CCUS in Clean Energy Transitions

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YEF CCUS workshop, 11 December 2020

International Energy Agency

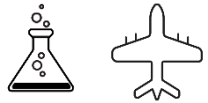
Carbon capture, utilisation and storage: an overview

Capture

Capturing CO_2 from fossil or biomass-fuelled power stations, industrial facilities, or directly from the air.

Use

Using captured CO_2 as an input or feedstock to create products or services.



Transport

Moving compressed CO_2 by ship or pipeline from the point of capture to the point of use or storage.

Storage

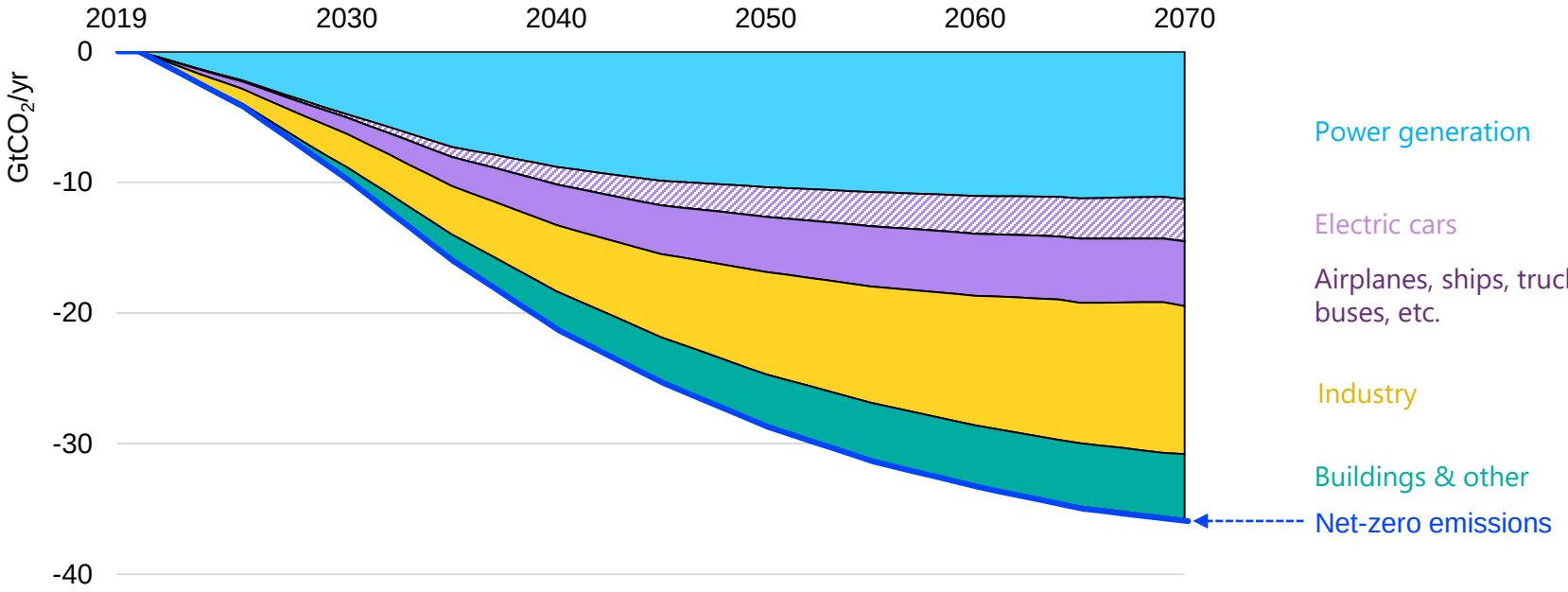
Permanently storing CO_2 in underground geological formations, onshore or offshore.

A new dawn for CCUS

- Stronger investment incentives and climate targets are building new momentum behind CCUS:
  - More than 30 new projects announced recently
  - Governments and industry have committed USD 4.5 billion in 2020
- CCUS can contribute to emissions reductions across the energy system, with **four strategic roles**:
  - Tackling emissions from existing energy assets;
  - A platform for low-carbon hydrogen production;
  - A solution for the most challenging emissions in sectors such as heavy industry & aviation; and
  - Removing carbon from the atmosphere

CCUS is part of a portfolio of technologies for net zero

Global CO_2 emissions reductions in the Sustainable Development Scenario, relative to baseline trends



Clean energy technology progress in the power sector and with electric cars is encouraging, but alone not sufficient to reach climate goals. A broad portfolio of technologies will be needed for a transition to net-zero emissions.

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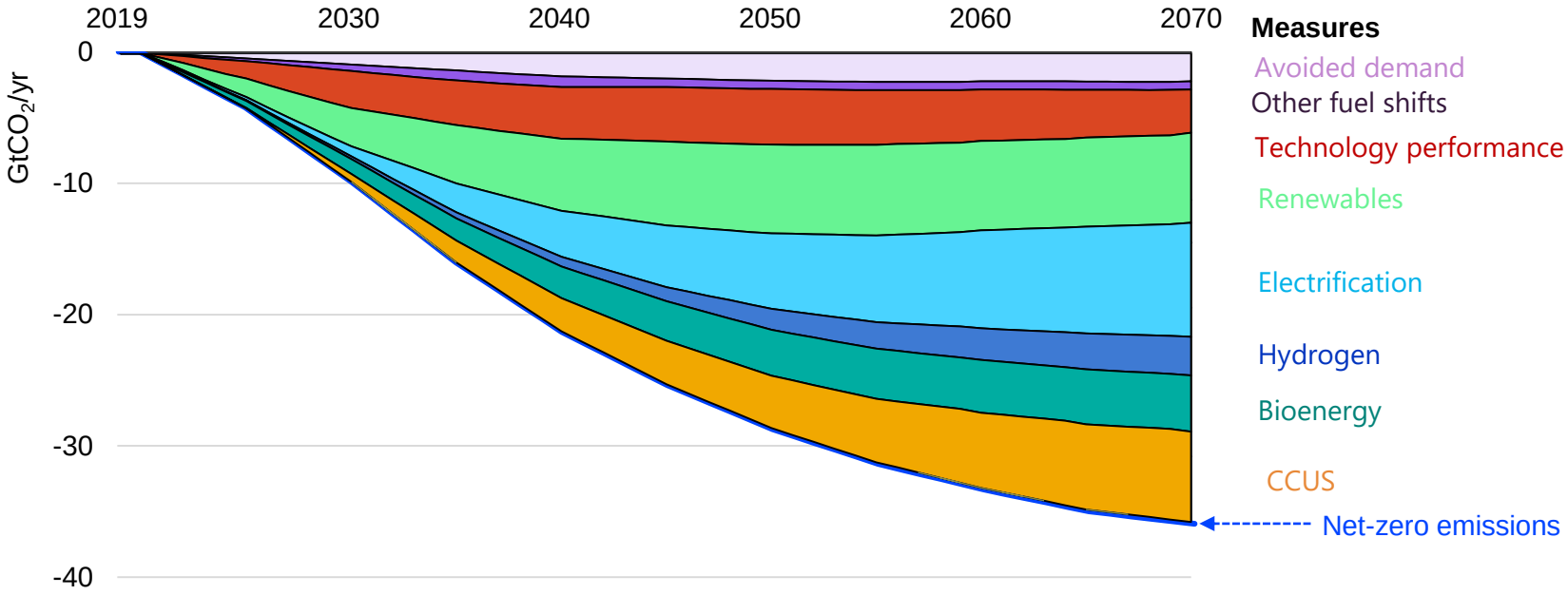

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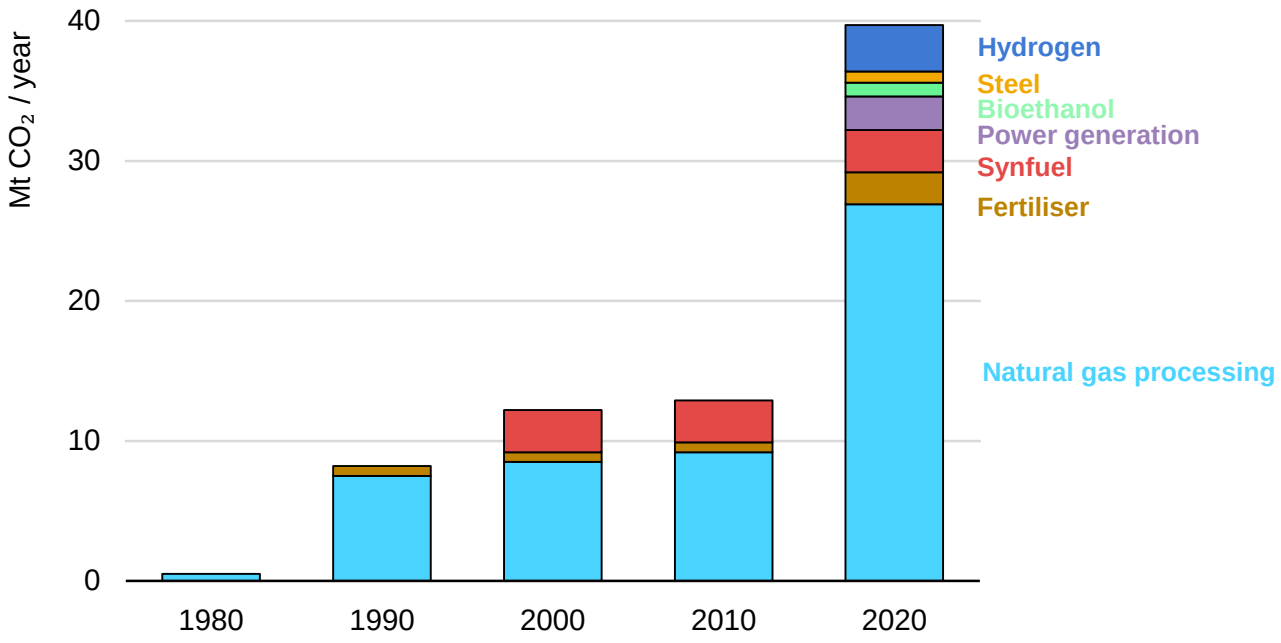

Carbon capture facilities have been operating since the 1970s and 1980s

Source: IEA analysis based on GCCSI (2020), Facilities Database, https://co2re.co/FacilityData.

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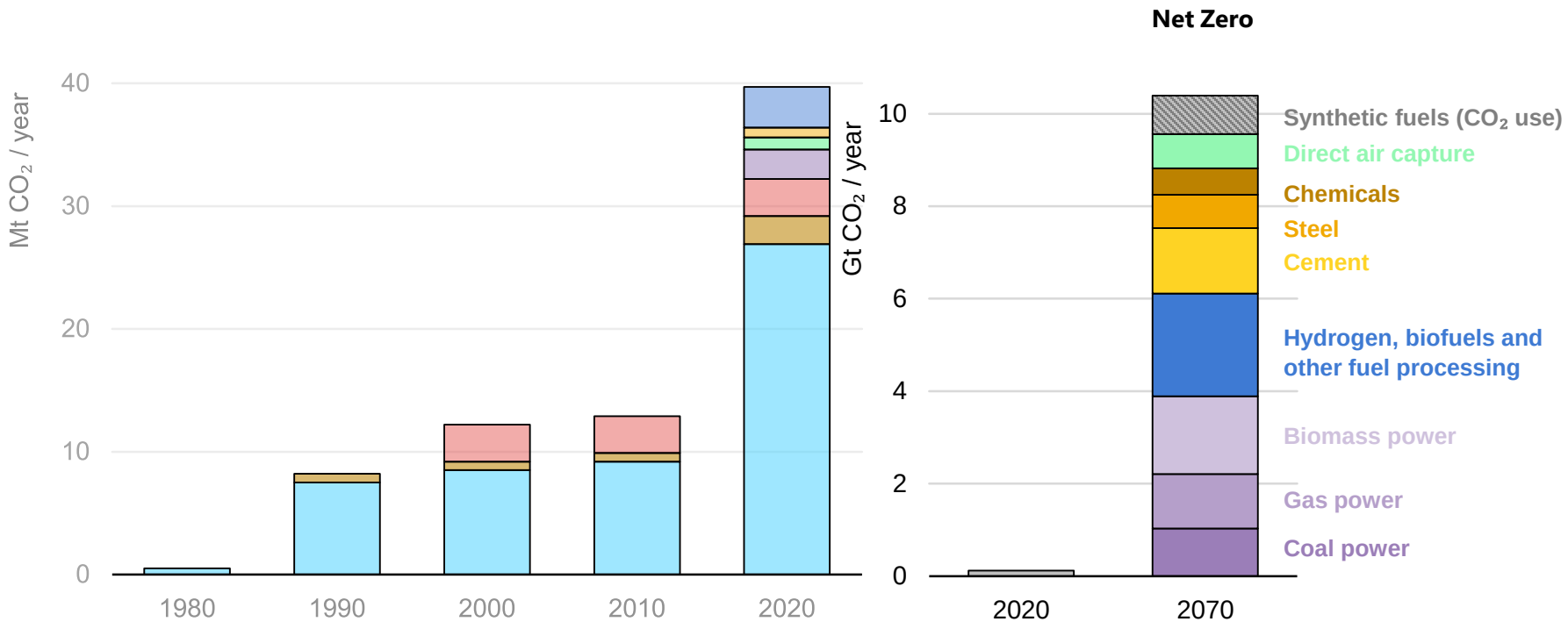

Carbon capture facilities have been operating since the 1970s and 1980s
But a significant scale-up will be required for net-zero.

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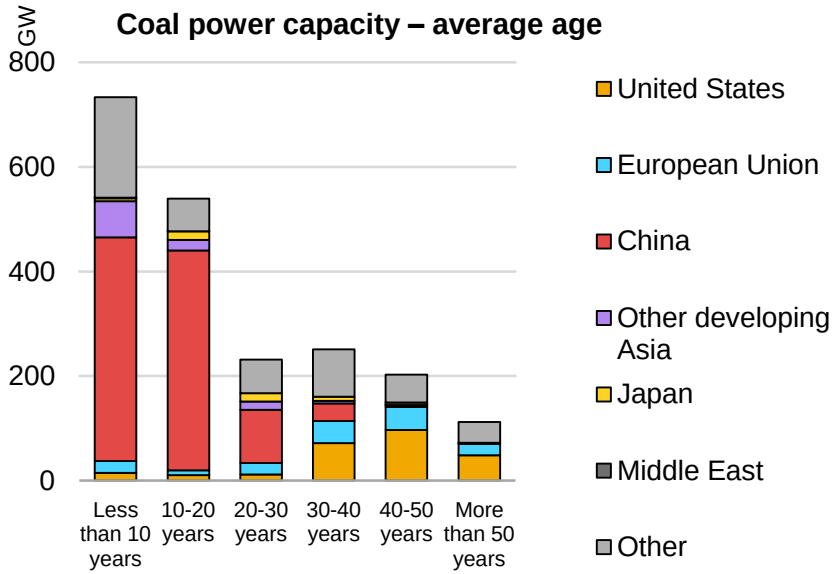
Four strategic roles for CCUS

1. Tackling emissions from existing infrastructure



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It is a low-cost option for low-carbon hydrogen production in many regions

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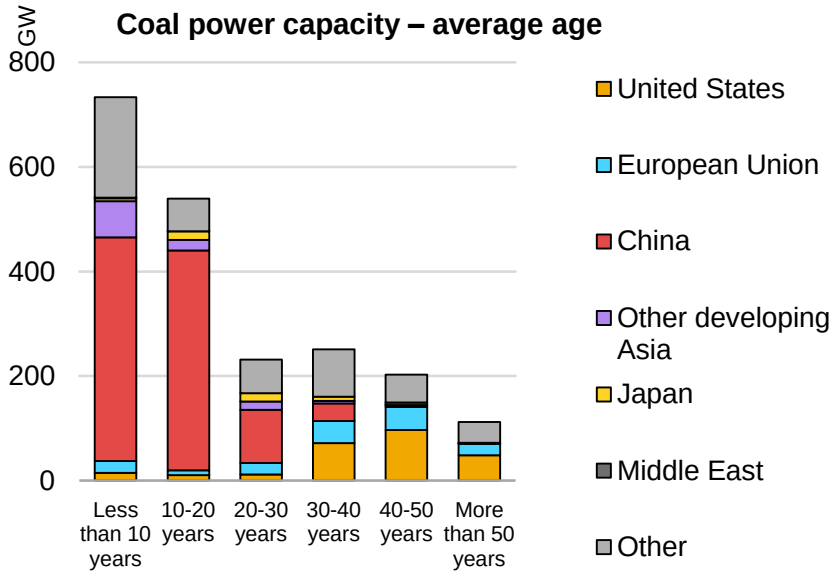

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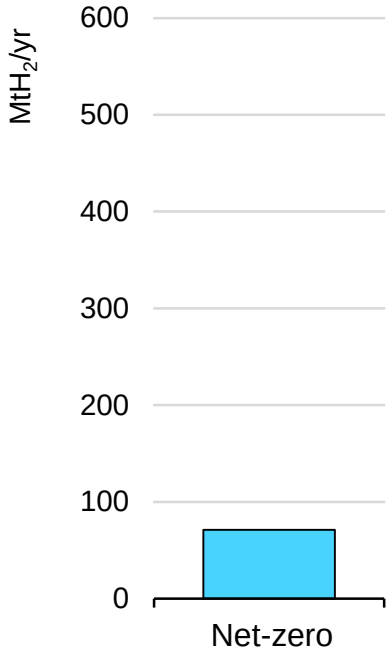

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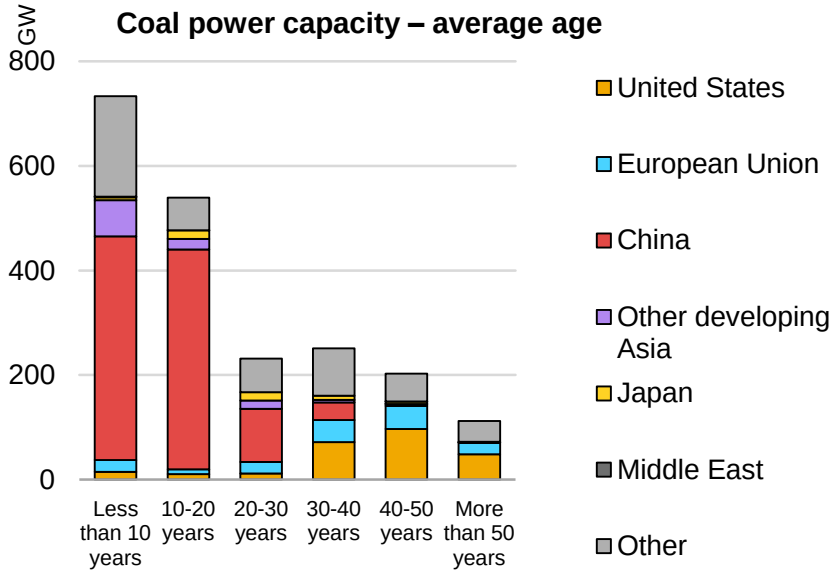

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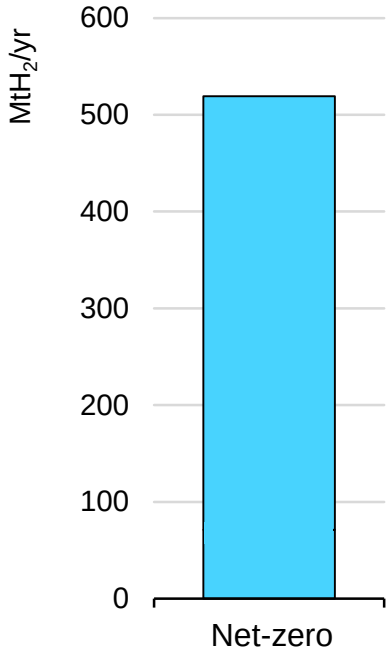

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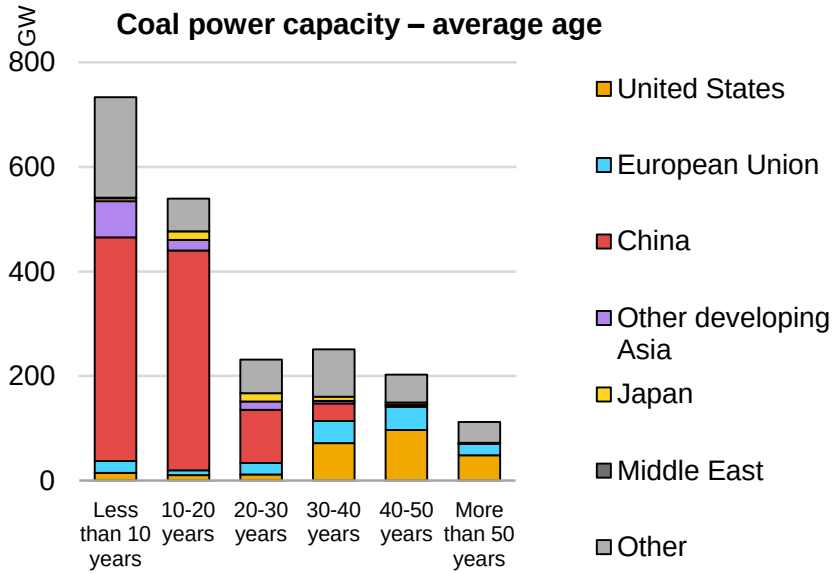

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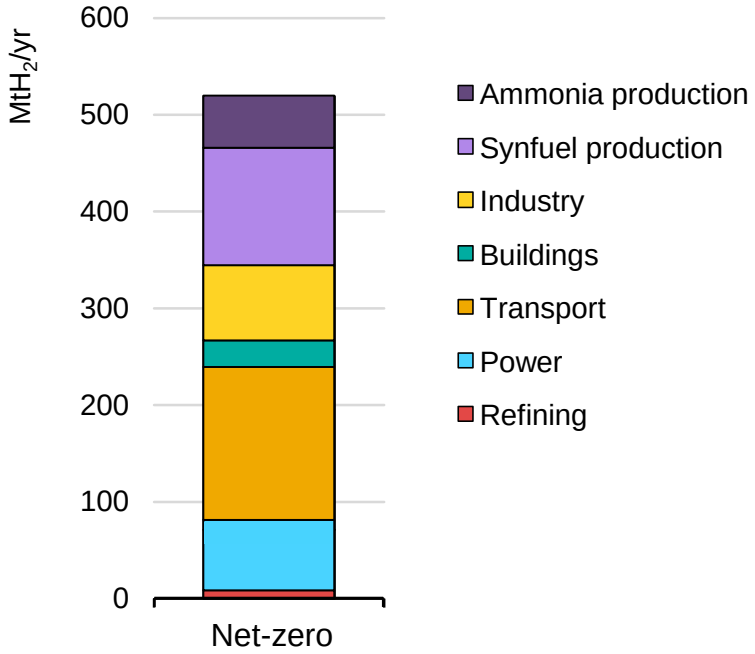

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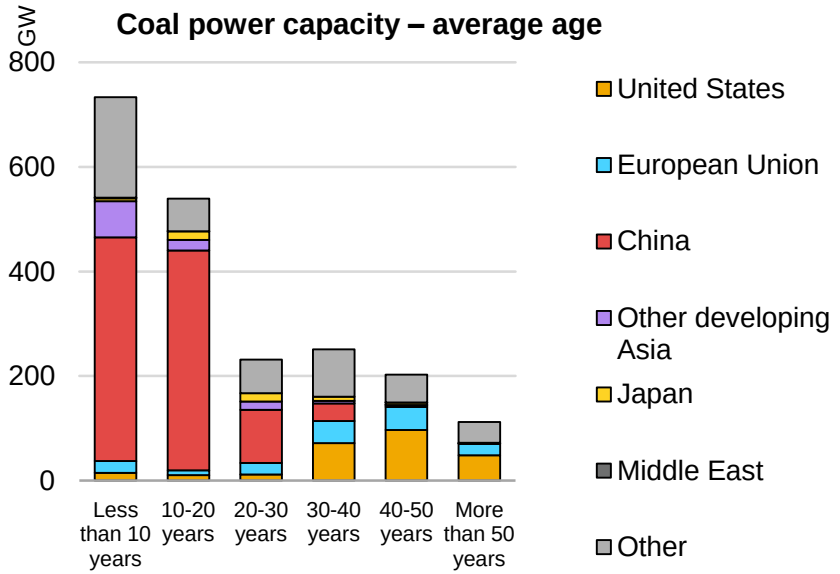

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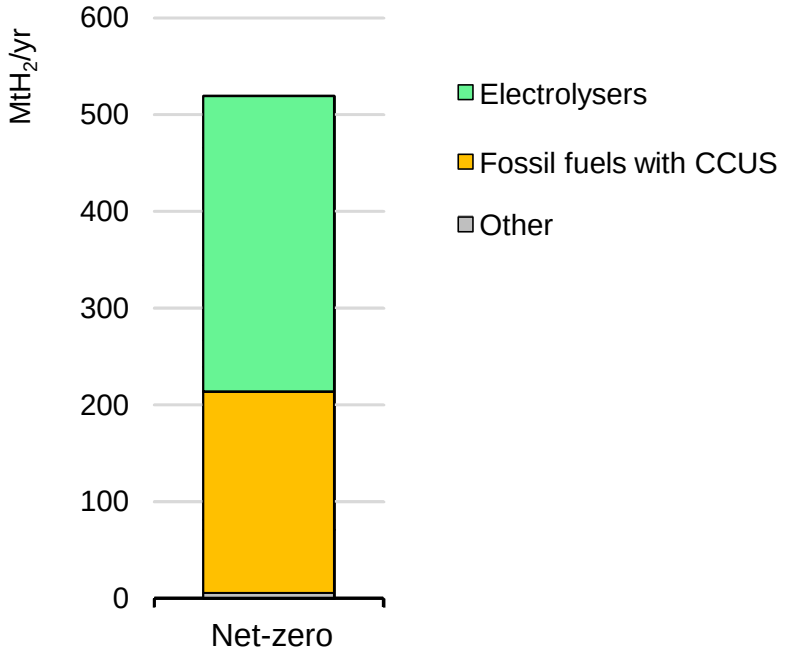

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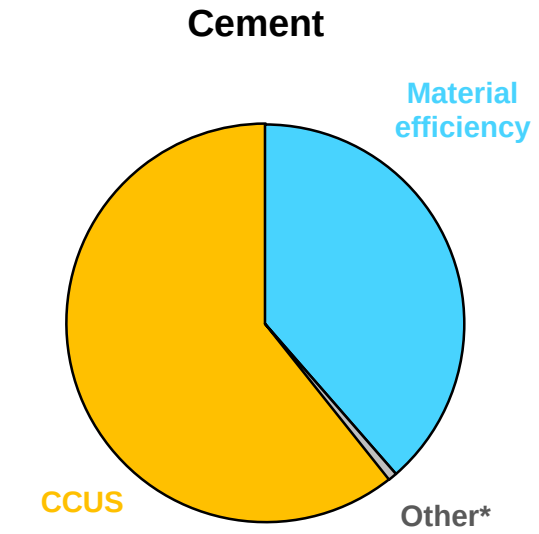

*Hydrogen, bioenergy, electrification, and fuel shifts

CCUS plays an indispensable role in heavy industry, particularly cement

Bioenergy with CCS and direct air capture can balance hard-to-abate emissions for net zero

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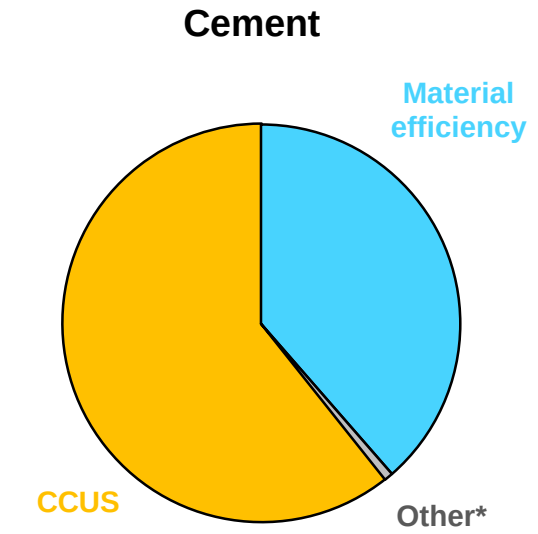

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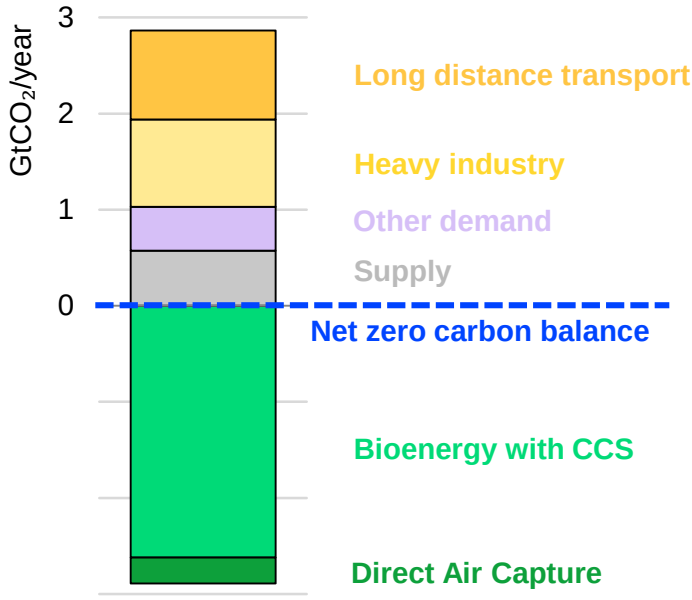
4. Removing carbon from the atmosphere



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Government and industry action this decade is crucial

- Four high-level priorities for governments and industry would accelerate the progress of CCUS over the next decade:

1. Create the conditions for CCUS investment
2. Target the development of industrial hubs with shared CO_2 infrastructure
3. Identify and encourage the development of CO_2 storage
4. Boost innovation for critical CCUS technologies