



Session 6	Microbes and gaseous feedstocks
Pitch Title	Sustainable production of carbon negative ingredients using Archaea
Company	Arkeon biotechnologies GmbH
Speaker	Justin Smith
Keywords feedstock	Carbon dioxide, hydrogen, industrial offgas
Keywords technology	Precision fermentation, sustainable proteins, gas fermentation.
Keywords End-Product	Sustainable proteins, amino acids

Abstract:

Arkeon is revolutionizing carbon upcycling by converting industrial CO₂ into high-value compounds using archaea microbes. Arkeon’s proprietary strain is able to produce all 20 essential amino acids and can be modified to over produce single amino acids. Using Arkeon process, we aim to decouple ingredient production from agriculture and its reliance on land, water, and energy, whilst capturing CO₂ emissions and contributing to a circular carbon economy.

Arkeon has developed a molecular tool box tailored for genetic modification of our patented Archaeal strain and a corresponding gas fermentation process that allows us efficiently produce Leucine at high rates as the first go to market product. The Leucine technology will be ready for upscaling to pre-commercial production volumes in 2025 followed by Isoleucine and Valine platforms which are in our developmental pipeline.

At industrial scale, our Archaeal technology platform is capable of undercutting existing fermentation derived amino acid cost structures reliant on sugar feedstocks and can remain cost competitive at a hydrogen price of 4-6 €/kg depending on scale. The average global green hydrogen price in 2020 was 5.78 €/kg and is projected to drop below 4 €/kg by 2030 allowing Arkeon and its licensing partners to sustainably produce Amino Acids from CO₂ with enhanced profitability.

