

SUSTAINABILITY AND CONSULTING ENGINEERS

By the ACEI Sustainability Committee



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THE ENDANGERED ENVIRONMENT

The October 2018 report from the UN's Intergovernmental Panel on Climate Change concluded that the earth has already warmed by 1°C since pre-industrial times and is likely to exceed the target set in the 2015 Paris Agreement – to limit the increase to 1.5°C – by a factor of two. This existential challenge, resulting from excessive consumption of finite, polluting resources, will require *“rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems”* to tackle it.

Ireland's National Planning Framework identifies that by 2040 an additional one million people are expected to be living in Ireland. These people will need to be accommodated in new residential developments and work buildings; they will also need new institutions and infrastructure. Without proper planning, this growth will be

haphazard and uneven and could lock Ireland into carbon-intensive assets for decades.

Addressing these challenges is the domain of the engineer. The consulting engineering profession in particular can play an influential role in delivering these transitions, given its role in shaping policy and designing society's infrastructure.

A STRATEGIC FRAMEWORK

ACEI embraces the concept of sustainable development, which is founded on the premise of intergenerational equity and defined by the Brundtland Report as *“development that meets the needs of the present without compromising the ability of future generations to meet their own needs”*. A balanced approach to sustainable development addresses the three pillars of environmental, social and economic concerns. These pillars are at the core of the UN's 2030 Agenda for Sustainable

Development and form the basis of a strategic framework for the ACEI approach to sustainability.

In relation to the environment, over half of non-renewable resources consumed by human activity are used in construction and hence efficient material use is a key issue for managing the environmental impacts of development. This should entail the minimisation of resource inputs (encompassing both materials and energy) and maximizing both the lifespan of the assets and the eventual reuse/recycling of resources at the end of its lifecycle. It is crucial to embed these considerations in the design and procurement of construction projects, to minimise the use of finite resources. Carbon footprint assessments need to become routine and ultimately the economic cost of environmental pollution should be included into economic assessments of projects.

The second pillar of sustainable development is the social value added to a community through impacts such as improved facilities, access to employment and creating a public realm. There is not yet a single, consistent approach to measuring wider social value, which provides challenges at a project level, although there are methodologies emerging. These incorporate a range of metrics to assess outcomes delivering social, community and commercial benefits.

Economic management is the final principle, incorporating a whole-system, whole-life view of a project. This provides deeper insights than just focusing on the capital cost of delivering a project. Governance is a related issue, especially in the public sector, given its scale and role as owner of a significant portion of assets developed by the construction industry. Recent assessments, such as the Hackitt Review (commissioned in the UK after the Grenfell Tower tragedy) raised questions about the ability of the public sector to deliver safe and sustainable projects in the built environment and there may also be lessons that Irish authorities can learn from this.

ROLE OF THE CONSULTING ENGINEER

Engineers have the professional training and experience required to play an influential role in the delivery of sustainable development and their professional goals should include a commitment to this. Consulting engineers can raise the profile of sustainability with clients and support them in the procurement of assets that are sustainable while also meeting the needs of end-users. It is the asset owners and developers that make the most impactful decisions in this regard and hence consulting engineers need to maintain an influential working relationship with their clients to ensure that the projects are conceived, designed and developed in a sustainable manner. This means guiding clients to go beyond the traditional focus on function, cost minimisation and programme; clients need to address sustainability, resilience and societal impacts into their design briefs. Consulting engineers will need to leverage a holistic range of skills, including:

- Effective communication: listening, influencing and



knowledge sharing are important techniques to achieve these objectives.

- Innovation: challenging conventional decision-making and delivery approaches will result in improved outcomes.
- Risk management: risks should be allocated to the party best suited to managing it.

The profession has a particular role in, and obligation towards, the protection of the environment and accordingly ACEI endorses the FIDIC recommendations that each consulting engineer should:

- Keep informed on global environmental issues
- Adopt an interdisciplinary approach to solve environmental problems
- Inform clients, the public, and government about environmental problems and how to minimise impacts
- Promote the protection of the environment
- Support environmental education and R&D

ACEI also recommends that relevant environmental and social studies are undertaken on individual projects, in an objective and impartial manner. The findings should be used to inform and encourage clients on how to prevent or minimise the adverse environmental and social effects of projects in all phases. Specific attention should be paid to over-exploiting natural resources, which should be assessed and brought to clients' attention, as appropriate. Ultimately, consulting engineers should take appropriate action or even decline to be associated with a project, if the client is unwilling to support adequate efforts to address the sustainability of the project design and delivery.

REFERENCES

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