MEMBER

ADVANCED **MEMB**RANES AND MEMBRANE ASSISTED PROC**E**SSES FOR PRE- AND POST-COMBUSTION CO_2 CAPTU**R**E

H2020 GRANT AGREEMENT NUMBER: 760944

Start date of project: 01/01/2018 **Duration: 4 years**

WP08 - Dissemination and communication

D8.5
MEMBER dissemination activities/events M36

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v0.1	18-01-2021r	First Release	HYGEAR TECNALIA	R. Makkus J.L. Viviente
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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	
CON	Confidential, only for members of the Consortium	

(*) for generating such code please refer to the Quality Management Plan, also to be included in the header of the following pages

(**) indicate the acronym of the partner that prepared the document

Content

1. EXECUTIVE SUMMARY

1.1. Description of the deliverable content and purpose

Among the task foreseen in the MEMBER project, dissemination and communication activities play a crucial role to spread the scientific knowledge and technological developments to the largest audience. This package of activities will increase visibility of both project and partners, and will guarantee its optimal acknowledgement and future exploitation, as they will address the main European forums and platforms on the project's topic.

The aim of this deliverable is to describe the different dissemination and communication activities carried out in the frame of the project MEMBER in the period to Month 36. The dissemination and communication activities are based on the Dissemination and Communication Plan of the MEMBER project (see Deliverables D8.1 and D8.2). According to this plan the activities in the third year of the project are focus on:

- The internal and external disseminations with special focus on communicating with the external audience:
  i. internal dissemination between the WPs,
  ii. creating an effective network between all participants,
  iii. the update of the website.
  iv. public deliverable
  v. presentation of results at internationals events as well as scientific workshops. A key event in this stage was the scientific workshop organized by TUE at M26.

1.3. Deviation from objectives

There was a delay in the drafting of the present deliverable due to the covid situation.
There is not impact on the other activities of the project

2. Dissemination and communication tools

Actions have been undertaken to create awareness of the MEMBER project, its objectives and anticipated results. These actions have been carried on and will continue through the entire project duration. Main activities during the period are detailed in the next sections.

2.1. Websites

For safety reasons it was decided to keep the public website and the private platform separated. From the public website there is no link to the private platform.

2.1.1. Private

The MEMBER internal project platform is available since February 23rd, 2016. It is based on Alfresco (http://docs.alfresco.com/) The Alfresco is an open source Enterprise Content Management (ECM) system that manages all the content within an enterprise and provides the services and controls that manage this content. The software has been initially updated for managing all the internal activities of the consortium related to MEMBER (i.e.; directories and subfolders related to the different WPs, documents such as deliverables, Periodic Reports, agendas, minutes of the meeting and presentations, etc). Further, modification will be included on request from the partners or for improving the use of the platform. This software is already used in our previous projects.

After login into Alfresco, the user can navigate between projects it has the rights to access. Once inside the website of MEMBER one can directly see who the users are and what are the latest contents added to the system. The user can now communicate with the other users or navigate the content of the website and add/modify elements inside the website.

2.1.2. Public

A public web-site (https://member-co2.com) has been created during initial months of the project and it is continuously updated with all the publishable information from the project partners. This web site is provided and managed by TECNALIA, and contains all public information about the project, organised in the following sections:

- Summary, which provides a short summary on the project including the general objective;
- Objectives, which provides more detailed information of the scientific and technical objectives together to an overview of the work package structure;
- Partnerships, which identifies the organizations involved in the project consortium;
- Workshops, which provides the information on the events organised by MEMBER
- Dissemination, with three subsections: Communication, Presentation and Publications; these parts will be continuously updated with any public documents generated at any time in the project;
- Events, which describes the list of events where the MEMBER project has been present somehow or that could be of interest for MEMBER partners; this will be also regularly updated;
- Contact, which provides access for contacting the coordinator.

The public website will be regularly updated with relevant news related to the activities of MEMBER and non-confidential documents.

2.2. Media campaign

In addition to the public website, different documents have been prepared for the dissemination of the project along the period: video, and newsletter. During period 1 a non-confidential presentation, a poster

and a leaflet were prepared. The non-confidential presentation as well as the poster and leaflet can be used by all consortium members disseminating MEMBER at conferences, lectures etc. They can be downloaded from the public website at kink: https://member-co2.com/content/presentations. A non-confidential public presentation highlighting the main results reported in the Period Report 2 will be published in M39 (March 2021).

2.2.1. Newsletters

One newsletter has been released along the period. The newsletters can be downloaded from the public website: https://member-co2.com/content/communication. Another newsletter highlighting the main results reported in the Period Report 2 will be published in M39 (March 2021).

2.2.2. Video

The two videos have been released. One addressing the general public (duration: 4 min) and another one using more technical terms that could be used as educational video at the university (duration: 5 min). They have been uploaded in YouTube and are also accessible at the public website.

2.2.3. Public reports

Three report have published in the public in the public website (https://member-co2.com/content/publications)

- Deliverable D2.2: Industrial requirements.
- Deliverable D8.3: MEMBER dissemination activities/events M18.
- Booklet: MEMBER Workshop on "Membrane Processes for CO2 Capture".
- Deliverable D8.5: MEMBER dissemination activities/events M36 (this document)

2.2.4. Dissemination of the project in press and/or social media

MEMBER project activities and public documents has been advertised at the website of some consortium members as well as in different LinkedIn networks: Gas separation membranes (375 members) and Membrane reactors (251 members). Two other LinkedIn groups: Membrane separation (1303 members) and Global Hydrogen Ambassadors Network (2848 members) will be included in the dissemination channels of MEMBER. In addition to this, a first mailing lists have been created including contacts of the partners as well as from related EC projects and main associations on the field. The contact lists will be further updated along the project life and it will also take into account the market / customer analysis.
Several project partners have put a link on their website to the Member project. KT has a link to the Member project on their LinkedIn page.

3. Dissemination activities

The list of the main dissemination activities (including participation to conferences or scientific papers publications) are detailed hereafter. Up to now 25 contributions to various conferences have been made, 3 articles in scientific journals published or submitted, one patent filled out and one thesis presented (see https://www.member-co2.com/content/publications). We do not include all the already detailed before but delivered in the MEMBER public web-site:

Type of activities	Main leader	Title	Date	Place	Type of audience	Estimated Number of persons reached	Countries addressed
Web-site	TECNALIA	MEMBER public web-site	2018	Own web-site	Scientific Community Industry General Public Policy makers Medias Investors Customers	1000	All
Web-site	KT	Description MEMBER plus link.	2018	KT website	Customers General public		All
Web-site	GALP	Description MEMBER	2018	GALP intranet	Internal		All
Web-site	C&CS	Short summary of MEMBER plus link	2018	C&CS webiste	Customers General public		All
Web-site	IFE	Description of the MEMBER project	2018	IFE intranet and web-site	Internal and customers		All
Presentation to different companies	IFE	SER technology status and associated development projects	2018-2019	IFE	Private companies		Norway
Social media	TECNALIA	Release MEMBER news and public documents	2018, 2019	LinkedIn group: Gas separation membranes	Scientific Community Industry General Public	375	All

Social media	TECNALIA	Release MEMBER news and public documents	2018, 2019	LinkedIn group: Membrane reactors	Scientific Community Industry General Public	251	All
Social media	TECNALIA	Release MEMBER news and public documents	2019	LinkedIn group: Membrane separation	Scientific Community Industry General Public	1303	All
Social media	TECNALIA	Release MEMBER news and public documents	2019	LikedIn group: Global Hydrogen Ambassadors Network	Scientific Community Industry General Public	2848	All
Social media	TECNALIA	Release MEMBER news and documents	2019	LinkedIn profile of the Membrane Technology and Process Intensification Platform at TECNALIA	Scientific Community Industry General Public	-	All
Other	IFE	Display of MEMBER and associated partners logos on an information board at the IFE-HyNor center	2019	IFE-HyNor Center	General public, visiting companies		Norway
Participation to a conference	TECNALIA	Poster: MEMBER project. Advanced MEMBranes and membrane assisted procEsses for pre- and post-combustion CO2 captuRe.	July 9-13, 2018	Euromembrane 2018. Valencia, Spain	Scientific Community	200	All

Participation to a conference	TECNALIA	Poster: MEMBER project. Advanced MEMBranes and membrane assisted procEsses for pre- and post-combustion CO2 captuRe	November 14th – 15th, 2018	17th Aachener Membran Kolloquium. Aachen, Germany	Scientific Community	200	All
Exhibition	TUE	Hallway poster Chemical Engineering department to inform chemical engineering student about group projects	26-10-2018	Technical University Eindhoven	Scientific Community	50	All
Participation to a conference	TUE	Abstract on thermodyanamic comparison of MA-SER and membrane assisted chemical looping reforming process with outlook to economic evaluation	8-7-2019	Technical University Eindhoven	Scientific Community	200	All
Participation to a conference / poster abstract submission	TUE	Abstract on internal membrane modelling using vacuum or sweep flow operation	8-7-2019	Technical University Eindhoven	Scientific Community	200	All
Participation to a conference	TECNALIA	Abstract ADVANCED MEMBRANES AND MEMBRANE ASSISTED PROCESSES FOR PRE- AND POST-	8-7-2019	Technical University Eindhoven	Scientific Community	200	All

		COMBUSTION CO2 CAPTURE					
Participation to a conference	UNIZAR	Post-combustion gas separation by Mixed Matrix Membranes	16-6-2019	Lulea University of Technology International Zeolite Membrane Meeting 2019	Scientific Community	200	All
Participation to a conference	UNIZAR	Influence of the casting solution concentration on the morphology, thermal properties and CO2/N2 separation performance of Pebax® 1657membranes	May 2019	XXXVII Reunión Bienal de la Real Sociedad Española de Química San Sebastian (E)	Scientific Community	200	Spain
Participation to an event other than a conference or workshop	TUE	Presentation SYNGAS CLEANING SYSTEM DESIGN FROM BIOMASS GASIFICATION	29-3-2019	Internal TU/e	Scientific Community	50	Netherlands
Participation to a conference	JM (A. Deacon)	Abstract Developing efficient MOF scale-up routes for carbon capture applications	June 2019	ICCDU XVII Germany	Scientific Community	50	All
Participation to a conference	TECNALIA (O. David et al.)	Advanced membranes and membrane-assisted processes for pre- and post-combustion CO2	26-30th May 2019	RSEQ meeting, San Sebastian	Scientific Community	50	Spain

		capture (MEMBER project)					
Participation to a conference	TECNALIA (J.L Viviente)	Abstract and Presentation: Advanced MEMBranes and membrane assisted procEsses for pre- and post-combustion CO_2 captuRe	June 18-19th (2019)	10th Trondheim CCS conference	Scientific Community	200	All
Participation to a conference	TECNALIA (J.L Viviente)	Presentation Advanced MEMBranes and membrane assisted procEsses for pre- and post-combustion CO_2 captuRe	July 8 – 11 2019	ICCMR-14 Eindhoven (NL)	Scientific Community	150	All
Participation to a conference	A.Deacon et al.	Poster: Developing efficient MOF scale-up routes for carbon capture applications	June 23-27, 2019	ICCDU XVII, Aachen Germany	Scientific Community	200	All
Participation to a conference	S. Pouw	Presentation: Thermodynamic comparison of MA-CLR and MA-SER process	July 8 – 11 2019	ICCMR-14 Eindhoven (NL)	Scientific Community	200	All
Web site	ECOREC	MEMBER summary and ECOREC activity within the project	2019	ECOREC web site	General Public, Customers		Italy
Web-site	KT	Announcement Workshop on membrane processes for CO_2 capture	2019	Linked-in	General public		All

Participation to a conference	L. Mosca (KT)	Processes for CO2 Carbon Capture	15-1-2020	Workshop on membrane processes for CO_2 capture	Scientific Community	100	All
Participation to a conference	O. David (Tecnalia)	Optimization of PBI hollow fiber membranes for gas separation	12-17 July, 2020	ICOM2020	Scientific Community	200	All
Participation to a conference	J. Meyer et al. (IFE)	Progress in Development and Manufacture of CaO-based Solid Sorbent for Pre-combustion CO2 Capture through Sorption-Enhanced Reforming	5 – 8 October 2020	GHGT-15, Abu Dhabi, UAE	Scientific Community	200	All
Participation to a conference	S. Pouw (TUE)	A study on the effects of membrane geometry and permeance with respect to mass transfer limitations in gas purification modules using dense membranes.	9-11 June 2020	CFD 2020 Trondheim (Norway)	Scientific Community	200	All

3.1. Scientific publications (This field is only for peer reviewed articles)

Type of scientific publication	Title of the scientific publication	DOI	ISSN or eSSN	Authors	Title of the journal or equivalent	Number, date	Publisher	Place of publication	Year of publication	Relevant pages	Public & private participation	Peer-review	Is/Will open access provided to this publication
Article in journal	Poly(ether-block-amide) copolymer membrane for CO2/N2 separation: The Influence of the casting solution concentration on its morphology, thermal properties and gas separation performance	10.1098/rsos.190866		Lidia Martínez-Izquierdo, Magdalena Malankowska, Javier Sánchez-Laínez, Carlos Téllez and Joaquín Coronas	Open Science Accepted, in press		RSQ		2019			*YES*	*Gold open access*
Article in journal	Sized-controlled ZIF-8 nanoparticle synthesis from recycled mother liquors: environmental impact assessment	10.1021/acssuschemeng.9b07593		M. García-Palacín, J. I. Martínez, L. Paseta, A. Deacon, T. Johnson, M. Malankowska, C. Téllez, J. Coronas					2019				
Article in journal *Under review*	PBI hollow fiber membranes: Influence of PVP additive			Miren Etxeberria-Benavides, Sara Miguel, Mari Mar					2020				

	on manufacturing scalability			Díaz de Guereñu, Freek Kapteijn Jorge Gascon Oana David									

3.2. Member workshops

Along this period two workshop have been organised in the frame of the MEMBER workshop. The first workshop on "Membrane processes for CO_2 capture" was organised by MEMBER and was hosted by TUE on January the 15th, 2020. 53 persons attended the workshop. The agenda is shown in the figure hereafter. Public presentation are available in the website (https://www.member-co2.com/content/publications).

MEMBER

ADVANCED MEMBRANES AND MEMBRANE ASSISTED PROCESSES FOR PRE- AND POST-COMBUSTION CO_2 CAPTURE

H2020 GRANT AGREEMENT NUMBER: 760944

Workshop on membrane processes for CO_2 capture

Auditorium 4, Eindhoven University of Technology, January 15th, 2020

Agenda

9:30 - 10:00 Registration/Coffee

10:00 – 10:15 Introduction – Welcome (Fausto Gallucci, José Luis Viviente)

10:15 – 10:45 An overview on MEMBER project (José Luis Viviente – TECNALIA)

10:45 – 11:10 Coffee Break - posters

11:10 - 11:40 Mixed Matrix Membranes for CO_2 capture (Freek Kapteijn – TU Delft)

11:40 - 12:10 High temperature catalysts and sorbents (Julien Meyer – IFE)

12:10 - 12:40 Pd based membranes development (Ekain Fernández – TECNALIA)

12:40 – 13:40 Lunch – posters

13:40 - 14:10 Membrane reactors – current status and perspectives (Fausto Gallucci – TUE)

14:10 - 14:40 Process design for CO_2 capture (Vittoria Cosentino – KT & Leonardo Roses – HYGEAR))

14:40 – 15:10 An overview on BIONICO project (Marco Binotti – POLIMI)

15:10 – 15:40 Environmental aspects of membrane-based CO_2-capture (Mireille Faist – QUANTIS)

15:40 – 16:00 Coffee Break – posters

16:00 - 16:30 An overview on C2FUEL project (Camel Makhlofi – ENGIE)

16:30 – 17:00 Closure of the workshop (Fausto Gallucci, José Luis Viviente)

Figure 1. Agenda of the 1st public workshop organised by MEMBER

In addition, a second international workshop on "CO_2 capture and Utilization" (was organised jointly by 11 EC funded project (https://www.iwccu.org/index.php):

- MEMBER (https://member-co2.com/),
- CARMOF (https://carmof.eu/,
- BIOCOMEM (https://www.biocomem.eu/),
- C2FUEL (https://c2fuel-project.eu/),
- COZMOS (https://www.spire2030.eu/cozmos),
- eCOCO2 (https://ecocoo.eu/),
- CO2Fokus (https://www.co2fokus.eu/),
- C4U (https://c4u-project.eu/),
- REALISE (https://realiseccus.eu/),
- CONVERGE (https://www.converge-h2020.eu/),
- KEROGREEN (http://www.kerogreen.eu/)

The joint workshop was an online workshop organized by TUE with the support of the coordinators of the eleven projects. The workshop took place on February 16th and 17th, 2021. Around 200 people were registered for this online workshop. Besides the plenary session with key presentations there was two parallel session as well as poster sessions along the two days. See the agenda in the next two figures.

	Breakup Room 1	Breakup Room 2
	Opening & Plenary sessions (chairperson Fausto Gallucci)	
9:00-9:30	All coordinators - Introduction to projects	
9:30-10:00	Dr. E. De Coninck (CTO ArcelorMittal) - The zero Emission Plant	
10:00-10:30	Dr. Walter Eevers (CO2 Value Europe)	
10:30-11:15	Coffee break and posters	
	Session 1A (chairperson Jose Luis Viviente)	***Session 1B (chairperson Camel Makhloufi)***
11:15-11:35	Dr. O. David - A review of the membrane development steps from material to final product	Dr. M. Noponen and Dr. X. Sun - High temperature electrolysis and co-electrolysis
11:35-11:55	Dr. V. Spallina - System simulation for integration of CO_2 capture technologies into steelworks and CCUS clusters	Prof. J Serra - Direct electrocatalytic conversion of CO_2 into chemical energy carriers in a co-ionic membrane reactor
11:55-12:15	Dr. M. Saric - Methanol membrane reactor: modelling and experimental results	Dr. V. Middelkoop - CO2Fokus at a glance: CO_2 utilisation focused on DME production, via 3D printed reactor and solid oxide cell based technologies
12:15-12:35	Dr. Adam Deacon - Realising the potential of MOFs through efficient scale-up	Dr. M. Tsampas - The KEROGREEN CO_2 plasma route to CO and alternative fuels
12:35-12:55	Dr. M. Etxeberria-Benavides - PBI based mixed matrix hollow fiber membranes for pre-combustion CO_2 capture	Dr. G. Bonura - 3D-printing in catalysis: Development of efficient hybrid systems for the direct hydrogenation of CO_2 to DME
12:55-14:00	Lunch break	
	Plenary session (chairperson Fausto Gallucci)	
14:00-15:00	Dr. Angels Orduna (Spire 2030)	
	Session 2A (chairperson Giampaolo Manzolini)	***Session 2B (chairperson Vesna Middelkoop)***
15:00-15:20	Dr. G. Garcia - LCA and TEA of the COZMOS technology	Dr. M. Sleczkowski and Dr. Pablo Ortiz - Turning gas separation membranes green with biobased block copolymers
15:20-15:40	Dr. A. Mattos or Dr. A. Mitchell - How can public policy and business model innovation be developed to address challenges of CCUS and realise the opportunity?	Dr. A. Benedito - CARMOF Project: a CO_2 capture demonstrator based on membrane and solid sorbents hybrid process
15:40-16:00	Dr. L. Engelmann - Perception of CO_2-based fuels and their production in international comparison	Dr. R.H. Heyn - Introduction to the COZMOS project
16:00-16:20	Dr. N. Dunphy - Social studies in REALISE project	Dr. L. Petrescu - Converge technology for efficiency methanol production with negative CO_2 emissions: energy and environmental analysis
16:20-17:05	Coffee break and posters	

Figure 2. Agenda of the Joint workshop: February 16th (2021).

	Breakup Room 1	Breakup Room 2
	Opening & Plenary Sessions (chairperson Fernanda Neira D'Angelo)	
9:30-10:00	All coordinators - Introduction to projects	
10:00-11:00	Dr. K. Bakke - Northern Lights – concept, plans and future	
11:00-11:45	Coffee break and posters	
	Session 3A (chairperson José Serra)	***Session 3B (chairperson Oana David)***
11:45-12:05	Dr. A. De Paula Oliveira - SER and SEWGS for CO_2 capture: experimental results	Msc. A. Sliousaregko - Industrial membrane requirements for CO_2 removal from different gas mixtures - Current practices and developments
12:05-12:25	MSc. S. Poto - Membrane reactors for DME production	Dr. I. Kim - Technologies demonstration in REALISE
12:25-12:45	Dr. U. Olsbye - Catalyst development within the COZMOS project	Dr. N. Kanellopoulos - Hybrid VTSA pilot plant and design of industrial demo plant for CO_2 capture
12:45-13:05	Dr. S. Krishnamurthy - CO_2 capture using 3D printed PEI adsorbents supported by carbon nanostructures	Mr. Paul Cobden and Prof. C. Abanades - Pilot preparation for demonstration in the C4U project
13:05-13:25	Dr. S. Perez - Process intensification in the conversion of CO_2 with a milli-structured reactor	Mr. T. Swinkels - Decentralized FA based power generators
13:25-13:45	Dr. F. de Sales Vidal Vazquez - The KEROGREEN syngas route to alternative fuels and chemicals	Dr. L. Roses - Design and development of a membranebased post-combustion CO_2 capture system
13:45-14:30	Lunch break	
14:30-15:30	***Round table and questions - closure (chairpersons Fausto Gallucci and Fernanda Neira)***	

Figure 3. Agenda of the Joint workshop: February 17th (2021).