Kanadevia INOVA

Abstract for CO2-based Fuels and Chemicals Conference 2026

Option 1

Title: From Waste to Fuel: Catalytic and Biological Methanation of Captured CO_2

Abstract:
Transforming waste into carbon-neutral fuel offers a highly sustainable pathway for future energy systems. This approach relies on advanced catalytic or biological methanation technologies that convert captured CO_2 sourced from waste-to-energy facilities such as waste-incineration carbon-capture units or anaerobic digesters processing organic waste into renewable methane.

By integrating efficient CO_2 extraction with robust methanation processes, the resulting system provides a scalable solution for significantly reducing emissions while producing clean, grid-compatible fuel.

Closing the cycle, the combined capture–methanation–utilization chain creates a circular carbon loop in which waste-derived CO_2 is continuously reused instead of being emitted. This closed-loop approach enables the substitution of fossil natural gas, supports flexible energy storage through synthetic methane, and contributes to a climate-neutral, resource-efficient energy infrastructure.

Option 2

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.