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nanomemc²

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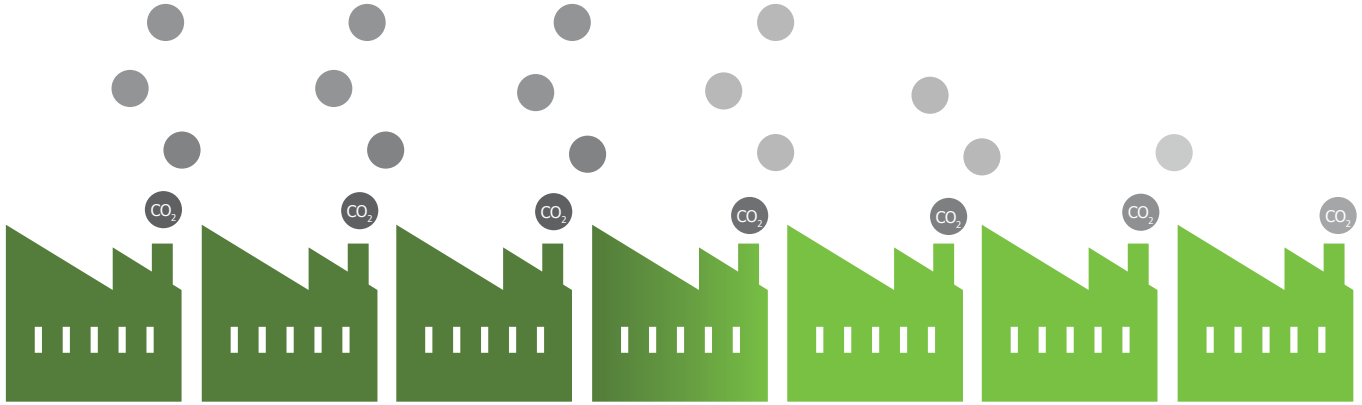
NanoMaterials Enhanced Membranes for Carbon Capture



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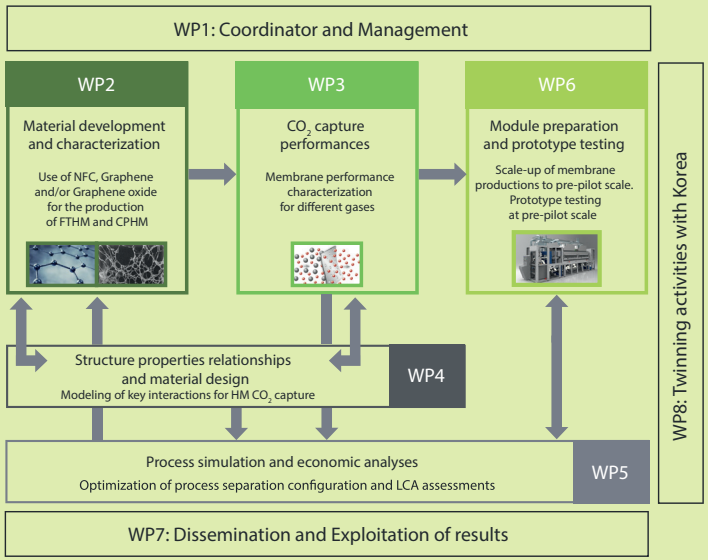
www.nanomemc2.eu

THE PROJECT

Membrane separation can be applied to many CO_2 capture processes from pre-combustion (CO_2-H_2 / CO_2-CH_4 separation) to post-combustion (CO_2-N_2) and oxyfuel (O_2-N_2) and is generally endowed with high flexibility and potentially low operating costs when compared to other capture methods. However, current materials lack the separation performance and durability needed for an efficient and economically feasible exploitation of such technology. The NANOMEMC² project aims to overcome current limitations by focusing on the development of innovative CO_2 selective membranes with high flux and selectivity, suitable for application to both pre and post-combustion capture processes. Nanofibrillated cellulose (NFC), Graphene (G) and Graphene Oxide (GO) suspensions will be produced and appropriately functionalized for obtaining two different types of membranes: novel Facilitated Transport Hybrid membrane (FTHM) and Continuous Phase Hybrid Membrane (CPHM).



AIMS & GOALS

The general objective of the NANOMEMC² project is to contribute to a real and effective deployment of CCS technologies by reducing the cost and energy penalty of CO_2 capture through the development and optimal integration of innovative membranes for CO_2 separation within different energy intensive industrial processes.

It will be implemented through the attainment of the scientific NANOMEMC² main goal: to fully develop the potential of membranes in the selective capture of CO_2 from gaseous emissions, increasing the efficiency of the capture step, and reducing the overall CCS cost below the value of 40€/tonne of CO_2 avoided. NANOMEMC² will focus on both pre-combustion and post-combustion strategies thus applying new membranes for separation of CO_2 on both fuels and flue gases.

PROJECT BENEFITS

The NANOMEMC² approach is to address, through process intensification and technological innovation, three of the highest priorities in the EU energy-intensive industry, namely:

- CO_2 emissions reduction (-35% for basic set up);
- Energy penalty (from current 30% of amine absorption down to potential 20% expected);
- Cost competitiveness (at least -20% for both CAPEX and OPEX).

The NANOMEMC² project will have relevant impacts in the EU industry and global markets, by:

- contributing to **advance the knowledge** on new materials, technologies and processes for cost-efficient and high-performance CO_2 capture;
- **build a strong** and concrete case for rapid **industrial application**;
- **improving the competitiveness of EU industry**;
- **set up of a strong business model** and related business plan for the NANOMEMC² innovations.

nano memc²

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