Sustainable Development Group

Bringing it together – the role of the IOM3 Sustainable Development Group

Geoff Hale/Stuart Patrick

(with support from Louis Brimacombe and Mark Jolly)
Sustainable Development Group
Board Membership

• Mining & Minerals – Tony Hartwell, Stephen Barnett
• Metals Sector – Louis Brimacombe, Richard Thackray, Tamara Alliot
• Packaging – Keith Barnes, David Harding-Brown
• Cement and Concrete – Alan Maries, Andrew Dunster
• Wood – James Coulson
• Plastics (& Rubber?) and Composites – Stuart Patrick, Graham Sims
• Surface Engineering – Allan Matthews
• Vehicle Engineering – Pat Winfield
• Life Cycle Thinking & Circular Economy – Mark Jolly, David Jesson, Catherine Joce, Sophie Parsons, Sarah Wilkes, James Goddin
Round table on sustainability issues

Board members highlight topical issues at each meeting. Recent topics include:

• Plastics in the oceans/PVC Recycling (link into PVC 2017 conference)
• Car batteries for electric vehicles – LCA suggests that car batteries are critical, yet data is hard to obtain from OEMs
• Raw materials sourcing – role of mining within a circular economy
• Responsible sourcing within the timber industry – the existence of two codes - FSC (a forest certification scheme) and PEFC (programme for endorsement of forestry construction)
• Recyclability and reuse of metals

Arising from such discussions, Board members may be invited to other meetings to cover these topics

These discussions are being considered as one of the key components of a SDG newsletter
What is the role of IOM3 in the context of Sustainability

Sustainability?

Circular Economy?

Methodology to determine how to make things better, not worse? (but for who, and in what respect?)

Materials:
Improving how we source, manufacture, provide social value in use, and approach end of life optimisation will be Central to achieving a more Sustainable Society.
The high level challenges for a better society …..

UN Sustainable Development Goals – Launched September 2015
Making the Economy More Circular with Value Optimisation

Minimal & responsible virgin resource inputs → Minimal resource loss / waste

Closed Loop Recycling

Open Loop Recycling / Cascading

Refurbish / Remanufacture / Recondition

Reuse / Redistribute /

Life extension/ Service Support

Direct & indirect value creation through process & product / service efficiency

Usage / Share

Minimal resource loss / waste
Life Cycle Assessment

Indicates the scale of environmental and resource impacts associated with an activity or function from the extraction of raw materials, through to ‘end use’ impacts.
Life Cycle Assessment – What is it?

• A life cycle assessment ('LCA', also known as life cycle analysis, ecobalance, cradle-to-grave-analysis) is the assessment of the environmental impact of a given product or service throughout its lifespan.

• ISO 14000 series of environmental management standards are extensively used to help ensure consistency
  – ISO 14040 and ISO14044

• 4 Key Areas
  – Goal and Scope
  – Life cycle Inventory
  – Life Cycle Impact Assessment
  – Interpretation
Making the Sustainable Choice: Triple Bottom Line Life Cycle Thinking

Along with environmental considerations, the social and economic performance of a material is crucial for making sustainable decisions. A life cycle approach helps to identify and develop holistic and robust solutions.

Viability / Affordability / Life Cycle Costing / Whole Life Costing

Now described in BS8905 Framework Standard, ‘Sustainable Use of Materials’

Material choice

LCA/Carbon footprint
Resources use

Safety / Comfort / Aesthetics/Functionality
Examples of SDG activities

• Held the **Innovation Towards Sustainable Materials conference** in 2010 which set a platform for debate across all materials and market sectors.

• In 2013, the SDG initiated an **Automotive Sustainability Exchange** event which brought together experts in the sector to consider how material selection influenced sustainability in automotive design.

• The SDG collaborated with the IOM3 Iron and Steel Society to run a **European Steel Environment & Energy Congress (ESEC)** in September 2014, which addressed the challenge of environmental impacts, climate change and resource efficiency for steel products and steel plant operations.

• Took responsibility for the Iron and Steel Society Bessemer Master Class on **Sustainability and Life Cycle Thinking** in October 2014.

• Worked with ADS (Aerospace, Defence, Security and Space) group to hold a workshop on **EcoDesign and Product Sustainability in the Transport Sector**, May 2016.
SDG Focus Themes

- Climate Change/Environmental Impacts
- Resource (and water) efficiency
- Society and Materials (CSR/Social Value)
- Methodology, Standards and Regulations
- Research/Education/Congress

All materials (and their sourcing) have sustainability challenges, but they also all have a positive contribution to make and a positive story to tell.
Current areas of SDG Board activity

• 3 Board members sit on the group developing BS 8001 on the Circular Economy
• Contributing to various Innovate UK proposals
• Involvement with the development of an EU strategy roadmap for non-ferrous metals
• Best practice being developed for EMAS (Environmental management and audit scheme) for Fabricated Metals in Europe, which goes beyond the requirements of ISO 14001)
• Members sit on a number of EPSRC panels, help to frame calls and competitions, and act as assessors
Funding Opportunities

• EU funding for Sustainable development assessment methods (H2020 calls). More coming?

• The Commission and a number of EU Institutions/Trade associations are funding PEF (product environmental footprint) work. This is about defining methodology for products and is highly political.

• Innovate UK supports doing LCA work within project proposals (so part funds life cycle thinking)

• The Universities through EPSRC and various other Research Council funding include LCA in projects and CDTs etc (for PhD subjects). This is mainly to educate students about LCT/LCA
The Role of IOM3?

- Visibility and pro-active engagement in Sustainability forums and debates
- Leadership and guidance on the role of materials, and their contribution to a sustainable society
- Supporting educational and training programmes, potentially including endorsement and awards
- Setting out how IOM3 can support policy development, the key role being to check technical validity and scientific rigour
- Helping to bridge the views of Industry and Academia, and across sectors
The Voluntary Commitment of the European PVC industry
My Background

• Over 40 years experience in PVC formulations, processing, testing and end-use applications
• Chair IOM3 PVC Committee/MPG Committee Member/Polymer Society Board Member/Design Innovation in Plastics Organising Committee/IOM3 Sustainable Development Group ....

Author of: A Practical Guide to PVC (Smithers Rapra)
Why the hostility to PVC?

• Greenpeace Campaign in UK

“We held actions at various chlorine plants for a few years but got nowhere, so we switched attention to PVC, at the other end of the production chain”
Pete Roche, Greenpeace UK
Chemical Week, February 26 1997

• God created 90 elements but the devil created 1
  – Chlorine
  – (Greenpeace Quotation)

• Why do you think that there is so much hostility to chlorine?
Chlorine & Organochlorine Chemistry

Benefit to Society
- CFCs?
- PCBs?
- DDT?
- Chlorinated Water?
- VCM?
- PVC – High Energy, Dioxins?

Environmental Impact
The PVC Debate - historic criticism of PVC has come in 3 basic areas:

- Hazards involved in polymer production
- Additives used to give PVC its many different properties – processing heat stabilisers to process PVC into products and give those products added longevity and plasticisers that are used to make flexible articles from a material that is basically rigid
- Hazards associated with disposal of PVC products at their end of life
Changing Attitudes towards PVC

• In the late 90s a series of emotive images were used for the first time to counter the misleading allegations

• In addition there was significant interest in the debate of whether or not PVC had a future

• Some environmentalists saw a benefit from PVC provided that the environmental aspects could be managed

• The European Commission undertook a full assessment of PVC
  - The Industry responded with a Voluntary Commitment known as Vinyl 2010
Vinyl 2010 – 10 Year Supply Chain Partnership
What did Vinyl 2010 represent?
Vinyl 2010 for sustainable development

Towards a sustainable future

- Committed to transparency
- Promote social dialogue (EMCEF)
- Enhance stakeholder dialogue
- Promote sustainable development among wider audiences

- Minimise environmental impact of production
- Responsibly use additives (plasticisers and stabilisers)
- Phase out certain additives (Cd-/Pb-stabilisers)
- Minimise environmental impact of products at the end-of-life
- Boost collection and recycling schemes

- Promote scientific and technical innovation
- Promote and support the creation of self-driven collection and recycling schemes
- Provide market with sustainable products
- Contribute to the image and reputation of the industry
- Private funding partnership
Vinyl 2010 – European PVC Voluntary Commitments

• Manufacturing (Resources & Emissions)
  – Compliance to Industry Charters regarding PVC production emission standards
• Additives
  – Elimination of Cadmium – **Done**
  – Full replacement of lead stabilisers by 2015 - **Done**
    • Staged Reduction targets for 2005 and 2010
  – Plasticisers – full support to EU risk assessments
• Waste Management
  – 200,000 additional tonnes per annum of post-consumer PVC waste by 2010 (over and above recycling covered by legislation or already in place in 2000)
PVC – Some Key Facts

- Global demand ~ 27 million tonnes annually
- Western Europe ~ 8 million tonnes with market value Eur 70 billion
- Western Europe ~ 23000 firms providing some 530,000 jobs
- Plastics account for ~4% of crude oil/gas usage with 0.3% being used for PVC (Ethylene)
Hazard versus Risk

Hazard is the potential of something to cause harm; risk is the likelihood of harm occurring. Chemicals regulation is largely focused on minimising risks associated with chemicals – and rightly so. However, in the EU the hazard classification of individual chemicals can impact significantly the regulation of products containing those chemicals, regardless of the actual risks that the products may pose to human health or the environment.
Megatrends impacting Chemical Industry

- Population Growth
- Ageing Population
- Less Arable Land/Growth In Urbanisation
- Greater Global Disposable Income
- Rising Energy Costs/Energy Management
- Greater Environmental Focus & Regulation
- Political
- Social
- Environmental
- Economical
- Wild Card
- Greater Global Disposable Income
Day Seminar - Rubber and Elastomers – sustainably meeting tomorrow’s challenges

Monday 15th May 2017 Manchester
Sponsored by ARTIS

Speak to me afterwards for more information
Thank you
Any immediate questions?