



## The circular economy

### The transition is accelerating



#### What is the circular economy?

The circular economy aims to eliminate waste through multiple changes to production and consumption patterns, thereby decoupling economic growth from resource usage. Recycling becomes an integral part of a product's life cycle, including design and input materials rather than purely an optional end-of-life extra. Utilisation patterns are developed to extend life cycles and improve usage rates to enable more to be achieved with less.

#### What is wrong with the linear model?

The linear model is depicted as 'take-make-waste'. This is a rapid way of using the world's resources, which industrialisation has accelerated through the rise in consumption and the development of products like plastics, which nature is unable to handle/recycle. The Ellen MacArthur Foundation estimates that currently only around 40% of what is consumed is recycled and, while European municipal waste recycling rates have improved by 100bp over the last decade, they were still only at 47.7% in 2019 according to Eurostat. As a consequence, the earth's natural resources are being used up at an accelerated rate. This is highlighted by Earth Overshoot Day, the date when humanity's demand for ecological resources and services in a given year exceeds what the earth can regenerate in that year. In 2020, this was 22 August, up from 23 September in 2000. In the UK it was 19 May and in the United States it was 14 March (source: Global Footprint Network). Hence the current route of consumption appears unsustainable.

#### What does this transition to circular mean?

The overarching view is that there is a requirement for a shift from the linear cradle-to-grave model to a circular cradle-to-cradle paradigm. Various concept frameworks have been promoted, all based on the sustainability and elimination of waste. Leading the way is the Ellen MacArthur Foundation, whose model espouses:

#### Edison Insight

'A move to a circular economy is essential for resource utilisation and environmental concerns. In turn, this will drive new business models disrupting historic linear economics.' David Larkam, Edison Analyst

1) Design out waste and pollution. Maximise use of resources and remove the potential for harm from pollutants, including greenhouse gasses, which operate outside nature's cycle.

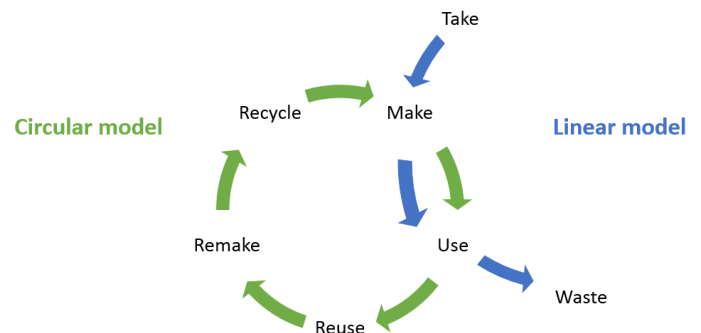
2) Keep products and materials in use. Design for durability, reuse, remanufacturing and recycling to maximise the product and materials' life span. Promote the use of biomaterials compatible with nature's own circularity.

3) Regenerate natural systems. Avoid non-renewable sources (for example fossil fuels) and look to improve nature's renewable sources to strengthen the natural environment.

An alternative strategy is to look at eliminating waste, which occurs in four categories: wasted resources, wasted capacity, wasted life cycles and wasted embedded value. (source: Waste to Wealth by Rutqvist and Lacy).

The overall goal is to provide a nature-enhanced closed loop system.

The economy models



Source: Edison Investment Research

#### What does this mean for business?

The expectation is that the circular economy will lead to changes in the value chain that will promote different business opportunities. These can be categorised in five different groups; three are within the traditional physical product cycle and two are focused on the utilisation phase:

1) Circular inputs: replacing existing linear materials and supplies with recyclable or

biodegradable alternatives. This includes renewable power, bioproducts such as compostable plastics, or materials which are fully recyclable. Opportunities include biodegradable plastics.

2) Product life extension: elongation of the life cycle through repair, reprocessing and/or upgrading. This involves extending the life of the product past its 'first use' through repair and upgrades (eg additional memory in a computer). The alternative is resale to a new user, which avoids premature entry into the recycling loop or waste and hence loss or underutilisation of resource.

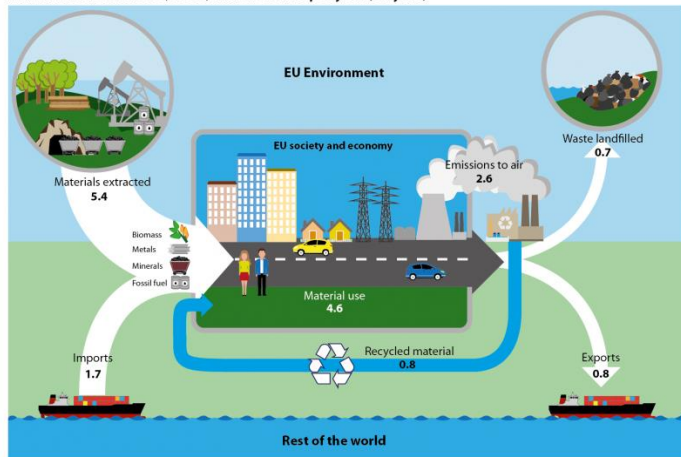
3) Resource recovery: recycling or 'reverse logistics' in all elements of the product life cycle with a financial incentive to retain the highest economic value from a hierarchy of waste perspective. Hierarchy of waste is, in terms of preference, prevention/avoidance, closed loop recycle, upcycle (use the waste to create a new higher-quality product), downcycle (use waste to create a lower-quality product), energy recovery and landfill disposal. The circular architecture is likely to benefit from the requirement for recycled content within the product, as well as from end-of-life Extended Producer Responsibility levies.

4) Sharing platforms: increasing the usage element of a product life through multiple users. On average, a car is driven for 4% of the time (source: RAC Foundation), hence the rise in car-sharing clubs and the potential for autonomous driving vehicles, particularly when augmented by the benefits of electrification.

5) Product as a service: ownership remains with the manufacturer, which instead sells the service that the product offers. The manufacturer retains control of the valuable material resources and of the full product life cycle.

These business models are seen as complementary, with companies encouraged to undertake multiple circularity strategies. Technology is a key enabler for these new models. The power from the fourth industrial revolution and the internet facilitates these new business models. This dislocation against more traditional incremental development provides opportunities for new disruptive business models. This permits a step change to occur where previously incumbents have been able to use their

Material flows in the EU, 2018, billion tonnes per year (Gt/year)



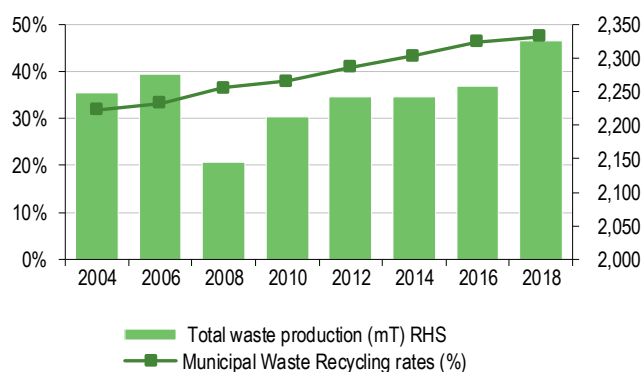
market position to protect their current lucrative linear business model.

## How are we performing at present?

Europe is at the forefront of this initiative, yet progress has been slow with EU-27 countries reporting the rate of circularity of material use at 11.9% in 2019, up from 8.3% in 2005.

Indeed, the level of recycling has increased as European municipal waste recycling rates show, but so has the level of waste, albeit on a relatively marginal basis.

### European waste and recycling



Source: Eurostat

## What is the government doing about this?

In May 2020, the EU released its New Circular Economy Action Plan, which forms part of its new industrial strategy and a shift to a 'sustainable economic system' in line with the target for carbon neutrality by 2050. The plan follows on from the first Circular Economy Action Plan in 2015, which contained 54 action points now largely fulfilled.

The 2020 plan presents a set of interrelated initiatives to establish a policy framework that will make sustainable products, services and business models the norm. Key elements of the plan include:

- improving product durability, reusability, upgradability and reparability, addressing the presence of hazardous chemicals in products, and increasing their energy and resource efficiency;
- increasing recycled content in products, while ensuring their performance and safety;
- enabling remanufacturing and high-quality recycling;
- reducing carbon and environmental footprints;
- restricting single-use and countering premature obsolescence; introducing a ban on the destruction of unsold durable goods;
- incentivising product-as-a-service or other models where producers keep the ownership of the product or the responsibility for its performance throughout its lifecycle;

- mobilising the potential for digitalisation of product information, including solutions such as digital passports, tagging and watermarks; and
- rewarding products based on their level of sustainability performance, including by linking high performance levels to incentives.

This policy framework will be progressively rolled out, while key product value chains will be addressed as a matter of priority. These are wide-ranging and include electronics & ICT, batteries & vehicles, packaging, plastics, textiles, construction & buildings and food, waste & nutrients. Further measures will be put in place to reduce waste, including an internal market for high-quality secondary raw materials. These new requirements will necessitate changes to individual business models. For instance, there will be a 'right to repair' for electronics goods and increased responsibility for end of life with 'reward systems to return old devices'. There will also be a review of automotive end-of-life regulations that are already in place.

[https://ec.europa.eu/environment/strategy/circular-economy-action-plan\\_en](https://ec.europa.eu/environment/strategy/circular-economy-action-plan_en)