



Forum for the Future

**Challenges to Engineering
Education for Sustainable
Development – 28th March 2007**

Lorna Pelly

Who are we and what we do?



Forum for the Future is a sustainable development charity.

We aim to show that a sustainable future is both possible and desirable



How we work with our partners



Advice & Education

transforming
companies and
sectors to deliver
sustainable
development

Research

cutting edge
and driving new
thinking on
sustainability
and business

Advocacy

creating an
enabling
environment for
sustainable
business

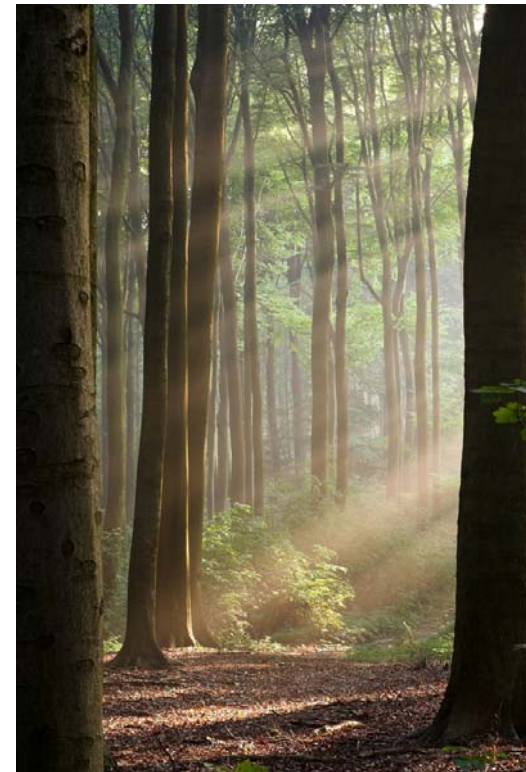






Why we need to change

- IPCC: 4th Assessment report
- CO₂ levels at their highest for 650,000 years
- 90% certainty this is due to man-made emissions



The Engineering profession



- Built environment
- Infrastructure
- Transportation
- Energy generation and supply
- Manufacturing



Forum for the Future's approach



- Focus on the younger generation as the future decision-makers and leaders
- Future Leaders survey
- Engineers for the 21st Century
- Masters in Leadership



Future Leaders survey



- Summer 2006 survey
- In partnership with UCAS
- 54,240 respondents, 17-21 years old
- 15% applicants
- UK coverage

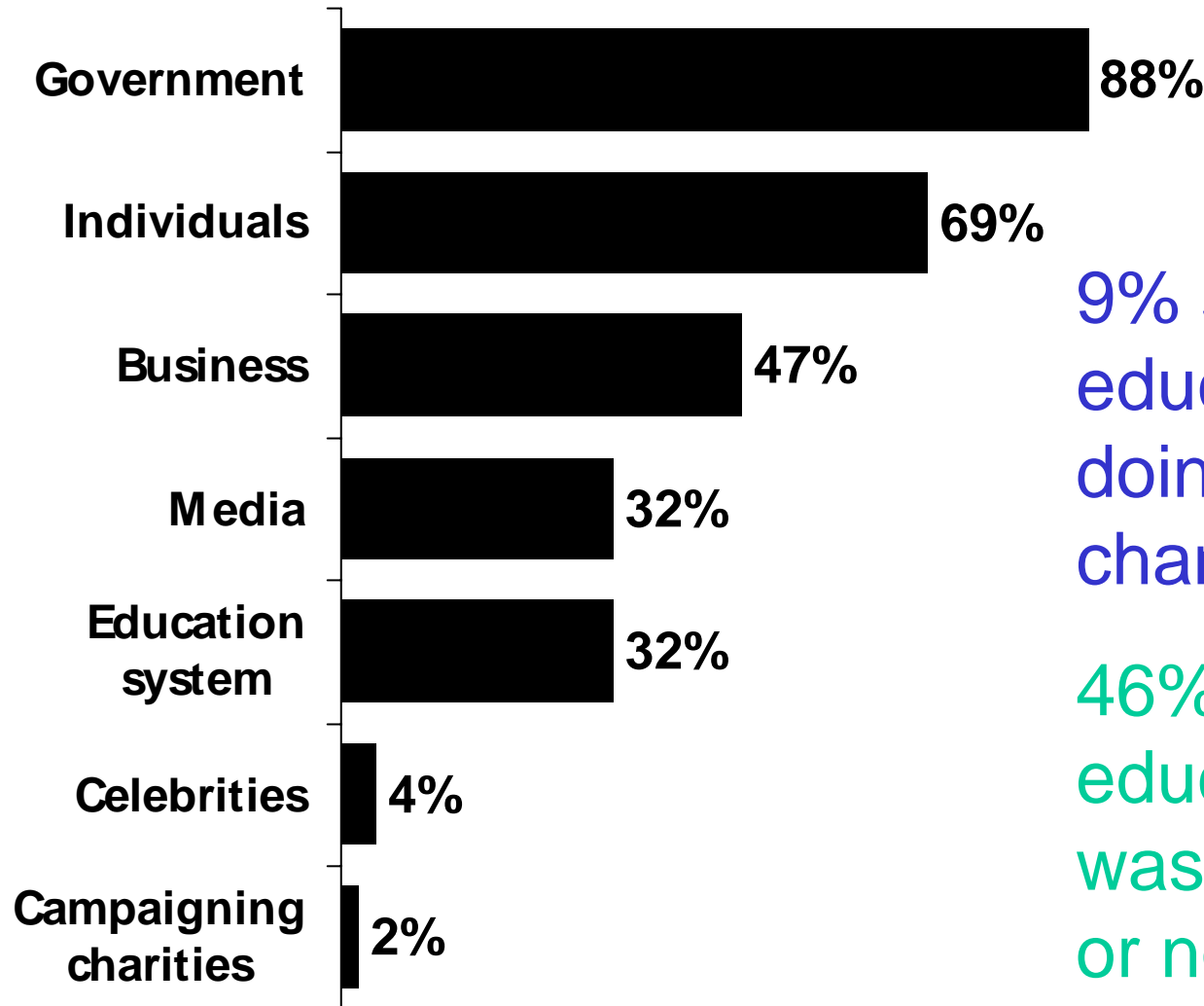


The future...



- 85% believe it is likely or very likely **humans will survive** to the next century
- 76% believe **lifestyles need to change** radically across the board
- 91% think that by 2031 the effects of **climate change will be felt**
- 70% think that **tigers will be extinct** by 2031

Whose responsibility is it to create change?



9% said the education system is doing a lot to create change

46% thought the education system was doing very little or nothing

Was sustainable development 'very important' when choosing your course?



- 74% Architecture, building and planning
- 64% Social studies
- 62% Education
- 61% Engineering
- 32% Language and literature
- 31% Classics and religious studies

Are environmental considerations 'very important' when choosing your career?

- 20.5% - Veterinary science and agriculture
- 19.8% - Architecture and planning
- 16.8% - Physical sciences
- 14.4% - Engineering
- 6.9% - Languages
- 5.5% - Technologies

Environmental considerations are very important when choosing an employer, type of career, bank, car and voting



- 14.6% - Veterinary science and agriculture
- 14.4% - Creative arts and design
- 10% - Architecture, building and design
- 8.5% - Engineering
- 7.3% - Combined sciences
- 4.3% - Technologies

Is it 'very important' to have an interesting job?



- 83% of females, against 75% of males
- 78% of engineers, ranked 20 out of 26 subjects
- 81% of females choosing engineering, against 78% of males
- But...only 240 out of 2031 taking engineering were female

How important is sustainable development when choosing a course?

- 54.1% females said 'important' or 'very important', against 51.7% males
- 70.7% females taking engineering said 'important' or 'very important', against 59.4% males



‘Only when the mindset of the previous generations become extinct will real progress have been made’ James, 18, University of Birmingham

‘Refusing to take responsibility for our actions is the easy option. I hope that education will help.... so that people can make informed choices’ Ruth, 18, University of Brighton

Engineers for the 21st Century – Phase 1



- **An Inquiry** (1999-2000) into the engineering profession
- **Young engineers** reflecting on their own profession
- 47 recommendations, filtered into a Top Ten
- No.2 - **'Back to Basics'**



Engineers for 21st Century – phase 2



- A review (2002-2003)
- Scorecard – scores of 0 to 6 out of 10
- Distilled into **4 Change Challenges**



Engineers for the 21st Century



- To make **choosing the sustainability option** easier and cheaper for clients and contractors
- To build capacity of teachers and trainers to **integrate sustainability into courses**
- To make **specifying for sustainability** criteria in materials and processes an effective tool for change
- To **embed sustainability** thinking and practices **into the culture of organisations** and across different professional groupings

Engineers for the 21st Century – phase 3



- Anglian Water
- Balfour Beatty
- Conoco Philips
- Environment Agency
- Lloyd's Register
- Ove Arup Foundation
- Royal Academy of Engineering
- DEFRA
- EEF
- Engineering Council (UK)
- Engineering and Physical Sciences Research Council
- The Gatsby Charitable Foundation
- Royal Commission for the Exhibition of 1851

Sustainable Development in engineering education – ‘what I wish I learnt at university’

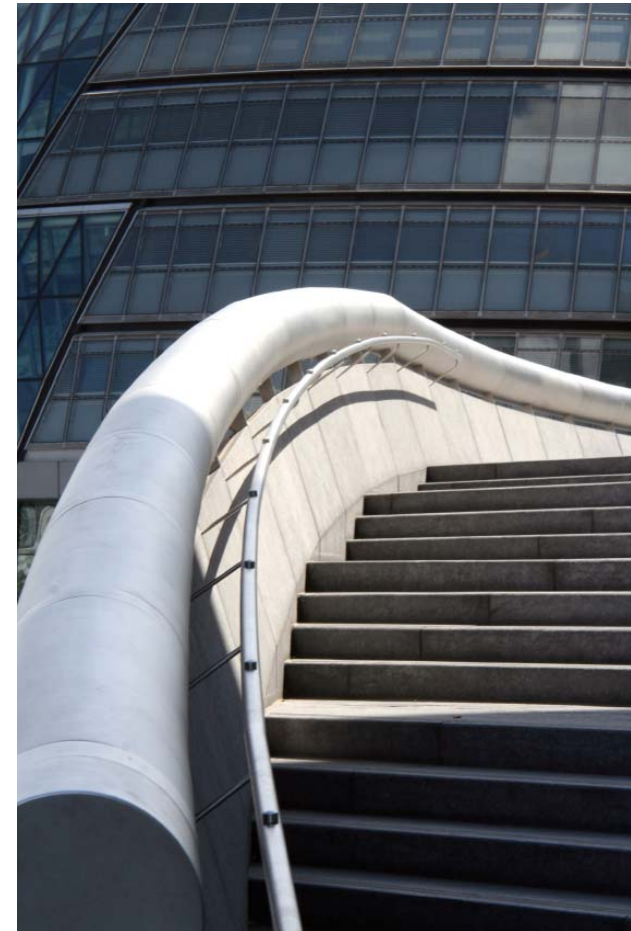
- Liz Meddings (Arup) and Tim Thorne (Balfour Beatty)
- Questionnaire of young engineers (Grad +2 to +10)
- What they want / need to know about sustainability
- Find consistent messages



Sustainable Development in recruitment and professional development



- Alan McKay (Conoco Philips) and Matt Humphrey (Anglian Water)
- Survey to engineering employers
- Follow up interviews found methods of good practice
- Yet to be embedded across the industry



Masters in Leadership in Sustainable Development



- A fast-track program to develop multi-disciplinary skills
- Students take up placements in six key sectors:
 - Environmental / development NGO
 - Local and regional government
 - Politics
 - Business
 - Finance
 - Media



Masters in Leadership for Sustainable Development

Prospectus
2007-2008

Developing leaders for
a sustainable future



Graduate employment...



- HM Treasury
- DCLG
- DEFRA
- BP
- Excel
- nPower Renewables
- Seven Trent
- National Trust
- WSP
- Faber Maunsell
- Thames Gateway
- Green Alliance
- IPPR
- Climate Care
- Accenture

Key learning points



- Future Leaders showing us that we have a youth that is **environmentally aware**
- Engagement with **young engineers** has shown that sustainable development is a topic they want to incorporate into their **careers**
- Projects from E21C are now investigating specific areas of interest

The challenge

- Engineering recruits **want to learn** about sustainable development
- Business will require engineers that are **literate** in sustainable development
- Education needs to respond to these demands
- How do we close this gap?
- Is sustainable development the answer to make engineering a **more desirable** career?

Thank you



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