

Chemistry for Tomorrow's World

Sustainable product design



Our high level of industrial and domestic waste could be reduced if more attention was given to the potential environmental impact of new products. Mistakes made during product design can embed unsustainable practice, both in production, including the waste from manufacturing, and how components can be reused or recycled.

Formal industry standards need to be carefully developed, to determine when detrimental environmental impacts during a product's life are incurred, and when intervention is necessary to reduce these. It is likely that cooperation and legislation at an international level will need to drive the design of sustainable products.

How can the chemical sciences help?

- The '4Rs' of product design (reduction, remanufacture, reuse and recycle) must be integrated into every design process to ensure that we make the most of available resources and minimise environmental impact. Chemistry will be central to the development of biodegradable products and materials that are easier to recycle. The chemical sciences are also needed to develop new ways to recover useful components from waste. This would result in a significant decrease in the amount of waste going to landfill and ease the burden on limited resources.
- Existing manufacturing processes need to be redesigned and optimised using new tools. The merit of a process must be assessed using new standards that consider environmental impact. Through green chemistry and chemical engineering, methods can be improved for every chemical product, from creation to end of life.
- To measure the success of improvements, standardised 'life cycle assessment' (LCA) tools and metrics need to be clearly established; such measurements would take into account the impact of a product through its manufacture and its use, to its eventual disposal. This must be done through cooperation across all the sciences and engineering to allow for the creation of rules and guidelines that industry will be able to implement.

About the RSC & Chemistry for Tomorrow's World

The Royal Society of Chemistry (RSC) is the leading society and professional body for chemical scientists. Over 2008 and 2009, it gathered expert views to identify priority areas where the chemical sciences can play an important role in the development of society.

For more on this initiative please visit our website: www.rsc.org/roadmap, contact us at roadmap@rsc.org or call the RSC science team on +44 (0)1223 432424.