

EU projects on CCUS represented at the LCA for CCUS & Alternative Fuels workshop.

High TRL Projects

	ACCESS	Aurora	ConsenCUS	CO2SMOS	C4U	HIRECORD
Start year – End year	2021-2025	2023-2026	2021-2025	2021-2025	2020-2024	2022-2026
Project objective(s)	Quantify environmental impacts of capturing and storing CO2 from industrial emitters in Europe	Full chain assessment scenarios in the AURORA project using CESAR1 solvent	Scale-up of capture and conversion of CO2 with novel versatile technologies into high-added value products. Development of net-zero CO2 clusters	High added-value chemical production from biogenic CO2 emissions for circular bio-based industries	Decarbonize the Steel Industry and integration into the North Sea Industrial Cluster	Scale-up a CO2 capture plant using Rotating Packed Bed absorber and desorber with the APBS-CDRMax solvent
Storage and or utilization	CCS	CCS/CCU	CCU	Utilization Only	CCS	CCS/CCU
Technology developed	Capture: enzymatic solvent (Saipem), rotating packed bed absorber; capture design: integrated cement kiln with carbon capture and biomass use; Utilization: continuous two-step mineral carbonation process for demolished concrete	Innovative solvent-based CO2 capture technology named CESAR1 (open-source) for large-scale cost-efficient integration.	High capture efficiency with potassium hydroxide and electrochemical conversion to formic acid, and potassium formate	Gas fermentation; Electrocatalytic reduction; Bio-catalyzed conversion; Liquid fermentation; Catalytic conversion	DISPLACE to create a CO2 clean stream in the furnace and CASOH a calcium oxide process that also creates a CO2 clean stream	Capturing demonstration: Rotating Packed Bed, absorber and desorber, with the APBS-CDRMax solvent. For Utilization : SNG - PCC
TRL	7 by the end of the project	7-8	7	5-7	7 to 9	6 to 9
Gain from the LCA	Contribution to environmental impacts from transport and storage chains and networks for CO2 to guide the development of CO2 infrastructure in Europe.	Back end add on existing process considering just the flue gas; Heat integration with the end users (existing processes); effective solvent degradation	Value of CCU step with ConsenCUS technology in three different use cases (Cement, Magnesia and CHP in Refinery situation).	Quantify the environmental benefits of converting biogenic CO2 into sustainable products in contrast to conventional synthesized chemicals; optimize resource use across the value chain, and provide actionable data to minimize the carbon footprint and align with EU sustainability goals.	Identify environmental hotspots of these technologies (DISPLACE and CASOH)	Assess the sustainability and degree of circularity of CO2 capture plant using Rotating Packed Bed, absorber and desorber, with APBS-CDRMax solvent. Aim to enhance LCA metrics by a minimum of 30% regarding: Resource consumption, Human health impact ecosystem damage
Website	https://www.projectaccess.eu/	https://aurora-heu.eu/	https://consencus.eu/	https://co2smos.eu/	https://c4u-project.eu/	http://hirecord.eu/

Low TRL Projects

	CO2FOKUS	EcoFuel	LAURELIN	Photo2Fuel	Vivaldi
Start year – End year	2019-2023	2021-2024	2021-2025	2022-2025	2021-2025
Project objective(s)	Direct catalytic conversion of CO2 to dimethyl ether	Production of synthetic fuels from CO2	Production of methanol via CO2 hydrogenation	Acetic acid/methane production via microorganisms and CO2	Bioproduction of organic acid from CO2
Storage and or utilization	CCU	CCU	CCU	CCU	CCU
Technology developed		Develop and demonstrate a process chain for fuel production from CO2	Catalyst systems for advanced hydrogenation technologies	Photo-micro-reactor and separation technologies	Bioelectrochemical systems for nutrient recovery, electrochemical conversion for methanol and formic acid production, bioproduction process for organic acid production
TRL	6 by the end of the project	2-4	2-3	2-4	5 by the end of the project
Gain from the LCA	LCA to evaluate and identify improvements in processes and internation decision-making	Assess potential of project processes in comparison to fossil and alternative fuels from the literature	Assess benefits of synthetic fuels compared to conventional fuels	LCA will guide selection of the system to be scaled up	Assist researchers in technology development at early stages
Website	https://www.co2fokus.eu/	https://ecofuel-horizon.eu/	https://laurelin.eu/about-the-project/	https://www.photo2fuel.eu/	https://www.vivaldi-h2020.eu