Editorial

Nicholas Lander BE (Hons), BA, CEng, MCIBSE
Director, N Lander Consulting, Melbourne, Australia

I am writing this editorial in October, in a city locked down by a virus. It seems that all we've heard about this year is Covid-19 and the dual threats it poses to human health and our economies. This is understandable, given we are often driven by fear. What is less understandable, however, is the comparative lack of coverage of actual existential threats to humanity, and the failure to account for these in various national Covid-19-recovery programmes (McElwee *et al.*, 2020). Those of us old enough to remember grim warnings of what climate change will bring in the future now realise that the future is very much here, sooner and worse than we thought. At the same time, the very systems of life that give us fresh air, clean water and healthy food are themselves under threat, from climate change and our own short-sighted actions that directly destroy biodiversity (Díaz *et al.*, 2019). This is the real threat. The pandemic, believed to come from a wildlife market, is just a symptom of our impact on the natural world.

As engineers, we have a critical role to play in addressing this threat. Historically, we have come up with solutions to the various problems of human development without giving much thought to environmental impacts. Or we've looked at those impacts at the project level without giving enough thought to the wider context. Thankfully, that is changing, but there is further to go on this, the greatest challenge in human history.

All of our projects need to understand their place in the natural world, but also their place in relation to other projects and the built environment in general. Only by seeing that the work we do is part of an interconnected system, comprising both human and natural capital, will we be able to deliver truly sustainable engineering solutions.

With this in mind, the articles in this month's *Engineering Sustainability* have a buildings focus. It is important for civil engineers to understand what's going on in buildings because of the knock-on effects to infrastructure: higher efficiency in buildings means less power and water needs to be provided, for example. In our first article, Yildiz and Koçyiğit (2020) explore energy efficiency optimisations at Balıkesir University in Turkey, concluding energy savings of over 60% are possible. Readers with a buildings background may not be surprised by the findings, especially given the design options investigated, but they are, nonetheless, important. Existing building stock presents a huge opportunity to reduce emissions, especially in countries with slowing population growth such as Turkey (World Bank, 2019), where there is less need for new stock.

Such retrofits, of course, bring in new materials (which need to be sourced with the above comments in mind), and dispose of old ones. Ding *et al.* (2020) have recognised the environmental impact

of this and, using agent-based modelling, have determined where the greatest impacts lie and what is the efficacy of different policies. This applies not just to building renovation, but all forms of urban renewal. This reflects the need for engineers of all stripes to think about end-of-life impacts of their designs, not just project-life.

Our third article is one I found particularly interesting, given my career started in building physics. In this paper, Caner and Ilten (2020) study empirically measured perceived comfort in a Turkish university hospital and compare it with the comfort levels set out in the standards. They find that actual comfort levels reported by occupants was at odds with the standards, which has implications for heating and cooling design in buildings. They also quantify the difference in perceived comfort between different groups of people.

All this serves to remind us that, as engineers, we design for people. Published guidelines help us in this, but we need to be cognisant of who we are designing for, why, and what are the impacts elsewhere in the system. Blind adherence to standards should not trump the fundamentals of good design. And good design is, of course, integrative, as pointed out by my colleagues in previous editorials, such as Godfrey (2020).

On a final note, this year has seen great disruption to normal life and work due to the Covid-19 pandemic. In April, delivery of printed copies of the journal was halted due to reduced Airmail and delays at Customs. Readers can be reassured that purchased 2020 printed journal issues will be posted to them before Christmas. In January, we will see another change as the journal moves to solely online-only format. PDF is now the most common format in which to read the journal, reflecting the preference of institutional libraries and the desktop convenience for readers of finding, receiving and sharing articles in PDF. This also, of course, has environmental benefits, in keeping with the overall theme of the journal. We expect this trend to continue, with fewer subscribers opting to pay extra for issues to be printed and posted to them. If you are one of our readers who does like to receive a hard copy, these will be available to purchase on a per issue and per volume basis. Prices will be announced in the New Year. Readers who require a printed copy for accessibility reasons should contact journals@ice.org.uk.

I hope you enjoy this issue.

REFERENCES

- Caner I and Ilten N (2020) Evaluation of occupants' thermal perception in a university hospital in Turkey. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173**(8): 414–428, <https://doi.org/10.1680/jensu.19.00059>.
- Díaz S, Settele J, Brondizio ES *et al.* (2019) *The Global Assessment Report on Biodiversity and Ecosystem Services: Summary for Policymakers*.

-
- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) secretariat, Bonn, Germany.
- Ding Z, Gong W, Fan Z, Tam VVY and Illankoon IMCS (2020) Agent-based modelling for environmental impact of renovation waste in Shenzhen, China. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(8)**: 397–413, <https://doi.org/10.1680/jensu.19.00040>.
- Godfrey S (2020) Editorial. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(5)**: 215–216, <https://doi.org/10.1680/jensu.2020.173.5.215>.
- McElwee P, Turnout E, Chiroleu-Assouline M *et al.* (2020) Ensuring a post-COVID economic agenda tackles global biodiversity loss. *One Earth*, <https://doi.org/10.1016/j.oneear.2020.09.011>.
- World Bank (2019) *World Bank Open Data*. See <https://data.worldbank.org> (accessed 06/07/2020).
- Yildiz Y and Koçyiğit M (2020) A study on the energy-saving potential of university campuses in Turkey. *Proceedings of the Institution of Civil Engineers – Engineering Sustainability* **173(8)**: 379–396, <https://doi.org/10.1680/jensu.20.00006>.