Technical Brief: Functional Prototype 5

Boecillo, Valladolid Spain

Responsible **Partner**

CARTIF

UNIVERSITÀ DEGLI STUDI DI PADOVA

Anaerobic digestion system coupled with a microbial electrolysis cell for biogas upgrading

Production Line

Anaerobic Digestion

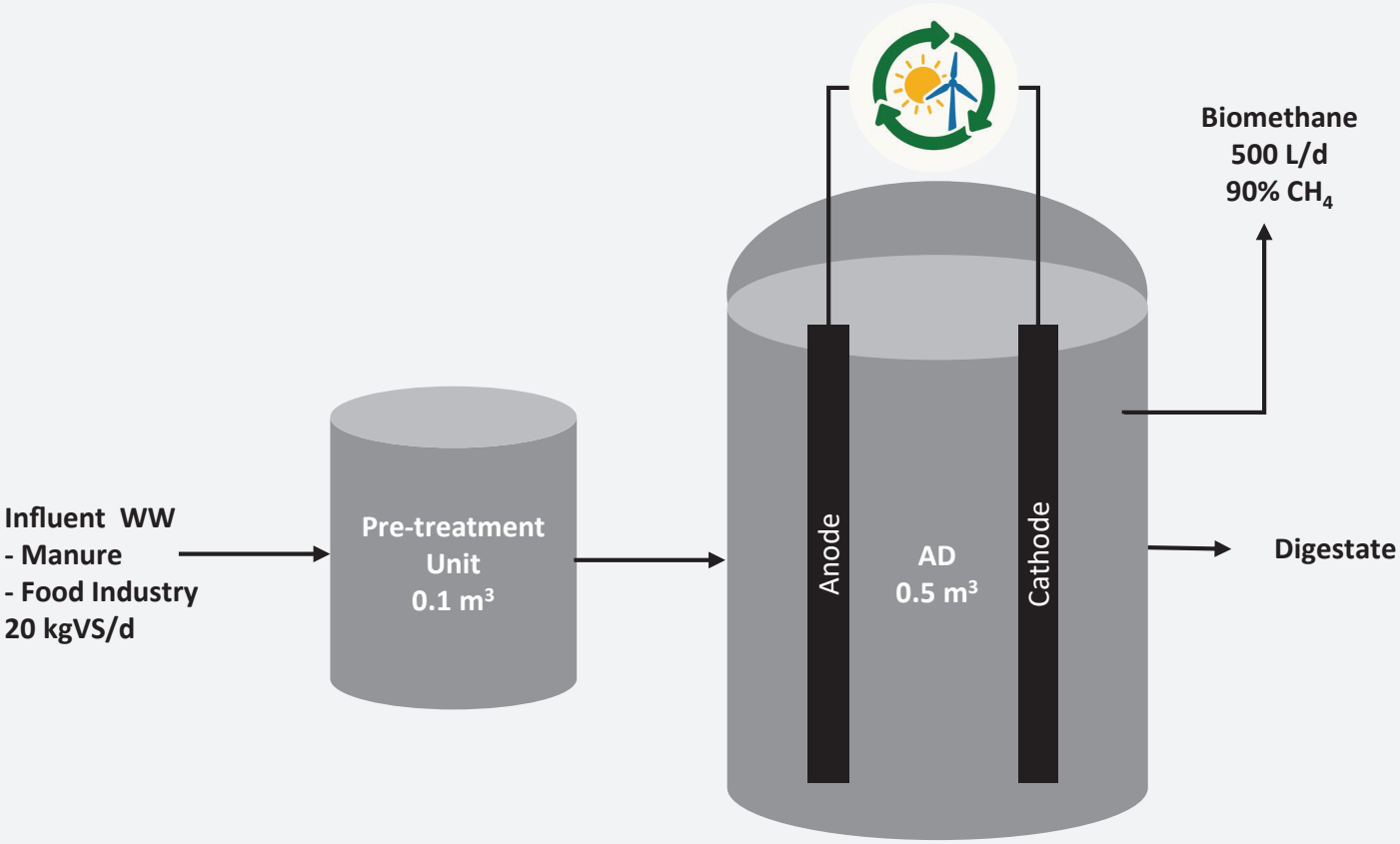
Biogenic Gas CO_2

End-Product

Upgraded Biogas / digestate

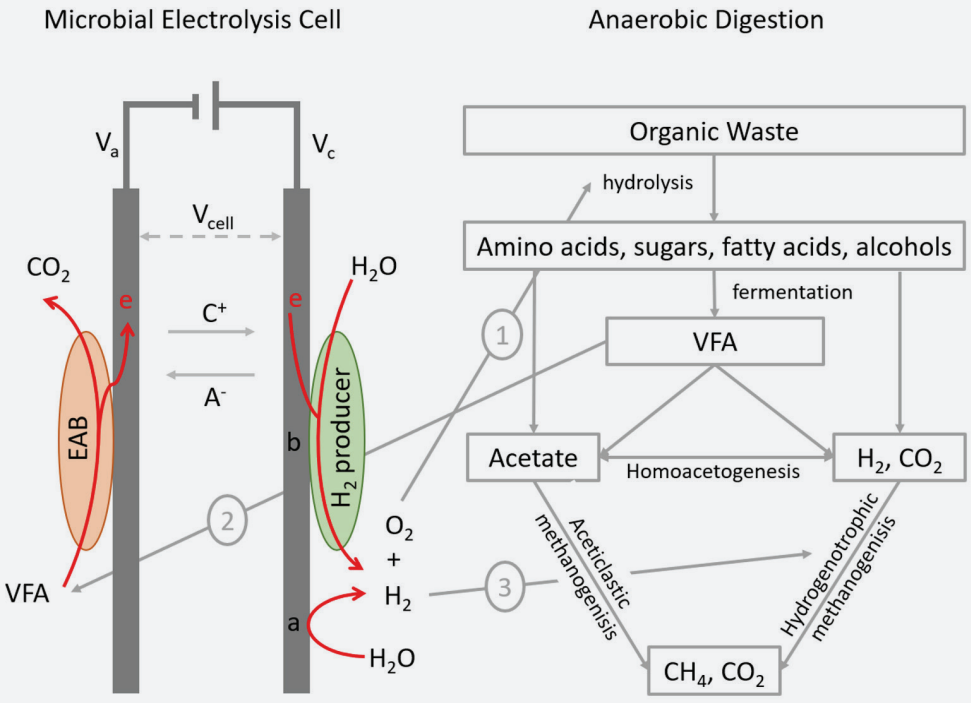
Technologies

Integration of anaerobic digestion & microbial electrolysis for in-situ bio-methanation



Performance Indicators

Indicator		Baseline	CRONUS FP5	Improvement (%)
CO2 emissions	kg CO2 emissions / kg biofuel produced	2,9	1,5	48
Carbon captured / Carbon utilized	kg C captured / kg C initial feedstock	-	0.08	-
Bioenergy efficiency 1 (%BE1)	Energy content of produced biofuels / Energy input in the whole system	1,0	4.0	300
Bioenergy efficiency 2 (%BE2)	Energy content of produced biofuels / Energy content of initial feedstock	1,5	6,8	350
Biomass resource utilization (%BR)	kg products / kg initial feedstock	40	53	33



Integration of anaerobic digestion & microbial electrolysis for in-situ bio-methanation

Possible synergies between the 2 technologies:

1. Formation of micro-oxic zones enhancing hydrolysis,
2. Consumption of VFAs by electrochemically active bacteria limiting VFA accumulation promoting AD stability
3. Production of H2 promoting hydrogenotrophic methanogenesis and thereby enhancing CH4 content.