

BGB & THE CIRCULAR ECONOMY:

The Role Of The Engineering Sector

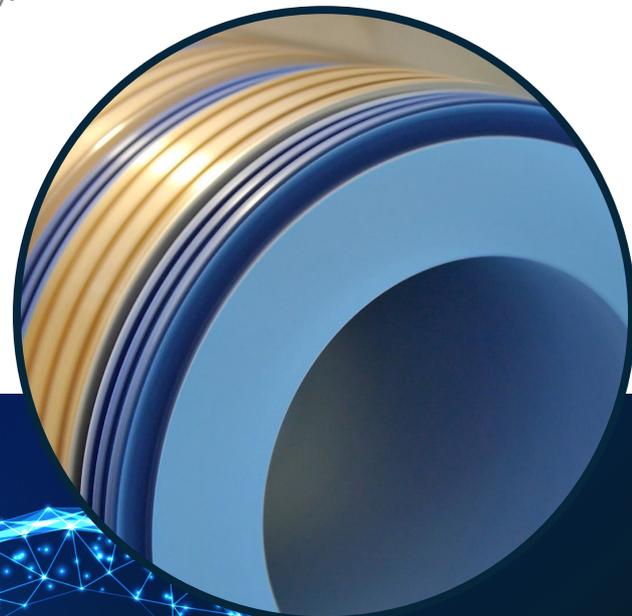
Engineers are 'future builders' with a global societal responsibility to fulfil the broad environmental, economic, social and ethical expectations of their work. They are tasked with finding and designing solutions to the key challenges that population growth poses. Given the importance of engineering in shaping the future and the unsustainable nature of present production and consumption, the sector plays a key role in the transition from a linear economy to a circular economy. The engineering sector has a lot to gain from embracing the circular economy approach; cost savings, resource efficiency, reduced environmental impact and new income streams from recovered resources are some of the benefits attainable in the sector.

The Institution of Engineering Technology argues that engineers can, through technical intervention, create effective solutions for a circular economy ^[1].

ReSOLVE Framework:

- **R**egenerate
- **S**hare
- **O**ptimize
- **L**oop
- **V**irtualize
- **E**xchange

They can develop sustainable designs and engineering methods to improve the reuse, repair, refurbishment, remanufacturing, and recycling of products for a circular economy.



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The ReSOLVE framework, developed by McKinsey & Company, proposes that businesses can implement the following actions in their circular economy approach [2].

REGENERATE 	<ul style="list-style-type: none"> • Shift to renewable energy and materials • Reclaim, retain, and restore health of ecosystems • Return recovered biological resources to the biosphere 	
SHARE 	<ul style="list-style-type: none"> • Share assets (e.g. cars, rooms, appliances) • Reuse/secondhand • Prolong life through maintenance, design for durability, upgradability, etc. 	
OPTIMISE 	<ul style="list-style-type: none"> • Increase performance/efficiency of product • Remove waste in production and supply chain • Leverage big data, automation, remote sensing and steering 	
LOOP 	<ul style="list-style-type: none"> • Remanufacture products or components • Recycle materials • Digest anaerobically • Extract biochemicals from organic waste 	
VIRTUALISE 	<ul style="list-style-type: none"> • Books, music, travel, online shopping, autonomous vehicles etc. 	
EXCHANGE 	<ul style="list-style-type: none"> • Replace old with advanced non-renewable materials • Apply new technologies (e.g. 3D printing) • Choose new product/service (e.g. multimodal transport) 	

Source: Growth Within: A Circular Economy Vision for a Competitive Europe; Ellen MacArthur Foundation; Cowes, UK, 2015. Gotten from Company interviews; Web search.

S. Heck and M. Rogers, Resource revolution: How to capture the biggest business opportunity in a century, 2014



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The Ellen MacArthur Foundation and McKinsey Center for Business and Environment found that most of the industries they studied in 2015 ^[2] could adopt three to four of the six circular-economy actions and potentially improve performance and reduce cost. The engineering sector can easily adopt some of these actions. It can regenerate (shift to renewable energy and materials), optimise (increase performance/efficiency of products and remove waste in production and supply chain), Loop (recycle materials and remanufacture products/components) and Exchange (apply new technologies and replace old with advanced renewable materials).

One area where the engineering sector plays a major role in the advancement of the Circular Economy is in circular design. The Circular Economy advocates for resources to be kept in use for as long as possible ^[3], this is often only possible where products have been designed for circularity. Circular design involves designing durable products that have a low environmental impact in manufacturing and in their use and lend themselves well to circular economy principles.

The goal is to design products for reuse and upgradeability while reducing the need to dispose of most of the physical product. This way products remain in use longer, and companies have less need to make new products thereby reducing their consumption of raw material and (potentially) greenhouse gas emissions.

Companies like BGB primarily design their products in-house, this means they can design their products such that it is easy to recover and regenerate materials at the end of the product's service life. Such companies play a vital role in improving understanding and acceptance of the Circular Economy.



References:

[1] S. Mackay, "Engineering in the circular economy", EIT | Engineering Institute of Technology, 2017. [Online]. Available: <https://www.eit.edu.au/engineering-in-the-circular-economy/>.

[2] Ellen MacArthur Foundation; SUN; McKinsey Centre for Business and Environment. Growth Within: A Circular Economy Vision for a Competitive Europe; Ellen MacArthur Foundation: Cowes, UK, 2015.

[3] Waste and Resources Action Programme (WRAP) [Online]. Available: <http://www.wrap.org.uk/about-us/about/wrap-and-circular-economy>

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