MATESA

Project ID: 608534
Funded under: FP7-ENERGY

Advanced Materials and Electric Swing Adsorption Process for CO2 Capture

From 2013-09-01 **to** 2016-08-31, closed project

Project details

Total cost:	**Topic(s):**
EUR 5 709 173	ENERGY.2013.5.1.2 - New generation high-efficiency capture processes
EU contribution:	**Call for proposal:**
EUR 2 965 707	FP7-ENERGY-2013-1 See other projects for this call
Coordinated in:	**Funding scheme:**
Norway	CP - Collaborative project (generic)

Objective

"Carbon capture and storage (CCS) is one of the technological solutions to decarbonize the energy market while providing secure energy supply. So far, the cost of CCS is dominated by the CO2 capture, reason why new capture techniques should be developed.
Adsorption techniques have already been evaluated for CO2 capture. So far, the main drawbacks of this technique are the energetic demand to regenerate the adsorbent and obtain high purity CO2. However, the utilization of commercially available materials was employed in the former evaluations. New materials with targeted properties to capture CO2 from flue gases can improve the performance of adsorption processes significantly.
The vision of MATESA is to develop an innovative post-combustion capture termed as Electric Swing Adsorption (ESA). The utilization of hybrid CO2 honeycomb monoliths with high-loading CO2 materials (zeolites and MOFs) will be targeted. Classical ESA regeneration is done by passing electricity through the adsorbent, releasing adsorbed CO2 that can be recovered at high purity.
A game-changing innovation in MATESA is the development of a regeneration protocol where electricity is only used to increase the purity of CO2 in the column and further regeneration is done using available low-grade heat. The predicted energy savings of the developed process may transform this CO2 capture process in a key component to make CCS commercially feasible in fossil fuel power plants going into operation after 2020.
In order to realize a proof of concept of the proposed process, a strong component of the project will deal with the development of a hybrid material that is able to selectively adsorb CO2, conduct electricity, result in a low pressure drop and have reduced environmental impact. The development of such a material is important for MATESA and will also have a significant impact to increase the energy efficiency of pre-combustion CO2 capture and other energy intensive gas separations."

Related information

Report Summaries	Periodic Report Summary 1 - MATESA (Advanced Materials and Electric Swing Adsorption Process for CO2 Capture)
	Periodic Report Summary 2 - MATESA (Advanced Materials and Electric Swing Adsorption Process for CO2 Capture)

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Subjects

Energy Saving - Energy Storage and Energy Transport

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