



**CO₂ VALUE
EUROPE**

Carbon Capture and Utilisation in the European context

Anastasios Perimenis, Secretary General

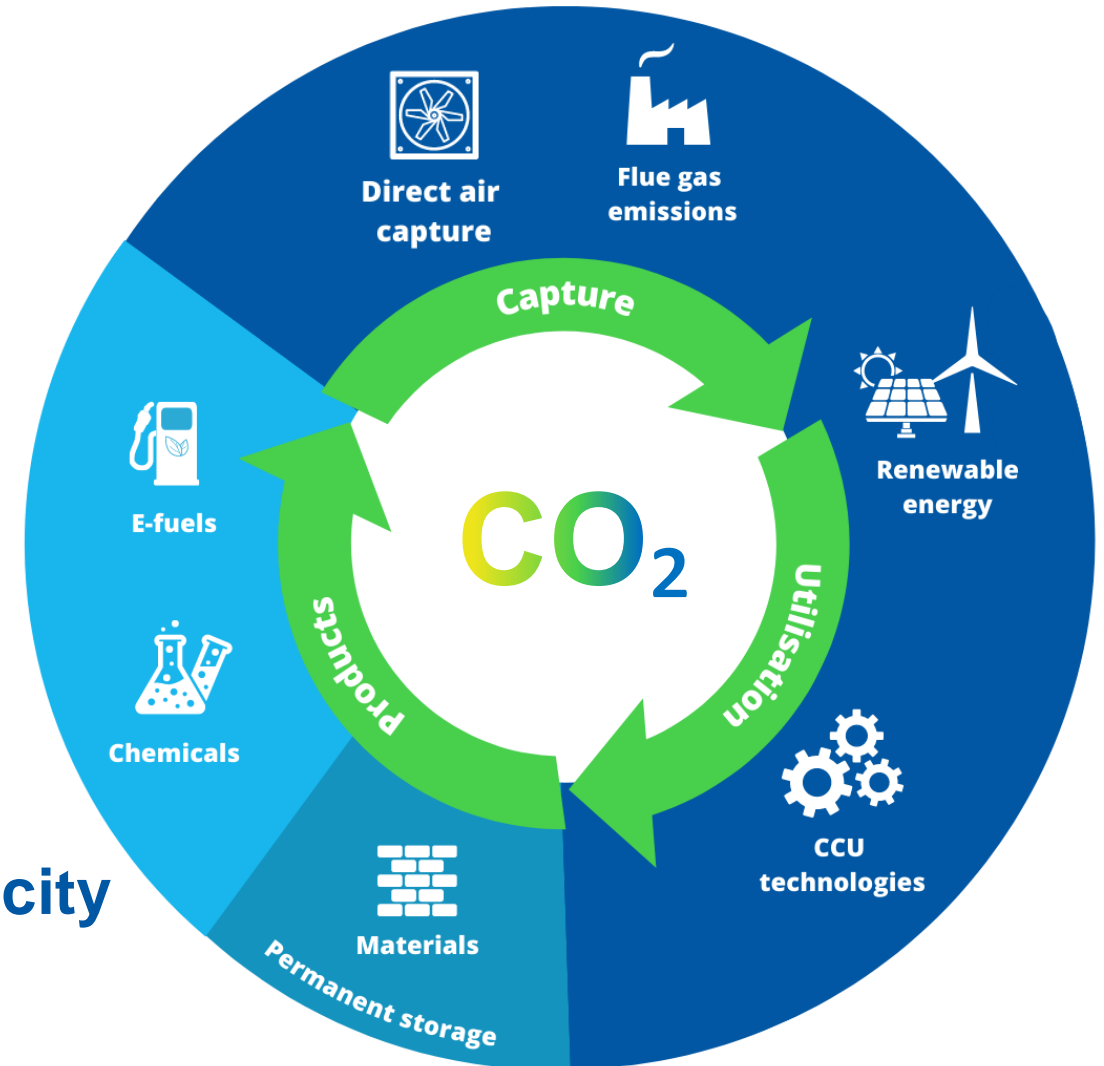
23 November 2021 – BioRECO₂VER - Webinar

BioRECO₂VER



Why Carbon Capture & Utilisation (CCU)?

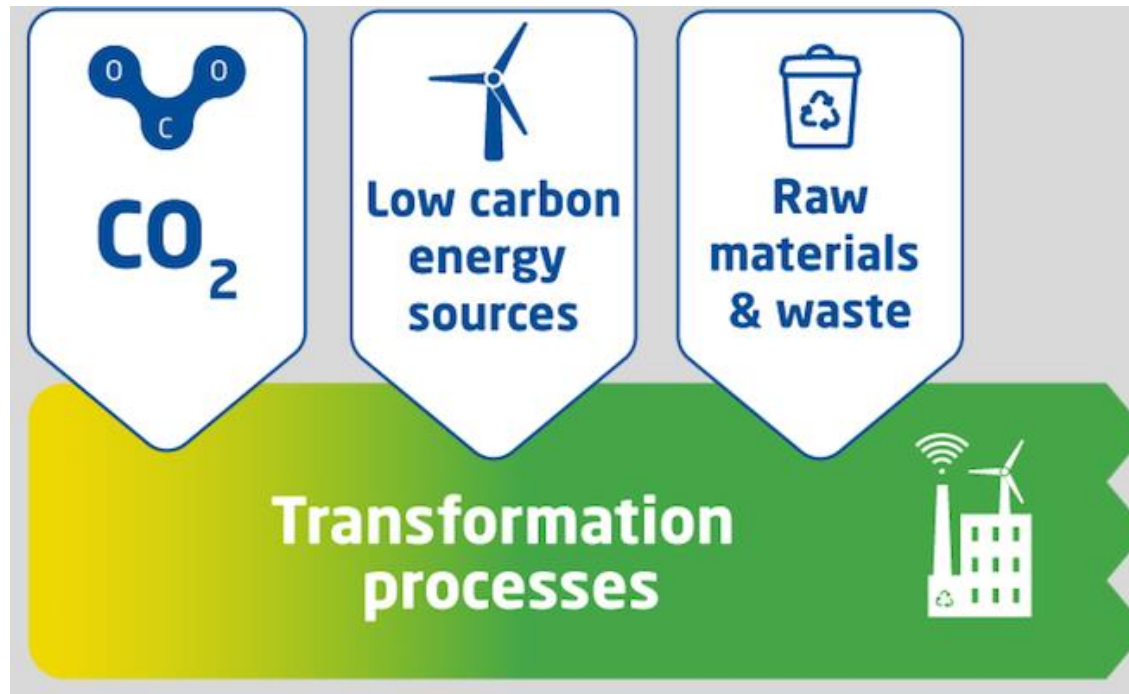
- ✓ Net-zero to negative emissions
- ✓ Alternative carbon feedstock
- ✓ Circularity and waste management
- ✓ Sustainable & resilient industry
- ✓ Storage & transport of renewable electricity





CO₂ Value Europe integrates stakeholders from the complete CCU value chain across industries

Upstream



We are focusing on the deployment of CCU and representing the CCU community in front of the EU authorities. We bring together partners from the **complete value chain!**

Products



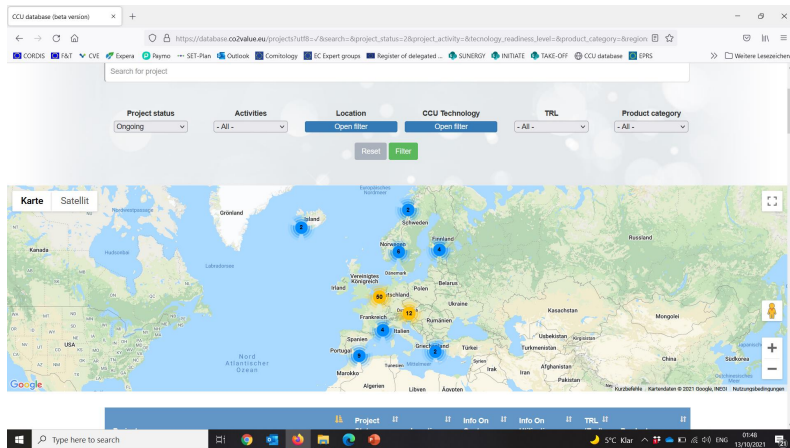
Downstream



Multinational Companies, SMEs, Regional Clusters, Research Institutions, Universities



**Collective intelligence
on CCU technologies**



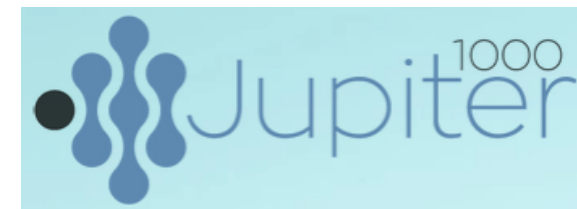
**Up-scaling and
innovation**



**Policy, advocacy,
communication**



 CCU is happening now...



CCU is happening now...

CCU database (beta version)

https://database.co2value.eu/projects?utf8=✓&search=&project_status=2&project_activity=&tecnology_readiness_level=&product_category=®ion:

CORDIS F&T CVE Expera Paymo SET-Plan Outlook Comitology EC Expert groups Register of delegated ... SUNERGY INITIATE TAKE-OFF CCU database EPRS

Search for project

Project status Ongoing **Activities** - All - **Location** Open filter **CCU Technology** Open filter **TRL** - All - **Product category** - All -

Reset Filter

Karte Satellit

Map showing project locations across Europe and surrounding regions. The map includes labels for various countries and regions, and project locations are marked with colored circles and numbers:

- Island: 2
- Schweden: 2
- Norwegen: 6
- Finnland: 4
- Irland: 50
- Itschland: 12
- Frankreich: 4
- Italien: 2
- Spanien: 9
- Marokko: 2
- Algerien: 2
- Libyen: 2
- Ägypten: 2
- Tunesien: 2
- Griechenland: 2
- Türkei: 2
- Syrien: 2
- Irak: 2
- Iran: 2
- Afghanistan: 2
- Pakistan: 2
- Ukraine: 2
- Rumänien: 2
- Polen: 2
- Dänemark: 2
- Belarus: 2
- Russland: 2
- Kasachstan: 2
- Usbekistan: 2
- Kirgisistan: 2
- Mongolei: 2
- China: 2
- Südkorea: 2
- Japanisch: 2
- Ostchinesisches Meer: 2

Project Info On Info On TRL

Type here to search

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Support in Research, Innovation & Deployment

Horizon Europe

Several (>30) topics of interest for CCU in 2021-2022

First deadlines 10/2021



IMPORTANT PROJECTS OF COMMON INTEREST (IPCEI)

Based on Strategic Value Chains, two of which are linked to CCU:

- Hydrogen Technologies
- Low CO₂ emissions industries



CCU/CCS is a priority in the Strategic Energy Technology Plan

INNOVATION FUND

Driving clean innovative technologies towards the market



CCU is part of the Innovation Fund

Two calls already published (for [large-](#) and [small-scale projects](#))

Approx. €25 billion for 10 years; yearly calls

High TRL, mature, innovative, pre-commercial projects with significant climate mitigation benefit

✓ **H2020 : More than 90 collaborative projects receiving more than 650 M€**



Complex regulatory framework






non exhaustive list

- ⚖ Sustainable Taxonomy
- ⚖ RED II revision
- ⚖ ETS revision
- ⚖ Carbon Removal Certification Mechanism
- ⚖ ReFuel Aviation / FuelEU Maritime
- ⚖ Energy System Integration → CCUS Forum
- ⚖ SET-Plan CCUS Action 9
- ⚖ Sustainable Products Initiative
- ⚖ Alternative Fuels Infrastructure
- ⚖ Hydrogen Strategy
- ⚖ Next Generation EU → *Recovery & Resilience Fund*
- ⚖ New Industrial Strategy
- ⚖ Climate Law
- ⚖ Energy Taxation Directive
- ⚖ Carbon Border Adjustment Mechanism
- ⚖ CO2 emissions for cars and vans
- ⚖ Restoring carbon cycles
- ⚖



CCU in Fit-for-55 Package

Launched on 14 July 2021 by the European Commission

	Policy instrument	Impact on CCU
	<u>EU Emissions Trading System (EU ETS) revision</u>	<ul style="list-style-type: none">✓ CO₂ which is chemically and permanently bound in a product under normal use (e.g. CO₂ mineralisation) is excluded from the obligation to surrender allowances;✓ Avoid double-counting of emissions released by the use of RFNBOs*.
	<u>Renewable Energy Directive (REDII) revision</u>	<ul style="list-style-type: none">✓ At least 2.6% of the energy supplied to transport by 2030 is covered by RFNBOs;✓ 50% of the use of hydrogen in the industry is covered by RFNBOs.
	<u>ReFuelEU Aviation</u>	<ul style="list-style-type: none">✓ Binding targets per volume shares for RFNBOs: min 0.7%, 8%, 28% of RFNBOs by 2030, 2040, 2050, respectively and minimum 28% by 2050.
	<u>Fuel EU Maritime</u>	<ul style="list-style-type: none">✓ Binding GHG reduction targets for ships: 2%, 6%, 26%, 75% in 2025, 2030, 2040, 2050, respectively, by including RFNBOs to reach these targets.
	<u>Energy Taxation Directive revision</u>	<ul style="list-style-type: none">✓ Minimum taxation rate of zero for 10 years for RFNBOs for specific types of air and waterborne navigation.

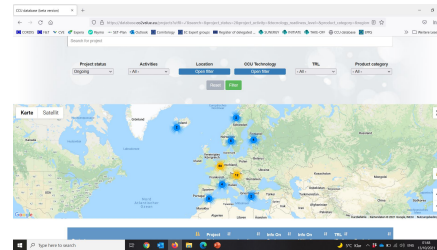
* RFNBO: Renewable fuels of non-biological origin (i.e. incl. CCU fuels)

Steps forward

➤ Science is confirming

- 🌐 CCU can utilize up to 7 Gt CO₂ per year by 2050 [Hepburn et al., 2019](#)
- 🧪 CCU can lead to annual reductions of up to 3.5 Gt CO₂-eq in the **chemical** sector in 2030 [Kätelhön et al., 2019](#)
- 🏭 **Mineralisation** can reduce climate impacts over the entire life cycle based on the current state-of-the-art [Ostovari et al., 2020](#)
- 🚰 **DAC-to-fuel** pathways can provide climate benefit over conventional fuel if low carbon electricity is used [Liu et al., 2020](#)

➤ Projects are showcasing



➤ Upscaling is key

Research & Innovation

- Materials & catalysts
- Process integration
- CCU in modelling & scenarios
- Metrology for CO₂
- LCA/TEA/Societal

Policy

- EU Taxonomy
- Renewable electricity
- Market-pull mechanisms
-

Funding

- Ecosystem of public, private and industrial investors
- Synchronisation between national & EU schemes
- ...



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