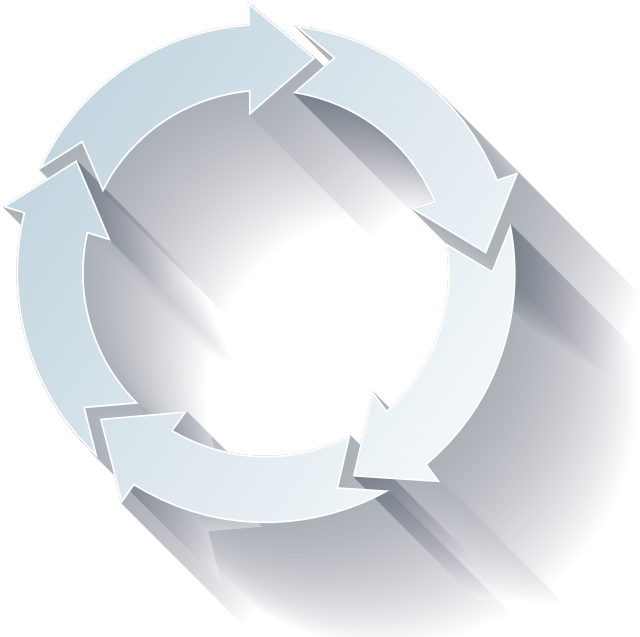
ENGINEERING COUNCIL



GUIDANCE ON SUSTAINABILITY

for the engineering profession

www.engc.org.uk/sustainability

Engineering Council

This guidance describes the role of engineering professionals in enabling society to live sustainably. It lists six guiding principles to support and motivate them, at whatever stage of their careers, in working sustainably and is intended also to be of help to others working in engineering.

1. **Contribute to building a sustainable society, present and future**
2. **Apply professional and responsible judgement and take a leadership role on sustainability**
3. **Do more than just comply with legislation and codes: be prepared to challenge the status quo**
4. **Use resources efficiently and effectively**
5. **Seek multiple views to solve sustainability challenges**
6. **Manage risk to minimise adverse impact and maximise benefit to people and the environment**

This guidance is intended as an introduction to sustainable development and aims to encourage all those working in engineering to adopt sustainability thinking in their practice. It applies across all sectors of engineering, so sector-specific context and practical step-by-step guidance are not included. For that, users are encouraged to refer to material published by a range of sectoral organisations, including engineering bodies, governments and corporates. Some links are available on the Engineering Council's sustainability website pages: www.engc.org.uk/sustainability

This guidance is issued by the Engineering Council. It replaces and updates the previous guidance. It will be reviewed periodically and comments are welcome. Professional Engineering Institutions and Professional Affiliates are encouraged to use this to assist them in developing guidance for their members.

What is sustainable development?

According to the UN-commissioned Brundtland Report in 1987, sustainable development is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs".

The report is available at: sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf

This recognises the rights of future generations – their right to achieve a sustainable level of development and the right to be able to utilise natural resources.

Sustainable development must also meet the challenge of the climate emergency by reducing energy and resource consumption to within the limits set out by science-based targets. Other crucial global challenges that require urgent action include the adverse effects of depletion of resources, environmental pollution, increased consumption, and damage to ecosystems including loss of biodiversity.

UN Sustainable Development Goals

The Sustainable Development Goals (SDGs) are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice.

Adopted by all UN member states in 2015, the 17 Goals are all interconnected, and engineering professionals have a crucial role in helping to achieve these by the target date of 2030: www.un.org/sustainabledevelopment/

The 17 Goals

The role of the engineering professional in sustainability

Engineering professionals[1] have a significant role to play in helping society achieve a more sustainable way of living. They work to enhance the welfare, health and safety of all, paying due regard to the environment and the sustainability of resources. Their work is influenced by the opportunities and challenges that sustainability brings. Due to their knowledge and skills, they are the providers of options and solutions to maximise social value and minimise environmental impact.

Engineering professionals carry out their role in a broad context, encompassing social, ethical, environmental and economic challenges. Increasingly those working in engineering are required to take a wider perspective including the goals set out in the UN's Sustainable Development Goals.

Globalisation brings important opportunities for engineering professionals to promote change through sharing experience and good practice. They have a key leadership and influencing role in working towards sustainability, increasingly as part of multi-disciplinary teams that include non-engineers, and through work that crosses national boundaries.

Engineering professionals' obligations with respect to sustainability

As well as adhering to legislation, engineering professionals' obligations can be categorised as professional and ethical.

Professionally registered engineers and technicians are required to carry out their work in a way that contributes to sustainable development, as outlined in the UK Standard for Professional Engineering Competence (UK-SPEC) and the Information and Communications Technology Technician (ICT*Tech*) Standard.

Ethical responsibilities to respect life, law, the environment and public good, are set out in the Engineering Council and Royal Academy of Engineering (RAEng) joint Statement of Ethical Principles.

All those working in engineering are strongly encouraged to refer to the UN's Sustainable Development Goals, and to integrate these into their work.

Those working in engineering need to be informed, committed and creative, and play an active role in the successful management of the planet's ecosystems, safeguarding the security and prosperity of future generations.

[1] In this Guidance, 'engineering professionals' means registered engineers and technicians, as well as non-registrants engaged in engineering including tradespeople, students, apprentices and trainees. Non-engineers managing or teaching engineering professionals should be made aware of this Guidance.

Principles to guide engineering professionals

The following six principles provide guidance on achieving sustainable development through engineering. They are applicable to all those working in engineering, across the range of roles, sectors and career stages. They support those making decisions for clients, employers, society and communities to integrate sustainable development into engineering activity. The principles are fully compatible with UK-SPEC and with the ICT*Tech* Standard, helping registrants to meet professional obligations.

1

Contribute to building a sustainable society, present and future

Engineering professionals have a responsibility to maximise the value of their activity towards building a sustainable world. This requires an understanding of what society demands and what is achievable, recognising that both change over time. This is not only about doing less harm but also about actively restoring and regenerating, where possible. They should:

- recognise that though their activity may be local and immediate, its potential impacts may be global and long-lasting and may span several supply chains
- understand the full range of sustainability implications across the life cycle of products, processes or systems
- understand other relevant social and cultural structures outside their own normal community of practice
- be proactive, contribute and positively influence the sustainable development of communities, local or global

2

Apply professional and responsible judgement and take a leadership role

Engineering is a profession with a strong ethical dimension. Engineering professionals have an important role in contributing solutions for issues such as poverty, under-development and environmental degradation. In making a sound judgement, the engineering professional should:

- consider the broad context for their work
- be aware that there are inherently conflicting and un-measurable aspects of sustainability
- adopt a systems thinking approach wherever appropriate
- keep their sustainable development knowledge up-to-date

- provide issues, options and solutions to decision-makers enabling sound decisions, congruent with sustainable development principles
- lead by example, influencing others to improve their engineering sustainability performance, including non-engineers and those in the supply chain
- include lessons learnt as part of the engineering process

3 Do more than just comply with legislation and codes: be prepared to challenge the status quo

In seeking sustainable solutions, simply complying with current legislation, codes and environmental protection regulations may not be sufficient. Engineering professionals should:

- strive to go beyond the minimum wherever possible, anticipating future legislation which may be more stringent
- question current standards and seek improvement
- drive the development of future legislation and regulations in line with sustainable development principles
- alert the relevant authorities if proposed regulatory change could give rise to fresh issues which endanger sustainable engineering practice

4 Use resources efficiently and effectively

Those working in engineering have a stewardship role with respect to the planet's finite resources. This brings a responsibility to use resources efficiently and effectively, and to take account of the whole life cycle from the design phase to manufacturing and use, and to end-of-life waste management. Engineering professionals should:

- minimise any adverse sustainability impacts at the design stage
- design and use products, processes and services with the lowest possible consumption of raw materials, water, energy and other resources
- adopt life cycle assessment as normal practice, including in the supply chain, to quantify the environmental implications of projects
- apply the principles of circularity (circular economy), promoting the elimination of waste and pollution, and the continued safe use of resources for as long as possible

- adopt strategies for re-use, recycling, decommissioning and safe disposal of components and materials
- seek regenerative outcomes to redress damage and past harm

5 Seek multiple views to solve sustainability challenges

Solving increasingly complex and interconnected sustainability challenges will require working in multi-disciplinary teams, across geographical boundaries, and with greater inclusivity of communities. Engineering professionals should:

- proactively engage with all those who may be impacted, positively or negatively, by proposed solutions
- seek to involve those who traditionally may not have had a voice in the development of engineering solutions
- listen to and recognise the value of the perspectives of others
- utilise cross-disciplinary knowledge and expertise, and diverse skills at all stages of a project
- consider the potential impacts for future generations
- seek a balanced approach

6 Manage risk to minimise adverse impact and maximise benefit to people and the environment

Engineering professionals are routinely involved in planning and managing projects, where they should:

- undertake a comprehensive risk and benefit assessment before a project begins and after completion
- strive to ensure responsible and ethical sourcing
- include the risks and benefits of environmental, economic and social impacts beyond the lifetime of the engineering project, product or service
- consider the potential risks of how the product or service will be used, to enable mitigation at the design stage
- prioritise sustainability goals including where scientific knowledge is not conclusive, applying the precautionary principle
- instigate monitoring systems so that all impacts of engineering projects are identified at an early stage

Background and further information

Sustainability is referred to both explicitly and implicitly in several Engineering Council documents, including UK-SPEC, the ICT*Tech* Standard, the Accreditation of Higher Education Programmes (AHEP) and the Statement of Ethical Principles. Many Professional Engineering Institutions produce materials related to sustainability. For further information and resources, visit: **www.engc.org.uk/sustainability**

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