

IPCC report: The Role of Carbon Capture and Utilisation to Mitigate Climate Change

# Conclusion and Perspective

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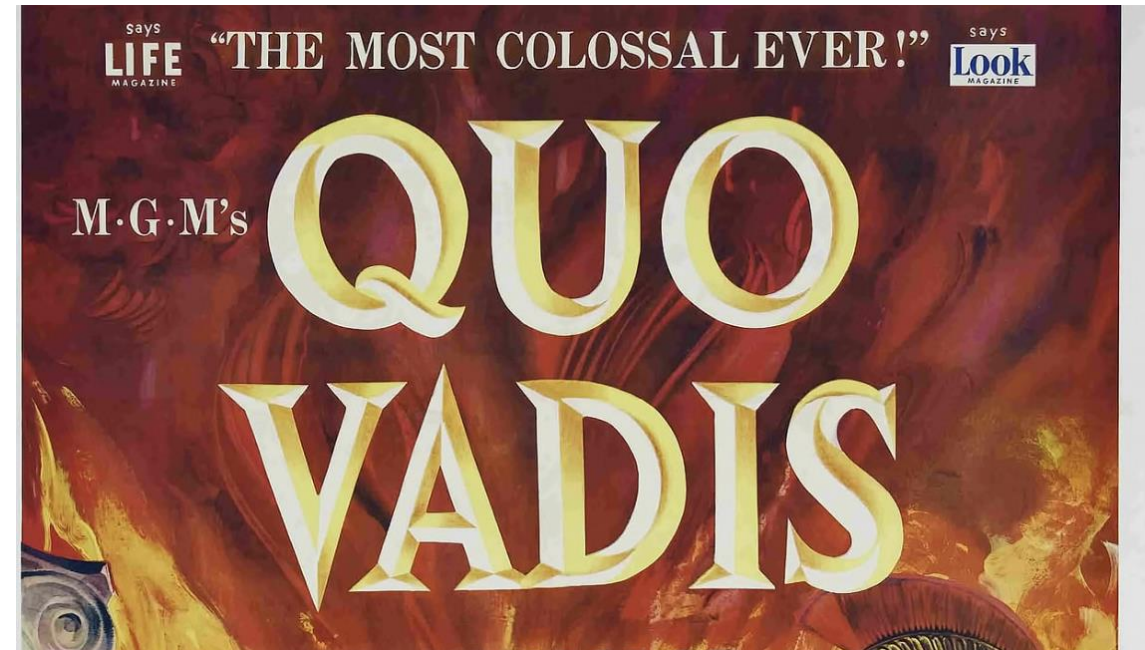
Brussels, Belgium



**GLOBAL CO<sub>2</sub>  
INITIATIVE**

UNIVERSITY OF MICHIGAN

- CCU in the IPCC AR6 WG3
- State of technology
- Context to energy systems
- Context to building sector
- Context to chemical industry
- Measuring impact
- Societal acceptance
- What's next?









[https://en.wikipedia.org/wiki/Quo\\_Vadis\\_\(1951\\_film\)](https://en.wikipedia.org/wiki/Quo_Vadis_(1951_film))


# Key to remember


- It's not only about climate change mitigation!
- It's necessary to provide essential carbon-based products!
- “Biogenic carbon feedstock is expected to be limited due to competing land-uses.”\*


\* Technical Summary, p. 82

# Opportunities for CO<sub>2</sub>-based products

\$0.5 to \$2 trillion/year opportunity		2 to 8 Gigatons of CO <sub>2</sub> / year	
		Annual Market Opportunity (USD Billions)	Annual CO <sub>2</sub> Consumption (Million Tons)
	<b>Construction materials</b> Concrete, aggregates	<b>165-550</b>	<b>900-5,000</b>
	<b>Fuels</b> Natural gas replacement, gasoline, diesel fuel, jet fuel	<b>10-250</b>	<b>700-2,100</b>
	<b>Chemicals</b> Solvents, detergents	<b>200-750</b>	<b>135-565</b>
	<b>Engineered materials</b> Carbon fiber, carbon nanotubes, graphene, carbon ceramics	<b>140-400</b>	<b>30-84</b>
	<b>Polymers</b> Plastic foils, containers, furniture, plastic housings, toys	<b>2-25</b>	<b>1-20</b>
	<b>Agriculture &amp; food</b> Fertilizer, protein for human consumption, feed for animals	<b>&gt; 25</b>	<b>&gt; 40</b>

60 kg = .06 tons =  1 human

1 MT = 1 million tons =  17 million humans

1 GT = 1000 MT =  2x earth population



**CO<sub>2</sub> is a new ingredient**

**CO<sub>2</sub> replaces fossil carbon**

**CO<sub>2</sub> is a new ingredient**

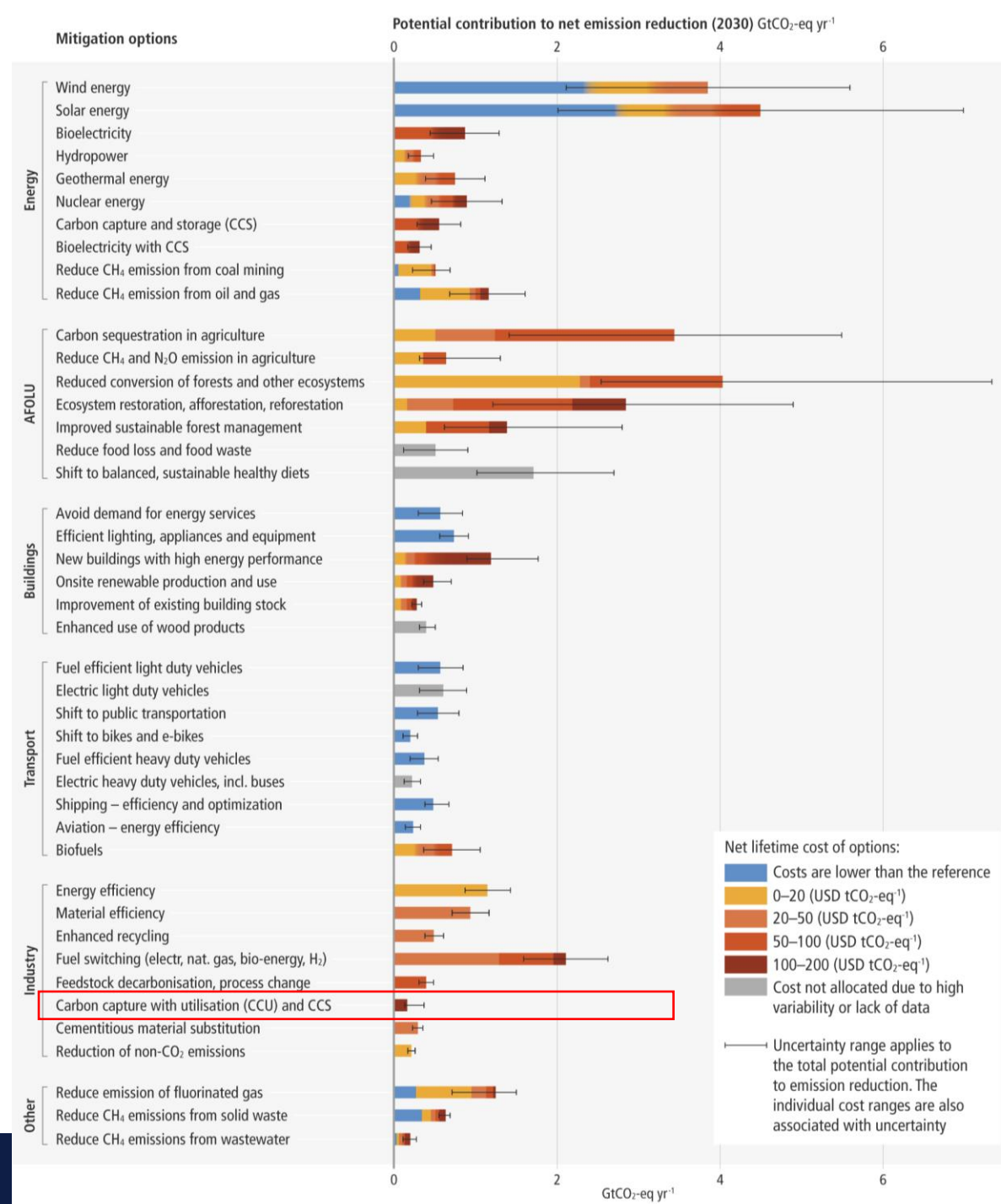
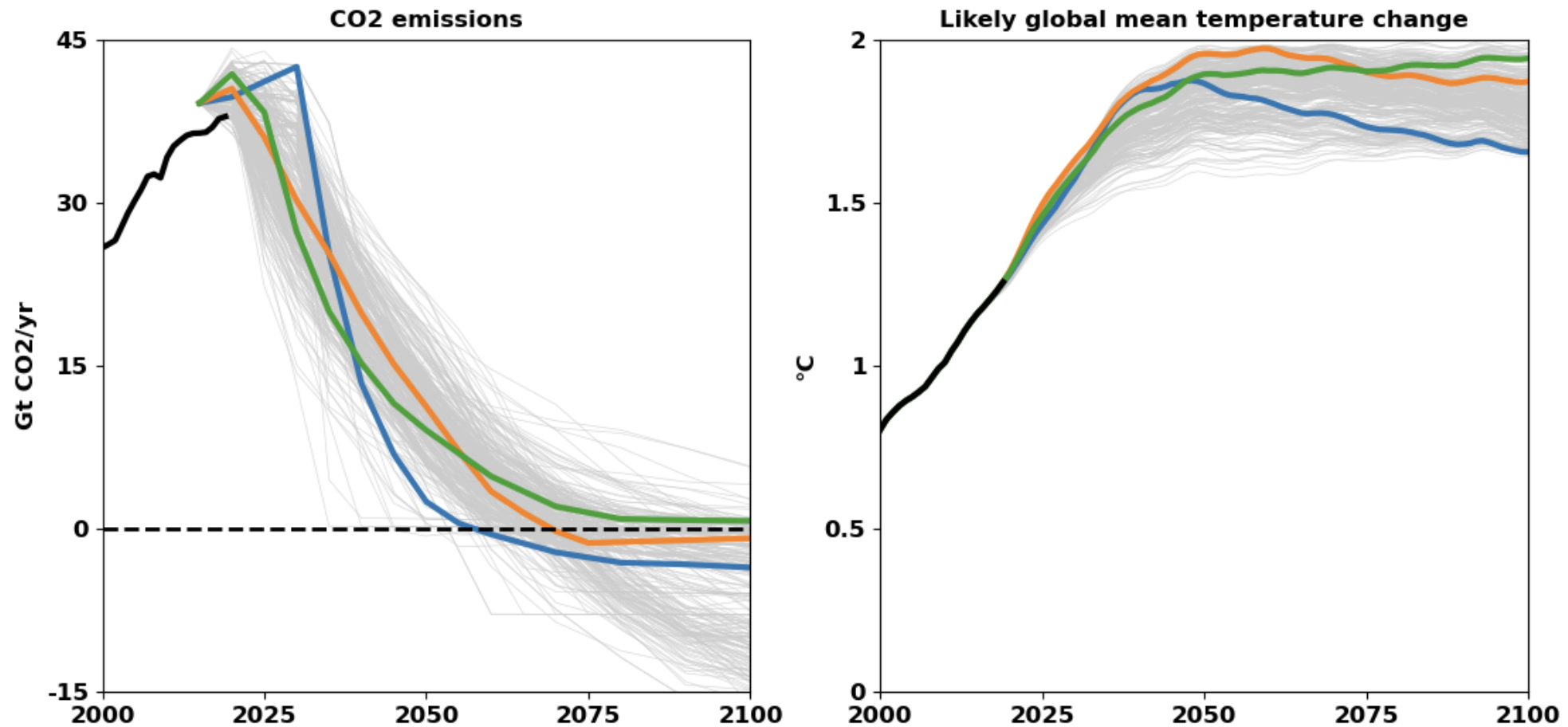


Figure TS.23: Overview of emission mitigation options and their cost and 3 potential for the year 2030.

Technical Summary, p. 108

# Why Speed Matters



Box TS.6 Figure 1: CO<sub>2</sub> Emissions (panel a) and temperature change (panel b) of three alternative 2 pathways *likely* limiting warming to 2°C and reaching net zero CO<sub>2</sub> emissions at different points in time. (Technical Summary, P. 50)

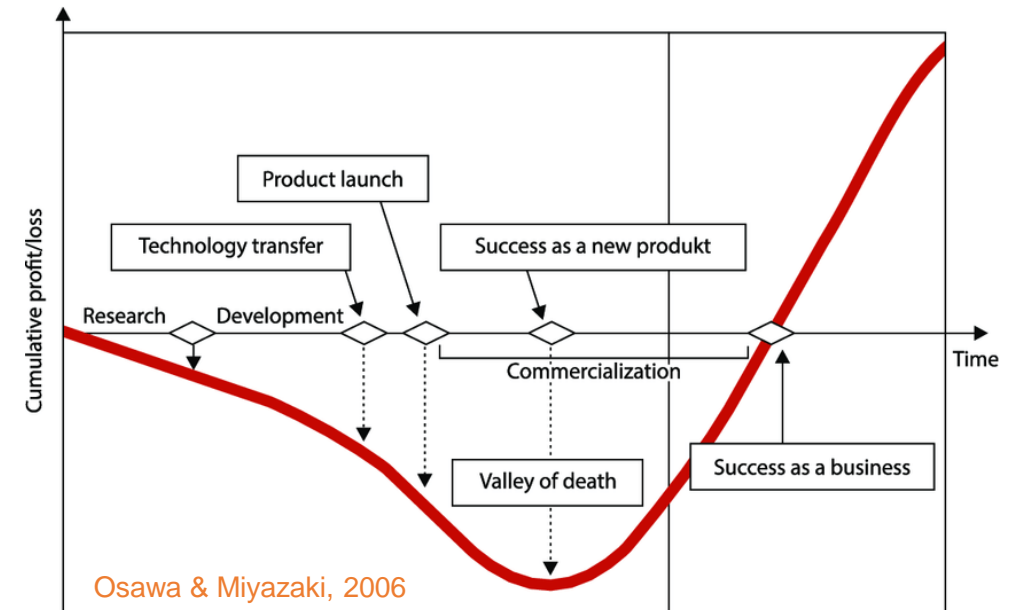
# Research is not enough ...



“It seems to me that there is such a canyon between what the academic world considers complete and what the industry considers emerging – it is the old Valley of Death.” (private comm.)



Need facilities, hubs, entities, policies to help bring pieces together and scale along the entire value chain





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