



Engineers and climate action: are we rising to the challenge?

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Abstract

'Despite the overwhelming evidence that we are not doing enough, there is still substantial resistance to talking about the possibility of living in a world where we temporarily overshoot 1.5°C.'

- Debra Roberts IPCC Co-Chair WGII AR6.

It is crucial for engineers to consider the implications of living in such a scenario, where common sense suggests that changes in critical natural systems may become irreversible and take urgent action to mitigate, respond and adapt to the threats posed by climate change.

This paper reflects on the role of engineers in climate action. It frames the challenges and opportunities for the profession to drive action, presenting examples of what is being done by the global engineering community. It sets out what will be needed from engineers in terms of innovation and changing mindsets, as well as the required skills, training, and capacity building. Finally, it argues that engineers should be bolder, louder, and more visible in advocating for climate action.

Keywords: climate action; engineering; resilience; adaptation; infrastructure; advocacy; capacity building.

1 Introduction

1.1 The urgent need and opportunity for resilience and adaptation to a changing climate

In 2023, the estimated overall losses from disasters triggered by natural and climate-related hazards was a staggering \$250 billion [1]. In addition to the damage losses, the economic shockwaves are far-reaching, for example, losses in productivity as a result of broken supply chains and unquantifiable losses such as lost education and mental health impacts. While absolute economic losses are concentrated in high-income countries, the human cost of disasters falls overwhelmingly on low- and middle-income countries.

Our built environment and supporting infrastructure systems are increasingly complex, interdependent, and reliant on sophisticated

digital technology. These systems have become fragile due to fragmented governance and under-investment and are now operating in an uncertain future.

Embedding and enhancing resilience is becoming essential to better prepare for the threats we can anticipate and to respond to those we cannot predict or avoid. Resilience should be to all hazards, but climate change has become an area of urgent focus because it introduces greater levels of uncertainty and can exacerbate pre-existing hazards and risk drivers, substantially amplifying the negative consequences of disasters when they occur.

Climate mitigation and decarbonisation efforts have taken up much of the conversation about climate to date. However, the IPCC AR6 Synthesis Report [2] conveys the urgency of implementing resilience and adaptation measures alongside