



HydroHub

Growth and Innovations for the Low Carbon Industry

Carbon Management - Services along the CO₂ Value Chain

An initiative of **TUVNORDGROUP** companies

hydrohub.de/en

Carbon Management: Key to a Sustainable Future

Carbon Management is the cornerstone for developing a climate-neutral carbon industry and offers companies opportunities for innovation and growth. It requires a new focus on handling CO₂ emissions to make a decisive contribution to decarbonization, especially in the energy sector and energy-intensive industries. The avoidance of new carbon dioxide emissions should be the primary goal; nevertheless, CO₂ will continue to be a component in a modern, competitive industrial society. With Carbon Capture Storage (CCS) or Carbon Capture Utilization (CCU), unavoidable CO₂ emissions can be stored or further utilized, making a relevant contribution to achieving climate goals. Both play a crucial role in transforming the industry and building a sustainable circular economy.

TÜV NORD GROUP supports with numerous services in addressing the challenges along the entire CO₂ value chain.



HydroHub is already working with various stakeholders today from business and politics on the planning and implementation of carbon management projects. We support companies in challenges along the entire value chain, for example, with the creation and validation of strategies and feasibility studies, consulting, planning, and implementation in plant construction, or regulatory and route engineering for networks and distribution networks as well as storage facilities. The focus is also on the further development and innovation of

products and services to meet new market requirements, such as the IoT (Internet of Things) platform DMT SAFEGUARD with comprehensive sensors for monitoring and condition surveillance, as well as further investments in the development of exploration technologies for CCS storage.

Independent operational companies of TÜV NORD GROUP offer comprehensive services and products in the traditional testing and certification business, also for the carbon management segment.



Selected Action Fields in the CO₂ Market:



CO₂ Sources

Industries: such as Cement, Steel, Chemical
Energy Production: Coal and Gas Power Plants
Transport: Airplanes, Ships, Trucks
Biogenic Sources: Agriculture, Biomass Power Plants



CO₂ Separation (Carbon Capture)

Pre-Combustion Capture: CO₂ capture from fuels before combustion
Post-Combustion Capture: CO₂ Exhaust filtering after combustion
Direct Air Capture (DAC): Direct CO₂ removal from ambient air
Oxyfuel Combustion: With pure O₂ for easier CO₂ separation



CO₂ Transport

Pipelines: Efficient for large quantities over short to medium distances
Ships: For international transport over long distances
Trucks/Trains: Flexible for smaller quantities or special applications



CO₂ Application (Carbon Utilization)

E-Fuels/further Fuels: Methanol, synthetic kerosene
Chemical Industries: Plastics, fertilizers, synthesis of chemicals
Construction Materials: Bind CO₂ in concrete (e.g., CarbonCure)
Biological Utilization: Algae cultivation for biofuels or food



CO₂ Carbon Storage

Geological: Injection into deep rock layers (e.g., saline aquifers)
Mineral: Reaction with minerals for permanent binding

We have compiled our services along the hydrogen value chain into 16 detailed PDFs for you. You can easily access them via the QR code. Alternatively, visit: hydrohub.de/en/downloads



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