

International Strategic Information Services

207 High Street
Newburyport MA 01954 USA
978-462-2733
isisinfo@comcast.net

The Politics of CCS

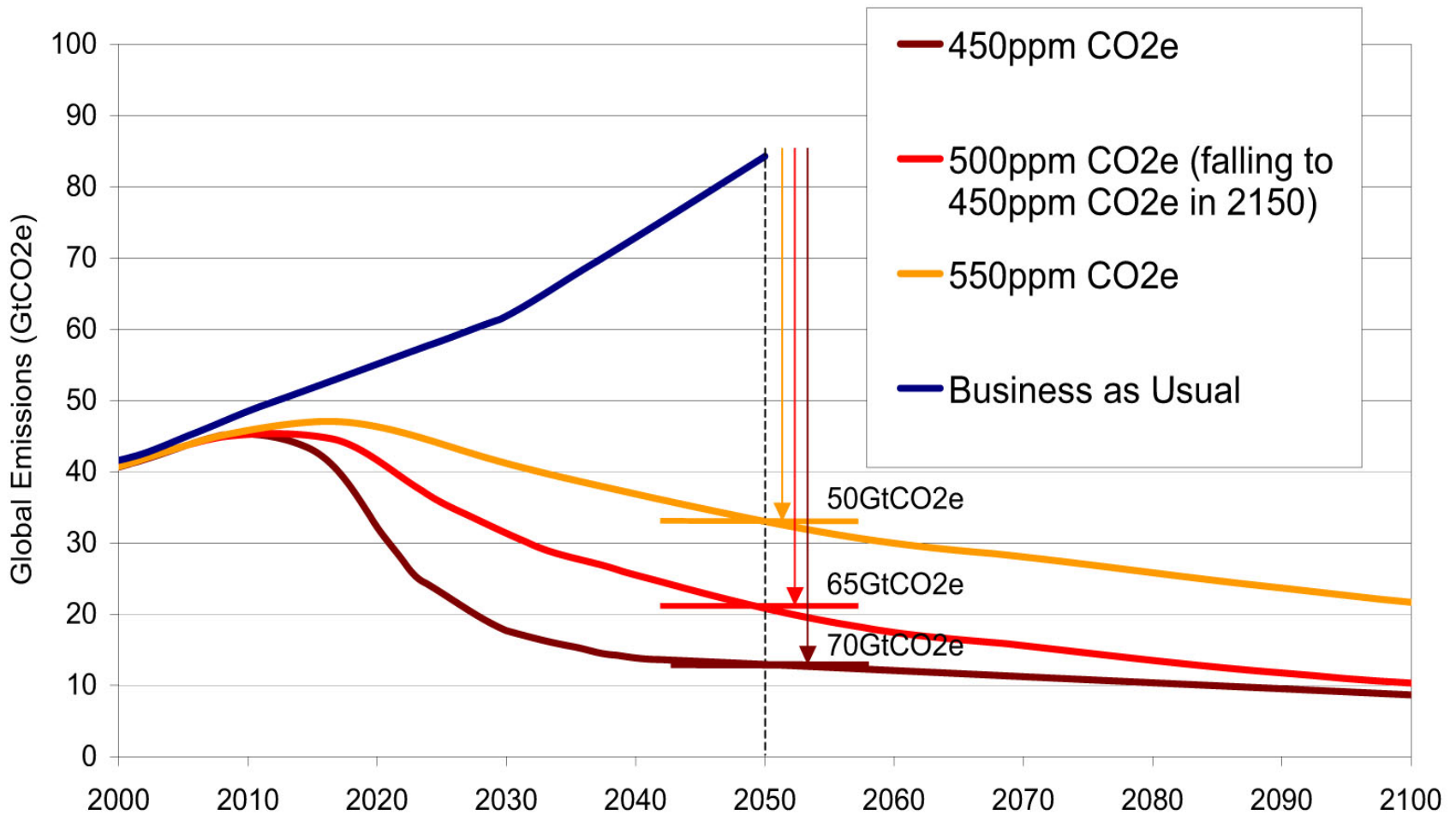
by
Dr. Manfred G. Raschke

Coal's New Frontier, April 24-25, 2007, St Louis

The Stern Review Has Set The CO₂ Agenda Going Forward

- From 42Gt GHG in 2000 (3/4 CO₂) to 5 Gt by 2100.
- With current atmospheric GHG levels of 430 ppm CO₂e the earlier IPCC target of 450 is undoable.
- New target is to stay below 550 ppm CO₂; this could limit temperature increase to 2°C (3.6°F).
- To achieve this must reach 60% *global* emission reduction from 2000 level by 2050
 - For Europe 60-80% reduction
 - For stationary emission sources 80% or better by 2050
- Global emissions must peak in 10 to 15 years.
- Stresses need for China and India to participate.

BUSINESS AS USUAL EMISSIONS AND STABILIZATION TRAJECTORIES FOR 450 – 500 PPM CO₂e



The Stern Review's Long Term Reduction Targets have Found Broad Acceptance

- Proposed UK long-term legislative target of 60% reduction by 2050.
- EU policy adopted March 8-9, 2007: limit temperature change to 2°C with global emissions to peak in next 10 to 15 years and 50% of 1990 by 2050.
- McCain-Lieberman sets target of 60% reduction for US by 2050.
- Leahy-Sanders sets target of 80% below 1990 by 2050.
- Waxman sets target of 80% below 1990 by 2050.

- *Stern Review* did not go unanswered – it is regarded not just as an academic argument, but rather as a radical revision of the economics of climate change.
- Critics' Views:
 - Stern's conclusions not in the mainstream of economic modeling of climate change
 - Ample grounds for criticism of use of a near zero discount rate
 - Issue is how to appropriately weigh costs and benefits of emission reductions over present and future generations

See for yourself:

- <http://nordhaus.econ.yale.edu/SternReviewD2.pdf>
- <http://www.econ.com.ac.uk/faculty/dasgupta/stern.pdf>
- Robert M. Carter, Ian Byatt, et al., *World Economics*, Vol. 7.4, Oct.-Dec., 2006, pp. 165-232

INTERNATIONAL GLOBAL WARMING CONCERNS

	A great deal	A fair amount	A little/Not at all	Don't Know
United States	19%	34%	47%	1%
Great Britain	26%	41%	32%	1%
Spain	51%	34%	14%	2%
France	46%	41%	14%	0%
Germany	30%	34%	36%	1%
Russia	34%	31%	34%	*
Indonesia	28%	48%	23%	1%
Egypt	24%	51%	23%	1%
Jordan	26%	40%	34%	*
Turkey	41%	29%	23%	8%
Pakistan	31%	25%	39%	5%
Nigeria	45%	33%	20%	2%
Japan	66%	27%	7%	0%
India	65%	20%	13%	2%
China	20%	41%	37%	2%

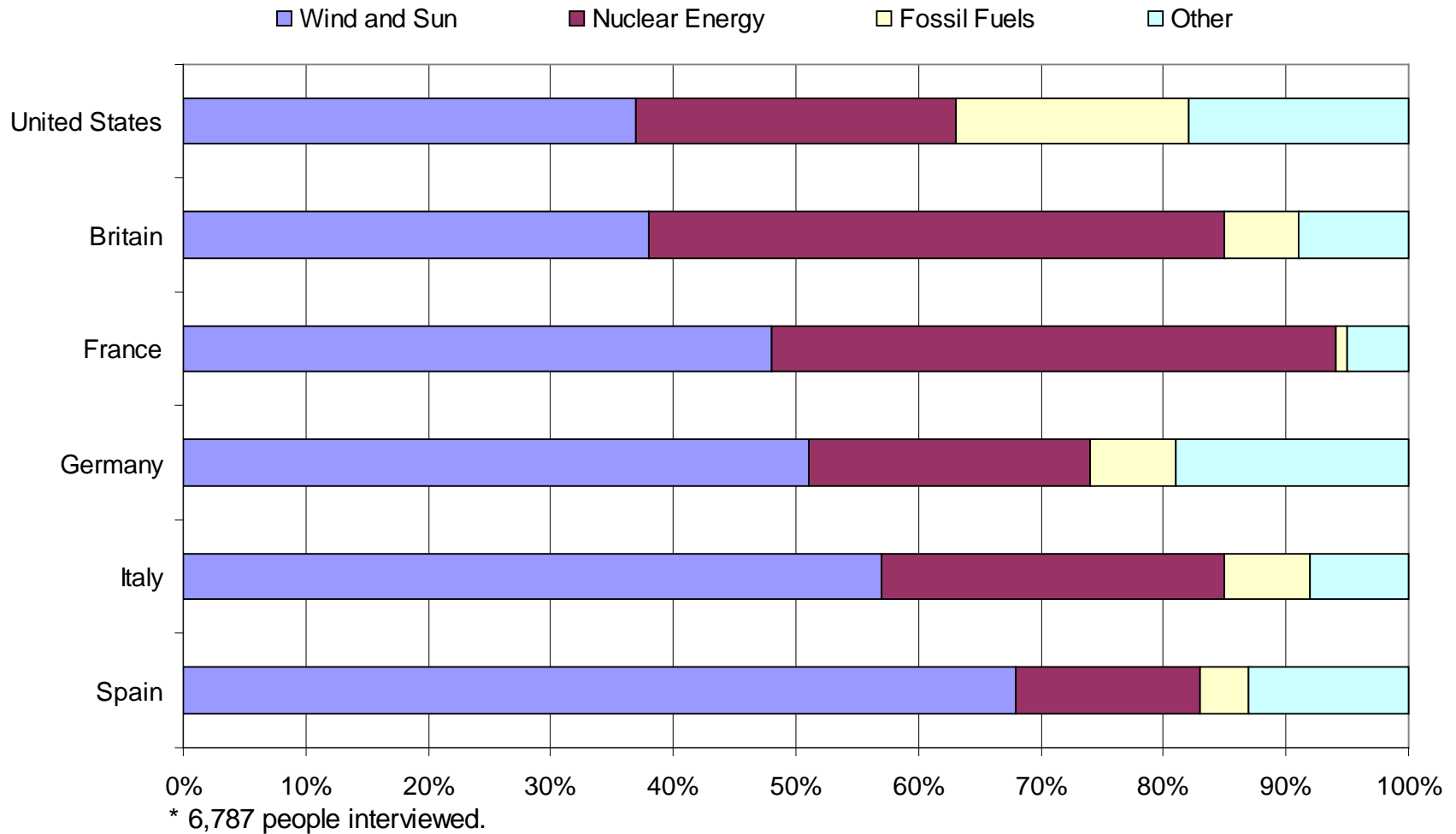
Based on those who have heard about the “environmental problem of global warming.” 16,710 interviews in 15 countries.

* Less than zero

Source: PEW Global Attitudes Project. Survey released June 13th 2006.

IN THE EUROPEAN PUBLIC'S* MIND FOSSIL FUELS ARE HEADED FOR OBLIVION

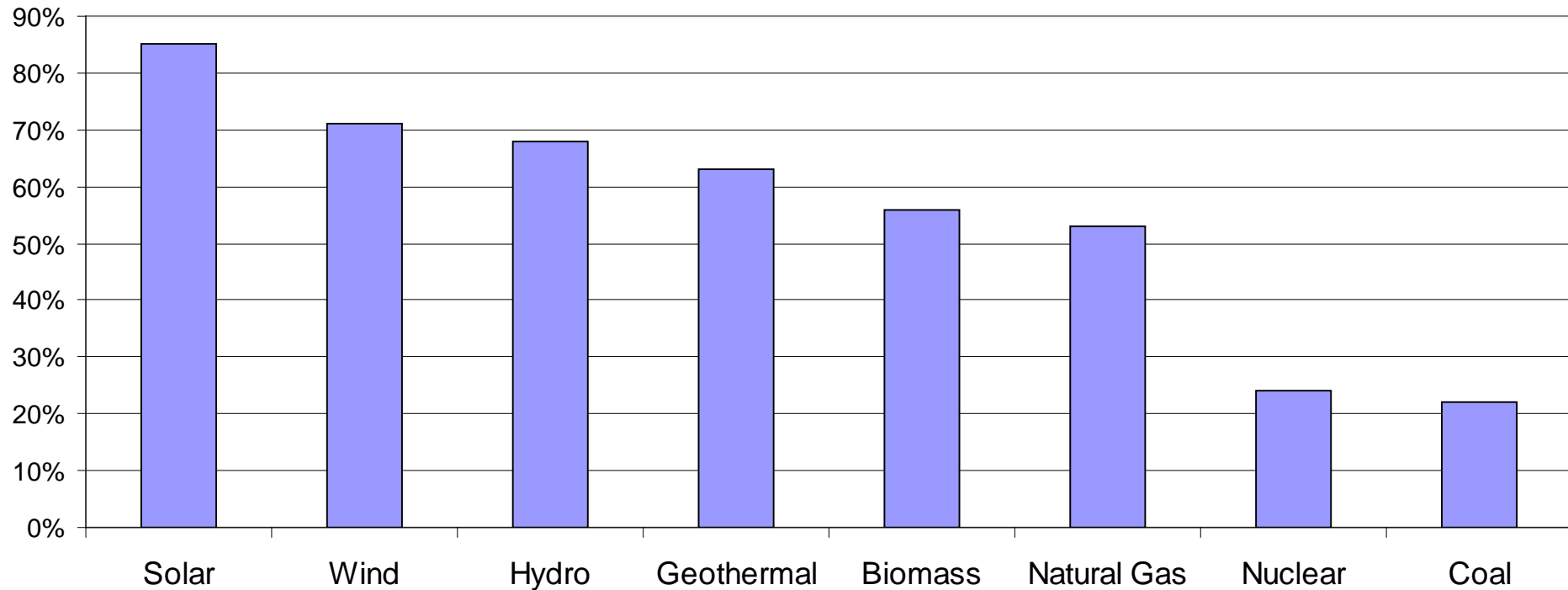
In 2057, what will be the primary source of energy for your country?



Source: Harris Interactive, March 2007.

GERMAN POLL RESULTS OF FUTURE ENERGY SOURCES

- Which energy sources will Germany rely on for its energy security in 2025-2035? (multiple answers possible)



- When divided by political parties coal support is 18% for the liberal economic FDP and the conservative CDU/CSU.

- There is general agreement that CCS must play a major role in any emissions abatement strategy.
- So:
 - *Stern Review*
 - IPCC
 - European Commission
 - Germany, UK, Netherlands and Norway
 - The Bush Administration
 - Glen Eagles G8 Summit (2005)
 - Several U.S. presidential candidates: Barack Obama, John Edwards, Hillary Clinton, Mitt Romney, John McCain
- CCS brings the additional potential of de-carbonization of the transportation sector (e.g. hydrogen production or plug-in hybrid vehicles) as well as the residential sector (e.g. hydrogen for residential fuel cells; heat pumps) through carbon capture at a single large site.

CCS DEVELOPMENT REQUIRES TWO IMPLEMENTING STEPS

1. Long-term transparent price signal for CO₂
2. Secure and rational regulatory structure for capture, transportation and sequestration .

THE OPPONENTS OF CCS

- Majority of the environmental NGOs
 - Have blocked inclusion under CDM
 - Endangers market penetration of renewables
 - Concern over CO₂ leakage
 - Technology not yet ready
 - Would continue use of coal
- The Nuclear Lobby?
 - With 20-30%+ of electricity from renewables, there may not be much room for competing baseload technologies (particularly if conservation reduces demand growth).
- Some generators focus on greater efficiency first, e.g. E.on and STEAG.

CO₂ PRICE SIGNAL

- Phase I EU ETS has been a disaster in this regard trading between €31.00/tonne CO₂ to as low as €0.50/tonne CO₂.
- Phase II will have greater allocation scarcity but major unknowns:
 - Supply curve for CERs.
 - Competition from Japan or Canada for CERs.
- Prices from voluntary trading schemes, such as CCX or VERs, seem too low.
- CO₂ prices in some EOR projects are high enough to support some CCS.
- Norway has shown that high carbon taxes are an effective stimulant to sequestration.
- EC considering mandating CCS for all coal plants after 2020.

EUA CLOSING PRICES FOR PERIOD 1 AND PERIOD 2 ALLOWANCES

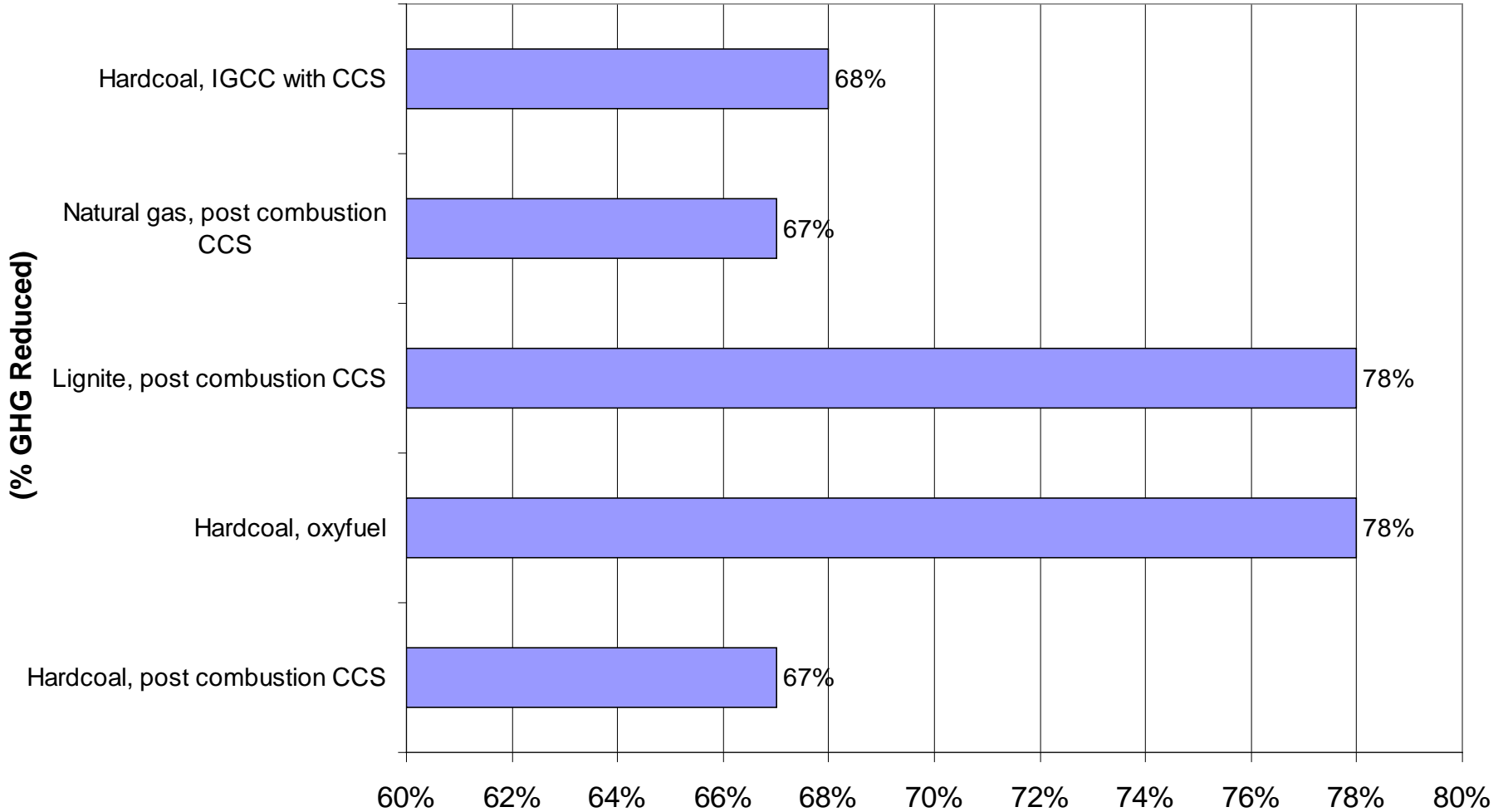


Source: PointCarbon.

REGULATORY UNKNOWNNS

- Will transportation and storage be subject to international criteria set by a UN agency or will it continue to be regulated at a state level as currently in the U.S?
- Will concern over ocean acidification halt deep ocean sequestration?
- Long-term liability for storage for: 100 years, 1,000 years, 40,000 years?
- Should deep saline aquifers be excluded if they have geothermal potential?
- “Zero emissions” is still too high under Life Cycle Assessment: depending on assumptions CCS reduces emissions only by 67-78%.

GHG REDUCTIONS FOR VARIOUS CCS TECHNOLOGIES



Source: Germany, Ministry of the Environment.