

DeltaSpark

We make CO₂ removal profitable

In a nutshell

Rapidly rising global temperatures, fuelled by record-high CO₂ emissions, demand urgent and large-scale reductions to avoid catastrophic climate impacts. Switzerland introduced a carbon tax of 120CHF/tonne of CO₂ to reduce Swiss CO₂ emissions (36 million tons CO₂ eq. in 2022) and promote carbon dioxide removal (CDR). The scarcity of fast, cost-effective CDR solutions hinders carbon reduction, especially for cement manufacturers, waste incinerators and energy providers, cutting profits.

Why is our technology important?

One strategic way to remove CO₂ is to store it directly into minerals. However, these reactions are typically slow, often taking several days. To accelerate the process, mineralisation companies rely on high-pressure, high-temperature reactors. Despite such extreme conditions, the reaction still requires few hours to complete, resulting in discontinuous process and inefficient process.

DeltaSpark's multi-patented electrocatalytic mineralisation process enables CO₂ to be mineralised up to 1000 times faster than current technologies. Simultaneously, it generates clean hydrogen (H₂) and clean oxygen (O₂) at a fraction of their current market prices, making CO₂ removal not only technically feasible but also economically profitable. The compact and modular design will enable each shipping container-sized unit to mineralized at least one ton of CO₂ per day, offering a scalable and efficient carbon removal solution.

The benefits of our solution

- First continuous and modular CO₂ mineralisation process.
- up to 1000 times faster mineralisation than the competition.
- Simultaneous production of cheap clean H₂ and O₂.

Keywords

Carbon Removal, Mineralisation, Clean Hydrogen

Founding Team

The founding members met in 2022 during the Ph.D. excellence program, which offers training about public speaking, and leadership.

Suhas Nuggehalli Sampathkumar (future CTO) – Ph.D. student in water and CO₂ electrolysis, with two WIPO patents. Designated as a Class D researcher by the EU Fuel Cell and Hydrogen Joint Undertaking, with a proven track record of securing up to 3.4 million CHF in funding to advance GEM Lab's research leadership in water electrolysis and fuel cell technologies, with the objective of transferring and expanding this expertise into the field of CO₂ electrolysis. Brings extensive expertise in high-temperature solid oxide cells as well as low-temperature electrolyzers and fuel cells, establishing a leading position in the field of electrochemical conversion systems. Authored more than six publications during the PhD program.

Luc Bondaz (future CEO) – Completed a Ph.D. at EPFL on membranes for carbon capture, while simultaneously earning an MSc in Business Analytics from Imperial College London, graduating with First Class Honors. Selected and trained by McKinsey Switzerland during a 6-month mentorship program, to bridge the gap between Science and Business Analytics. This multidisciplinary background brings extensive expertise in molecular separation, energy systems, carbon capture technologies, workforce, supply chain, marketing and financial analytics.