



## Ceramic Membranes for Natural Gas Production: Challenges and Environmental Benefits

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### Abstract

Since the beginning of Pre-Salt production, the technology based on the use of polymeric membranes was chosen to separate CO<sub>2</sub> from the produced natural gas, due to the high CO<sub>2</sub> content found in the reservoirs of those fields. Notwithstanding the success of this operation, which resulted in the injection of tens of thousands of tons of separated CO<sub>2</sub> since 2008, it is still observed that a large amount of hydrocarbons permeates the membrane, together with the CO<sub>2</sub>, leading to the loss of gas production and increase in energy demand for CO<sub>2</sub>-rich stream (membrane permeate stream) injection into the reservoir. The search for a new material, more selective to CO<sub>2</sub>, contributes to an increase in separation efficiency, increase in the specified gas export and a decrease in CO<sub>2</sub> emissions involved in the process. This work will show the stages of technology qualification, from formulation and proof of concept in laboratory tests, through testing stages with an intermediate prototype and, finally, with tests in field conditions, using the membrane in its final application scale. The process of qualifying a new technology may take some years, but on the other hand, it is essential to confirm the potential initially identified in the formulation of the technology and, even more importantly, to reduce the risks involved in innovation, in its use in production projects.