



Materials UK

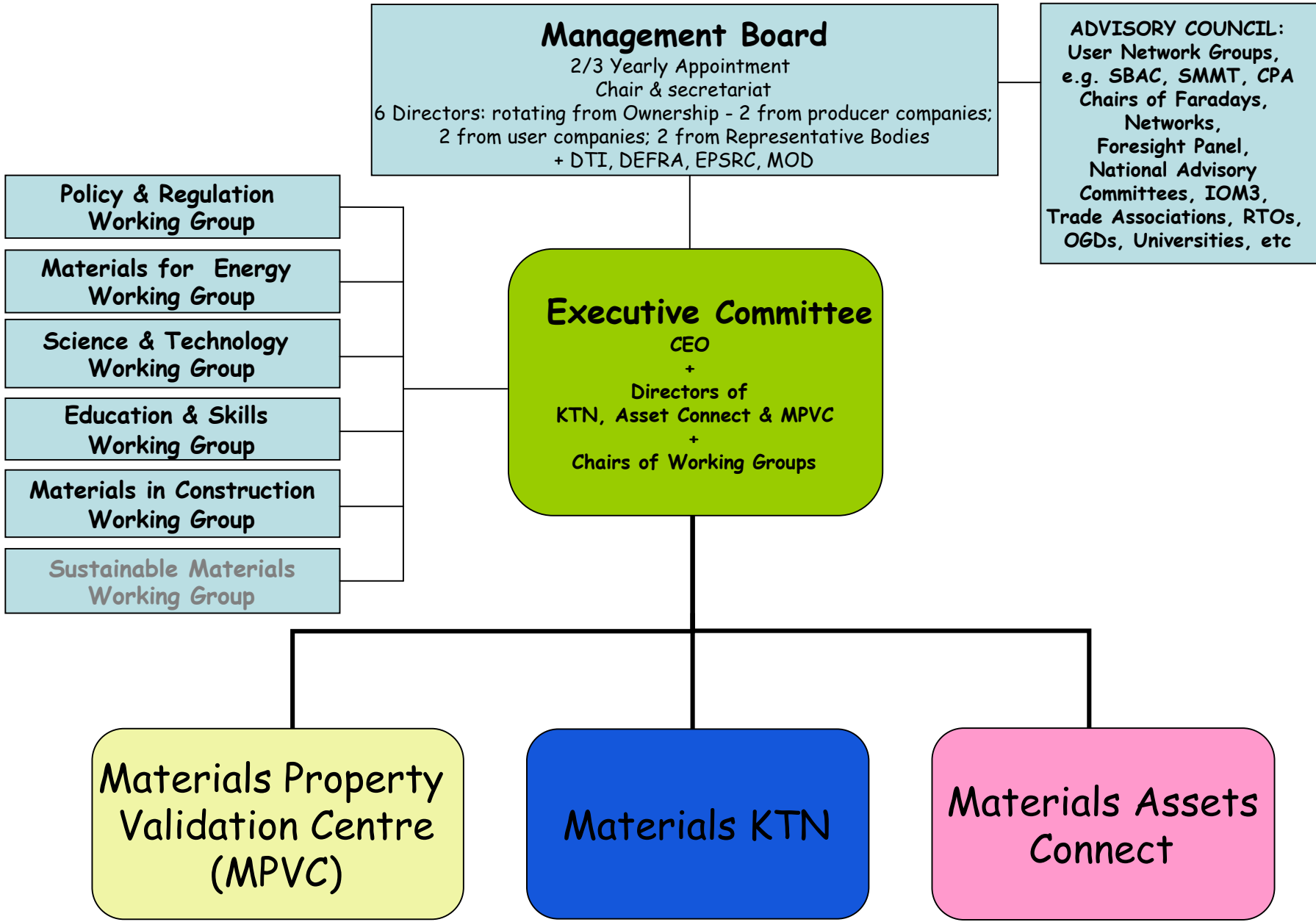
Progress Report and Forward Plan

Community Meeting

25/01/07

David Bott

DTI



What are we doing?

- **Materials Knowledge Transfer Network (KTN)**
 - Is working to deliver improved industrial performance through innovation and new collaborations by driving the flow of people, knowledge and experience between business and the science-base, between businesses and across sectors
 - Will drive knowledge transfer between the supply and demand sides of technology-enabled markets through a high quality, easy to use service
- **Materials Assets Connect**
 - Will be a register of all UK R&D assets that are available for use by the community
- **Materials Property Validation Centre**
 - Will deliver certified/validated data on materials properties covering whole life cycle - enabling more efficient re-use and recycling

What are we doing?

- Working Groups
 - Time limited groups established to address a clear remit endorsed by the Advisory Council as of importance to the Materials community.
 - Made up of experienced practitioners examining issues, making recommendations, publishing their findings and initiating programmes to address the issue
 - Policy and Regulation
 - Education and Skills
 - Science and Technology
 - Materials for Energy
 - Materials in Construction
 - Sustainable Materials
 -and more if needed

What are we doing?

- Although there are many issues facing the Materials industry, the Innovation and Growth Team recognised three as paramount.
- Materials UK will initially concentrate its resources on addressing these..
 - **Materials for Energy**
 - **Sustainability**
 - **Design**
- They are, to an extent, inter-related

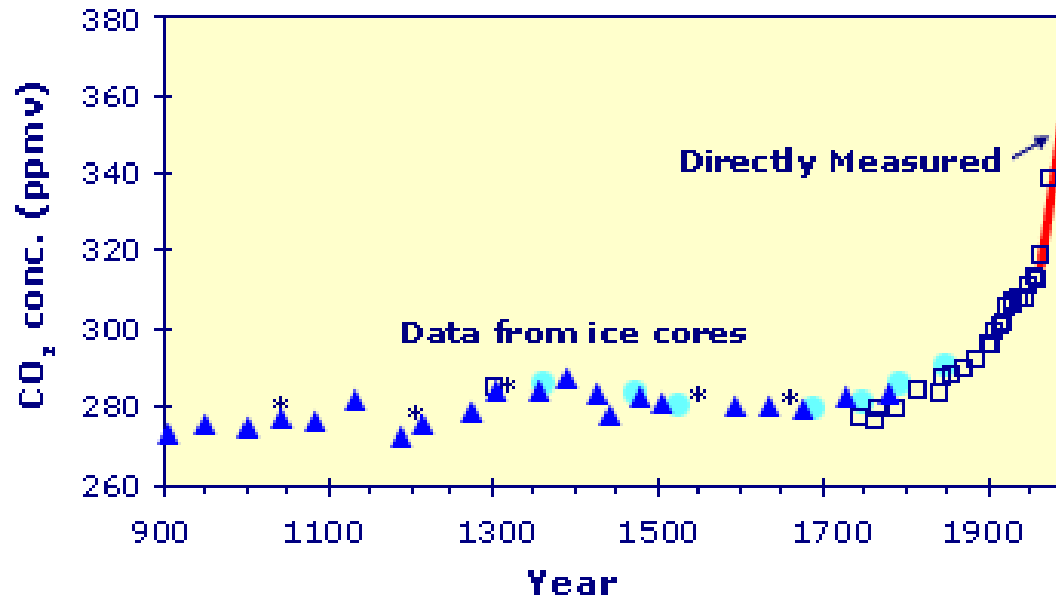
Why energy?

- We consume 84 million barrels of oil a day.
- We consume two barrels of oil for every barrel discovered.
- We are burning through the fossil record at a rate of 20 million years per year
- The oil and gas we are finding is in places that are tough to reach - and hard to work in
- From coal to electric light is 3% efficient
- But 0.01% of the energy that lands on the earth from the sun would provide the energy budget for whole world economy



..and effect of its use?

Trends in CO₂ concentrations for past 1000 years
(parts per million by volume, ppmv)



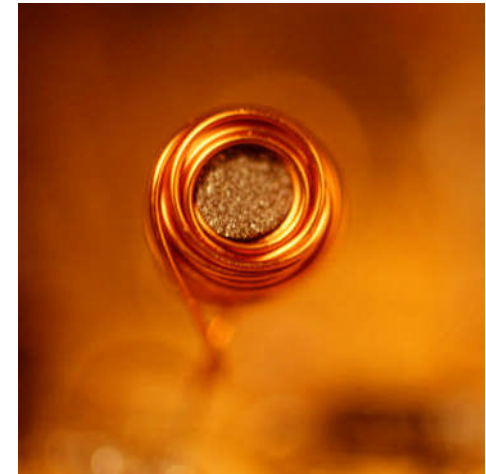
Source: Carbon Dioxide Information Analysis Center (CDIAC)
(<http://cdiac.esd.ornl.gov/>)

What can we do?

- Materials are critical for energy generation, energy storage, energy transmission and energy conservation
- In nearly all areas, we are not up against theoretical limits of effectiveness
- We are working with engineers to specify and develop new materials which allow systems to achieve more efficient energy generation, lower loss energy storage, higher efficiency energy transmission and more efficient energy conservation

Why sustainability?

- We have used more of the earth's resources since 1950 than in all of history up to that point
- Copper usage in the US is 170kg per person (including 21kg per automobile and 200kg per house)
- Current China usage is 35 kg per person
- If China's usage rose to US levels..
- **..the global need would be 1.7 billion tonnes**
- **But the global resource is 1.6 billion tonnes!!**



...and our use of materials?

- 93% of production materials do not end up in saleable products
- 80% of products are discarded after a single use
- 99% of materials used in the production of, or contained within goods, are discarded in the first six weeks
- A pentium processor creates 2.75 kg of waste
- Over your life-time you will landfill 4 tonnes of plastic waste



What can we do?

- The life cycles of many materials - even common ones - are not fully quantified
- We need to understand the full life cycles of these materials and provoke a serious debate on materials selection against application need - the Materials Property Validation Centre is an important step
- We are launching a Sustainability Working Group

Using Design

- People do not, for the most part, choose to buy “materials”
- They buy what materials are used to make - products!
- They also choose to buy a particular product not just for functional performance....
- ...but for other characteristics, appearance, touch, and so on
- Understanding how these influence the use of materials is key to the future
- The concepts and practices of “design” are not (often) taught to scientists and engineers as part of their formal education,
- ...and it is not necessarily easy for them to understand

Using Design...

...means understanding materials



QuickTime™ and a TIFF (Uncompressed) decompressor are needed to see this picture.



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Reputation
Integrity/Ethics
Experience
Market position
Marketing

Personality
Aesthetics
Trend
Tactile feel
Provenance

Usefulness
Ingenuity
Usability
Innovation
Performance

Materials
Finish
Engineering
Dependability
Safety

Emotional

Functional

$$\text{Value} = \frac{\text{Brand} + \text{Design} + \text{Quality}}{\text{Cost}}$$

Desirability
Perception of
fair exchange

Profitability
Social Cost
Environment

What can we do?

- Design is not a simple quantity - it is a complex variable
- Design is the planning of new products and processes
- We have to drive a greater exchange of needs and capabilities between the “design” and “technological” communities...
- ...if we are to be able to make the things people want to buy without compromising the supply of resources and energy
- The KTN has a “design node” which is bringing designers and materials scientists together
- Get involved!

What next?

- We need to grow our membership
 - The Advisory Council needs your company!
 - The Working Groups always need volunteers
- We need to engage the RDA/DAs
 - By understanding and sharing the distribution of our industry
- We need to build a deeper relationship with the EPSRC
 - To unlock the potential of the science base



Contact us!

For more information, look at..

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