MATERIALS KNOWLEDGE TRANSFER NETWORK

Dr Robert Quarshie
KTN Director
Global top 50 by R&D

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Sector</th>
<th>Country</th>
<th>Rank 2005</th>
<th>Rank 2003</th>
<th>2005/06 R&amp;D £bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ford Motor</td>
<td>A</td>
<td>USA</td>
<td>3</td>
<td>1</td>
<td>4.66</td>
</tr>
<tr>
<td>2</td>
<td>Pfizer</td>
<td>P</td>
<td>USA</td>
<td>2</td>
<td>5</td>
<td>4.33</td>
</tr>
<tr>
<td>3</td>
<td>General Motors</td>
<td>A</td>
<td>USA</td>
<td>6</td>
<td>4</td>
<td>3.97</td>
</tr>
<tr>
<td>4</td>
<td>Daimler Chrysler</td>
<td>A</td>
<td>Germany</td>
<td>1</td>
<td>2</td>
<td>3.88</td>
</tr>
<tr>
<td>5</td>
<td>Microsoft</td>
<td>S</td>
<td>USA</td>
<td>7</td>
<td>11</td>
<td>2.84</td>
</tr>
<tr>
<td>6</td>
<td>Toyota Motor</td>
<td>A</td>
<td>Japan</td>
<td>4</td>
<td>6</td>
<td>2.73</td>
</tr>
<tr>
<td>7</td>
<td>Johnson &amp; Johnson</td>
<td>P</td>
<td>USA</td>
<td>14</td>
<td>13</td>
<td>2.66</td>
</tr>
<tr>
<td>8</td>
<td>Siemens</td>
<td>E</td>
<td>Germany</td>
<td>5</td>
<td>3</td>
<td>1.54</td>
</tr>
<tr>
<td>9</td>
<td>Samsung Electronics</td>
<td>E</td>
<td>S.Korea</td>
<td>17</td>
<td>33</td>
<td>3.33</td>
</tr>
<tr>
<td>10</td>
<td>GlaxoSmithKline</td>
<td>P</td>
<td>UK</td>
<td>11</td>
<td>8</td>
<td>3.14</td>
</tr>
<tr>
<td>11</td>
<td>IBM</td>
<td>S</td>
<td>USA</td>
<td>9</td>
<td>7</td>
<td>3.13</td>
</tr>
<tr>
<td>12</td>
<td>Intel</td>
<td>TH</td>
<td>USA</td>
<td>16</td>
<td>12</td>
<td>3.02</td>
</tr>
<tr>
<td>13</td>
<td>Novartis</td>
<td>P</td>
<td>Switzerland</td>
<td>20</td>
<td>25</td>
<td>2.82</td>
</tr>
<tr>
<td>14</td>
<td>Volkswagen</td>
<td>A</td>
<td>Germany</td>
<td>10</td>
<td>10</td>
<td>2.85</td>
</tr>
<tr>
<td>15</td>
<td>Matsushita Electric</td>
<td>L</td>
<td>Japan</td>
<td>8</td>
<td>9</td>
<td>2.80</td>
</tr>
<tr>
<td>16</td>
<td>Sanofi-Aventis</td>
<td>P</td>
<td>France</td>
<td>12</td>
<td>17*</td>
<td>2.78</td>
</tr>
<tr>
<td>17</td>
<td>Nokia</td>
<td>TH</td>
<td>Finland</td>
<td>13</td>
<td>16</td>
<td>2.73</td>
</tr>
<tr>
<td>18</td>
<td>Sony</td>
<td>L</td>
<td>Japan</td>
<td>15</td>
<td>15</td>
<td>2.62</td>
</tr>
<tr>
<td>19</td>
<td>Roche</td>
<td>P</td>
<td>Switzerland</td>
<td>19</td>
<td>26</td>
<td>2.52</td>
</tr>
<tr>
<td>20</td>
<td>Honda Motor</td>
<td>A</td>
<td>Japan</td>
<td>18</td>
<td>20</td>
<td>2.31</td>
</tr>
<tr>
<td>28</td>
<td>AstraZeneca</td>
<td>P</td>
<td>UK</td>
<td>24</td>
<td>27</td>
<td>1.97</td>
</tr>
<tr>
<td>29</td>
<td>Nissan Motor</td>
<td>A</td>
<td>Japan</td>
<td>27</td>
<td>42</td>
<td>1.96</td>
</tr>
</tbody>
</table>

37 Bristol-Myers-Squibb | P | USA | 42 | 40 | 1.80
38 NTT | T | Japan | 34 | 22 | 1.57
39 Renault | A | France | 41 | 48 | 1.56
40 Peugeot | A | France | 37 | 47 | 1.48
41 BAE Systems | Ae | UK | 46 | 58 | 1.45
42 Canon | E | Japan | 40 | 46 | 1.41
43 Hyundai Motor | A | S Korea | 56 | 69 | 1.36
• Combined annual UK turnover around £200bn

• UK exports around £50bn

• Key to innovation in many sectors

• UK has world-class reputation in materials knowledge
Challenges Facing Materials

- Climate Change impact
- Energy costs
- Raw materials costs
- Capital intensity
- Competitive pressures - global market dynamics
- Skills shortage

Knowledge Transfer Networks
A DTI business support solution
Delivered through the Technology Programme

Funded by Government, Regional Development Agencies, Devolved Administrations and Research Councils
What is UK doing?

• 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
Meeting Industry and TSB Objectives
– Knowledge Transfer

1. Improving knowledge transfer infrastructure

2. Improving UK productivity and competitiveness

3. Improving knowledge exchange between business and the science base

4. Increasing innovation amongst businesses in the community

5. Improving business to exploit global knowledge
(-)ve  Cash Flow    (+)ve

Product development timescale

Cheaper

Quicker

KTN

Faster rate of return

Business as usual

Quicker

Product development timescale

KTN

Knowledge Transfer Networks
A DTI business support solution
Delivered through the Technology Programme

Funded by Government, Regional Development Agencies, Devolved Administrations and Research Councils
Market Size / Segmentation

• Size of target market
  • **13,000 individuals**
  • **6,000 organisations**

• Proportion of that market which is necessary to deliver the main KTN objectives
  • **Target Companies responsible for 80% of total turnover**
  • Include at least 25% of SMEs
  • Check target membership provide at least **90% of total gross value add**
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
Key Nodes of the Materials KTN

Knowledge Transfer Networks
A DTI business support solution
Delivered through the Technology Programme

Funded by Government, Regional Development Agencies, Devolved Administrations and Research Councils
Contacts:

Colin Richards - Governing Board Chairman
Andrew Tinker - Chairman Development Committee
Robert Quarshie - Project Director
Jan Czerski - Technology Translator (N. England/Wales)
Sally Beken - Technology Translator (S.E., Rubber Technology)
Brian Turtle - Network Coordinator
Matthew Thornton – Web/Industry Co-ordinator
Business Innovators for Midlands, N.I and Scotland - to be appointed
Building the Infrastructure

- Partnership with the British Plastics Federation
- RDA study conducted for KTN as input to Strategy
- Creation of Board and Development Committee
- Strategy paper developed by Board
- Promotion of the Polymer Innovation Network brand
- New web portal – www.polymerinnovate.net
- Launch of SPARK Awards
- Regional Roadshows
- Events, Conferences, Exhibitions
- 2nd Newsletter issued
Sustainable Production and Consumption using Polymers

- 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
## Team working across the Materials KTN

<table>
<thead>
<tr>
<th>Key cross-cutting themes</th>
<th>Specifics</th>
<th>Theme Leader</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability</td>
<td>- Resource efficiency for construction, transport, packaging</td>
<td>Robert Quarshie</td>
</tr>
<tr>
<td></td>
<td>- Use of design</td>
<td>Bernie Rickinson</td>
</tr>
<tr>
<td>Structural Integrity</td>
<td>- Application of smart technologies</td>
<td>Deborah Pullen</td>
</tr>
<tr>
<td></td>
<td>- non destructive testing</td>
<td>David Arthur</td>
</tr>
<tr>
<td>Biomimetics</td>
<td>- Development of SRA</td>
<td>Walter Lewis</td>
</tr>
<tr>
<td></td>
<td>- Industrial application of technology</td>
<td>David Arthur</td>
</tr>
<tr>
<td>Nanomaterials</td>
<td>- Development of SRA</td>
<td>Patrick Grant</td>
</tr>
<tr>
<td></td>
<td>- Industrial application of technology</td>
<td></td>
</tr>
<tr>
<td>Skills development</td>
<td>KTP, Secondments, CASE Links Mat UK WG</td>
<td>John Liddle</td>
</tr>
<tr>
<td>Materials for energy</td>
<td>- Implementation of SRA</td>
<td>Alan Patridge</td>
</tr>
<tr>
<td></td>
<td>- Engagement with investment initiatives</td>
<td></td>
</tr>
<tr>
<td>Materials for healthcare</td>
<td>Cross-KTN initiatives</td>
<td>Brian McCarthy</td>
</tr>
</tbody>
</table>
Spark Award
Trelleborg Industrial AVS

Axion Recycling Ltd and the University of Wales, Swansea collaborate on ABS recycling project

Best Industrial Collaboration
3D Simulation of Water Assisted Injection Moulding
Polymer IRC at Bradford University with Polymer Innovation Network

Funded by Government, Regional Development Agencies, Devolved Administrations and Research Councils
Quote from David Kind:

Material Development Manager.
“The Materials KTN brought us together, and the SPAR K Award allowed it to happen. The collaboration has worked perfectly since neither of us had expertise in the others field. Trelleborg produced the samples and we quantified their fire behaviour”
Taylor Products wins Yorkshire Forward CIC Award

Cardiff based Taylor Products Ltd won the award for process innovation in recognition of its work with the Bradford University based Polymer CIC. The partners were brought together by Technology Translator Jan Czerski and the development quickly qualified for a Spark Award to fund the “proof of concept” stage. Taylor Products Ltd worked with Bradford University to prove the energy efficiency of their Insulwatt Heater. The product is designed to be used by plastics manufacturers who suffer high energy costs in their manufacturing process. David Scheeres, the Technical Director of Taylor Products Ltd commented:

“There is no doubt that the involvement of Faraday Plastics was a major driver in finding us a suitable partner for this collaboration and also indicating the type of research needed to validate our technology in line

David Scheeres, Technical Director of Taylor Products Ltd