

New and emerging technology, ethics and environment

Life Cycle Analysis (LCA) includes:

- the source of materials for the product or component
- the energy used and pollution caused when manufacturing
- the energy used and pollution caused during a product's useful life
- the disposal of the product at the end of its useful life.

Designers and consumers consider these before purchasing a product. These factors can often influence purchasing decisions.

New or emerging materials, manufacturing methods or energy sources can often provide opportunities for greener products. This could be a more eco-friendly material or a self-repairing material. For example, the inner tube in the tyre below, which contains a sticky liquid that hardens when it contacts air – a perfect cure for punctures.



The Six Rs of Sustainability

Designers can often improve products by using the Six Rs. **REDUCE, REUSE, RECYCLE, REPAIR, RETHINK, REFUSE** can often provoke innovation in products.

Better build quality can improve a product's performance during its expected life – designers can ensure that products are easy to service, maintain and repair.

Planned obsolescence is producing a product that is intended to last for a specific time span. This allows newer products to be introduced to succeed previous versions.

'Cradle to cradle' is a concept of taking a product from start to finish. 'Cradle to cradle' looks at putting a product to good use at the end of its life to create a new product.

Ecological footprint

Ecological design can be defined as solving problems alongside minimising environmental damage. Designers must solve problems without creating other problems. Eco is about nature, living things, cycles and patterns.

Eco-efficiency refers to moving towards sustainable development – creating goods, products and services to satisfy user needs and wants while reducing ecological impacts and resource depletion. After all, any natural resources that we use will eventually run out!

The footprint of a product is a measurement of the environmental impact from cradle to grave.

Fair trade

This is an arrangement to help producers in developing countries to achieve trade relationships with other countries. It promotes sustainable development by improving trading conditions, including the rights for the workers.

Worker exploitation

Different countries have different laws about employment for workers. Sometimes workers can be exposed to unfair working conditions including poor or unfair levels of payment. This includes child labour.

Social, cultural, economic and environmental responsibilities

Designers and manufacturers have a duty to ensure that their decisions do not infringe certain codes and laws.

Social – products must not have an unforeseen side effect on a group of people.

Cultural – ensuring that a product is acceptable and not offensive for a specific group.

Economic – ensuring that financial decision making is good for the product. This could relate to material selection, profit margins, running costs or energy efficiency.

Environmental – recently, a lot of legislation and laws have been passed to enforce certain conditions. Many manufacturers now have to comply with targets on lowering CO₂ (carbon dioxide) emissions.