

# University of Birmingham-VP Scheme

- School of Engineering
- Dept of Metallurgy and Materials
- Case Studies
  - Sustainable Materials
  - Hydrogen Economy

# Survey Results

- 75% of students starting level 2 in M&M
- Little or no knowledge of:
  - Design for the environment, definition of sustainable development, life cycle assessment, ISO14001, fuel cells etc
- Mirrored RAEng results
- Need to give background

# Birmingham Case Study Research

- National Teaching Fellowship Project
- Summary – Importance of:
  - Interactive learning
  - Student centred activities
  - Exposing students to real world issues
  - Using wealth of practical examples in Engineering
  - Case studies rather than case histories

# Mini Case Studies

- Materials in a Sustainable Economy Module
- Modified Course – Level 2
- Background Lectures - Introduction to SD, Materials and Energy Resources, Cyclic Processing, Life Cycle Assessment, Materials in Ecodesign, Renewable Energy
- Mini case studies related to SD
  - Students assess SD implications of particular industry
  - eg aluminium recycling, wind power, glass recycling
  - Assessed by individual report and presentation

# Hydrogen Economy Case Study

- Real world issue facing industry
  - How do companies react to a potential HE?
- Groups of 5 students
  - Act as consultancy for imaginary materials company
  - VP & University colleagues act as board
- Should the idea of a Hydrogen Economy be taken seriously by industry?
- Assess SD impact on company of a particular product eg PVs, H-storage materials, fuel cells

# HE Case Study Teaching Issues

- Background lecture and discussion with VP etc
- Group membership pre-selected
- Group skills training, role assessment
- Student progress monitored during case study
- Key skills
  - Group learning, communication, independent study
- Assessment
  - Group report and presentation
- Element of peer assessment marking
- Good feedback from students

# Development into Engineering

- STP (Special Technology Programme)
  - Group report for University environmental coordinator on University response to SD
- Core Level 1 – design for the environment
- Mech Eng Level 3
  - Industry response to SD
- Postgraduate courses
  - MRes, EngD

# Conclusions

- Emphasis on student interactive case studies
- Importance of embedding SD case studies in existing courses
  - Need person in place with knowledge of University teaching practices and courses
- Importance of awareness of outside activities
  - Corus, AWM, Bham City Council etc

# References

- International Survey: Environment and SD
  - Universities of Surrey and Melbourne
- Case Study Research
  - 'Case Studies in Materials Science', LTSN Booklet
- HE case study
  - <http://www.cases.bham.ac.uk/metmat/hydrogen.htm>