High performance MOF and IPOSS enhanced membrane systems as next generation CO2 capture technologies

GENESIS develops and upscales some of the most promising materials for CO2 capture and demonstrates their performance, durability and reliability in industrial environments. The materials are IPOSS and MOF membrane systems that have demonstrated great performance for CO2 capture.

Objectives

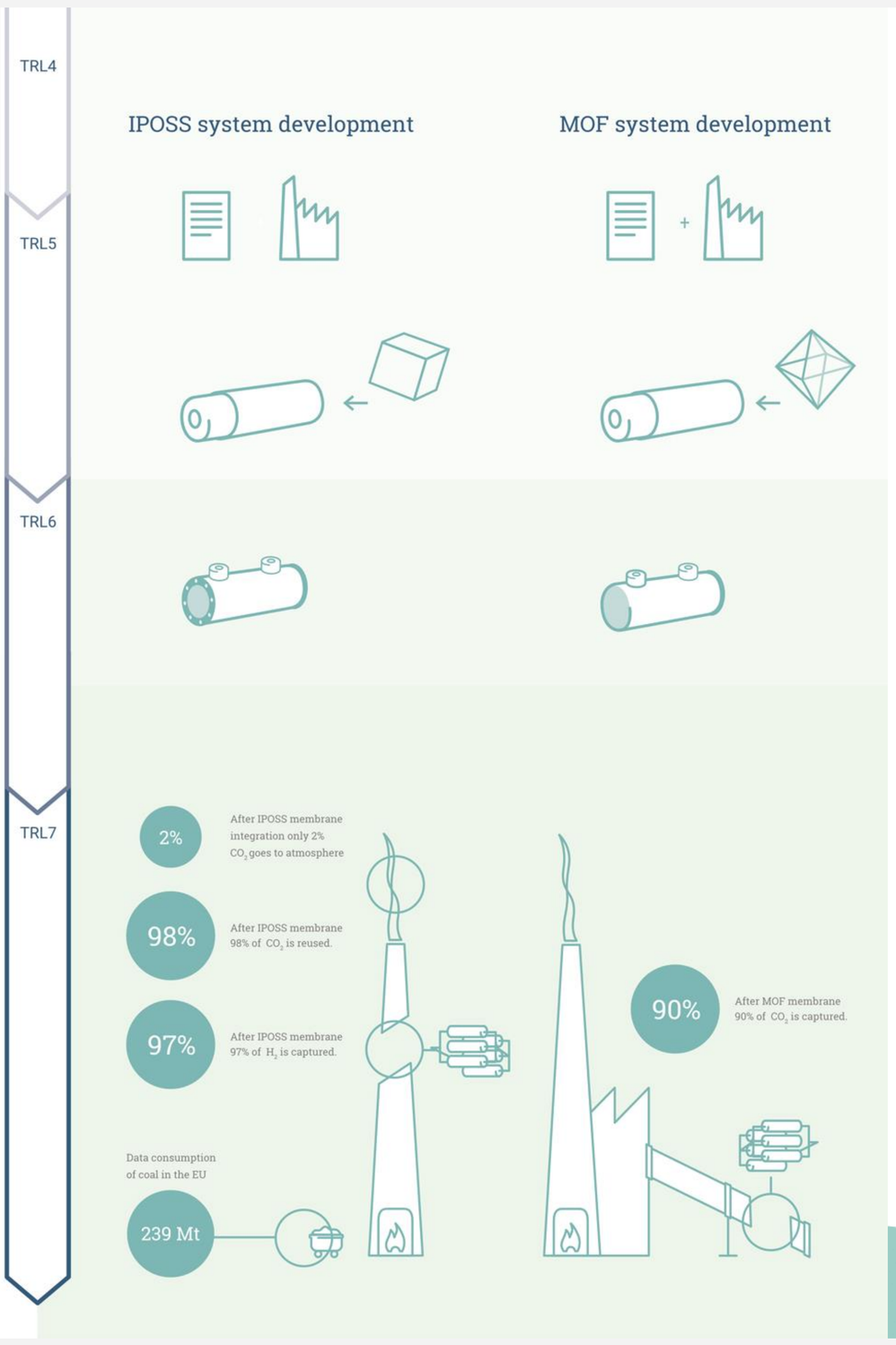
1 Develop Mixed Matrix membranes that capture at least 90% of CO2

2 Demonstrate CO2 capture system in Cement and Steel industry

3 Demonstrate membrane systems in pre-combustion and post-combustion applications

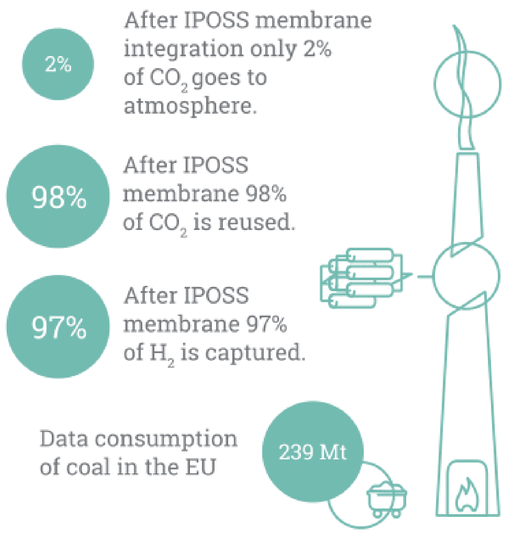
4 Recover CO2 at a cost of 15€/MWh

Developments



Processes

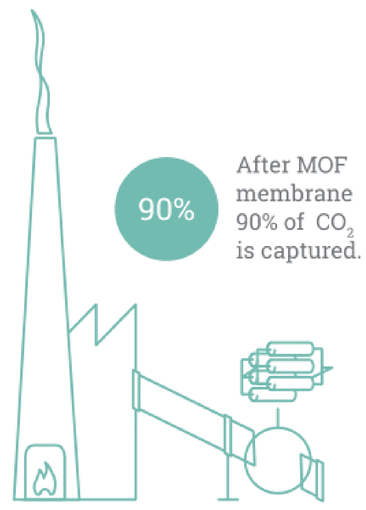
Pre-combustion process



Pre-combustion CO_2 capture relates to gasification plants which are found in power production, but also for the manufacturing of natural gas steel and bulk chemicals.

Post-combustion process

The **post-combustion process** has the highest potential to be retrofitted to traditional power plants or in industries like steel, cement and bulk chemicals.



The materials being developed and upscaled within the GENESIS project are IPOSS (polyPOSSimide hybrid organic-inorganic) and MOF (Metal-organic framework) membrane systems with great performance for CO2 capture.

The membranes have a high gas permselectivity and stability at elevated temperatures and can be produced at a large scale. The nanostructured materials like MOF and IPOSS can be tailored to obtain suitable membrane selectivity and permeability characteristics.

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