Keep-in-Touch meeting
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SYAMESE (Synergy between plasmas and separation membranes for sustainable CO_2 conversion) and CANMILK (Carbon-neutral milk) projects

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In this KIT meeting of the N-PRiME group, two new projects where several group members are involved will be presented.

SYAMESE is an exploratory FCT project that proposes to use an all-electric route for conversion of greenhouse gas CO_2 into chemically useful CO and O_2. A highly novel approach to electro-synthesis will be studied by merging two developing technologies: oxygen-conducting membranes used in solid oxide electrolysis and plasma conversion. In this way the reactivity of the plasma will be synergistically combined with the selectivity of electrolysis. This project proposes a solution with direct separation of conversion products CO and O_2, high durability and output, by using the plasma as cathode of the electrolysis cell.

CANMILK is a Horizon Europe project started in 2022 to which we recently hoped-on (https://canmilk.eu/). The novelty of the on-going project is to combine plasma technology and catalysis to develop an energy efficient method for the abatement of highly dilute methane, i.e. methane that is found in concentrations significantly below 1 vol% in the indoor air of animal barns. However, there remains the key question of what happens on the direct interface of plasma and catalyst. We propose to use both modelling and experimental expertise to study the activity and lifetime of the plasma-generated radicals on the catalyst surface, which has direct impact on the feasibility of the developed technology. The understanding of the radical transfer from plasma to the catalyst would greatly improve the design of the CANMILK technology.