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Abstract for CO2-based Fuels and Chemicals Conference 2026

Title: Closing the CO_2 Loop: From Organic Waste to High-Purity CO_2 for the Food & Beverage Industry

Abstract:
The transition to sustainable carbon management requires innovative pathways to capture and reuse CO_2 within circular systems. This presentation explores a comprehensive approach beginning with CO_2 extraction from organic waste via anaerobic digestion, followed by biogas upgrading using membrane or amine technologies. The process is completed by liquefying the CO_2 extracted from biogas, resulting in a high-purity product suitable for efficient storage, transport, and application in the food and beverage industry. By integrating these steps into a closed-loop system, we demonstrate how waste-derived CO_2 can replace fossil-based sources, reduce greenhouse gas emissions, and contribute to a climate-neutral value chain.