



# Monitoring and reporting of CCS in the EU ETS

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International Symposium – Reduction of emissions and geological  
storage of CO<sub>2</sub>

IFP, Ademe, BRGM - Paris 15-16<sup>th</sup> September 2005

# Overview

- **Challenges to considering CCS in the EU ETS**
- **Focus: monitoring and reporting issues for installations exporting CO<sub>2</sub> to a CCS value chain**
- **Conclusions, challenges and next steps**

# CCS in EU ETS: Why?

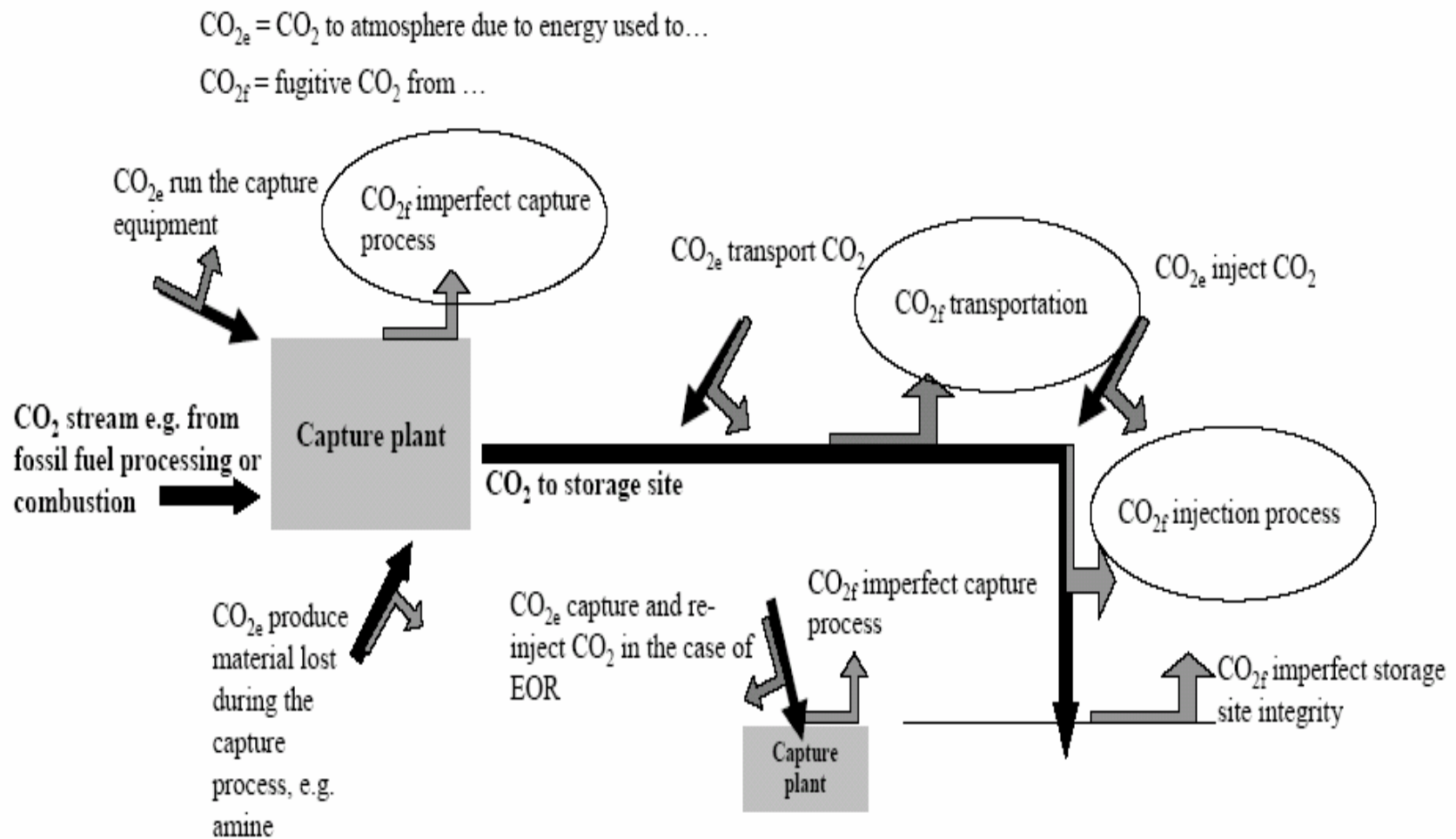
- **Current costs for CCS high: >20 Euros/tonne CO<sub>2</sub> abated (Current EUA price ~ 15 Euros/t CO<sub>2</sub>)**
- **Integrating *carbon value* will greatly improve overall CCS economics**
- **Narrow window of opportunity in North Sea for EOR: next 10 years or so..**
- ***What's needed? Evolution of credible fiscal and regulatory framework, including:***
  - development of robust installation level Monitoring & Reporting (M&R) guidelines for CCS operations in EU ETS

# Background to development of M&R guidelines

- **Decision C(2004)130 [M&R Guidelines] invites:**  
“MS interested in the development [of M&R guidelines for CCS] to submit research findings to the Commission”
- **UK DTI response:** form *ad hoc* group of experts to develop M&R guidelines
- **1<sup>st</sup> points:**
  - Need to maintain integrity of overall EU ETS cap, otherwise; simply export CO<sub>2</sub> from installation then vent from a pipeline or storage site
  - Need more robust framework than current CO<sub>2</sub> ‘transfer’ arrangements in Decision C(2004)130
- **Note: focus is on “installations” as defined in EU ETS**

# Considerations for CCS in the EU ETS

- **Fugitive emissions:** can occur across whole CCS chain (capture, transport, injection)
- **Indirect emissions:** additional power requirements for capture, transportation, injection (energy penalty, booster stations etc.)
- **Seepage from storage reservoirs:** Short and long term seepage issues to consider
- **Responsibility for measurement:** Potentially number of different operators across chain
- **Verification requirements:** what data? from who?
- **Timeframes:** Annual versus geological



Source: Haefeli et al., IEA, 2004

# Fugitive emissions

- **Calculate** CO<sub>2</sub> emissions using approved M&R plan for installation, based on primary fuel input to operations
- **Measure** (metering to custody transfer standard):
  - exports of CO<sub>2</sub> to pipeline
  - imports of CO<sub>2</sub> to injection facility
- **Reconcile**: estimate fugitive losses across the chain using a *mass balance* calculation
- **Medium-term goal**: to develop *emissions factors* for inventory approach – will improve accuracy

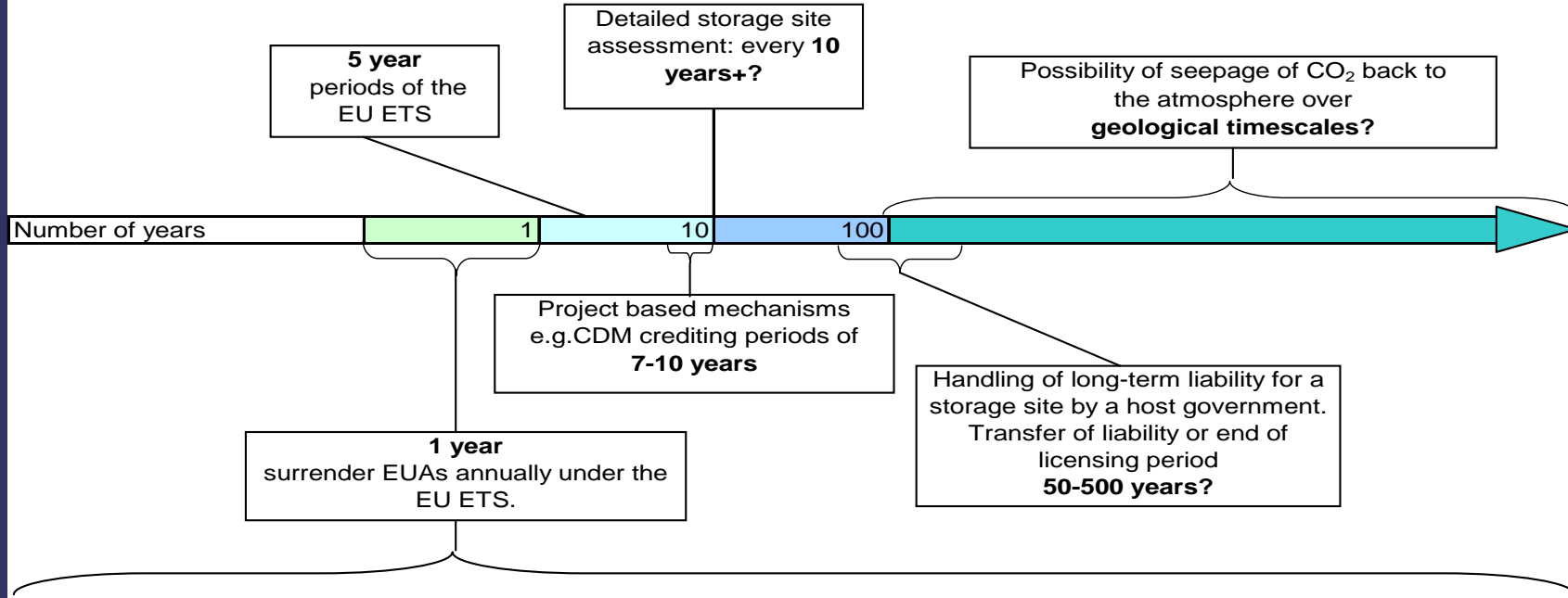
# Indirect emissions

- **Energy penalty for capture:** accounted for by calculating CO<sub>2</sub> produced at installation using primary fuel inputs
  - Can use existing guidelines (Decision C(2004)130) for all “installations” covered by scheme
- **Booster stations:**
  - >20MW thermal input = installation in its own right
  - <20MW thermal input = outside scope of EU ETS
- **Need to avoid *double accounting* in electrically powered booster stations, thus not included**

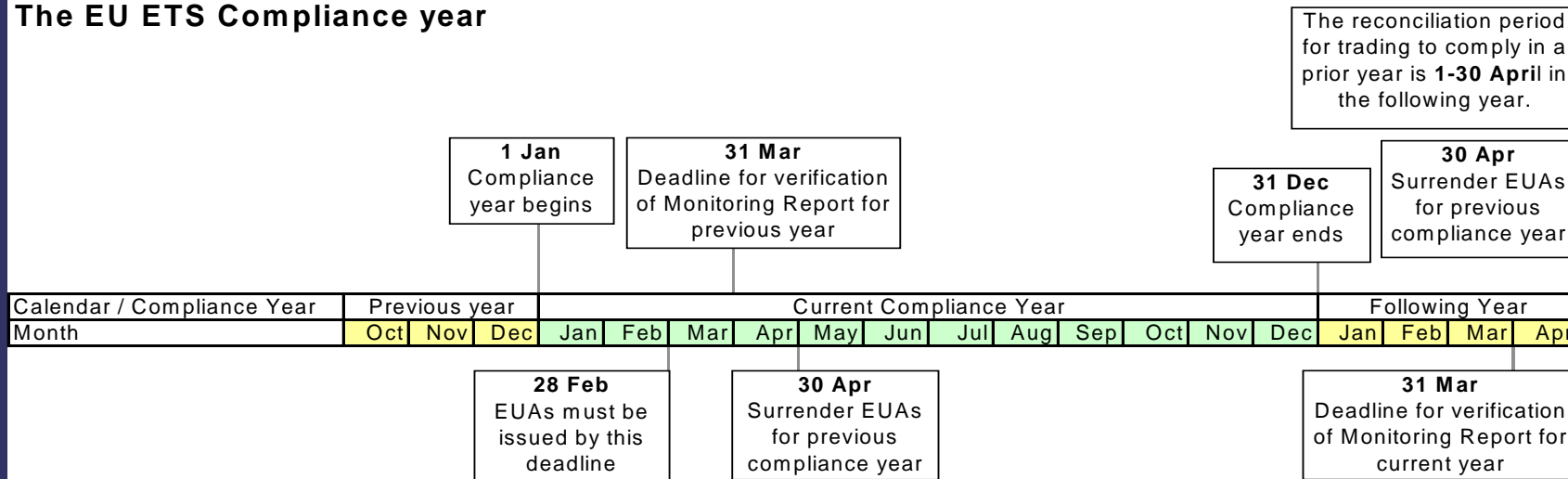
# Seepage from storage sites (1)

- ***Most problematic aspect!***
- **Range of literature looking at *ex ante* methods to account for possible future seepage:**
  - Discounting of emissions (like DCF)
  - Default factors
  - Temporary crediting (like for LULUCF)
- **Creates a number of problems:**
  - Assume storage site *will* leak;
  - That the timeframe and flux rate can be determined *ex ante*
  - Discount factor could be so small to = <1 EUA / yr etc.

# Milestones in a CCS project



## The EU ETS Compliance year



## Seepage from storage sites (2)

- Thus, need to exclude any storage site seepage from an exporting installations' inventory
- But need to maintain integrity of emissions cap in the EU ETS cap and trade regime
- Therefore, propose an alternative approach to *ex ante* methods
- Alternative approach dependent on the development of ***coherent and robust storage site permitting/licensing regime***

# Seepage from storage sites (3)

- **Licensing requirements for storage sites:**
  - Operator due diligence – operator shows all available evidence suggests a good storage site
  - Emergency plan to control any short-term seepage
  - Commitment to monitor, quantify and report any seepage
  - Include seepage emissions in National Inventory
  - Time limiting license (TLL) and subject to review based on storage performance
  - Operator required to purchase EUAs = to any seepage; could make this over 5 or 10 year period and align to EU ETS periods and TLL

# Seepage from storage sites (4)

- **Operator could manage this risk by:**
  - Ensuring contract with installation requires installation operator to set-aside some EUAs until license renewal
  - Buy EUAs out of the MS NER surplus left over at the end of the EU ETS Period
  - Buy EUAs during first year of next EU ETS Period
  - A combination of the above
- **Benefits**
  - Removes uncertainty over *ex ante* methods
  - Aligns with EU ETS Periods
  - Maintains integrity of EU ETS overall cap

# Responsibilities and Verification

- **Becomes increasingly complex under *common carriage* scenarios**
- **Need to introduce specific requirements to publicly report data at various points across CCS chain**
- **Verifiers: will need to collate disparate data in order to complete verification**
- **Storage site licensing: verifier will require Installation operators to provide evidence that CO<sub>2</sub> exported to licensed storage site**

# Conclusions, challenges & next steps

- **Conclusions**

- Market led: CCS in EU ETS will stimulate investments in CCS in the longer term – near-term, other types of support will be needed
- Licensing: provides regulatory certainty and should be part of good practice going forward
- Could be partly achieved by including storage sites as “installations” with zero allowances

- **Challenges:**

- Monitoring, detecting and quantifying seepage losses from storage sites

- **Implementation and next steps:**

- DG Env considering proposals: Defra to table concept at EU ETS WG 3 on MRV
- Need to consider breakthrough CO<sub>2</sub> in EOR
- Issues to be resolved regarding CCS in project-based mechanisms



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