Engineering Professors' Council Congress 2008

The future of engineering education

Professor Lord Kumar Bhattacharyya
Director, WMG

WMG
Innovative Solutions

The future of engineering education

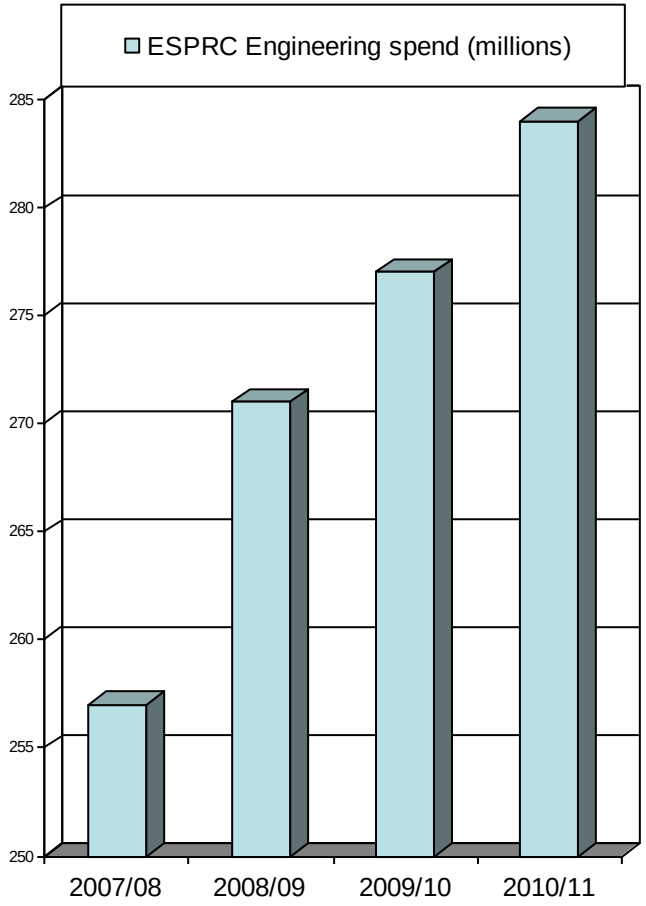
- Key issue for WMG and me personally
  - Founded WMG in 1980
  - Few staff and tough Economic times
  - Belief in future of British engineering sustained us.
  - Now 250 staff, 150 associates, three buildings and multi-million turn over

WMG
Innovative Solutions

The last decade in Science funding

Overall increase in Science Funding

- 2.8% GDP in 1997, 3.7% today
- EPSRC engineering funding increasing
  - £257m in 2007/08, £271 2008/9
- BUT
  - Rate of funding increase slowing after 2008.
  - Defence and Gov't departmental research falling
  - UK private R&D investment still low

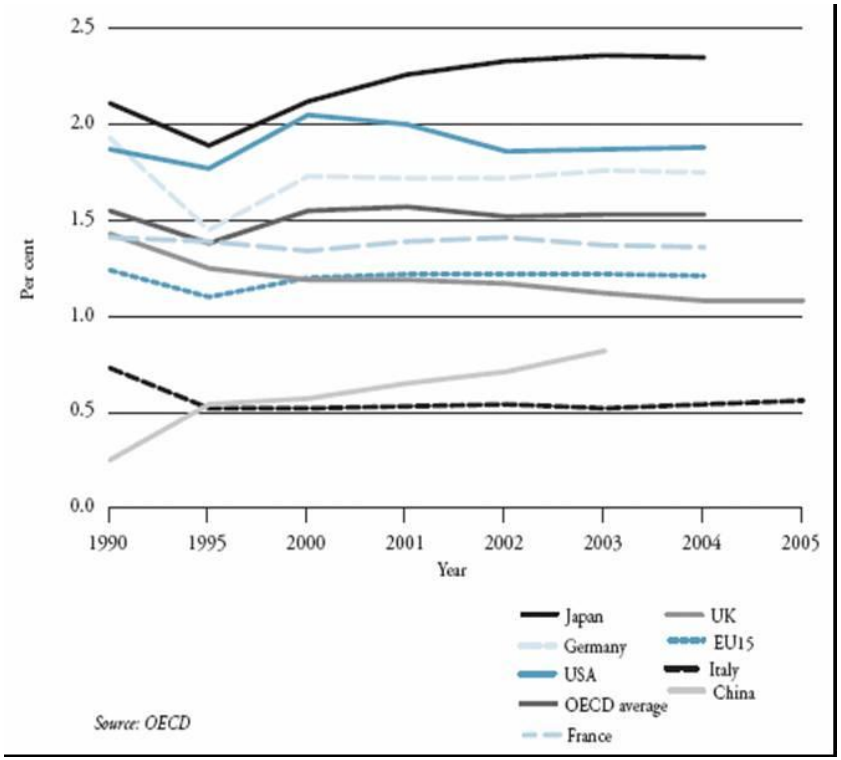


WMG
Innovative Solutions

The challenge of private investment

- UK BERD is just over one per cent of GDP
- Japan is over two per cent
- The US and Germany are well over one and a half per cent.
- UK investment concentrated in Aerospace and Pharmaceuticals
- UK investment often controlled from overseas

UK BERD investment vs. other nations



WMG
Innovative Solutions

Future Challenges

- Likely tighter government funding settlements
  - Therefore need to widen income streams
- Increasing global competition for private funding
  - More competitive market so research must be of high quality
  - New partnerships to generate more UK based investment
- Need to attract best talent
  - Both Global and local

WMG
Innovative Solutions

The contribution of WMG

- Historic gap between new engineering ideas and research and application in UK business
  - UK business was in vicious cycle
  - Not investing in future and in danger of being overwhelmed
- Believed that partnerships could produce results for industry and have academic research value.
  - We provide ideas, academic rigour, open minds and passions for solutions.
  - Successes : CAD-CAM, Materials, Engines, Construction

WMG
Innovative Solutions

Importance of Partnership

- 3 reasons partnerships will be vital
  - Providing value for money for state funding
  - Reward Industry for investing in future
  - Provide answers to major economic and social challenges
- Opportunity for engineering as the science that provides real world solutions
- Government needs to recognise importance too
  - International challenges
  - Research assessments
  - Going beyond “paper production”

WMG
Innovative Solutions

Innovation and Industry

- Innovation white paper
  - Path to creating “innovation nation”
    - Not all new ideas- but funding base is there.
  - Focus on stronger partnership culture
    - Technology Strategy Board
    - RDA’s/Businesses/FE
    - Practical, ambitious objectives
  - Importance of Technology Demonstrators

WMG
Innovative Solutions

Technology Demonstrators

- Chance to show how engineering can result in real world change
  - Public issues
  - Private need
  - Academic challenge
- Low carbon vehicles first demonstrator
- £40 million initial investment.
- A chance to inspire, too

Eco one Race car

WMG
Innovative Solutions

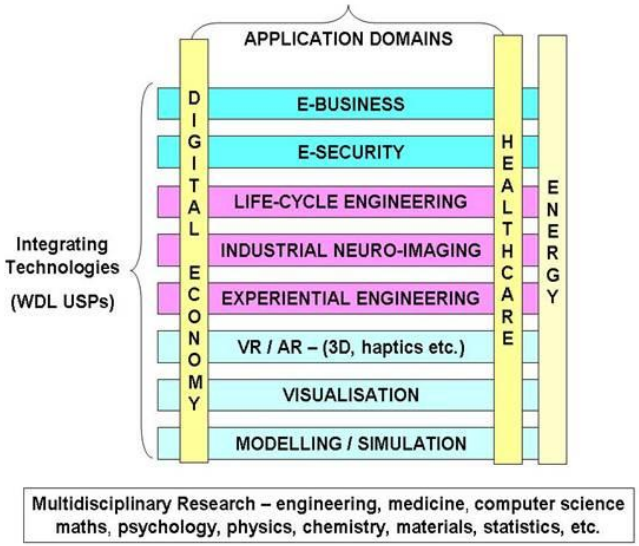
Small Business Innovation

- Untapped Research resource
  - 99% of businesses, 60% of UK employment, 50% of Turnover
  - Yet only make 4000 applications for R&D tax credits
  - Less than a third of R&D Tax Credits goes to SMEs!
- Why?
  - Too complex, too much time out of business, too many other pressures.
- Vouchers?
  - Based on Dutch model
  - Proposed in Innovation White paper
  - Acts as “Berd Seed”

WMG
Innovative Solutions

Digital Laboratory

- £100 million investment
- Digital technology represents new ways to offer innovation and solutions
  - Multi-Disciplinary approaches to real world problems
- Scaleable resources
  - New ways of working
- Flexibility to research resource.
  - From Virtual Reality to experiential engineering



WMG
Innovative Solutions

Conclusions

- Academic Rigour
- Focus on Innovation
- Practical application
- Real world solutions
- Inspiring a new generation

WMG
Innovative Solutions