

Overview

- **Processes for data collation**
- **Support for CCS**
- **Knowledge of CCS**
- **Perceived benefits**
- **Concerns & questions**
- **Conclusions**

Processes for data collection

1. Large group engagement process

- n=329
- QLD (2), WA, VIC, SA

2. Roadmap of communication activities around CCS

3. International survey

- USA, Sweden, UK, Spain, Japan, Australia

Overview of the day

- **Welcome**
- **Introductions**
- **Pre-workshop questionnaire**
- **Digi-vote: Round 1**
- **Awareness, state of play**
- **MORNING TEA**
- **Presentation: Climate Change**
- **Reactions and points of clarification**
- **Presentation: Energy technologies**
- **Reactions and points of clarification**
- **LUNCH**
- **Deliberation**
- **AFTERNOON TEA**
- **Concerns and key messages**
- **Post-workshop questionnaire**
- **Digi-vote: Round 2**
- **About Energymark**
- **Wrap-up**



Processes for data collection

1. Large group engagement process

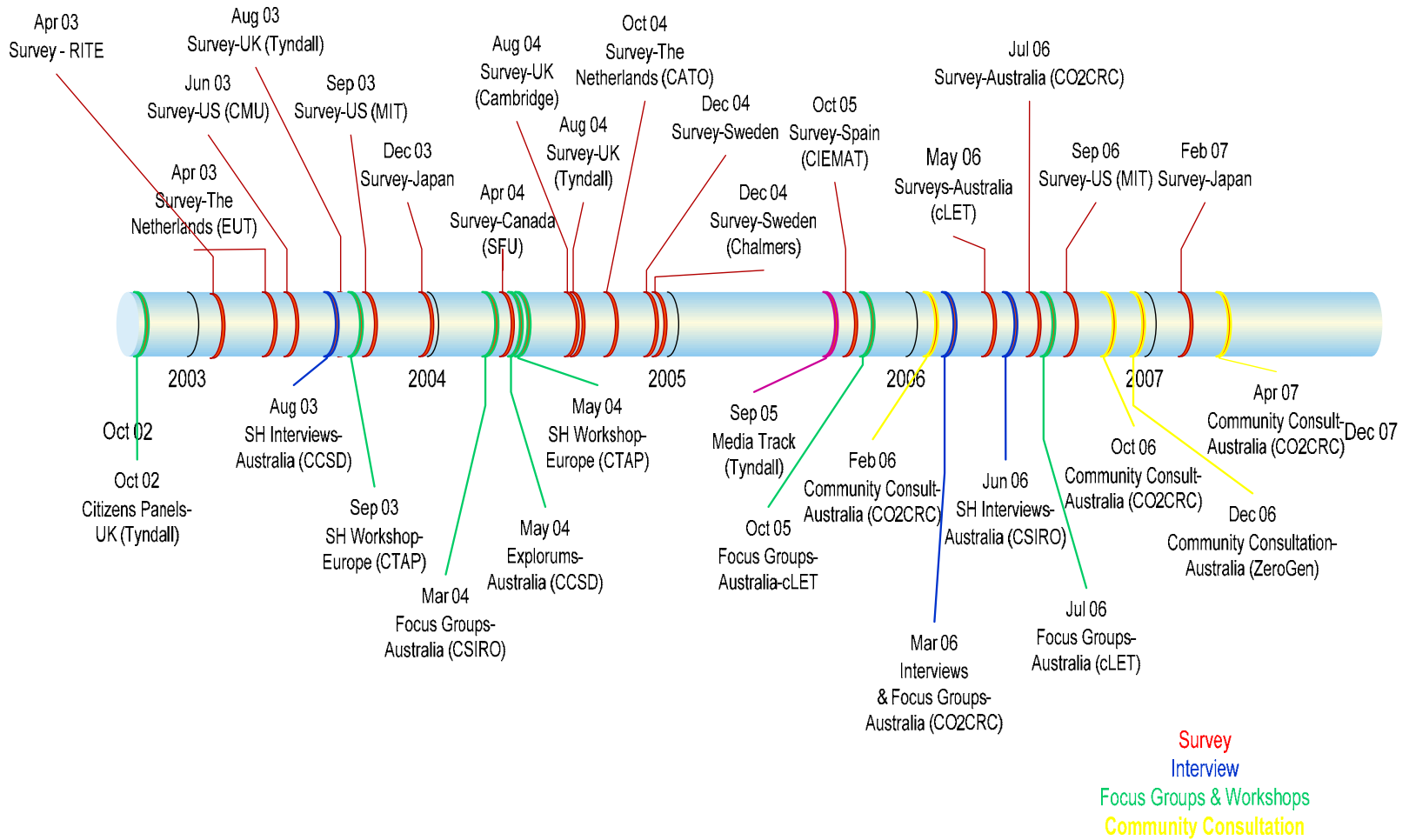
- n=329
- QLD (2), WA, VIC, SA

2. Roadmap of communication activities around CCS

3. International survey

- USA, Sweden, UK, Spain, Japan, Australia

Timeline of CCS communication 2002 - 2007



Processes for data collection

1. Large group engagement process

- n=329
- QLD (2), WA, VIC, SA

2. Roadmap of communication activities around CCS

3. International survey

- USA, Sweden, UK, Spain, Japan, Australia

Support for the range of energy technologies

Note: Significant changes between before and after at $p < 0.05$ are underlined

| | Feb 2008, Youth | | Mar 2008, QLD | | Jun 2008, VIC | | Nov 2008, WA | | Feb 2009, SA | |
|------------|-----------------|------------|---------------|-------|---------------|------------|--------------|------------|--------------|------------|
| | Before | After | Before | After | Before | After | Before | After | Before | After |
| Biofuels | <u>4.0</u> | <u>3.5</u> | 4.9 | 5.0 | <u>4.4</u> | <u>4.9</u> | <u>4.6</u> | <u>5.1</u> | <u>4.9</u> | <u>5.2</u> |
| CCS | 3.8 | 4.4 | 4.1 | 4.4 | <u>4.2</u> | <u>5.0</u> | 4.4 | 4.6 | <u>4.7</u> | <u>5.6</u> |
| Coal | 2.1 | 2.2 | 2.9 | 3.2 | 3.3 | 3.8 | 3.2 | 3.5 | <u>3.2</u> | <u>3.7</u> |
| Geothermal | 5.8 | 5.6 | 5.4 | 5.5 | 5.1 | 5.1 | 5.3 | 5.0 | <u>5.7</u> | <u>6.1</u> |
| Hydro | <u>5.2</u> | <u>4.8</u> | 5.3 | 5.2 | 5.0 | 5.3 | <u>5.8</u> | <u>5.1</u> | <u>5.5</u> | <u>5.2</u> |
| Nat. Gas | 4.5 | 4.5 | 4.8 | 4.8 | 5.0 | 5.0 | 4.7 | 4.6 | 5.1 | 5.1 |
| Nuclear | 3.3 | 3.4 | 2.9 | 2.9 | <u>3.1</u> | <u>3.8</u> | <u>4.2</u> | <u>4.6</u> | 3.8 | 3.9 |
| Oil | 2.9 | 2.5 | 3.3 | 3.2 | 3.4 | 3.4 | 3.3 | 3.5 | <u>3.2</u> | <u>3.6</u> |
| Solar | 6.8 | 6.7 | 6.5 | 6.6 | 6.6 | 6.7 | 6.7 | 6.8 | 6.7 | 6.6 |
| Wave/tidal | 5.7 | 5.5 | 5.8 | 5.7 | 5.3 | 5.6 | 5.6 | 5.9 | <u>5.8</u> | <u>4.2</u> |
| Wind | 6.2 | 6.1 | 6.2 | 6.3 | 6.1 | 6.3 | 6.3 | 6.4 | 6.3 | 6.5 |

Attitude to CCS (%)

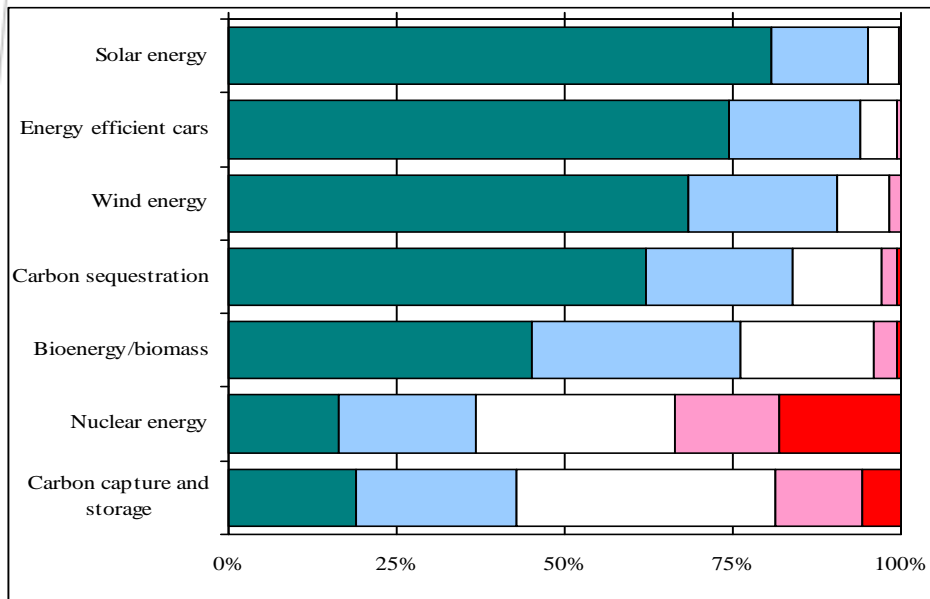
How strongly do you support the use of carbon dioxide capture and storage?

| | Feb, 2008 | | Mar, 2008 | | Jun, 2008 | | Nov, 2008 | | Feb, 2009 | |
|---------------------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
| | Youth | | Brisbane | | Melbourne | | Perth | | Adelaide | |
| | Before | After | Before | After | Before | After | Before | After | Before | After |
| Strongly disagree | 6.9 | 3.6 | 8.6 | 10.2 | 2.1 | 2.1 | 1.6 | 4.8 | 1.5 | 0.0 |
| Moderately disagree | 13.8 | 10.7 | 5.2 | 1.7 | 2.1 | 4.3 | 4.8 | 4.8 | 3.1 | 2.3 |
| Disagree | 0.0 | 14.3 | 6.9 | 5.1 | 14.9 | 4.3 | 1.6 | 6.5 | 5.3 | 3.8 |
| Unsure | 48.3 | 25.0 | 48.3 | 32.2 | 59.6 | 14.9 | 54.8 | 21.0 | 47.3 | 9.9 |
| Agree | 13.8 | 35.7 | 8.6 | 27.1 | 6.4 | 40.4 | 22.6 | 37.1 | 10.7 | 22.1 |
| Moderately agree | 13.8 | 7.1 | 17.2 | 13.6 | 8.5 | 19.1 | 9.7 | 17.7 | 13 | 38.2 |
| Strongly agree | 3.4 | 3.6 | 5.2 | 10.2 | 6.4 | 12.8 | 4.8 | 6.5 | 17.6 | 23.7 |
| Missing responses | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 | 0.0 | 1.6 | 1.5 | 0.0 |
| Total | 100 | 100 | 100 | 100.1 | 100 | 100 | 99.9 | 100 | 100 | 100 |

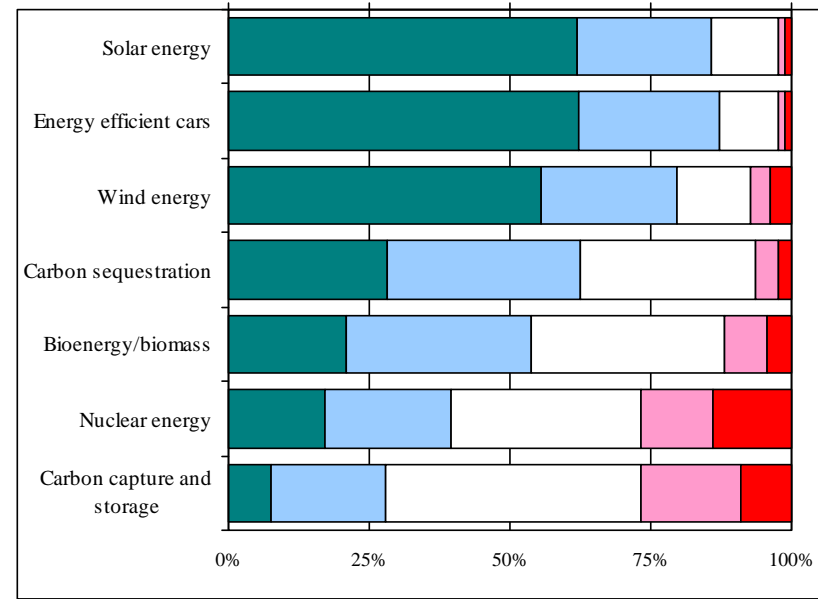
International comparison of public attitudes

Preferred energy technology to address global warming

Australia



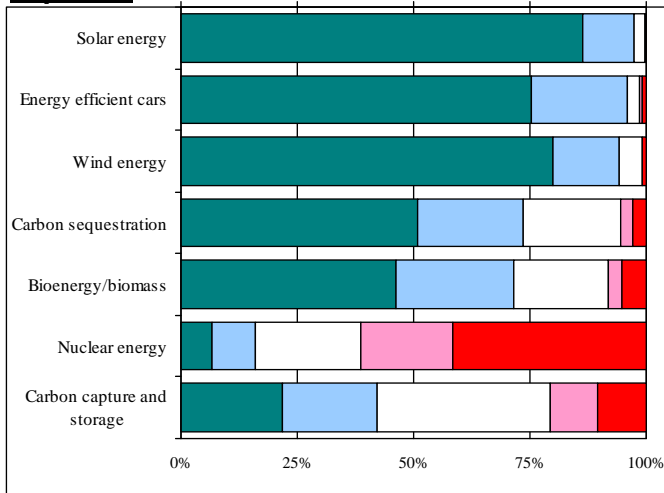
UK



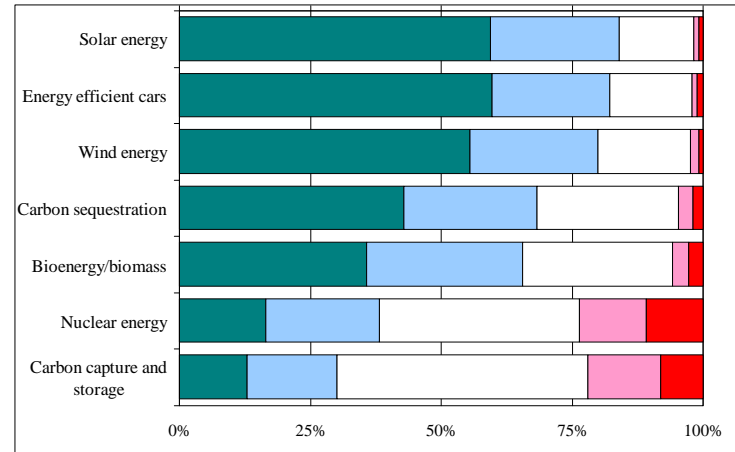
D. Reiner et al., (2007) *An international comparison of public attitudes towards carbon capture and storage technologies*. GHGT-8

International comparison of public attitudes

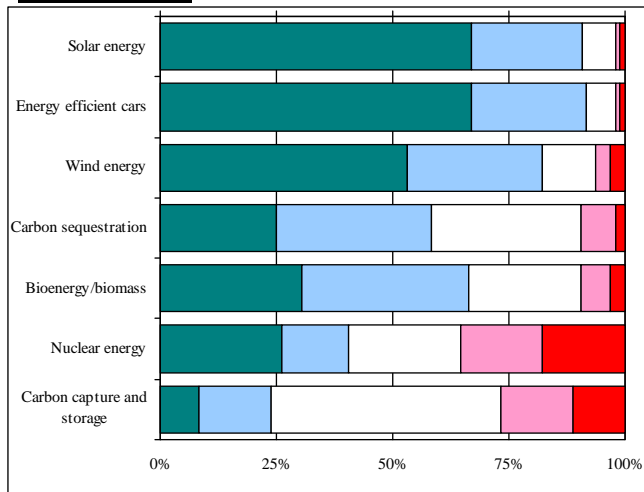
Spain



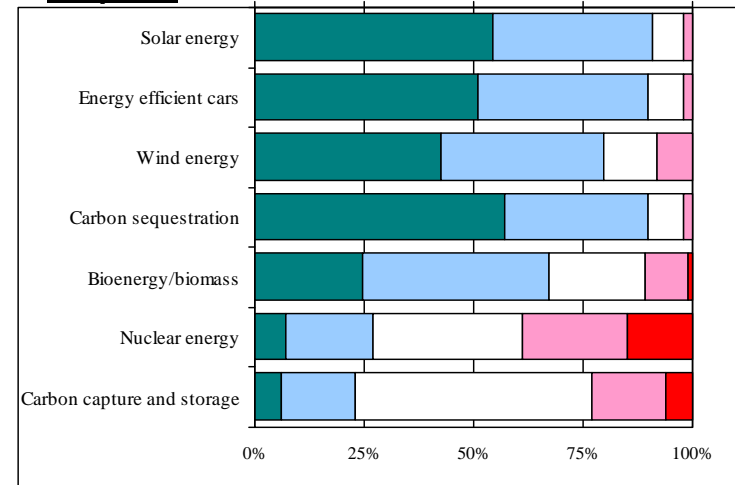
US



Sweden



Japan



Knowledge of energy technologies

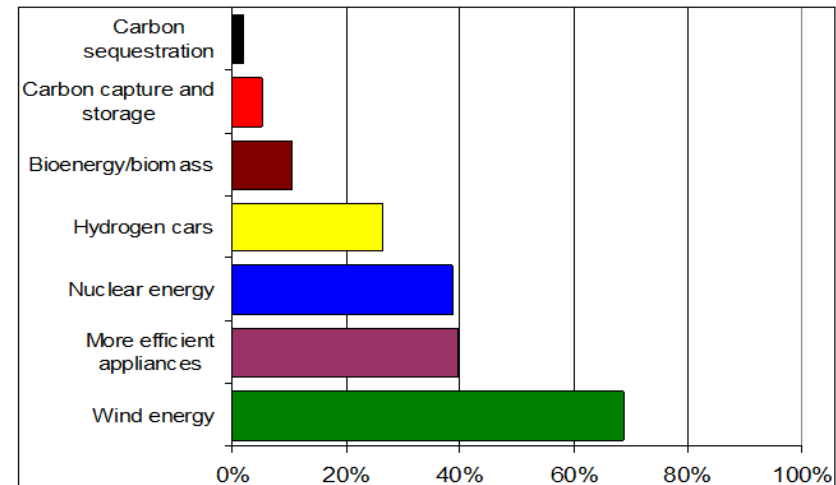
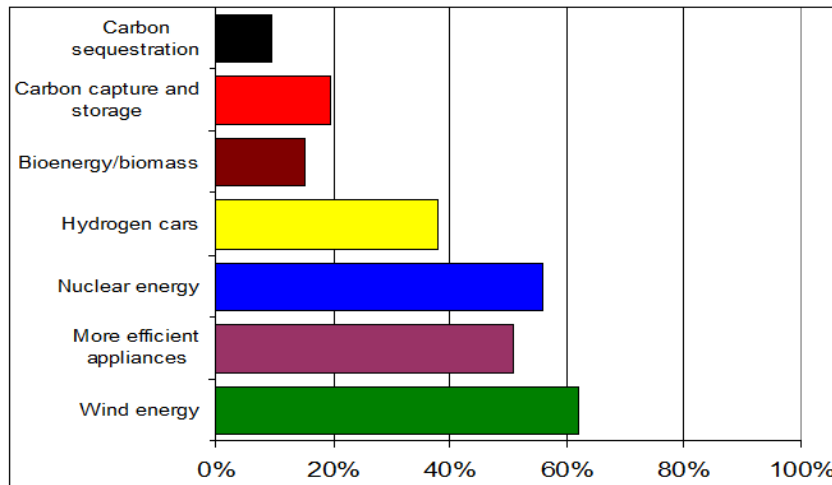
| | Feb 2008, Youth | | Mar 2008, QLD | | Jun 2008, VIC | | Nov 2008, WA | | Feb 2009, SA | |
|------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | Before | After | Before | After | Before | After | Before | After | Before | After |
| Biofuels | 4.1 | 4.6 | 4.2 | 4.9 | 3.3 | 4.7 | 3.6 | 4.7 | 3.8 | 5.0 |
| CCS | 3.0 | 4.9 | 3.2 | 4.4 | 2.8 | 5.1 | 2.8 | 4.8 | 2.9 | 5.1 |
| Coal | 4.3 | 5.2 | 4.3 | 5.0 | 4.2 | 5.5 | 4.2 | 5.0 | 4.4 | 5.4 |
| Geothermal | 3.6 | 4.9 | 3.5 | 4.6 | 3.3 | 4.9 | 3.3 | 4.7 | 3.7 | 5.3 |
| Hydro | 3.6 | 4.6 | 4.2 | 4.9 | 4.2 | 5.1 | 4.2 | 4.9 | 4.3 | 5.1 |
| Nat. Gas | 3.3 | 4.9 | 4.1 | 4.8 | 4.2 | 5.4 | 4.2 | 5.0 | 4.4 | 5.2 |
| Nuclear | 4.4 | 4.9 | 3.8 | 4.5 | 3.7 | 4.8 | 3.7 | 4.7 | 4.1 | 4.8 |
| Oil | 4.0 | 4.6 | 4.2 | 4.8 | 4.2 | 5.3 | 4.2 | 4.8 | 4.4 | 5.0 |
| Solar | 4.6 | 5.6 | 4.8 | 5.3 | 4.7 | 5.6 | 4.7 | 5.5 | 4.9 | 5.7 |
| Wave/tidal | 2.9 | 3.8 | 3.6 | 4.4 | 3.6 | 4.7 | 3.6 | 4.7 | 3.6 | 4.8 |
| Wind | 3.6 | 5.0 | 4.2 | 5.1 | 4.3 | 5.3 | 4.3 | 5.2 | 4.5 | 5.4 |

International comparison of public attitudes

Public Awareness: Heard or read of the following in the past year?

Australia

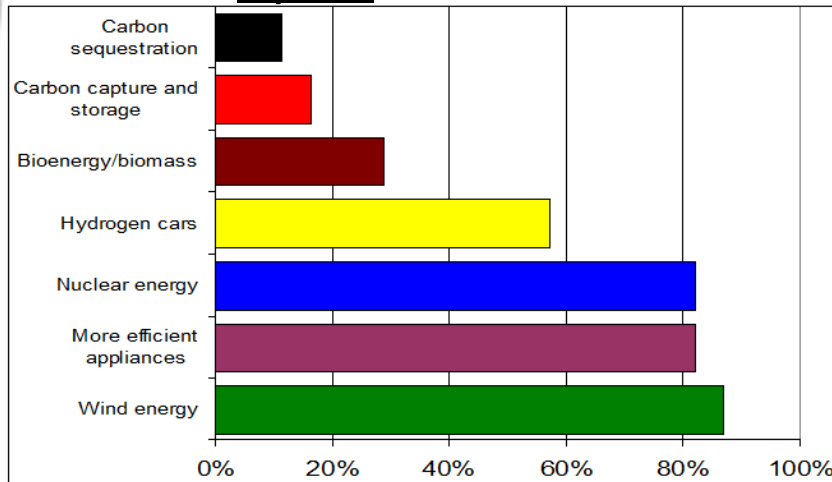
UK



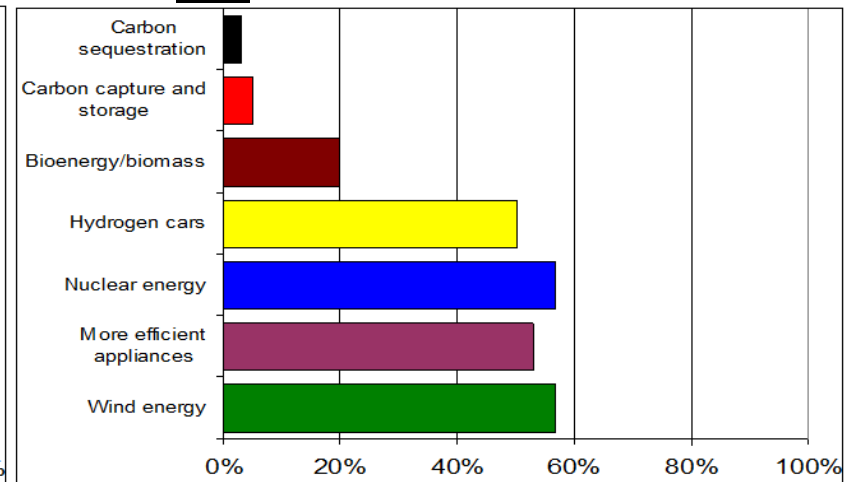
D. Reiner et al., (2007) *An international comparison of public attitudes towards carbon capture and storage technologies*. GHGT-8

International comparison of public attitudes

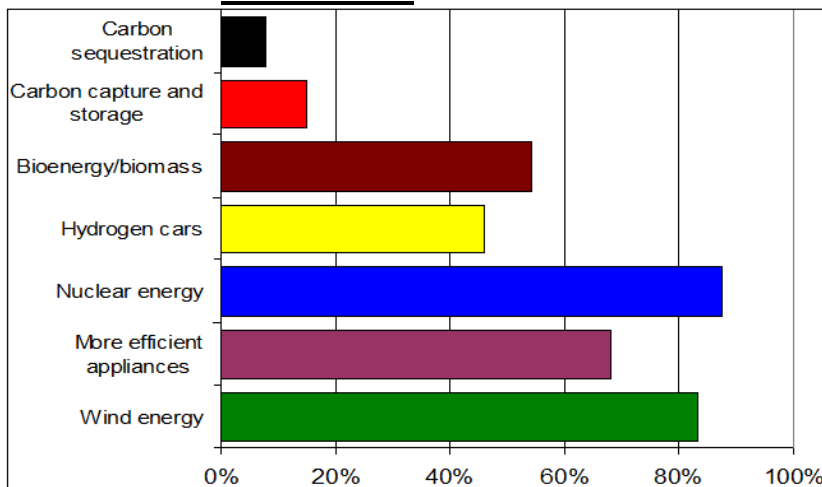
Spain



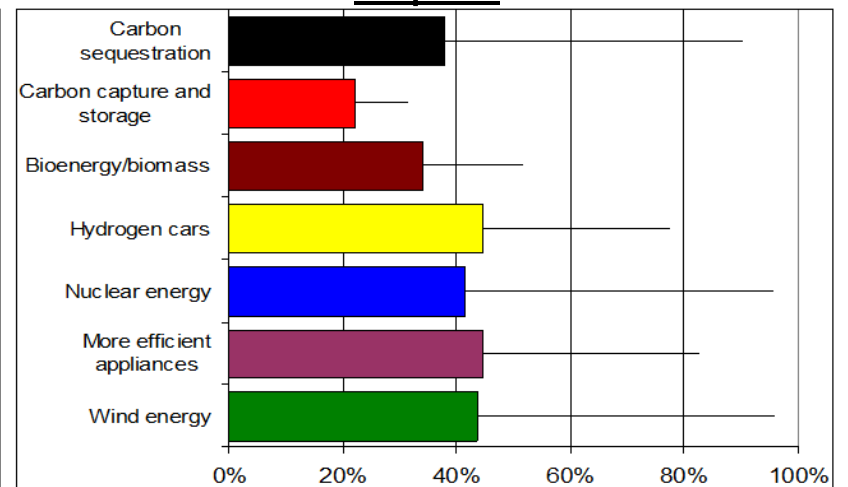
US



Sweden



Japan



D. Reiner et al., (2007) *An international comparison of public attitudes towards carbon capture and storage technologies. GHGT-8*

Benefits

- **It could provide a good bridge to the future.**
- **If successful can reduce large quantities of CO₂ from the atmosphere.**
- **Allows continued use of fossil fuels which provides an economic advantage for some countries.**
- **Energy security around the world.**
- **Helps to clean up coal fired power plants for developing countries who need access to energy.**
- **Allows emissions to be reduced without having to change lifestyle too much.**

Concerns

- Safety risks of a CO₂ leak.
- The risk of contamination of ground water.
- Any harm to plants and animals near storage sites.
- Assumption CO₂ is explosive.
- Is it the wrong solution for climate change, a bandaid?
- Are there enough available storage sites?
- It appears to require a large infrastructure which does not necessarily exist today.
- Long term liability issues.
- Cost – economic efficiency.
- Scale required for successful CO₂ mitigation.
- It is an unknown technology.
- Should not be pursued at the expense of renewable energy sources.

Questions about CCS

- ***“Have any studies been done on ways to use CO₂ emissions for practical uses thereby creating a recycling effect rather than just bury it?”***
- *We need to know more about it before widespread application - Is it safe? What are the long-term effects? Is it a cover-up operation – will it give companies that invest in this technology the appearance of looking green without actually doing anything?*
- ***CCS is not an answer but can be a bridge for other technologies. I thought it was bad but now I have changed my opinion.***
- *What is payback period for building CO₂ sequestration, brings jobs and progress but how many emissions?*
- ***CCS is a pipedream; there is not concrete evidence of it working***
- *How far down the track is carbon sequestration? How soon can we implement? How long can we use the special sequestration spots?*

Conclusions

- **Varying levels of knowledge about climate change and its causes – need this to accept CCS**
- **Still limited knowledge about CCS**
 - Knowledge greater among more educated participants
 - Very little knowledge of the potential scale required
- **Any communication needs to be in context of climate change mitigation – suite of options**
- **CCS is a bridging technology to a more sustainable future**
- **CCS investment not at expense of renewables**
- **Need to provide scientific based information, includes benefits and risks**
 - information on natural/industrial analogues will assist risk perception
- **Communication about how other people or organisations view CCS will influence acceptance.**

International communication group

- **C2S2RN**

- 70 researchers
- UK, US, Japan, Europe, Australia.

CSIRO

Peta Ashworth
Senior Social Researcher

Phone: +61 7 3327 4145

Email: Peta.Ashworth@csiro.au

Web: www.csiro.au

CSIRO

Naomi Boughen
Social Researcher

Phone: +61 7 3327 4079

Email: Naomi.Boughen@csiro.au

Web: www.csiro.au

CSIRO

Simone Carr-Cornish
Data Analyst

Phone: +61 7 3327 4077

Email: Simone.Carr-Cornish@csiro.au

Web: www.csiro.au

Thank you

Contact Us

Phone: 1300 363 400 or +61 3 9545 2176

Email: Enquiries@csiro.au **Web:** www.csiro.au

