CarbFlex is an emerging venture designed to address critical gaps in the European biogenic CO_2 value chain, providing scalable solutions for Carbon Capture and Utilization (CCU) and Carbon Capture and Storage (CCS). As Europe intensifies its efforts to achieve Net Zero by 2050, biogenic CO_2 has become a critical feedstock for mandated CCU applications, such as e-fuels, as well as for negative carbon credits in CCS. Despite its growing importance, the efficient utilization of biogenic CO_2 faces significant challenges, including the fragmented nature of sources, high capital expenditure requirements, counterparty risks, and regional constraints. CarbFlex seeks to overcome these barriers by implementing an integrated "CCUS-as-a-service" model that aggregates CO_2 from diverse sources, deploys capture technologies, and coordinates logistics for liquefaction, storage, and transport.

Initiated by InnoEnergy as part of its broader strategy to develop market-driven solutions for hard-to-abate industrial sectors, CarbFlex is being established as a commercial entity with the purpose of deploying carbon capture technologies to aggregate, process, and commercialize biogenic CO_2. By creating a robust biogenic CO_2 value chain, CarbFlex supports Europe's transition to a low-carbon economy while addressing technical and logistical bottlenecks in the deployment of CCUS systems. A key feature of CarbFlex's approach is its flexibility and scalability: by decoupling CO_2 aggregation from hydrogen production, the venture enables biogenic CO_2 utilization across multiple applications—including sustainable aviation fuels (eSAF) and permanent geological storage.

CarbFlex targets high-demand regions such as the Nordics, Central Europe, and Iberia, aiming to establish its First-of-a-Kind (FOAK) network by 2030 with an annual aggregation capacity of up to 2 megatons of biogenic CO_2. This initiative aligns with the EU's ambitious carbon management strategy of capturing 450 million tonnes of CO_2 annually by mid-century. By leveraging established technologies and fostering collaboration across stakeholders in the carbon value chain, CarbFlex offers a transformative solution that advances the technical viability of CCUS while unlocking new opportunities for innovation in carbon management. For researchers and academics in chemical engineering and related fields, CarbFlex represents a compelling case study in integrating circular economy principles with advanced carbon capture technologies to support Europe's decarbonization goals.