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- Reduction of Emissions and Geological Storage of CO₂
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Carbon Capture and Storage – Social need and public questions and perceptions



- The threat of climate change
- Reduce emissions
- Public opinion on CCS
- The problem of leakage
- Concerns
- Confidence
- Summary

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The threat of climate change



The goal

<< 2°C

**ICs
- 80%
2050**

Climate Change

temperature increase
sea-level rise
precipitation changes
severe weather events

urgent need to reduce GHG, esp. carbon dioxide
„stop temperature from increasing as fast as we can“

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... reduce emissions as fast as we can



Means, act NOW:

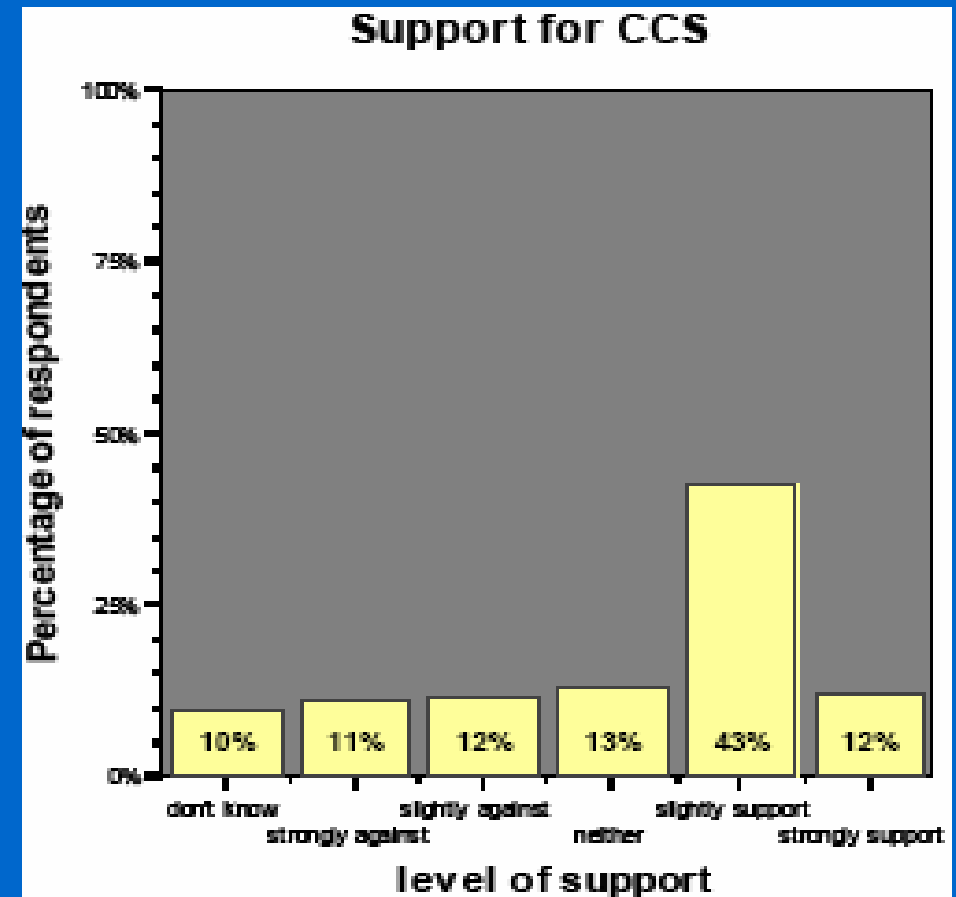
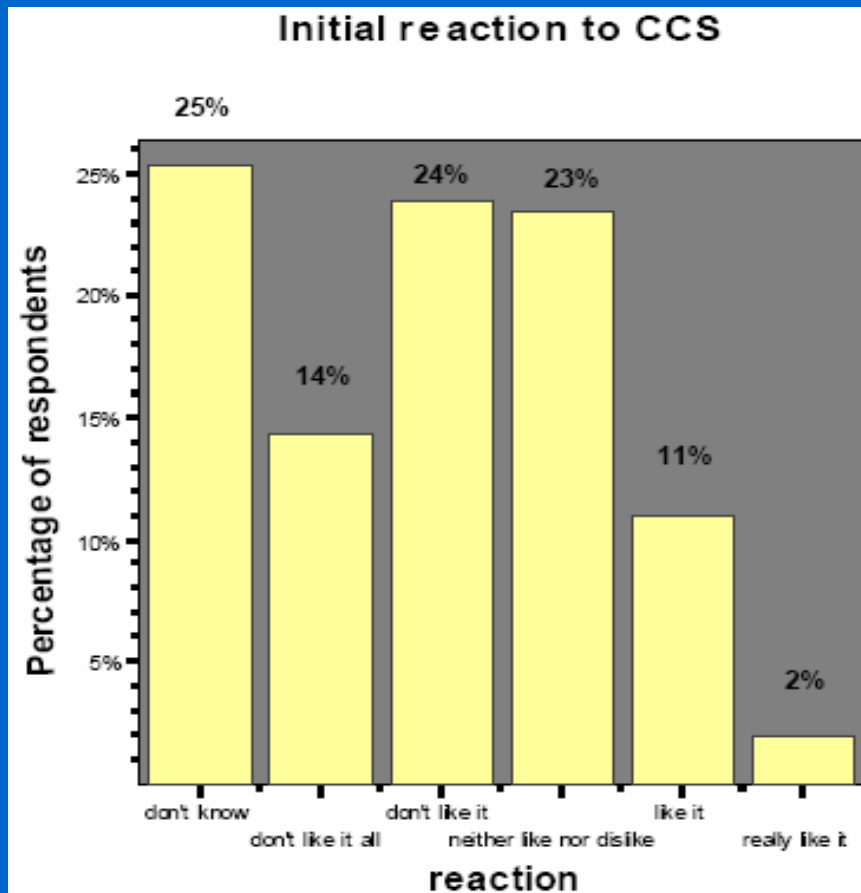
- reduce fossil fuel consumption
- increase renewable energy, energy efficiency, saving
- energy supply management
- **CCS** as a possible future option

WHY?

- efficiency increase / energy saving
 - switch to Renewables
 - wait until fossils are depleted

is seen as **... not strong enough**
... not fast enough
... stupid solution

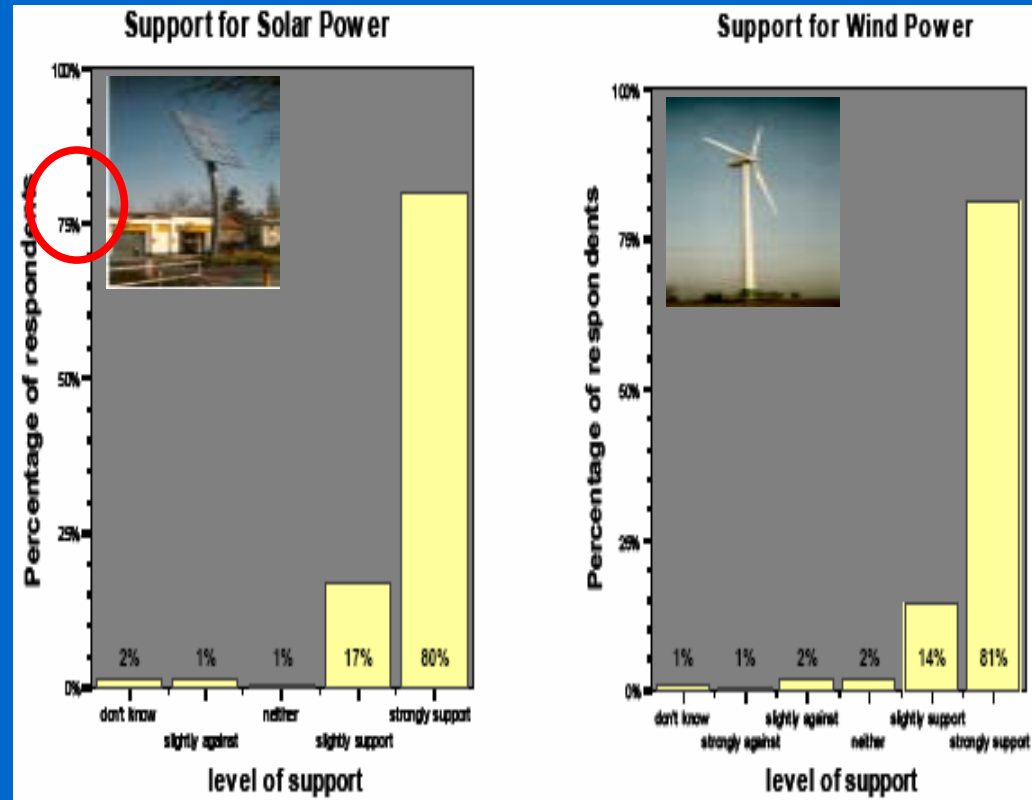
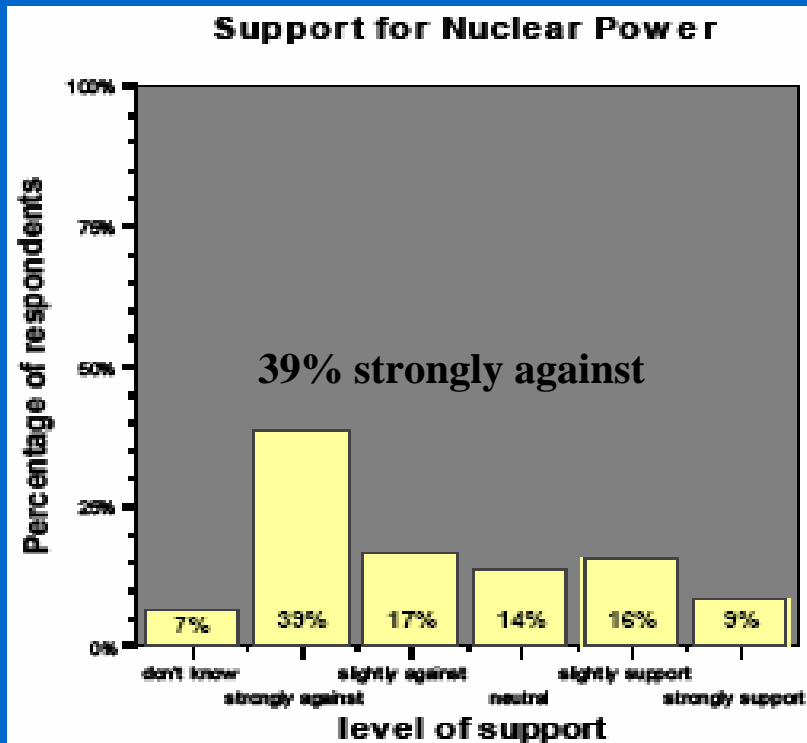
The public is uninformed and unsure about CCS



Source: Tyndall Centre, Simon Shackley

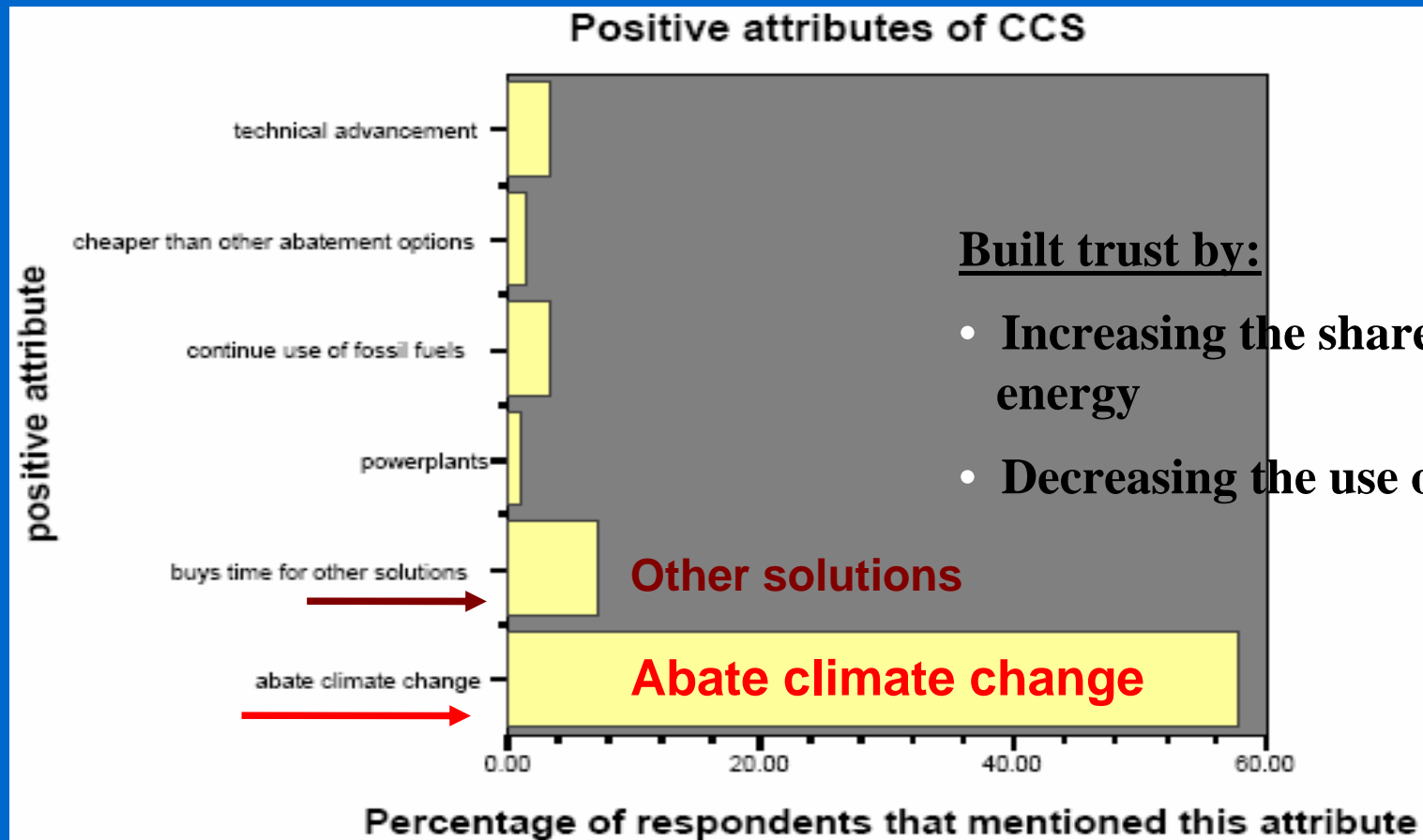
The public is slightly supportive, but ...

43% slightly support CCS



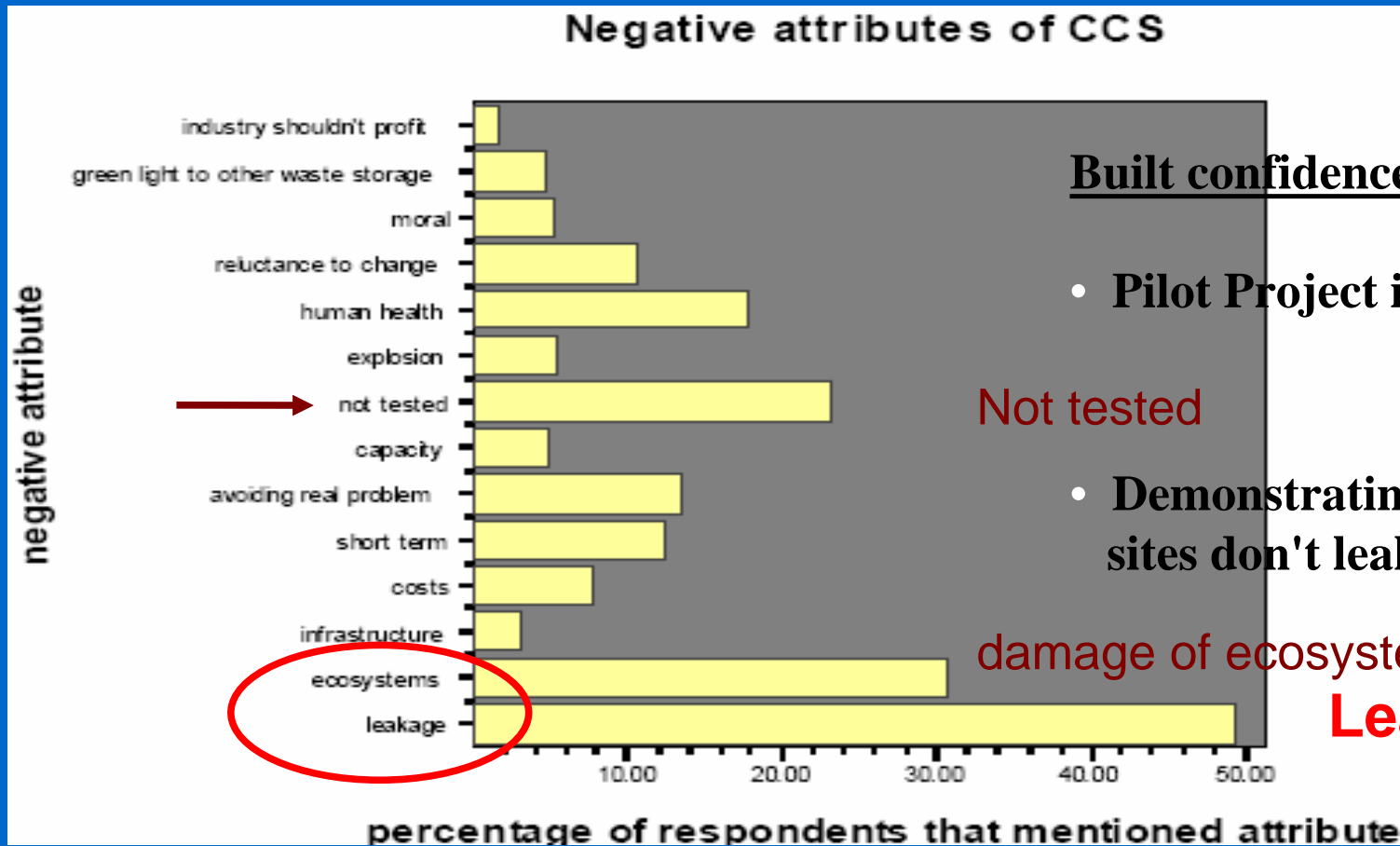
80% strongly support renewables

Public perception on CCS



Source: Tyndall Centre

Public negative attributes on CCS



Built confidence by:

- Pilot Project involving public

Not tested

- Demonstrating that storage sites don't leak

damage of ecosystems due to
Leakage

Source: Tyndall Centre, Simon Shackley

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The problem of leakage

Can this be done safely?

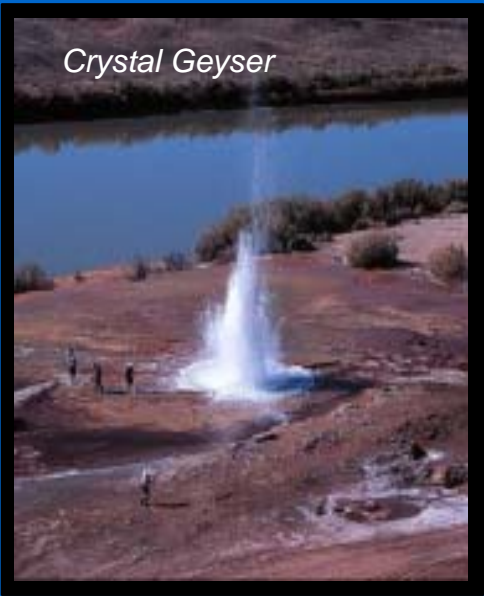
The discussion of “leakage rates” and “retention time” **RAISES CONCERNS!**

Catastrophic release

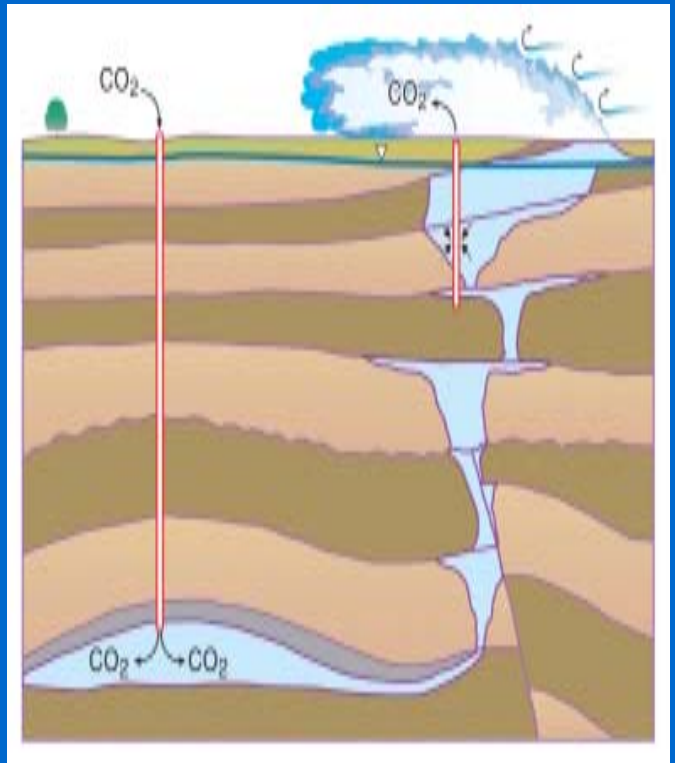
slow diffusive seepage

Natural analogues

Natural analogues



Crystal Geyser

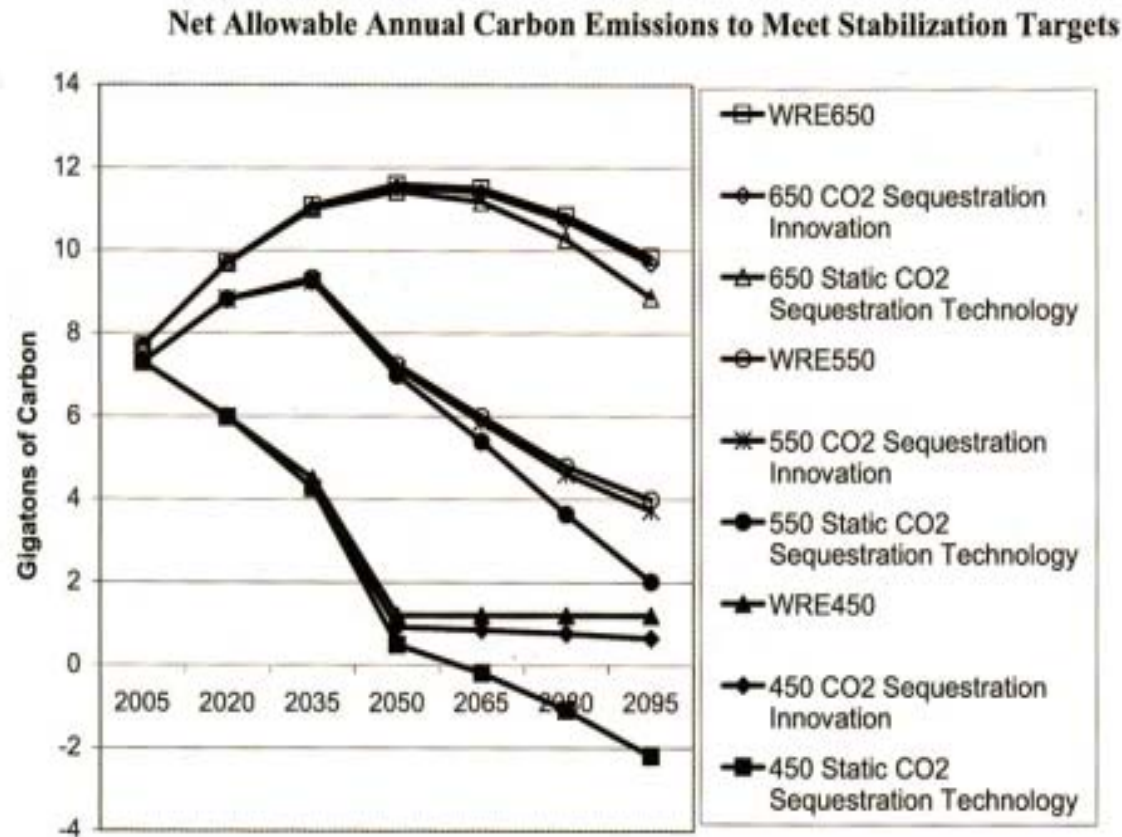


Ciampino $f_{CO_2} = 0.38 \text{ m}^3\text{m}^{-2}\text{day}^{-1}$



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The problem of leakage



Large scale use of up to 30 % of all mitigation possible by the end of this century

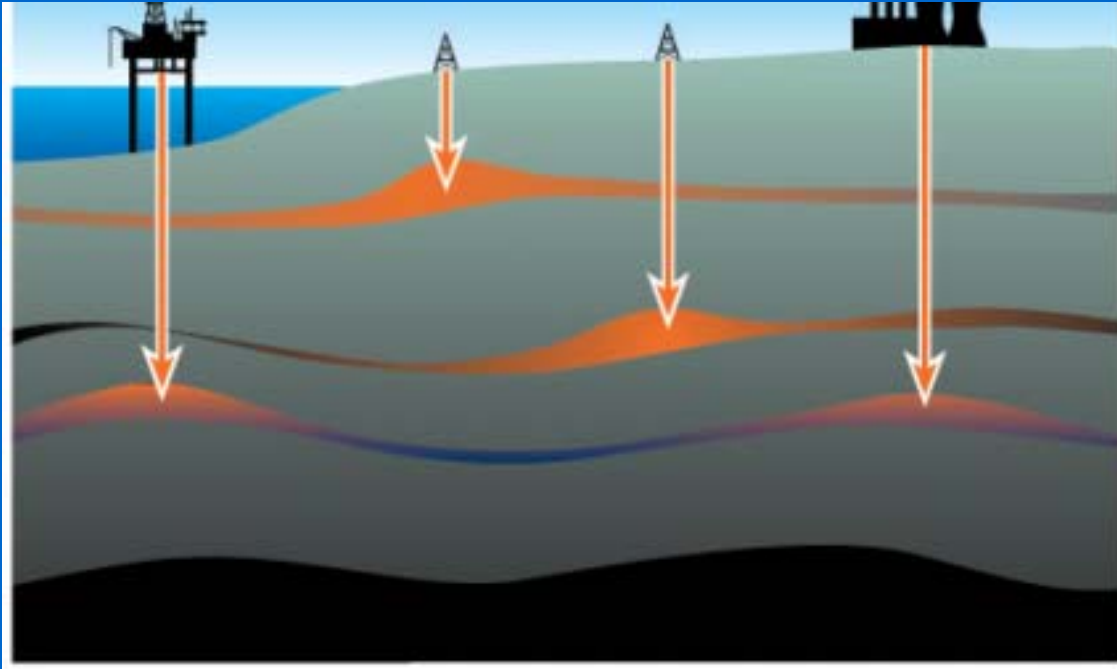
RAISES CONCERNS!

If leakage were to become a significant source of emissions, emissions of human activities would have to be restricted to even lower levels to reach a set stabilization target.

Source: Dooley & Wise

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Concerns ...



How much is acceptable?

Storage capacity over 11,000 Gt CO₂ worldwide.

Business as usual could mean up to 2,200 Gt to be stored underground by the end of this century.

That's difficult to understand and accept, especially when industry and government is NOT acting right now!
- and just point to the BAU scenarios -

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... if you want to built Confidence for CCS



Open and transparent discussion

- Explain the problem (fossil fuel use and climate change)
- Show the energy pathway, make clear where you want to go
- Strong Post-2012 targets

And for possible storage sites:

- Proper site selection with public involvement
- Liability - during and after injection stage, long-term monitoring (polluter pays principle, insurance system?), guidelines and best practise standards ...

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Summary



People are alarmed about climate change:

they have a rough idea of what needs to be done

- reduce the cause of the problem, the burning of fossil fuels and
- switch to renewables, energy efficiency, energy saving,
- use CCS carefully and only additional for a short period of time

< 2°C

to help prevent earth from further heating

As long as CCS is only meant to continue the fossil fuel use, people will oppose because they don't understand why not all options are taken forward right now.