

EXECUTIVE SUMMARY

Direct Air Capture with Carbon Storage (DACCS) removes CO₂ directly from the atmosphere and stores it in geological formations or long-lived materials. Unlike more conventional carbon removal methods, it is not constrained by biomass or land availability, but current costs remain high relative to many other carbon removal approaches, reflecting the technology's early stage of commercial deployment. DACCS has a removal potential of 0.5 to 5 gigatons of CO₂ per year globally by 2050.

WHAT IS DACCS?

DEFINITION

DACCS uses engineered chemical or physical processes – typically solid-sorbent, liquid-solvent, membrane, or electro-chemical contactors – to extract CO₂ directly from ambient air, which is then compressed and transported for storage, most commonly via geological sequestration in basalt formations, deep saline aquifers or depleted O&G reservoirs. The two most deployed technologies are liquid solvent (L-DACCS) and solid sorbent (S-DACCS). Captured carbon can also be mineralized into materials such as concrete.

USES AND BENEFITS

DACCS is used almost exclusively for long-term carbon removal. Its principal benefits are high measurability (direct monitoring of captured CO₂ flow and concentration), high durability (1,000+ year storage with low reversal risk in geological formations), and geographic flexibility (siting driven by low-carbon energy access and storage infrastructure rather than feedstock). It also offers immediate atmospheric benefit at the point of removal. Alternatively to permanent storage, captured CO₂ can also be used to produce synthetic fuels, plastics, or other chemicals.

RISKS & LIMITATIONS

DACCS carries high energy demand relative to other removal pathways, requiring dedicated low-carbon power procurement. Engineering complexity, sorbent/solvent costs, and energy needs mean per-tonne costs are high, though economies of scale can bring this down over the medium-to-long term. Industry scalability in the near-term depends heavily on government policy and subsidy support (currently concentrated in Europe and North America) and/or carbon credit offtake agreements with private buyers. It is important to have environmental guardrails and also commercial flexibility for PPAs.

COMMON DAC TECHNOLOGIES

CAPTURE MEDIUM TYPES:

SOLID SORBENT

Air passed over solid materials that bind CO₂, either chemically or physically.

LIQUID SOLVENT

Air is contacted with a liquid solution, typically alkaline, that chemically absorbs CO₂.

REGENERATION METHODS:

TEMPERATURE

CO₂ released by heating the capture medium, often combined with vacuum.

ELECTROCHEMICAL

CO₂ released by applying electrochemical displacement from the capture medium.

APPLICABLE STANDARDS & METHODOLOGIES

ACR: Methodology for the Quantification, MRV of GHG Emission Reductions and Removals from CCS Projects

Puro.earth: Geologically Stored Carbon (covers DACCS and BECCS / bio-CCS)

Global Carbon Council: GCCMT001 Methodology for project activities involving the capture, transport, and geological storage of CO₂

Verra: VM0049 Carbon Capture and Storage (with Module VMD0056 Removals from CO₂ Capture from Air) [CORSIA]

Isometric: Direct Air Capture Protocol [CORSIA and CCP]

Government Standards: EU CRCF DAC methodology; Canada Federal Offset DACCS Protocol (In Development)

THE CARBON CREDITING PROCESS

HOW DACCS CREDITS ARE GENERATED

1. CO₂ is captured from ambient air via a DAC contactor (sorbent, solvent, membrane, or electrochemical)
2. Captured CO₂ is compressed and transported to an approved storage site or durable-material end use
3. CO₂ is injected into permitted geological storage (or mineralization site) under monitored conditions
4. Net removals are quantified: gross CO₂ captured less lifecycle emissions (energy, transport, embodied equipment emissions)
5. Continuous monitoring of the injection/storage site for leakage risk
6. Independent third-party verification against the applicable protocol
7. Credits are issued after all verifications have been completed and the documentation has been attested by the registry.

POLICY AND REGULATORY OUTLOOK

EU: The Commission adopted its first CRCF delegated act (Feb 2026) with certification methodologies covering DACCS, BioCCS and biochar; the DACCS capture facility must be sited in the EU, though storage can use shared cross-border infrastructure. The EU ETS reform proposal would integrate permanent removals via a cap increase auctioned from 2031–2040.

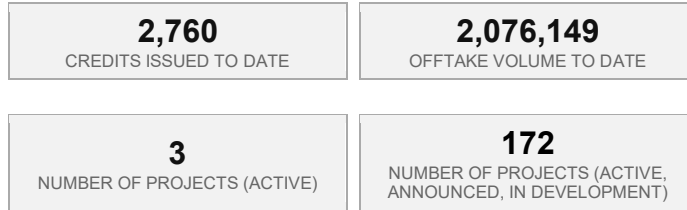
US: The Section 45Q tax credit remains the principal federal incentive, offering roughly \$180/tonne CO₂ for DACCS, the highest rate of any 45Q pathway. Compliance market integration is being explored in California and Washington.

UK: Developing a domestic Greenhouse Gas Removals (GGR) framework and consulting on integrating GGRs into the UK ETS from 2029; a CRCF-equivalent minimum-quality standard is not yet in place.

Japan: The GX-ETS cap-and-trade scheme is transitioning from voluntary to mandatory from 2026, creating a compliance pathway that removals credits, including DACCS, could eventually access.

Compliance/Regulatory Markets: Direct compliance-market eligibility remains limited. In the US, DACCS projects can stack 45Q tax credit value with voluntary credit sales. The EU CRCF gives DACCS a certified-removals pathway and the EU ETS reform proposal would bring DACCS in via a cap increase auctioned from 2031–2040. Japan's GX-ETS and a future UK ETS removals pathway are not yet operational for DACCS credits.

MARKET SNAPSHOT – KEY STATS



GEOGRAPHIC DISTRIBUTION OF PROJECTS (ANNOUNCED, IN DEVELOPMENT & ACTIVE)

Geographic Distribution



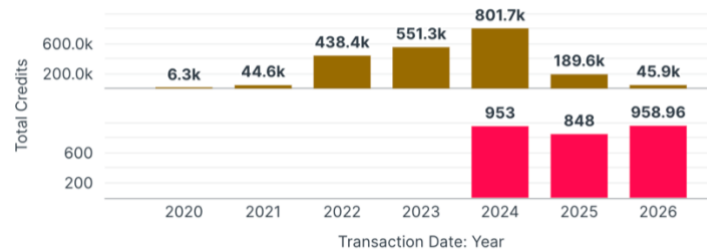
CREDIT PRICE TRENDS

Price Trend

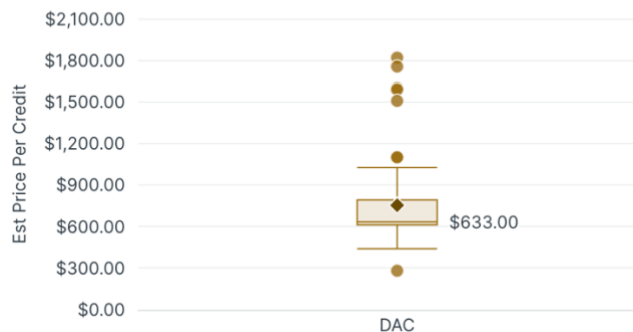


ISSUANCE AND OFFTAKE TRENDS

Offtake deal Issuance



Price of Credit



BUYER BREAKDOWN (RETIREMENTS)

DACCS CREDITS RETIRED BY BUYER



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IETA CARBON MANAGEMENT BUSINESS BRIEF SERIES

PURPOSE & OVERVIEW

This IETA Carbon Management Business Brief Series aims to provide market clarity on CCUS and engineered CDR pathways from market participants and stakeholders. IETA's suite of [business briefs](#), covering nearly all compliance carbon markets, is publicly available.

REFERENCES

AlliedOffsets, DACCS data and information. Accessed 25 September 2026, 9.00AM ET.