

Contract N°: 031773

## **PROMEMBRANE**

**– Promotion and Focussing of Current Research Activities of Membrane  
Technology in Water Treatment in the Mediterranean Region –**

Instrument: Specific Support Action

Thematic priority: B1.3, INCO Mediterranean Partner Countries

### **Publishable Summary**

**Part of Deliverable35**

**– Month 24 –**

Due date of deliverable: August 14<sup>th</sup>, 2008

Actual submission date: November 14<sup>th</sup>, 2008

Start date of project: 15<sup>th</sup> August 2006

Duration: 24 months

Report prepared by:

**BIOAZUL**

**Final version**

<b>Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission Services)	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	X

## Project Summary

The complex dimensions of the Mediterranean freshwater resources, their fragility and their scarcity have been highlighted and have received considerable attention as a primary priority issue politically, technically and scientifically. Membrane Technology (MT), with its different applications in water treatment (desalination, potable water treatment, wastewater treatment and reuse) has showed to be a powerful tool to abate the water crisis in the Mediterranean region. During the last five years, this technology has received a lot of attention, resulting in an improvement of membrane materials and techniques, which provide higher fluxes and longer lifetime, partly improving the fouling and high costs. Although there are several national and international membrane research activities, lack of cooperation, very limited know-how exchange and an uncoordinated use of resources leads to parallel and ineffective R&D activities.

The primary objective of ProMembrane is to support the current research and development activities in MT focussed on water treatment in the Mediterranean area, providing an international stage to local research organisations and universities devoted to the development of membrane technologies in the following areas: municipal and industrial wastewater treatment, surface water purification and brackish and sea water treatment for drinking purpose. The first stage of the project will cover the identification, mapping and evaluation of the on-going research, in order to propose future research and cooperation strategies. The second stage will be the diffusion and dissemination of successful experiences and research activities being currently carried out through the organisation of the two regional contests "PROMEMBRANE Young Scientist Award" along the frame of the two regional Fairs in Egypt and Syria and an International Conference in Tunisia, encouraging and promoting further research activities in MT.

## Project Objectives

As a Specific Support Action, the primary objective of ProMembrane is to support and focus the current research and development activities in Membrane Technology (MT) for water treatment in the Mediterranean area, promoting international cooperation among research organisations and universities devoted to membrane technologies. It will aim the overture and presentation of the on-going research to facilitate the dissemination and to make known the existing potential for the development of this technology in the region. The project will be carried out by 7 research institutions with the overall goal of encouraging further research in the area, increase the scientific background and unifying efforts in the membrane research field in order to offer in a medium-long term option to the water supply and treatment situation in the Mediterranean water scarce area.

The general, scientific and technologic objectives addressed in ProMembrane are the following:

- To identify and map the on-going research activities in the field of MT in the Mediterranean region.
- To support the current research activities in MT for water treatment in the Mediterranean region, assessing the on-going research in the field and identifying the gaps in knowledge and the barriers for the cooperation of R&D activities in a Mediterranean scope.
- To promote and facilitate the dissemination, transfer and exploitation of results of current and past research by the organisation of regional fairs and a final conference.
- To encourage the permanent participation of young scientists in the field of MT by the organisation of two regional scientific contests "ProMembrane Young Scientist Award".
- To promote the establishment of permanent communication links between research centres in the Mediterranean region, promoting the know-how exchange and expertise in relation to membrane technologies.
- To develop adequate recommendations for future research activities in order to fulfil the scientific and technological needs for the further implementation of MT in the Mediterranean region.

## Contractors List

Participant Role	Participant type	Participant number	Participant name	Participant short name	Country	Date enter project	Date exist project
CO	RTD	1	Verein zur Förderung des Technologietransfers an der Hochschule Bremerhaven e.V.	TTZ	Germany	1	24
CR	RTD	2	Centre de Biotechnologie de Sfax	CBS	Tunisia	1	24
CR	RTD	3	Instituto per la Tecnologia delle Membrane	ITM-CNR	Italy	1	24
CR	SME	4	BIOAZUL S.L.	BioAzul	Spain	1	24
CR	RTD	5	National Research Centre	NRC	Egypt	1	24
CR	RTD	6	Al-Baath University	ABU	Syria	1	24
CR	RTD	7	Birzeit University – Water Studies Institute	BZU	West Bank and Gaza Strip	1	24

**Table 1.** Contractors list

## Contact details of the co-ordinator

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## Work Performed, Results Achieved So Far and Expected End Results

The objective of ProMembrane project is to support and focus the current research and development activities in Membrane Technology (MT) for water treatment in the Mediterranean area, promoting international cooperation among research organisations and universities devoted to MT. The project aims to facilitate the dissemination of the current research work and to raise awareness of the existing potential for development of this technology within the targeted region. It will offer a medium- to long-term alternative for water supply and treatment in the locations of the Mediterranean Basin experiencing a water scarcity problem.

In order to achieve the above mentioned objectives, the work has been organised in the following five Work Packages (WPs) as, stated in the Description of Work (DoW):

- WP 1. Project Management
- WP 2. Mapping of current research exercise
- WP 3. Assessment of on-going research
- WP 4. Proposal of research and development strategies
- WP 5. Promotion and diffusion of membrane technology research in the Mediterranean area

During the second twelve months of the project, reporting from the 15<sup>th</sup> August 2007 until the 14<sup>th</sup> August 2008, **all WPs have been active: WP1, WP2, WP3, WP4 and WP5**, and the tasks foreseen within them in the DoW have been performed by the responsible project partners.

**The management activities of the project (WP1) have been carried out in parallel to the support activities, ensuring the correct coordination, communication and cooperation between the partners.** Since the project started, **the project has been run according to the management tasks: TTZ (General and Financial Coordination), CBS (Scientific Project Management) and BIOAZUL (Administrative Project Management).** TTZ has managed the project in relation to the support activities performed, ensuring efficiency and effectiveness, as well as correct coordination, communication and cooperation amongst partners for the development of deliverables and accomplishment of milestones. It has also administered the second payment received by the EC and transferred resources to partners, provided assistance on financial and contractual issues and maintained communication with the EC. BIOAZUL has coordinated the preparation of the short project update reports (D28 and D31), as well as the second and final reporting period reports: second activity report (D35, current report), final activity report (D37), second and final management report (D36 and D38). TTZ has requested all project partners to prepare the cost statement (Form C) for the second reporting period and the audit certificate for the whole project according to the contract. The on-line questionnaires requested by the EC are being filled in by the project partners, with the support and guidance from BIOAZUL. CBS has reviewed the deliverables with scientific content, supported TTZ in the development of the Regional Fairs scientific programmes and supervised the overall development of the ProMembrane Young Scientist Award. Furthermore, CBS organised the International Conference in Sfax in May 2008 and developed the scientific programme. Finally, TTZ and NRC organised a technical project meeting held in Cairo, Egypt, along with the Regional fair in Region B, and the final meeting with ITM-CNR in Cetraro, Italy, from the 20<sup>th</sup>- 21<sup>st</sup> of July, 2008.

**Two different schemes** based on D14 developed in task 2.2 and the scheme prepared by TTZ with a complementary approach classified in region A and B and assorted by the specific membrane technology used and water final use, **for possible research clusters in the field of MT for water and wastewater treatment in the Mediterranean region were developed and discussed at the mid-term meeting, as well as the content of the draft report (D23).** As proposed by ITM-CNR, D14 was updated matching and supplementing the information from deliverable 14 by means of official data (UN databases, for instance); all partners agreed on that and updated of deliverable 14 and its annexes. The final D23 was prepared based on this update.

**The discussion and evaluation of the information related to the current research in the field of the MT in the Mediterranean Partner Countries (MPC) belonging to WP3 was already included in the agenda of the mid-term meeting.** TTZ started a debate on how to assess the ongoing research based on the data collected in WP2, in order to prepare D25. After the discussion, it was suggested that ABU could develop a questionnaire with the information required to make such assessment and a deadline to ensure all partners will provide feedback on time. With the information compiled, a final report on Evaluation of the on-going research performed in the field of membrane technology for water treatment in the Mediterranean Region was prepared (D25).

**Within WP4** a preliminary discussion led by ITM-CNR took place during the mid-term meeting about the recommendations for future collaboration and research to point the road of action of research on membrane technology and its further application, taking into account the technological and scientific information drawn from WP2 (D14) and WP3 (D25). D27 reports about the performance of membrane technologies for water treatment processes, as well as the main drawbacks associated and suggestions for the future research orientations, including the development and design of new membrane systems.

Within WP5, the **official website of the project (task 5.1), [www.promembrane.info](http://www.promembrane.info) launched in November 2006 in three languages (English, French and Arabic), has been quarterly updated (D26, D29, D33 and D40)** according to the work plan. Sections devoted to the Regional Fairs, the Young Scientific Award and the International Conference have been fully updated in this reporting period. **The database platform (task 5.2), launched in August 2007 (D13), contains three databases: Database of Membrane Technology Documents (142 references by technology used and 152 references by final application), Database of Membrane Technology Experts (539 experts) and Database of Membrane Technology Events (30 events).** These three data bases have been updated three times (D22, D30 and D39) in the second year of the project. This platform is an essential part of ProMembrane website and aims to contribute to the support of the current research activities in MT for water and wastewater treatment in the Mediterranean region, the promotion and facilitation of the dissemination, transfer and exploitation of results of current and past

research, as well as the know-how exchange and expertise in relation to MT in the Mediterranean region.

Within task 5.3, the **Scientific Committee evaluated the ten applications of the Young Scientific Award in Region A and B, Four applications were received for the contest in Region A from Syria and the pre-evaluation was reported in D17.** Six applicants were received for the contest in **Region B** from North Africa (Egypt and Tunisia) and reported in D24. The best three from each region were invited to attend the International Conference in Sfax (Tunisia) and the travel and accommodation was organised and paid by CBS. TTZ prepared a certificate for the prize distributed at the Conference and arranged together with the CBS the bank transfer of the 600€ to the winners.

**From the 9<sup>th</sup> to the 11<sup>th</sup> of September, the first ProMembrane Regional Fair foreseen in the DoW took place in Homs (Syria) at the Al-Baath University facilities (task 5.4).** As part of this task, the promotional E-flyer (D02) and scientific programme (D15) were developed. More than 200 experts from Syria working in the field of water treatment or environmental protection and some experts from Kuwait, Jordan, Lebanon, Saudi Arabia, Yemen and Iraq attended the Fair. During the fair, the local participants offered different membrane prototypes and presented the technological needs for water and wastewater analysis.

**The second Regional Fair in Cairo, Egypt (task 5.5) took place from the 29<sup>th</sup> to the 31<sup>st</sup> of October 2007.** A promotional E-flyer (D03) and the scientific programme (D16) were developed. About 500 invitation letters were sent to universities, research centres, companies, etc. in the Middle East countries and the Mediterranean Area including the neighbour Arab countries, the North African countries as well as in Egypt. More than 200 participants were registered in the fair. They were mostly from Egypt, but other participants were also from different countries including Saudi Arabia, Yemen, Sudan, Iraq, Morocco, Libya, Kuwait, Italy and USA as well as ProMembrane partners from Germany, Italy and Syria.

**The ProMembrane International Conference (task 5.6) took place from the 4<sup>th</sup> - 8<sup>th</sup> of May 2008 in Sfax, Tunisia** along with the International Symposium on Biotechnology (ISB). The aim was to attract the maximum number of actors in the field and to provide them a common platform for scientific exchanges on new ideas and latest research works in the field of Membrane for water and wastewater treatment in the Mediterranean Region. 700 participants from 37 countries attended the ISB. MENA countries participants had the possibility to attend to the ProMembrane lectures, keynote and oral contributions in the field of environmental technology of more than 20 invited speakers from the different parts of the world. Several dissemination materials were developed in order to promote the Conference. The E-propaganda promoting the International Conference (D05) and a promotional printed flyer for the International Conference (D06) have been developed in three languages (English, French and Arabic). The printed copies of the flyer - French version (500 exemplars), English version (1000 exemplars) and Arabic version (1100 exemplars) - were actively distributed by project partners.

**Other dissemination activities belonging to task 5.7 (Network solidification) have also been performed during this period, i.e. preparation and presentation of dissemination material, attendance to conferences, seminars and meetings, and the introduction of the project to relevant stakeholders and authorities.** A more detailed explanation of the dissemination activities carried out, as well as several routes for the exploitation actions expressed by project partners to date regarding the results, are available in section 1.4 and in the attached Annex 1 "*Plan for Using and Disseminating the Knowledge*".

A detailed description of the activities performed within each WP is presented in the following chapters. The specific results derived from the work performed during the first twelve months of the project are briefly compiled in table 2.

WP no.	Work Package title	Lead-contractor Short name	Start month	End month	Deliverable No	Status
WP1	Project Management	TTZ	1	24	D28, D31, D35, D36, D37, D38	✓
WP2	Mapping of current research exercise	BZU	1	12	D23	✓
WP3	Assessment of on-going research	ABU	12	14	D25	✓

<b>WP4</b>	Proposal of Research and Development Strategies	ITM-CNR	14	24	D27	✓
<b>WP5</b>	Promotion and diffusion of membrane technology research in the Mediterranean area	NRC	1	24	D22, D24, D26, D29, D30, D32, D33, D34, D39, D40	✓

**Table 2.** Workpackages list of the ProMembrane project and deliverables submitted in the reporting period

The project counts with and official logo, included in the webpage and all dissemination materials produced in the ProMembrane project:



**Figure 1.** ProMembrane official logo