

**GREENPEACE**



**CCS**

**Public Perception**

**Environmental Aspects**



## *Climate Change*

- Keep global warming well below 2°C to prevent dangerous climate change

**This requires global greenhouse gas reductions in the order of at least 50% (> 80% in industrialised countries) by 2050**

- Get to a low carbon world where all people have access to clean water, food and energy supply





## *Energy supply*

- New renewable energies provide clean energy, energy efficiency reduces demand
- New, more efficient coal power plants need less coal and emit less CO<sub>2</sub> than old power plants - but there is still too much land degradation and water pollution due to mining and too much CO<sub>2</sub> emitted.



... how about CCS?



## *Carbon dioxide Capture and Storage\**

### **A. Public Perception**

- Awareness, comparison of technologies,
- Attributes, deal with the risks / solve the problems, the unknowns

### **B. Environmental concerns**

- Liability, regulatory, accounting issues, monitoring
- Risk of leakage
- Contribution to sustainable development

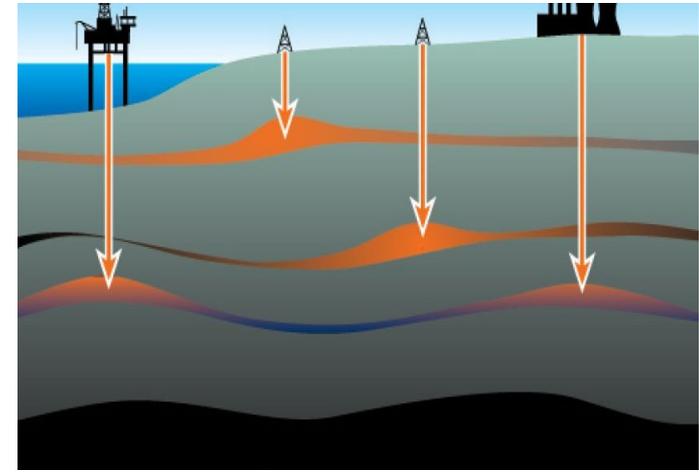
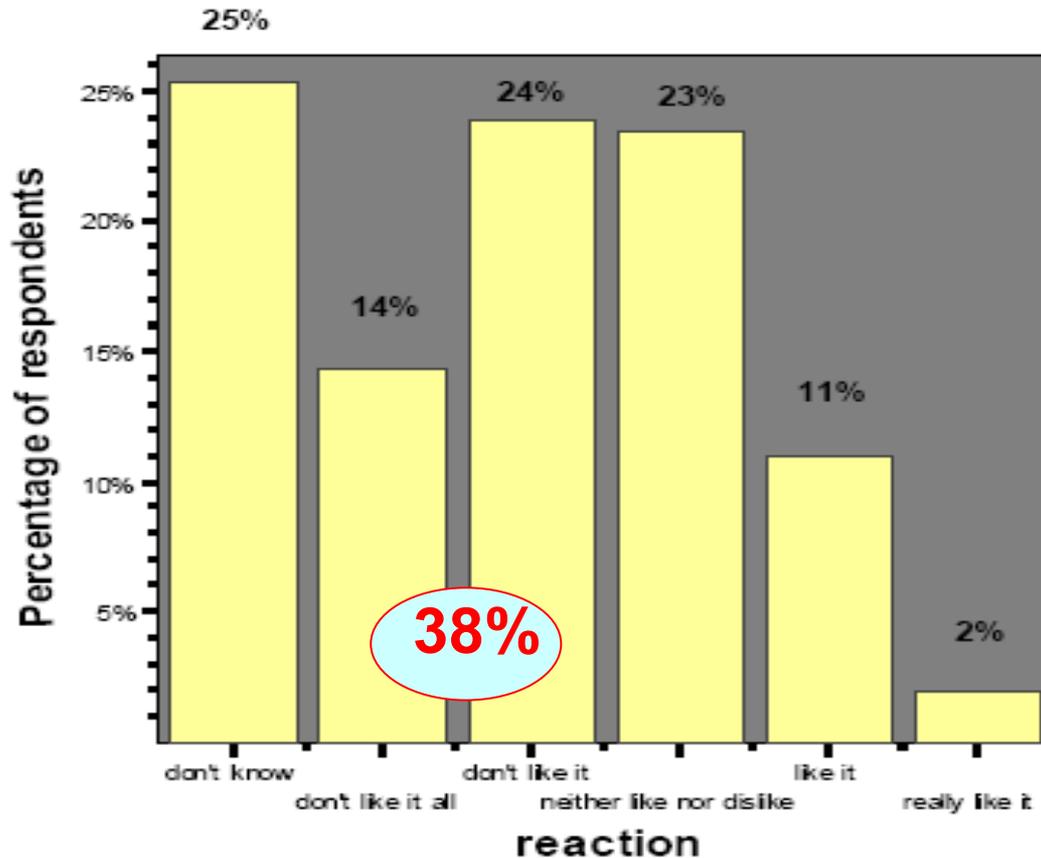
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\* Geological storage – NO ocean storage (The oceans are rich in biological life and any disposal of CO<sub>2</sub> eventually lowers the pH to dangerous levels; storage not permanent).



## Awareness

Initial reaction to CCS



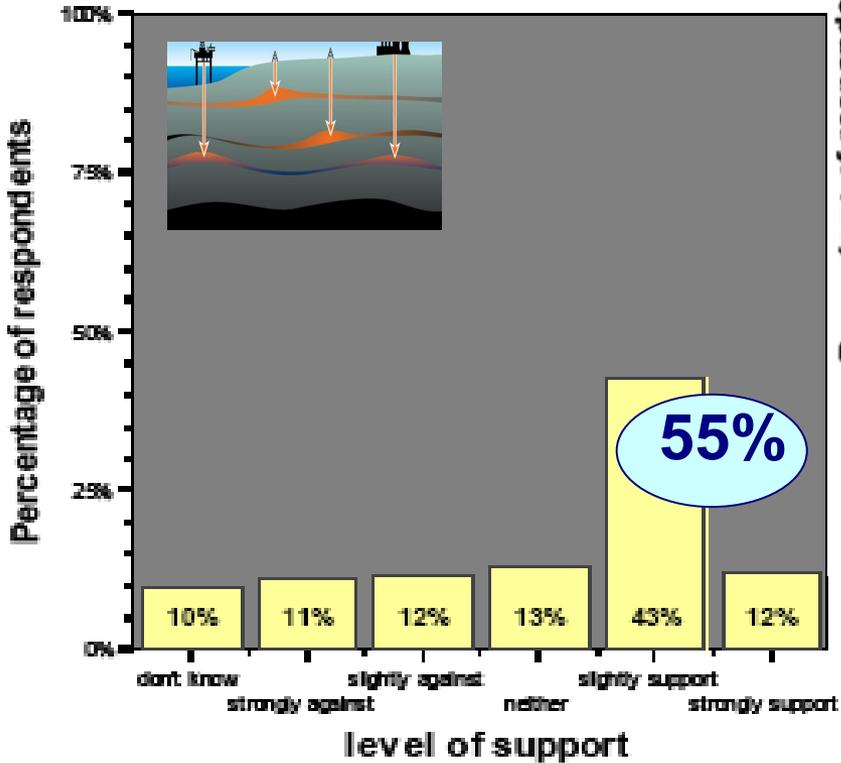
Only a few studies available  
(e.g. Tyndall, ACCSEPT)  
HERE: UK questionnaire  
(2 panels, Interview 212 people)

Source: Tyndall Centre, Simon Shackley et al. (2004)

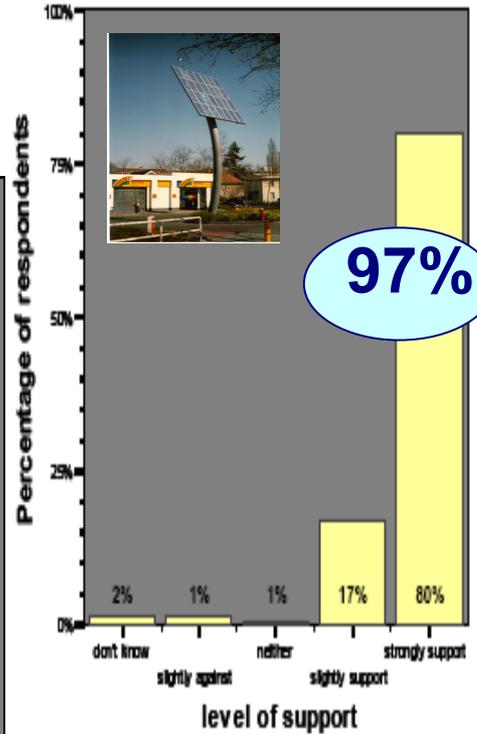


## Technologies

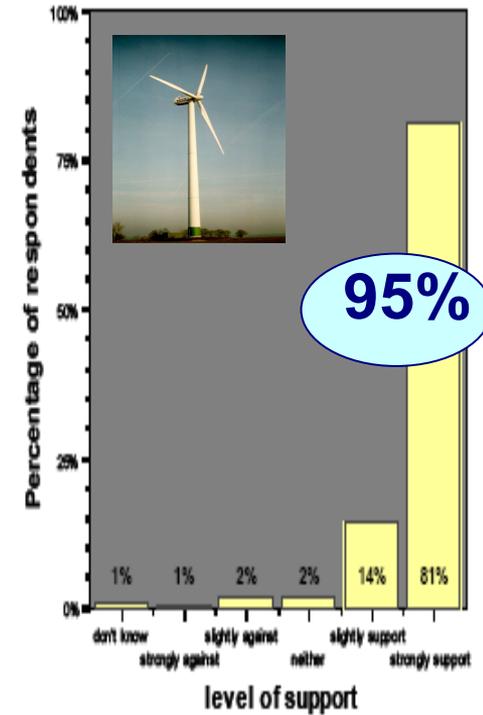
### Support for CCS



### Support for Solar Power



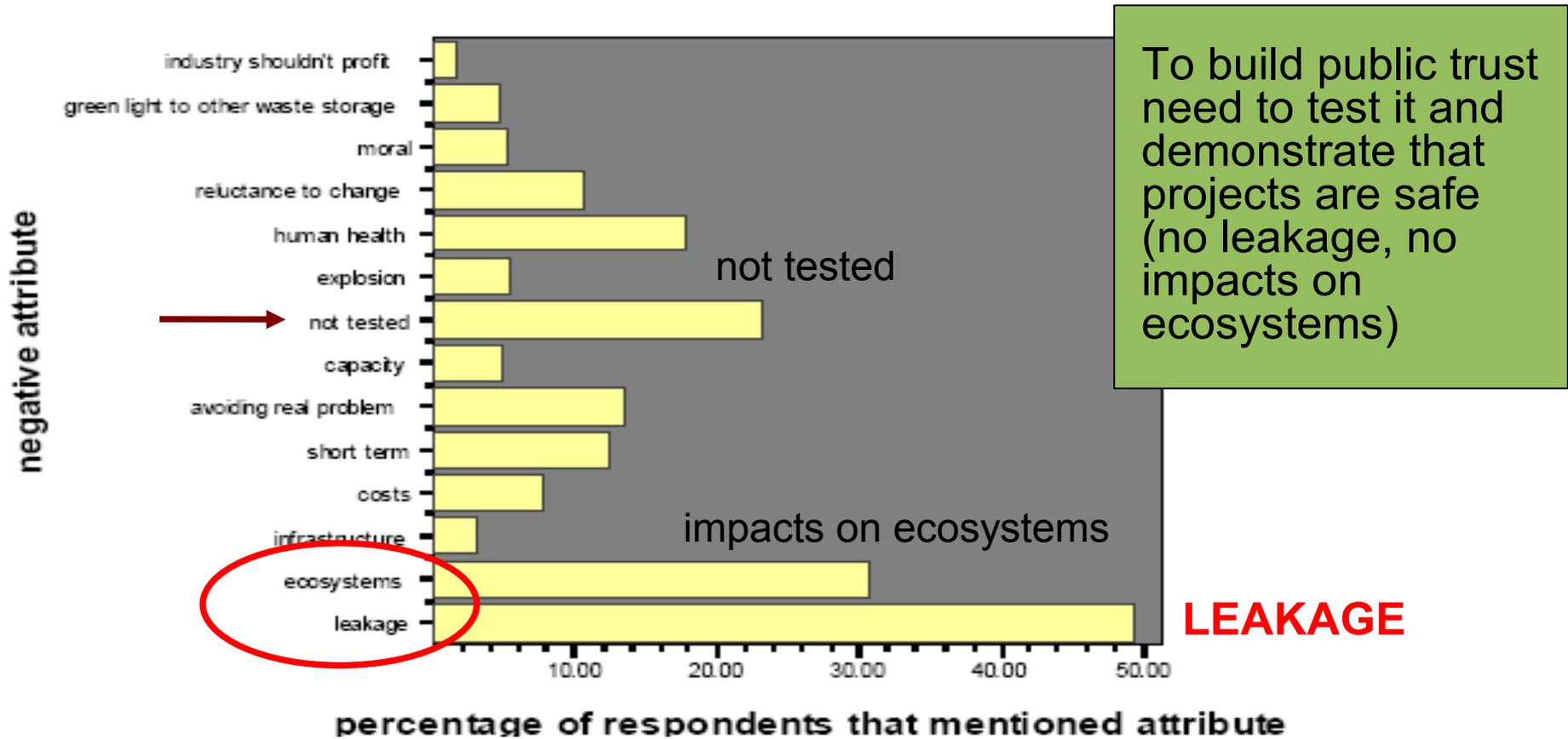
### Support for Wind Power





## Public concerns

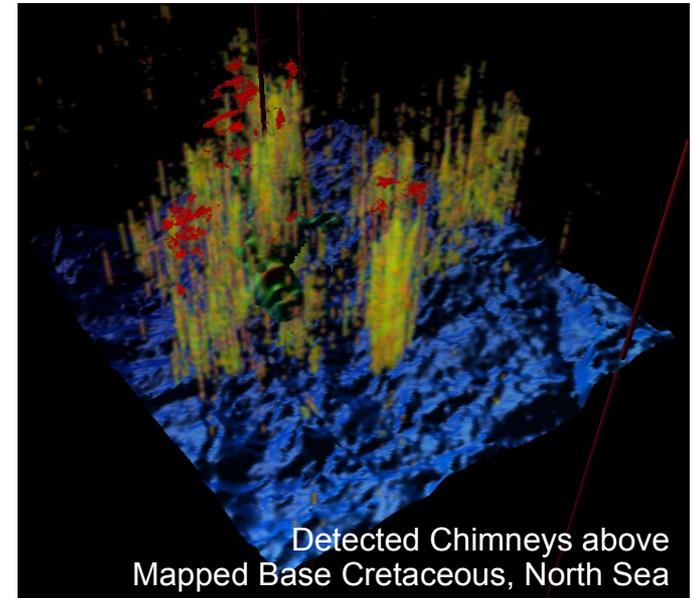
### Negative attributes of CCS





## *Risk of leakage*

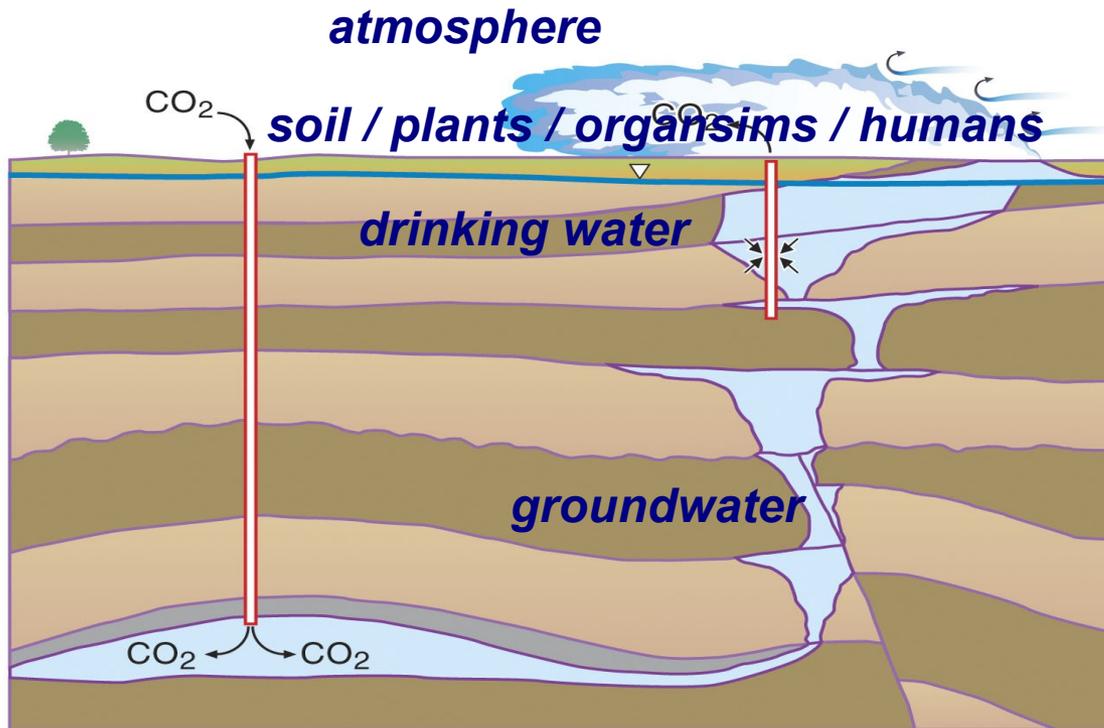
- Local risk: If CO<sub>2</sub> leaks out of a storage formation, local impacts may exist for humans, ecosystems; groundwater and oceans (food supply). The risk increases if the injected CO<sub>2</sub> stream contains toxic impurities.
- Global risk: Release of CO<sub>2</sub> may contribute significantly to climate change if some fraction leaks from the storage formation to the atmosphere. Continuous leakage could, at least in part, offset the climate benefits of CCS.



The IPCC report classifies two types of leakage scenarios: (1) abrupt leakage, through injection well failure or leakage up abandoned wells, (2) gradual leakage, through undetected faults, fractures or wells.



## *Risk of leakage*



An expert from CO<sub>2</sub>CRC:

Explosive leaks are unlikely, monitoring may not detect trickled leaks.

(New Scientist, 2005)



## *Lock-in situation*

CCS is a radical departure from the path of renewable energy and efficiency – its intent is not to avoid the production of harmful emissions but instead to bury them.

Because of high costs for CCS large point sources are essential. Who is going to pay the price (for electricity, for monitoring, for remediation). Who is taking liability?

A vast infrastructure is a pre-requisite for CCS being a large scale climate mitigation option.

A centralized fossil energy structure finally blocks the development of a decentralized renewable energy system.

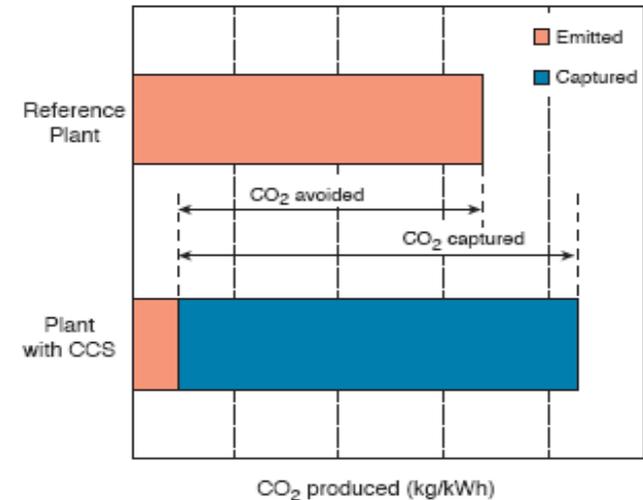


Figure: IPCC SRCCS

## *Contribution to sustainable development?*

*'meets the needs of the present without compromising the ability of future generations to meet their own needs'* [Brundtland Commission, 1987]

- Coal power plants equipped with a CO<sub>2</sub> capture facility for CCS need more coal and produce more CO<sub>2</sub> than conventional power plants.
- CCS increases the dependence on fossil fuel sources and technologies.
- CCS does nothing to contribute to the real, proven energy solutions to climate change: renewable energy and energy efficiency and conservation



**CCS is not sustainable, since it obliges future generations to monitor stored CO<sub>2</sub> for safety and climate protection reasons, and to remedy potential leakage.**



## *Example CDM*

- CCS does not provide long term benefits to local communities, whereas a shift from traditional energy sources to renewable energy would promote local development by creating employment.
- CCS does not fulfil the description of the Marrakesh Accords, that the CDM should lead to transfer of environmentally safe and sound technology. CCS is still an unproven technology / a technology under development that should not be tested in developing countries.
- CCS is a technology for a small number of developing countries that already rely on coal (or oil and gas). Many countries will be left outside.



## *Summary*

Public in general is unaware of CCS. Renewable energies are strongly favoured over other energy sources including CCS. To build public trust there is a need to test it and demonstrate that projects are safe, i.e. no leakage occurs, no impacts on ecosystems will be created.

Environmental impacts increase due to increased mining activities, water needs, and still CO<sub>2</sub> being emitted (also lower compared to conventional coal power plants without CCS, but higher than compared to renewable energies). CCS is a costly, still unproven technology that creates long-term commitment for safe-guarding geological CO<sub>2</sub> storage sites with a risk of leakage remaining.



## *Conclusion*

- If we take climate change seriously profound, long-term structural changes are needed, especially related to the use of fossil fuels. We must begin and continue to move to efficient use of renewable energy and help developing countries achieving real sustainable development.

**CCS doesn't help us with the urgent need to cut emissions in the next 10 to 15 years and to provide access to clean energy!**

