

Annua Rev | ew

2020/21



UK

ENGINEERS

WITHOUT BORDERS

Introduction

Over the last year, we have continued to see unprecedented flooding, deadly droughts and the devastating impact of the COVID-19 pandemic across the world. The time for action is now and no sector is exempt.

We have been working hard to inspire sector-wide engagement of globally responsible engineering in education and industry. From August 2020 to June 2021 we have continued to develop our long-standing activities such as the Design Challenges and Change Makers campaign whilst adding new opportunities including strategic university partnerships, student Designathon and our work on developing the international engineering competencies with our Engineers Without Borders cousins from across the globe. This year we most notably developed and published our 2021-2030 strategy, [Reaching the tipping point for globally responsible engineering](#).

Learn more about this year's activities and achievements...

A photograph of three women sitting around a conference table in a modern office. They are engaged in a discussion, with one woman on the left smiling and looking towards the center. The woman in the middle is looking towards the right. The woman on the right is looking towards the center. In the background, there is a large television screen displaying a blurred image of a building. On the table, there is a laptop, a telephone, and some papers. The overall atmosphere is professional and collaborative.

Inspiring Change

We inspire change through panel discussions, thought leadership, training opportunities, design challenges and by showcasing those who are leading the way in **embedding globally responsible engineering into their day to day practice.**

Showcasing Change Makers

We are very proud of the movement we have galvanised and are committed to communicating the experiences and insights of individuals. Our [Change Makers campaign](#) provides an opportunity for individuals to explain how they are **embedding globally responsible engineering into their day to day practice**, how the movement played, and continues to play, a role in developing this approach and their hopes for the future of the sector. This year we added three inspiring Change Makers:

[Milly Hennayake](#), Civil Engineer at Arup. Milly grew up in Sri Lanka and the UK. She studied Civil and Environmental Engineering at the University of Cambridge, where she was part of the Engineers Without Borders UK Chapter – eventually becoming president. After working with charities to improve temporary housing and public spaces in Brazil and Kenya, she now works as a Civil Engineer, helping to develop effective drainage systems to prevent flooding.

[Marayam Lamere](#), a Doctoral Researcher and Mechanical Engineering Lecturer at The University of the West of England, Bristol (UWE). Marayam spearheaded the implementation of the Engineering For People Design Challenge into the curriculum at UWE for engineering students and continues to work on the high-profile PEE POWER® project developed by the Bristol BioEnergy Centre, which is making waves as a new technology that converts urine into fertiliser and disinfectants whilst also generating electricity.

[Jon Samuel](#), Group Head of Responsible Business Partnerships for Anglo American and trustee of the Anglo American Foundation. Anglo American pioneers sustainable mining standards within the mining industry, and has an extensive Sustainable Mining Plan which Jon helped to develop. Jon has worked with Engineers Without Borders UK on behalf of the Anglo American Foundation for 14 years, and the partnership has created significant value for both organisations.

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I went to the University of Cambridge that placed a great deal of emphasis on the technical side of engineering. When I came across the Engineers Without Borders Chapter, it showed me a more global perspective and the human side of engineering and inspired me to consider a whole new career path.

Milly Hennayake, Engineers Without Borders UK Change Maker



Delivering Design Challenges

To embed global responsibility in engineering education, we ran our flagship [Engineering for People Design Challenge](#) and delivered the Efficiency for Access Design Challenge in partnership with Efficiency for Access for the second year.

During a pivotal moment in an undergraduate student's learning, the Engineering for People Design Challenge encourages individuals to broaden their awareness of the social, environmental and economic implications of their engineering. The 2020/21 Engineering for People Design Challenge was delivered in partnership with Peruvian charity [EcoSwell](#), which supported the creation of the year's design brief centred around two neighbouring communities, Lobitos and Piedritas on the northern coast of Peru. Students were tasked to design for the communities by investigating and addressing the challenges found in one of the eight challenge areas: Built Environment; Water; Sanitation; Energy; Waste; Food; Transport; Digital.

By the end of the 2020/21 academic year, this Design Challenge reached over 10,000 students across South Africa, the UK and Ireland and the USA. Since its conception in 2011, the Design Challenge has reached over 52,500 students.

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“

Sustainability is more than a word or concept, it is actually a culture, and if we aim to see it mirrored in the near future, what better way exists than that of planting it in the young hearts of today knowing they are the leaders of the tomorrow we are not guaranteed of? It is possible.

Participating student, Engineering for People Design Challenge

[The Efficiency for Access Design Challenge](#)

is a global, multi-disciplinary competition that empowers teams of university students to help accelerate clean energy access. The 2020/21 Efficiency for Access Design Challenge, delivered in partnership with Efficiency for Access was delivered in 15 universities from Bangladesh, Ethiopia, India, Kenya, Nepal, Uganda and the UK. 116 students took part and submitted 23 ideas, ranging from a [Vaccine Refrigeration Unit](#) to [Solar Battery Cooker](#). You can [explore the award-winning designs](#).

Training Community Leaders

We ran two training series throughout the year, Building Community Leaders preparing those in our university community for the year ahead, and Inspiring Community Leaders, providing an opportunity to celebrate their achievements.

We ran 11 sessions during our Building Community Leaders series covering a myriad of topics including an introduction to the movement, skills needed for the year ahead and facilitation techniques suitable for the virtual environment to support them to be impactful throughout the year and grow the movement.

During Inspiring Community Leaders, 83 people participated over eight sessions covering what had been achieved over the last year, in addition to tailored sessions for Chapter members to explore the next steps to becoming a globally responsible engineer, as well as support to prepare for the year ahead.

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I thoroughly enjoyed this series, specifically the breakout rooms where we could discuss ideas and meet new people in a friendly way – we were encouraged by the Engineers Without Borders UK Team to share our ideas and have important conversations!

Toni, EWB Glasgow President

Influencing Change

If we're going to address the climate crisis and meet the UN Sustainable Development goals, there must be a commitment to globally responsible engineering across the engineering community. Last year we focused on broadening our reach through public-facing engagements, encouraging individuals and organisations to reflect on and commit to global responsibility.

The movement was featured in numerous **publications including E&T magazine** where Chief executive, Katie Cresswell-Maynard was **interviewed** on the urgent changes needed in the sector and the approach of Engineers Without Borders UK to achieve this. We spoke widely about the cruciality of ethics in engineering, including through thought leadership articles and during appearances on two podcasts hosted by Electronics Specifier and the New Civil Engineer.

For **World Engineering Day for Sustainable Development**, we highlighted work across the sector and collaborated with guest author and sustainable web design expert Tom Greenwood who explored **the impact of our digital carbon footprint**.

We have also been part of numerous events including supporting the **National Symposium on developing Socially Responsible STEM professionals**; presented at the United Kingdom Atomic Energy Authority (UKAEA) and members of the Institution of Civil Engineers; we featured in the **Engineering Climate Conference hosted by ICE Scotland**.

We featured in the Design and Technology Association, Designing your future – inspiring careers campaign, you can watch interviews with current and former Engineers Without Borders UK employees, **Luke Smith** and **Rabia Chhaya**.



“

City is delighted to be partnering and making history with Engineers Without Borders UK. This outstanding charity is establishing its first-ever strategic partnership with our university and deepening its five-year relationship with our School. This will further our commitment to educating socially responsible STEM professionals, clearly illustrated through joint innovative engineering design programmes, such as the Engineering for People Design Challenge and our soon to be launched, Efficiency for Access Design Challenge.

Professor Rajkumar Roy, Dean of City's School of Mathematics, Computer Science and Engineering

Forming Strategic University Partnerships

There is a pressing need for new skill sets within the engineering profession; **only 7% of engineering companies**² in the UK with a sustainability strategy say they have the skills needed to fulfil it. To help address this need, in 2021, we introduced a new university partnership model to embed global responsibility into the education and student experience at university.

In April 2021, we established **our first strategic university partnership** with City University London.

You learn more about what we're aiming to achieve together on our [website](#).

In June 2021, we announced a **multi-year partnership** with the new higher education provider, TEDI-London. Founded by Arizona State University, King's College London and UNSW Sydney, the institution offers a different kind of engineering education that takes a project-based, interdisciplinary global design approach. You learn more about the specific aims of the partnership on our [website](#).

Challenging International competencies

In 2020, **we worked with several Engineers Without Borders organisations to coordinate a response** to a consultation on proposed revisions to the International Engineering Alliance's Graduate Attributes & Professional Competencies (GAPC) Framework. Engineers Without Borders UK, Engineers Without Borders Australia, and Engineering Change Lab Canada led the way in coordinating the response, with involvement from Engineers Without Borders Brazil, India, Philippines, Netherlands, USA, and South Africa. As a group, we felt a key component was missing; the critical reflection needed for engineers to be able to address this century's complex problems, deeper comprehension of the ethical issues inherent in engineering and broader appreciation for the knowledge needed to make effective engineering judgments.

The response was followed by an open letter issued by Engineers Without Borders International to the International Engineering Alliance and the World Federation of Engineering Organisations, which was picked up in The Engineer, Electronic Specifier, Global Construction Review and Design Products & Applications. You can read the full open letter on our [website](#).

Becoming thought leaders

Over the last year, we have invested time in research to support us to reflect on the impact of the movement and explore what it means to be globally responsible in practice.

We will be publishing **a report with the Royal Academy of Engineering**. The research, conducted by UCL, explores the extent to which global responsibility is embedded into engineering practice in the UK and is an initial step towards a long-term objective of achieving this in decision-making across engineering fields. In the report, we highlight the urgency and some of the practical barriers behind placing emphasis on global responsibility and explore some of these practicalities with engineers working in the built environment sector to discover how someone can this practice into their day to day.

In September 2020, four Master's research projects we supported were completed, three from the University of Warwick and one from the Technical University of Munich. These projects **all centred around global responsibility in engineering**, in particular, programmes of support for professionals, volunteer professionals involvement in design challenges, learning techniques at different career stages and frameworks to evidence positions on global responsibility in wider discussions of engineering ethics. This research supports our advocacy for globally responsible engineering, assesses the impact and improvements to our educational offerings and encourages lifelong, meaningful commitment to globally responsible engineering through collaborative research.



Mobilising the movement

We are calling for the engineering community to commit to global responsibility through activities delivered by student Chapters, through collaborative campaigns and through facilitating critical conversations with industry leaders

Engaging in education

In 2020/21, 19 Chapters joined the movement. Despite the challenging year, Chapters ran 203 events and engaged 4,846 participants to inspire and engage those in their university community. Highlights of the year include seeing a number of our Chapters support the design and delivery of our student Designathon, continued delivery of virtual events including panel discussions and a podcast, and delivering [**Outreach workshops during the COVID-19 pandemic.**](#)

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Working creatively

We collaborated with architecture charity [**AzuKo**](#) to deliver the Designathon, our first extra-curricular national multidisciplinary challenge, producing solutions for real-world problems.

Over 150 students from universities around the country participated in this month-long intensive challenge, supported by 34 professionals from the movement who volunteered their time to provide invaluable feedback and guidance.

You can read the [**full interview**](#) with the winning team and [**explore the ideas from the 2021 Designathon here.**](#)



Our experience at the Designathon has demonstrated that the engineering sector still has a long way to go to meet the needs of all in society. It has also shone the light on the organisations that are leading the way in this fight for equality and fairness to all; Engineers Without Borders UK and AzuKo demonstrate that it is possible to lead with new ideas and an ethos of empowerment.

Winning team

Facilitating critical conversations

We are using our influence to facilitate conversations that we hope will create lasting change across the sector.

We are part of the Engineering Council's working group on the guidance for engineers on sustainability and their joint working group with the Royal Academy of Engineering on engineering ethics. On behalf of the group, we ran a 100-minute ethics workshop with CEOs from Professional Engineering Institutions, the Royal Academy and the Engineering Council to further sector-wide understanding of the importance of ethics in engineering.

We are also part of the Royal Academy of Engineering's working group on engineering education, and **we have been brought in specifically to ensure perspectives on sustainability are present in discussions.**

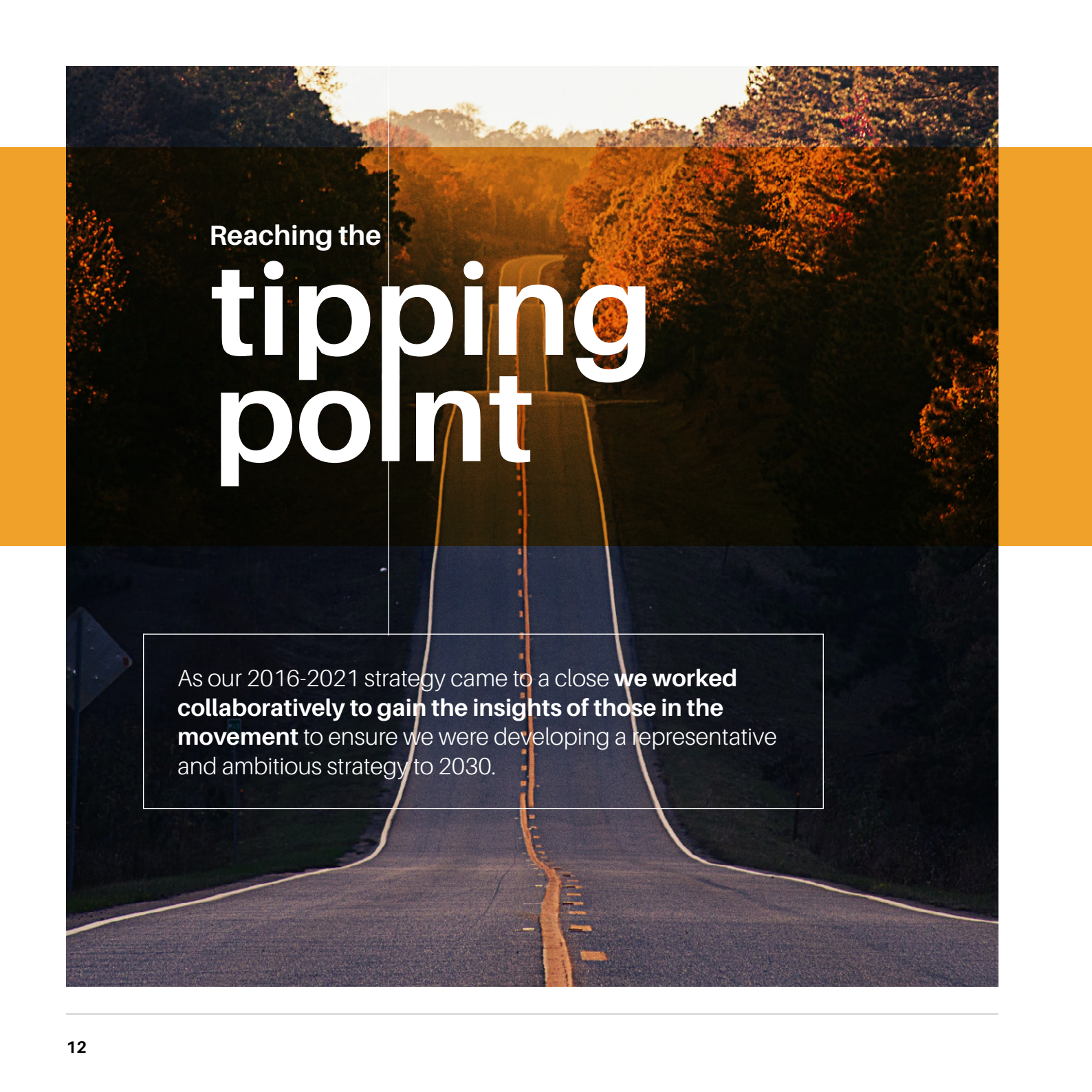
Engineers Without Borders UK members participated in the reviews of the Engineering Council's Sustainability Guidance, voicing that they felt more specific detail, practical examples and further resources were needed to support engineers and technicians to apply the guidance in their day to day. They told the Engineering Council that stronger wording was required to ensure all professional engineers and technicians understand their responsibility and adhere to this guidance in practice. Following on from this valuable input, members were invited to input on their Guidance on Risk review, with specific focus of feedback being that the Engineering Council should provide stronger guidance on risks relating to people and planet.

Rowing for change

We were impressed and excited to meet the Enginoars, a team of four friends who are rowing across the Atlantic Ocean in 2022 to raise funds and awareness for Engineers Without Borders in 2022.

[Learn more about their journey on our website.](#)





Reaching the

tipping point

As our 2016-2021 strategy came to a close **we worked collaboratively to gain the insights of those in the movement** to ensure we were developing a representative and ambitious strategy to 2030.

Developing a new strategy

First we asked the movement about their vision for Engineers Without Borders UK, looking at what they hoped to see achieved over the next 10 years and the impact we'd have together. Then, through a series of focus groups and surveys, we looked at where to focus our efforts, developing our theory of change and identifying the goals of the strategy. We finished off by working together to develop the principles of globally responsible engineering and the action-based individual commitment members would be invited to make to put global responsibility into their day to day practice.

From there, we finalised the commitment and began to prepare for the strategy launch.

Launching a vision

In May 2021, we published **our strategy to guide us through the decade of action**. It provides a strong, persuasive plan to put global responsibility at the heart of engineering, ensuring a safe and just future for all.

As society moves towards the deadline to meet the UN's Sustainable Development Goals (SDGs), we will **inspire** the engineering community to commit to global responsibility. We will **upskill**, equipping people to put purpose into practice. And we will **drive change**, collaborating with companies, universities and a wide variety of organisations to accelerate globally responsible engineering becoming mainstream. By 2030 we will build a movement of over half a million people, powerful enough to radically transform the culture of engineering.

To achieve social and environmental justice, we need those working in and around engineering to commit to global responsibility.



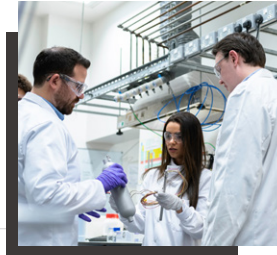
Our 2021-30 strategy sets out

four key principles for globally responsible engineering

that we want to see adopted across the engineering community and embedded in the culture of how all engineering is taught and practiced.

Responsible

To meet the needs of all people within the limits of our planet. This should be at the heart of engineering.

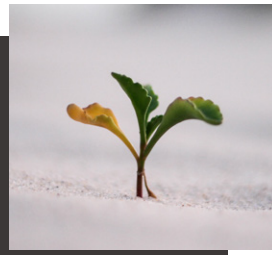


Purposeful

To consider all the impacts of engineering, from a project or product's inception to the end of its life. This should be at a global and local scale, for people and planet.

Inclusive

To ensure that diverse viewpoints and knowledge are included and respected in the engineering process.



Regenerative

To actively restore and regenerate ecological systems, rather than just reducing impact.

You can demonstrate your professional commitment

to globally responsible engineering by becoming a member of Engineers Without Borders UK.

You be will joining a diverse network of people who share your dedication and will inspire, support, and help build your confidence to put these principles into action.

With thanks

to our 2020/21
collaborators
and **partners**.

Anglo American
Foundation

Ashurst

Azuko

Black & Veatch

City, University of London

EcoSwell

Efficiency for
Access Coalition

Electrocomponents

Engineers Without
Borders South Africa

Engineers Without
Borders USA

Iona Capital

John Laing
Charitable Trust

Motorola Solutions Foundation

Publitek

Spirax Sarco
Engineering Plc

TEDI-London

**This is an ambitious strategy but the
scale of the challenge demands it.**

By bringing together thousands of people and organisations, we
will develop unstoppable momentum towards achieving social
and environmental justice through engineering.

**Join the
movement.**



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Engineers Without Borders UK is a registered charity in England & Wales (No. 1101849)
and Scotland (No. SC043537) and is a company limited by guarantee (No. 4856607).