

# Here, now

## About TMO Renewables

- About the Company: TMO is a licensing business focused on the commercialisation of its protected, flexible technology platform of which the first application will be for the production of cellulosic bioethanol from organic waste materials.
- Proof of principle: TMO has been working on multiple feedstocks both within our laboratory and industrial scale demonstration plant which has been operational since mid- 2008.
- Now commercialising: TMO has signed agreements in the U.S., China and Brazil.

## The market

- The market conditions for the production of biofuels and biochemicals are driven by a range of factors including rising oil prices, interest in diversifying the energy matrix, security of energy supply, greenhouse gas emission reduction and opportunities for economic and rural development.
- The Global Renewable Fuels Alliance (GRFA) estimated a global ethanol production of 88.7 billion litres (23.5 billion gallons) in 2011.
- The United States (U.S.), the leader in global ethanol fuel production, is strongly supported by Brazil and China. The U.S. industry enjoys substantial government support with the government acting in support of the development and establishment of an ethanol market over many years. The revised Energy Independence and Security Act of 2007 set out a target for 36 billion gallons of ethanol to be produced by 2022.
- Government support for the development and production of cellulosic ethanol is growing globally specifically in countries such as China and Brazil. Increasing interest is also being shown in many other countries such as those within the EU in order to meet the targets set out by the Renewable Energy Directive (RED). This interest has also been seen in countries throughout Asia and Eastern Europe.

### Leadership Team:

**R Parker**  
Acting CEO

**S Martin**  
Director R&D

**J Robinson**  
Associate Director  
of Engineering

**G Bramwell**  
Head of Administration

## What makes the TMO process unique



### The TMO Molecular Toolkit.

- A series of powerful biological tools that can be used to “engineer” the TMO Organism (TM242) to deliver a wide variety of valuable products.
- By utilising powerful biotechnology breakthroughs in metabolic engineering and synthetic biology, TMO will facilitate the development of a flexible technology platform designed to take a range of cellulosic materials and convert them into useful fuels, and other bio-based chemicals.

### Simplified cost-effective process.

- Avoids high operating costs as the natural ability of TM242 to consume and convert longer chain sugars results in reduced enzyme loadings and therefore cost
- The process can utilise low value or negative value feedstock materials that would otherwise be considered waste materials

### Ability to handle a broad range of feedstocks.

- TM242 can effectively utilise the many different sugars found in cellulosic materials.
- This allows the TMO process to utilise a broad range of biomass feedstocks

### An end-to-end package is delivered that provides individual solutions to all requirements for processing a feedstock to the desired end product. The licensee is offered:

- The TMO organism
- A fully integrated engineering and science solution
- Process “know how” through a supported control system design and a feedstock specific enzyme cocktail
- Licensee support: operational support, continued process enhancement support, remote process control support
- Proprietary process engineered and mechanically designed and operated pretreatment and high solids
- Enzyme hydrolysis system

### Delivery of process improvements from the TMO Laboratories and Pilot Plant

- Final evaluation is carried out at our Process Development Unit whose design delivers the advantage that any feedstock can be tested with industrial rigour at commercial scale thereby providing direct feedback to the client
- This forms part of the TMO Performance Guarantee

### Board of Directors:

**T Yeo**  
Chairman

**R Parker**  
Acting CEO

**S Martin**  
Director R&D

**P Allen**  
Non-Executive Director

**J Miller**  
Non-Executive Director

**N Rodgers**  
Non-Executive Director