

The IPCC's 6th Assessment Report on ways to combat climate change

Key takeaways

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The IPCC¹ published the third and final instalment of a comprehensive review of climate science, covering measures that can be taken to reduce emissions. This followed a first report published in Aug 2021 that highlighted irreversible human changes to the climate, and a second report published in Feb 2022 warning of detrimental consequences. The key findings of the report include the following:

- a. While it is “almost inevitable” that temperatures would rise above 1.5 °C, (beyond which many of the impacts of climate breakdown will be irreversible), the IPCC said it may be **possible to bring temperatures below the critical level by the end of the century** through advancements in technologies;
- b. Major transitions are necessary to cut down GHG emissions across the energy sector e.g. significant **reductions in fossil fuel use, deployment of low-emissions energy sources, and improving energy efficiency and conservation**;
- c. **Reduction in non-CO₂ GHGs**, particularly methane (CH₄), are also required to lower the level of peak warming;
- d. There should be a **shift in energy investments from fossil fuels towards low-carbon technologies**. Various low-carbon technologies, e.g. carbon capture and storage (CCS²), have shown rapid progress over the years with lower unit costs, enhancing the feasibility of a faster energy transition; and
- e. Implementation of **carbon dioxide removal (CDR) measures** are likely required if net-zero emissions are to be achieved. CDR measures comprise anthropogenic activities that remove CO₂ from the atmosphere and store it in products or geological, terrestrial or ocean reservoirs. Although CDR measures may be necessary to achieve global climate goals, it cannot substitute deep emissions reduction.

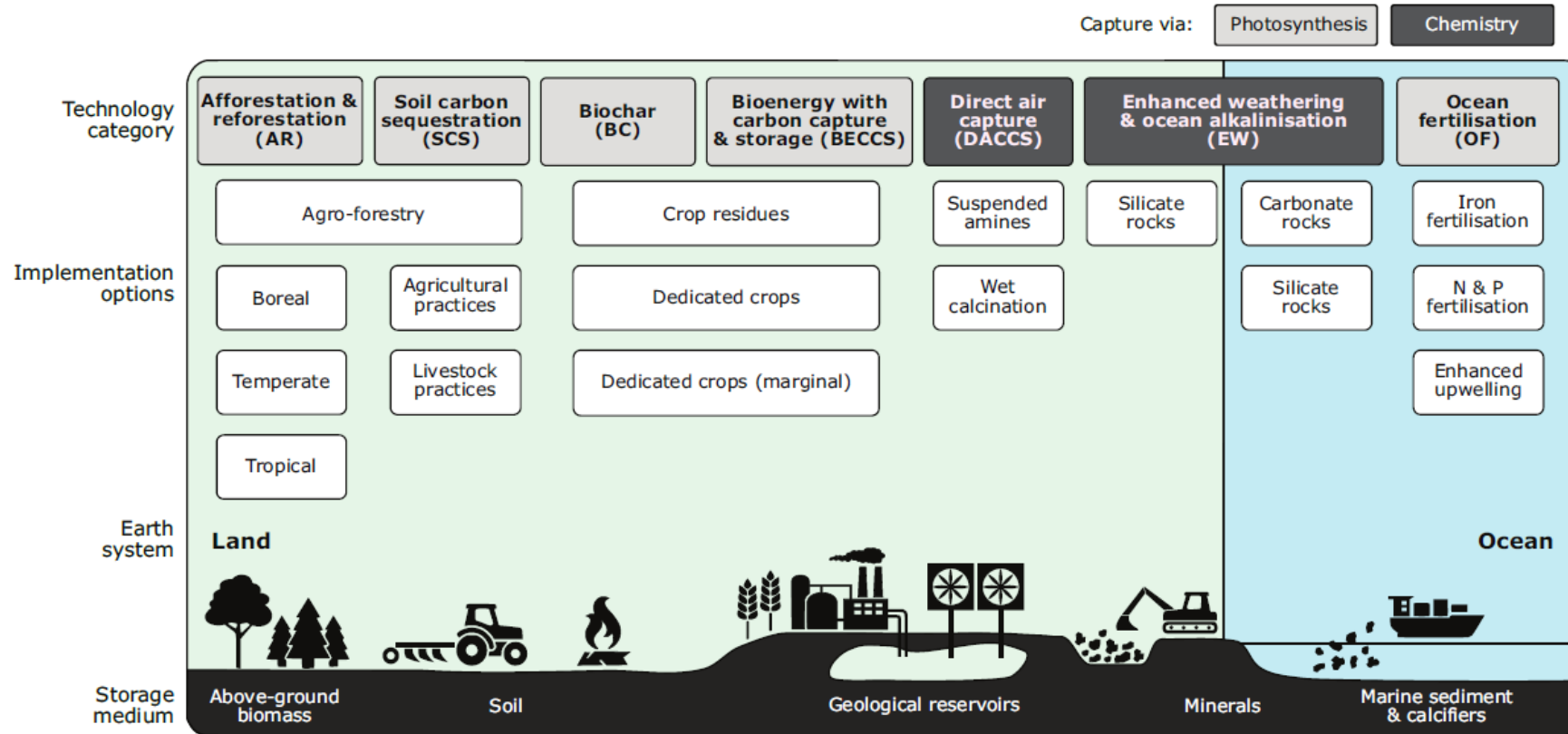
¹ The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations responsible for advancing knowledge on human-induced climate change. UN Member States include key Asian markets e.g. Singapore, China, Malaysia and Indonesia.

² Carbon capture and storage (CCS) refers to the process of capturing carbon dioxide before it enters the atmosphere, transporting it and storing it. Carbon dioxide is usually captured from large point sources such as chemical plants.

Overall thoughts: Countries may need to move swiftly towards a low-carbon economy via deep emissions cuts to prevent a climate disaster.

- 1) Given the urgency to bring temperatures below the critical level, the report findings may urge policymakers to **re-evaluate their decarbonisation measures** and **accelerate implementation timelines**. This can include more **comprehensive regulatory and monitoring requirements** for **emissions-intensive industries** e.g. energy and chemicals. For example, China's pilot programme for the largest coal-fired power providers, steel mills, and oil and gas producers to develop GHG emissions monitoring plans is a step in the right direction. However, issues such as integrity of data submitted would need to be appropriately enforced and monitored.
- 2) **Policymakers may include CDR measures (Annex A) as an integral component of countries' decarbonisation plans**, especially to address hard-to-abate residual emissions. These measures vary in their maturity, cost, effectiveness and feasibility of implementation in different countries. Upscaling the deployment of various CDR measures to complement emissions cuts would depend on approaches to address feasibility constraints for nascent CDR measures.
- 3) As a next step, governments plan to meet in Egypt in Nov 2022 for COP27 to discuss ratcheting up their respective climate goals and actions. While the authorities of key Asian markets have **efforts in line with their climate goals and IPCC's recommendations (Annex B)**, **the outcomes of the measures to meet the climate goals are dependent on industry action and successful commercialisation of low-carbon technologies**. COP27 discussions will occur amidst a more challenging climate with the aftermath of geopolitical tensions from the Russian invasion, increasing energy and food prices and soaring inflation.

Annex A: Carbon Dioxide Removal (CDR) technologies and their respective implementation options



Source: Minx, J. C., Lamb, W. F., Callaghan, M. W., Fuss, S., Hilaire, J., Creutzig, F., ... & Dominguez, M. D. M. Z. (2018). Negative emissions—Part 1: Research landscape and synthesis. *Environmental Research Letters*, 13(6), 063001.

Annex B: OCBC key markets' climate change goals and efforts in line with IPCC's recommendations

Key market	Climate change goals	Countries' efforts in line with IPCC's recommendations
Singapore	Achieve net-zero emissions by or around 2050	<ul style="list-style-type: none"> To facilitate greater emissions cuts, Singapore's carbon tax rate will be increased from the current \$5/tCO₂e to \$25tCO₂e in 2024 and 2025, \$45tCO₂e in 2026 and 2027, and potentially reaching \$50-\$80tCO₂e by 2030 Existing government incentives support reduction of non-CO₂ greenhouse gases e.g. CH₄ Singapore is studying emerging advanced low-carbon technologies such as Carbon Capture, Utilisation and Storage (CCUS) and low-carbon hydrogen as potential longer-term options to reduce emissions
China	Reach its carbon emissions peak before 2030 and become carbon neutral by 2060	<ul style="list-style-type: none"> China's carbon trading scheme launched in July 2021 could facilitate greater emissions cuts by 30% - 60% by 2060 China is also adopting a zero-tolerance policy on fraudulent reporting of carbon emissions There are many CCUS pilots in operation, and supporting policies on commercial CCUS would be required to incentivise large-scale projects
Malaysia	Become carbon neutral by 2050	<ul style="list-style-type: none"> Malaysia has not developed a carbon pricing policy but has announced that a carbon tax is included in its 12th Malaysian Plan (2021-2025) Industry stakeholders are exploring opportunities and project collaborations on CCS to help provide CO₂ storage solutions
Indonesia	Achieve reach net-zero emissions by 2060 or sooner	<ul style="list-style-type: none"> Indonesia aims to roll out its carbon tax on coal power plant operators in July 2022 (delayed from April 2022 to balance economic recovery amid increasing energy prices) There are joint research activities with industry players on carbon capture and hydrogen technologies

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