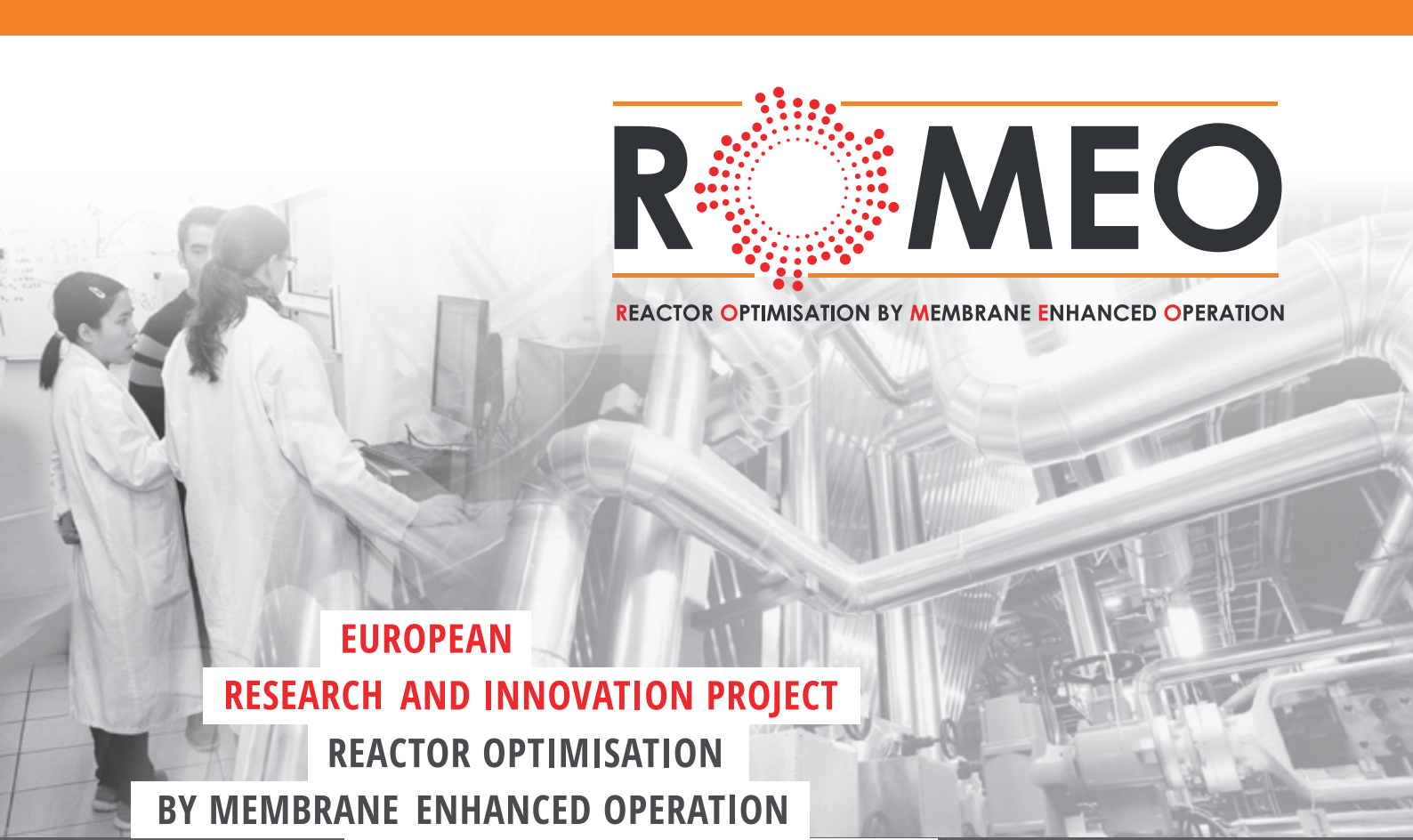


ROMEO

REACTOR OPTIMISATION BY MEMBRANE ENHANCED OPERATION

EUROPEAN RESEARCH AND INNOVATION PROJECT

REACTOR OPTIMISATION BY MEMBRANE ENHANCED OPERATION

REDUCING ENERGY CONSUMPTION IN PROCESS INDUSTRY

Industry & academia teaming up around a new reactor concept: reaction and downstream processing steps combined into a single unit.

Reducing energy consumption by up to 80% and emissions by up to 90% in industrial catalytic gas-phase reactions.

Demonstrations plants for bulk chemicals and bioenergy applications.

ROMEO'S AIM AND IMPACT

ROMEO is a European Research and Innovation Project funded by the European Commission. It is developing a new reactor concept using homogeneous catalysis and membrane technology to carry out chemical synthesis and downstream processing in a single step. Process intensification for catalytic-driven and eco-friendly reaction systems will be brought to a new level thanks to this two-in-one reactor. ROMEO's reactor will improve efficiency and long-term sustainability for the process industry that is highly dependent on energy, raw materials and water resources.

DEMONSTRATION PLANTS

Processes for bulk chemicals and bio-energy applications have been chosen to demonstrate the efficiency of ROMEO's technology in a near industrial environment. *A demo plant for hydroformylation* will be built. This facility will convert olefins and syngas to aldehydes. These molecules are used as precursors for plasticizer alcohols. *A demo plant for water-gas shift reaction* will be built. This demo plant will use CO or CO-containing syngas derived from biomass. If successful, the ROMEO researchers will have found a way of generating hydrogen from biogenic waste materials, for example wood waste.

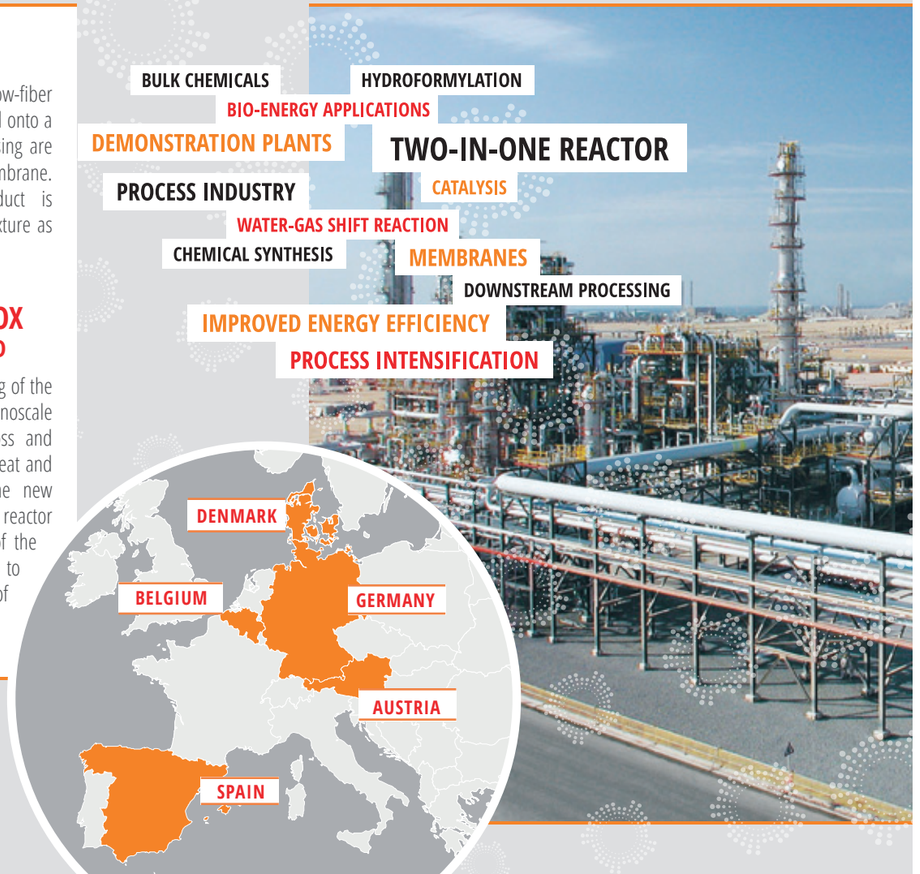
A TWO-IN-ONE REACTOR

ROMEO's reactor includes bundles of hollow-fiber tubes and a homogenous catalyst being fixed onto a membrane. Chemical synthesis and processing are carried out in a single step thanks to the membrane. In this "two-in-one" reactor, the product is continuously removed from the reaction mixture as soon as it is formed.

A NANO TO MACRO TOOLBOX

FLEXIBLE REACTOR DESIGN METHOD

ROMEO intends to get detailed understanding of the processes involved in its new reactor, from nanoscale (catalyst phase, membrane, transport across and inside the membrane) to macro-scale (e.g. heat and mass flow, industrial process design). The new know-how will be used to develop a flexible reactor design method: a detailed understanding of the different components will allow the tool-box to be flexible and tailored for a wide range of applications.



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www.romeo-h2020.eu

ROMEO IN A NUTSHELL

EC Call: **H2020-SPIRE-2015**
Grant agreement n°: **680395**
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Duration: **48 months**
EC funding: **6 millions €**

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