

An Introduction to TWI and the Materials Group



Damien Kirkpatrick
Collaborative Programme Manager

- Independent R&T organisation
- Specialising in materials, joining, assembly, training & technology transfer
- Limited liability guarantee and non-profit distributing
- 3500 industrial members in 75 countries
- 900 staff



5 UK Technology Centres



8 International Facilities



Key Industry Sectors

Aerospace	Automotive	Construction	Equipment, Consumables/Materials
Electronics	Medical	Oil & Gas	Power

TWI's Energy Sector Credentials

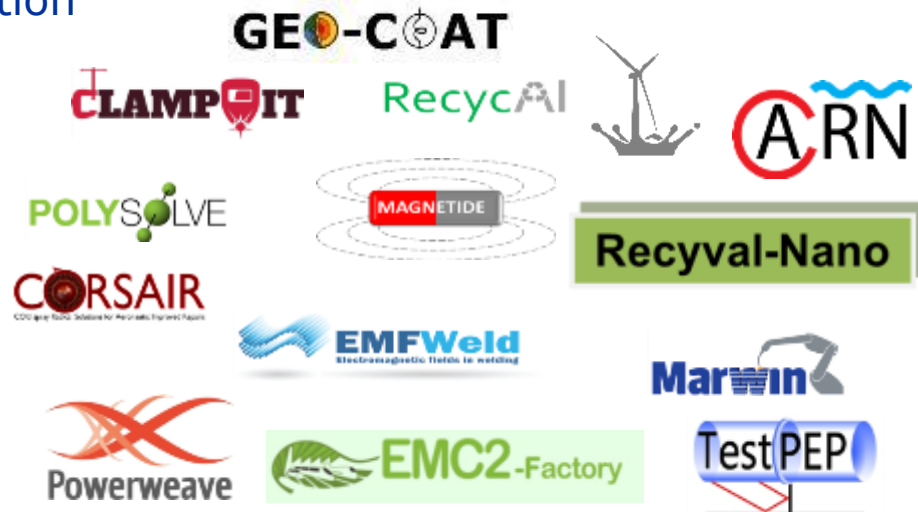
- For more than 55 years, TWI has added value to the energy industry by providing:
 - Technological solutions;
 - Advice and consultancy;
 - All underpinned by world-class research

- TWI focuses its technologies and support to cover the following:
 - Plant and equipment life-cycle extension
 - Asset management
 - Risk-based inspection and maintenance
 - Condition monitoring and non-destructive testing systems
 - Supply chain development technology transfer and training
 - Structural integrity, corrosion and advanced inspection services



Previous experience with European R&D&I projects

- TWI has participated in more than 350 large collaborative projects
- From Framework II to Horizon 2020
- TWI has been consortium or technical project leader on at least half of these projects since Framework 5
- TWI has worked with over 1,000 collaborators since FP7
- Topics included:
 - Materials testing and characterisation
 - Additive manufacturing
 - Corrosion protection
 - Materials process development
 - Advanced coatings
 - Materials recycling
 - Renewable energy
 - Valorisation of waste heat
 - ...and many more



Energy Related Projects and Capabilities

Hydrogen Economy



- **Materials Testing in HPH**
- **Diffusion through materials**
- **Materials degradation behaviour**
- **Performance-microstructure relationship**

Tidal stream turbines



Tidal Design project optimised materials selection & manufacturing for an innovative tidal stream turbine

Coatings for Offshore Renewable Energy



To develop a coating that resists corrosion, fouling and cavitation in a seawater

Controlling Corrosion Offshore

Thermally Sprayed Aluminium (TSA)

- **TSA creates a barrier between steel and seawater**
- **TSA is also more electronegative than steel and provides galvanic protection**



Corrosion Mitigation for Biomass Power Plants



Thermal spray coatings reduced corrosion, consisting of oxidation and chlorination of the substrates, resulting in increased lifetimes of the boilers

Geothermal Energy



Development of novel and cost-effective corrosion resistant coatings for high temperature geothermal applications

- Secure, clean and efficient energy
 - [LC-SC3-RES-1-2019-2020: Developing the next generation of renewable energy technologies](#)
 - LC-SC3-RES-7-2019: Solar Energy in Industrial Processes
 - LC-SC3-RES-8-2019: Combining Renewable Technologies for a Renewable District Heating and/or Cooling System
 - [LC-SC3-RES-14-2019: Optimising manufacturing and system operation](#)
 - LC-SC3-RES-16-2019: Development of solutions based on renewable sources that provide flexibility to the energy system
 - LC-SC3-RES-17-2019: Demonstration of solutions based on renewable sources that provide flexibility to the energy system
- Nanotechnologies, Advanced Materials, Biotechnology and Advanced Manufacturing and Processing
 - LC-NMBP-27-2019: Strengthening EU materials technologies for non-automotive battery storage
 - LC-NMBP-28-2020: Advanced materials for innovative multilayers for durable photovoltaics
 - LC-NMBP-29-2019: Materials for non-battery based energy storage
 - [LC-NMBP-31-2020: Materials for off shore energy](#)
- Fuel Cell and hydrogen calls
 - FCH-02-1-2018 Demonstration of a large scale electrolyser for converting renewable energy to hydrogen
 - [FCH-02-4-2018 Thermochemical hydrogen production from concentrated sunlight](#)
 - FCH-02-5-2018 Hydrogen carriers for stationary storage of excess renewable energy
 - [FCH-04-2-2018: Hydrogen admixtures in the natural gas grid](#)



Thank you for your attention!

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