



# Game Changer?

## The European Union's Net Zero Industry Act, and its Implications for Carbon Management in Australia

19 August 2024 | Curtin Institute for  
Energy Transition

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I begin today by acknowledging the Whadjuk Noongar people of the Nyoongar Nation, Traditional Custodians of the land on which we stand today.

I pay my respects to their Elders past, present, and emerging, and extend that respect to Aboriginal and Torres Strait Islander peoples here today.





## **Dr. Alice E. A. Evatt**

### **Research Fellow**

Net Zero for the Fossil Fuel Sector  
Oxford Net Zero and The Environmental Change  
Institute,  
University of Oxford

### **Expert Advisory Group Member**

Science Based Targets Initiative (SBTi)  
Oil and Gas Standard Development Project



## **Professor. Myles Allen CBE**

**Head of Atmosphere, Oceanic and Planetary Physics**  
University of Oxford

### **Lead Author**

IPCC Special Report on 1.5

### **Lead Author**

Oxford Principles for Net Zero Aligned Carbon Offsetting





1°C

1/2 Trillion  
Tonnes of  
Fossil Carbon

Coal. Oil. Gas. Limestone.

2 Trillion  
Tonnes of  
Carbon Dioxide

(CO<sub>2</sub>)



# Total known fossil reserves



How much have we used?



# Total known fossil reserves



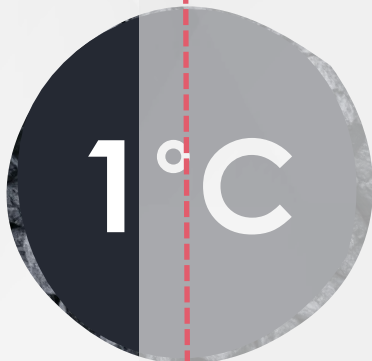
250 years

How much have we used?

How long did it take us to use it?



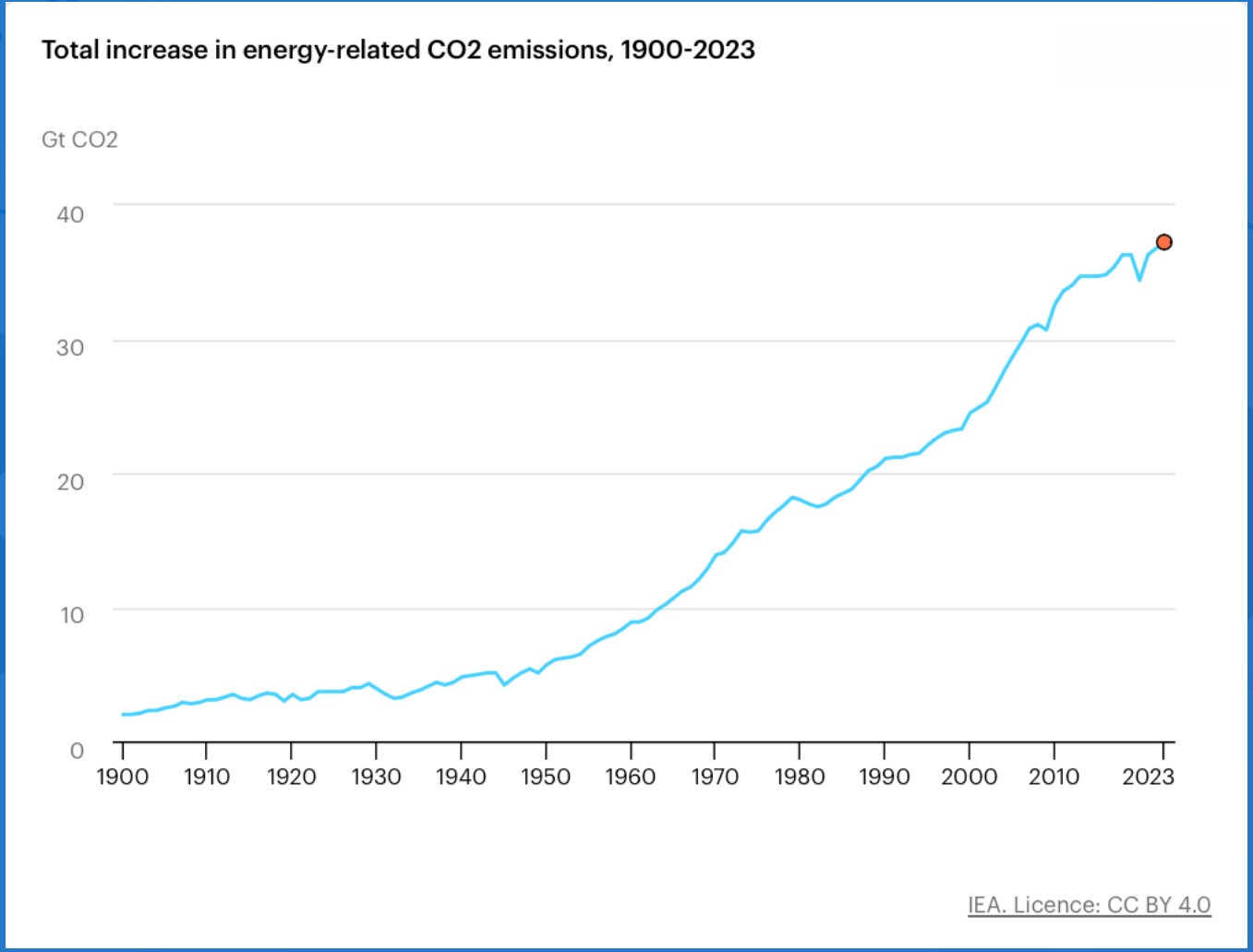




250 years

How much have we used?

Total known fossil



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How long did it take us to use it?



**1 | GEOLOGICAL NET ZERO**

**2 | INTERNATIONAL POLICY DEVELOPMENTS**

**3 | LESSONS FOR AUSTRALIA**



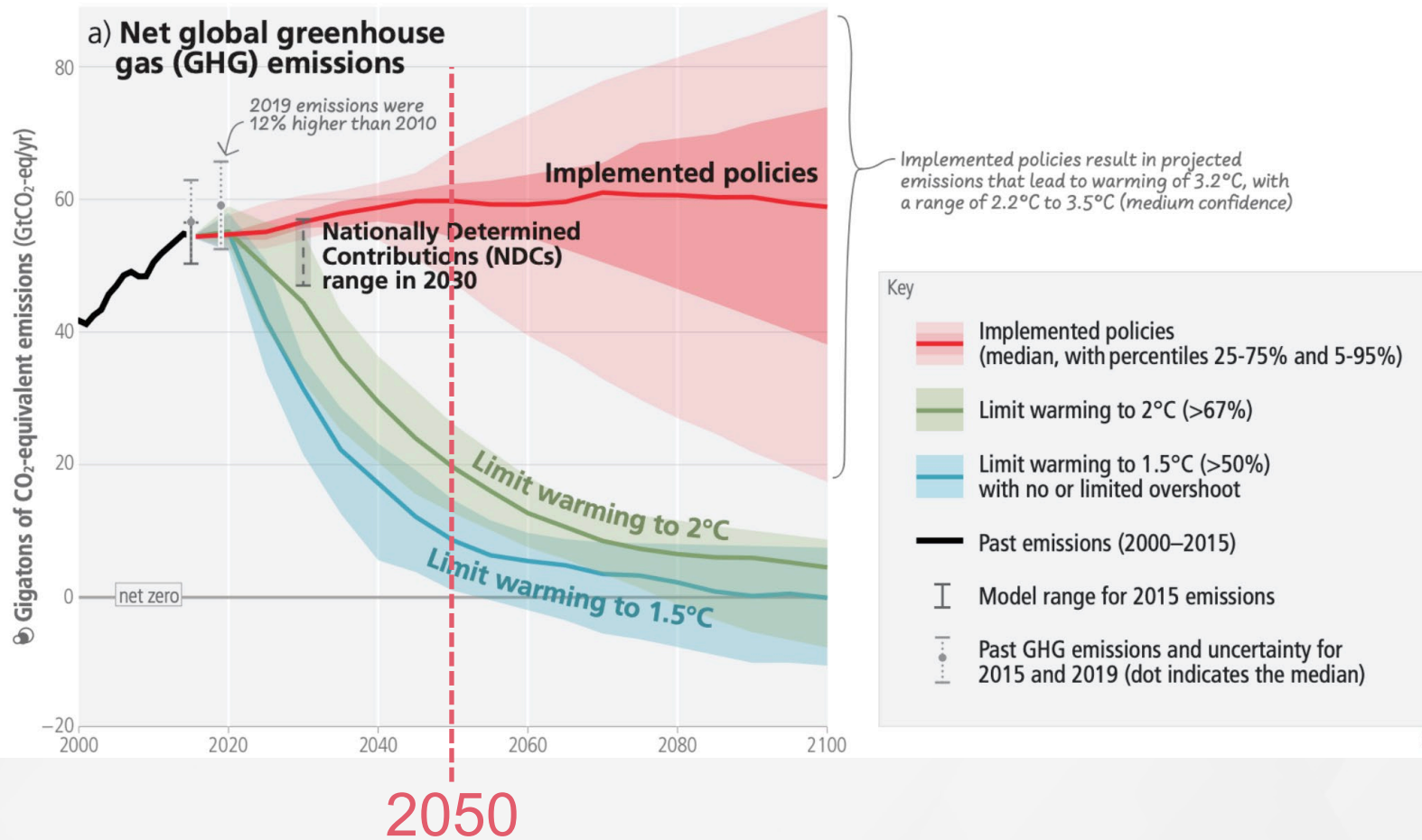


# Geological Net Zero. GEOZero.



## Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO<sub>2</sub> and net zero GHG emissions can be achieved through strong reductions across all sectors

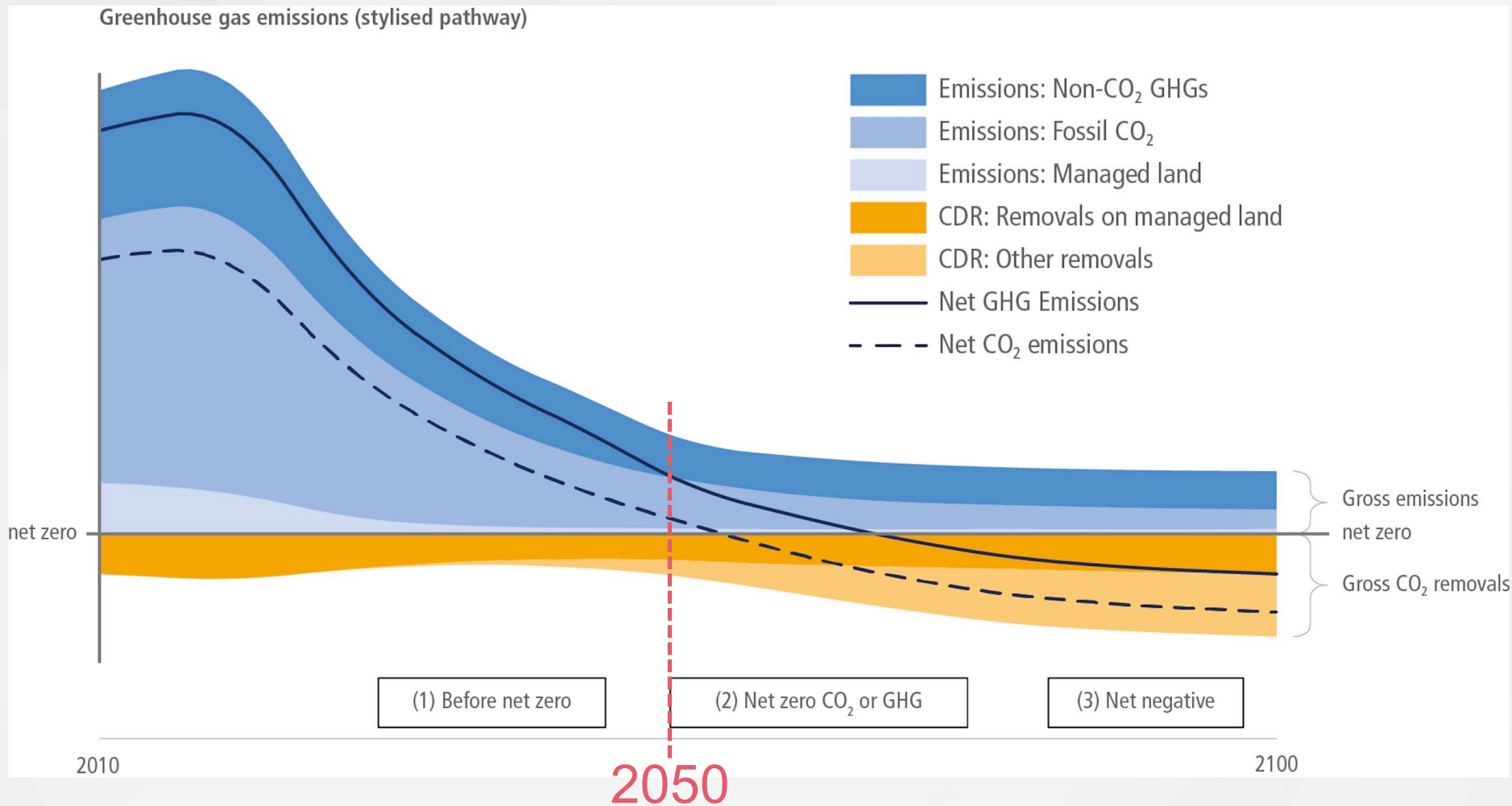


# Emission Reductions

Source:

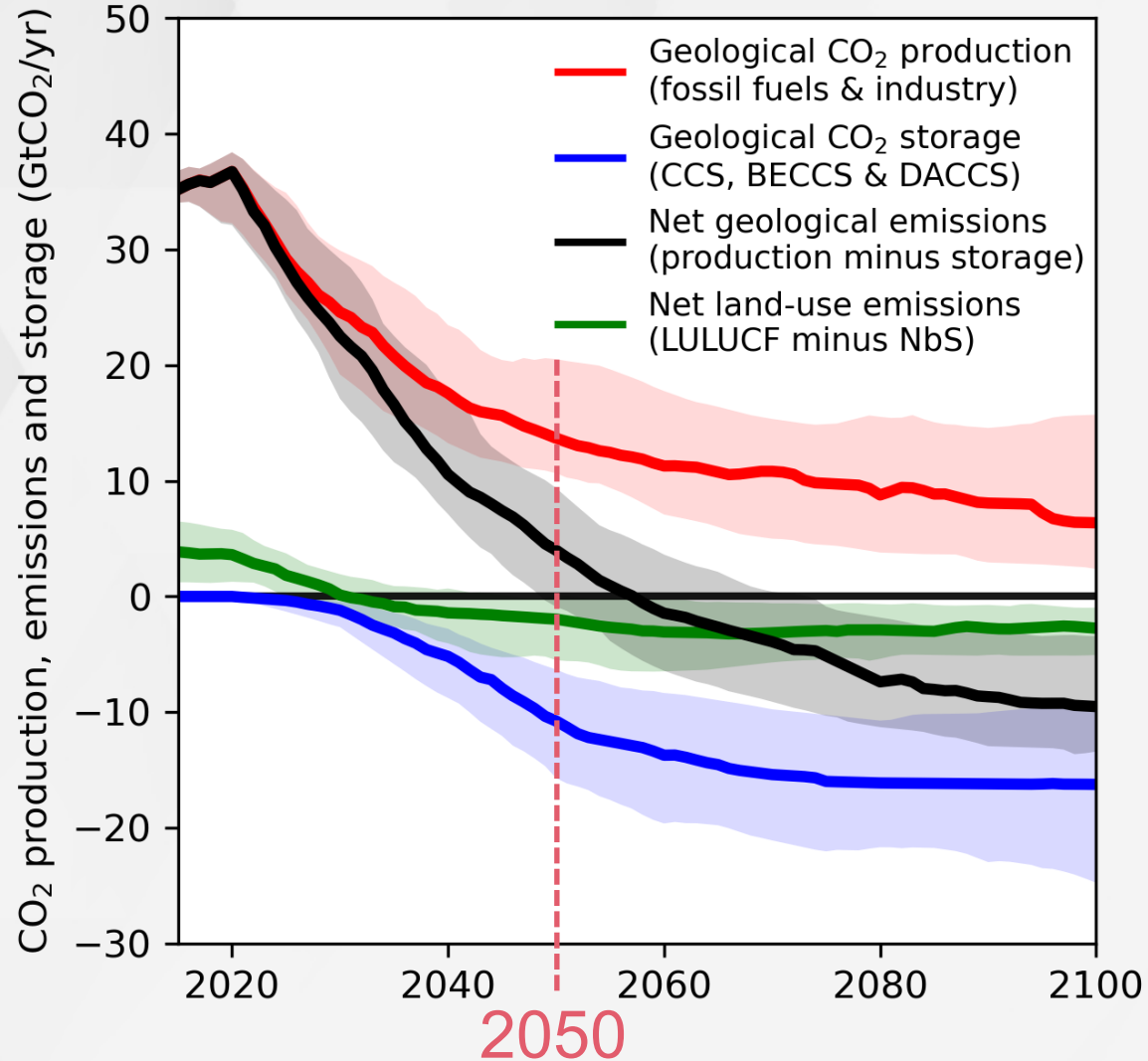


# Emission Reductions & Emission Removals



Source:





## Geological CO<sub>2</sub> Production

Coal. Oil. Gas. Limestone.

&

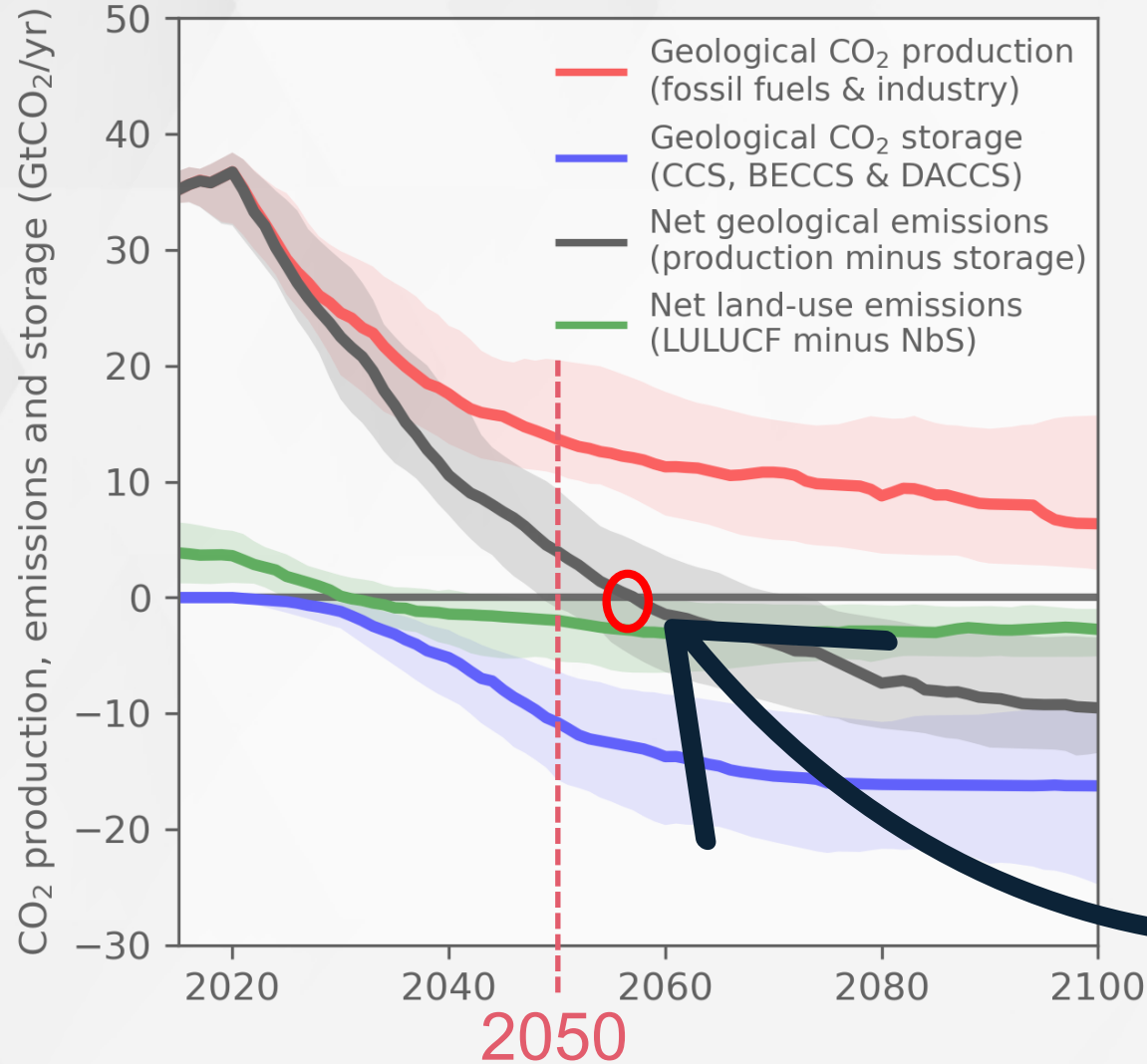
## Geological CO<sub>2</sub> Storage

Carbon capture and storage (CCS). BECCS. DACCS.

Industrial CO<sub>2</sub> production and storage in "technology neutral" 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database





## Geological CO<sub>2</sub> Production

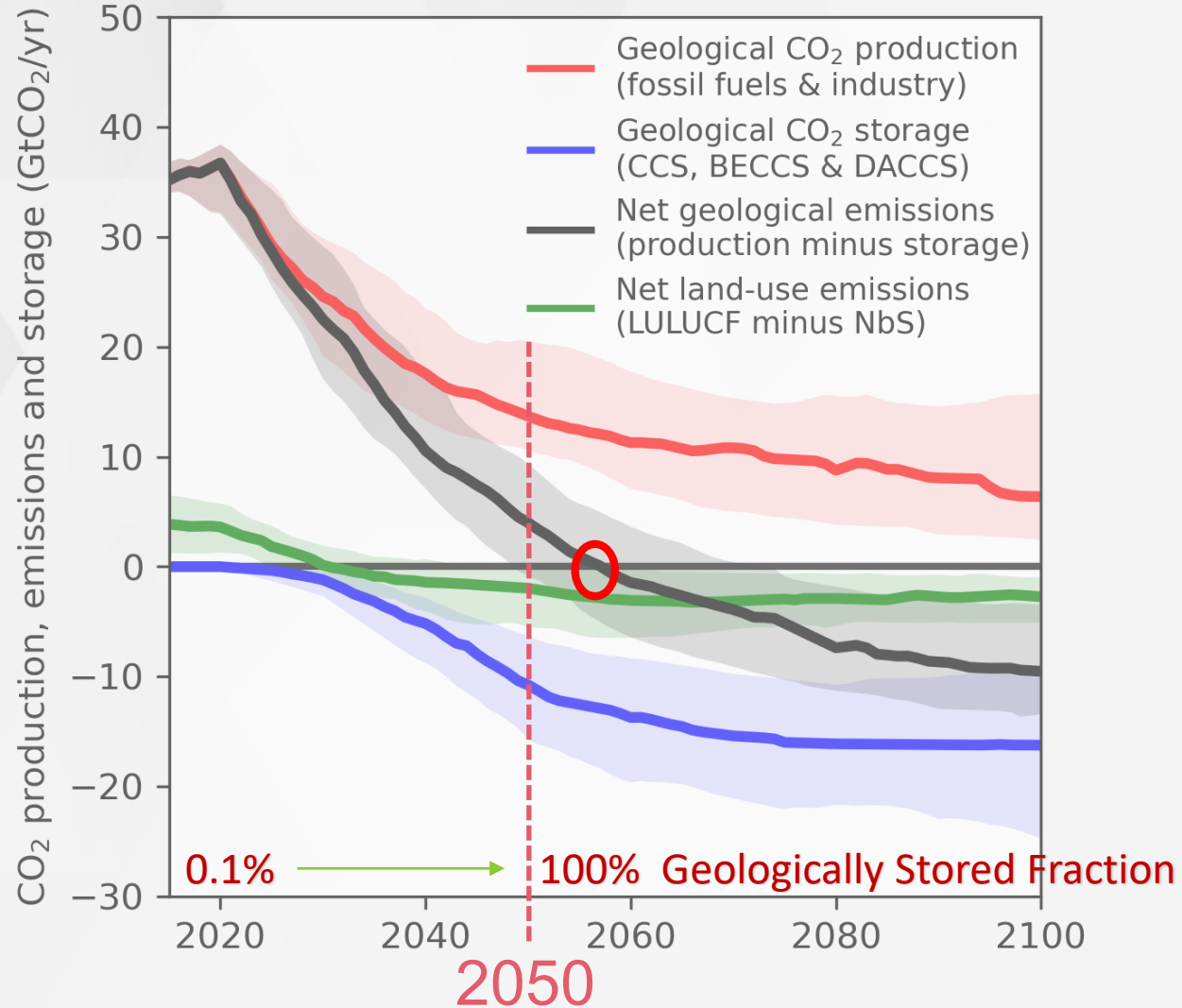
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## Geological Net Zero

Industrial CO<sub>2</sub> production and storage in “technology neutral” 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database





## Geological CO<sub>2</sub> Production

=

## Geological CO<sub>2</sub> Storage

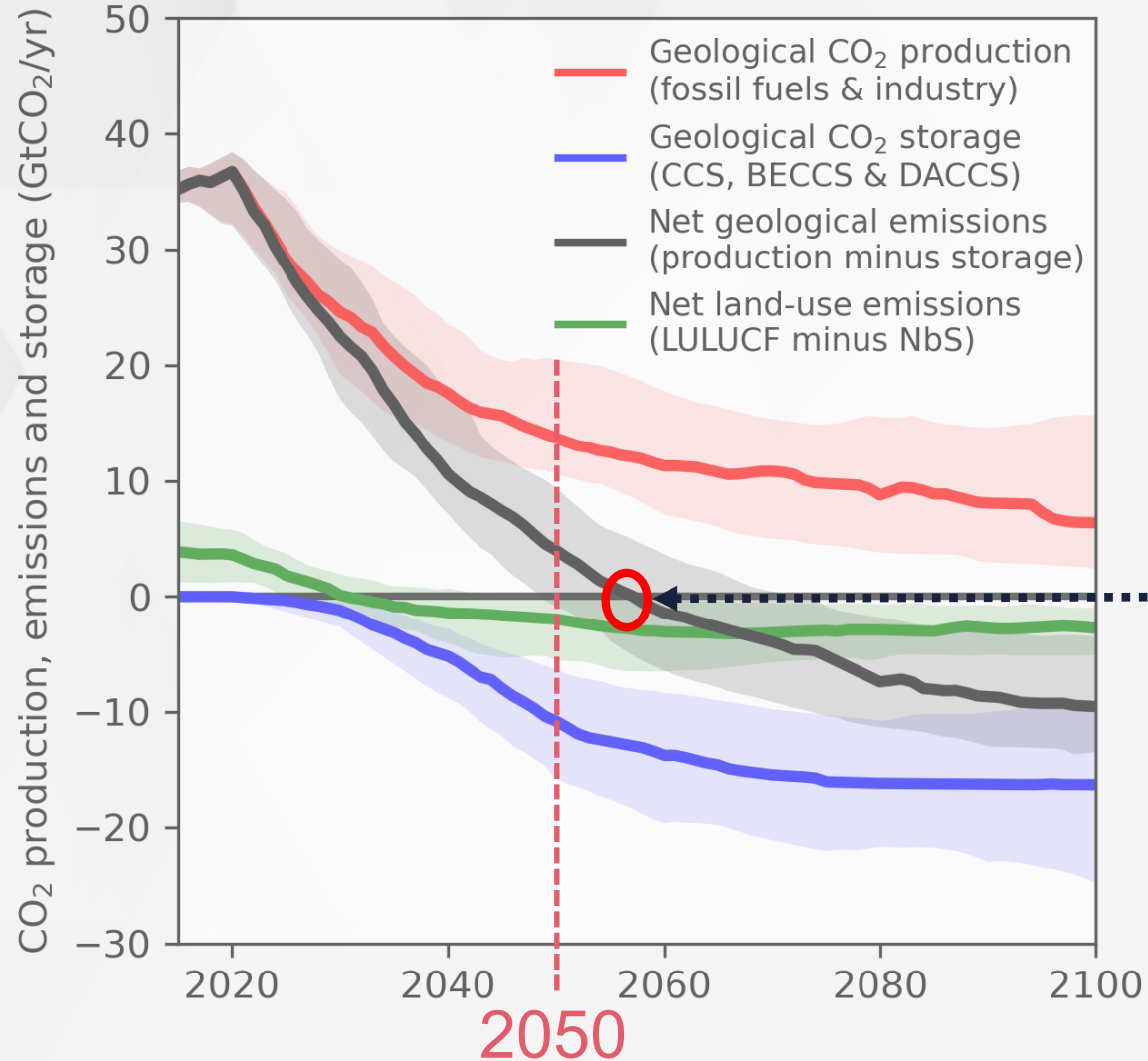
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## Geological Net Zero

Industrial CO<sub>2</sub> production and storage in “technology neutral” 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database





## How do we get to Geo Net Zero?

**PRODUCE LESS**



**STORE MORE**

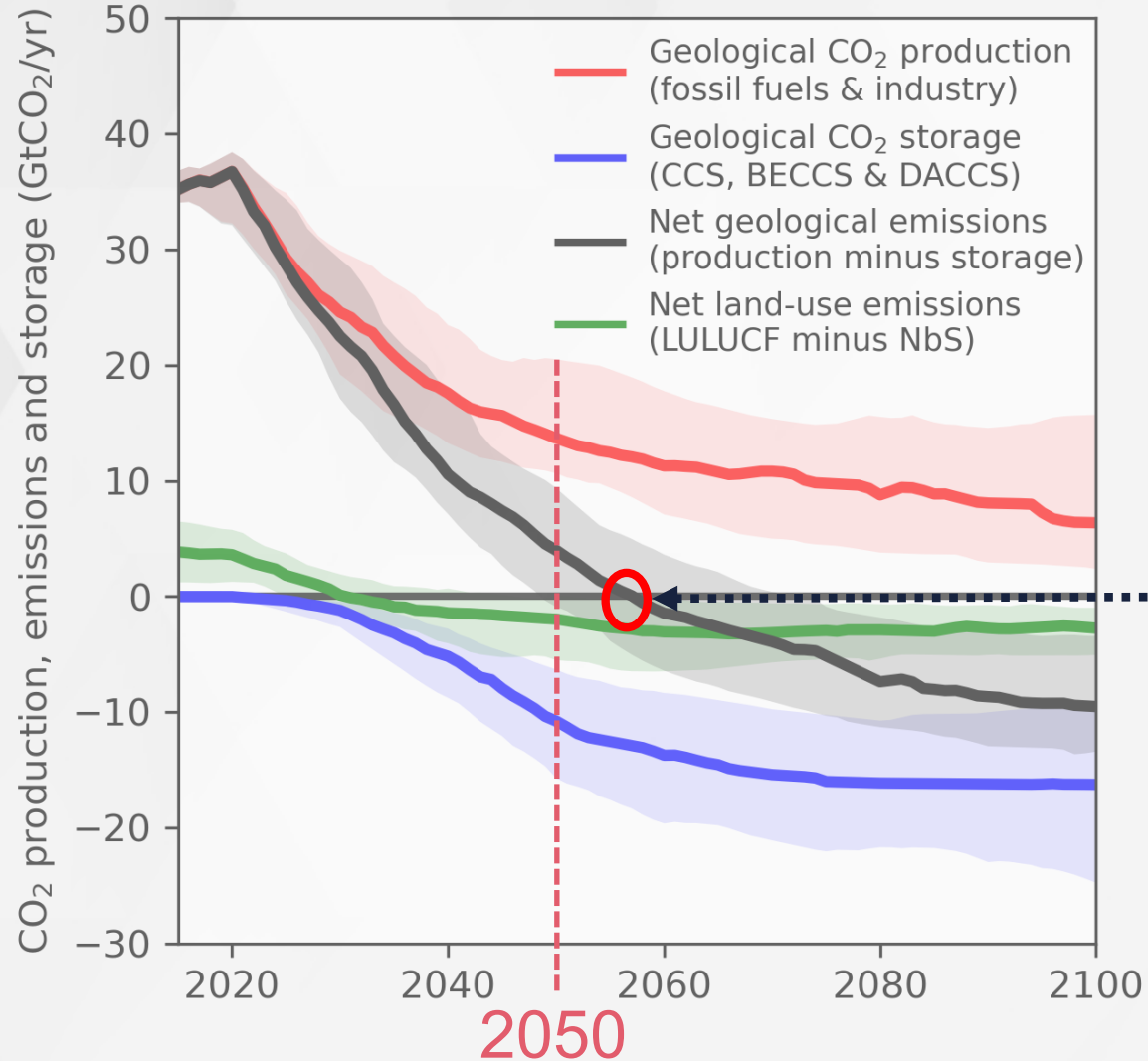


Industrial CO<sub>2</sub> production and storage in “technology neutral” 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database







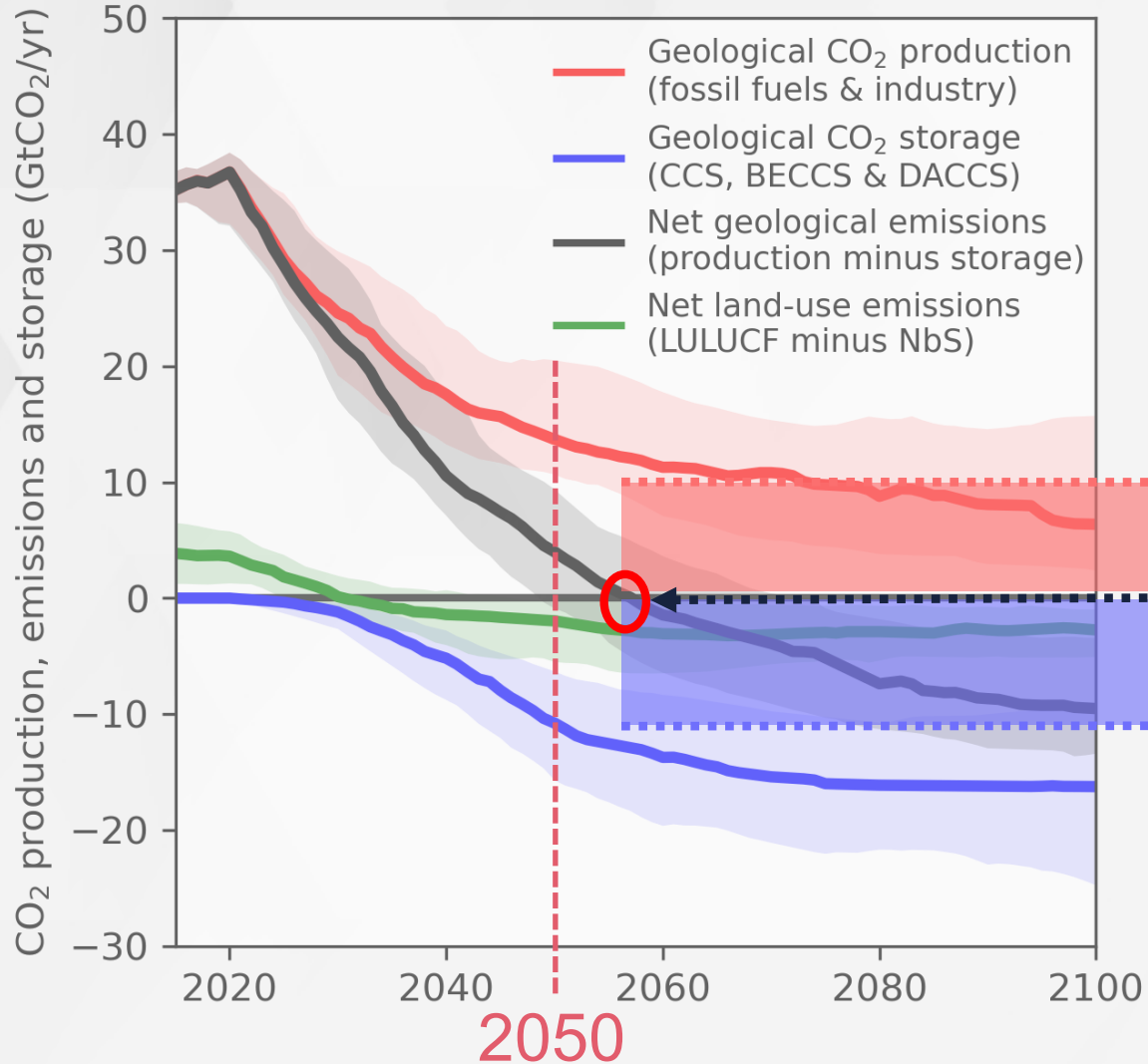
**Before the world stops using fossil fuels**

**We need to stop fossil fuels from causing global warming**

Industrial CO<sub>2</sub> production and storage in “technology neutral” 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database





## Why is Geo Net Zero necessary?

In IPCC scenarios we are still using fossil fuels long after we reach net zero

So, if we want to meet our targets, we must store the rest.

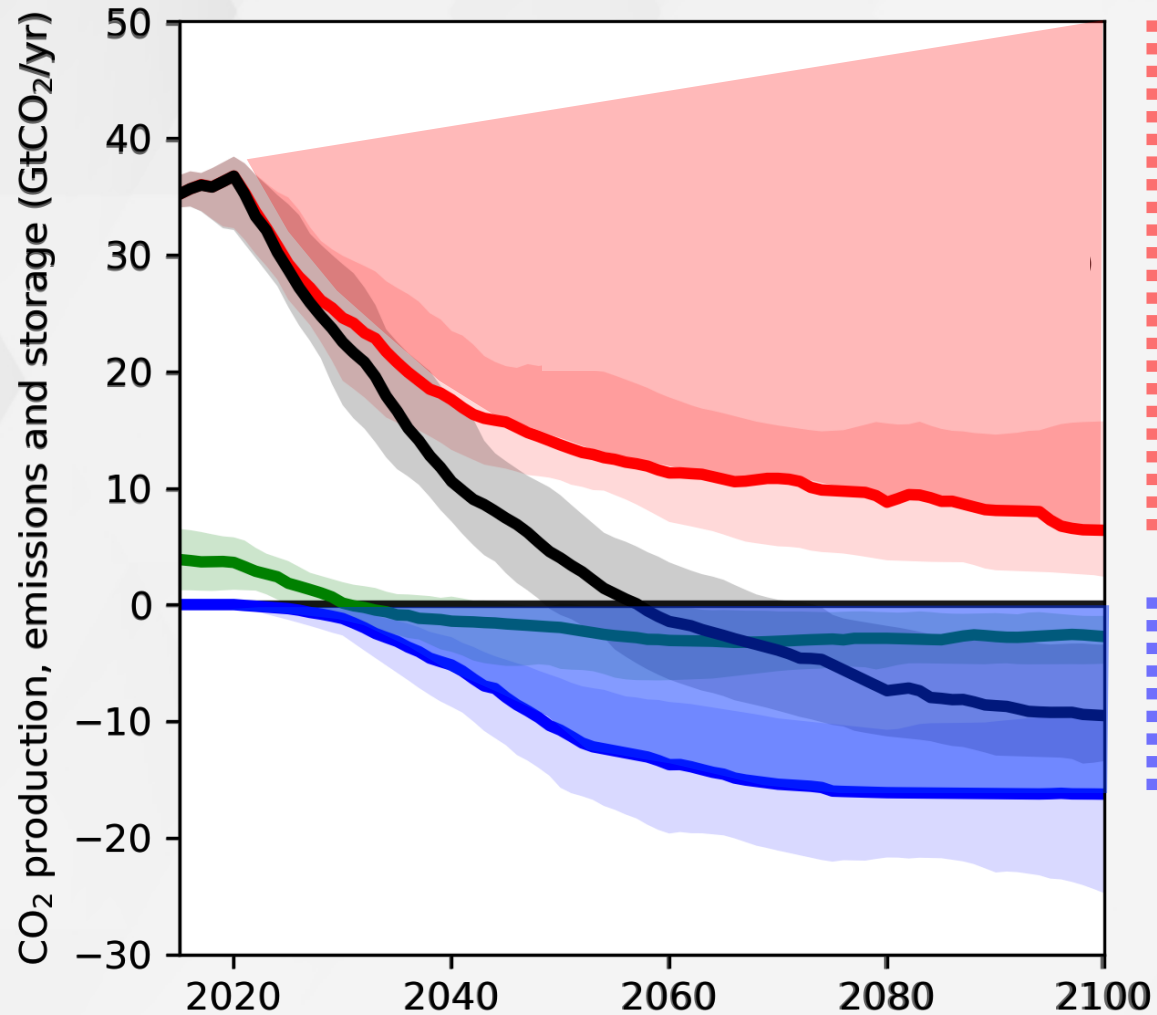
This is true, even if we drastically reduce emissions

And even if we electrify the grid

Industrial CO<sub>2</sub> production and storage in “technology neutral” 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database





## What should we prioritise in our climate strategies?

Majority of the focus will have to be reductions

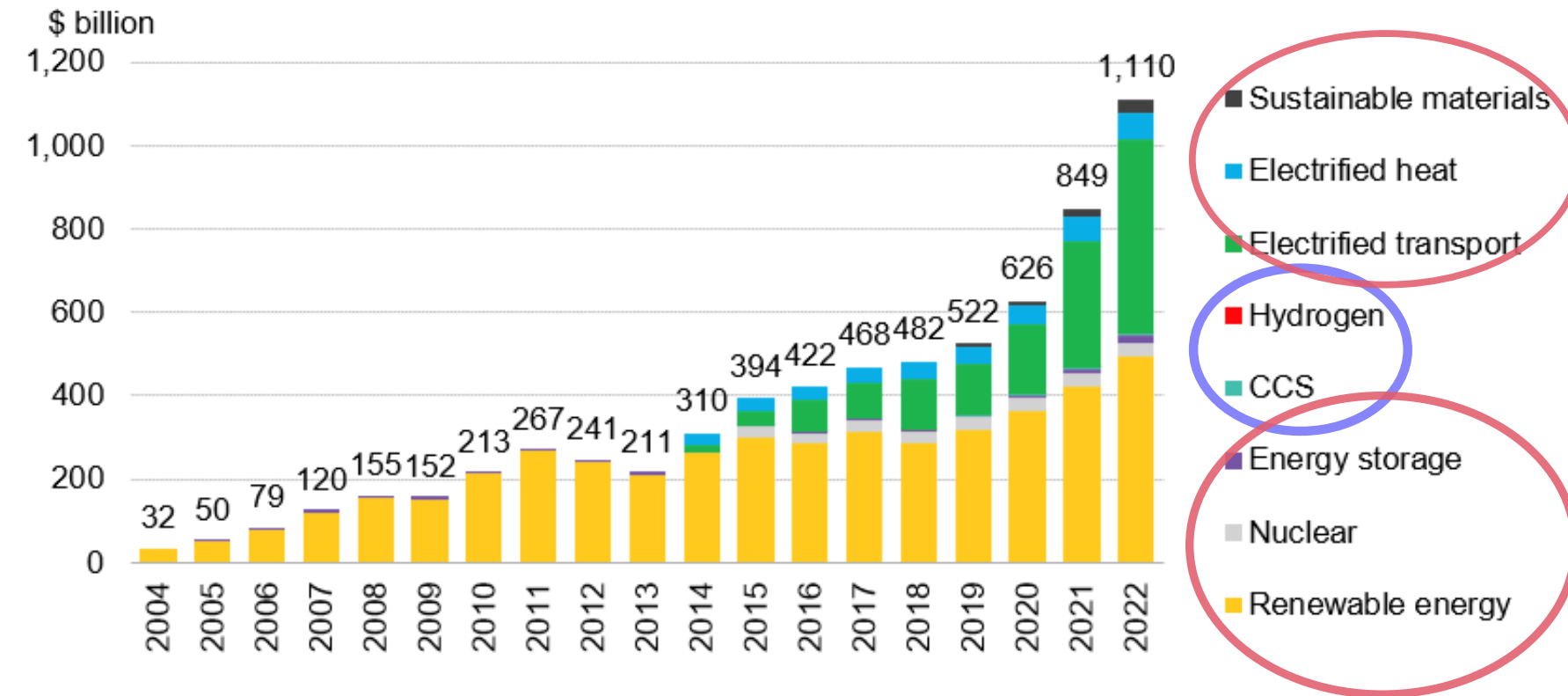
Nature restoration

But scaling carbon dioxide disposal is also a huge part of the solution

Industrial CO<sub>2</sub> production and storage in “technology neutral” 1.5°C scenarios

Source: Jenkins et al (2023) from IPCC database



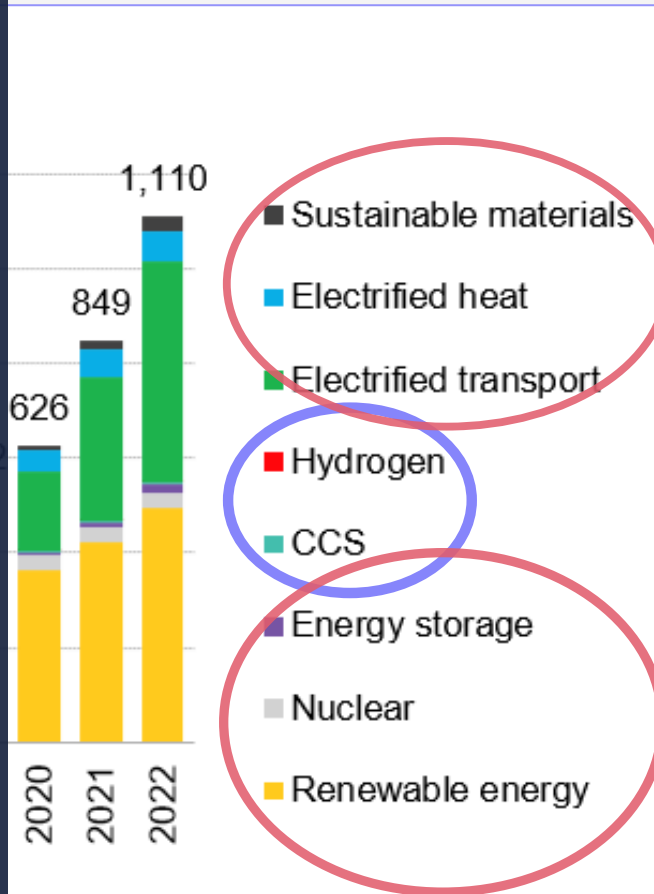
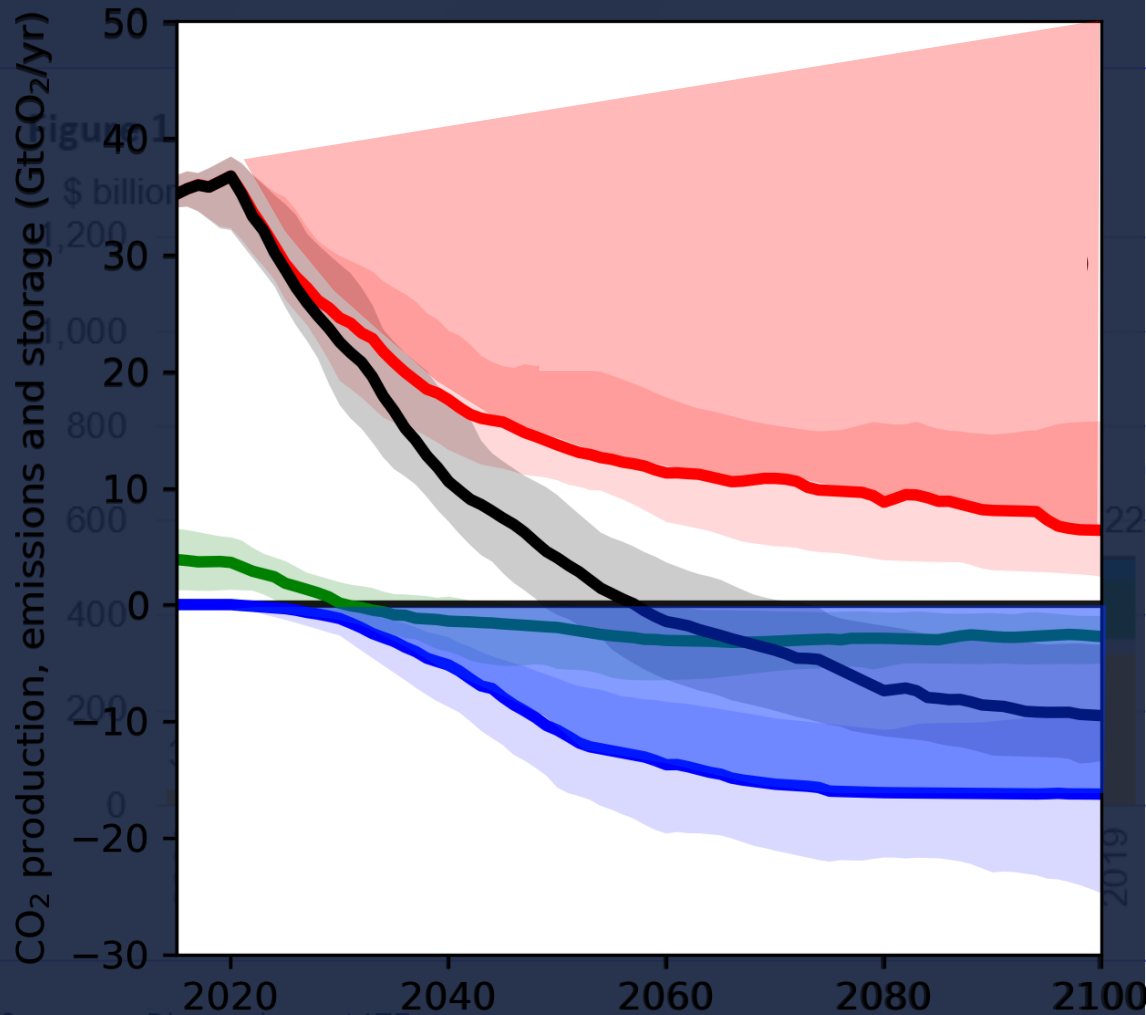
**Figure 1: Global investment in energy transition by sector**

**Investment relevant to reducing CO<sub>2</sub> production**

**Investment relevant to increasing CO<sub>2</sub> storage**

Source: BloombergNEF





Investment relevant to reducing CO<sub>2</sub> production

Investment relevant to increasing CO<sub>2</sub> storage

Source: BloombergNEF



**We Need Geological CO<sub>2</sub> Storage.**

**The BIG question:**

**How do we fund it?**



# Two kinds of money | two kinds of policy

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**Private Money**

Market mechanisms

**Public Money**

Subsidy & Public Funding



# Which one will help us build capacity?

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**Private Money**

Market mechanisms

**Public Money**

Subsidy & Public Funding



# Two kinds of money; two kinds of policy

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## Private Money

Market mechanisms

- **Carbon pricing** has been **ineffective** at supporting the near-term development of large-scale capital-intensive capture and storage (**Zakkour et. al., 2024**).
- **This is not news.** Short-comings were recognised early on (**Carbon Pricing Leadership Coalition, 2017**).



# Which one will help us build capacity?

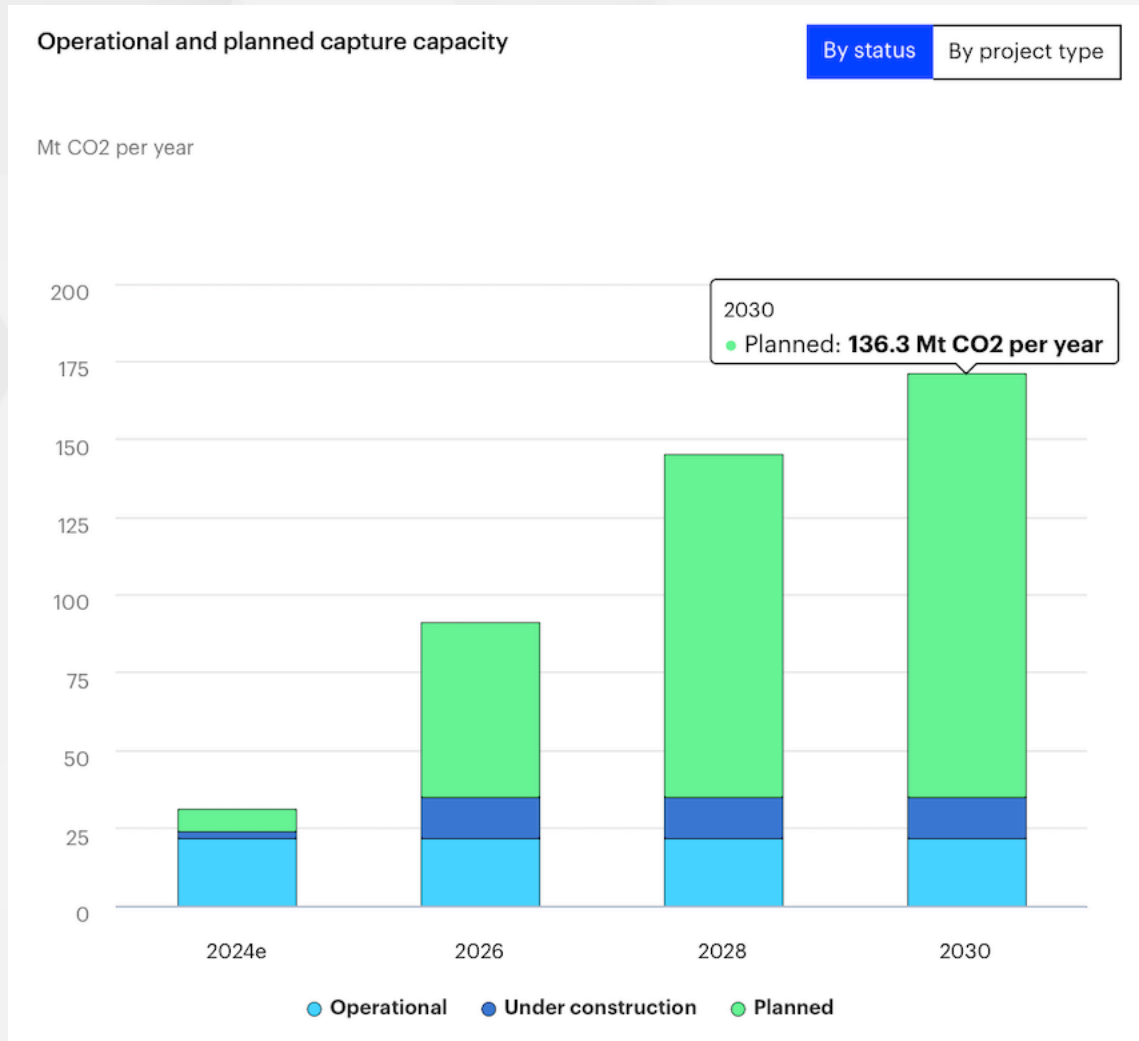
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- **The Inflation Reduction Act** and its **45Q tax credit** for carbon sequestration.
  - > High credit values
  - > Direct pay option
  - > Extended timelines

**Public Money**

**Subsidy & Public Funding**





- Global capacity of **50MT CO<sub>2</sub>/year** (US = **21.8MT**)
- 136MT CO<sub>2</sub>/year planned for 2030
- Total up to **171MT CO<sub>2</sub>/year by 2030**

A stylized globe with light green continents and a darker green background, centered behind the main text.

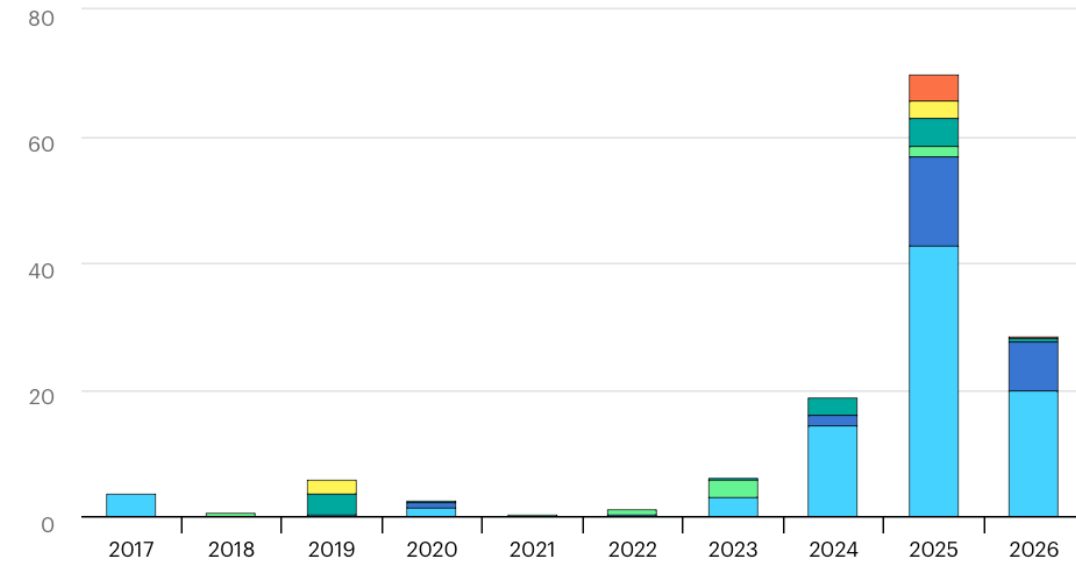
**The world is waking  
up to the need for CO<sub>2</sub>  
storage and disposal.**



Capacity additions for CO<sub>2</sub> capture projects by announced start date, 2017-2026

Open [↗](#)

Mt CO<sub>2</sub> per year

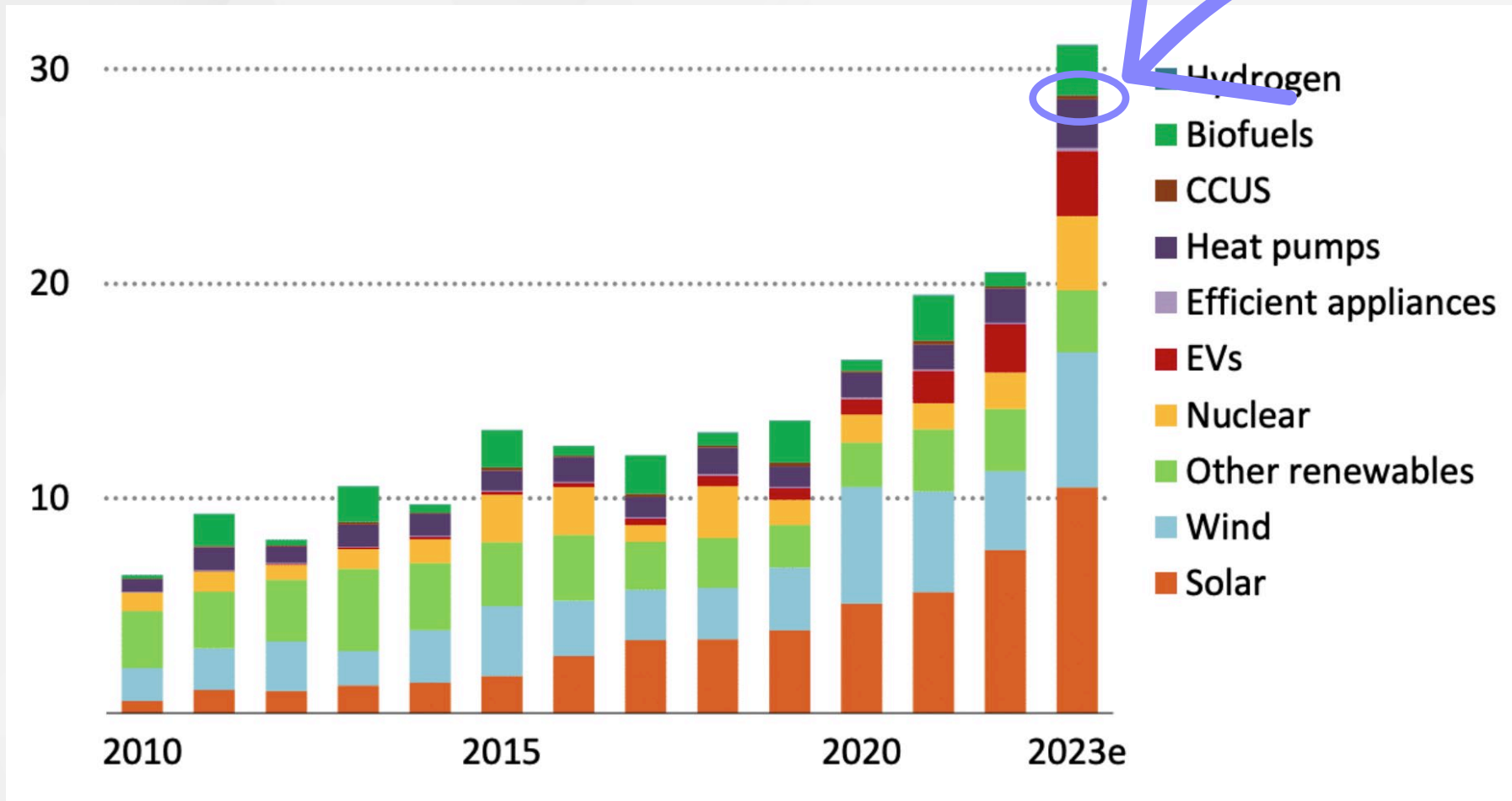


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● North America
 ● Europe
 ● China
 ● Asia Pacific
 ● Middle East
 ● Latin America
 ● Other

**Strong policy signals and new support schemes have triggered a rapid expansion in the project pipelines for low-emissions hydrogen and CCUS**





You can see it!

Source: IEA, Clean Technology Deployment Index



# Which one will help us build capacity?

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- **The Inflation Reduction Act** and its **45Q tax credit** for carbon sequestration.
  - > High credit values
  - > Direct pay option
  - > Extended timelines
  
- > **Same game. Whole new level.**


## Public Money

Subsidy & Public Funding



# Which one will help us build capacity?

---



**Public Money**

Subsidy & Public Funding

**FINANCIAL REVIEW**

Subsidy wars: Carbon capture cost adds up for fertiliser maker

afr.com May 22, 2024 - 4:15pm



# Which one will help us build capacity?

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## Downsides

- Not a finite source
- Subject to political change
- Public acceptance

**Public Money**

**Subsidy & Public Funding**



**Could there be a game changer?**

# **The Net Zero Industry Act**

# Article 18





# Quantifying and Deploying Responsible Negative Emissions

Assessing the realistic potential of Carbon Dioxide Removal and its contribution to achieving climate neutrality



## Project Partners





Entered into force on  
**June 29, 2024**

- **Focus on Strategic Net-Zero Technology Products Manufacturing Ecosystem**



Solar photovoltaic  
and solar thermal



Electrolysers  
and fuel cells



Onshore wind and  
offshore renewables



Heat pumps and  
geothermal energy



Sustainable  
biogas/  
biomethane



Batteries  
and storage



Carbon capture  
and storage



Grid technologies



- **Primary Objective:**

Improve the functioning of the internal market by establishing a Union-level framework that ensures the Union's access to a **“secure and sustainable supply of net-zero technologies”** (Article 1)

- **Supportive Regulatory Framework:**

- Cuts administrative red tape and
- Accelerates and simplifies permitting across the EU
- Increases planning and investment certainty.





- **Coupled with ambitious targets:**

EU aims to provide:

- at least **40%** of the **EU's annual deployment needs** for strategic net-zero technologies.
- At least **15% of global market share by 2050.**





## EU NET-ZERO INDUSTRY ACT: MAKING THE EU THE HOME OF CLEAN TECH INDUSTRIES

- **Security is at the heart of the NZIA:**

**Aim:** reduce and prevent strategic dependencies that could hinder access to essential technologies and components required for the transition to a greener economy.

- Russia and Ukraine
- China's net zero manufacturing capacity; dominance in supply of renewables and critical minerals

> the US Inflation Reduction Act



# Storage Injection Capacity

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**Article 16:** Sets a goal for the EU to achieve an annual CO<sub>2</sub> injection capacity of 50 million tonnes by 2030, excluding sites used for Enhanced Hydrocarbon Recovery.

**Article 17:** Requires Member States to publicly disclose data on potential CO<sub>2</sub> storage sites, ensuring transparency and aiding CCS project planning.

**Article 17a:** Mandates the development of CO<sub>2</sub> transport infrastructure, including cross-border facilities, considering economic and environmental benefits.

**Article 18:** Introduces an obligation on oil and gas producers. Any entity engaged in the production of oil and gas within the territory of the Union must provide an individual contribution to the Union wide target of 50mt of CO<sub>2</sub> injection capacity by 2030

**Article 18a:** Establishes a regulatory framework for the CO<sub>2</sub> market, with the possibility of legislative action to address issues, especially for hard-to-abate emissions.





# A New Kind of Mandate Policy

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## What is the significance of Article 18?

### 1. First Legislated Climate-Focussed Fossil-Fuel Sector Mandate

Article 18 marks the first successful legislative agreement to introduce a climate-focused mandate on a wide group of fossil fuel producers.

### 2. First legislated inclusion of Penalties on Fossil-Fuel Sector for Non-Compliance

*“Effective, proportionate and dissuasive”* -- the legislation mandates penalties by Member States on oil and gas entities for non-compliance with their injection capacity obligations.

### 3. First Injection Capacity Obligation

The ICO introduces a novel subject of obligated demand, a sector-specific mandate for CO<sub>2</sub> injection capacity.



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# Why Now?

## ETS Damage Control

- **Carbon price policy mechanisms have proven ineffective. (Zakkour et. al., 2024).**
- **The EU ETS failure to scale the CCS value chain was acutely felt:** its scaling geological storage and carbon transport was flagged as a key issue affecting the CCS value chain, blocking CCS technology scale up **(European Commission, 2023a).**
- **The US subsidy model is not suitable for Europe, its Single Market Mechanism, and runs the risk of market distortion.**



# Defining Features

---

- **It's temporary**

A “Band-aid Obligation”. Designed to accompany the ETS.

- **It's grounded in ability**

Similarities between the ICO and the U.S. Defense Production Act (DPA)

- **Potential Consequences**

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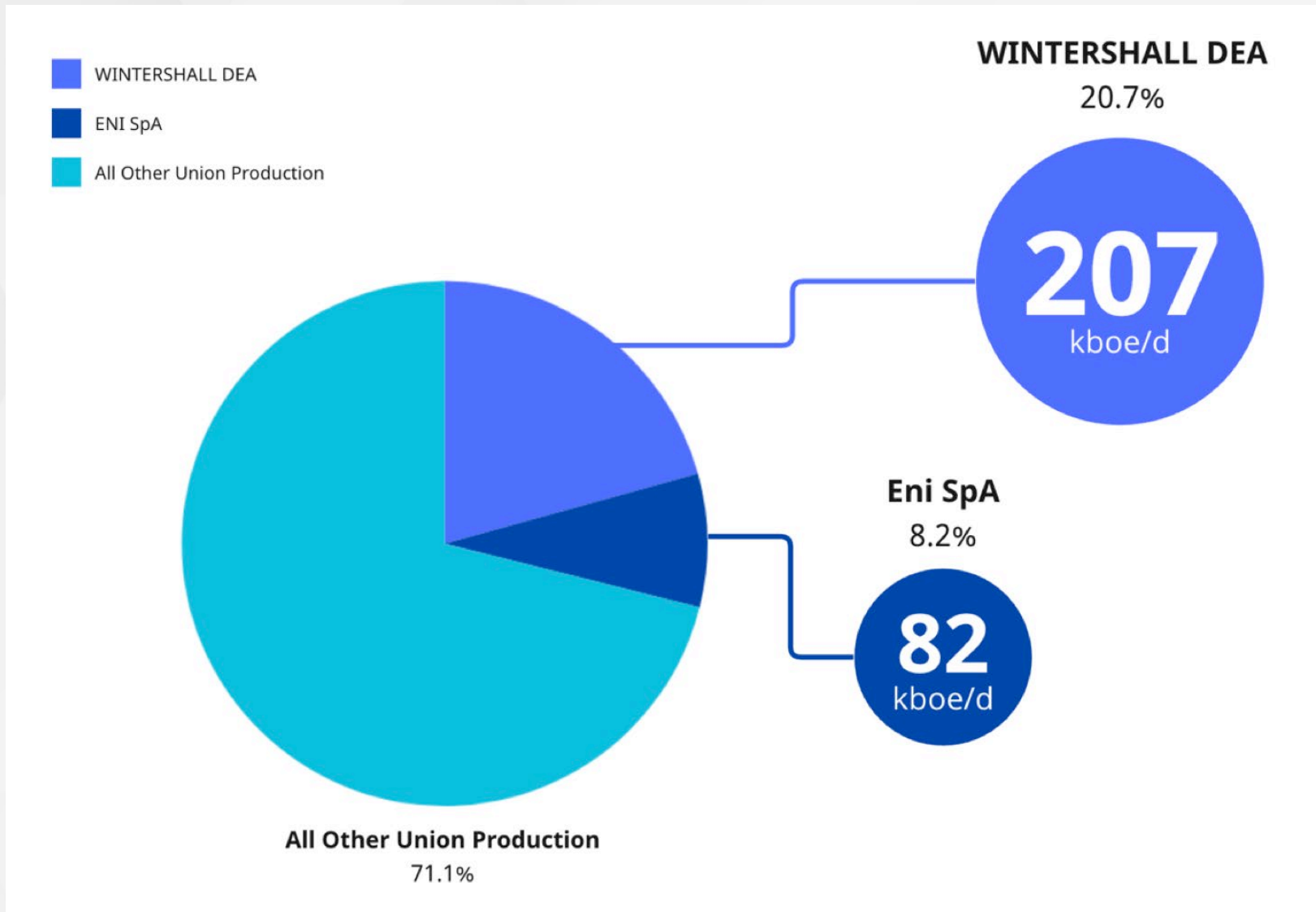
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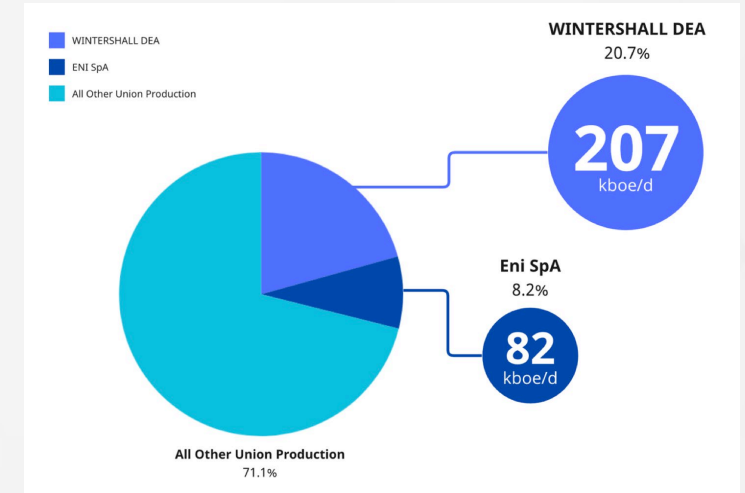
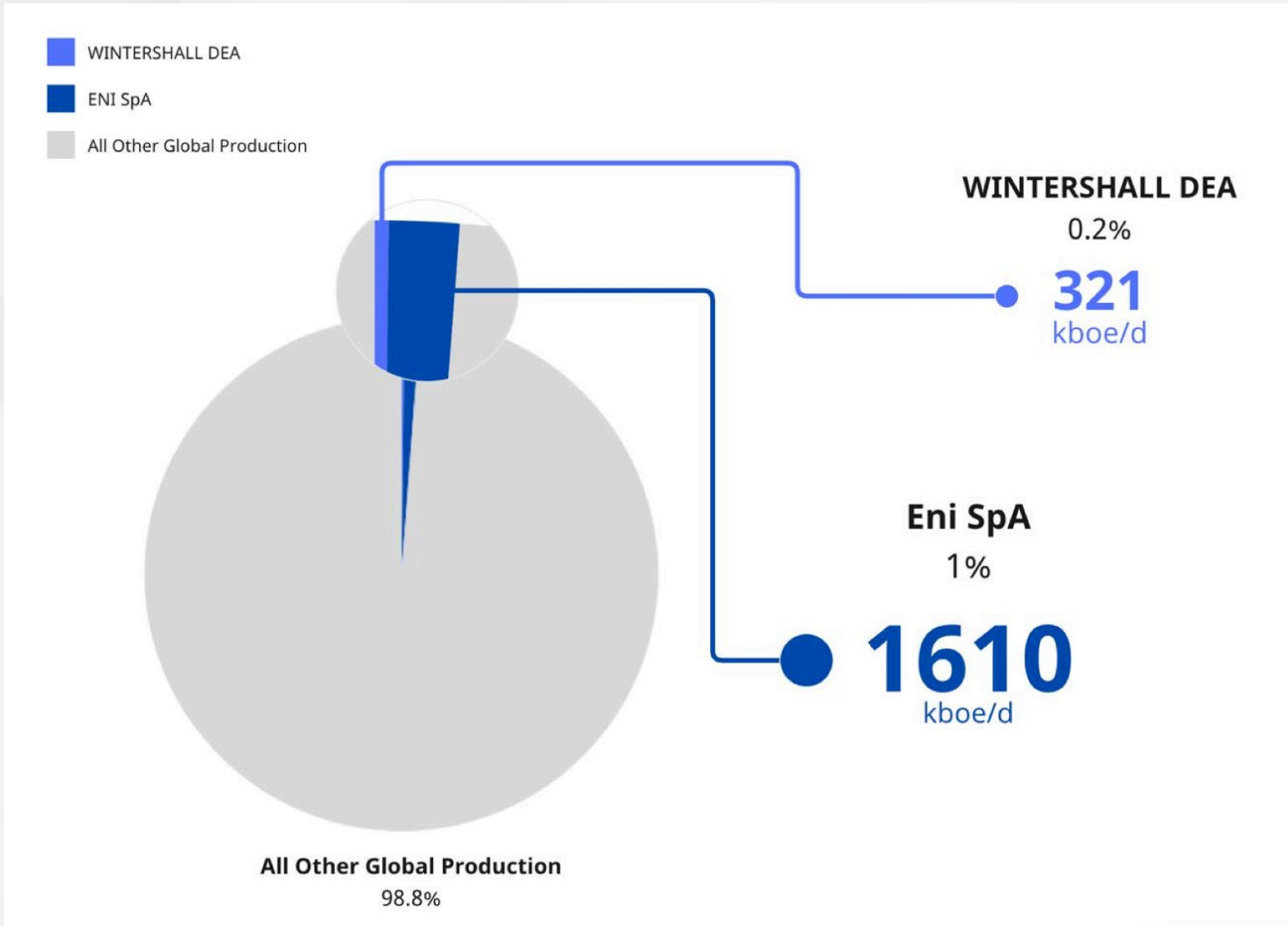




European Union Production of Oil and Gas 2022: Wintershall DEA, and Eni SpA

Source: Evatt et al, NEGEM, (2024)





Global Production of Oil and Gas 2022: Wintershall DEA, and Eni SpA

Source: Evatt et al, NEGEM, (2024)



**Lessons for Australia?**



# ~~Lessons for Australia~~



**Because we've done  
this before**



# Renewable Energy Target

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# Renewable Energy Target

## A mandate policy

**2001:**

*Mandatory Renewable Energy Target.*

The Renewable Energy Target (RET) is an Australian Government scheme that aims to reduce greenhouse gas emissions in the electricity sector and increase renewable electricity generation. The RET sets a target to deliver an extra 33,000 gigawatt-hours (GWh) of electricity from renewable sources every year from 2020 to 2030.

The RET creates a market to incentivise the generation and use of renewable energy. This supports the transition towards a more sustainable and less carbon-intensive energy system.



### Key point:

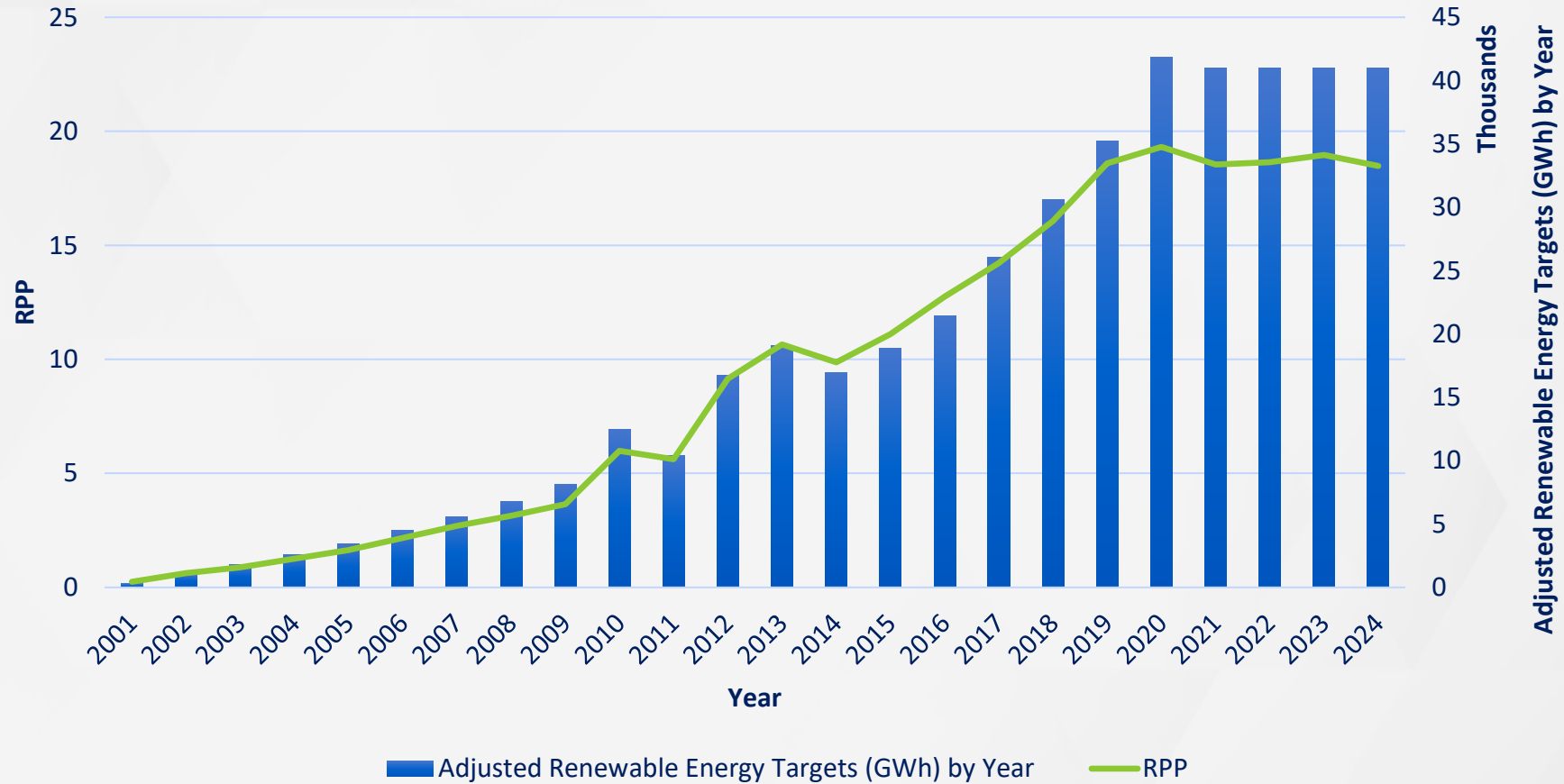
A RET-liable entities **MUST** purchase a certain percentage (Renewable Power Percentage) of their electricity from renewable sources each year.

### Mandated activity

Source: Clean Energy Regulator, Australian Government, 2024.



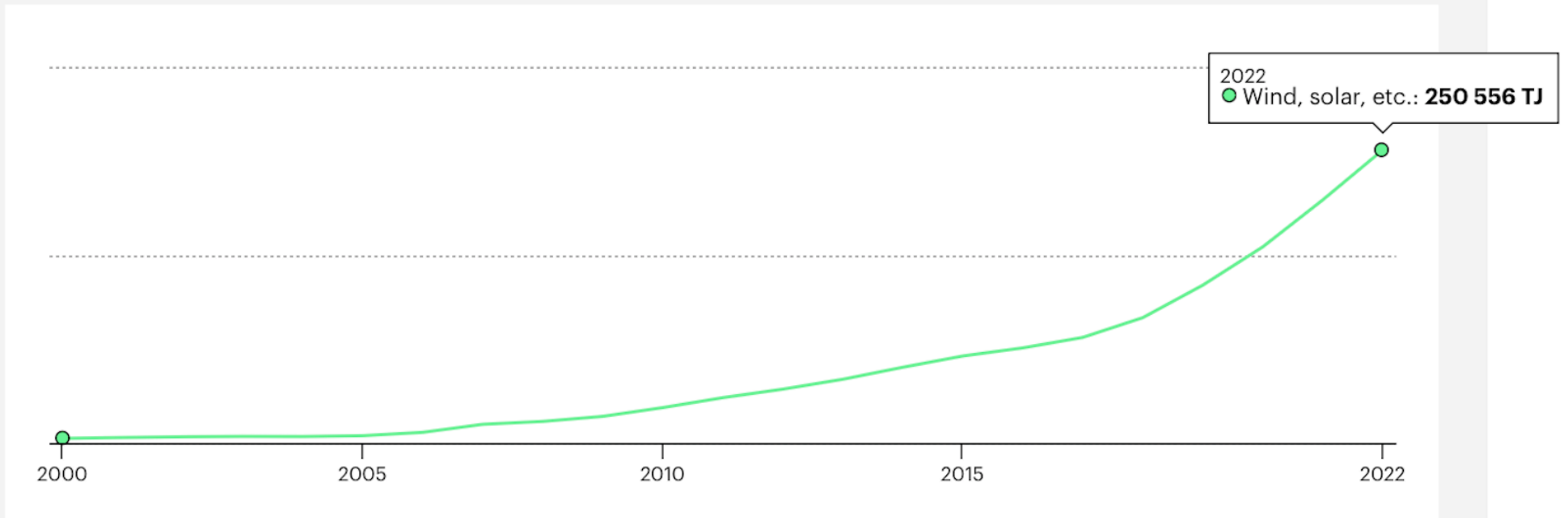
## Renewable Power Percentage (RPP) and Adjusted Renewable Energy Targets (GWh) by Year



Source: Inputs from Clean Energy Regulator, Australian Government, 2024



# Has it worked?



Source: IEA, Evolution of total energy supply in Australia since 2000



# What about something closer to home?



# WA Domestic Gas Policy





# WA Domestic Gas Policy

## A mandate policy

- The WA Domestic Gas Policy mandates that liquefied natural gas (LNG) export projects in Western Australia must reserve a portion of their gas production -- 15% -- for the domestic market to ensure a stable and affordable local gas supply.
- Seen as necessary to ensure the WA's domestic gas requirements
- Safeguards WA's energy security.
- **Has it worked?** You tell me.



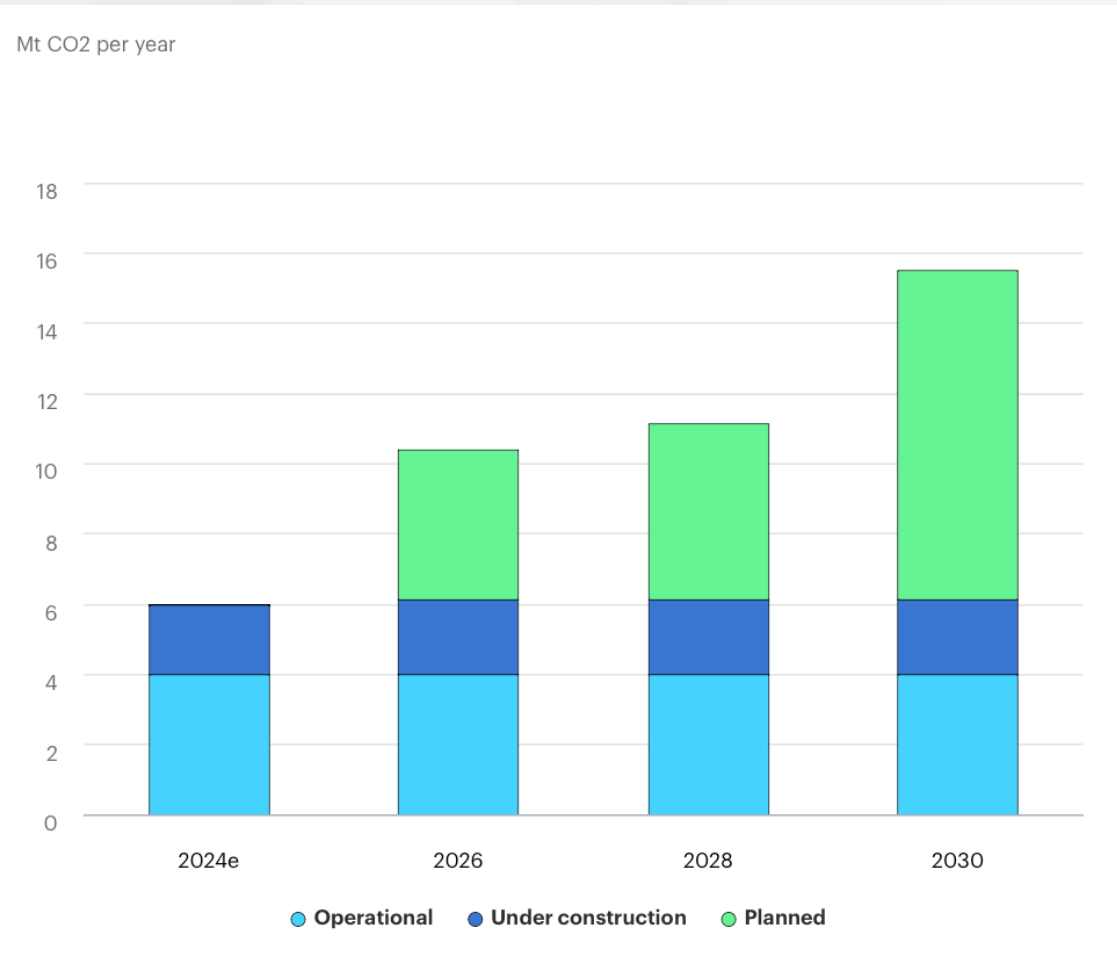


## Could a similar mandate policy help get Australia really going on CCS?

“We want to be able to demonstrate that without subsidies without support, we can build cost competitive economic CCS projects in this region, and hopefully it will kickstart government policy and industry engagement into Australia’s CCS opportunity, in which we think we have a very strong competitive advantage globally and particularly regionally,” Mr Gallagher said.



## Australia

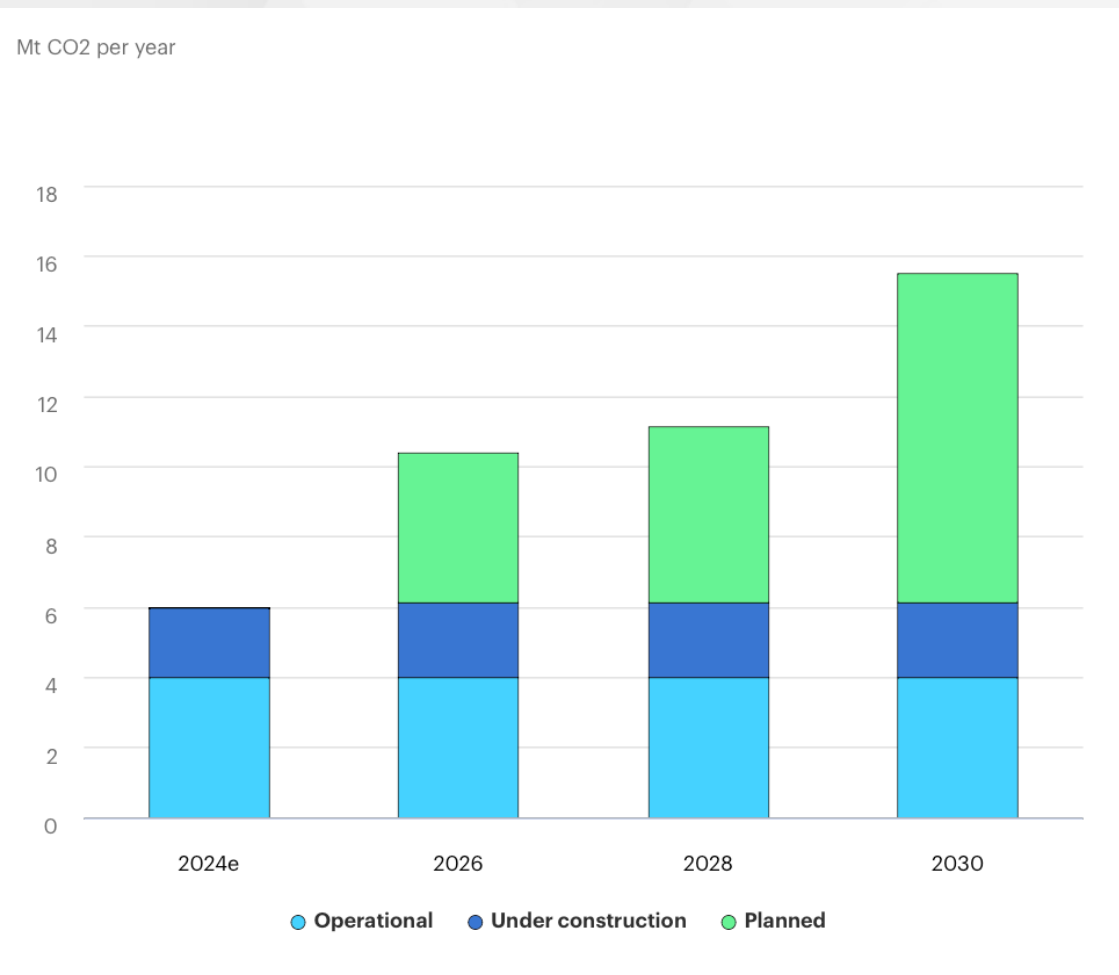


### Operational and planned capture capacity

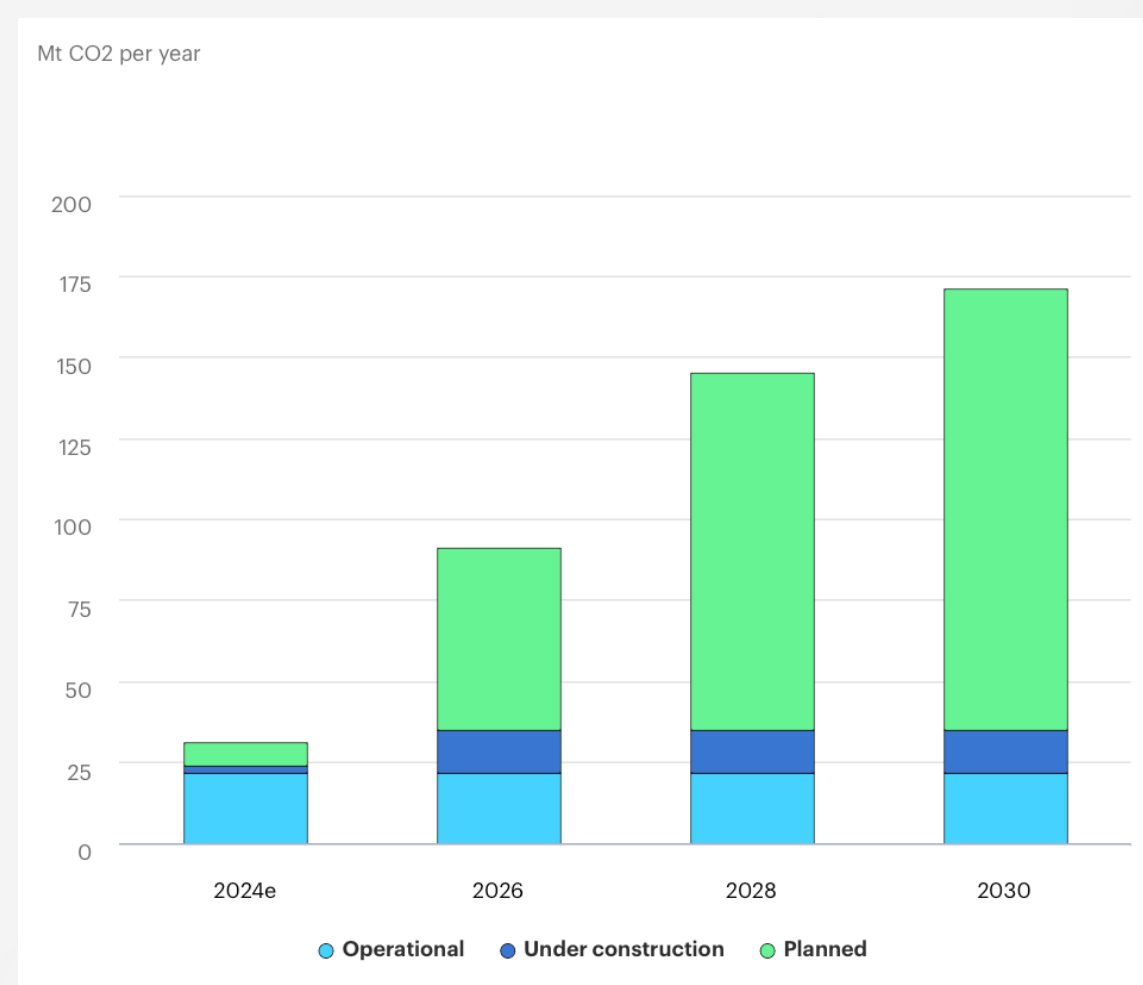
Source: IEA, World Energy Investment 2023 Overview and key findings



## Australia



## United States

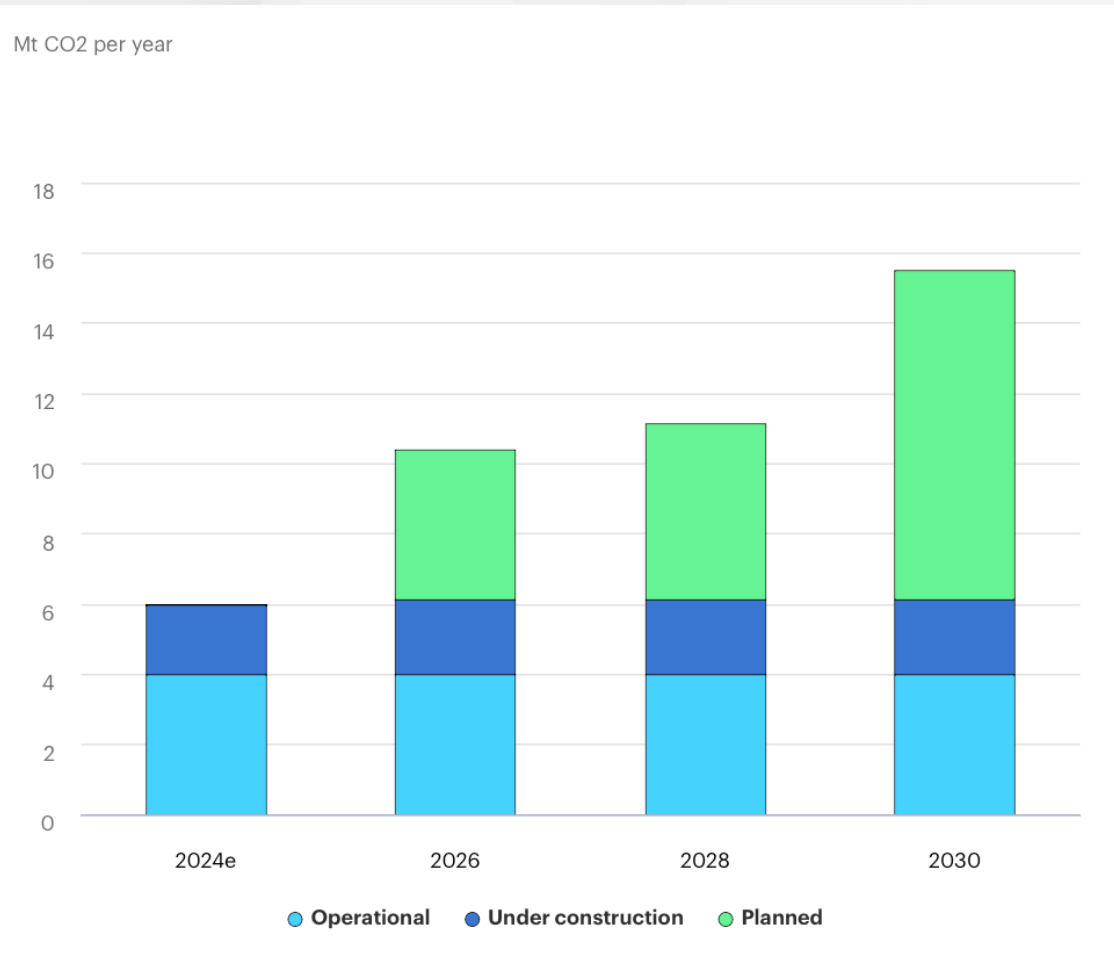


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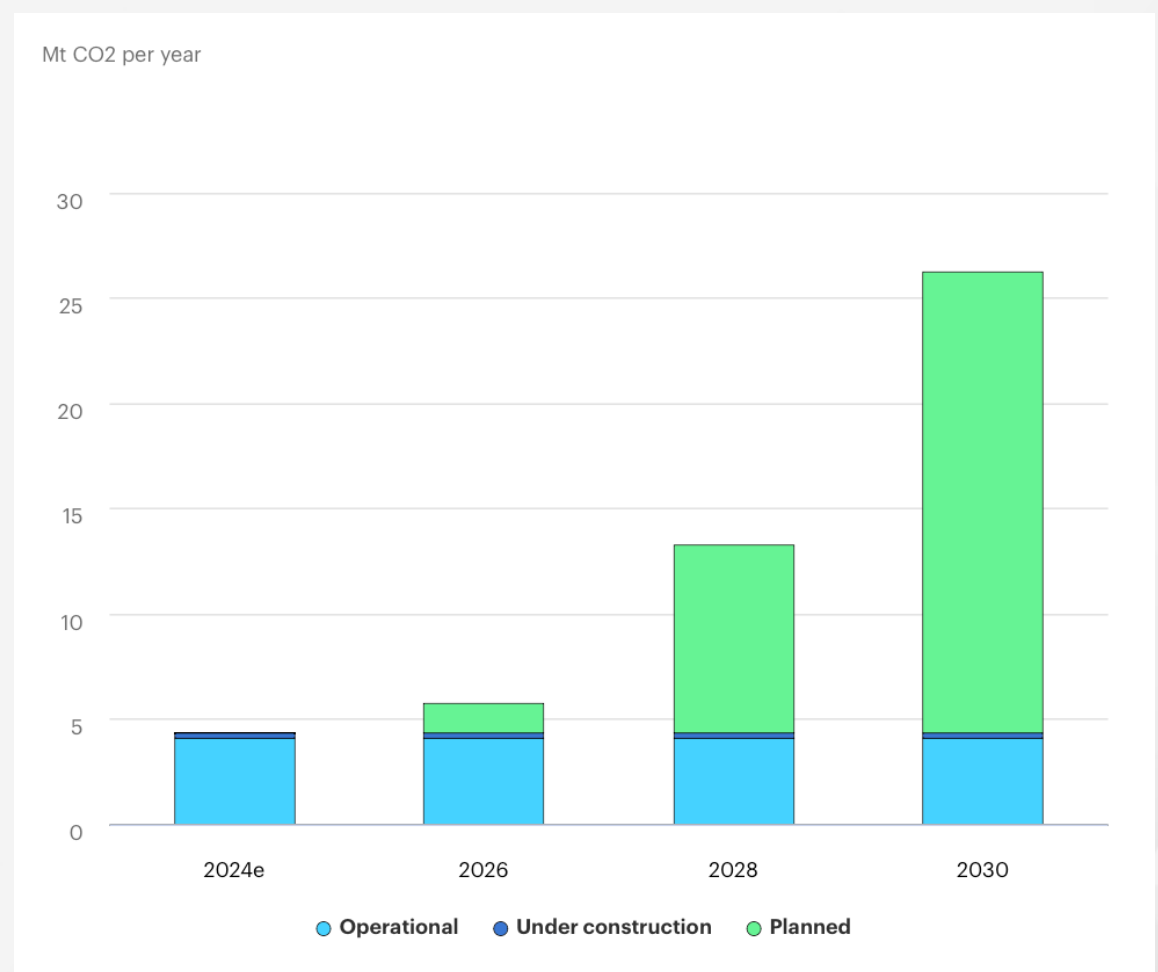
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## Australia



## Canada

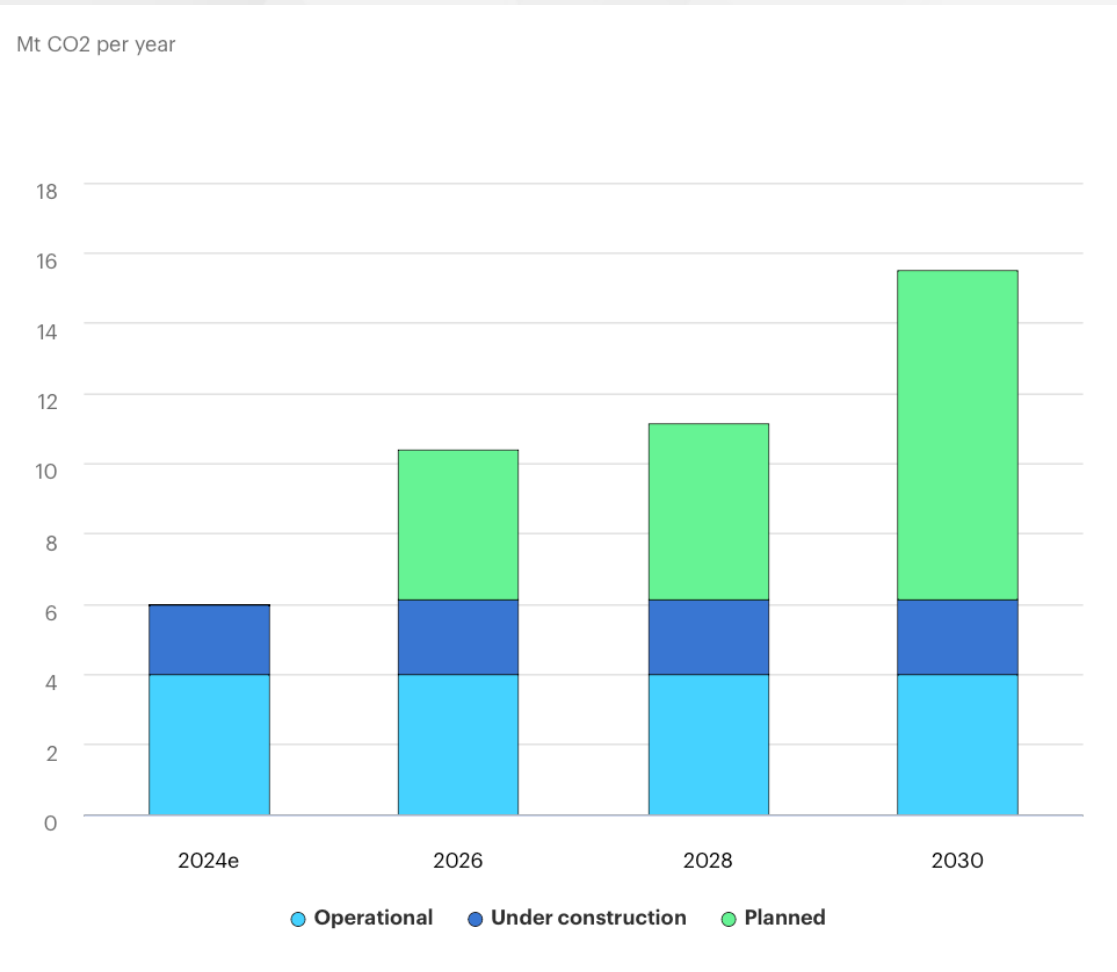


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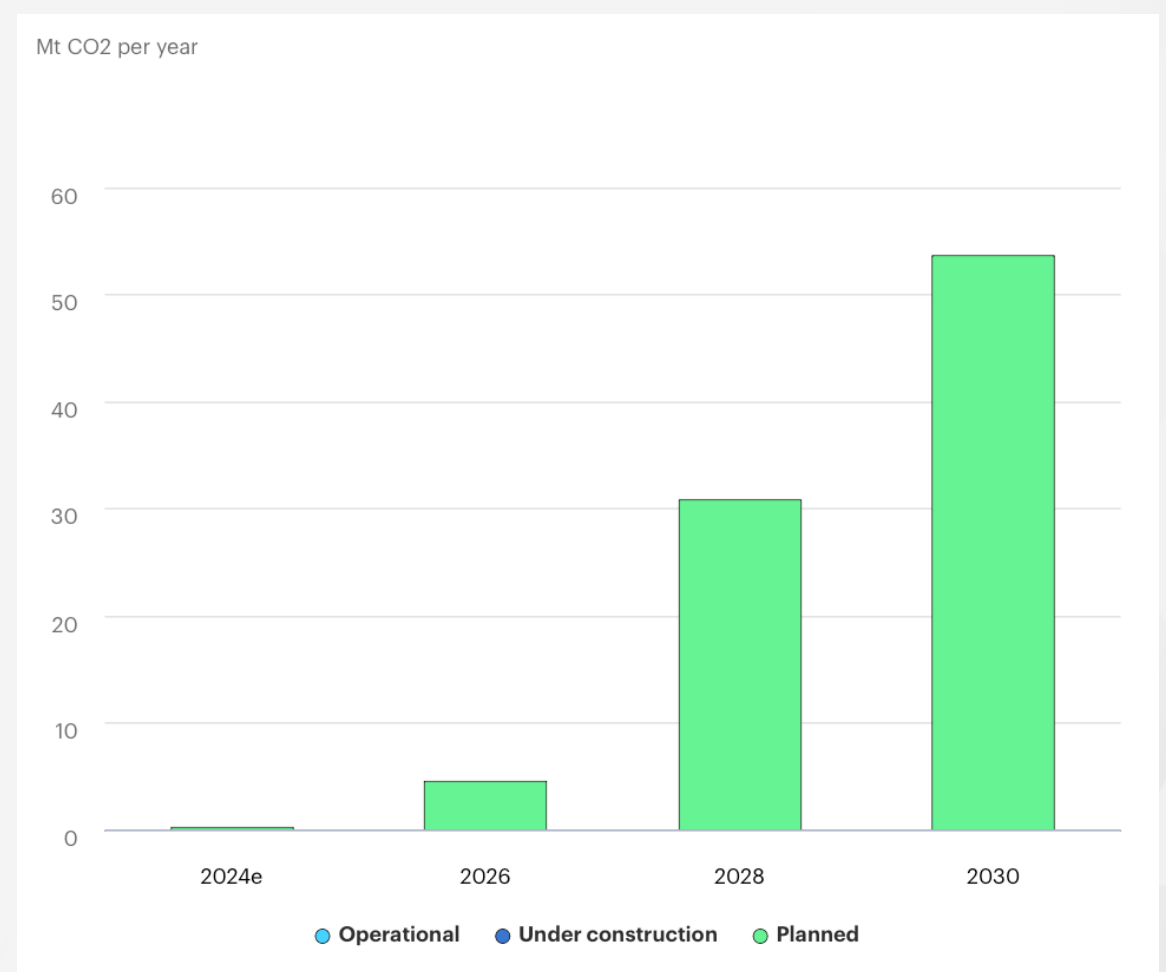
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## Australia



## United Kingdom

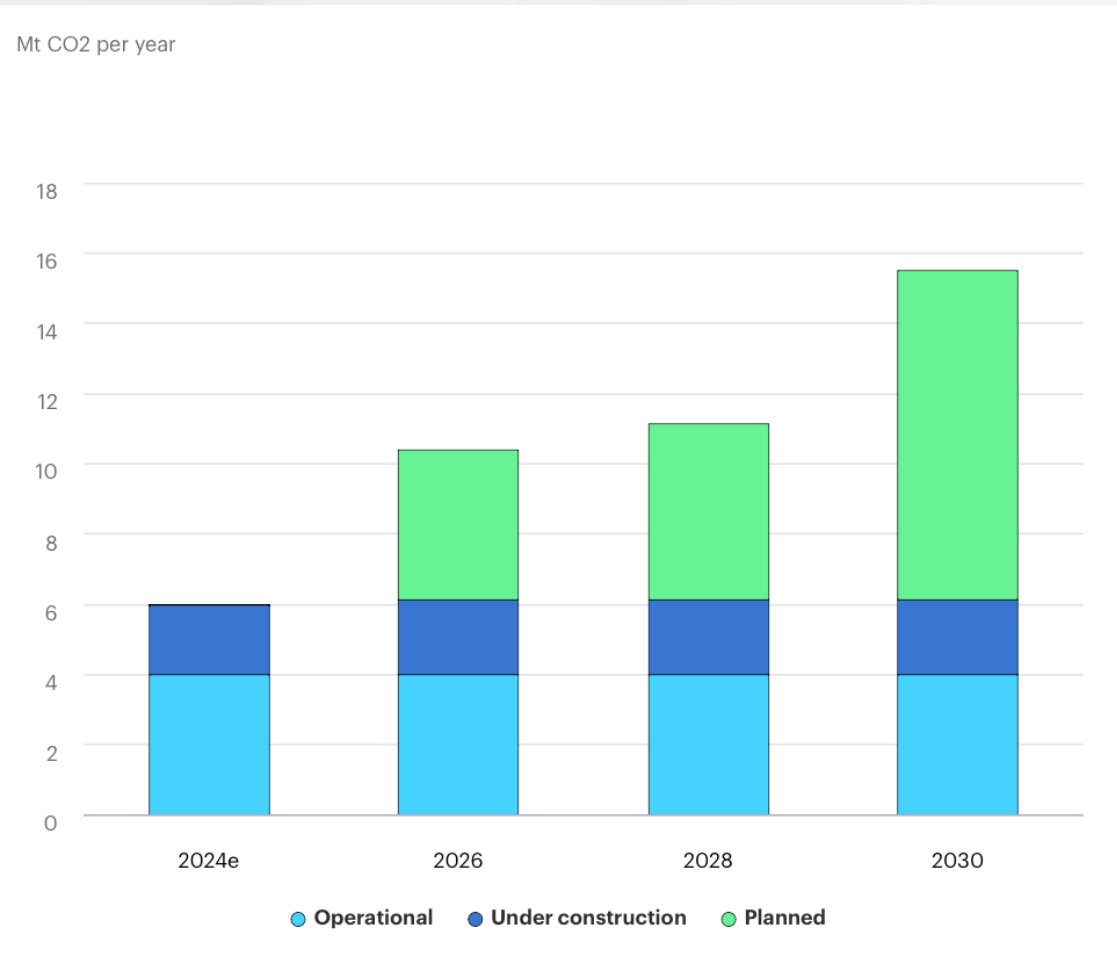


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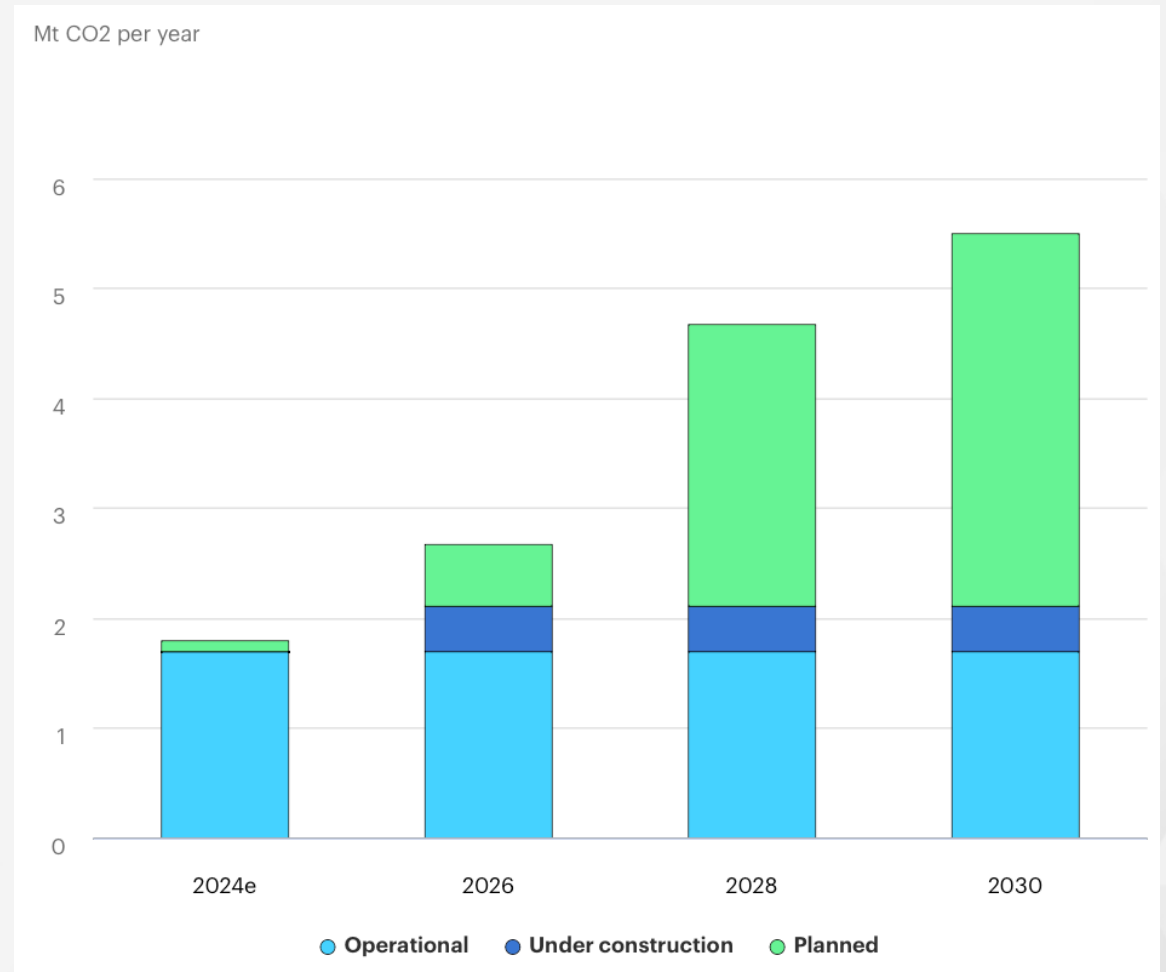
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## Australia



## Norway

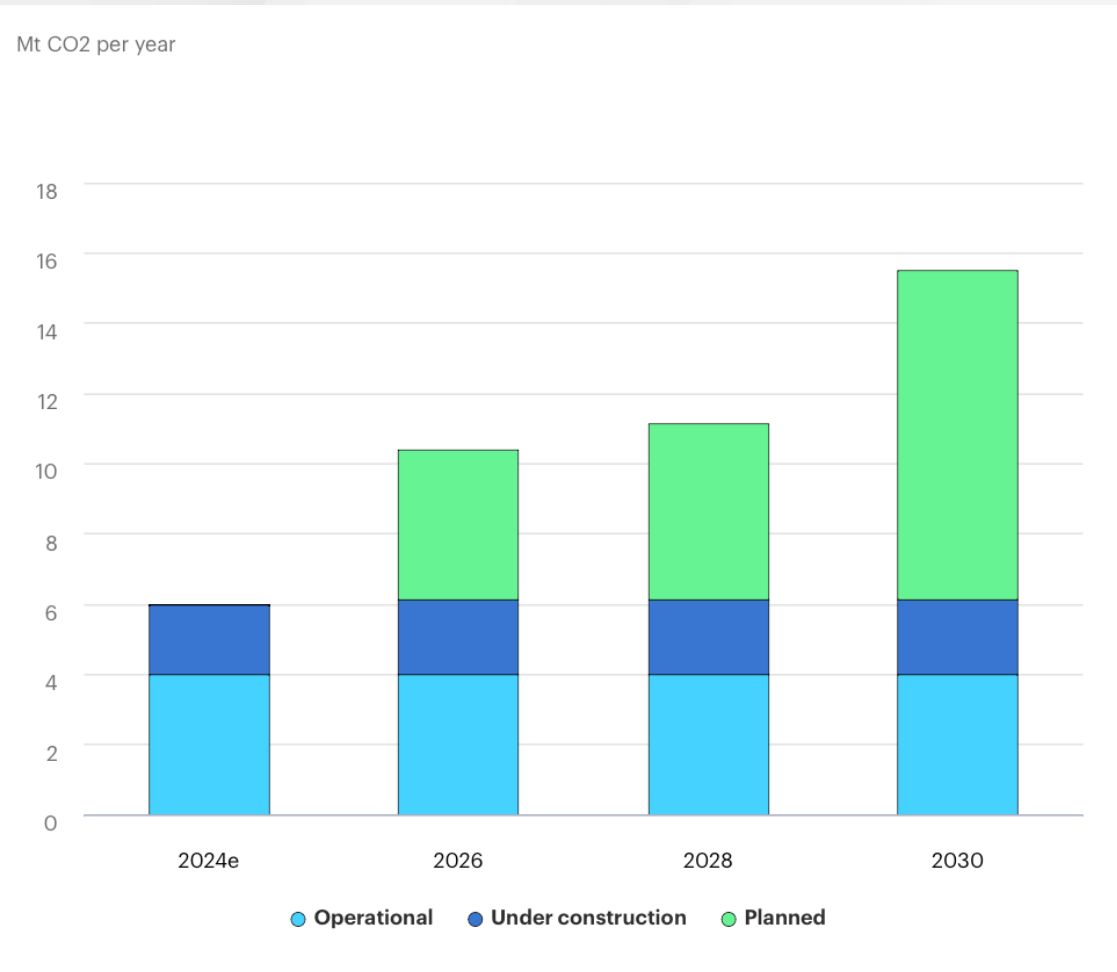


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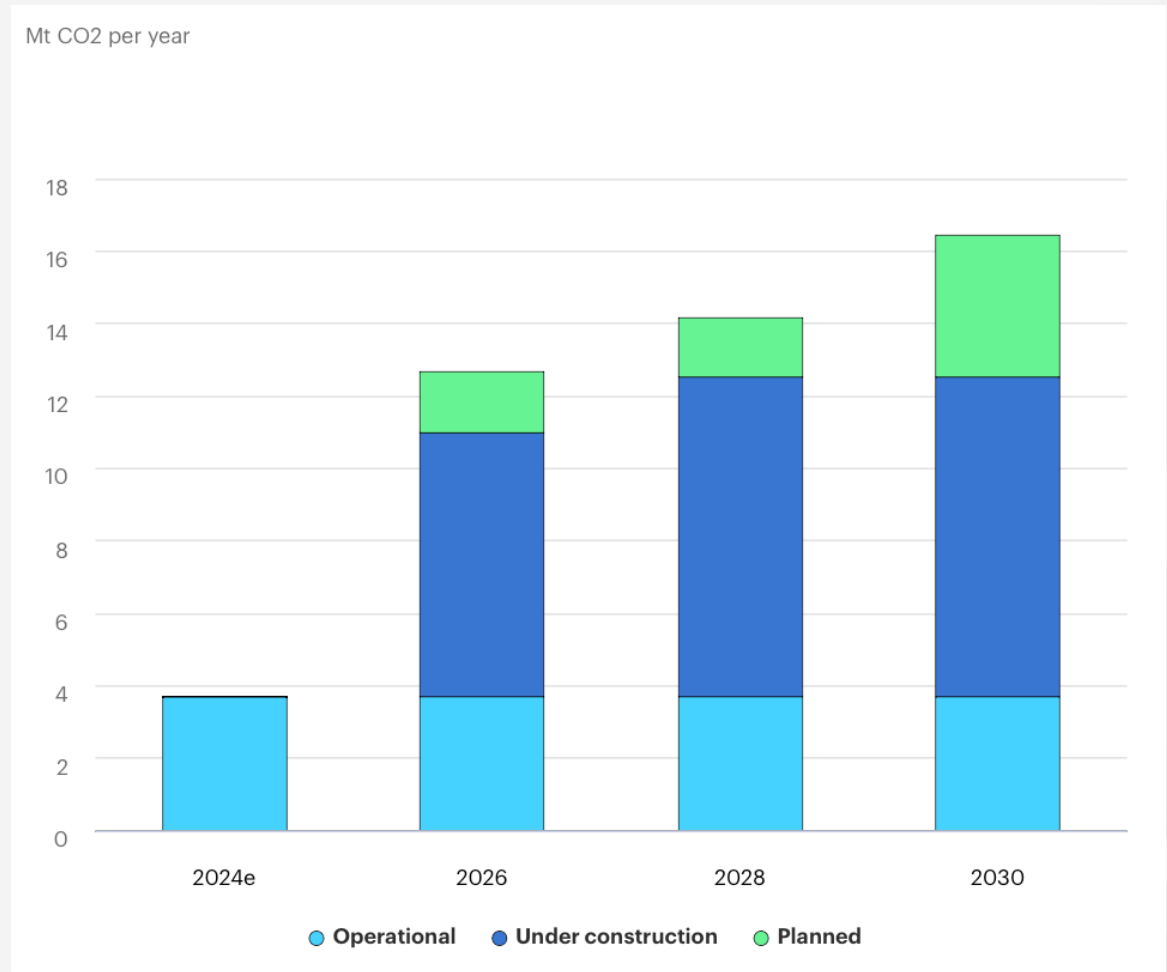
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## Australia



## Middle East



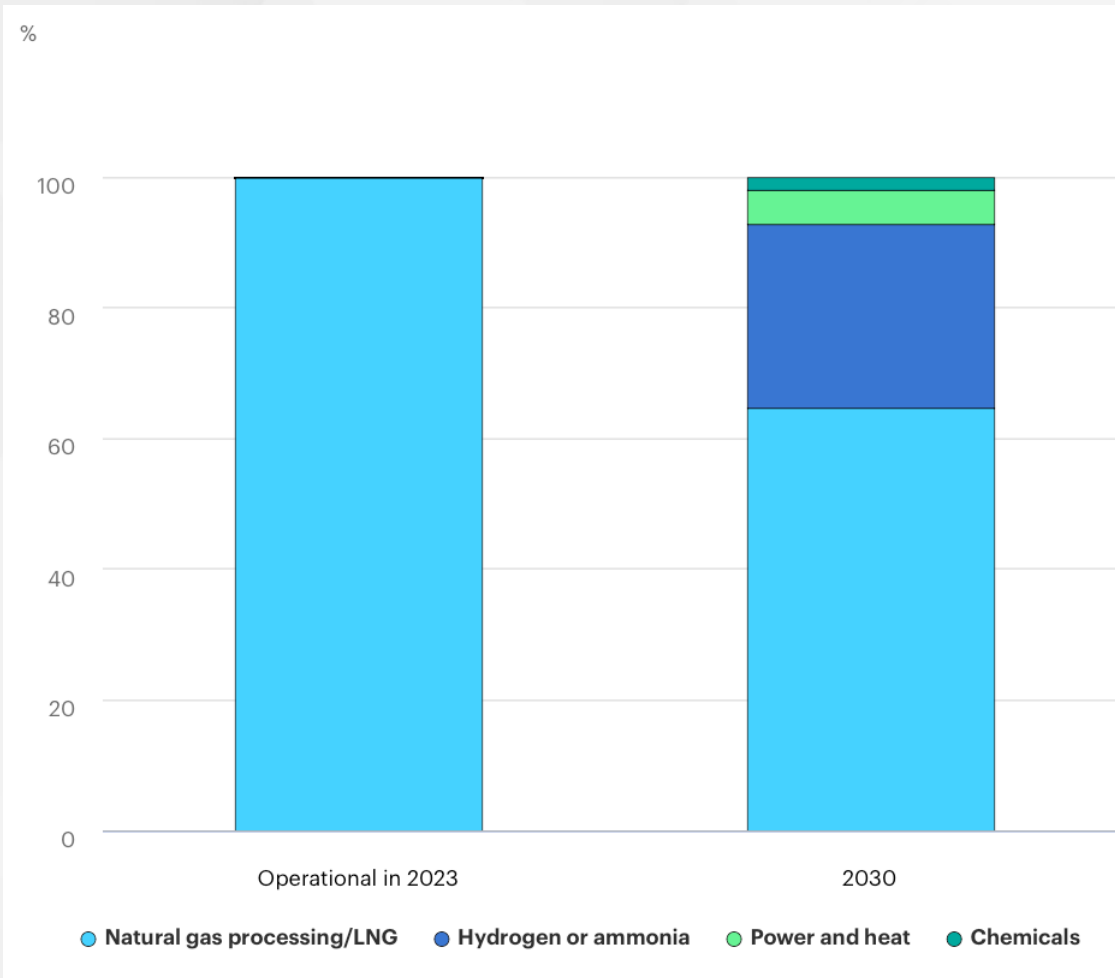
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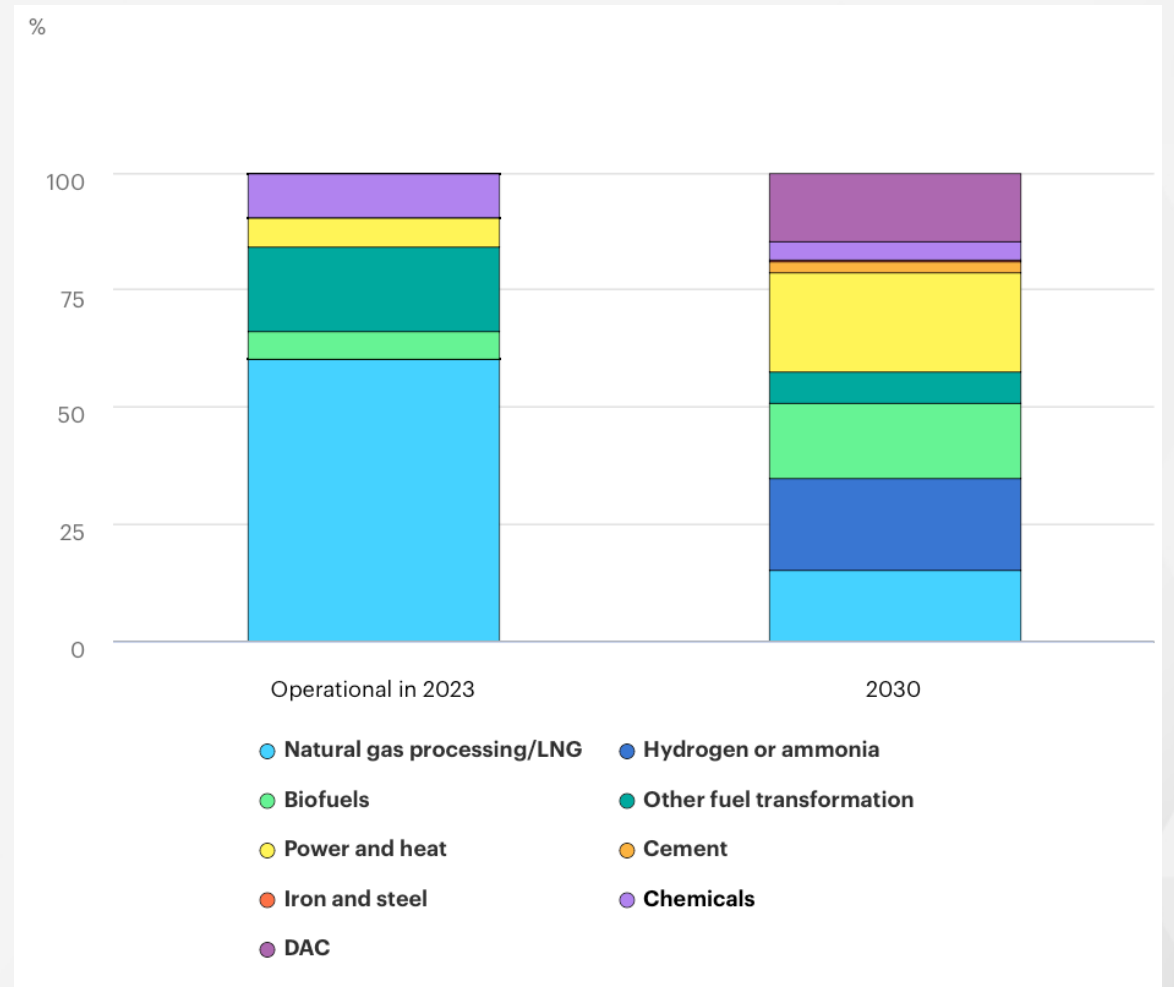




## Australia



## United States



### Operational and planned capture capacity

Source: IEA, World Energy Investment 2023 Overview and key findings



**Private Money**

Market mechanisms

**Mandates**

**Public Money**

Subsidy & Public Funding



**The pitch:**

**Should we mandate the scale up of  
the CCS value chain in Australia?**



## Prepared by Dr. Alice Evatt

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