



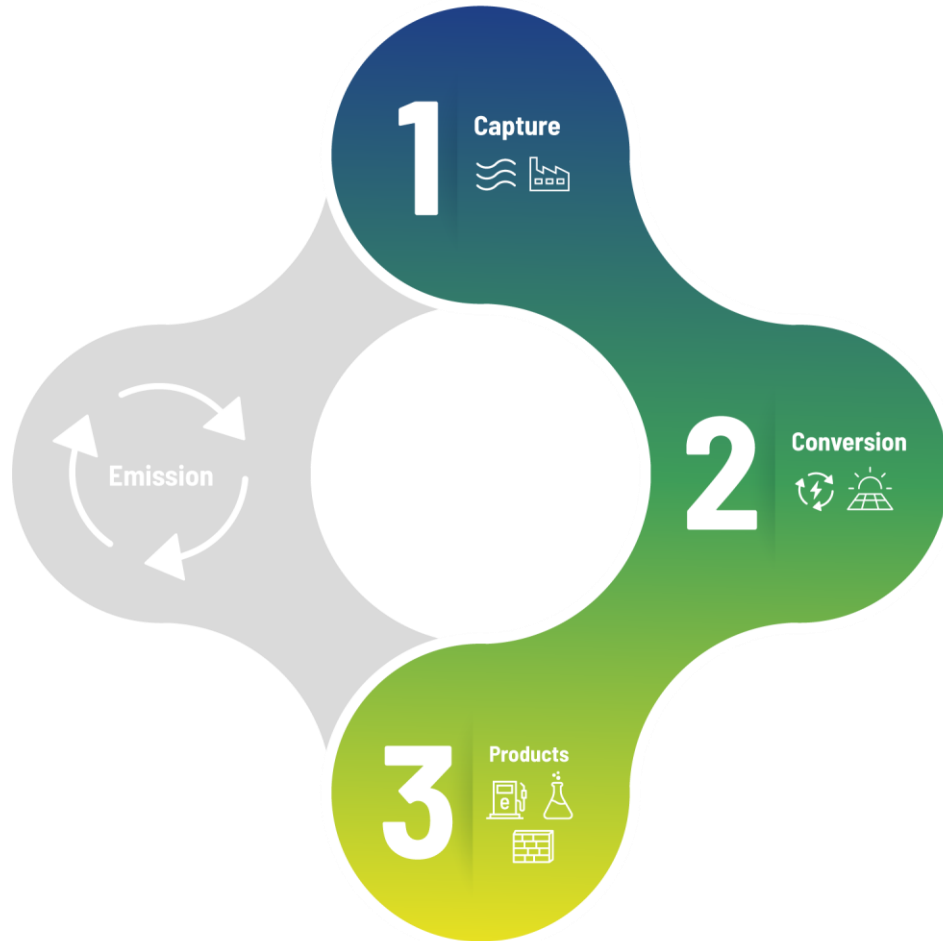
CCU in the current political context - Implications for the Waste-to-Energy sector

Anastasios Perimenis, Secretary General

DGAW - Erneuerbare Kraftstoffe aus CO₂: Herstellung und Einsatzbereiche

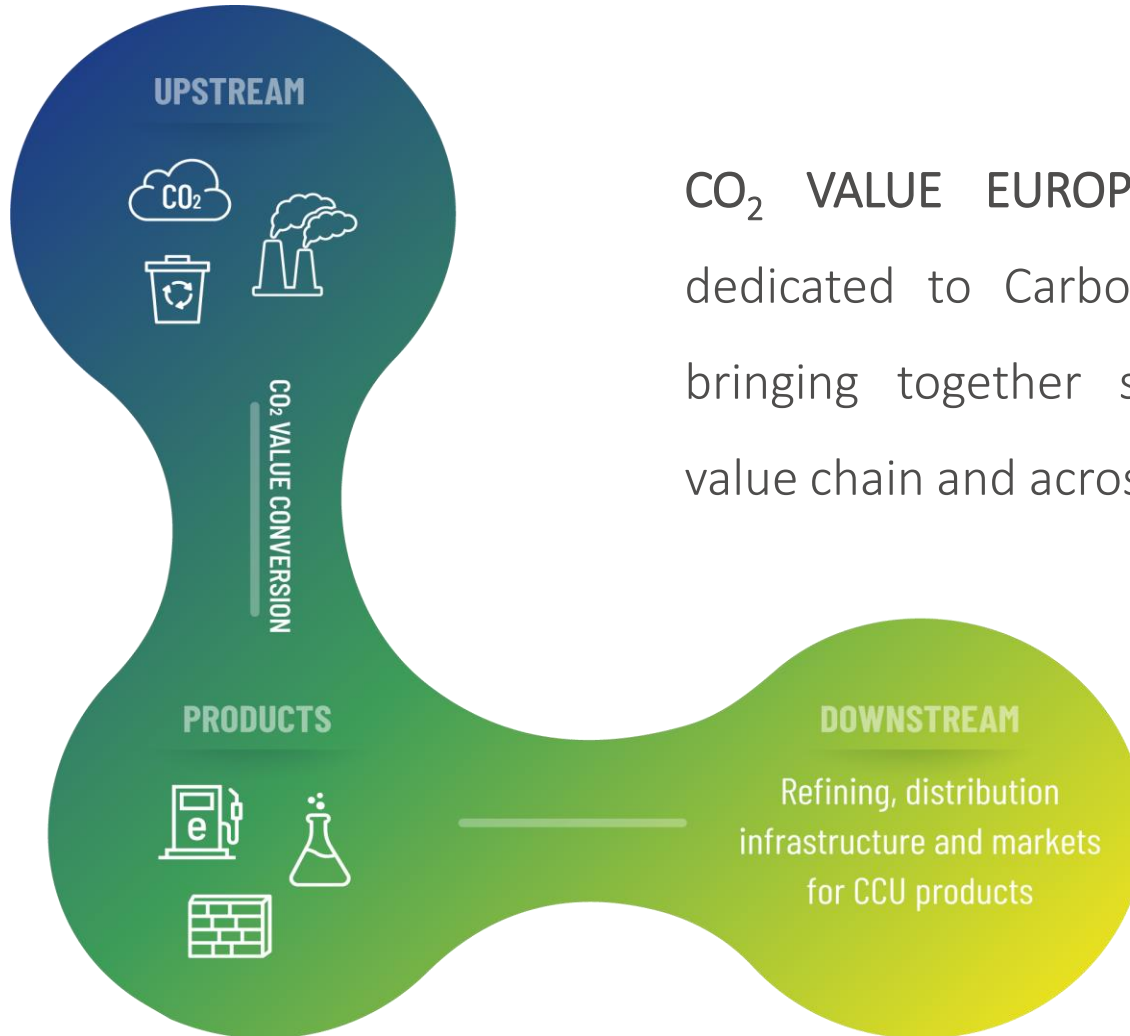
25 May 2023, Hamburg (hybrid)

What is CCU and why is it important?



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

The Association



CO₂ VALUE EUROPE is the European association dedicated to Carbon Capture & Utilisation (CCU), bringing together stakeholders from the complete value chain and across industries.

Membership base (86)

28 Large Companies 24 Research Organisations 28 SMEs 6 Clusters

--	--	--	--

Strategic priorities



Raise visibility & awareness , mutualise knowledge and provide evidence-based information on CCU



*Create a **supportive and consistent regulatory framework** to support large-scale deployment of CCU*



*Support the **development** of both innovative and industrial-scale **projects***



Quantify the contribution of CCU to reach EU's climate mitigation and circularity goals



*Support the creation of a **funding ecosystem** with both public and private funding actors*

Policy framework

Instrument	Impact on CCU
EU ETS revision	<ul style="list-style-type: none"> ✓ CO₂ which is chemically and permanently bound in a product under normal use (e.g. mineralisation) is excluded from the obligation to surrender allowances; ✓ Avoid double-counting of emissions released by the use of RFNBOs
RED revision (REDIII)	<ul style="list-style-type: none"> ✓ Combined target of advanced biofuels + RFNBO*: minimum 5.5% of energy in transport by 2030 ✓ Sub-target for RFNBO: minimum 1% of energy in transport by 2030 ✓ 42% of the use of hydrogen in the industry to be RFNBOs by 2030, 60% by 2035
REDII Delegated Acts	<ul style="list-style-type: none"> ✓ Rules on additionality, geographical and temporal correlation of RFNBO production ✓ Methodology to calculate 70% GHG emission reduction for RFNBO/RCF; eligibility of CO₂ sources (e.g. DAC, bioCO₂, industrial ETS CO₂ until 2036/2041)
ReFuelEU Aviation (on-going)	<ul style="list-style-type: none"> ✓ SAFs quotas : min 6%, 20%, 34%, 42%, 70% by 2030/25/40/45/50 respectively ✓ Synthetic aviation fuels quotas : min 0.7%** , 5%, 10%, 15%, 35% by 2030/35/40/45/50 respectively
Fuel EU Maritime	<ul style="list-style-type: none"> ✓ Binding GHG reduction targets for ships: 2%, 6%, 14.5%, 31%, 62%, 80% in 2025/30/35/40/45/50, respectively ✓ 2% RFNBOs quota in 2034 if RFNBOs account for less than 1% in fuel mix in 2031; multiplier “2”
Sustainable Carbon Cycles <i>(non legislative)</i>	<ul style="list-style-type: none"> ✓ Min. 20% of carbon in chemical and plastic products should be from sustainable non-fossil sources by 2030 ✓ Tracing the origin of CO₂ used in products
Energy Taxation revision (on-going)	<ul style="list-style-type: none"> ✓ Minimum taxation rate of zero for 10 years for RFNBOs for specific types of air and waterborne navigation.
Net Zero Industry Act (new)	<ul style="list-style-type: none"> ✓ CCU is a net-zero technology, but not a “strategic” net-zero technology
EU Certification for Carbon Removals	<ul style="list-style-type: none"> ✓ DAC/BioCO₂ to mineralisation recognised as removal

* RFNBO = Renewable fuel of non-biological origin ; ** further average and minimum shares to be covered between 2030-2034

Particularities for the WtE sector

1. **ETS revision:** *“by July 2026, the Commission should also assess ... on the feasibility of including municipal waste incineration installations in the EU ETS, including with a view to their inclusion from 2028 and with an assessment of the potential need for an option for a Member State to opt out until the end of 2030”*
 - ✓ **but:** *“from 1 January 2024, combustion of fuels in installations for the incineration of municipal waste with a total rated thermal input exceeding 20 MW, for the purposes of Articles 14 and 15”*
 - For MRV purposes only, WtE plants are included as of 2024, but CO₂ not yet in the pricing scheme (?)
 - Is this only for emissions from auxiliary fuels in WtE or for all WtE emissions ?
2. **Eligibility of CO₂ for RFNBO and RCF (REDII Delegated Act on GHG methodology)**
 - ✓ WtE CO₂ is not mentioned in the DA
 - ✓ ETS industrial CO₂ (in the pricing scheme) from electricity generation eligible until 2036
 - As long as WtE are not in the ETS (i.e. in the pricing scheme), the fossil WtE CO₂ is not eligible for RFNBO/RCF
 - If WtE is in the ETS in 2028, there is a margin of 8 years for CO₂ from WtE electricity (unless deadlines are reviewed)
 - ✓ Biogenic CO₂ from sustainable (REDII) biomass eligible without limits
 - MSW are part of Annex IX of REDII, so the biogenic fraction of WtE CO₂ should be eligible without end dates

Particularities for the WtE sector

3. On the applicability of energy from WtE.

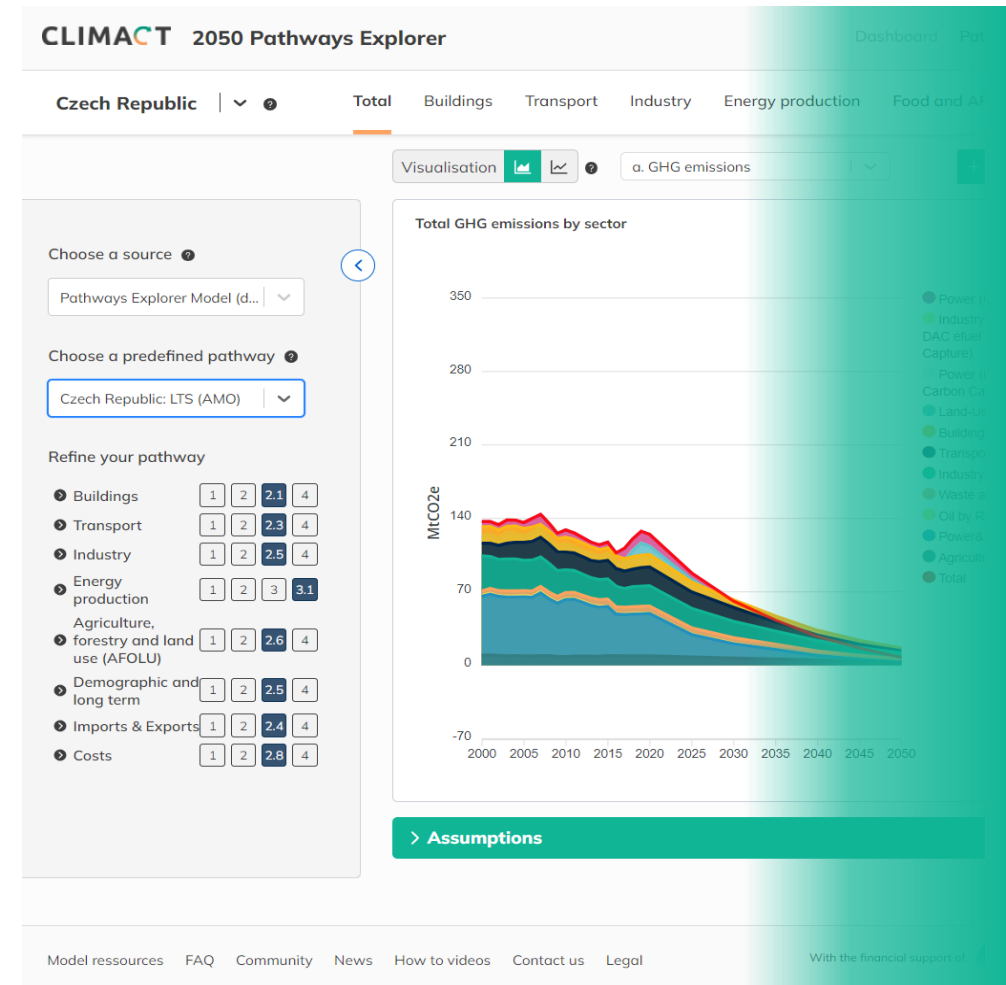
- ✓ The decisive factor for definitions of renewable/low-carbon fuels is the origin of the energy content
- ✓ RFNBO → renewable, non-biogenic
 - *i.e. the WtE energy (both the fossil and the biogenic fraction) is therefore by definition not eligible for RFNBO*
- ✓ Recycled carbon fuels (RCF):
 - ✓ Either from waste processing gas and exhaust gas of non-renewable origin that are unintentional and unavoidable consequence of industrial production process (*typical example steel off-gases*)
 - ✓ Or from liquid and solid streams of non-renewable origin not suitable for material recovery (*typical example gasification, pyrolysis*)
 - *WtE energy would not apply because the energy source of RCF is in the input itself*
- ✓ Further/New definitions are introduced in topical instruments (e.g. ReFuel EU Aviation, Gas package):
 - *Synthetic aviation fuels = RFNBO → WtE excluded*
 - *Synthetic low-carbon aviation fuels (ReFuel EU) → non-fossil, low-carbon, non-biogenic → WtE excluded*
 - *Low carbon hydrogen (Gas package) → non-renewable → WtE theoretically included if product < 70% GHG*
 - *Low carbon hydrogen for aviation (ReFuel EU) → non-fossil, non-renewable → WtE excluded*

WtE & CC/CCU examples

Project	Location	Technology / Product
FlagshipTWO	Sundsvall, Sweden	Catalytic conversion / methanol
Carbon2x	Riihimäki, FI	Catalytic conversion / Methane, chemicals
Forest CUMP	Espoo, FI	RWGS + FT / chemicals
Lipor	Maia, PT	RWGS + FT / SAF
HyNetherlands	Delfzijl, NL	Catalytic conversion / Methanol
Rakkestad	Rakkestad, NO	Solvent-based capture / CO ₂
Herccules (HEu)	Brescia, IT	Mineralisation / binder
Access (H2020)	Oslo, NO	Solvent & enzyme-based capture / CO ₂
HySkies (IF)	Forsmark, SE	Biological conversion / SAF
CaLby2030 (HEu)	Asturias, ES	Calcium looping / CO ₂

CVE's EU 2050 Roadmap for CCU

- ❑ to *develop* contrasted **scenarios** that describe the future context (i.e. *what could happen*) within which the **vision** of significant development of the CCU industry can be realised (i.e. *where we want to be*);
- ❑ to *perform modeling* of CCU pathways to provide **quantified information** on how the identified CCU deployment within our vision can feasibly contribute to climate goals (i.e. *how much*);
- ❑ to *identify and describe actions* that will be necessary to realise the vision (i.e. *how to get there*) and to deduce **messages** for policy makers and other stakeholders
- ❑ To feed the process of the [CCUS Forum](#) that will deliver the official EU Strategy for CCS and CCU by the end of 2023





Thank you!

anastasios.perimenis@co2value.eu

www.co2value.eu

FOLLOW US ON

