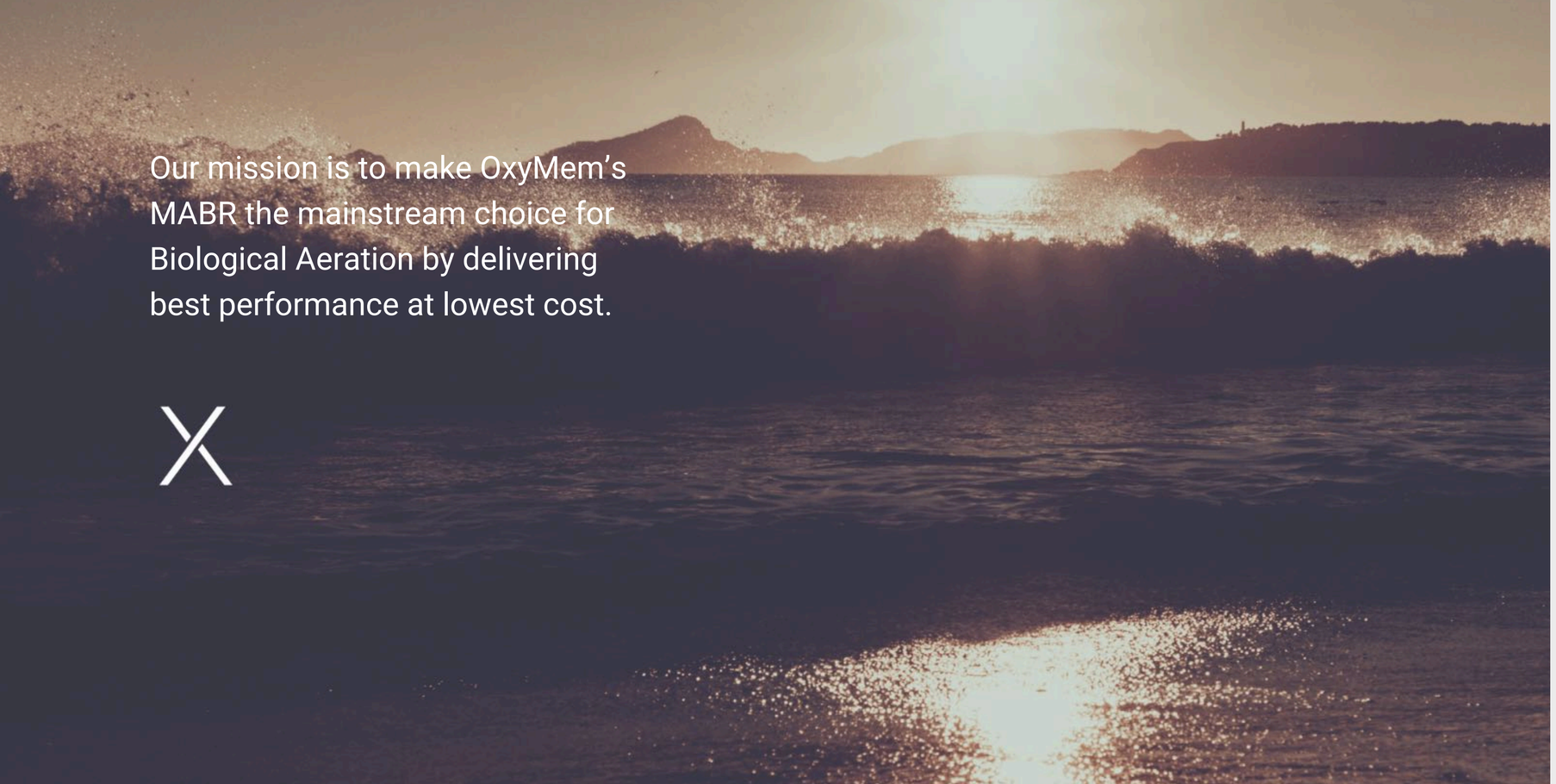
OXYMEM



WHO WE ARE

OxyMem is the first mover to make the Membrane Aerated Biofilm Reactor (MABR) commercially available. Our capabilities are in membrane research, development, process design and manufacturing. Our experience offers customers integrated and comprehensive solutions for MABR applications to allow them secure cost and competitive advantage.

WHAT WE DO

Our business covers wastewater treatment, membrane production, R&D, sales, operations and support. Our market focus and experience includes industrial wastewater treatment and reuse, municipal wastewater treatment and landfill leachate treatment. Our solutions encourage greater adoption of water reuse and as a result, advance a circular economy that makes water a well-managed resource. We deliver systems suitable for remote areas: our unit requires minimal labor (operation) and power. Our equipment is easy to use and therefore does not require a highly skilled operations team to operate as we also provide on-line monitoring and assistance. Our drop-in technology increases capacity of existing aerated systems, without the requirement of any additional footprint.

WHAT IS OUR VALUE

Our people have invested themselves in the construction of a world class treatment technology platform, the MABR. We take enormous pride in being first to deliver the most energy efficient aeration solution available on the market today. Our commitment is to continue to exceed the standard of the MABR year on year by staying true to our mantra for success – Deliver best performance at lowest cost.

TIMELINE

1998
Investigation into biofilm control solution (key enabling technology for MABR]

2004
First lab scale MABR constructed

2005
First ever biofilm control patent filed

2007
Biofilm control patent granted

2012
Prototype built to reduce membrane production costs by 10x

2013
First field scale MABR built and deployed (Severn Trent Water)

2014
OxyMem makes the MABR commercially available as a package plant

2015
Launch of the first "Drop-in" MABR

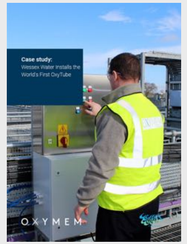
2016
Dow Chemical Company invests in OxyMem

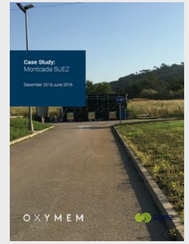
2017
MABR Generation 4 and OxyTube

Saudi Aramco invests in OxyMem

1998 2004 2005 2007 2012 2013 2014 2015 2016 2017

CASE STUDIES & DATA SHEETS





OxyMem's case studies available for download: www.oxymem.com/

PRODUCT EXPLANATION

OxyMem's Membrane Aerated Biofilm Reactor (MABR) simply solves OPEX intensive wastewater treatment with smarter aeration.

The OxyMem MABR is deployed as a 'Drop-in' module which can be fitted directly into an existing aeration tank. The MABR combines biological treatment for carbon and nitrogen removal which brings effluent to required discharge standards, all within a compact structure.

Biological treatment is accomplished through an attached growth system supported by an array of hollow fiber membranes. The MABR habitat creates an ideal environment to support a robust biofilm which absorbs and consumes carbon and nitrogen based pollutants. This offers improved nutrient removal, energy efficiency and impressive process resilience in a reduced footprint.

The typical module for municipal and industrial use is sized for an oxygen delivery capacity of 25kg of O_2 / day when operating on air. The module can also operate on oxygen –100kg/day.

HOW DOES IT WORK?

Following pretreatment the influent flows past MABR membranes and in doing so the nutrient content is consumed by the biofilm that is attached to the membranes.

The MABR uses hollow fibre, gas permeable membranes - to support the fixed film ecosystem, for the biology, which allows direct delivery of oxygen to the micro-organisms. The MABR can achieve up to 95% oxygen transfer rates which results in superior energy and process performance.

WHAT ARE THE BENEFITS?

75% Energy saving. The oxygen transfer per unit of energy in wastewater is 8kg O_2/kWh compared to 1-2kg O_2/kWh achieved from fine bubble in an conventional activated sludge process.

The approximate energy consumption of the system is 0.25 kWh/kg COD removed, which is 4 times less than the energy of fine bubble diffusion used in aeration system.

50% less sludge production (0.1-0.15kg TSS/kg COD removed as more of the COD is oxidized to CO_2) compared to conventional activated sludge.

OxyMem's highly automated process significantly reduces operator support time.

OxyMem can achieve all of this in a greatly reduced footprint. Save up to 80% of the floor space required for an activated sludge system.

Small Footprint

Remote access

Capacity Managment

Multiple Applications

Less Sludge

Process Resilience

Energy Savings

Competitive Pricing

PEOPLE

We are proud to have an exceptional managment team working in an ever-growing innovative environment

Wayne Byrne
Chief Executive Officer

Wayne is the commercial visionary and holds an International Executive MBA from Smurfit College of Business, and a Diploma in Advanced Management from University College Dublin (UCD). In the last 6 years Wayne Byrne acquired, restructured, and sold a major waste equipment supply company, Manvik Group. Manvik had over 80 staff, a turnover in excess of €40M, and had operations in UK and Ireland. Wayne, seeking more challenges in the clean technology space, went on to set up Biocore Environmental Limited and has established a significant presence in wastewater sludge management and renewable energy production. Wayne successfully sold Biocore to the management team in early 2016.

Wayne is a resourceful, experienced senior manager and managing director, with experience in both private and public sectors. He has brought multiple start-up and established companies including MNC's (Computer Associate, SAP) through multiple phases of international growth. He is experienced in business acquisition, disposal and business transformation. Wayne is an enthusiastic leader and team builder who is highly analytical and financially aware. He has an impressive track record of developing and implementing operational and business strategies. In the last 5 years Wayne has secured over €30M in debt and equity.

Prof. Eoin Casey
Innovation Director

Prof Eoin Casey is OxyMem's figurehead and is the worldwide pioneer of MABR technology, having written the seminal papers on the topic, (e.g. Casey et al, 1999). Eoin introduced the name MABR, filed a key-enabling patent (OxyMem), and is an acknowledged expert in MABR (3 out of the 10 highest cited papers for this technology) and authorship of the recent critical review in the top ranked journal Environmental Science and Technology.

Eoin is a Professor in the UCD School of Chemical and Bioprocess Engineering. His research is focused on bacterial adhesion and biofilms. The application of this research is directed primarily towards wastewater treatment processes. His research group is active in advanced membrane separation technologies, bio-plastic production and bioprocess scale-up. Achievements: Six PhD students supervised to completion, 26 peer-reviewed journal articles, one book chapter, 20 refereed conference proceedings, and 12 invited talks. Since 2002 he has led the Biofilm Engineering Research Group in the School of Chemical and Bioprocess Engineerining.

Dr. Eoin Syron
Chief Technical Officer

Dr. Eoin Syron is our technical leader and innovator. A graduate from the school of Chemical Engineering UCD. Where Eoin also conducted a PhD. The subject of his thesis was an investigation of the membrane aerated biofi lm reactor, which resulted in a patent, which he made in partnership with Eoin Casey. This patent forms the basis for the OxyMem proposition.

Eoin spent 3 years with Veolia. 1 year in the United States working as a Process Engineer where he was involved in the design and tender of industrial wastewater treatment plants, the investigation of biological treatment for Oil and Gas waste water and evaluating new technologies for inclusion into the Veolia portfolio and; 2 years with Veolia Enironnment Research and Innovation in Paris, France, In this position his role included managing the direction and the execution of both internal technology development projects and funded external projects along with providing technical support for some of the international Design and Build teams. Eoin was involved with a number of collaborative projects involving business units and Univiersitites from across the world.

In 2011 Eoin returned to the Biofilm group (UCD) to continue the development of OxyMem, this time focusing on scale up issues and investigating full-scale deployment of the technology.

Dr. Barry Heffernan
Chief Operations Officer

Barry is the most recent addition to OxyMem's leadership team. He joins us from Biothane (Veolia) where he spent the last 7 years in a high growth business. Barry has deep experience in process engineering, designing industrial wastewater treatment plants, project management, technical sales, industrial wastewater engineering, product

Barry also happens to be one of the co-inventors of the MABR control system, OxyMem's foundation IP... welcome home Barry!

John McConomy
Commercial Director

John McConomy is one of the newest additions to the OxyMem team. Having lived and worked in Europe, Australasia and the USA, John has direct experience of how engineering tradition and local cultures can infl uence the growth and success of new trends and innovations.

John holds an Honours degree in Mechanical Engineering from the University of Wales, Swansea and his career in wastewater started within the Xylem group almost 20 years ago. He spent the earlier part of this career primarily involved with wastewater treatment plant on-site operations; installing, maintaining and optimizing both effluent quality and long term operational costs of diffused aeration systems. He has worked with some of the world's largest diff used aeration manufacturers.

In his current role with OxyMem, John is responsible for ensuring owners and operators across the globe are provided with an opportunity to benefit from the latest advancements in aeration technology; offering the most efficient process solutions and enabling them to achieve lowest day-to-day and lowest whole life costs for their

Aidan Moore,
Manufacturing Manager

Aidan Moore holds a Degree in Manufacturing Engineering from ITT (Dublin) and for the last 25 years has worked on manufacturing development and improvement. Aidan managed, trained and mentored workforce to implement high level automation and speed production lines. He excels in novel solution development and quality control, which in the past, he showed working for Hewlett Packard as a Technical Supervisor and as a Process and Design Engineer in Celstica.

As Manufacturing Manager for OxyMem, Aidan is responsible for managing manufacturing lines and transition into high volume production. In addition, Aidan is driving the development of continuous improvement processes and process

OxyTube provides end users with an opportunity to experience OxyMem's advanced Membrane Aerated Biofilm Reactor (MABR) technology first hand, on their own wastewater facility, with minimal investment. For more information please visit our website:

www.oxymem.com/oxytube_mabr

AWARDS

OxyMem's proven technology and status as a technology disrupter and high-potential start-up has been recognised by leading independent inernational bodies, including:

GLOBAL CLEANTECH
OxyMem is named in the 2017 Global Cleantech 100. The Global Cleantech 100 represents the most innovative and promising ideas impacting the future of a wide-range of industries.

EuropaBio AWARDS
OxyMem was awarded for its cutting edge technology by EuropaBio. EuropaBio is the European Association for Bioindustries and it recognises innovative European SMEs who solve environmental problems through the application of biotechnology.

BREW
OxyMem secured one of six places in BREW Round III of The Water Council's Accelerator Programme in Milwaukee.

IMAGINE H_2O
Imagine H_2O, the leading accelerator for water technology, announced OxyMem as the growth stage category winner of the 2015 INFRASTRUCTURE CHALLENGE. Imagine H_2O's portfolio of water start-ups represents over $1 in every $10 of early stage water financing.

WERF LIFT
OxyMem was accepted into the Leaders Innovation Forum for Technology (LIFT) programme.

UK ENERGY AWARDS
Winner of the Energy Efficient Technology of the Year category at the UK Energy Awards 2014. This esteemed event recognises and rewards creative and innovative companies leading the way in reducing energy demand.

TechXchange
OxyMem won People's Choice Municipal Innovation Award at Singapore International Water Week.

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