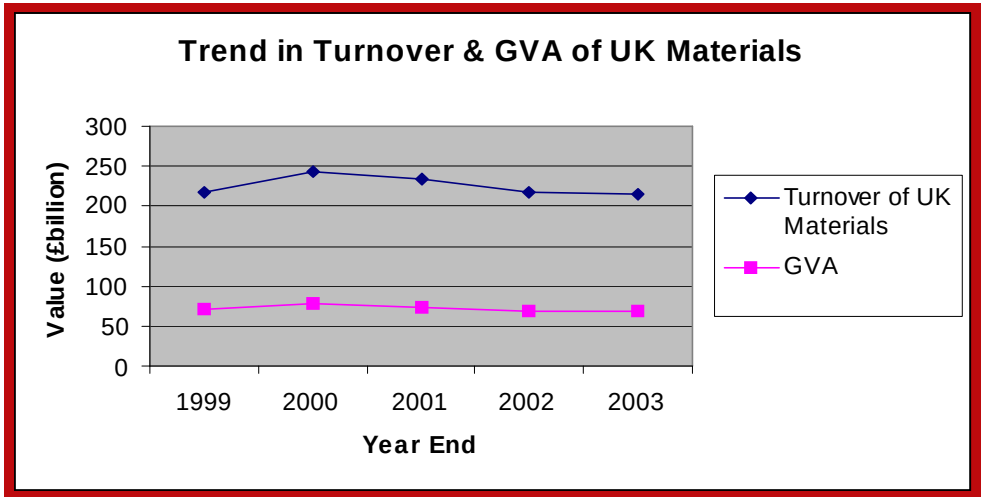
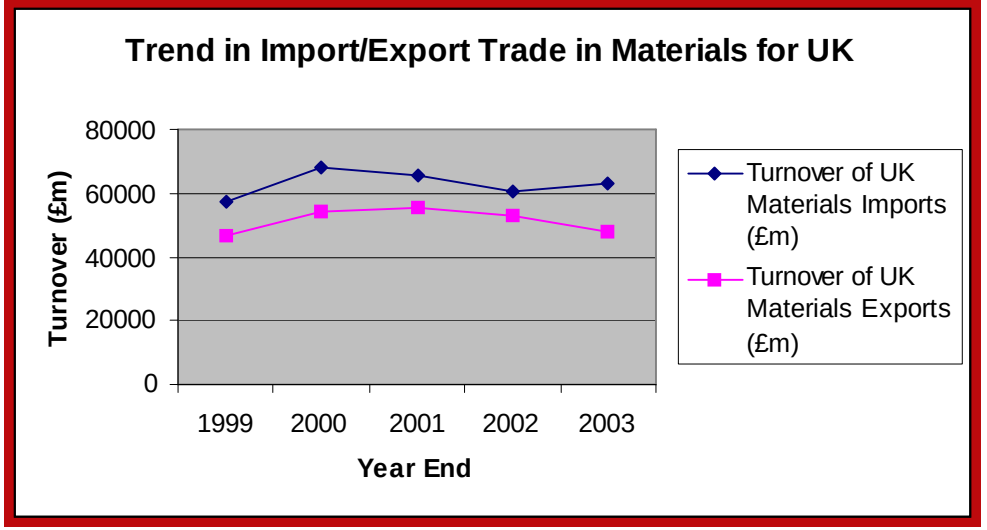
UK Materials Strategy

Importance of Materials

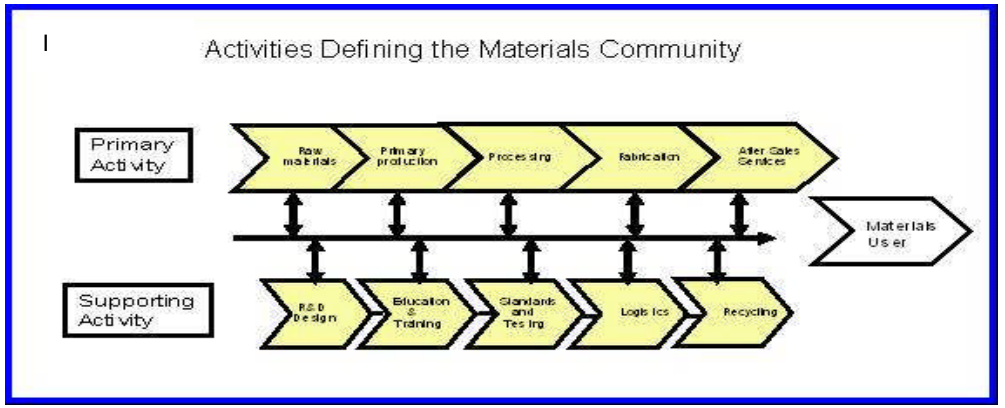
- Combined annual UK turnover around £200bn
- UK exports around £50bn
- Key to innovation in many sectors
- UK has world-class reputation in materials knowledge





Who is in the Materials Value Network

- Raw Materials producers
- Materials manufacturers and downstream processors
- Materials users
- Researchers, Architects, Designers and Specifiers
- Education and Skill Providers
- Fund Providers
- Government



Challenges Facing Materials

- Measures to mitigate Climate Change
- Energy costs
- Raw materials costs and availability
- Capital intensity
- Competitive pressures - global market dynamics
- Skills shortage

What is UK doing to address challenges?

- Development of National Strategy for Materials
- Advanced Materials - a key pillar in funding priorities
- Materials UK - a representative body for all in Materials value network
- Materials KTN – a key delivery channel for technology/knowledge transfer

Materials is one of the Key Technology Areas for TSB

Advanced Materials

Electronics and Photonics

Information and Communication Technologies

Bioscience and Healthcare Technologies

Sustainable Production and Consumption

Emerging Energy Technologies

Design Engineering and Advanced Manufacturing

DTI Technology Strategy

- Technology Strategy Board
- Annual Report 2006

- Technology Strategy
- Board - A call to action

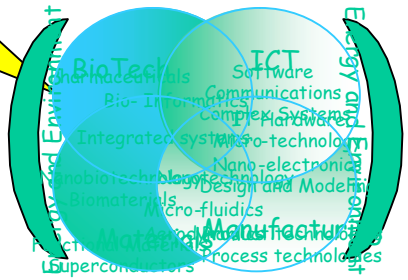
Formulation of Materials Technology Strategy

Strategic Role of Materials IGT

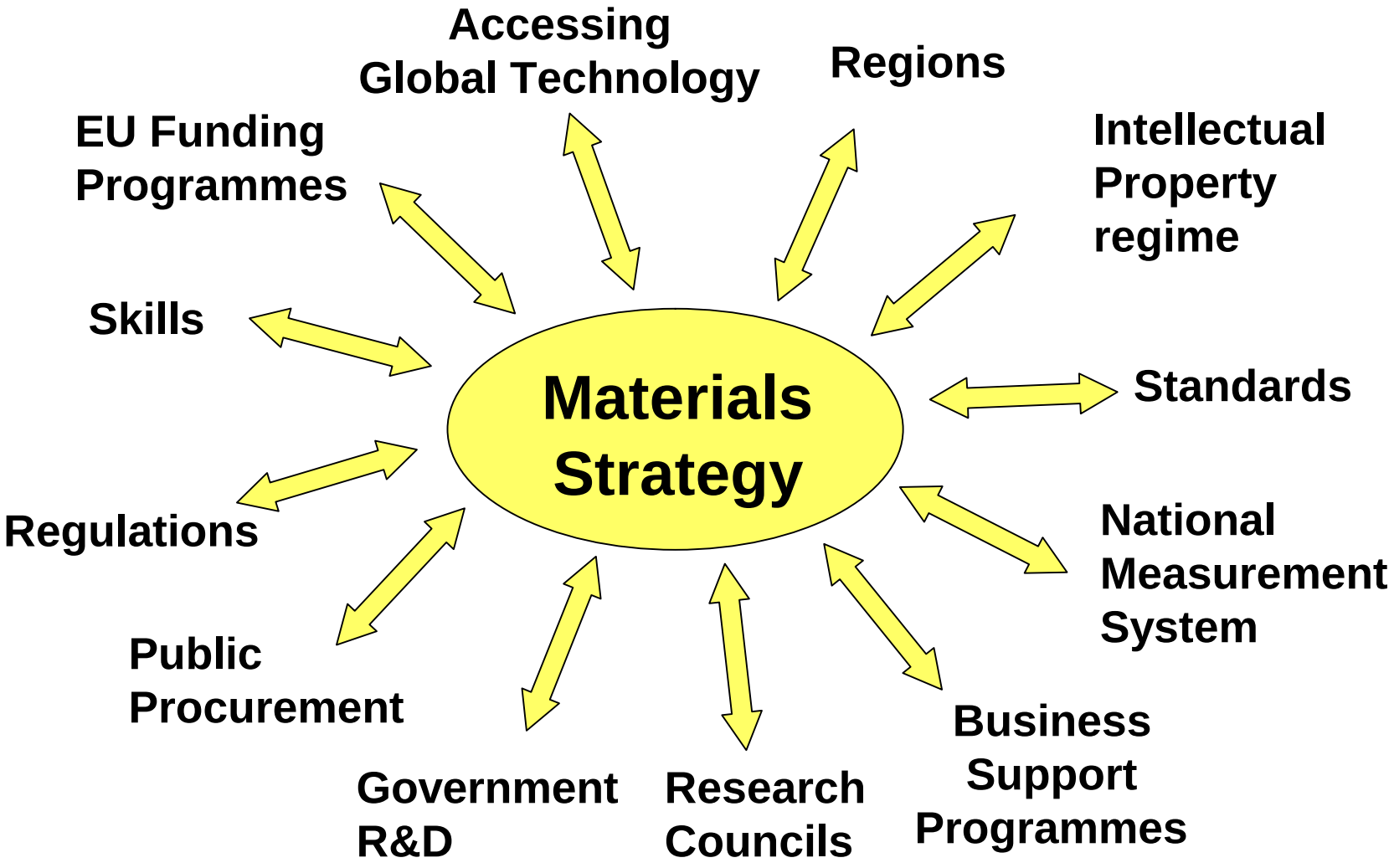
- Business-led identification of technology priorities
- Informed by developments in international research base but focussed on business-pull
- Strong role of Materials Innovation & Growth Team
  - Broad materials community input
  - All materials
  - Production and downstream processing
  - Supply chain issues
  - Engaged end-users &
  - Policy stakeholders, e.g. DEFRA, MOD, EPSRC, RDAs

Your Opinion Counts

- Innovation Growth Teams (IGTs),
- Innovation Age Partnership (IAP),
- International Networks
- Technology Networks
- Foresight panels,
- Faraday Partnerships,
- Research Council,
- Existing programme boards
- Industry & Industry groups such as CBI,
- Chambers of Commerce,
- Professional Institutes,
- Trade Associations,
- Academic groups



Strategy Implementation: A Networked Approach



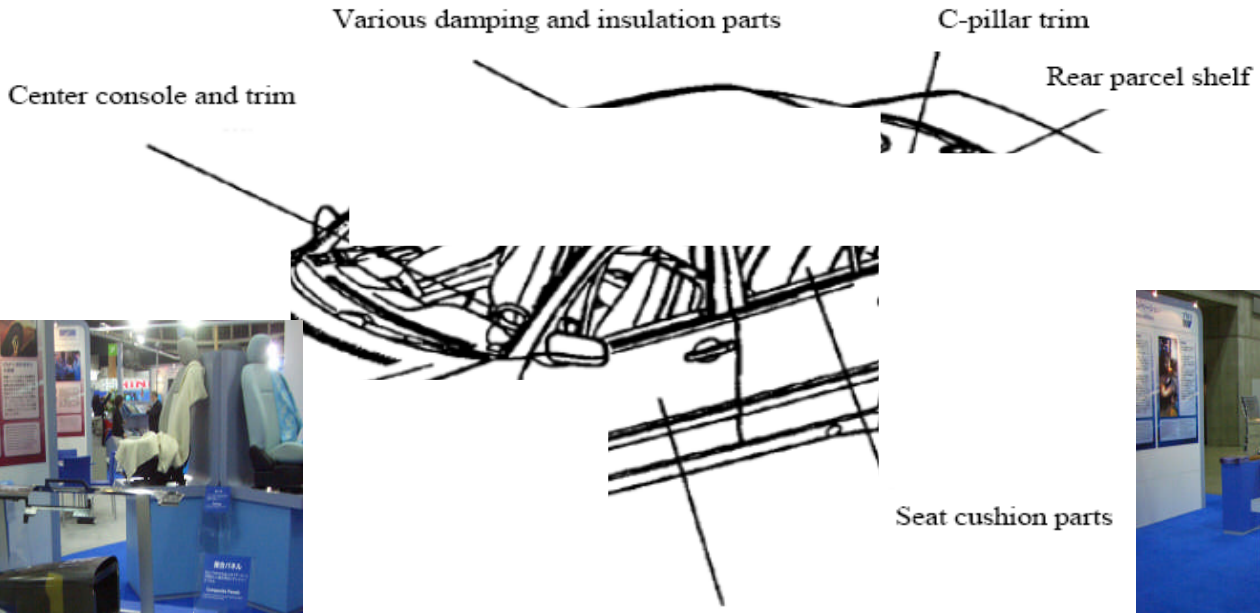
Materials Technology Priorities

- Development of New Materials
  - Structural materials, including light alloys and composites
  - Functional materials, e.g. plastics electronics and sensors
  - Multifunctional materials, e.g. Smart materials
  - Biomaterials, including biomimetics
  - Nanomaterials/modifiers
- Development of New Processes
  - Improved automation and testing
  - Low energy, low emission processes
  - Low waste processes
  - Alternative feedstock, e.g. renewable materials
- Developments in Modelling
  - Multi-scale predictive modelling
  - Modelling for design
  - Validation of design data
- Materials for Sustainable Production and Consumption
  - Materials for energy – e.g. generation, storage, transmission and efficient use
  - Recyclable materials – underpinning all developments
  - Materials for a re-use economy
  - Design for sustainability

Materials for Sustainable Production and Consumption

- Generation, storage, transmission and use of energy
- Efficient use of water, raw materials and other resources in production processes
- Minimising waste generation and maximising recycling and re-use of materials
- Eco-design of products for sustainability, including demountable structures
- Lightweighting of structural components
- Increased use of renewable materials

Use of renewable materials



Lightweight Structures

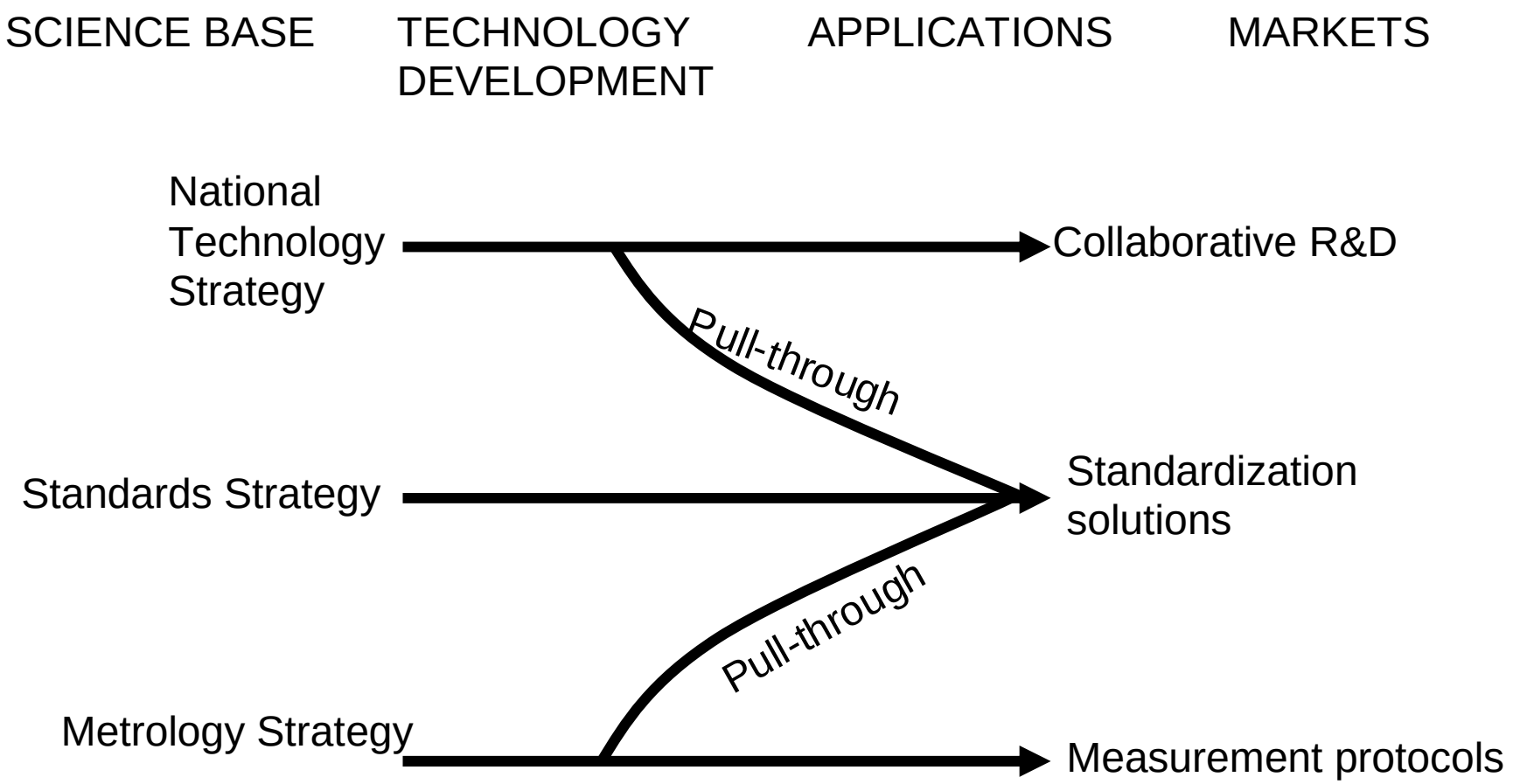
- The development of recyclable polymer matrix composites
- Ceramic matrix composites and nickel alloys for high temperature applications
- Magnesium, aluminium and titanium alloys for ultra lightweight applications
- Advanced high strength steels and metal foams for lightweight high tensile structures
- Lightweight paper and board for trims and packaging
- Application of novel design concepts to achieve lightweight structures
- Optimisation of structural integrity through use of
  - protective coatings,
  - honeycomb or bonded structures,
  - advanced joining techniques, use of hybrid materials
  - **challenge to maintain crash-worthiness**
  - improvement in wear and fire resistance.

Exemplar: Automotive Materials

Materials for sustainable developments

- Low Carbon and Fuel Cells
- Materials for high density hydrogen storage solutions
- Higher temperature/compact powertrain design
- Functional materials for harsh environments
- Advanced lubricants and coatings

Market-Driven Innovation

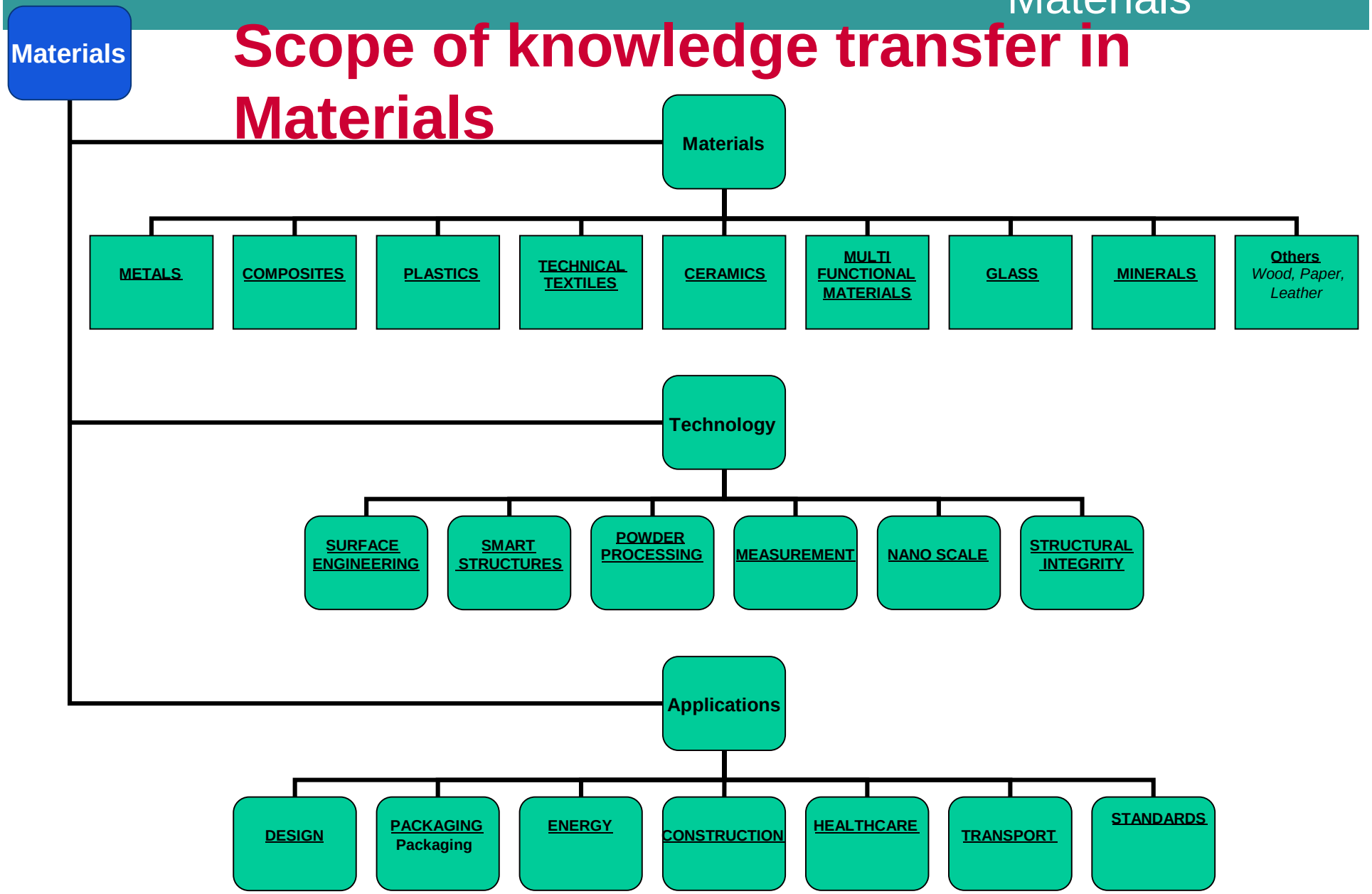


Technology Programme funding – since April 04

- Not just DTI – cross Government
  - DEFRA, MOD, EPSRC, RDAs
- Over £120m for collaborative R&D for materials
  - Business funding over £70m
  - Government support over £50m
- Over £900m total for collaborative R&D
  - Business match funding around £465m
  - Government support around £435m

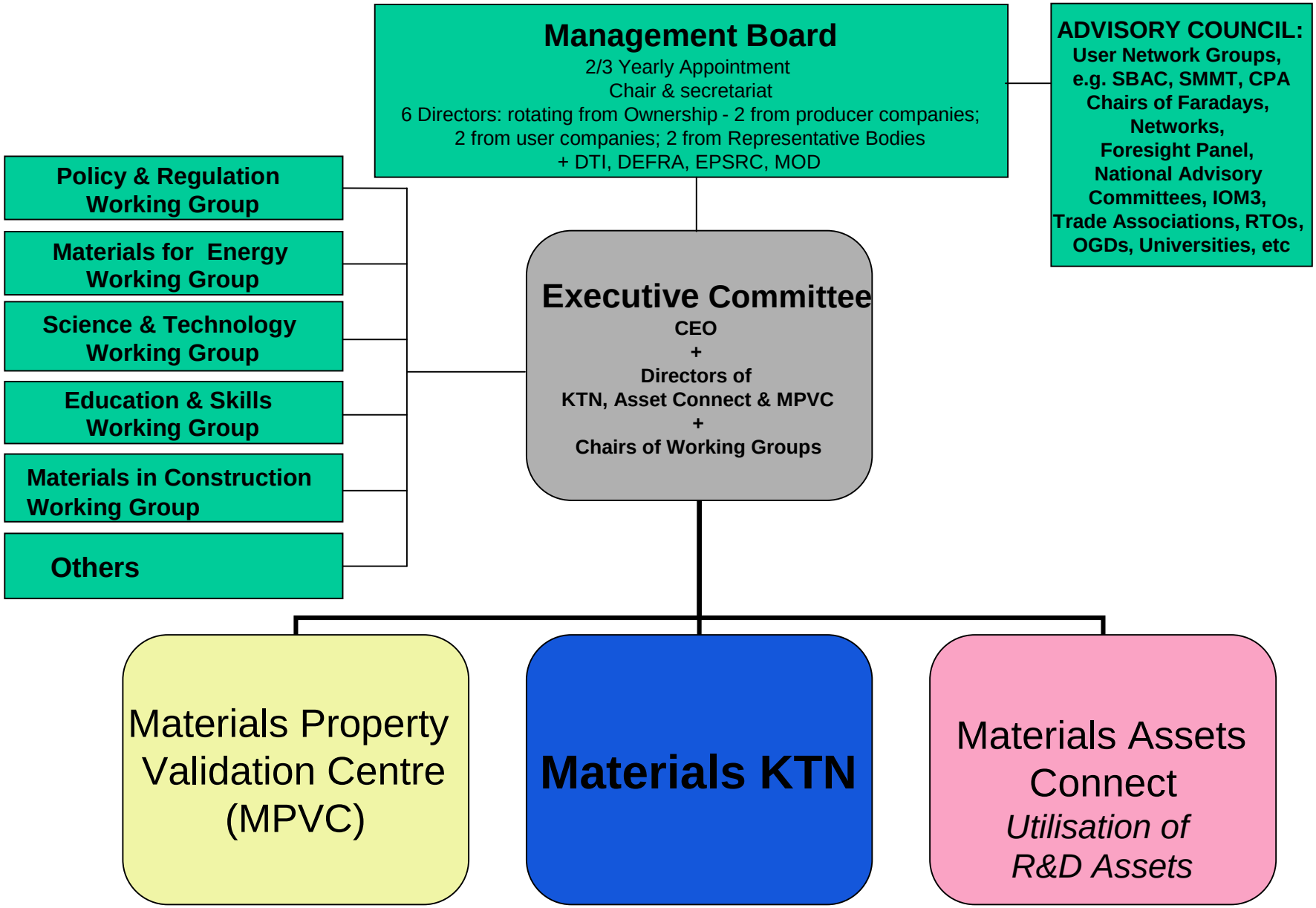
Provides Industry Connectivity

Scope of knowledge transfer in Materials



Materials UK

Materials



NETWORK GROUPS IN MATERIALS KTN

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