

**Abstract CAPTIN-2**

**Intensification of CO<sub>2</sub> capture processes II**, full cSBO with a proposed starting date on 1 October 2021 and a proposed duration of 30 months, with partners VUB, KU Leuven, UGent, UAntwerpen and VITO. Follow-up project of the currently running Moonshot sprint cSBO project CAPTIN (<https://moonshotflanders.be/mot3-captin/>).

In this follow-up project, we aim at the further development of new and more efficient, sustainable and economically viable CO<sub>2</sub> capture and separation technology with focus on point sources.

Different routes will be continued to achieve this goal:

1. Intensification of mass and heat transfer processes in CO<sub>2</sub> capture is aimed at, using a vortex unit and an aerosol reactor for liquid phase CO<sub>2</sub> absorption.
2. Electrification of the CO<sub>2</sub> capture processes using inductive heating (IH) will be implemented in order to develop faster and more efficient separation cycles.
3. The integration of CO<sub>2</sub> capture and conversion is envisioned using alkali-mediated capture combined with electrochemical conversion of CO<sub>2</sub> into chemicals.

The experimental test devices that have been developed in CAPTIN will be used to further investigate these new concepts. The already built models will now be fully exploited for the assessment of the new technologies in terms of efficiency. The main challenges that were identified in CAPTIN will be tackled: combining intensified absorption and stripping; enhancing efficiency of the inductive heating process; improving adsorbent energy absorption; process cycle optimisation; evaluating operating window and effect of operating conditions; process control. A roadmap analysis will be carried out to define technical and valorisation-related milestones and identify technical, economic, environmental and market-related hurdles.

To tackle this challenge, a multidisciplinary team has been built with experts in process intensification, separation processes, functional material development, electrochemistry and techno-economical assessment.

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