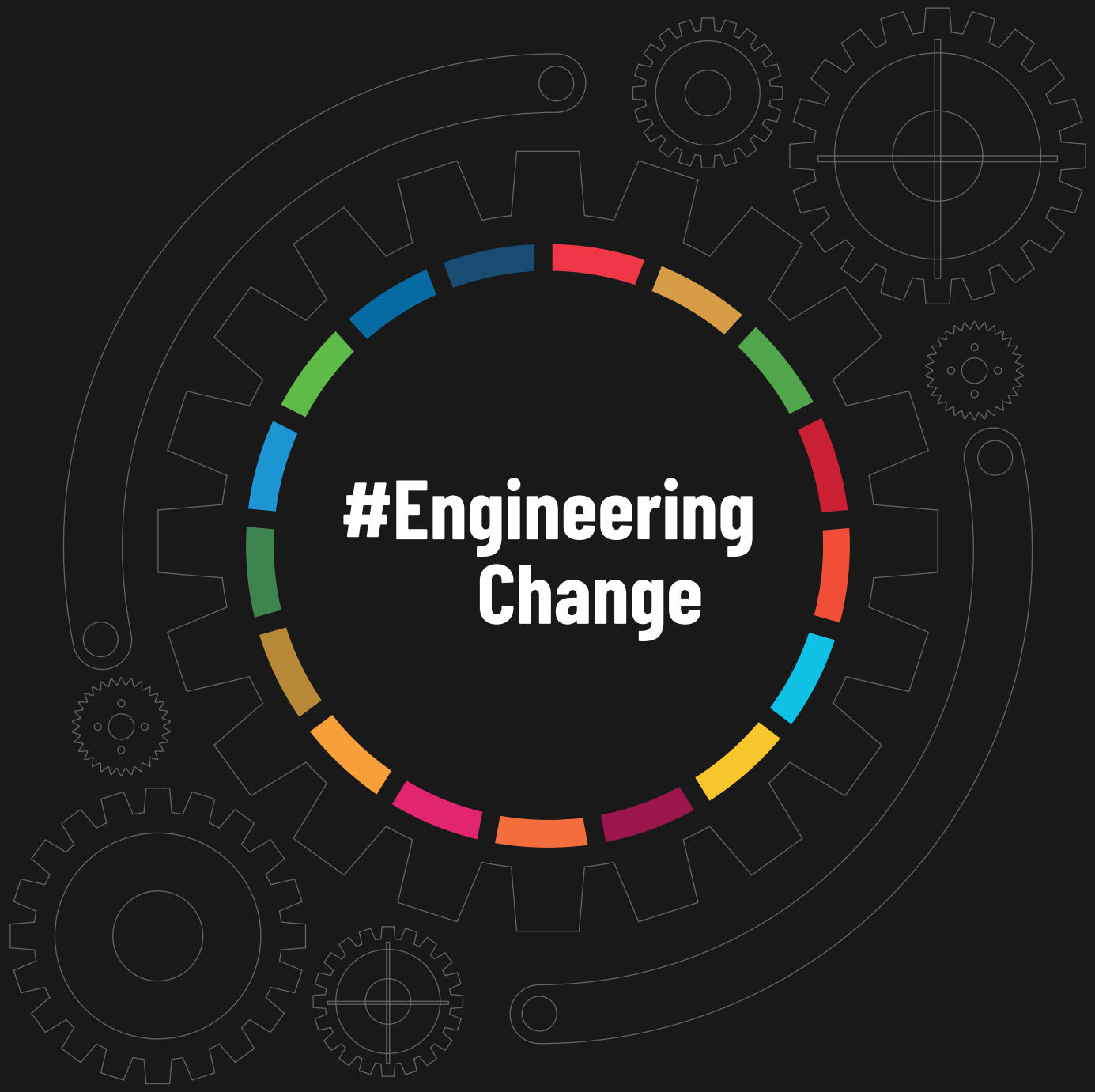


International Coalition for Sustainable Infrastructure

World Federation of Engineering Organizations
Fédération Mondiale des Organisations d'Ingénieurs
Committee on Young Engineers / Future Leaders

YOUNG ENGINEERS FUTURE LEADERS

EXECUTIVE SUMMARY

The **#EngineeringChange** campaign is a global initiative to empower young engineers to take action on the implementation of sustainable development in their workplaces, communities, and networks. The campaign is an initiative by the International Coalition for Sustainable Infrastructure (ICSI) and the World Federation of Engineering Organizations (WFEO) Young Engineers/Future Leaders Working Group on Climate Action (YE/FL SDG13) and was officially launched at COP28 UAE in December 2023.

This report presents the key insights of a global consultation of young engineers and engineering managers undertaken between October and November 2023 and outlines the objectives for the campaign. Notably, the consultation revealed an overwhelmingly positive response from young engineers on the value that they place on sustainable development in their work, adding to their job satisfaction and sense of purpose.

Several calls to action have been identified for individuals and organisations to accelerate engineering change, including building capacity within the workforce, rapidly creating opportunities for upskilling, championing the business case for sustainable development practices, and driving advocacy and training. We are calling for both individuals and organisations to advocate for and take part in mentoring and reverse-mentoring schemes, and for the inclusion of young professionals in decision-making.

For the purposes of this paper, **sustainable development practices** are defined as practices that advance the UN Sustainable Development Goals and utilise best engineering practices to balance and maximise positive environmental, economic, and social outcomes whilst minimising negative ones.

Contents

BACKGROUND

The **#EngineeringChange** campaign is a global initiative to empower young engineers to spearhead sustainable development in their workplaces, communities, and networks. The campaign is an initiative by the International Coalition for Sustainable Infrastructure (ICSI) and the World Federation of Engineering Organizations (WFEO) Young Engineers/ Future Leaders Working Group on Climate Action (YE/ FL SDG13).

Officially launched at COP28 UAE in December 2023, the campaign seeks to build on existing initiatives and resources to better equip young engineers and increase their capacity to drive sustainable development.

SURVEY

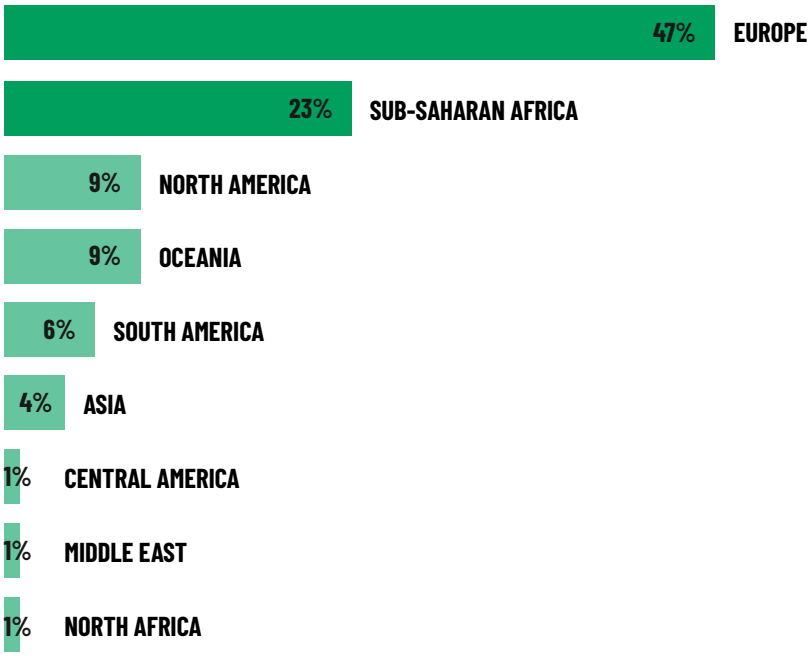
Between 12 October and 15 November 2023, ICSI and WFEO YE/FL SDG13 held a global consultation to determine sustainable development practices in the engineering sector from the perspective of young engineers (under 35) and engineering managers. The survey was offered in English, French, and Spanish. It aimed to understand the perceptions, barriers, and opportunities around implementing sustainable development practices in engineering work worldwide.

Key insights from the consultation will help to shape the **#EngineeringChange** campaign going forward, and will pave the way for building a community of young engineers who can take part in and benefit from the campaign.

Demographics

The survey received 232 responses of which 78% were from young engineers and 22% managers. Respondents were from 17 locations across Europe, Africa, North America, South America, Asia and Oceania. The largest share of respondents (37%) originated from the United Kingdom.

Fig. 1 Where young engineer respondents are based



YOUNG ENGINEERS

Most young engineers (73%) had between 0-5 years' professional experience, followed by 24% having 5-10 years' experience. The group having 10+ years' experience represented 2% of all young engineer responses.

Fig 2. Respondents broadly characterised in two categories: Young Engineers and Managers

Fig 3. Years of experience that young engineers have in the industry

Fig 4. Type of organisations the young engineers work for:

MANAGERS

The majority of managers (55%) work in the private sector, followed by the public sector (20%) and academia (10%). The remaining respondents work across civil society, NGOs and IGOs. Most managers (67%) work in organisations that employ 1-1,000 people.

Fig 5. Type of organisations the managers work for

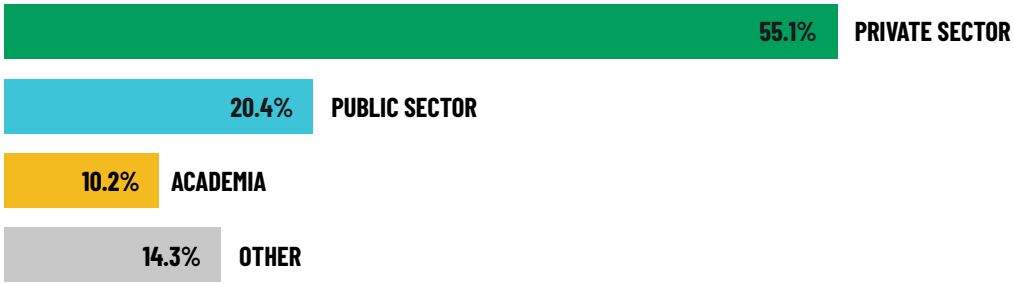
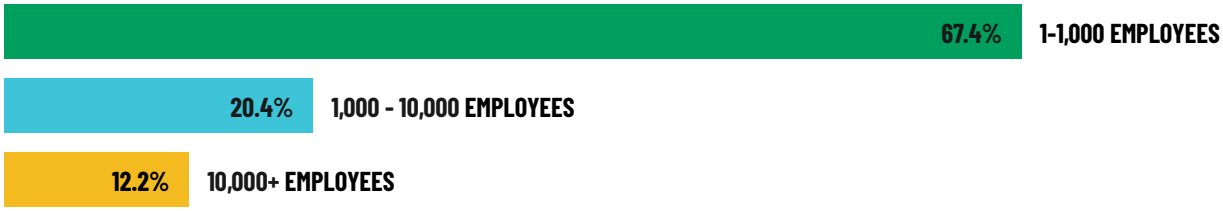


Fig 6. Size of organisations the managers work for

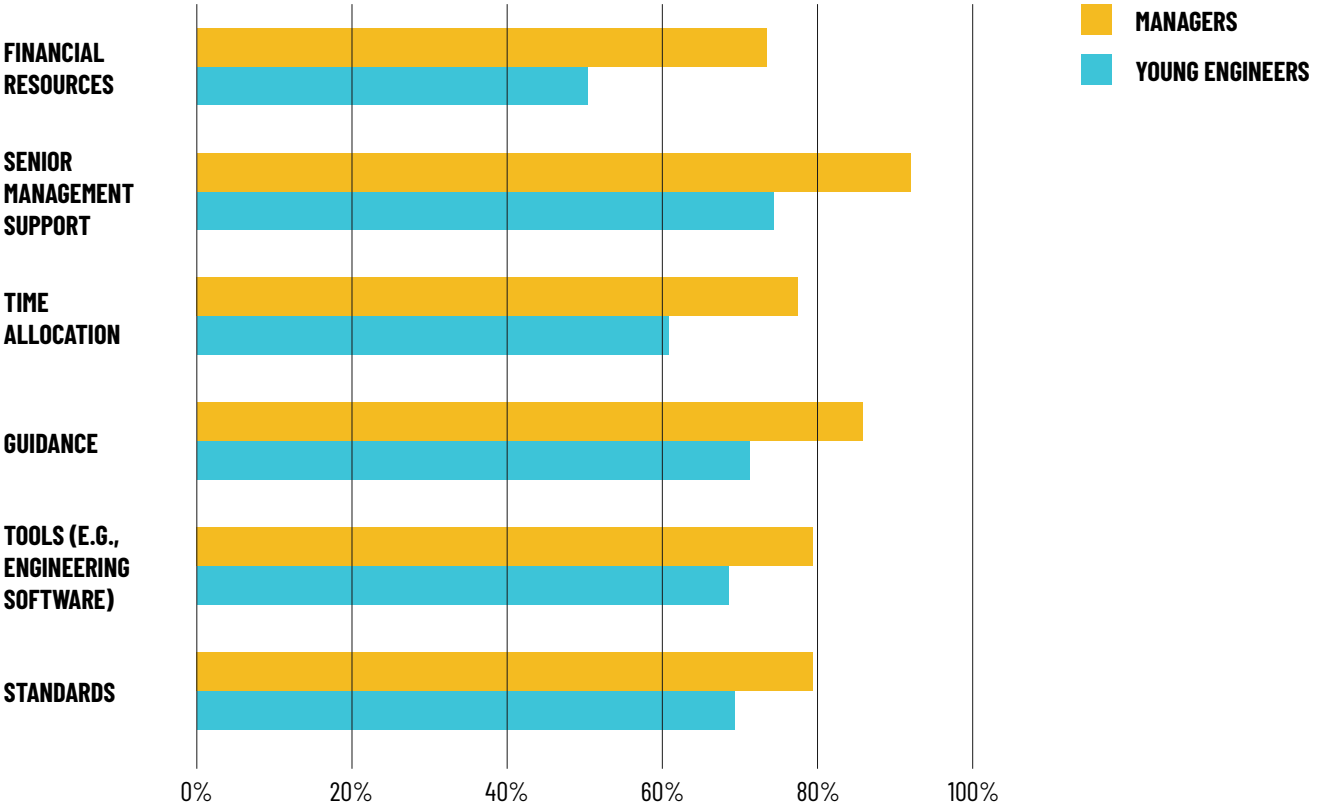


Key Insights

1 Young engineers consider the challenges to implementing sustainable development to be more significant compared to managers.

Most managers who responded to the survey felt that young engineers in their organisation were equipped to implement sustainable development practices in their work. However, the responses from young engineers were more divided, with many young engineers disagreeing, particularly on the sufficiency of financial resources and time allocation (48% and 39% respectively). When asked about the level of support available to implement sustainable practices at work, in general, managers were more optimistic than young engineers. Managers perceive a greater abundance of financial resources and senior management support.

Fig. 7 - Perception of level of support to implement sustainable development practices



Even though over half of young engineer respondents felt they were given reasonable resources to implement sustainable development practices, the capabilities do not necessarily lead to the degree of implementation in projects consistent with best practices.

Both young engineers and managers perceived barriers to implementation among the seven challenges presented to them in the survey (see Figure 8). However, young engineers rated these challenges higher compared to managers.

"There are no 'green engineers' to work with... I'm basically alone in this work."

Young Engineer

Fig. 8 - Perception of challenges to applying sustainable development practices

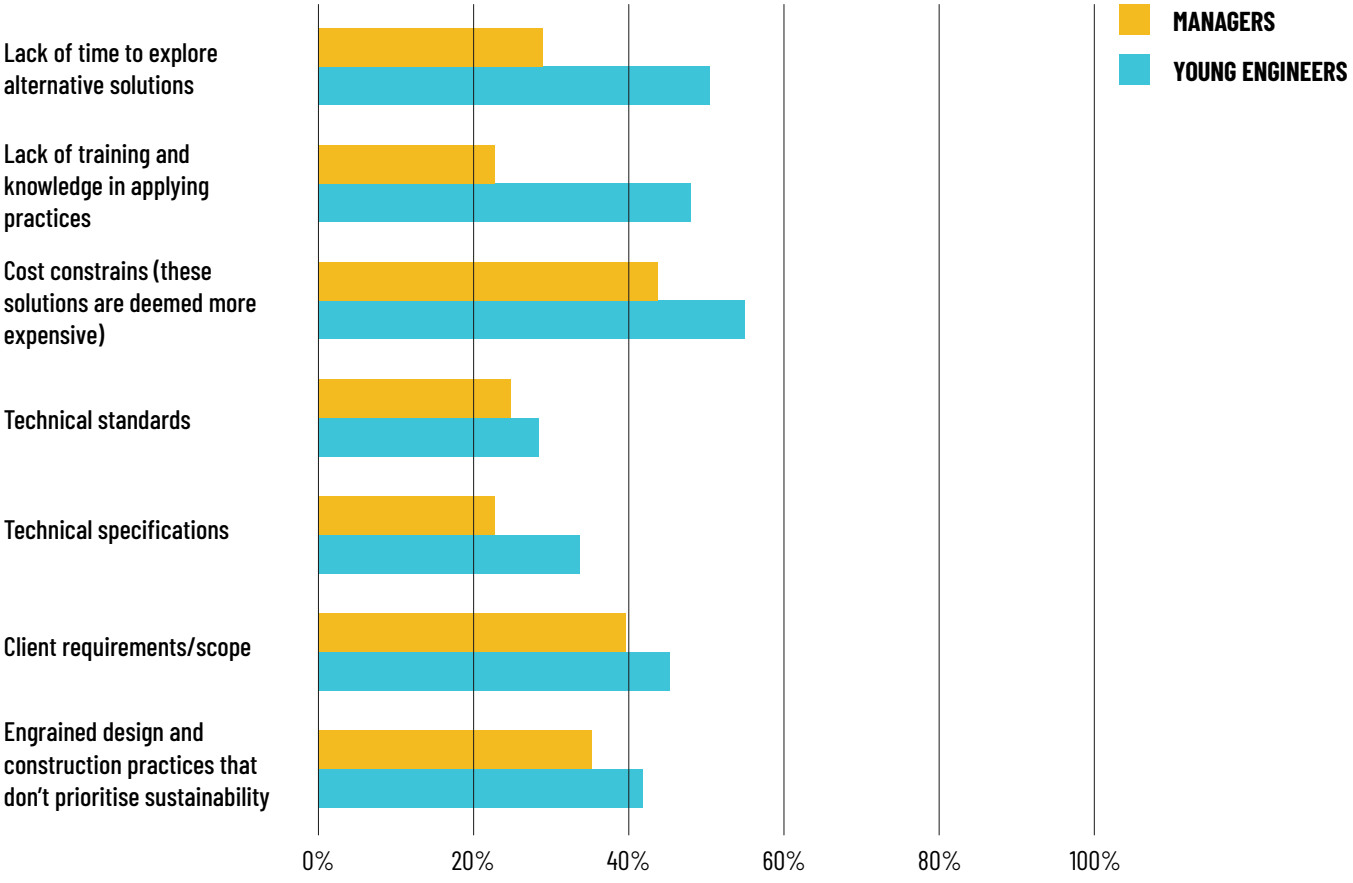


Figure 8 shows the perceived challenges of young engineers and managers in applying sustainable development practices in their work. It is interesting to note the differences in perception around the lack of time available to explore alternative solutions, where 28% of managers saw this as a challenge, as opposed to 50% of young engineers. Young engineers in the field believe that they do not have enough time during their working hours to explore alternative solutions in their practices. This could hinder their ability to find innovative solutions which require dedicated time and research to develop.

Another interesting finding is the discrepancy in the perceived lack of training and knowledge available for applying sustainable practices. Almost half (48%) of the young engineers felt that they did not have sufficient knowledge to apply sustainable practices in their field, whereas only 24% of managers felt similarly.

The difference in perception of these two challenges in the workplace highlights the potential for collaboration and dialogue between young engineers and managers to identify and provide the necessary training, while also empowering young engineers to proactively pursue upskilling opportunities. Furthermore, it underscores the importance of dedicating time to these training initiatives. Mentoring and reverse-mentoring schemes could also prove valuable to bridge these gaps in perception and to ensure that young engineers are included in decision-making. This cooperative approach is crucial in addressing the challenges and achieving the objectives of sustainable development.

Our findings indicate a prevailing perception among both young engineers and managers that sustainable solutions tend to be more costly. This perception, coupled with clients' budget constraints, often hinders the adoption or inclusion of sustainable designs. While it is evident that traditional design and construction practices pose challenges to the integration of new approaches to sustainable development for both young engineers and managers, this also presents a unique opportunity. By enhancing knowledge and dedicating time to exploring alternative sustainable practices, young engineers can spearhead a shift in the wider industry. This newfound expertise can then be leveraged to make sustainable development practices more financially attractive, incentivising clients to incorporate these new approaches into their projects.

"Although there are some regulations, there is no major investment of state resources to implement and train young engineers to have a civil service career in the sector. Since there is no incentive, there is a high turnover of professionals."

Engineering Manager

2 Young engineers perceive additional training and upskilling to be significantly beneficial for them in applying sustainable development practices; however, tailored approaches are required.

Young engineers recognise significant benefits of upskilling in various areas. They understand the importance of adapting to climate change, integrating nature-based solutions into the built environment, and incorporating social, economic, and environmental outcomes in design. They also value the need for disaster risk assessment practices, resilience, and climate change mitigation strategies such as decarbonisation.

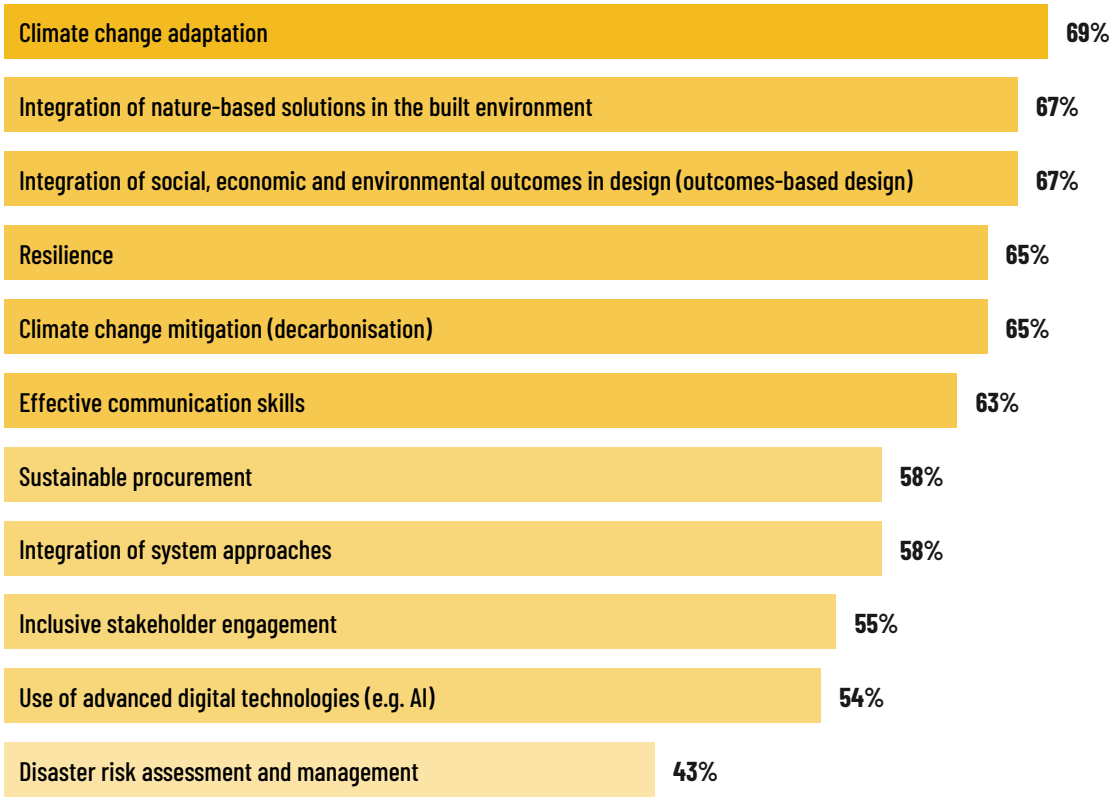
Findings revealed differences in opinion based on experience levels and regional contexts, particularly regarding skills like outcomes-based design, system approaches, and advanced digital technology. These results underscore the necessity of tailoring upskilling initiatives to cater to specific needs and challenges within the diverse engineering community.

With growing awareness of industry intricacies, experienced young engineers encounter additional barriers to sustainable development implementation. The experience brings not only increased awareness of sustainable development complexities but also a recognition of the organisational and cultural challenges, rooted in resistance to change, that are inherent in driving forward sustainability initiatives.

"Older generations of professionals and long-established infrastructure clients/owners are much more likely to be unwilling (or at least very hesitant) to deviate from the technologies and approaches that have been used for a long time."

Engineering Manager

Fig. 9 Topics of Interest to Upskill



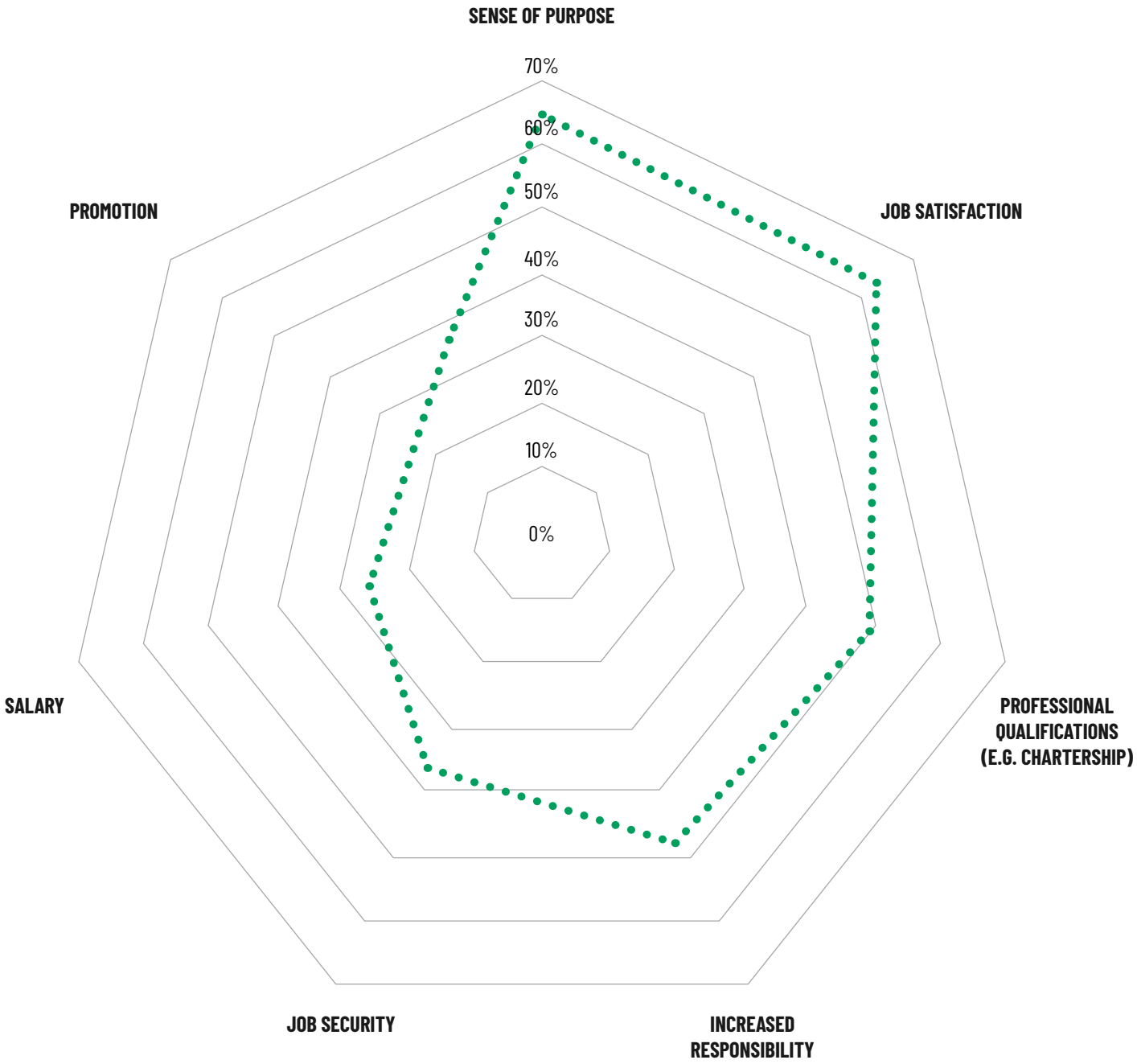
3 The survey highlights that additional skills in sustainable development yield both personal and professional benefits for young engineers.

Young engineers, across various experience levels, reported a significant enhancement in their sense of purpose (64%) and job satisfaction (63%) as a result of upskilling in sustainable development practices. This upskilling has not only contributed to their professional qualifications, e.g. chartership (49%) but has also bolstered their job security and increased their responsibilities (47%). These positive outcomes indicate that skills relating to sustainable development practices serve as a powerful catalyst for both personal and professional growth among young engineers. This shows a clear indication of the value that young engineers place on sustainable development and can help to inform management decisions around upskilling and talent retention. Both managers and young engineers agree that stronger advocacy is needed to rapidly upskill the workforce in sustainable development practices. While opinions around the impact of upskilling on salary and promotion prospects were more varied, the overarching sentiment remains positive.

"Sustainable development in our industry is crucial, and there should be more programmes to educate not only engineers but also the stakeholders in industry so that they will understand the importance and benefit of these and in return, will support us in the implementation."

Young Engineer

Fig 10 - Areas in which young engineers have personally benefited due to upskilling in sustainable development practices



WHERE TO FROM HERE?

BUILDING A PATH FORWARD

The **#EngineeringChange** campaign is poised to inspire young engineers to voice their needs for additional resources and support that can enable the successful integration of sustainable practices. Leveraging the insights from the survey, campaign partners will develop a targeted programme for the next 12 months that will seek to empower young engineers and their managers to be advocates for change in their workplace, community and networks. It will also provide guidance to young engineers in navigating existing resources.

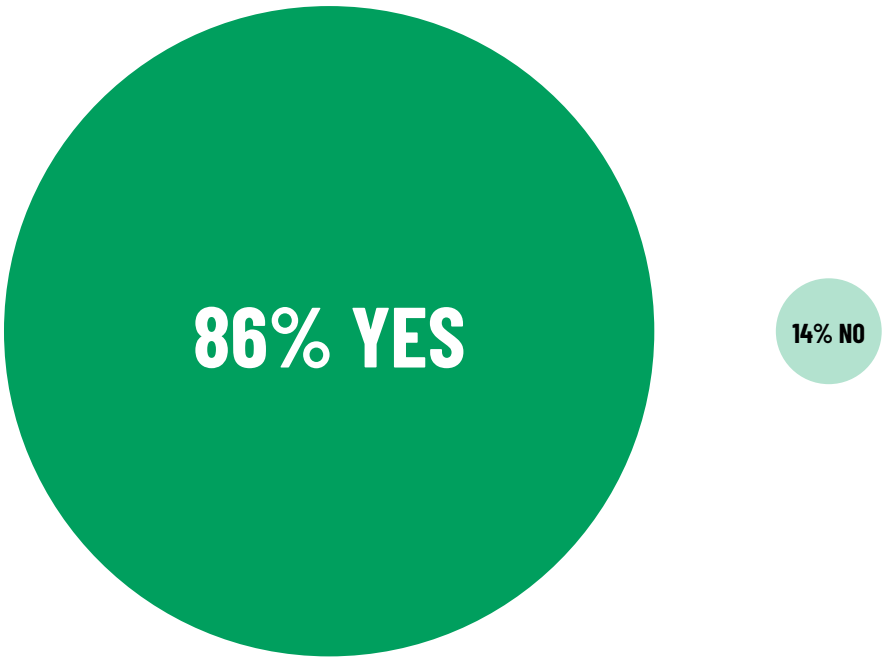
CREATING A PLATFORM FOR YOUNG ENGINEERS

The **#EngineeringChange** campaign will create a community which will serve as a place to connect and share resources, experiences, advice and solutions to challenges. This platform will look to provide young engineers with opportunities that they would not usually access through their workplace to help them build advocacy and leadership skills in the area of sustainable development.

There is a clear appetite for this kind of action, with 86% of young engineer respondents expressing interest in joining an international campaign that supports and empowers them to advocate for and implement sustainable development.

"Sustainable innovative technology should be shared without any patent and copyright etc., so that it can be implemented by all."

Engineering Manager



JOIN THE CHANGE

This initial consultation has highlighted barriers and opportunities faced by young engineers and managers in integrating sustainable practices in their daily work. As a starting point for the **#EngineeringChange** campaign, the below key actions have been identified to advance the adoption of practices that further sustainable development in engineering.

YOUNG ENGINEERS

- Enhance understanding of barriers to sustainable development practices within your organisation.
- Consider and share solutions to address barriers to the adoption of sustainable development practices.
- Learn how to create and present effective business cases.
- Proactively seek out opportunities for upskilling in sustainable development practices.

MANAGERS & ENGINEERING ORGANISATIONS

- Identify sustainability skills gaps and systematically address those through the provision of adequate resources and senior management support.
- Rapidly integrate sustainability into business models and practices, allocating time and finances to identify alternative and more sustainable solutions.
- Reward innovation and sustainable solutions.
- Create meaningful opportunities for young engineers to shape the strategy and decision-making.

BOTH

Advocate for and take part in mentoring and reverse-mentoring schemes, and for the inclusion of young professionals in decision-making.

"We need to challenge clients, and other engineers, on project requirements more frequently. We solve problems that are beyond scope, build when alternative solutions are available and over-engineer when we could rationalise in line with standards."

Young Engineer

JOIN OUR CAMPAIGN TODAY

#EngineeringChange

Contributors

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