

Oil & Gas Industry Experience: A Basis for Confidence

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IPIECA Background



IPIECA formed in 1974, following UNEP

- Provide point of contact for UNEP
- 30 member companies, 12 associations

CCWG:

- Original WG formed in 1974
- History of engagement with UNFCCC and IPCC
- Workshops + Publications

CCS TF

- Workshops (CCS Business Models) and presentations
- Publications

An industry perspective



Significant long-term promise of CCS

- Global distribution of geological formations
- Large CO₂ sources (power sector)
- Allows coal to contribute in GHG restrained world

Extends from existing experience, and technology

- Gas separation, transport and injection
- Characterization and management of geological formations

CCS adds costs and consumes energy

- Importance of R&D to reduce costs and improve efficiency
- Commercially viable in limited O&G activities: important early experience

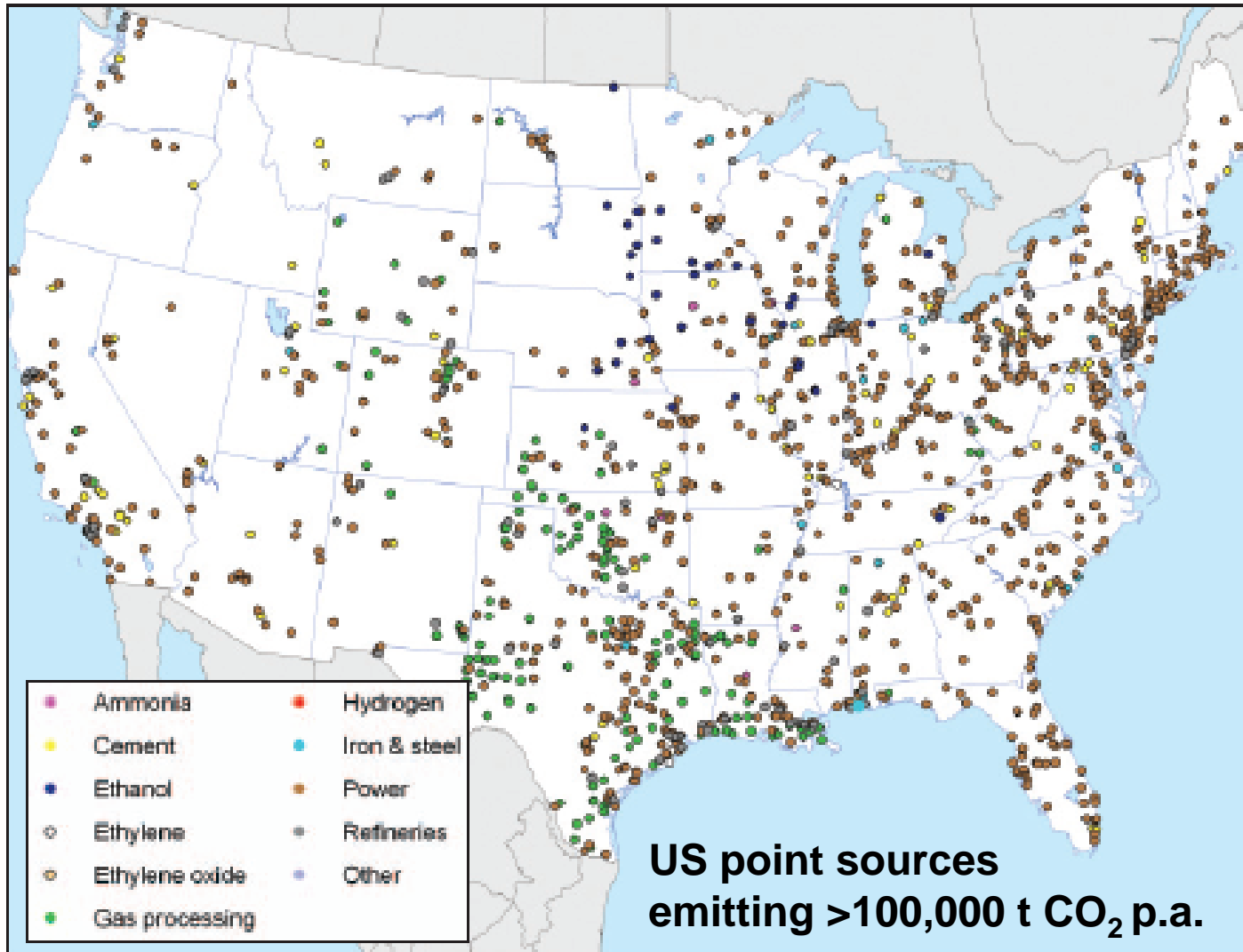
Large commercial uptake of CCS requires

- Policy to make CCS economically viable
- Enabling regulatory and legal framework

CCS is public good - govt's should work with industry to advance it

- IPIECA interested in facilitating such interaction

Potential scale of CCS infrastructure in USA



Geological capacity:
~3900+ Gt CO₂
(source: Dooley et. al.)

100% mitigation:
transportation of
50mn+ barrels
CO₂/day

CO₂ pipeline
infrastructure:

- Link sources to sinks
- Comparable scale to existing petroleum pipelines
- Decades to deploy

Basis for risk management



30 years of industry experience

- enhanced oil recovery (EOR)
- acid gas injection
- CCS projects

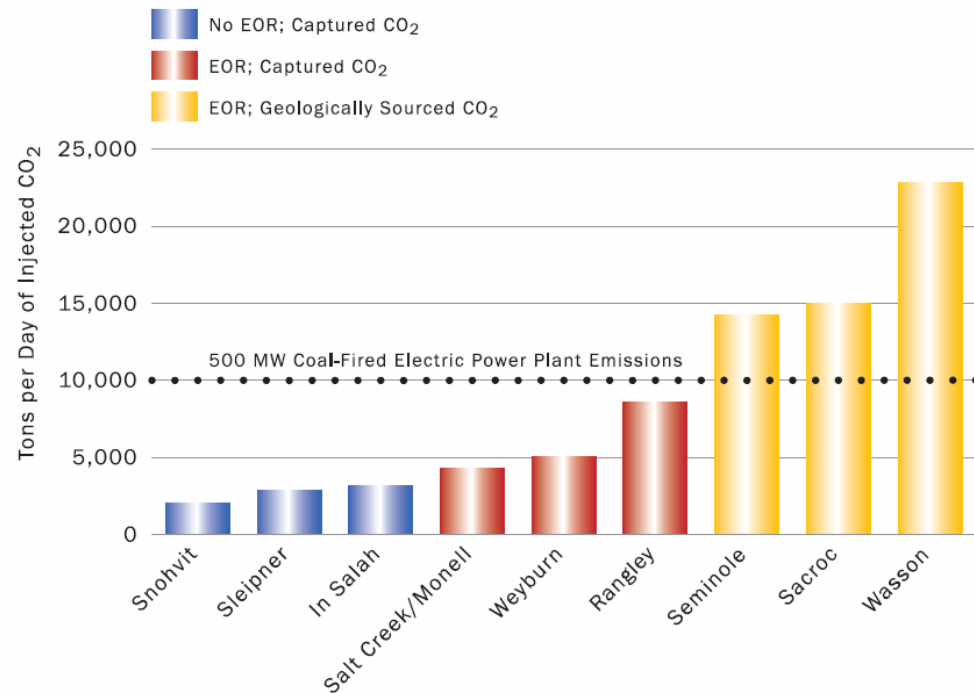
Safety achieved by site selection and risk management systems, using:

- Site characterisation
- Operational monitoring
- Scientific understanding
- Engineering experience

Experience gives valuable info on management of geological storage

- But fossil fuel emissions several orders of magnitude greater
- Substantial reduction in global emissions requires CCS on much larger scale

Industry is confident CCS can be practiced safely and effectively and we are prepared to work with others



Basis for risk management (2)



Geologic storage requires consideration of broader range of settings than considered for EOR

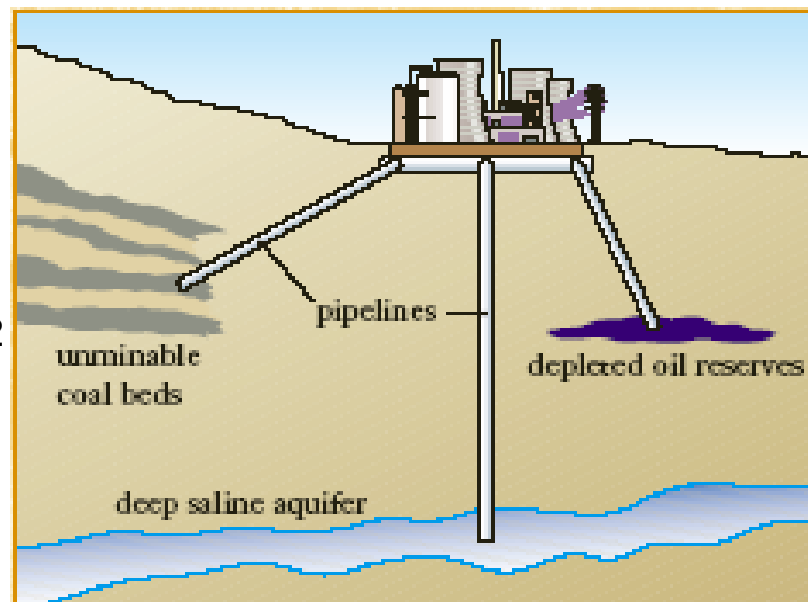
Sub-surface pore-space volume ample compared to fossil fuel CO₂

- Effective volume is evolving question
- Depleted O+G fields ~920 GtCO₂? (= 45% of fossil fuel CO₂ to 2050)
- Deep aquifers much greater capacity (up to 500% of emissions to 2050?)

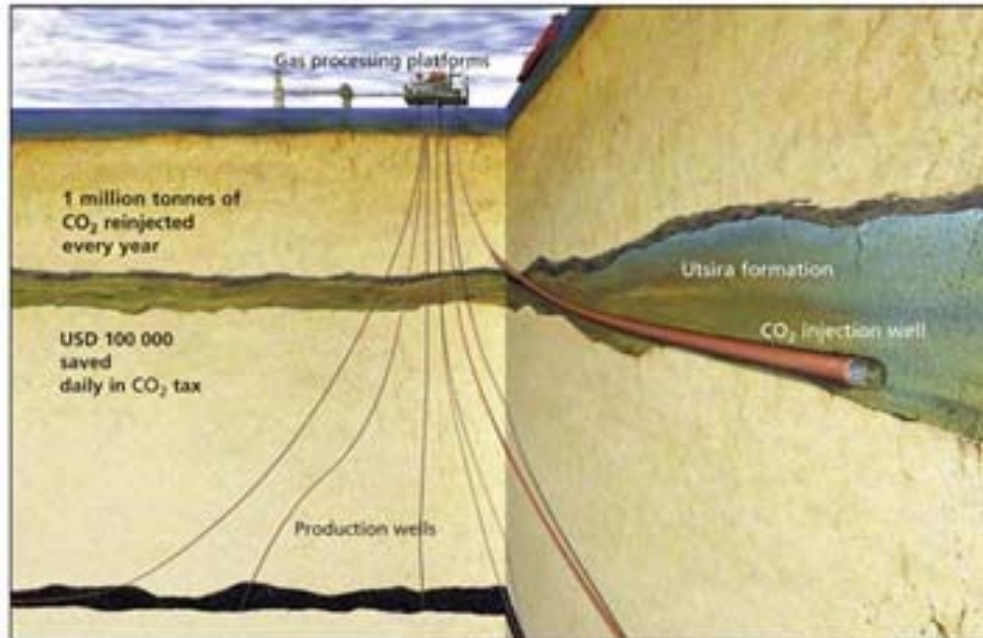
Safety achieved

- Site characterisation
- Operational monitoring

Geological storage merits aggressive development and improvement



The road ahead



Diverse incentives by academia, governments and industry are improving CCS prospects and performance:

- Accumulating commercial experience with gas injection
- Research initiatives to find lower-cost CCS technologies and improve understanding of risk
- Increasing number of CCS projects improve understanding through field experience

– Assessment of merits of CCS, and comparison to other options provide information for decisions, and the basis for public acceptance

These actions improve and better define the prospects of CCS and its contribution as a potential solution to climate change

Information and capacity building



Our experience is a resource

Information: a basis for policy and regulatory development

- *IPCC Special Report on CCS*
- *IPCC Guidelines for National GHG Inventories*
- *O+G Industry Guidelines to GHG Reduction Projects: CCS*
- *Carbon Dioxide Enhanced Oil Recovery, API*
- *Lessons Learned ... For Geological CCS, Benson et al*
- *CCS in the CDM, IEA GHG R&D Programme*
- IEA GHG also host detailed expert networks

Capacity building: preparing for a promising technology

- *CSLF activities*
- *CCS @ WPC 18, Johannesburg, 2005*
- *Promoting IGCC with CCS, Tsinghua, China, 2006*
- *CCS Business Models Roundtable, Oslo 2007*

We welcome any opportunity to contribute further

IPIECA participation in CCS



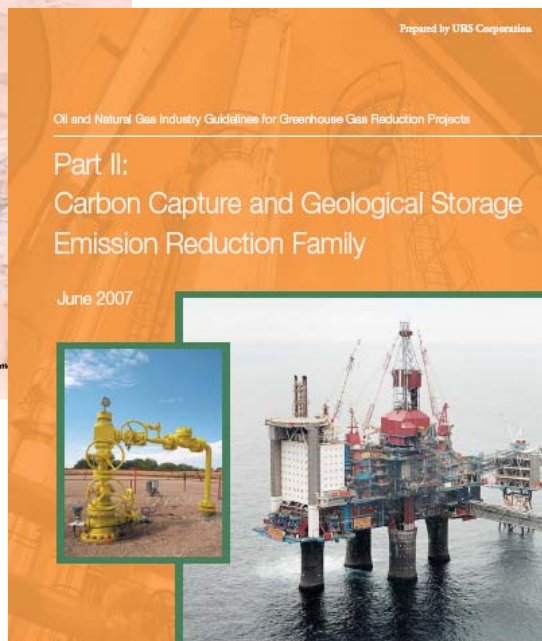
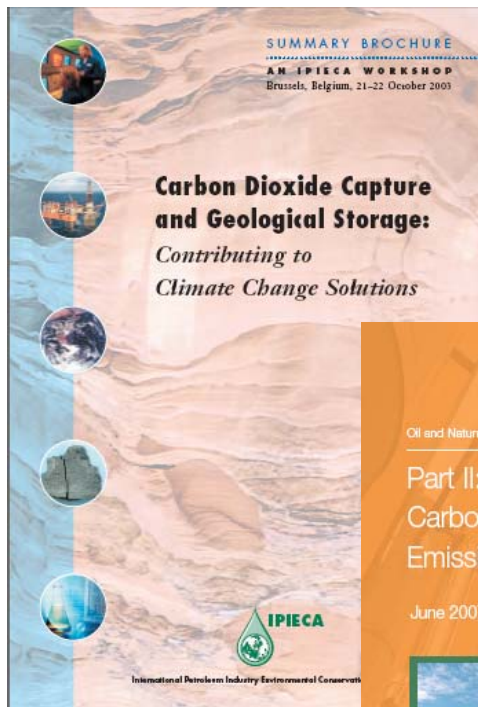
CCS TF Composition:

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Iain Wright (BP)	Robert Siveter (IPIECA)	Tom Mikus (Shell)
Dewey McLemore (Chevron)	Terry Killian (Marathon)	Frede Cappelen (StatoilHydro)
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Bruce Wilcoxon (ConocoPhillips)	Paulo Cunha (Petrobras)	

Participation in IPCC, G8, CSLF, and IEA GHG programmes

We are prepared to collaborate

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