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Editorial

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Editorial

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This September issue of *Engineering Sustainability* contains an eclectic mixture of quality papers written by no less than 20 authors drawn from five countries including the world's two most populated nations, China and India – such is the global draw to and concern for sustainability-related matters. The reader could be forgiven for thinking that this issue is a déjà vu of editions from an earlier year as there is constant referencing back to the expected narrative around concepts such as carbon dioxide, economics, energy, resources, efficiency, sustainability, public transport and so on! These and other sustainability-informing topics have been consolidated in literature over a considerable period (Strong and Hemphill, 2006).

Such is the hallmark of this highly rated journal – it continues to satisfy the thirst of engineers, managers, planners, policy makers, practitioners and especially academics as the journal continues to meet and inform the needs of these professional groupings. The reader in this issue has a comprehensive array of thoroughly well researched studies with sufficient relevance and application to provide meaning and application to the immediate tasks ahead in industry, while the authors have clearly written with authority and passion about their spheres of expertise and about well-constructed projects and studies.

With those opening words of praise and positivity, the reader could be lulled into a sense of excellence akin to 'George Orwell's 1984, like many works of literature, unmistakably carries with it literary traditions reaching back to the earliest of storytellers. Among the literary traditions that Orwell used is the concept of *utopia*, which he distorts effectively for his own purposes' (Moustaki, 2000: p. 5). Beware, there's nothing Orwellian about these five papers as each of them address real issues of our time and stand out as statements of considered thinking with undoubtedly further work to be achieved.

Of all the sustainability nomenclature of this age, the missing words or issue from these unprecedented times in 2020 is any reference to Covid-19 or the impact of the coronavirus pandemic; and yet, building energy efficiency (BEE) designs, structured review of corporate social responsibility (CSR) across global applications in design and construction, creative algorithmic ways to appraise design of residential buildings draw out these diverse approaches to design matters – perhaps this could have been a themed issue

of *Engineering Sustainability* on 'Design'? A reflection on these current autumnal days could lead to a prognosis that 'sustainability design', by protecting what we have and providing adequately for future generations, à la Brundtland thinking, is a mature way to address global challenges brought on by the pandemic, of which there will surely be more, and the broader engineering and built environment professionals have both the rational thought and ability to address the uncertainty of new challenges.

The Cambridge Institute for Sustainability Leadership kicks off this September edition, and as the sole UK-based paper, with a thorough review of how CSR is being embedded from a company's high-level policies into the application of major design and construction projects (Ahmed *et al.*, 2020) – arguably old meat in its initial content, but the four masters students and their academic tutor derived a CSR framework from literature and reviewed four large companies on their application of CSR principles on four major projects, each of value circa £100 million. A variation in approach led to a variety of CSR scores resulting in lessons to be learned about translating policy to practice, and the clear need for CSR standards which will act as the definitive benchmark, with links and joined-up thinking across sustainability measurement systems. Yet another creative Cambridge contribution to the sustainability agenda and design matters!

The Turkey-based academic paper on 'A genetic algorithm-based envelope design optimisation for residential buildings' (Caglayan *et al.*, 2020) pushed the simulation boundaries using Matlab software to code and analyse variables of a reference building and thereby reduce limited interoperability between diverse software packages. This detailed research study appraised pollution and environmental impact, linked to climate change; its innovative use of life-cycle cost as the subject of the algorithmic analysis brought rationality to the study across four differing climatic regions, albeit all in Turkey. This work has immense international relevance through repeatability in other regions and other disciplines; thereby it will surely be attractive to engineers, scientists and mathematicians.

This design theme using algorithms is continued by four Chinese academics in their rigorous paper on 'China's building energy efficiency standards assessment based on fuzzy evaluation algorithm' (Wang *et al.*, 2020). It is evident that BEE is regarded as

the key sector in the world for addressing climate change, and the authors present an effective method for evaluating BEE standards (BEESs) from both quantitative and qualitative perspectives, provided by (a) determining a BEES evaluation indicator system, including technological, economical and social indicators, by identification, correction and selection; and (b) establishing a BEES evaluation model: a fuzzy synthetic evaluation model based on the information entropy theory with the analytic hierarchy process – again mathematics being used to solve multi-arrays of data. Despite the academic rigour, this paper, in a practical way, carries out research on building energy consumption and promotes building energy conservation as important parts of China's energy conservation strategies. It concludes on important measures for the world to cope with climate change and address the local and global energy crisis – another great read!

Four authors from India's National Institute of Technology write on 'Construction waste in India' (Kolaventi *et al.*, 2020) and clearly identify this old sustainability chestnut as a thorn in the flesh of its wider construction industry, and return to the use of site waste-management plans (SWMs). Its logical approach to cause and effect of waste generation is tackled strategically with the innovative application of 'most significant factors' and 'path coefficient', by using structural equation modelling (SEM) – a multivariate statistical tool that consists of two components: a measurement model and a structural model. The net result is that the waste matter is seen as having an implicit impact on climate change and is being resolved by these sophisticated metrics – watch this space for strong governmental policies to enforce the concepts and details of SWMs.

The final paper of this eclectic mix – I did tell you so – is a fascinating piece on 'The newest public transport system applied to turbo roundabouts' by four (again) authors from Italy (Campisi *et al.*, 2020). This paper aims to show the impact of the existence of innovative public transport systems, namely the bus rapid transit, on an unconventional urban intersection geometry, namely the turbo roundabout. The study is city-based and relies on simulation

software to improve safety, reduce congestion and reduce pollution along with its explicit links (again) to climate change; don't be confused by the right-hand sided driving around the turbo roundabout as it is based in mainland Europe, especially in this almost post-Brexit period. Surely, this 'Italian Job' will be further enhanced by more field studies and application to those complex rural roundabouts.

Any serious sustainability reader could not fail to be impressed by the quality of this unusual mix of papers – the international draw, the attention to detail, the global resonance and the relentless pursuit of solving the sustainability/resilience agenda. The *Engineering Sustainability* journal is in good shape!

REFERENCES

- Ahmed TZY, Gilmore D, Jaffe P, Nakajima Y and Macmillan S (2020) Corporate social responsibility and construction design briefs: international case studies. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(6)**: 271–279, <https://doi.org/10.1680/jensu.19.00055>.
- Caglayan S, Yigit S, Ozorhon B and Ozcan-Deniz G (2020) A genetic algorithm-based envelope design optimisation for residential buildings. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(6)**: 280–290, <https://doi.org/10.1680/jensu.19.00041>.
- Campisi T, Canale A, Tesoriere G and Renčelj M (2020) The newest public transport system applied to turbo roundabouts. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(6)**: 315–322, <https://doi.org/10.1680/jensu.19.00008>.
- Kolaventi SS, Momand H, Tadepalli T and Siva Kumar MVN (2020) Construction waste in India: a structural equation model for identification of causes. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(6)**: 303–314, <https://doi.org/10.1680/jensu.19.00047>.
- Moustaki N (2000) *Cliffs Notes: Orwell's 1984*. Hungry Minds, Inc., New York, NY, USA.
- Strong WA and Hemphill L (2007) *Sustainable Development Directory*. Blackwell, Oxford, UK.
- Wang J, Zhang Y, Wang Y and Gu L (2020) China's building energy efficiency standards assessment based on fuzzy evaluation algorithm. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(6)**: 291–302, <https://doi.org/10.1680/jensu.19.00023>.