

**Title:**

INTERACT - R&D on INnovaTive Enzymes and poly(ionic-liquids) based membranes as post combustion CO<sub>2</sub> Capture key Technology

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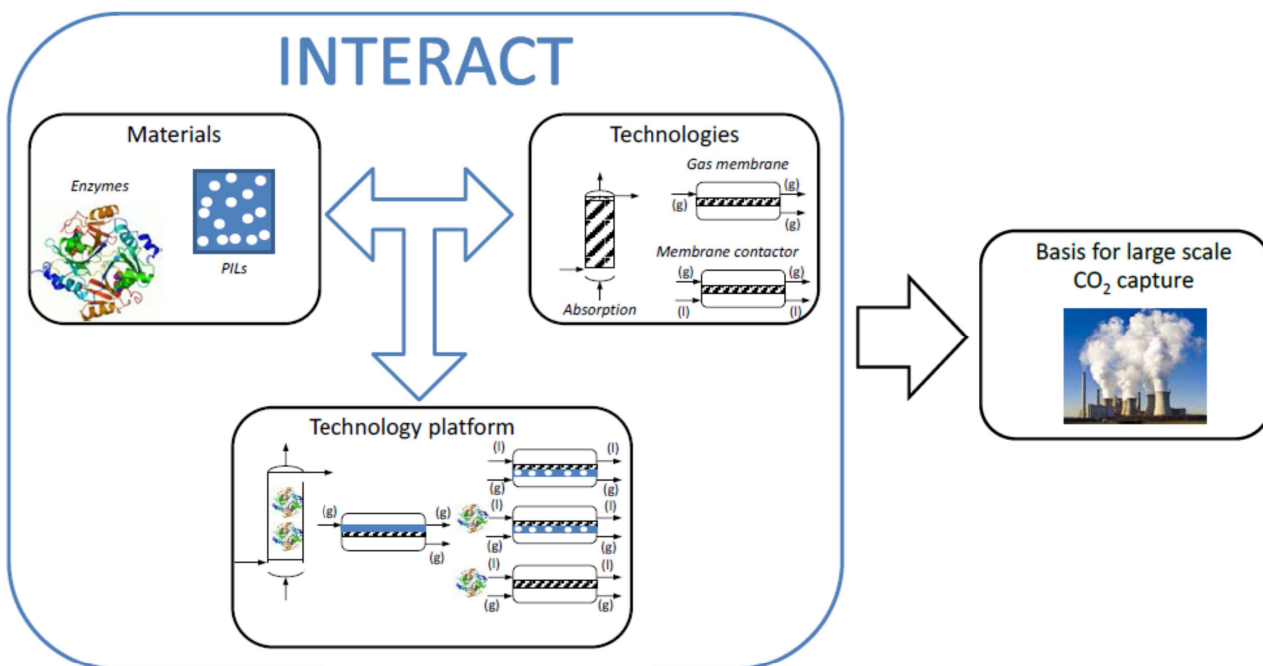
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**Abstract:**

A major task addressed in the Strategic Energy Technology Plan of the EU is the sustainable power generation from fossil fuels. A crucial step here is the separation of CO<sub>2</sub> from flue gas. INTERACT investigates the scientific and technological basis of radically innovative materials and processes. Strong improvement of the energy penalty of the capture process below 5 % points and reduction of the CO<sub>2</sub> capture costs significantly below 50% by simultaneously substantially decreasing the footprint of power plants and thus the environmental impact. INTERACT follows the idea of the concurrent engineering in which new materials for CO<sub>2</sub> capture i.e. membranes, highly efficient nanomaterials and biological absorbents are combined with innovative technologies resulting in real breakthroughs towards next generation carbon capture technologies.

The general concept of INTERACT is to open new pathways for development of high-potential novel processes for post combustion CO<sub>2</sub> capture based on new materials, using poly(ionic liquid)s [1] and/or enzymes [2], integrated into gas separation technologies such as gas separation membranes, absorption in columns and absorption using membrane contactors [3], resulting in process intensification.

Several innovative absorbents and adsorbents - the main bottleneck of the conventional processes - will be in depth analysed for applications in different unit process operations (see figure). Tests in full scale for long term operation under realistic operating conditions will confirm their feasibility. It will result of proof of concept for the most suitable combination of new “material by design” and innovative technology.



**Figure: The R&D interactions within the INTERACT project**

The INTERACT project consortium composed of industry, SMEs, universities and research institutes will provide the technological basis for advanced CO<sub>2</sub> separation both for large scale operation of power stations or other energy intensive industry as well as for smaller emission sources [4].

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**References:**

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- [2] Savile et al. "Biotechnology for the acceleration of carbon dioxide capture and sequestration", Current opinion in biotechnology, 22, 818-823, 2011.
- [3] Albo et al. "Carbon Dioxide Capture from Flue Gases Using a Cross-Flow Membrane Contactor and the Ionic Liquid 1-Ethyl-3-methylimidazolium Ethylsulfate", Ind. Eng. Chem. Res., 49 (21), 11045–11051, 2010.
- [4] [www.interact-co2.eu](http://www.interact-co2.eu)