7. Carbon negative techniques

Currently, the more technical carbon negative (CDR) approaches, particularly bioenergy with carbon capture and storage (BECCS), which is extremely energy-intensive, are prohibitively expensive unless fundamental techno-economic breakthroughs can be achieved.

Direct air carbon dioxide capture and storage (DAC) is even more energy-intensive than BECCS because of the much lower concentration of CO_2 in the atmosphere compared to flue gases.

Mineral-based carbon negative techniques, such as enhanced weathering, ocean alkalinisation and ocean fertilisation are also energy-intensive and costly, involving massive mining, processing, transport and dispersal activities. All these can cause unacceptable air, ground, water and/or noise pollution and there may also be dangerous side effects and feedbacks as a result of the applications.

The lack of security for forest carbon sinks and stores from planting soil disturbance, logging/clearing, pests and diseases with rising temperatures, wildfires due to the increasing frequency of extreme heatwaves and droughts make reforestation and afforestation unreliable carbon negative approaches.

Solar radiation management (SRM) proposals do not remove atmospheric CO_2, vital for reversing ocean acidification, a catastrophic risk to marine biodiversity and essential food sources for much of the world population.

Reducing the Earth's solar energy input locally or globally could also have damaging side effects and feedbacks, particularly on regional rainfall patterns. In addition, once started, if SRM approaches were stopped because they had become prohibitively expensive the masked, by then much more severe, global heating would return (termination shock).