



PARTNERS

CO-ORDINATOR:

- Technologie-Transfer-Zentrum Bremerhaven (ttz Bremerhaven) – Germany

RTDs:

- Centre de Biotechnologie de Sfax – Tunisia
- University of Bath – UK
- University of Cadi-Ayyad – Morocco
- University of Al-Baath – Syria
- European Membrane Institute – Netherlands
- Inter-Islamic Network on Water Resource Development and Management – Jordan
- Bioazul – Spain
- King Saud University – Saudi Arabia

STAKEHOLDER:

- Office National de L'Assainissement – Tunisia

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Project No: INCO-STREP-2006-015449



New Energy Efficient approach to the operation of Membrane Bioreactors for Decentralised Wastewater Treatment

WATER SCARCITY is a problem faced by all the countries of the Mediterranean area to some extent. In particular, the EU Water Initiative has identified the Southern Mediterranean as the area of highest water stress in the world. The region, with a very young and still fast-growing population, has the lowest per capita availability of water and the highest actual use of all potential freshwater resources.

MOST WASTEWATER produced in urban areas of the region is inefficiently treated due to poor maintenance of the equipment and high cost of electricity (in Morocco, for example, 60% of activated sludge plants are not operational). The majority of the treatment plants in the area use activated sludge processes, followed in some cases by rapid sand filtration. These techniques were developed to reduce the suspended matter load and oxygen demand of the discharged reclaimed waters and to reduce eutrophication of the bodies of water.

IN RURAL AND REMOTE AREAS, the population have practically no access to water sanitation, whereby wastewater is directly discharged into water bodies or re-used for irrigation without treatment, thus spreading water-borne diseases and causing eutrophication and pollution of water resources.

MEMBRANE BIOREACTOR TECHNOLOGY (MBR) is a very promising alternative to conventional water treatment as they act as a barrier against bacteria and viruses, achieving a high degree of water purification.



HOLLOW FIBRE MEMBRANES are one of the technologies typically used in MBR processes for treatment of a wide range of wastewaters by selective filtration through the porous material. Flat-sheet membranes are another technology available for investigation in the Puratreat.

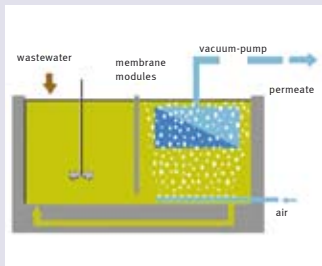


MOST MBRS currently in use have very high running costs because of the high pressure drop and high air-flushing rate required for their operation. The development of strategies or configurations for minimising energy consumption and costs, whilst maintaining high effluent quality is an important challenge.



APPLICATION IN THE MENA countries will help demonstrate the suitability of the project outputs. This will be facilitated by specific dissemination activities such as a project website, conferences and knowledge transfer by the consortium partners.

THE OBJECTIVE OF PURATREAT IS to investigate a new approach to the operation of membrane bioreactors that will include a comparison of three leading membrane technologies. The operating procedure is expected to yield very low energy consumption and reduced maintenance costs. These characteristics would make the bioreactors operating in these conditions suitable for peri-urban areas of the Mediterranean basin, where expenditure in public services is a critical factor.



THE PROJECT CONSISTS of eight workpackages, with tasks that include:

- Review process
- Development phase
- Experimentation
- Simulation and control
- Analysis
- Evaluation
- Dissemination
- Management

The consortium includes highly experienced partners in the field of membrane technology with state-of-the-art resources for achieving successful project outcomes

THE OBJECTIVES OF THE PURATREAT PROJECT ARE:

- **TO COMPARE THE PERFORMANCE OF MBRs WORKING UNDER CONVENTIONAL OPERATING CONDITIONS WITH THE PERFORMANCE ACHIEVED UNDER CONDITIONS SPECIALLY ADAPTED TO THE REQUIREMENTS OF MENA COUNTRIES**
- **TO STUDY THE PERFORMANCE OF THE MOST ADVANCED MEMBRANE TECHNOLOGIES AVAILABLE IN THE MARKET WORKING UNDER DIFFERENT OPERATING CONDITIONS**
- **TO STUDY THE PERFORMANCE, ENERGY CONSUMPTION AND MAINTENANCE REQUIREMENTS OF MBRs WORKING AT LOW SOLIDS RETENTION TIMES (SRTs) AS A POSSIBLE OPERATING PROCEDURE FOR THE APPLICATION OF THESE SYSTEM IN PERI-URBAN AREAS OF MENA COUNTRIES**
- **TO STUDY THE CHARACTERISTICS OF THE MICROBIAL COMMUNITY PRESENT IN THE REACTOR FOR THE DIFFERENT EXPERIMENTAL CONDITIONS INVESTIGATED**
- **TO PROPOSE THE MOST SUITABLE TECHNOLOGY FOR THE APPLICATION OF DECENTRALISED MBR WASTEWATER SYSTEMS AND ITS OPTIMUM OPERATING CONDITIONS**
- **TO STUDY THE FEASIBILITY OF DECENTRALISED WASTEWATER TREATMENT PLANTS BASED ON MBR TECHNOLOGIES IN THE MENA COUNTRIES**

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