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Editorial

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Welcome to the fifth issue of *Engineering Sustainability*.

In this issue Hawkins and Shaw raise the question of what sustainability or sustainable development is. Should we dwell on defining it, or just get on and deliver something better? Their briefing note illustrates how over-used the 's' word has become, particularly in the pages of this journal (and their briefing!). This is a valid point, and one which the editorial team have tried, if unsuccessfully, to address. Noting that five of the 18 references in this briefing note are from papers or briefings from this journal indicates that we are either becoming too introverted, have become part of the establishment or have much to do to broaden our content within the context of civil engineering. I leave the reader to judge!

Moving from definition to practicalities, it is probably easier to identify the 's' issues/impacts we need to address (Fig. 1), and leave others to find that difficult balance between the environment, social and economic factors. No one can yet claim to have achieved this. A fundamental point is that all impacts shown in Fig. 1 should be considered and form part of the engineering solutions civil engineers can deliver for society. The challenge for all of us is to demonstrate that, as civil engineers, we can 'improve the quality of life' in an equitable and lasting way.

We may need to remind ourselves of some staggering facts that underline the urgent need to find 's' solutions to our own everyday issues of water, waste, biodiversity, CO₂ creation and poverty¹:

- The average Kenyan person uses 4 l of water per day. One person in the UK consumes 680 litres per day.
- In the industrialised world, the volume of human generated refuse by inhabitants has tripled over the last 20 years.
- Today the atmosphere has the capacity to absorb only one third of the CO₂ that we produce each year.
- 4% of the wealth of the world's 225 most wealthy families would provide access to basic needs and fundamental health care, education and nutrition for the world.

These stark statistics clearly indicate that something should be done. In the words of Ghandi, we need to 'be the change you want to see in the world'.

I. BRIEFINGS

In the first briefing note, Hawkins and Shaw debate the definition, use and criteria of sustainable development and ask us to review and reconsider its application. They finish their briefing with a plea for 'consistency of meaning, consistency of application, consistency in examining the criteria and consistency of the results of inadequate criteria'. This presents an opportunity for research, establishment and exchange of good practice and exchange of information and tools. In short, this is an opportunity to improve the knowledge management base through the links ICE members have in academia and industry. If this knowledge could then be captured in a concise and practical way, it could be disseminated via the publications of the ICE (including journals). This in turn adds to our contribution to society and raises the profile and status of civil engineers.

The second briefing note describes the current activities of the ICE's Waste Management Board. Designing out waste and its reuse, recycling and disposal remain key areas of responsibility for all engineers. Is the Board tackling the right issues? Does it deliver value as a part of your subscription? Should more members engage with, challenge or contribute to the activities of the Board? This is your opportunity!

In the third briefing, Klee highlights the environmental impact of the cement industry: 'cement is second only to water as the most consumed substance on the planet and generates 5% of the world's greenhouse gases'. He describes how the industry is recognising its social and environmental responsibilities and the various stakeholder pressures and has established the Cement Sustainability Initiative. Recognising impacts and acting on them is the first step on the journey to a more sustainable future. The briefing note identifies that 'sustainability is not a straightforward issue for any of us (in the cement industry), but we all recognise that our viability and prospects of future existence—let alone growth—are now critically dependent on adopting a responsible approach to the subject'.

Shepherd describes the work of the London Sustainability Exchange (LSE) in the final briefing note. He outlines how the LSE is helping to make London the most sustainable city in the world. A modest ambition! The Exchange provides a learning network which aims to provide access to learning, opportunities

Wow! A real vision for the future, covering virtually all impacts in the sustainability impacts diagram in Fig. 1.

The second paper, by Carpenter, examines the scarcity of land resources and the influence of water use, energy generation and infrastructure on the use and abuse of land space and resource. The examples described present a testament to the enthusiasm of engineers to build and irrigate, to support expanding populations and their increasing demands. This provision of societies' needs; whether it be food, water, power or transport links, has been driven by a combination of the will to deliver quick economic and practical solutions. For the majority of examples quoted, there was little consideration given to environmental or even (local) social impacts. Society however is changing, particularly in well-developed countries, and has begun to recognise the importance of their landscape and environment. The author recommends we handle new development in a way that recognises the planet and its people as a resource. This resource should not be wasted. My simple interpretation of the message is that we should adopt a waste strategy for the bigger picture as well as at the design and project level

for strategic networks and motivate people to share knowledge and ideas. It aspires to deliver

- 'sustainable literacy' for all
- specialist skills...in construction and refurbishment, in waste management and remanufacturing
- 'sustainability support clusters' of businesses who can provide consultancy, construction, services provision, research and other services worldwide.

Practical advice, tools and guidance are available via a website or email bulletin (details are in the briefing note), enabling all individuals and organisations to benefit from this excellent initiative.

2. PAPERS

Woodall *et al.* describe the development of a set of self-assessment tools for helping organisations to assess their current progress in introducing sustainable business practices. More importantly, the tools help organisations to plan their next steps and improve performance. The tool has been developed and tested with six widely differing companies within the construction industry. One of those organisations, The Peabody Trust, has 'adopted sustainability as a central focus of its next annual plan and has developed a detailed sustainability strategy containing wide ranging and highly aspirational targets.

By 2010

- reduce waste by 50% on sites, offices and estates
- improve energy efficiency of stock by 20%
- produce clean electricity for 700 homes
- substitute cars in fleet by environmentally friendly vehicles
- an ecology plan for all estates to maximise plants and wildlife
- a social and economic plan for 40% of estates
- a community regeneration programme for up to 12000 residents
- a rolling programme for investing in staff

By 2020

- a carbon neutral, zero-waste business'

- reduce...so design 'waste' out
- reuse
- recycle

Carpenter's conclusions should be noted:

'Extravagant waste of the world's resources has to be urgently reversed...the investment in infrastructure, much of which is civil engineering, needs to be planned congruently with the protection of natural resources...need to make optimal use of existing...land resources'.

The final paper by Khalid and Artamendi describes an investigation of the engineering benefits of incorporating crumb rubber from waste tyres into paving asphalt by means of a wet process. The paper covers preparation of the crumb rubber modifier (CRM) and the effect of CRM quantity on the binder properties at mixing with aggregates and under compaction conditions. Design issues and performance are discussed, with particular reference to rutting resistance, retained stiffness for durability and resistance to fatigue cracking.

The authors conclude that

- the use of CRM significantly assists the minimisation and management of this rapidly increasing waste material
- technical and environmental benefits can be gained by adding waste rubber to asphalt used on roads with varying traffic demands.
- further work in this area could help turn waste tyres into a valued resource.

3. PANEL MEMBERSHIP

I am pleased to welcome Paul Jowitt, and Tony Parry and Jerome Connor to the editorial panel

REFERENCES

1. ARTHUS-BERTRAND. Earth from the Air Diary 2004. See <<http://www.earthfromtheair.com>> for further details.