Welcome to the third edition of the EMG Newsletter which we hope is providing improved communication with you as members of the Group.

There continues to be considerable interest and activity in the energy sector with, for example members of the House of Lords undertaking a review of the challenges that need to be addressed to support current, new build and future nuclear power generation through to decommissioning with the aim of identifying the needs to secure the future for the UK in this sector. In addition the current Issue, (March), of Materials World features articles addressing small modular reactors, off shore wind and energy efficient buildings. These span a wide range and clearly identify that it is not just in the supply but in the reduction of demand that materials related challenges have to, and are being addressed. In the case of small modular reactors there is a clear opportunity for UK industry and the supply chain since the estimated world market is 65 to 85 GW by 2015 with a value of £250 to £400bn.

We hope that now your Newsletter is established you will send topical contributions and views to the editor, Dr Peter Barnard at peter.barnard@doosan.com

Professor Peter Flewitt
Vice Chair Energy Materials Group
### Energy Materials Information Streams

The EMG microsite is a mine of information relating to Energy Materials with links to various sources of information, including funding sources for collaborative research/development e.g.

**Horizon 2020 - Energy calls for 2016 -2017 are now ratified and can be found at:**


A large range of areas of specific interest are covered, e.g.

- Advanced Power Generation Technology Forum (APGTF)
- EPRI (Electric Power Research Institute)
- EPSRC Supergen Programme
- EuMaT (European Technology Platform on Advanced Engineering Materials and Technologies)
- EURATOM/UKAEA Fusion Association
- National Fuel Cell Research Centre
- UK Energy Research Centre (UKERC)
- Zero Emission Technology Platform

The EMG micro website is actively managed and regularly updated, e.g. shortly to be added is the latest presentation from EMIRI on **“Establishing the Industrial Leadership of Europe in Advanced Materials for the Energy Union”**. A brief overview is given in the titbits section.

The link to the appropriate location on the micro site is given below


If you know of additional sites that our members would be interested in please advise and we’ll add them to the list. Also any sources of funding or items similar to the EMIRI presentation that you wish to bring to the group’s attention also please advise.

peter.barnard@doosan.com
Committee Member Profile – IOM3 Divisional Co-ordinator

Ian Warrington CEng. FIIMMM

Senior Materials Advisor-The Institute of Materials, Minerals & Mining

(ian.warrington@iom3.org)

Short CV

Having left school with Science O levels I gained an ONC in Science on day release whilst working for GKN as a Metallurgical Technician in the steel drop forging industry. Whist still in employment I was selected for a HND sandwich course in Metallurgy, leading to Graduateship part 1 to the Institute of Metallurgists and then gained a BSc. Honours in Metallurgy at Aston University.

Career path evolved with a number of international specialist metals and alloy manufactures (Sandvik, Acerinox) which involved technical sales support for stainless steels and Nickel alloys specified in petrochemical, power generation and oil & gas projects.

I have project managed a Euratom Energy contract to produce 50 Tungsten-LBSRP divertor modules for the JET experimental nuclear fusion reactor at UKAEA Culham laboratories. The contract was for design development, manufacturing and assembly over a 4 year period. This involved manufacture of 80,000 parts in high performance Inconel & Nimonic alloys, 99.95% pure Tungsten, TZM Molybdenum alloys with ceramic coatings for thermal and electrical insulation. Design evolution naturally occurred over the contract period with frequent scientific review meetings to ensure the physics & engineering performance demands would be met. Further project development roles followed into large scientific establishments such as CERN, Diamond, ESRF & ILL for the supply of hard metal and refractory material components.

I have been a member of the Materials Information team at IOM3 for 3years and provide technical advice on metals and engineering processes specialising in stainless steel manufacturing, ferrous forging, casting & welding, machining and material product application in a wide range of industries. I also lead IOM3’s contribution to the European FP7 MatVal and Horizon 2020 MATCH funded programmes.

Materials Interests

All metals and alloys, refractory metals and REE’s particularly materials for emerging energy technologies.

Outside Interests

Travel, wine tasting, fine dining and cooking, cricket-watching (my youngest son plays for Nantwich and Cheshire), grandchildren - 4 at the last count with 1 on the way. Walking and exercise at gym, Laser dinghy sailing (when on holiday). I act as elected Treasurer, on a voluntary basis, at Alsager Golf Club (10 years), a golf club with no course!
Organisation Profile
EMIRI

In this month’s issue we have referred to a recent EMIRI presentation, therefore it seemed appropriate to give a brief profile of EMIRI from the EMIRI home page.

“In 2012, following the development of the Strategy Energy Technologies (SET) plan and its associated SET Plan Materials Roadmap, key industrial actors and leading research organizations felt the need to associate under the Energy Materials Industrial Research Initiative (EMIRI) … an industry-oriented grouping complementary to established actors, uniquely positioned to span the innovation cycle and focusing solely on advanced materials for low carbon energy & energy efficiency technologies.

Today, EMIRI has more than 50 members across Europe, of which more than twenty are leading industries sharing a similar vision on driving forward research and innovation and building on a strong industrial sector in Europe on advanced materials for low carbon energy and energy efficiency technologies. Therefore EMIRI’s mission is to ensure that such long-term objective is translated into actions through different policies.

EMIRI’s strategy encompasses the full Europe-based value chain from the lab (R&I on advanced material) to the end-market development of various low carbon energy & energy efficiency technologies through the development of strategic elements for the competitive manufacturing of advanced materials and derived products.”

To find out more about EMIRI and its activities you are referred to http://emiri.eu/about
**Titbits Section**

Energy Storage Systems Inc. has recently published a report “Beyond Four Hours” on long duration energy storage, [info@essinc.com](mailto:info@essinc.com)

“Key findings from the report include:

- **Cost remains a primary concern but smart storage purchasers are beginning to look beyond capital expense to more effective measures of lifetime cost and flexibility.**

- **What makes long-duration storage (LDS) attractive is its availability to capture a wider range of use cases and potential revenue streams.**

- **Decision makers are aware of a growing need for LDS and want to know more about its potential.**

*The findings in this paper are based on a combination of online questionnaires and in-depth discussions. This paper makes the case that all-iron flow batteries can meet the requirements that developers have for a long-duration storage asset that is safe, low-cost, and flexible today and into the future.*”

A new addition to the Materials Today family namely Materials Today Energy has been recently introduced. The editors seem to be targeting 4 issues a year and aims to be a multi-disciplinary, rapid-publication journal focused on all aspects of materials for energy.

“*Materials science continues to play a vital part in the development of energy technologies spanning generation, storage, conversion, distribution and policy. Materials Today Energy provides a forum for the discussion of high quality research that is helping define the inclusive, growing field of energy materials.*”

Further information can be found at

The main focus of this presentation was to highlight the growing demand for Renewable Energy (RE) and Low Carbon Energy (LCE) and the opportunities that exist for EU wealth and job creation. The main take aways from the presentation are:

- China is becoming the world’s renewable energy power station, and have created some 400,000 jobs in the RE sector. Jobs that the EU have missed the opportunity of creating within the EU
- Accelerating transformation of the energy systems to LCE is a crucial part of the solution (referring to climate change mitigation)
- LCE technologies cover energy performance of buildings, harvesting of RE, energy storage and decarbonisation
- EU (based on historical industrial strength) has industrial leadership in Advanced Materials for LCE – This represents 500,000 jobs direct and indirect (this is close to 50% of EU-based jobs in LCE technologies)
- Policies stimulating market pull and technology push of LCE Technologies to ensure manufacturing could lead, by 2025+, to the creation of an additional 300,000 jobs in EU-based sector of Advanced Materials

**Upcoming Events**

**Next Committee Meetings**
Thursday 29th June 2017, at AMEC Foster Wheeler, Birchwood

Wednesday 1st Nov 2017, at IOM3, 297 Euston Rd, London

**EMG Workshops/Conferences**

EMG Annual Lecture, Thursday 13th July to be given by Dame Sue Ion, at IOM3, 297 Euston Rd, London

**Other Workshops/Conferences of Interest**

Microscopy of Oxidation 10, 3rd - 5th April 2017, Loughborough University

Energy Materials -East Mids Materials Society Prestige Lecture, 5th April, Nottingham Trent University

Research Day 2017, 8th June 2017, Holywell Park, Loughborough University

8th International Conference on Low Cycle Fatigue, 27th – 29th June 2017, Dresden, Germany

POWER-GEN and Renewable Energy World Europe 2017, June 27th – 29th June, Cologne, Germany

The 3rd International Conference on Materials and Renewable Energy, 26th – 28th July 2017, University of Hertfordshire

Euromat 2017, 17th – 22nd Sept 2017, Thessaloniki, Greece

Asia Power Week, 19th – 21st Sept 2017, BITEC, Bangkok, Thailand

ECCC Creep & Fracture 2017, 10th – 14th Sept 2017, Düsseldorf, Germany

14th International Conference on Functional Energy Materials, 6th – 7th Dec 2017 Dallas, USA

3rd IEA CCC Workshop on A-USC Power Plants, 13th - 14th Dec 2017, CSM, Rome


Parsons 2019, Sept 2019, Venue to be confirmed

**Interested in EMG Activities?**

Contact: Prof Stuart Irvine, s.j.c.irvine@swansea.ac.uk

Items Relating to Newsletter Contact: Dr Peter Barnard, peter.barnard@doosan.com