (\*business as usual – but now with scrubbers)
  - Developing CCS not only as an exclusive option for the future use of coal – a wider scope must emerge: all fossil fuels including natural gas, process emissions and net-sinks (biomass combustion, biofuel production)
  - CO<sub>2</sub> infrastructures create risks – these risks and the countermeasures must be made transparent
  - Fair compensation approaches must be developed

**Thank you  
very much**

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