Overview of Public Acceptance of CCS

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Studies to Date

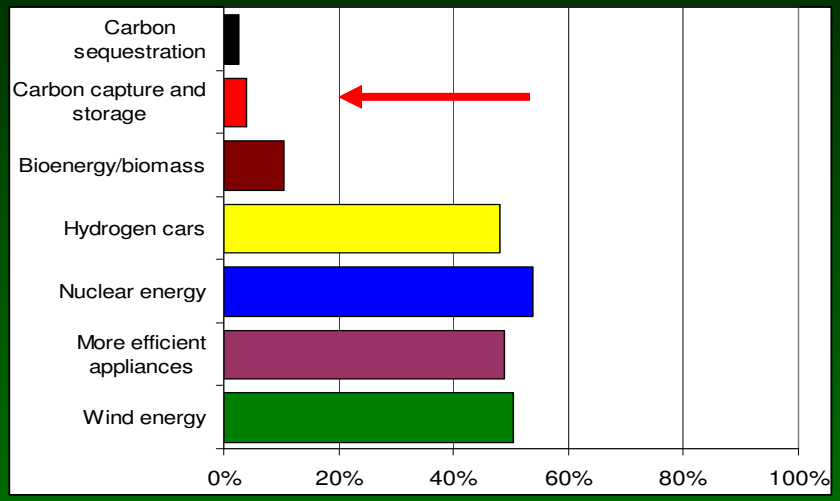
- Public Attitudes and Awareness
  - Studies in the UK, Sweden, US, Japan, the Netherlands, Canada, Spain, France, and Australia
- Stakeholder Attitudes and Awareness
  - AGS
  - CCP2 (DTI/IEA WPFF)
  - ACCSEPT
- Media Coverage
  - IEA GHG (Tyndall, CATO, etc)
- Focus Groups
  - Tyndall, CSIRO, CATO, SFU

AGS Project on Social and Political Implications of CCS

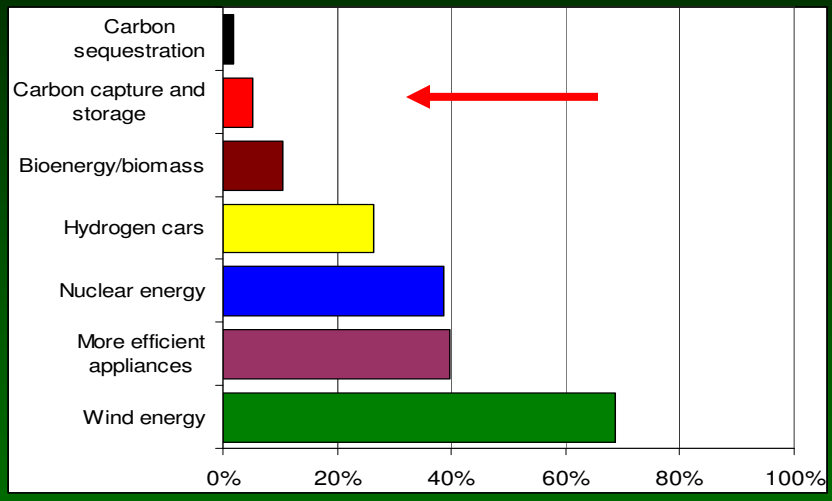
- MIT (Herzog, de Figueiredo)
- Cambridge (Reiner)
- Chalmers University of Technology (Johnsson)
- Mizuho Research & Information Institute (Itaoka)
- Public Surveys conducted in US (2003), Japan (2004), UK (2004), Sweden (2004), US (2006)
- Stakeholder Survey conducted in Japanese, Swedish and English in Spring 2006

Public Awareness
(heard/read of the following in the past year)

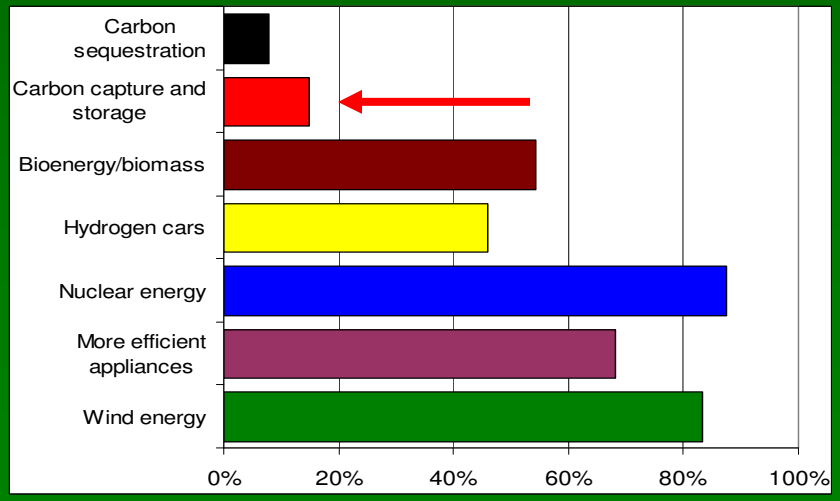
US



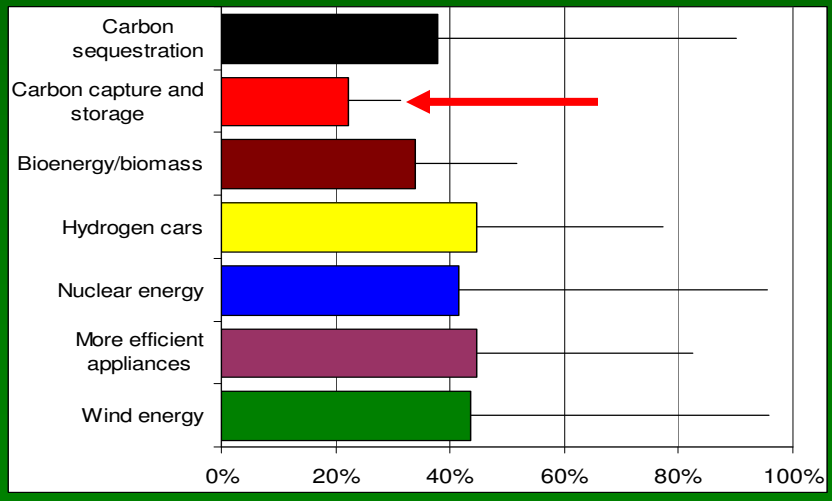
UK



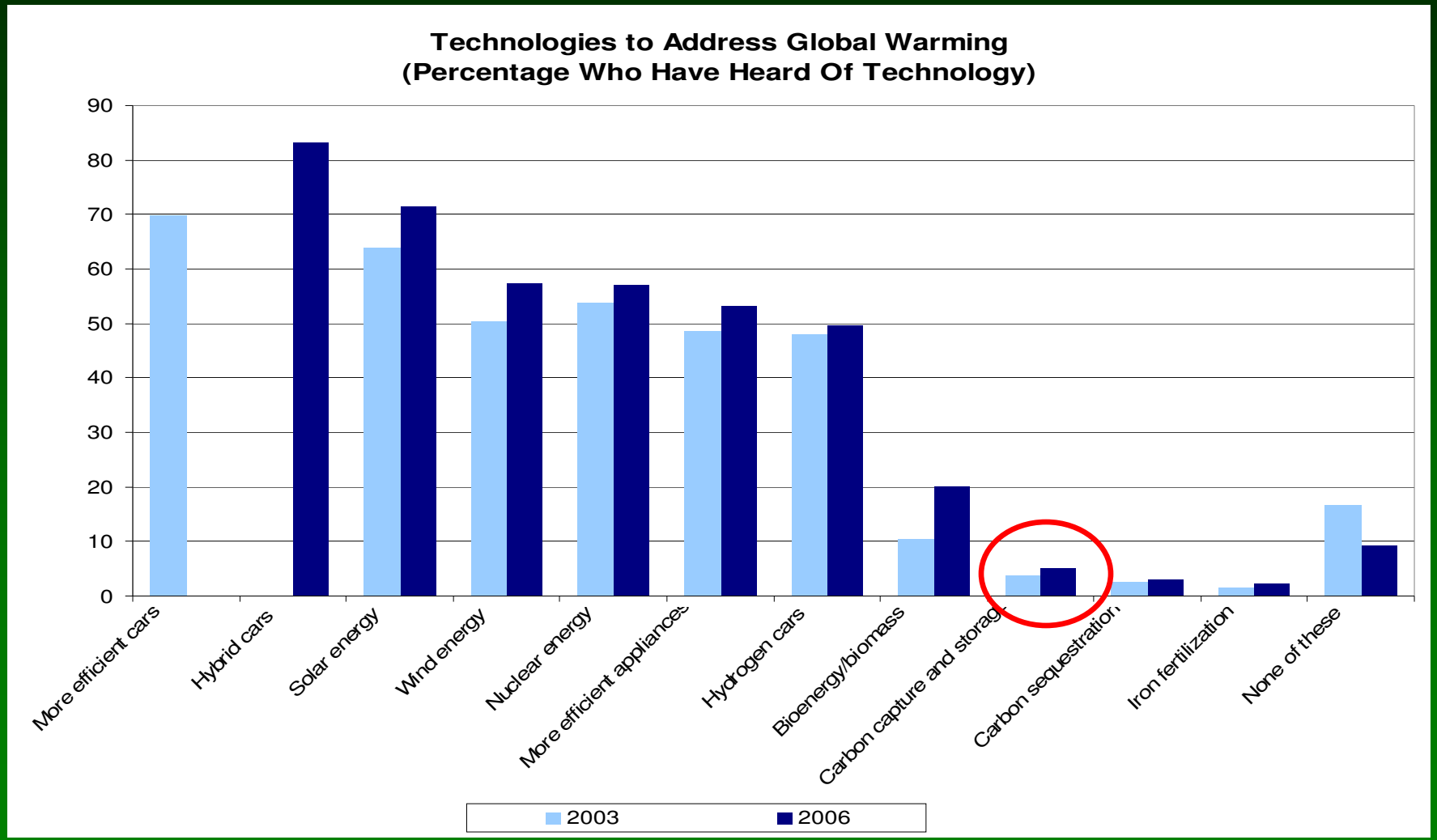
Sweden



Japan

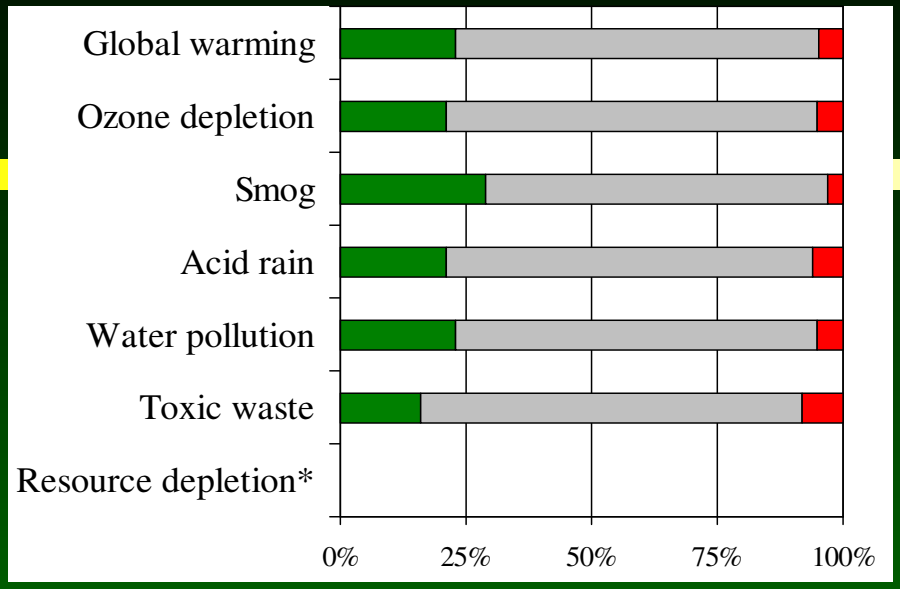


Shifts over Time? US 2003-2006



Can CCS Reduce These Environmental Concerns?

US



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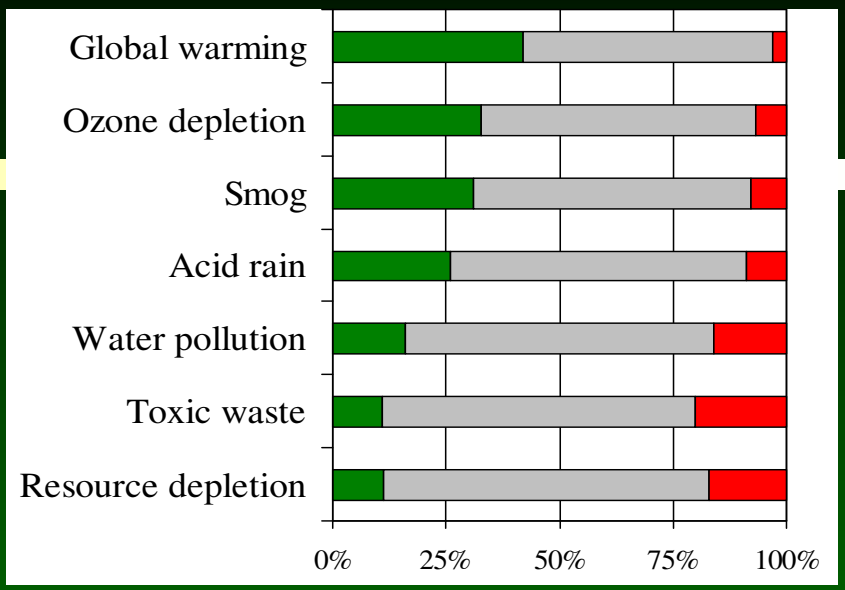
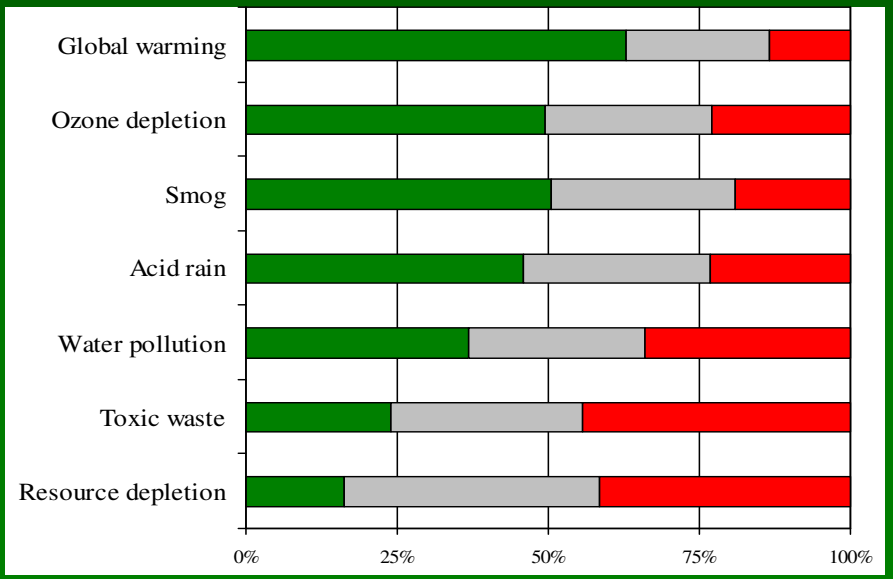
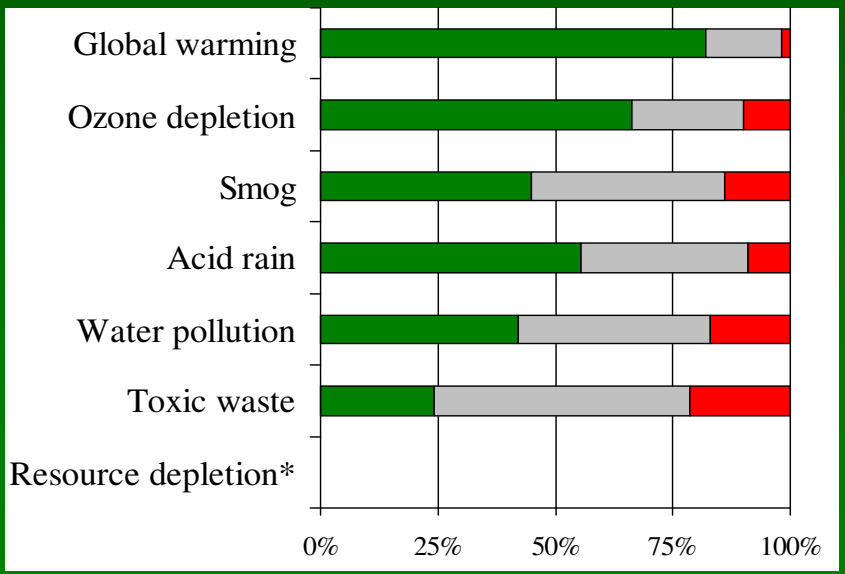


Sweden

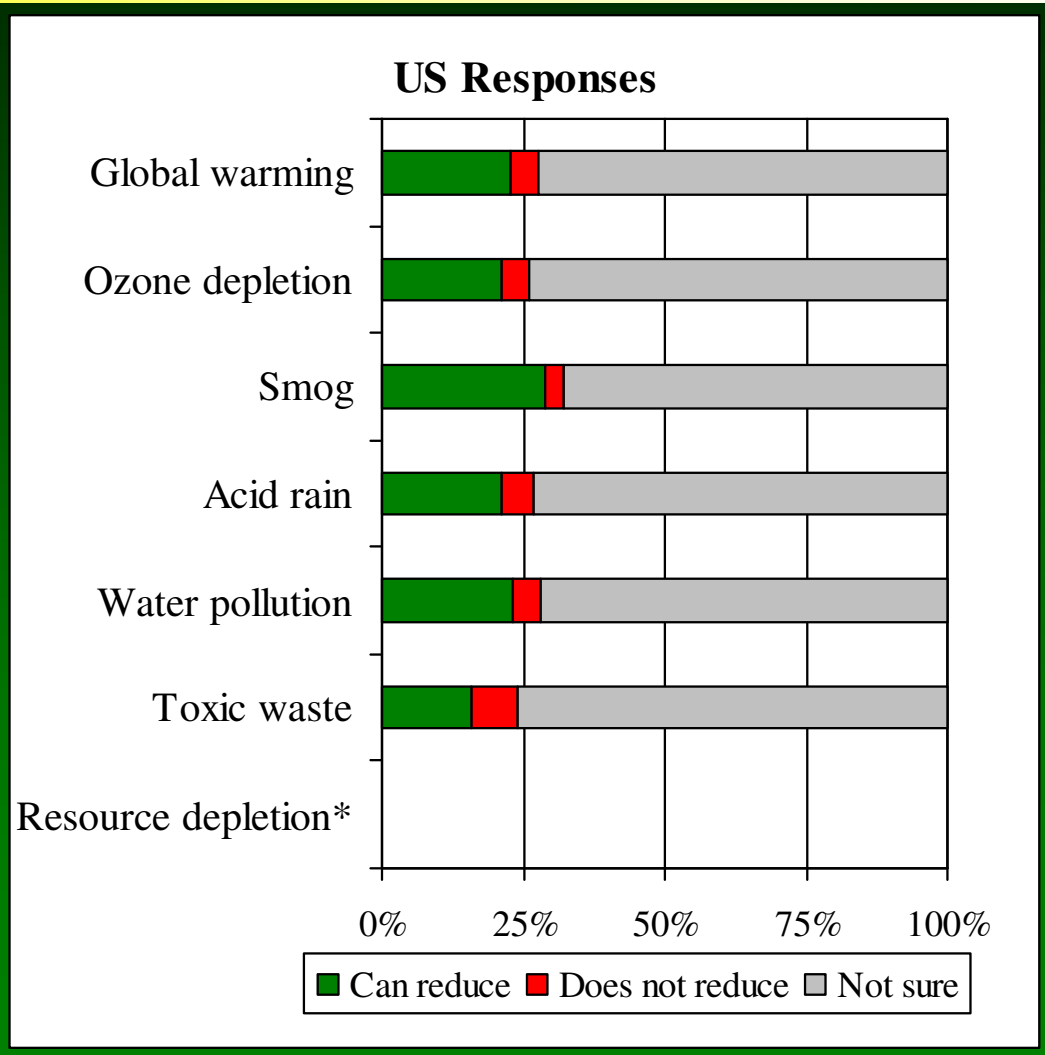


Japan

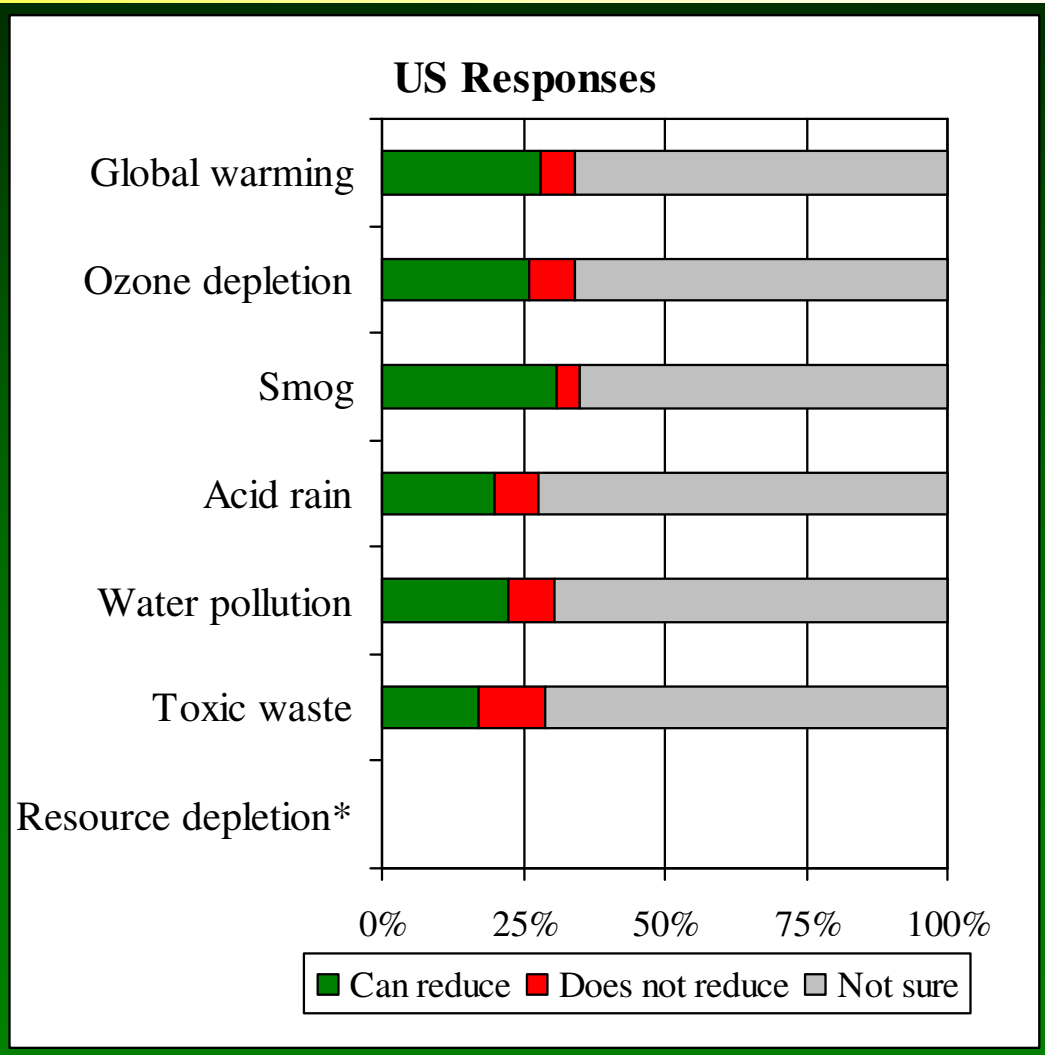


Can reduce | Not sure | Does not reduce

Can CCS Reduce These Environmental Concerns? 2003 Results for US

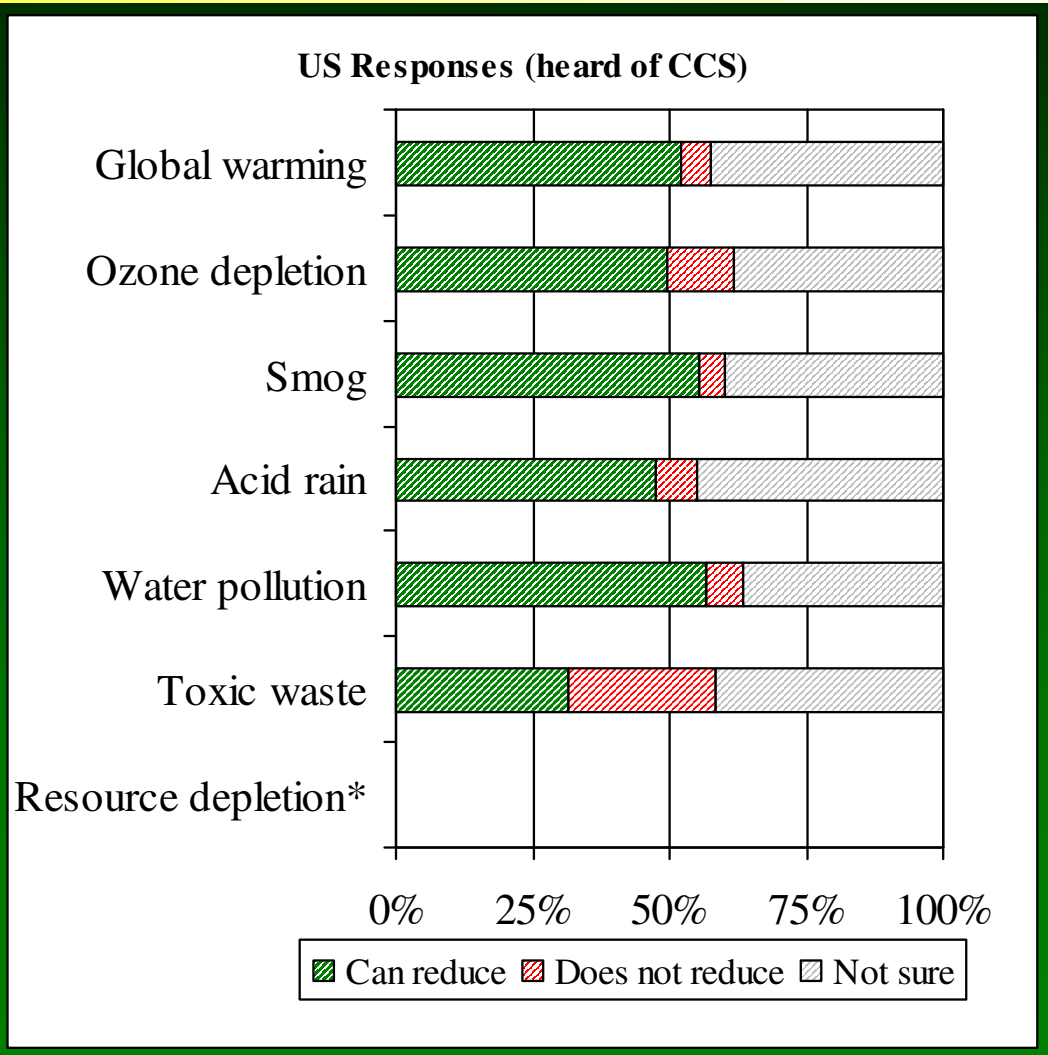


Can CCS Reduce These Environmental Concerns? 2006 Results for US

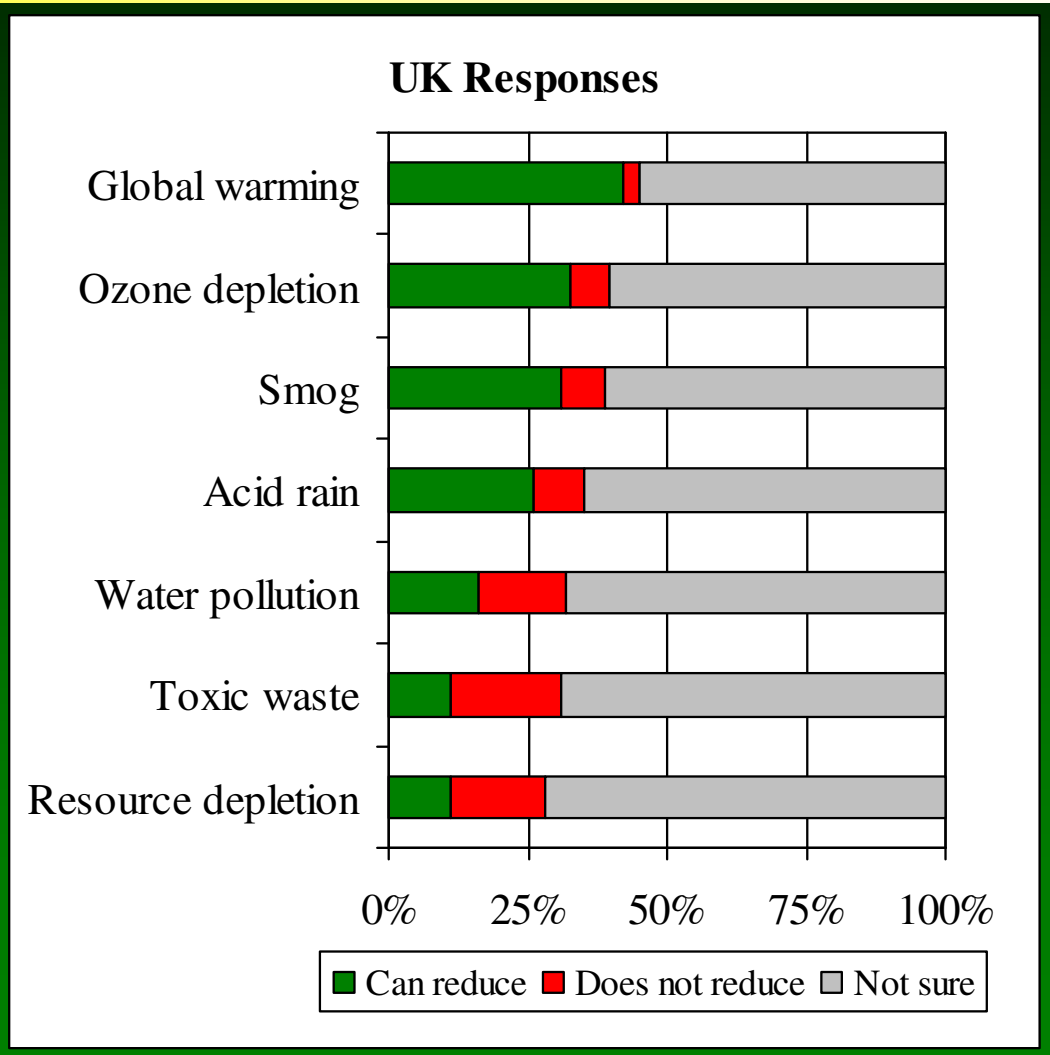


For respondents who have heard of CCS:

Can CCS Reduce These Environmental Concerns?



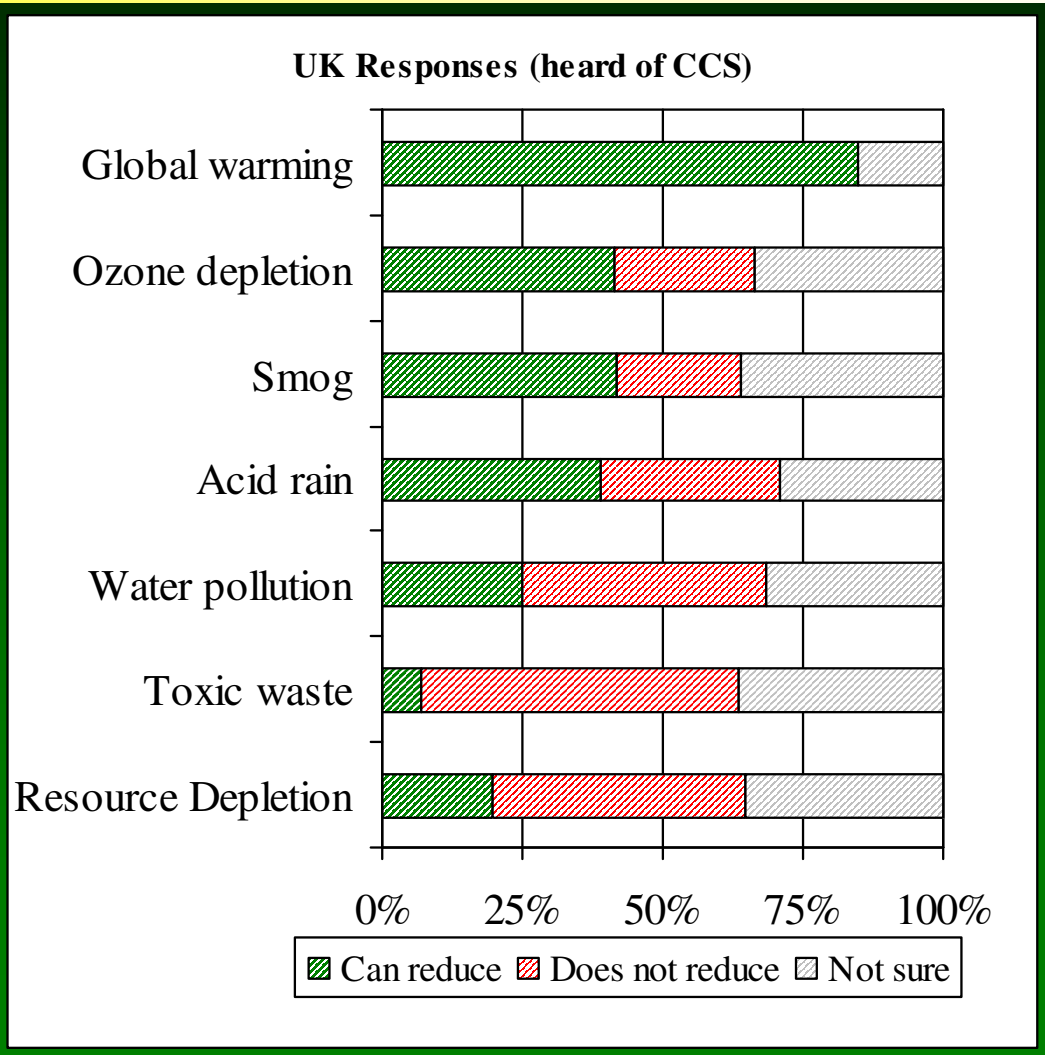
Can CCS Reduce These Environmental Concerns? UK Results



* Resource Depletion not included in the US Survey

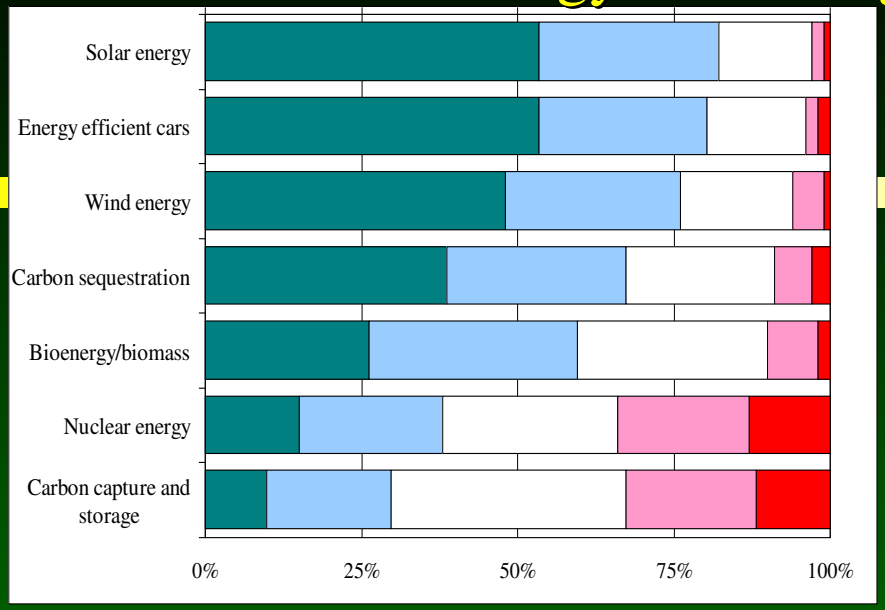
For respondents who have heard of CCS:

Can CCS Reduce These Environmental Concerns?



Preferred Energy Technology to Address Global Warming

US



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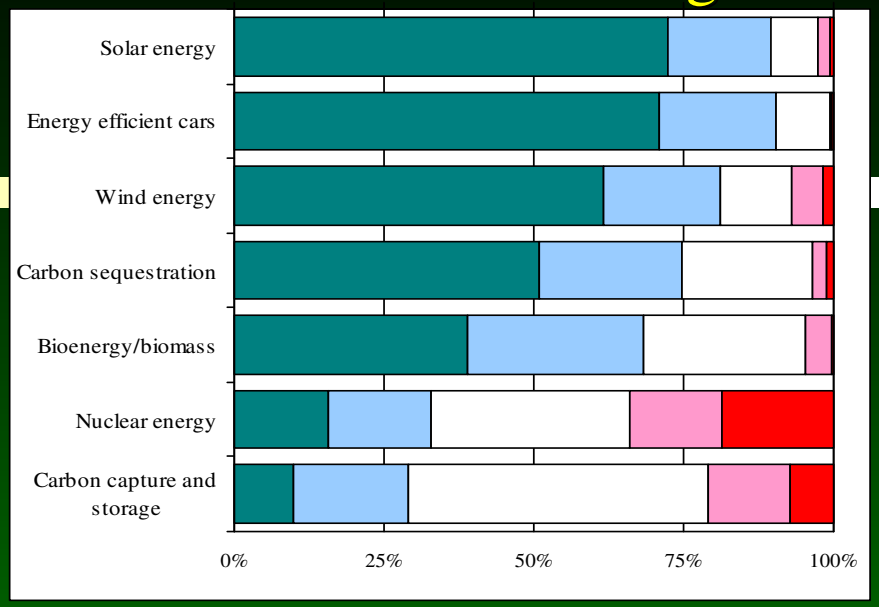

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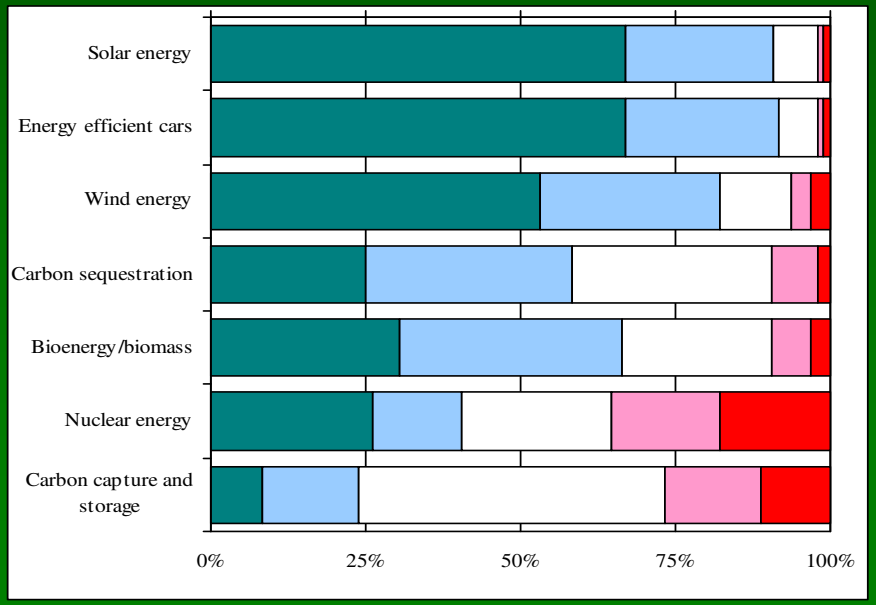
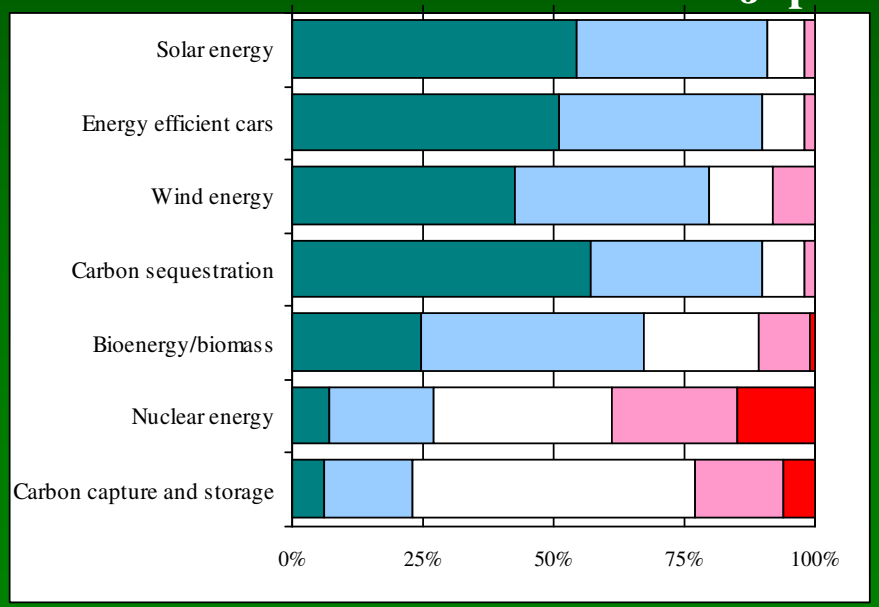
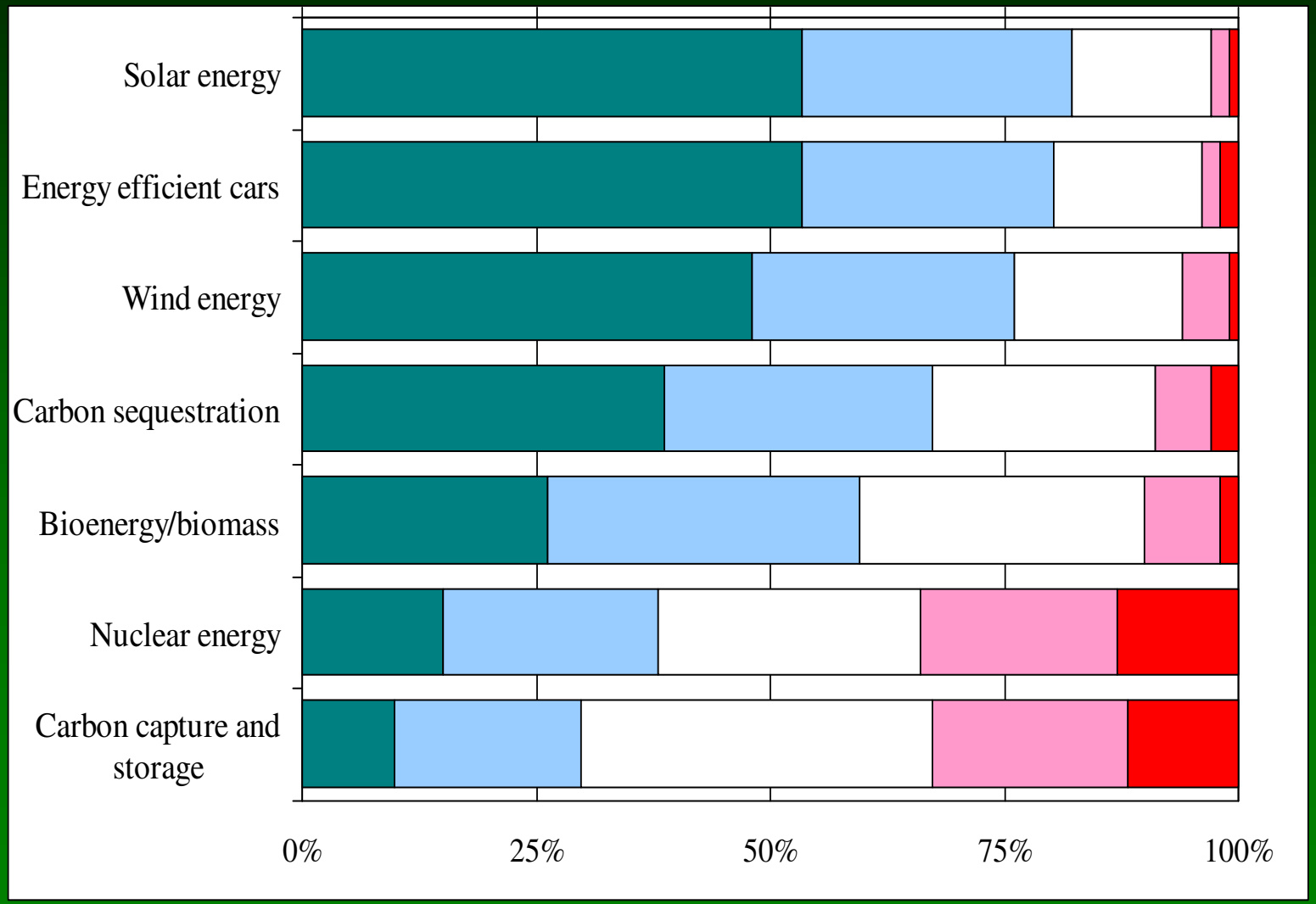


Japan

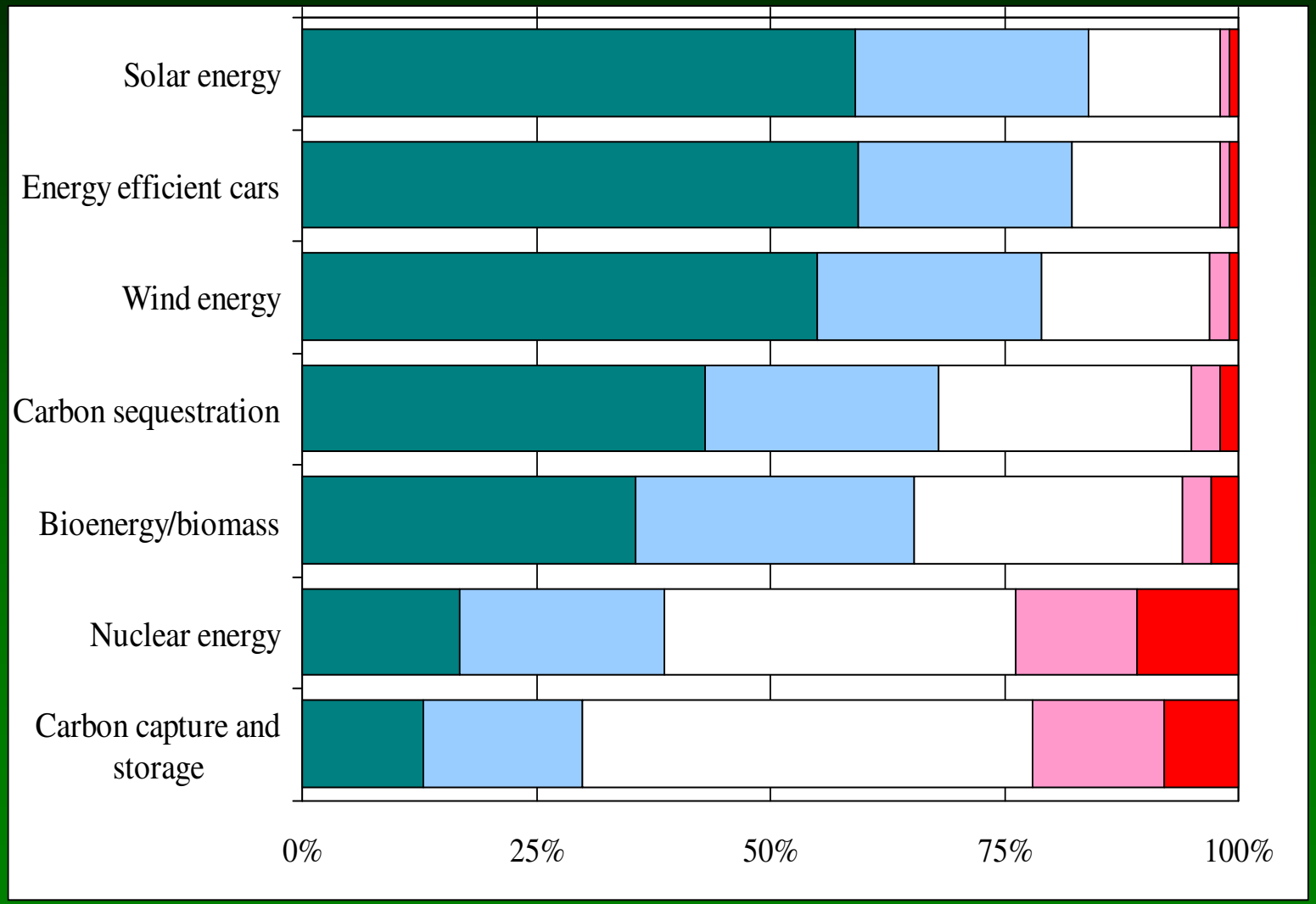


Definitely use | Probably use | Not sure | Probably not use | Definitely not use

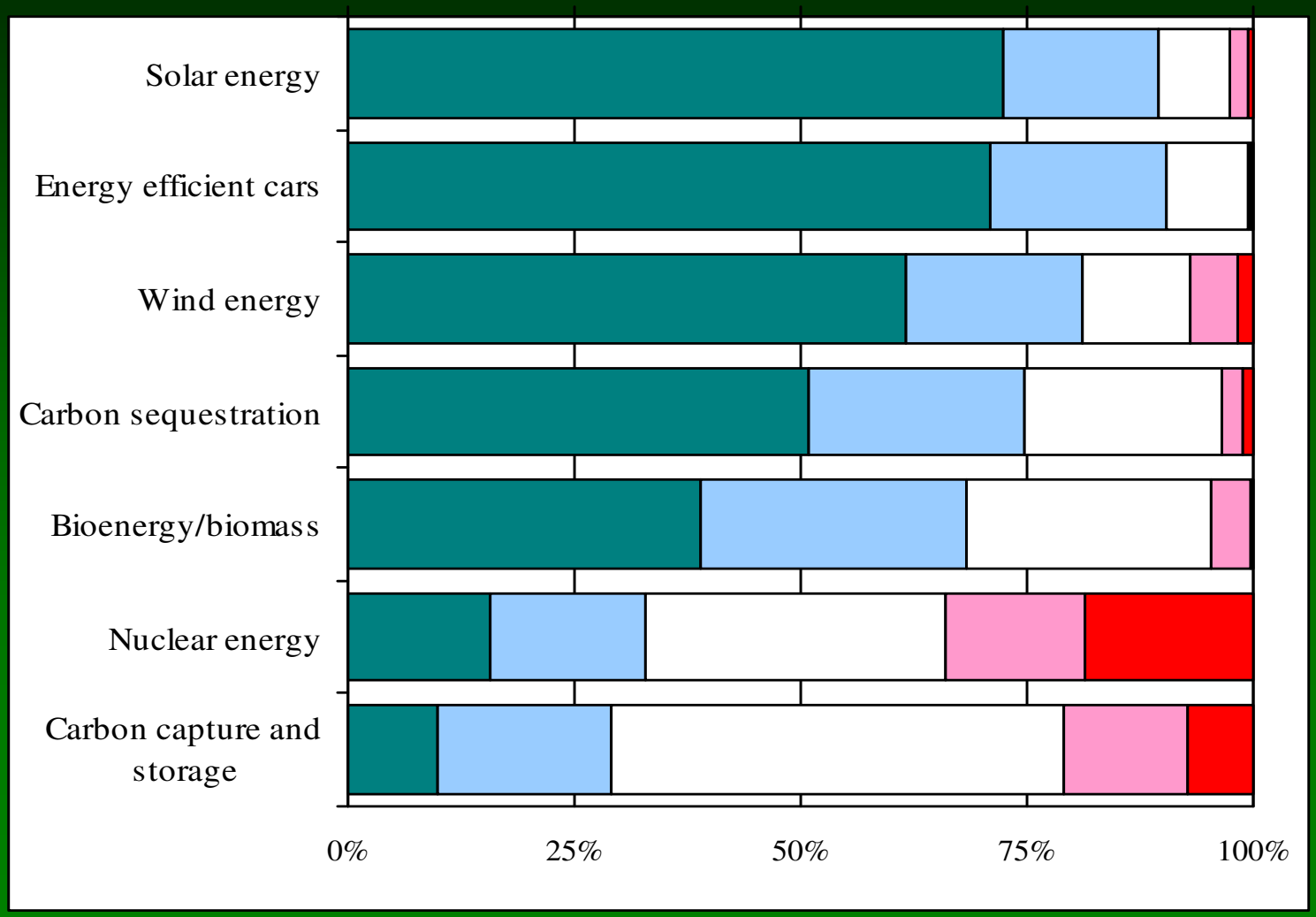
Any recent shifts over time? US 2003



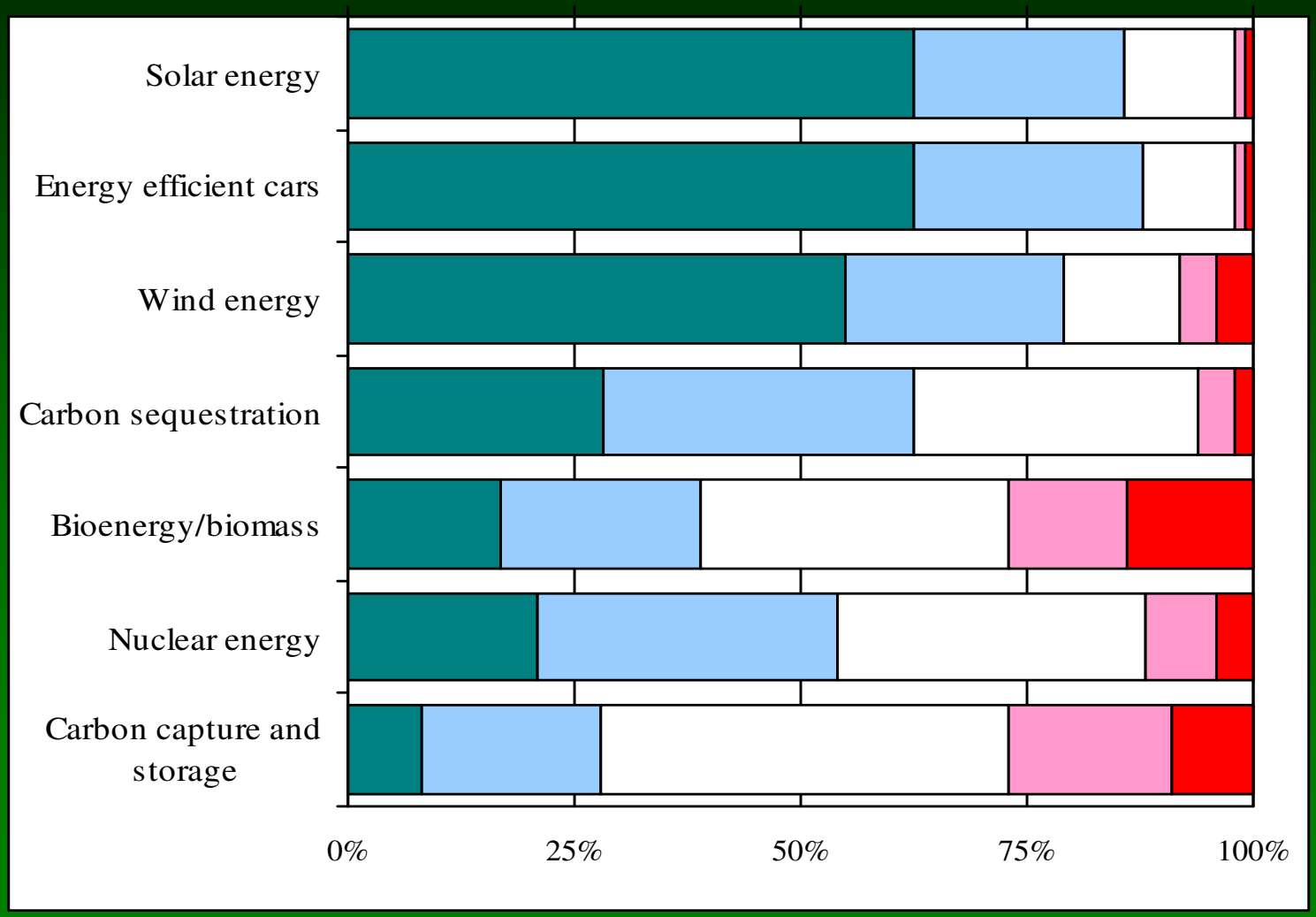
Any recent shifts over time? US 2006



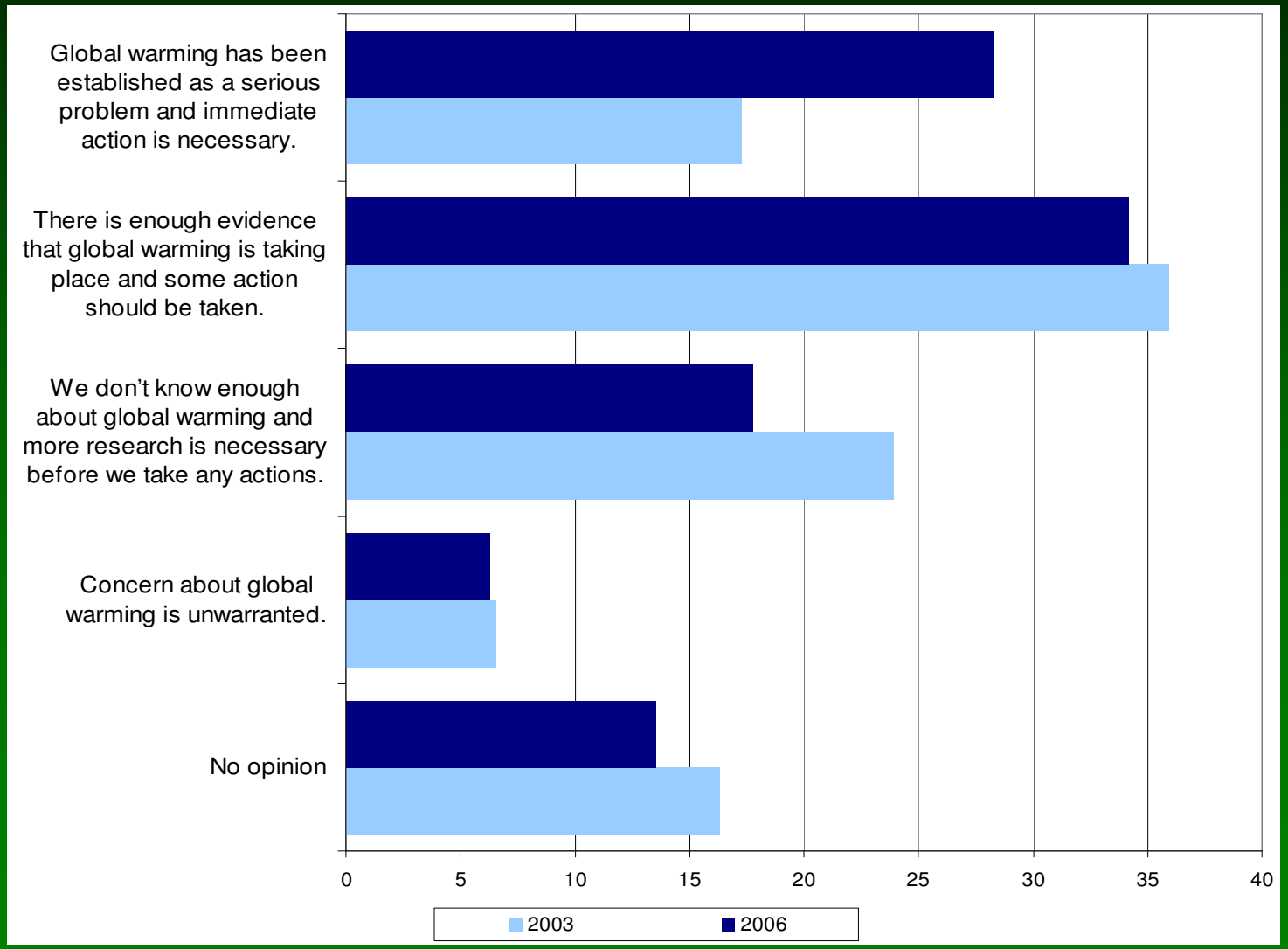
Any recent shifts over time? UK 2004



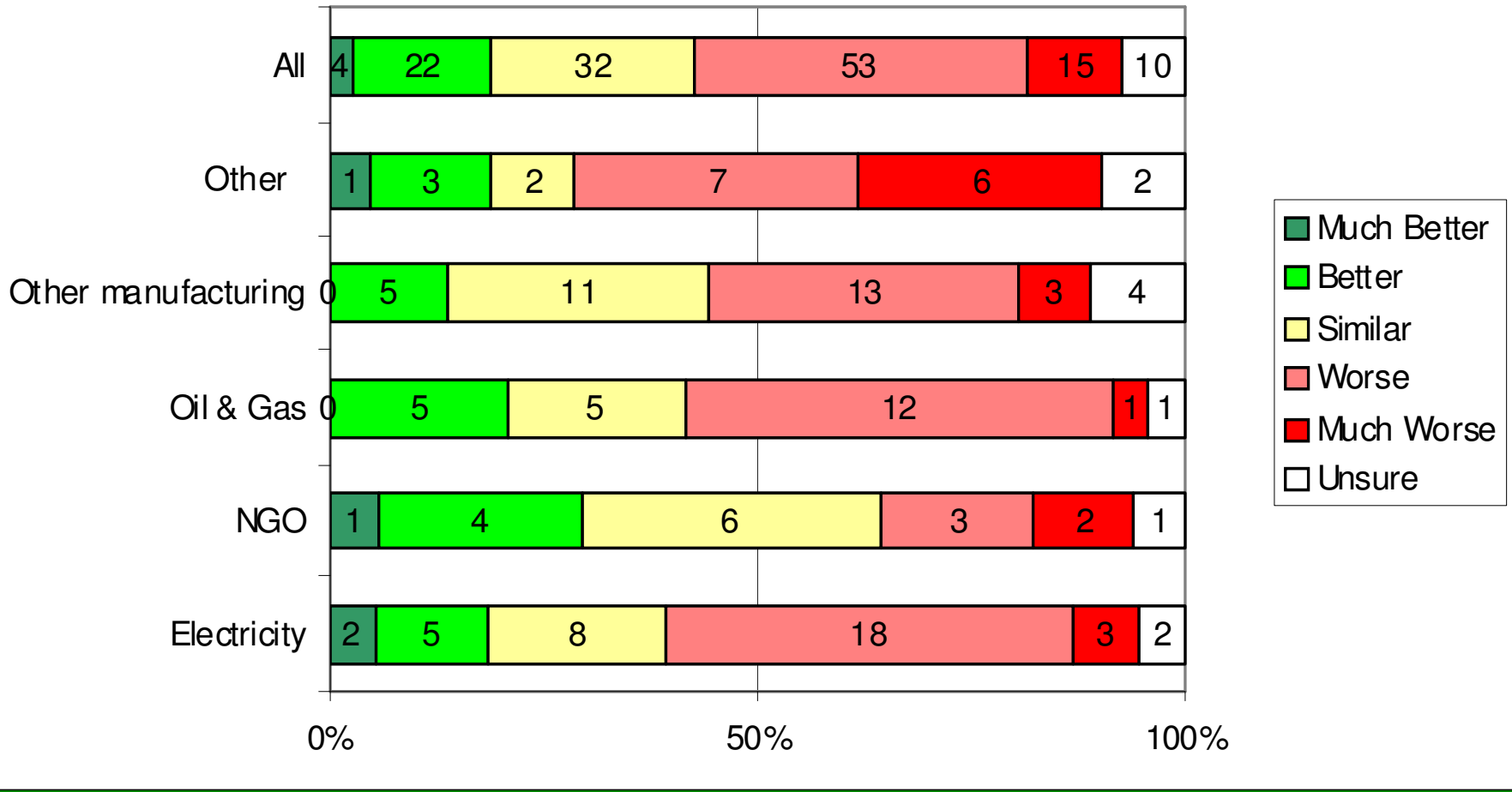
Any recent shifts over time? UK 2006



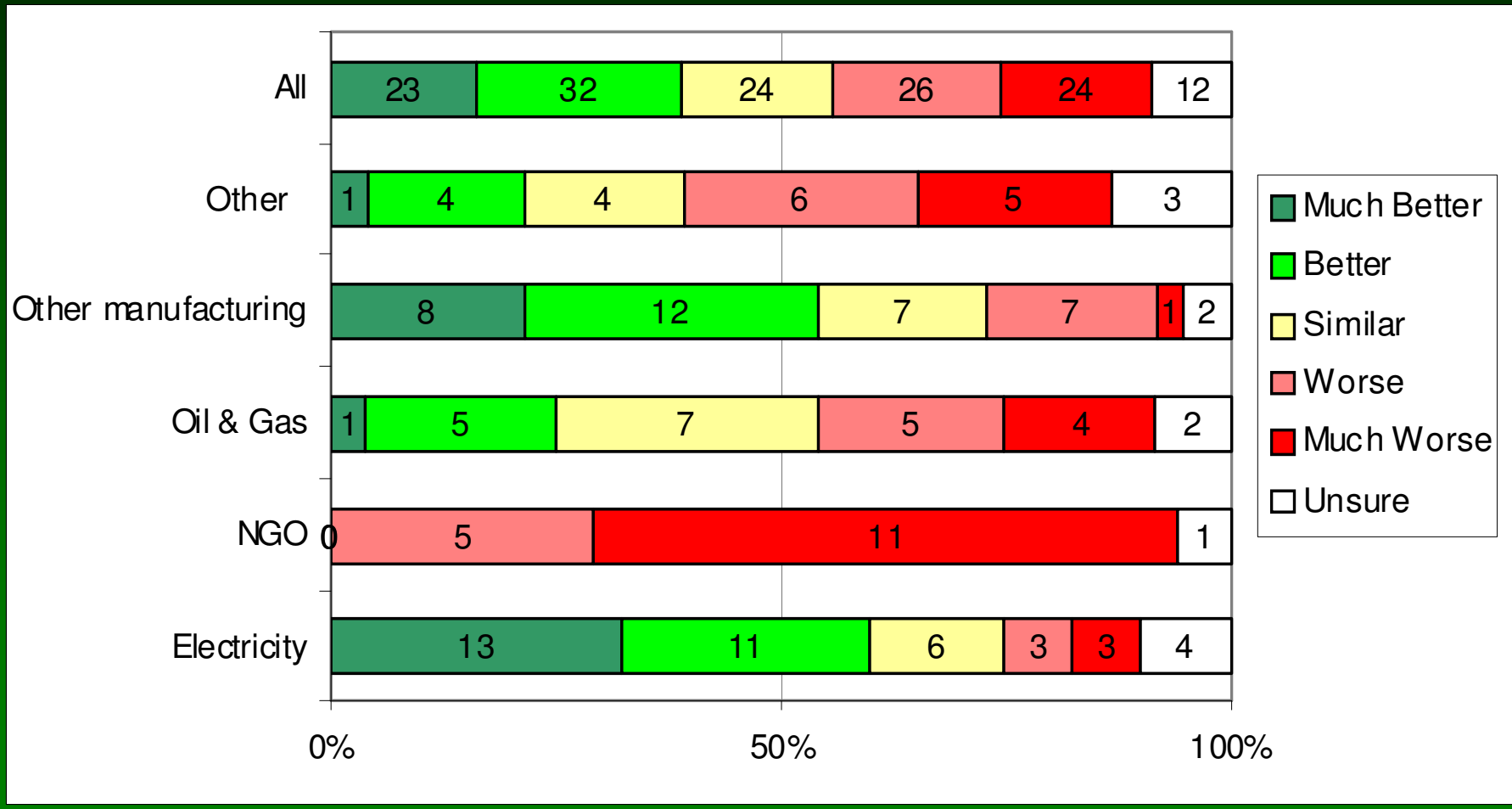
What has changed?: What Should Be Done to Address Global Warming



Compared with CCS… Natural Gas is:



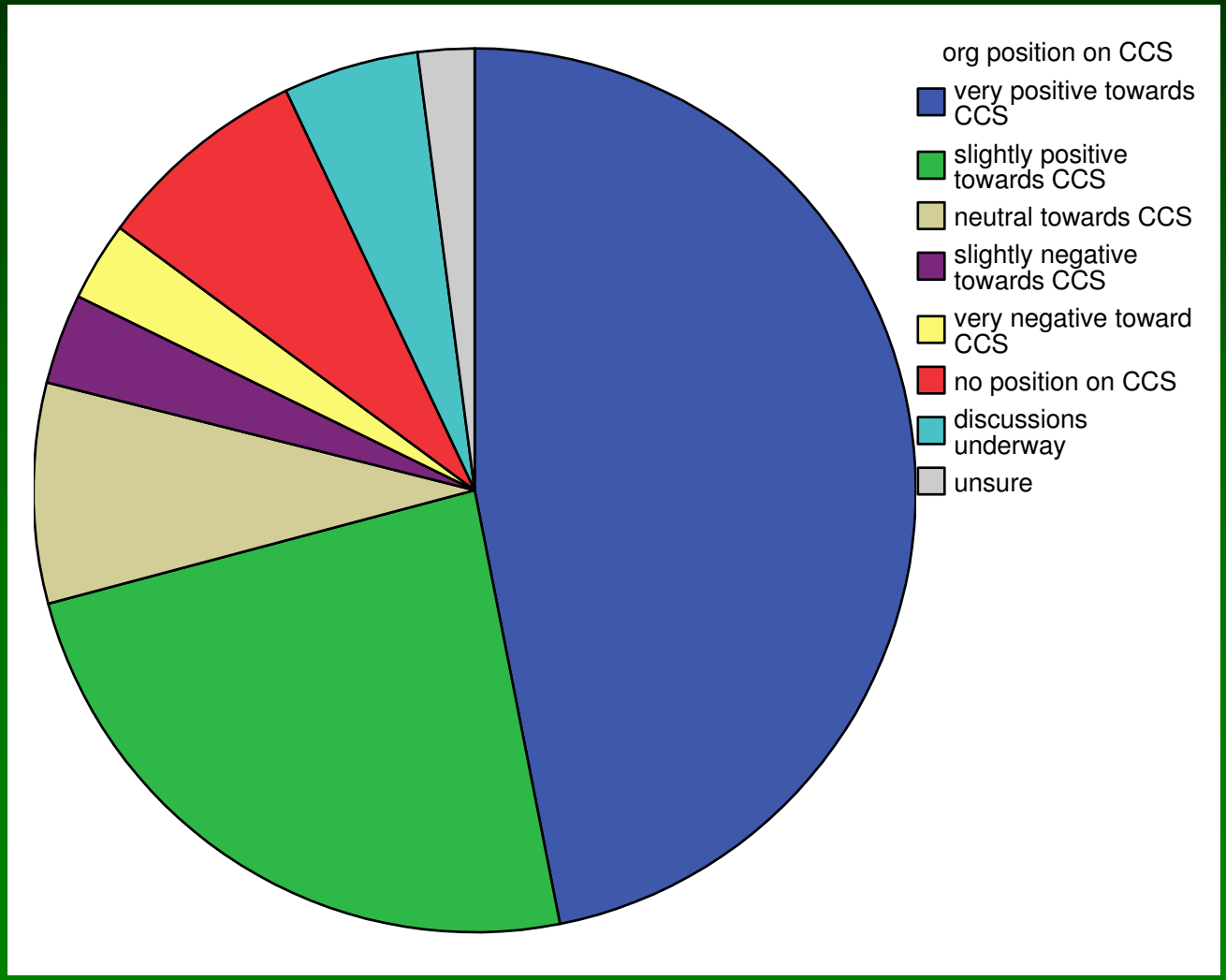
Compared with CCS…
Nuclear Power is:



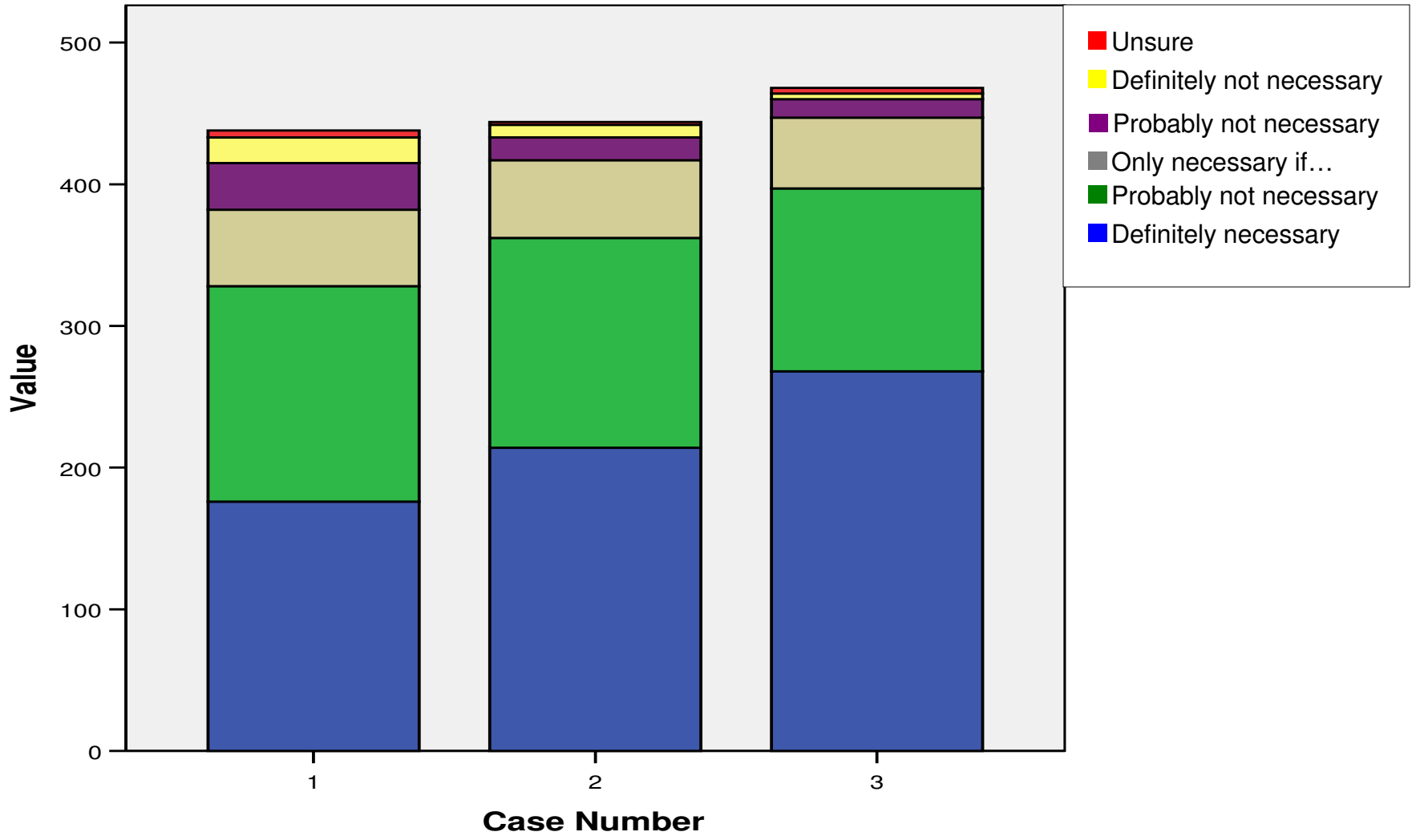
ACCSEPT Project

- Pan-EU stakeholder survey
  - 512 responses: industry (28%), research (34%) government (13%), NGOs (5%) and national and European parliamentarians (4%) in EU-25
  - UK (20%), Germany (11%), Netherlands (9%), France (6%), Italy (6%), Denmark (5%), Spain (5%) and Norway (5%)
  - Translated into 17 languages (funding from Shell)

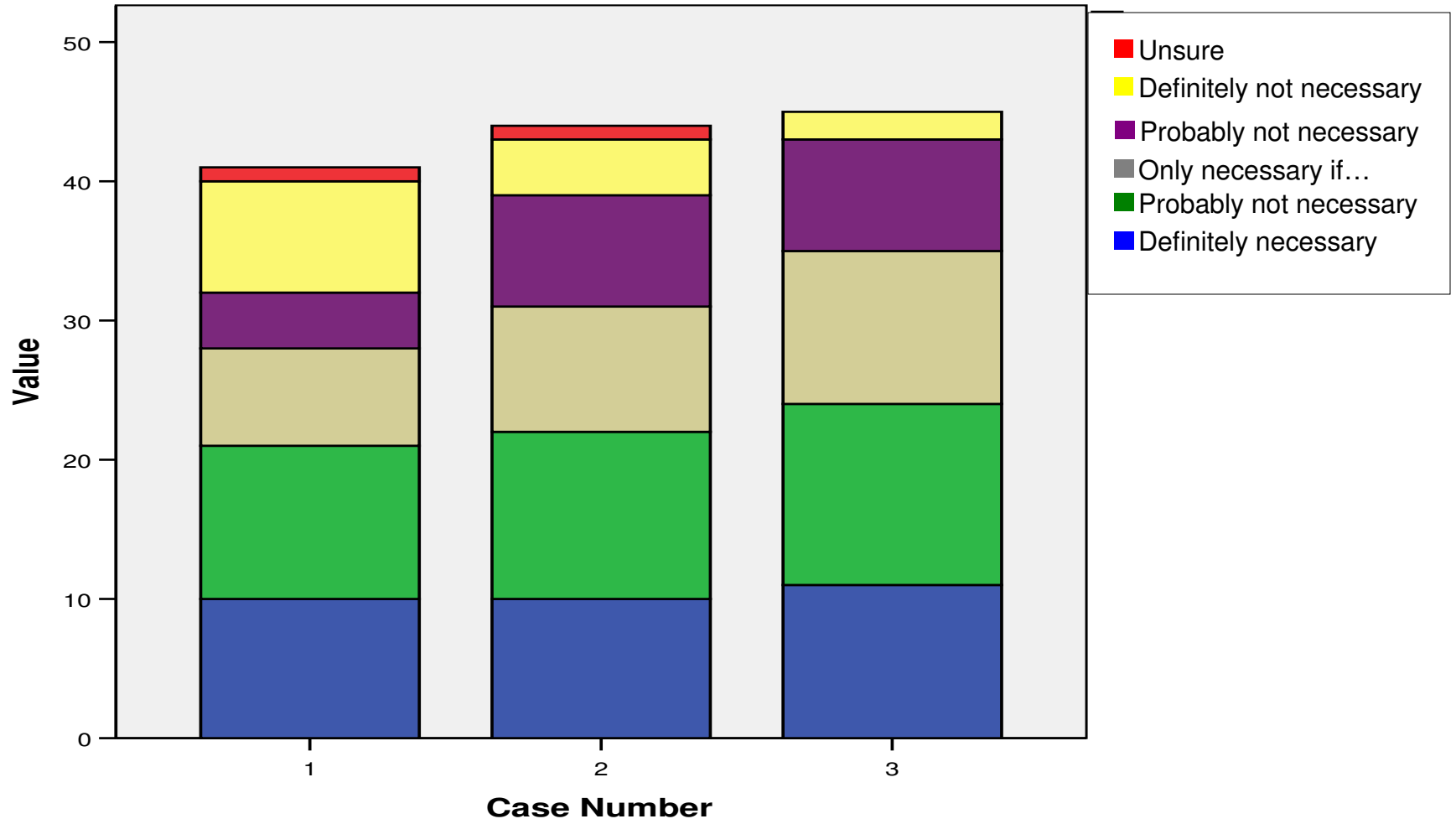
Organizational position on CCS



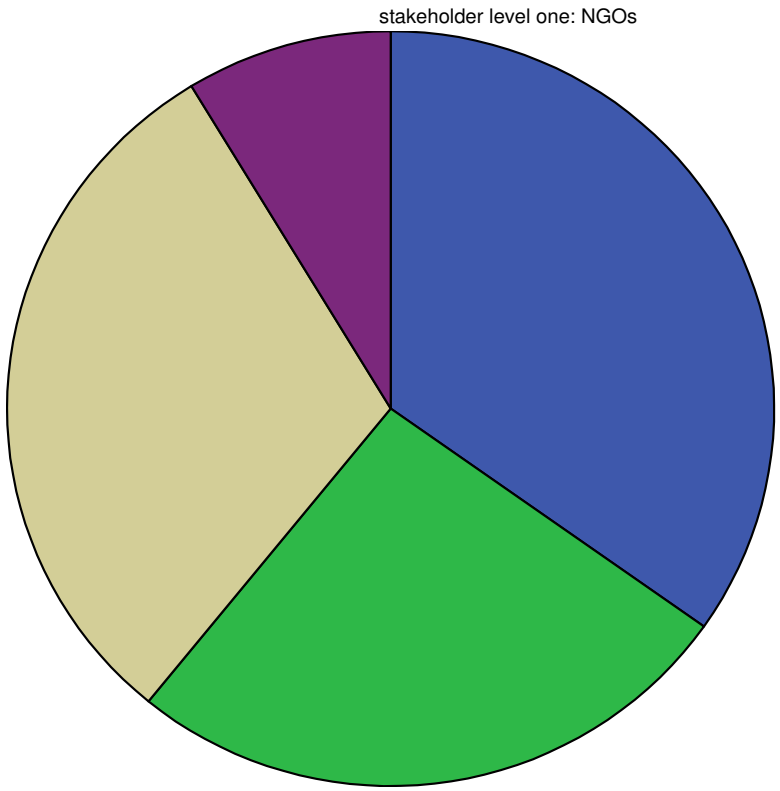
Perceived need for CCS in: (1) own country, (2) EU and (3) globally

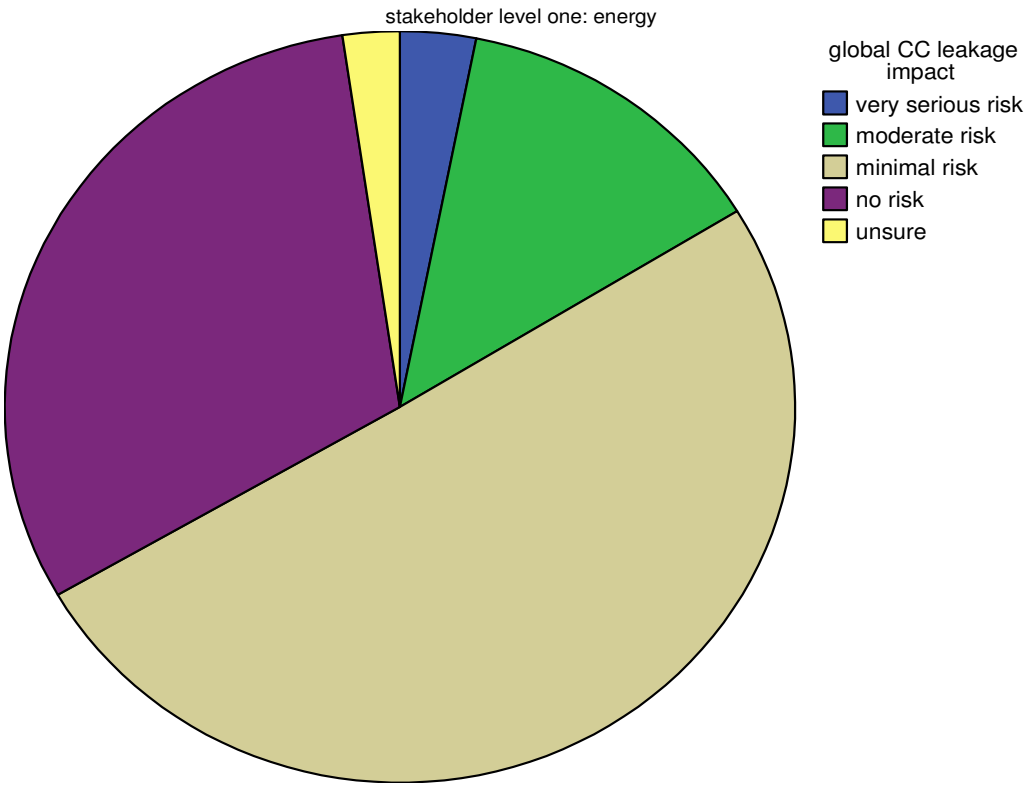


Perceived need for CCS by NGOs and parliamentarians in: (1) own country, (2) EU and (3) globally



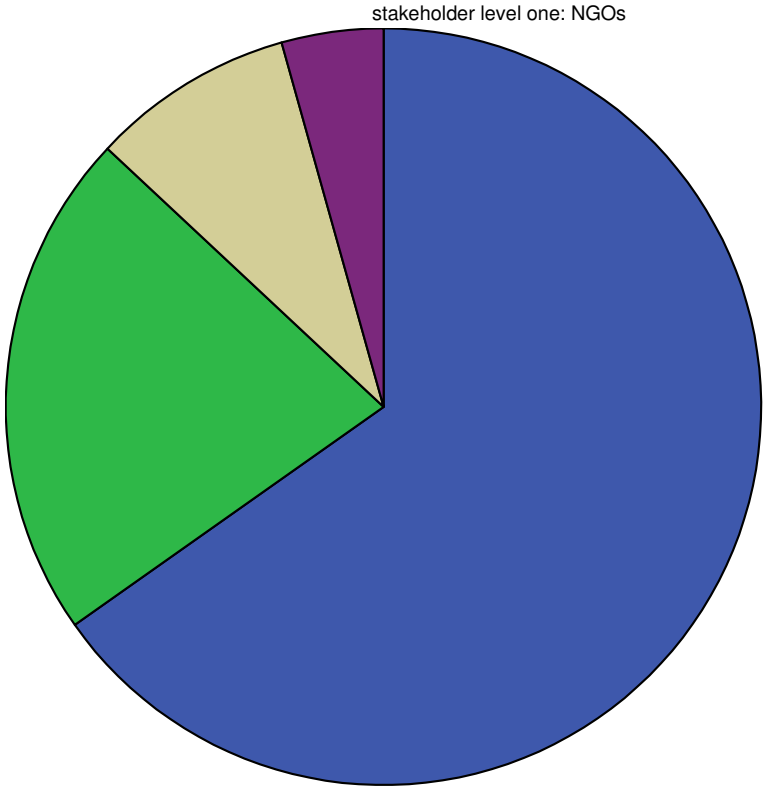
Risks associated with global impacts of leakage: NGOs (left), energy industry (right)

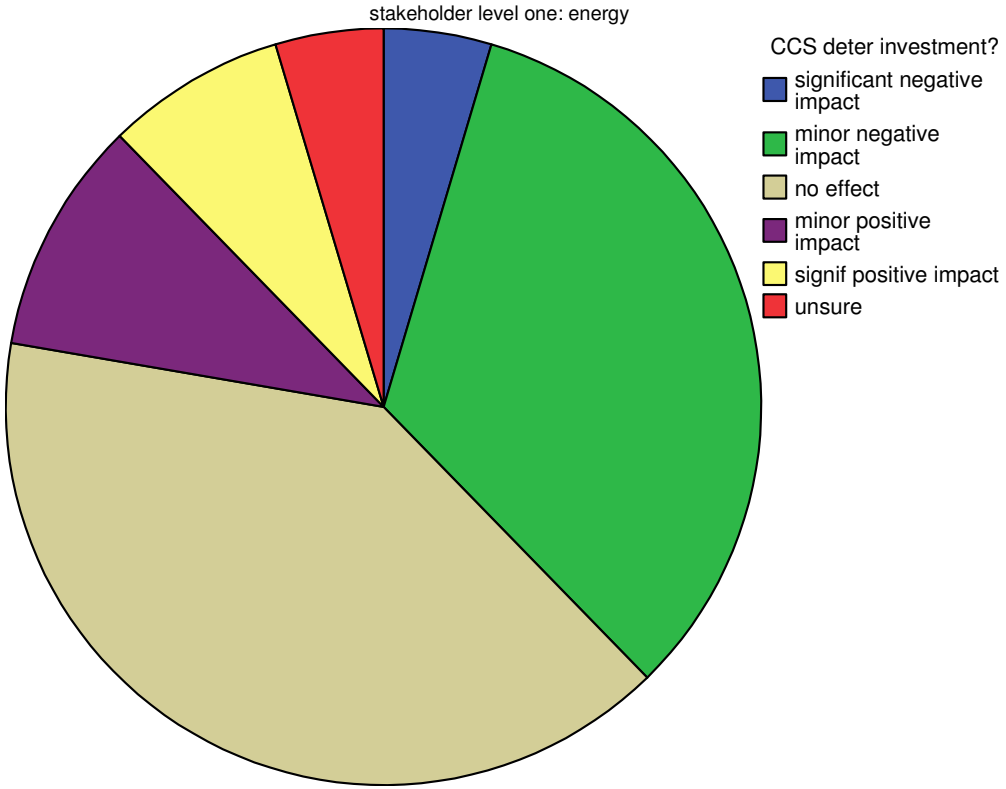




Sixth Framework Programme

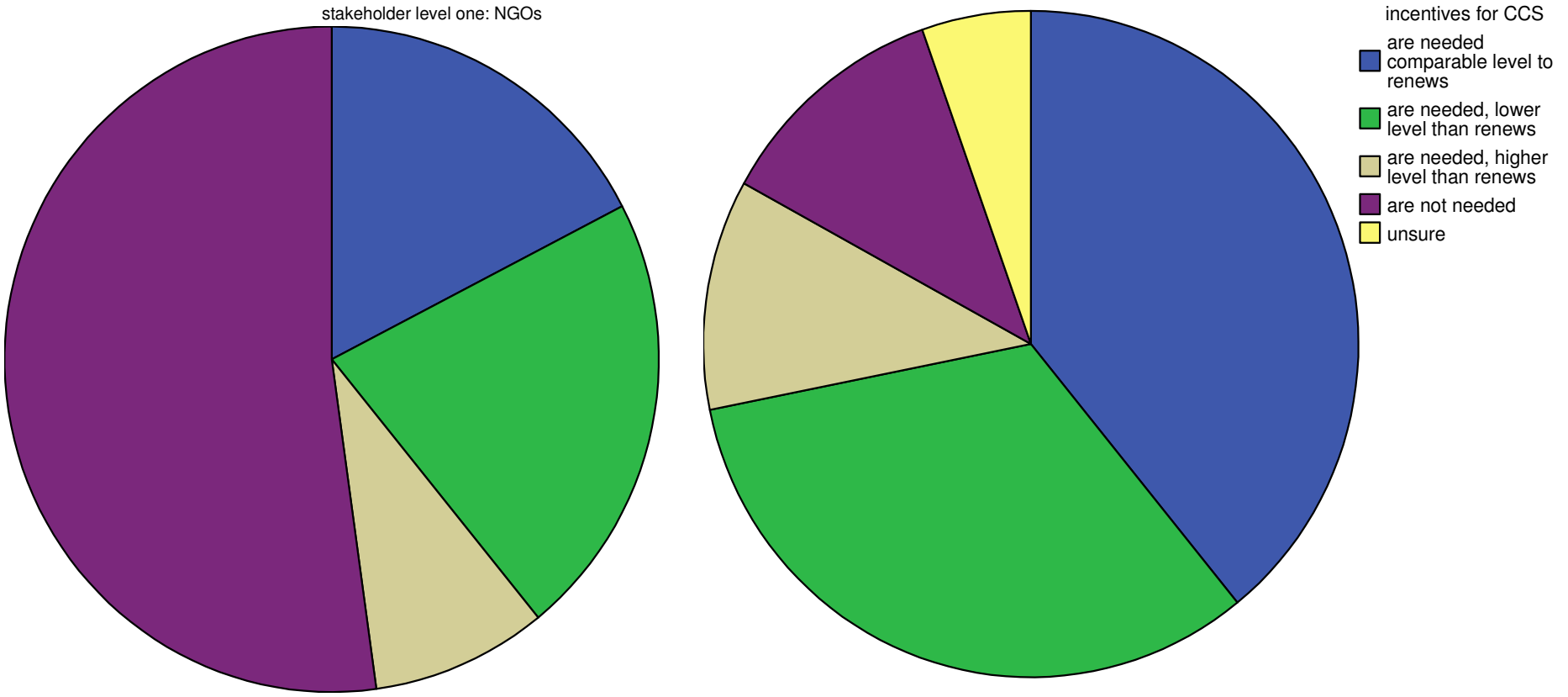
Impact of CCS on investment in other LZCTs in own country: NGOs (left), energy industry (right)





Sixth Framework Programme

Stakeholder views on provision of financial incentives for CCS: NGOs (left), overall (right)



Sixth Framework Programme

CO_2 Capture Project

IEA WPFF CCS Communications Strategy

Objectives

- Establish a stakeholder contact database
- Develop a prioritised assessment of public perceptions and potential concerns
- Conclusions and recommendations on strategies to address the above concerns based on the most appropriate and effective approaches to dialogue and education

Project Structure

Project Management - Iain Wright
Australia and New Zealand – Peta Ashworth
China –Sun Xin, Li Di, Zhu Yizhong and Xi Liang
Europe – Jason Anderson
India – Simon Shackley/TERI
Japan – Kenshi Itaoka
North America – Sarah Wade
South Africa – Joe Asamoah
Regional Coordination – David Reiner

Funded by: UK Department of Trade and Industry

U.S. Department Of Energy
Norges forskningsråd
European Union

Stakeholders

- R, D & D community
- Industry
- Policy makers and regulators
- ENGO's
- General Public

Prioritised CCS Issues

1. Cost of deployment
2. Scale of deployment
3. Perceived risks (to local health and safety)
4. Lack of accessible information
5. Supporting policies
6. Adequacy of regulatory frameworks to address the perceived risks

Prioritisation by Issue

Traffic Lights

- Presents a snapshot of the concerns for each region

	Not currently driving opinion
	Positive driver of opinion
	Has potential to be a negative driver of opinion
	Negative driver of opinion
*	Strong difference of opinion w/in stakeholder group

Cross-National Comparison: NGOs

	NA	ANZ	EUR	China	SA	Japan	India
1. Cost of Deployment	*						
2. Scale of Deployment	*						
3. Information / Communication							
Importance of broader energy context							
Access to information							
Information fit for purpose/useful to stakeholders							
Are efforts to communicate adequate							

Common Findings

- Different issues in regions depending on stage of development of CCS
- Not enough information in developing countries
- Quality of information needs to be improved and made "fit for purpose"
- Need to ramp up efforts for communicating CCS
- More effective to discuss CCS in broader context of climate change
- Concerns about leakage across all regions
- Social risk to *not* communicating about the technology

Overall Conclusions

- Early indications show little change in *public* awareness or attitudes towards CCS in last 2-3 years
- Several efforts to document stakeholder concerns find notable differences in views of NGOs from other stakeholders
- To date, *ad hoc* and haphazard approach to assessment with little focus on the role of information and underlying concerns

Qualitative Responses of Stakeholders on Selected Topics

Recommendations

- Implement appropriate commercial incentives for industrial deployment
- Demonstrate comprehensive regulatory frameworks
- Implement industrial-scale demonstration projects
- Resolve long-term liability issues for geologically stored CO2
- Clarify the role of CCS within a portfolio of solutions to climate change
- Increase education efforts (media, policymakers)
- Exploit opportunities for international collaboration

Public Outreach

- Public doesn't know anything about it – have an enormous public education challenge. If done right then can allay concerns, but must be done sensitively
- If environmentalists line up behind it, would get media and public support -- In coal states like Pennsylvania people love them [clean coal plants]. Demonstrating the future for coal mining [is] viewed favorably by [both the] public and elected officials.
- Doing homework for a public debate which hasn't started yet

Credible Sources?

- Academic community needs to be more involved in public outreach on both climate change and CCS – difficult for firms to address public acceptability – depends on government and scientists willingness to convey the gravity of the problem
- Cynical and skeptical [about social acceptability]– only people you hear talking about it are utilities and the [Bush] Administration […] Don't trust electric utilities and if they are the spokesman, I am not optimistic.

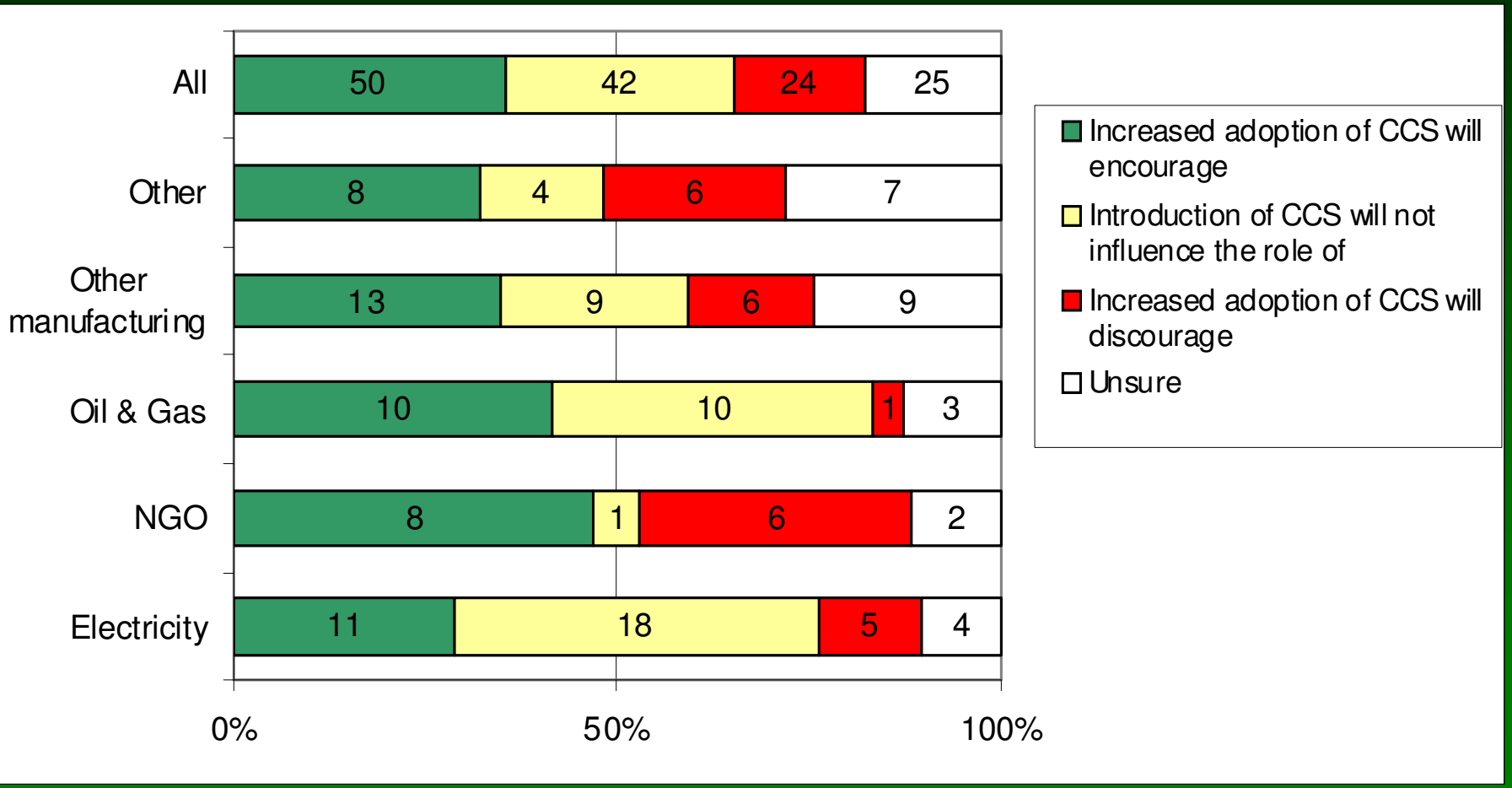
Government support

- [The problem with CCS is that] lots of utilities are looking for subsidies and if CCS remains as cost intensive it encourages government subsidies
- need confidence in reliability and that [should be the role of] private investment (BP, Statoil, etc) – the big fear is that government will divert significant resources to CCS
- Major concern is public funding. At moment, [CCS is] connected with impacts on other mitigation options. Funds should come primarily from private actors

Competition with Renewables

- Answered that increased use of CCS will encourage renewables and discourage nuclear energy, but those are "hopeful answers"
- One criticism of CCS is that it withdraws funds from R&D on renewables so negative, but what might be positive is a possible double dividend of combining CCS with biomass, which would have a negative CO_2 balance.
- Quite apart from CO_2 emissions prefer renewables because of structural issues of control – renewables promise more decentralized access over longer term

Effect of CCS on… Renewables



Effect of CCS on… Nuclear