

Sustainable Photo-ElectRochemical VALORIZATION of flue gases

Timeline | 11/2023 to 10/2026

ICIQ People | Galán-Mascarós Group

Overall Budget | 3.571.708,75 €
ICIQ's Budget | 650.750,00 €

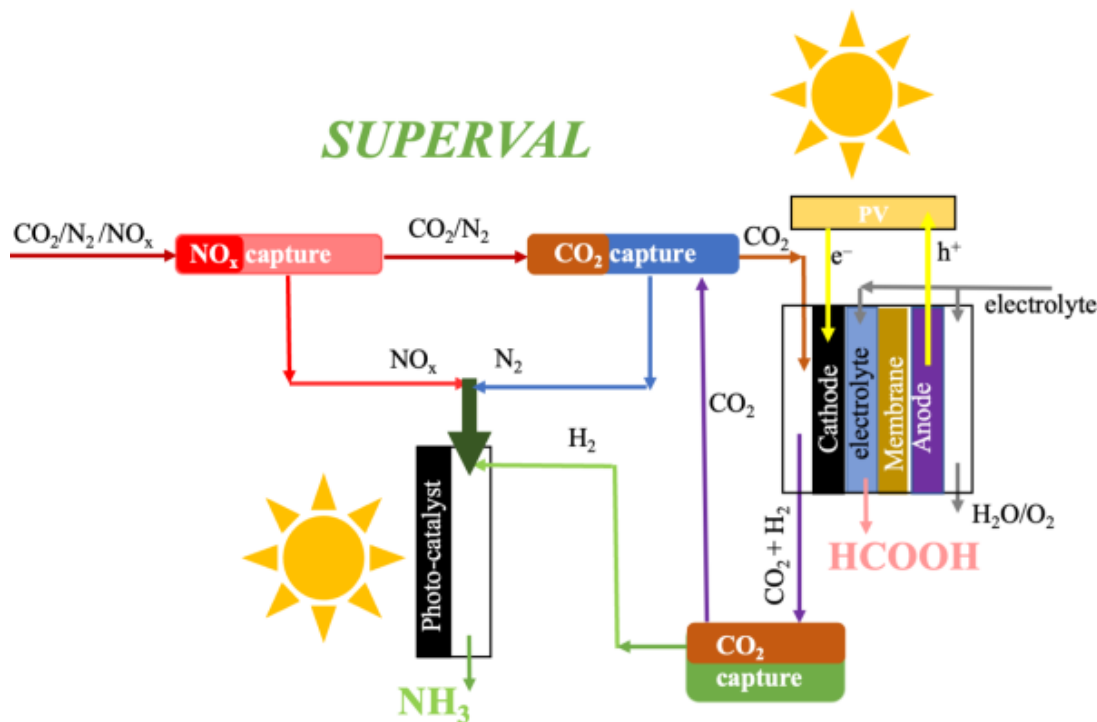
<https://cordis.europa.eu/project/id/101115456>

Call | HORIZON-EIC-2022-PATHFINDERCHALLENGES-01

SUMMARY

In the road to sustainability, the treatment of post-combustion emissions is still far from being techno-economically viable. On one end, the low concentration of CO₂ in these streams, precludes the use of current carbon capture (CC) technologies. On the other end, even if CC were successfully implemented, there are not plausible final uses, maybe except geological long-term storage. Our ambitious proposal aims to investigate the viability of a technology able to tackle these challenges at once. Our **SUPERVAL** technology will develop scientific solutions from low-cost, non-critical raw materials and processes, with the added value of removing/valorizing the NO_x contaminants from flue gas. We propose to design and realize an autonomous, solar-powered installation able to capture harmful emissions from flue gas, and valorize them as commodities for the chemical industry, using water as sacrificial source of electrons and protons. The CO₂ will be transformed into an organic, energy-rich molecule (formate). The NO_x will be also captured and transformed, in combination with N₂, into ammonia using the hydrogen obtained in the CO₂ co-electrolysis processes. This integrated effort will offer the comprehensive capture and valorization of carbon and nitrogen components in post-combustion emissions, thus limiting pollutants and resulting in added-value chemicals. The corresponding techno-economic analysis and life cycle assessment studies will help to shape the components and performance of **SUPERVAL** as a useful technological advancement in the search for zero net emissions.

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