This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 680395.

Reactor Optimisation by Membrane Enhanced Operation
H2020-SPIRE-2015 - RIA n° 680395
Start Date: 15th **September 2015**
Coordinator: Dr. Frank Stenger – Evonik - DE
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Delivrable

Report

First update of the project Brochure

D8.2.2_WP8_EMH_Update of the brochure_March2018

Public

Author(s): Frank STENGER (EVONIK), Mathilde BOUCHER and Stéphanie HERNANDEZ (EMH)

Task No. : 8.1

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Summary:

A first project brochure was created at the beginning of the project to describe ROMEO's overall aim, expected impact, its two-in-one reactor and the demonstration plants. It also features the list of ROMEO's partners and a map showing which European countries the partners come from. Targeted readers have a background in chemistry. For those who wouldn't, it provides catch phrases to get the gist of the project.

Two years and a half later and as planned in the Annex 1 of ROMEO's Grant Agreement, it seemed interesting to update the first project brochure. Its objectives and targets remain the same. **The update presented in this deliverable allows to clarify the context of ROMEO and to highlight what's really new with the project**.

The brochure is available on ROMEO's public website: http://www.romeo-h2020.eu/results/romeos-presentations/ . A high-resolution printable version of the brochure is also available for partners.

A second update is planned by the end of the project.

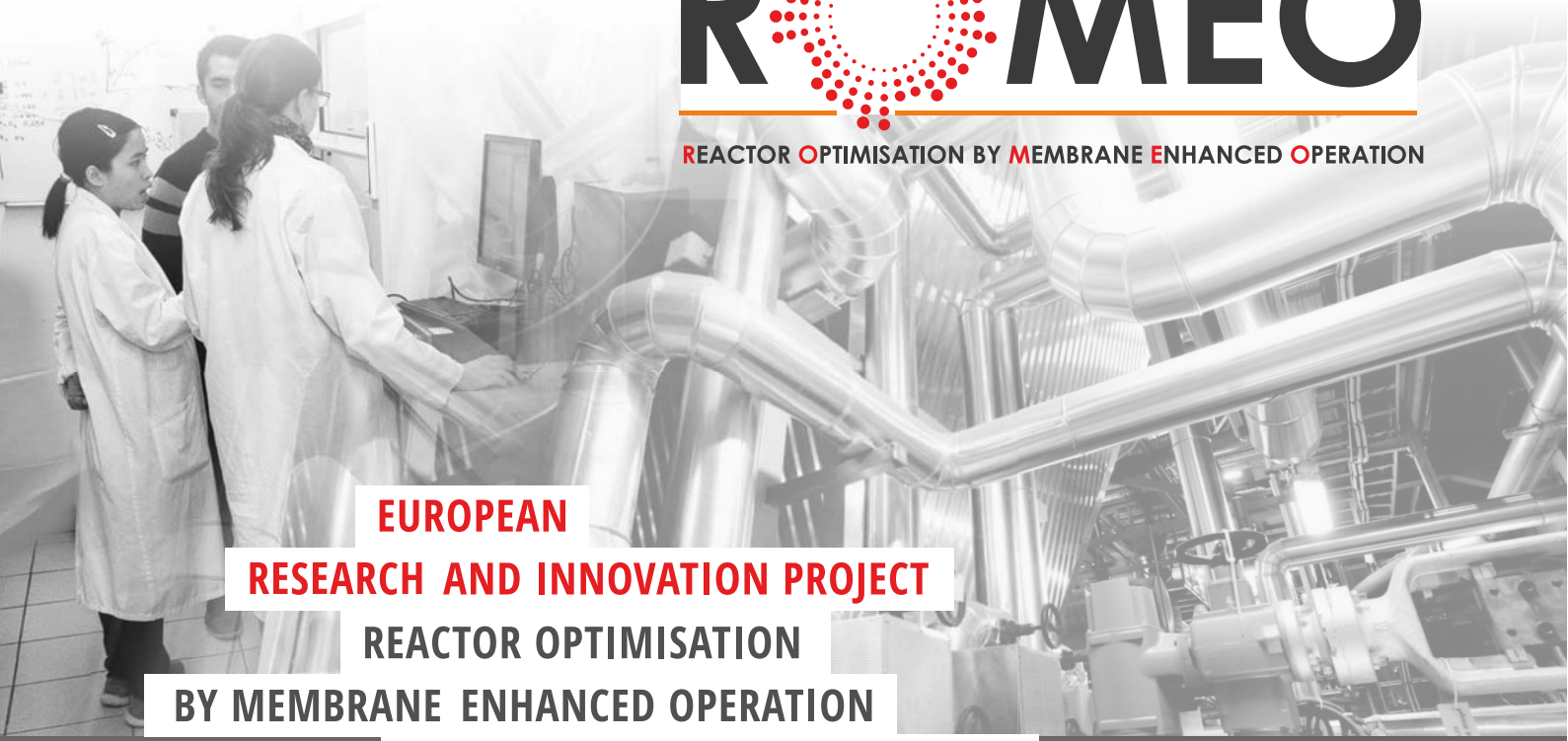
Document history and validation

When	Who	Type	Comments
05.02.2018	Mathilde BOUCHER (EMH)	First suggestions for an update (draft1)	*Update of the content of the first brochure, edited by EVONIK*
07.02.2018	Gilbert RIOS, Lucie VAAMONDE (EMH)	Comments and other suggestions (draft 2)	*Draft to share during the progress meeting (March 2018)*
13.03.2018	Mathilde BOUCHER (EMH)	Draft 3 of the updated content, including comments shared during the meeting	*Sent to the members of the steering committee for approval*
29.03.2018	Frank STENGER (EVONIK)	Draft 4 of the updated content, including comments from EVONIK, Linde (Bjoern SCHICHTEL) and FAU (Marco HAUMANN)	

Author(s):	Frank STENGER (EVONIK), Mathilde BOUCHER and Stéphanie HERNANDEZ (EMH)	Approved by the Coordinator : Yes Date: 29.03.2018
Reviewer(s)	Gilbert RIOS and Lucie VAAMONDE (EMH), Marc KRISTEN and Frank STENGER (EVONIK), Bjoern SCHICHTEL (Linde), Marco HAUMANN (FAU)	

ROMEO

REACTOR OPTIMISATION BY MEMBRANE ENHANCED OPERATION



EUROPEAN RESEARCH AND INNOVATION PROJECT

REACTOR OPTIMISATION BY MEMBRANE ENHANCED OPERATION

REDUCING ENERGY CONSUMPTION IN PROCESS INDUSTRY

CONTEXT

The immobilization of highly active and selective homogeneous catalysts by the supported ionic liquid phase (SILP) concept is extremely promising in the context of catalyst recycling and energy savings. By merging the SILP technology with membrane reactor technology for the first time, such homogeneous catalysts are applied for process intensification in an industrial setting.

INDUSTRY & ACADEMIA TEAMING UP AROUND A NEW CONCEPT OF "TWO-IN-ONE" MEMBRANE REACTORS TO REDUCE ENERGY CONSUMPTION AND EMISSIONS IN PROCESS INDUSTRY

ROMEO'S AIM

The project gathers 9 European partners from industry and academia to **implement an efficient platform for the optimal design of new integrated reactors.** Applied to large volume industrial processes, the innovative ROMEO approach will:

- **improve selectivity and productivity** of industrial reactions, including raw material savings
- **reduce energy consumption** by up to 80% in industrial catalytic gas-phase reactions
- **reduce related emissions** by up to 90%

ROMEO's "two-in-one" reactors combine optimized membrane modules and the immobilization of homogeneous catalysts to carry out chemical synthesis and downstream processing in a single step.

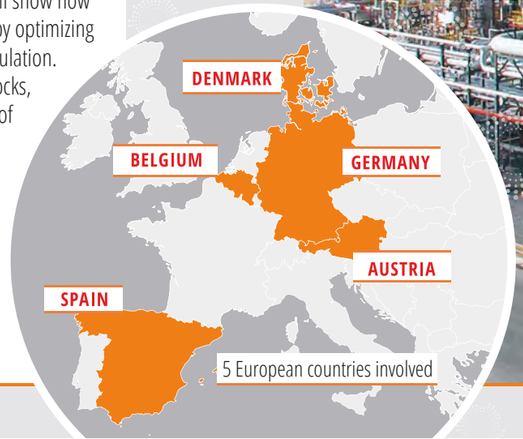
WHAT'S NEW WITH ROMEO?

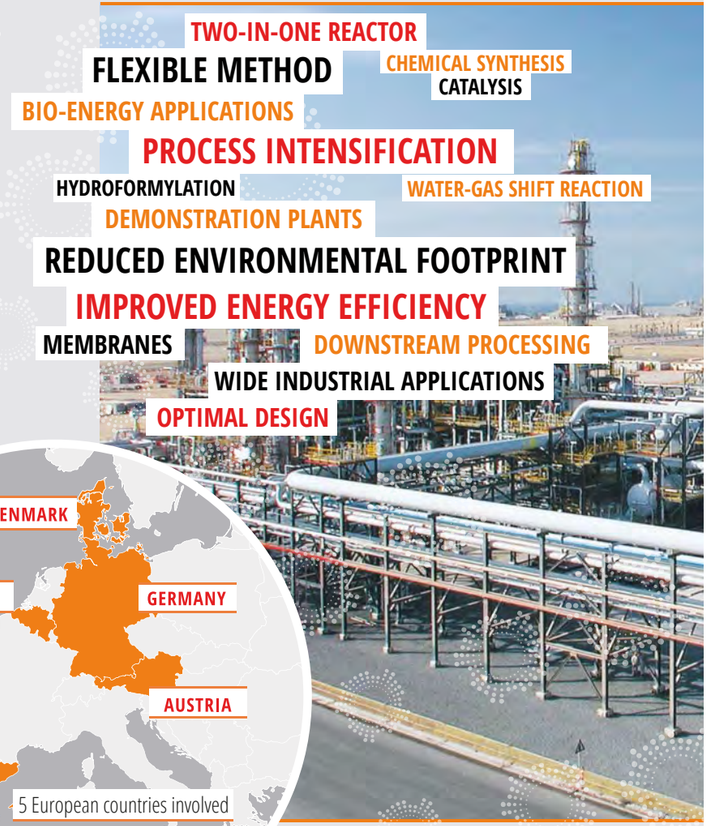
ROMEO intends to get detailed understanding of the processes involved in the well-argued design of new reactors, **from nano to macro-scale**. Two important reactions are chosen as demonstration cases:

1. **Hydroformylation**, to convert olefins and syngas to aldehydes (precursors for plasticizer alcohols).
2. **Water-gas shift reaction** which uses CO-containing syngas derived from biomass to generate hydrogen.

For both reactions, the project will show how to set up **adapted toolboxes** by optimizing choice via modelling and simulation. Based on the use of building blocks, it aims to facilitate the conception of apparatus for a large set of applications.

A NEW AND ESSENTIAL STEP TOWARDS THE CHEMICAL PLANT OF THE FUTURE : SAFER, WITH A REDUCED ENVIRONMENTAL FOOTPRINT AND HIGHER PRODUCT QUALITY





EUROPEAN PARTNERS

Evonik - Germany
Evonik Performance Materials GmbH // Evonik Technology & Infrastructure GmbH

FAU - Germany
Friedrich-Alexander-Universität Erlangen-Nürnberg

RWTH - Germany
Rheinisch Westfälische Technische Hochschule Aachen

DTU - Denmark
Technical University of Denmark

BioEnergy2020+ GmbH - Austria

LiqTech - Denmark
LiqTech International A/S

EMH - Belgium
European Membrane House

CSIC - Spain
Agencia Estatal Consejo Superior de Investigaciones Científicas

Linde AG - Germany

www.romeo-h2020.eu

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ROMEO IN A NUTSHELL

EC Call: **H2020-SPIRE-2015**
Grant agreement n°: **680395**
Start date: **September 14th, 2015**
Duration: **48 months**
EC funding: **6 millions €**

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SPIRE
Sustainable Process Industry through Resource and Energy Efficiency