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Editorial

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This issue of *Engineering Sustainability* brings together a selection of papers that showcase the international reach of this journal. It highlights the collective research efforts being undertaken from India, Turkey, Malaysia and Spain to resolve the sustainability challenges of the built environment sector.

As a journal, the editorial team is always keen to receive submissions which demonstrate the role of research and innovation in delivering sustainable development from a global perspective. We are also particularly interested in building an editorial panel with greater representation outside of the UK and that reflects the presence of the Institution of Civil Engineers in over 150 countries worldwide. If you are interested in joining the panel or being a guest editor for one of our themed issues, please do get in touch.

The building sector accounts for over one third of the global carbon dioxide (CO_2) emissions, according to the International Energy Agency (IEA, 2013). Building a more sustainable built environment requires approaches to be taken at a range of different scales. Often by working at the micro scale, we can find approaches which, when scaled up, can really make a difference to this macro challenge. Three of the papers in this issue focus on just that by analysing the benefits of improvements to principal construction materials.

The first two papers take a circular economy approach, both looking at the role waste from the sugarcane industry can play as additives in bricks and concrete construction.

Madurwar *et al*. (2018) focus on the suitability of using sugarcane bagasse ash (SCBA) to produce cellular lightweight bricks. India is the second largest producer of sugarcane, with 18 Mt/year of SCBA by-product available for reuse. However, much is dumped with its own knock-on environmental consequences. Their findings show that these bricks have better physical properties and greater thermal resistance, compared with Indian standard fly ash bricks. In addition to closing a waste loop, the bricks also carry a range of benefits associated with the reduction of heat gain in buildings and a lighter-weight product that supports safer construction methods.

Our second paper looks at the effects of SCBA as a partial replacement for cement on fresh and hardened concrete. In many ways concrete can be considered as a sustainable material, from its role as a thermal store to its durability, its widespread availability and the ability to create unique forms with often stunning results. However, the associated emissions from cement production contribute some 5% to global emissions. Naturally, zero-carbon dioxide concrete is the focus of researchers and suppliers, with over 800 cement patents filed in 2011 in Europe alone (The European Cement Association, 2013).

Cement replacements are one of the principal strategies promoted for this challenge. Shafiq *et al*. (2018) verified that SCBA is a promising by-product to use as a cement replacement material, based on its chemical composition, fineness and well-controlled incineration process.

Orbe *et al*. (2018) take a different approach to the concrete challenge. They have reviewed a multi-criteria decision-making method to enable consideration of an optimised approach to concrete design across sustainability parameters. They apply the integrated value model for sustainable assessment to the case study of structural concrete tanks to evaluate the performance of reinforced self-compacting concrete compared with a reinforced concrete solution.

In the last paper of this issue, we turn to another hot topic which is the health and well-being of building users, especially important in the context of education buildings. Yıldız *et al*. (2018) have conducted a field study to understand the luminous comfort in university classrooms in Turkey. Yıldız *et al*. (2018) conducted this research using a simulation method, the results of which were complemented by the application of a survey amongst the students. The paper concludes the need to consider an adequate daylight level and daylight uniformity in classrooms with high daylight performance. It also drafts a short guideline to design classrooms with high luminous comfort based on exhaustive analysis of user surveys.

We are always striving to increase diversity in our panel of editors and would like to invite readers with suitable qualifications to send your CV to the editorial coordinator, Rebecca Rivers (rebecca.rivers@ice.org.uk).

REFERENCES

IEA (International Energy Agency) (2013) *Transition to Sustainable Buildings – Strategies and Opportunities to 2050*. IEA, Paris, France. See https://www.iea.org/Textbase/npsum/building2013SUM.pdf (accessed 16/03/2018).

Madurwar M, Sakhare V and Ralegaonkar R (2018) Suitability and sustainability of sugarcane bagasse ash bricks. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171(3)**: 115–122, https://doi.org/10.1680/jensu.15.00044.

Orbe A, Rojí E, Cuadrado J, Losada R and Zubizarreta M (2018) Sustainable alternative of structural concrete retaining tanks. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171(3)**: 133–150, https://doi.org/10.1680/jensu.15.00062.

Shafiq N, Hussein AAE, Nuruddin MF and Al Mattarneh H (2018) Effects of sugarcane bagasse ash on the properties of concrete. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171(3)**: 123–132, https://doi.org/10.1680/jensu.15.00014.

The European Cement Association (2013) *The Role of Cement in the 2050 Low Carbon Economy*. The European Cement Association, Brussels, Belgium. See https://cembureau.eu/media/1500/cembureau_2050roadmap_lowcarboneconomy_2013-09-01.pdf (accessed 16/03/2018).

Yıldız Y, Caner I, Ilten N and Karaoglan AD (2018) Field study to analyse luminous comfort in classrooms. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **171(3)**: 151–165, https://doi.org/10.1680/jensu.16.00001.