



CARBON DIOXIDE REMOVAL

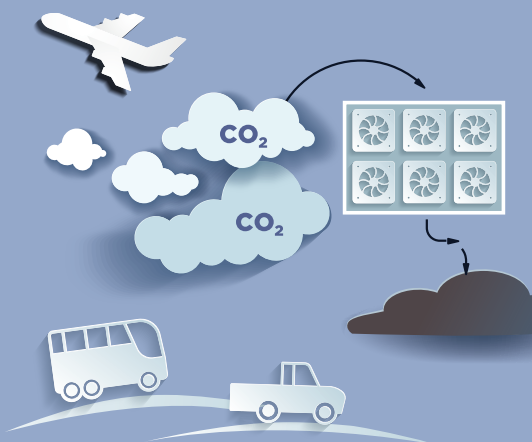
A Necessary Part of Achieving Net-Zero Emissions

The U.S. Department of Energy’s Office of Fossil Energy and Carbon Management (FECM) is focused on investing in technologies to reduce carbon emissions and minimize the environmental impacts of fossil fuel generation and use.

Carbon dioxide removal (CDR) is a key part of FECM’s overall strategy.

WHAT IS CDR?

CDR encompasses a wide array of approaches that capture carbon dioxide (CO₂) directly from the atmosphere and store it in geological, biobased and ocean reservoirs or in value-added products—like low-carbon concrete—to create negative emissions (i.e., when more carbon is removed from the atmosphere than generated).



Note: CDR is distinct from point-source carbon capture from the fossil power sector and heavy-duty industry.

WHY DO WE NEED CDR?

The dangers of climate change are increasingly evident, from the growing ferocity of wildfires in the West to the dangerous flooding along the Gulf Coast. To successfully address the climate crisis and achieve net-zero emissions by 2050, we must permanently remove CO₂ that has accumulated in the atmosphere and significantly reduce emissions.

CDR is a central part of this strategy. In fact, nearly all climate model scenarios that achieve international climate goals indicate the need for a near-term focus on CDR development and deployment.

CDR...

- Can address emissions from the hardest to decarbonize sectors (e.g., agriculture, aviation and shipping) to help the United States achieve a net-zero carbon economy.
- Can remove legacy CO₂ emissions from the atmosphere, which can help limit harm for climate vulnerable populations.

WHAT CDR APPROACHES ARE IN USE TODAY?

FECM is already investing in several CDR pathways. The office is also seeking to expand carbon storage demonstration and is leading an interagency CDR task force pursuing the advancement of many other forms of CDR approaches, including:



DIRECT AIR CAPTURE WITH STORAGE



SOIL CARBON SEQUESTRATION



BIOMASS CARBON REMOVAL AND STORAGE



ENHANCED MINERALIZATION



OCEAN-BASED CDR



AFFORESTATION/REFORESTATION

Pursuing this diverse list of CDR approaches will enable CDR technology deployment in many different localities that will be uniquely targeted to each setting and its community.