CIRCULAR ECONOMY

The circular economy is touted as a practical solution to the planet's emerging resource crunch. Reserves of key resources such as rare earth metals and minerals are diminishing, while exploration and material extraction costs are rising. The current 'take-make-dispose' linear economy approach results in massive waste. 90% of the raw materials used in manufacturing become waste before the product leaves the factory while 80% of products made get thrown away within the first six months of their life. This, coupled with growing tensions around geopolitics and supply risk, are contributing to volatile commodity prices. A circular economy could help stabilise some of these issues by decoupling economic growth from resource consumption.

The circular economy is a generic term for an industrial economy that is producing no waste and no pollution.
In broader terms, the circular approach is a framework that takes insights from living systems. It considers that our systems should work like organisms, processing nutrients that can be fed back into the cycle—whether biological or technical.

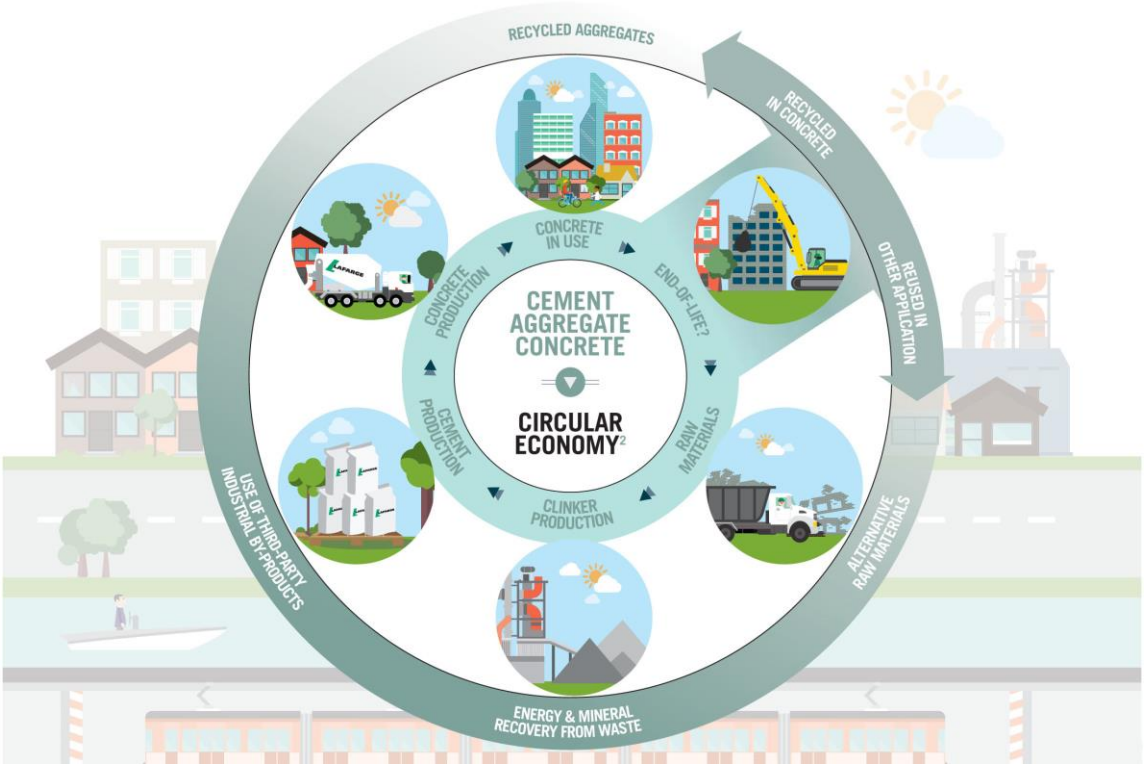

Figure 1: circular economy schematics
http://www.lafarge.com/en/2015-world-environment-day-lafarge-contributing-solutions-a-circular-economy

The circular economy aims to eradicate waste. Not just from manufacturing processes, as lean management aspires to do, but systematically, throughout the life cycles and uses of products and their components.
In working toward the circular economy, world should focus on longer-lasting products, developed for upgrade, ageing and repair.

While substituting secondary materials for primary materials can offer a part solution, recycling offers limited appeal as its processes are energy-intensive and generally downgrade materials, leading to continuing high demand for virgin materials. The circular economy goes beyond recycling as it is based around a restorative industrial system geared towards designing out waste.

The goal is not just to design for better end-of-life recovery, but to minimise energy use and any system should aim to run and generate energy through renewable sources.

Ground-level innovation in this field is being driven by large corporations who are piloting business models based on leasing, product performance, remanufacture, and extended lifecycle thinking. These companies have the power to effect change quickest, given their geographical reach through global supply chains.

Yet, scaling up a circular economy on an international level will likely require government support. A co-ordinated approach by world leaders to introduce positive legislative drivers such as waste prevention targets and incentives around eco-design to promote products that are easier to reuse, remanufacture and disassemble would be welcomed by many.

Our relationship with the products and services we purchase could be radicalised under a circular economy. What if we didn't buy the goods we use, but instead favoured access and performance over ownership? The 'pay per use' contractual agreements associated with smartphones for example could be extended to standard goods such as washing machines, clothes and other equipment. Such a shift would not only allow companies to retain product ownership for easier repair, reuse and remanufacture, but might result in producer responsibility obligations being extended to users as part of the purchase agreement.

Making the transition to a circular economy will be complex as it requires systems-level redesign and a pressing need for new skills across the creative disciplines of design, advertising and digital.

Circular economy in European Union

The EU has no choice but to go for the transition to a resource-efficient and ultimately regenerative circular economy.

The European environmental research and innovation policy aims at supporting the transition to a circular economy in Europe, defining and driving the implementation of a transformative agenda to green the economy and the society as a whole, to achieve a truly sustainable development.

The European Commission introduced a Circular Economy proposal in 2015. Historically, the policy debate in Brussels mainly focused on waste management which is the second half of the cycle, and very little is said about the first half: eco-design.

DID YOU KNOW?

Tesla's Gigafactory is special becouse of it's size and also becouse it is the buidling that is adopting circular economy right from the concept. It will produce batteries for significantly less cost using economies of scale, innovative manufacturing, reduction of waste, and the simple optimization of locating most manufacturing process under one roof.
The Gigafactory will also be powered by renewable energy sources, with the goal of achieving net zero energy.

Figure 2: Tesla gigafactory
https://www.tesla.com/gigafactory