

The Role of Business in Moving from Linear to Circular Economies



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Cover design: Joseph Shmidt-Klingenberg and Sebastian Obermeyer

Graphic Design: Joseph Shmidt-Klingenberg and Sebastian Obermeyer

Layout: Jinita Dodhia/ UNON, Publishing Services Section/Nairobi

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The Role of Business in Moving from Linear to Circular Economies

Coordinating lead author: Richard Swannell (WRAP)

Lead authors: Marc de Wit (Circle Economy), Alex Godoy Faúndez (Universidad del Desarrollo), Lerwen Liu (King Mongkut's University of Technology Thonburi)

Contributing author: Keith James (WRAP)

Contributors: Malin Nordin and Lotta Holmberg (Inter IKEA Group), Jacco Verstraeten-Jochemsen (Circle Economy)

GEO fellow: Elizabeth Berg (University of Wisconsin)

A full list of acknowledgments can be found [here](#).

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Key messages

The environmental impacts of today's "take, make, waste" or "linear" economy are dramatic and extensive. Resource extraction has tripled since 1970 to a massive 92 billion tons per year, and is projected to grow by another 70 per cent by 2050. Today's global economy is only 8.6 per cent circular. The combustion of fossil fuels, that have driven this growth, has already contributed to a 1.1°C average global temperature increase, and could lead to a 3.5°C increase by 2100 without global action. Many of the impacts of climate change, such as more frequent and intense storms and floods, lengthier droughts, sea level rise, increased number of extreme heat events, changing freeze/thaw patterns, and more frequent and intense forest fires are already being felt in countries and regions such as Germany and China, the Arctic and Australia, USA and Turkey ^[1].

Parts of the linear economy are having other impacts. The global food system contributes around 70 per cent of biodiversity loss and also consumes 70 per cent of available freshwater ^[2].

The linear economy also drives huge quantities of waste with around 24 billion t/y being discarded, much in uncontrolled landfills

A rapid shift to a more Circular Economy, which drives reduced use of raw materials, redesign, reuse, repair, remanufacture and recycling at every step of the value chain, could dramatically cut resource use, and coupled with decarbonization, can deliver a low carbon and lower impact future.

Moving from a linear to a circular economy is being driven by 5 key changes:

- Changes to the global policy environment
- Investor demands
- The need for greater business and supply chain resilience
- Changing consumer preferences, and
- The impact of the COVID-19 global pandemic

There is real opportunity for businesses to reduce costs, build resilience in their supply chains, comply with emerging policies and meet investor and customer requirements, through moving to a more circular approach.

To do this, businesses can use a value-chain approach to prioritize where they can take action to have the biggest impact on greenhouse gas emissions and make 'transformational sprints' towards circularity. These value chains, which include all the activities that provide or receive value, from: designing, making, distributing, retailing and consuming a product (or providing the service that a product renders), must be transformed by businesses.

By moving to a more circular business model, businesses can:

- Enter new markets and increase market share
- Reduce costs, risks and future proof the business
- Drive innovation, attract talent, deliver value and align with public expectations.

This brief examines how businesses can deliver this change, using food, electronics and construction value chains as examples. Successful businesses of the future are likely to be ones that deliver excellent value with minimum resource and environmental costs, while moving rapidly toward nature-positive solutions and net zero carbon emissions. Applying circularity principles can help businesses deliver a rapid and successful shift towards delivering these crucial priorities for humanity.

About GEO for Business

The United Nations Environment Programme [UNEP] and its global partners are proud to offer this series of stimulating briefs about the environmental challenges and business opportunities that demand transformational change at a global scale. These business briefs are meant to communicate the science of the environment to a broad business audience and provide possible pathways and roadmaps that business can follow to address these environmental challenges. The audiences these briefs hope to reach include companies in the supply chains of major multinationals, multinationals themselves as well as small to medium-sized enterprises. The themes of the first five briefs include:

- [how to transform in a time of uncertainty](#),
- [how to transform business models towards a fully circular model](#),
- [how to transform global food systems](#),
- how to build environmentally sustainable and resilient infrastructure,
- and the role finance needs to take in a transforming world.

1 What are the impacts of today's linear economy and why would transforming towards a circular economy model be necessary?

Although rising living standards and decreasing poverty rates have accompanied the economic model followed by the world for the last century^[3], such global economic prosperity has come at an increasingly steep environmental cost, making this model unsustainable. The doubling of the global population and global domestic product per capita growth in the last 50 years has been linked to material consumption that exceeds several planetary boundaries in many areas^[4]. These planetary boundaries, which encompass climate change, water use and chemical pollution, among other threats, describe nine biophysical limitations to safe life on Earth^[5]. Planetary boundaries are being breached, due to the following:

- Extractions of global resources, which have more than tripled since 1970, from 27 billion tons to 92 billion tons in 2017. Without action, resource extraction will more than double from current levels to 170–184 billion tons by 2060^[6].
- The combustion of fossil fuels, that have driven this growth in linear economy, has already contributed to a 1.1°C average global temperature increase, and could lead to an increase of 2.8°C or greater by 2100 without significant global action^[7].
 - ▶ Impacts from this global temperature increase will include more frequent and intense floods, hurricanes, typhoons, lengthier droughts, sea level rise, more extreme heat events, changing freeze/thaw patterns, coral reef bleaching and ocean acidification, and more frequent and intense forest fires, among others^[7].
- The current global food system, which is responsible for 70 per cent of global biodiversity loss^[8].
- Indoor and outdoor air pollution, which causes 7 million premature deaths per year^[6].
- Plastic pollution in oceans – since 2016, about 11 million tons of plastic have entered oceans per year, mainly from land-based sources^[9].

- Deforestation, although rates have decreased from around 10 million hectares per year in the 1990s to 6.5 million hectares per year in 2010–2015, overall net deforestation continues globally.
- Water pollution, which is responsible for 1.4 million deaths each year, with 2.3 billion people lacking access to safe sanitation services^[6].

It has become increasingly clear that “business as usual” is unsustainable for people and the planet. The sixth Global Environment Outlook (GEO-6) has presented how a healthy environment fundamentally underpins human health and well-being. The Sustainable Development Goals (SDGs) recognize that inequality, including poverty and gender discrimination, is causing significant human productivity and prosperity to be wasted^[6]. To ensure a healthy, prosperous and sustainable future for all, businesses need to change what and how they consume and produce as soon as possible^[10]. In addition to urgent environmental threats and the risk of volatile resource prices, businesses are facing significant technological innovations and the following external drivers of change, which are encouraging the transition towards more circular business models:

- policy environment changes
- investor demands
- the need for greater business and supply chain resilience
- changing consumer preferences
- the impact of COVID-19.

One way that businesses can respond to these drivers of change is by shifting from a linear business model to a circular one. A linear economy, which describes the process of extracting raw materials, making, using and then disposing of goods, relies on environmentally unsustainable rates of resource extraction and waste disposal, thus threatening planetary boundaries^[11]. In comparison, a circular model, which emphasizes a reduced use of raw materials and the reuse, repair, redesign, remanufacturing and recycling of resources

at every step of the value chain, ensures that materials or resources keep their maximum possible value as they move and are retained within different value chains (as stated in the United Nations Environment Programme (UNEP) circularity platform). Moreover, the shift from a linear economy to a **circular economy** needs to be gender inclusive if we are to be successful at achieving the sustainable development goals. In section 3, this brief presents examples value chains where pathways to circularity are possible, namely: food, electronics and construction.

Overall, the cornerstone of circular business strategies revolves around four areas:

- designing products and services with minimal resource use from the start to allow for circularity and longevity
- designing out waste and keeping chemicals of concern away from recycled material streams at all stages of the value chain
- designing *in* renewable and recyclable resources to help develop the market for sustainable and second-life materials and to reduce a company's reliance on virgin materials
- designing *in* regenerative raw materials to help reduce material use.

Figure 1 shows the main actions that can be taken to help build a more circular economy and ultimately shift the current economic model towards a more sustainable future. Adopting a circular model would reduce the use of natural resources, as well as their environmental impacts per unit of output, while continuing to enable improvements in human well-being. Life cycle thinking, which enables the identification of strategic intervention points along the value chain, is also essential for a successful and sustainable transition towards a circular economy.

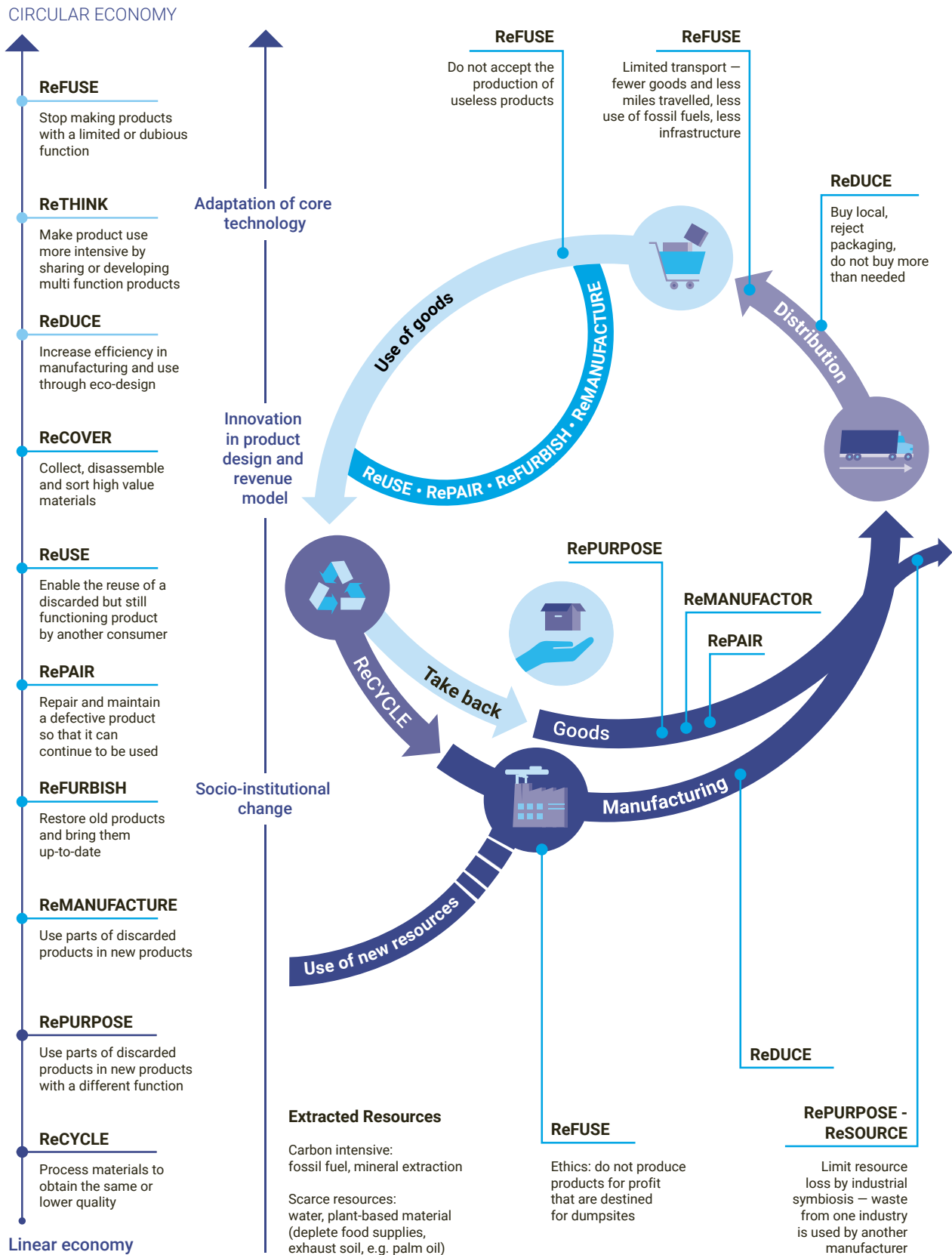
The aim of a circular economic model is to ensure that products and materials are kept at their maximum value while in use and when they are returned into the economy at the end of each life cycle. Transforming from a linear to circular business model by reducing waste and inefficient resource use is an essential element for achieving sustainable development ^[6] and will help put the world on a trajectory to achieve net-zero carbon emissions and a nature-positive future.

The rapidly **changing global and national policy environment** provides additional incentives for action. Several countries and regions have placed circularity and sustainable consumption and production at the centre of their policy efforts, including **Chile, China, Colombia, Rwanda, South Africa, Viet Nam** and the **European Union**, and several European countries have developed national frameworks on circularity, such as **Finland, France, Spain** and **Sweden**. The growing number of resource efficiency and recycling targets set by countries are intended to drive global economies and businesses to transition towards circular practices. At the global level, the **Global Alliance on Circular Economy and Resource Efficiency** was launched in February 2021, bringing together governments to work jointly for a global transition to circularity. Several regional alliances also exist, including the **Latin American and Caribbean Circular Economy Coalition** and the **African Circular Economy Alliance**. Specific global conventions, such as the Basel Convention, through its Plastic Waste Amendments, also contribute by further boosting efforts to control transboundary movements of waste, ensure environmentally sound management and prevent and minimize the generation of plastic waste. These kinds of policy drivers foster innovation and contribute to the development of new business models, new services and new value chains that reuse materials and products and reduce or eliminate waste ^[12]. Such new models are likely to create new jobs ^[13], offer greater inherent resilience and reduce environmental impacts ^[14].

The company Accenture estimates that the circular economy presents a \$4.5 trillion growth opportunity ^[15], providing a compelling business case for action. **Investors** are starting to see new financial opportunities and benefits and are providing products to financially support the transformation to a circular economy ^[11]. However, such opportunities currently remain limited for small to medium-sized enterprises (SMEs), which are critical actors in the move towards circularity and still face significant barriers in accessing funds to support their transformation.

Changing consumer preferences further support these transformative changes. By 2030, 62 per cent of the global population will be classified as lower- to upper-middle income, and will be the groups driving growth and changes in consumption ^[16,17]. A recent study ^[14] surveying attitudes, opinions and behaviours around healthier and more environmentally sustainable lifestyles found that 50 per cent of people wanted companies to enable environmentally

Figure 1: Steps to build a more circular economy



sustainable living by making more affordable products and services that are healthier for both people and the environment. Results from the study also show that nearly three quarters (74 per cent) of people want to greatly reduce their impact on the environment and nature, 77 per cent want to choose products that last longer and 59 per cent want to avoid disposable goods. These findings are an important driver for businesses to produce more environmentally sustainable products and services for consumers. Gender roles in production and consumption also play a big role in the shift to circularity. Consumption patterns differ by gender, with women being more impacted by unsustainable production ^[18]. As demand increases for products that are both good for people and the planet, it is likely that financial opportunities will also grow for businesses that are willing to meet these demands ^[19].

Finally, with COVID-19 demonstrating the effects that low-probability, high-impact events can have on businesses, **greater business resilience** is becoming a priority. Recent seasonally adjusted Index of Industrial Production data show that COVID-19 has significantly impacted both lower- and upper-middle-income countries, with SMEs having been particularly affected ^[20]. Economic stimulus and recovery funds provided by countries can be used to support the shift to a circular economy, though more needs to be done, as only 20 per cent of the announced recovery spending of \$16.7 trillion was considered positive for the environment ^[21]. COVID-19 also has gender dimensions ^[22], having doubly impacted women ^[23], who constitute a significant share of the labour force and also provide most childcare. Women in non-agricultural jobs in the informal sector are also highly impacted ^[22], as they have no social protection to shield them from COVID-19-related unemployment.

Embracing circularity could enable a more environmentally sustainable and resilient economic recovery from the COVID-19 pandemic ^[24]. Subscription models and other innovative approaches to supplying products and services can reduce and redistribute costs over time, simultaneously meeting demands for environmental sustainability and affordability – particularly for those on a low income ^[25]. COVID-19 has also highlighted the importance of **green urban spaces** and public-private collaboration in reducing overall consumption, developing shorter value chains and safeguarding basic needs and services (for example, food and mobility).

The transformation towards a circular economy presents opportunities for businesses of all sizes. Although larger businesses may be able to make bigger changes, these will take longer. Smaller businesses can react quickly in shifting to a circular economy, while new businesses have the opportunity to adopt a circular model from the beginning. Transforming any business from a linear to circular model requires a new approach to operations, products, services, culture and organization by reorienting investments towards circular business models ^[11]. By embracing circular models, businesses can benefit financially while also demonstrating that it is possible to live sustainably within planetary boundaries ^[26].

This brief shows that there is **opportunity to create economic value through circular models and services**, both in the short and long term. Although businesses should continue to work with policymakers to enable the right conditions and scaling potential for a circular economy, there is opportunity for businesses to act now. This brief presents the need for change, along with the opportunities available in the economy as a whole and in key sectors. It also identifies what businesses of every size around the world can do to be more circular, as well as the benefits that such actions will bring.

The following sections consider:

- the world's current level of circularity
- the biggest opportunities for change and how businesses can capitalize on these
- how businesses could develop their circular economy strategy
- opportunities for businesses.

2 What are the business opportunities of transforming to a circular economy?

For businesses to embark on their journey towards circularity, it is crucial to understand the entire chain of economic activities in which the business is involved. To do this, it is important to understand the following:

- How circular is the world today?
- What resources and materials are needed for different economic activities and what environmental impacts do they produce (including waste, pollution and greenhouse gas emissions)?
- What activities comprise a business' value chain, from the design, manufacturing, distribution, retail and consumption of a product or a service?

This section presents an analysis of the global economy and the materials flowing through and within it. It then evaluates specific industries and highlights circular economy strategies that businesses can adopt.

2.1 How circular is the world today?

In 2017, global material consumption exceeded 100 billion tons per year for the first time (Figure 2). Over 90 per cent of these resources (92 billion tons) were raw minerals, biomass, fossil fuels and ores, with a much smaller contribution (8.6 billion tons) comprising recycled materials^[27]. This means that in 2017 (the most recent year for available data), the global economy was only 8.6 per cent circular, a slight decrease from 9.1 per cent in 2015^[27]. At less than 10 per cent, the global circularity gap shows that significant efforts are needed to achieve a circular economy. Over the last four decades, the global use of materials has nearly tripled^[28].

Raw material consumption is not only increasing – from nearly 27 billion tons in 1970 to 92 billion tons in 2017 – it is accelerating. The International Resource Panel^[29] forecasts that by 2050, material use will amount to between 170 and 184 billion tons, a growth of more than 70 per cent from current levels. Businesses of all sizes, from start-ups to large multinational corporations, extract, produce, sell and dispose of these materials to satisfy key societal demand.

Figure 2 shows what happens to resources at their end of use. In 2017, out of 100 billion tons of total material inputs, 31 billion tons were put into long-term stock such as capital equipment and buildings, 14.6 billion tons were released as air emissions, 22.4 billion tons were lost to the environment and 32.6 billion tons became waste^[27]. Most of the waste stream (23.9 billion tons) was lost by being sent to landfill, incinerated or wasted in mining operations, or by becoming unregistered waste. Only 8.6 per cent of this material use was cycled back into productive use.

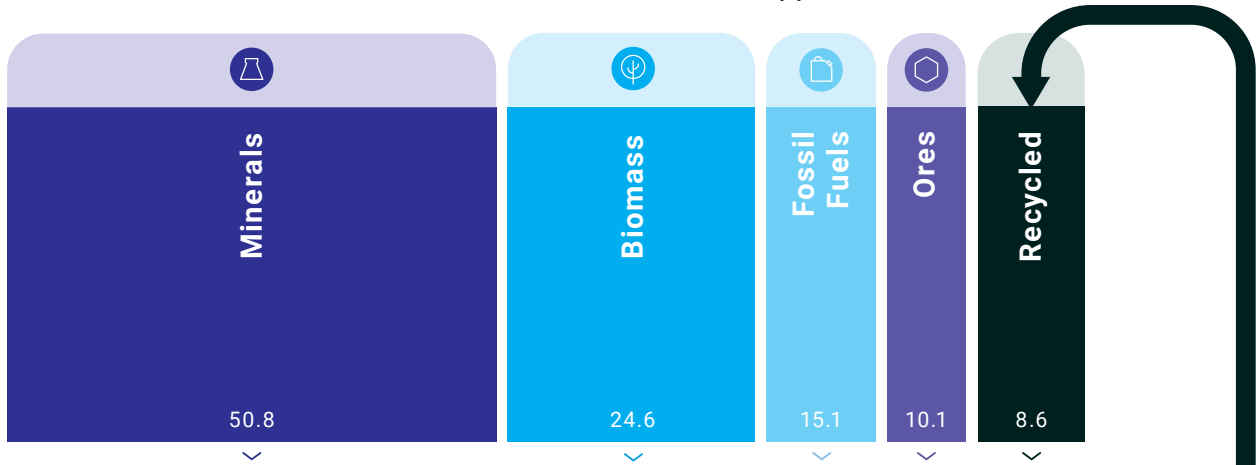
2.1.2 Identifying key intervention points and hotspots to build circularity

Shifting from a linear to circular economy requires taking into account aspects that extend beyond material and resource use, such as environmental and social impacts. Examining such data alongside material and resource-use data will make it possible to identify key intervention points that can simultaneously address multiple environmental sustainability objectives. One method that can help businesses measure circularity is the mass-value-carbon approach^[30], which assesses the global economy through three lenses crucial for circularity: material throughput (mass); financial value creation (value); and greenhouse gas emissions (carbon). This mass-value-carbon nexus provides a dynamic conceptual framework for identifying and evaluating key variables, as well as a global picture that is relevant for businesses, by highlighting which sectors, industries and global value chains can decisively contribute in the move towards a more circular economy^[30].

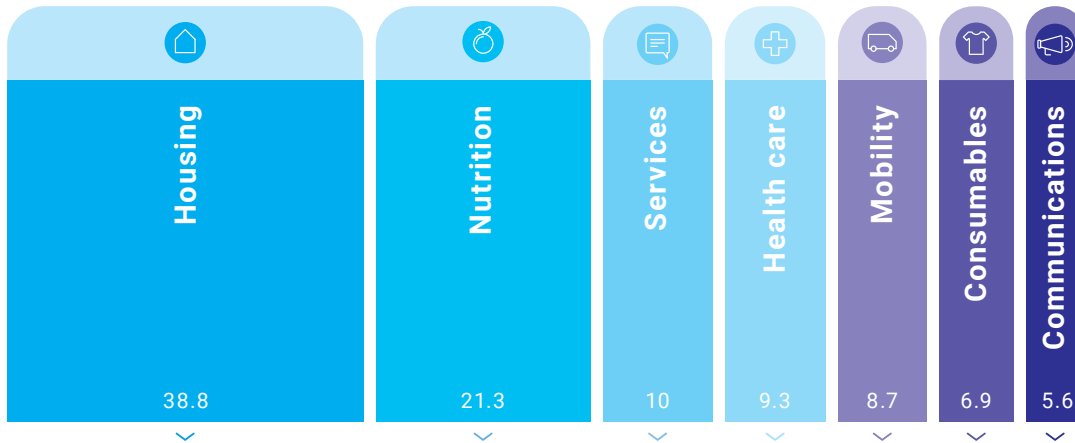
The value chain approach also offers this integrated perspective within different sectors and geographical scales. The approach considers the entire value chain of economic activities through an understanding of what happens at each stage in terms of resource use and environmental and social impacts, as well as how the value chain operates as part of a system. It also identifies key intervention points and helps shape corresponding action to be taken by key actors along the value chain, including businesses.

Figure 2: The global resource footprint behind satisfying key societal needs

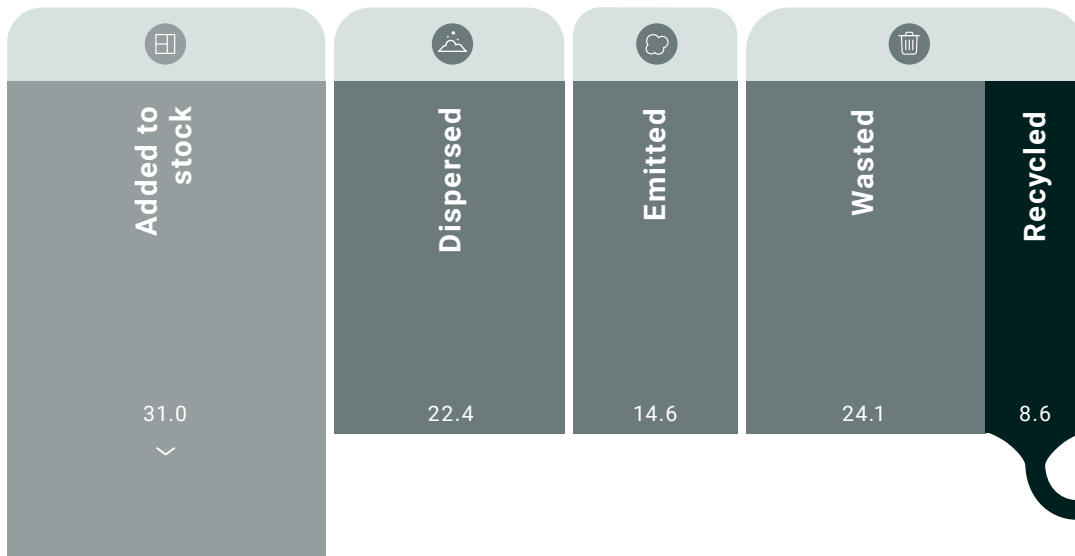
Human civilization extracts 92 billion tons of materials from the earth every year.



These materials are used to fulfill the needs of all human societies.



Only 9 per cent of all these materials are cycled back into the system. The remaining 91 per cent are burned, stored or lost.



Although these approaches work at different scales and use different definitions of value (considered exclusively financial in the mass-value-carbon approach, and not exclusively financial in the value chain approach), both help **prioritize** where to concentrate businesses' action in a context that reveals relationships, synergies and trade-offs.

2.2 Circularity within specific sectors and value chains

Circularity has a particularly large potential to be adopted in specific sectors and industries, and to contribute positively to reducing resource use and environmental impacts while also creating value. Sectors with a high material footprint and that have been prioritized for circularity (for example, by the Platform for Accelerating the Circular Economy – PACE) include construction, food systems ^[31], textiles ^[32], mobility, electronics ^[33] and **plastics**. For each of these sectors there are challenges across the industry that can be overcome by identifying key intervention points and different business innovations within each value chain. Some of these challenges include addressing inequality that derails the achievement of decent work for all women and men. Section 3 of this brief highlights three such sectors to provide insight into how their respective global value chains can become more circular.

The value chain has been described as comprising “all the activities that provide or receive value from designing, making, distributing, retailing and consuming a product (or providing the service that a product renders), including the extraction and provision of raw materials, as well as the activities that are involved with the textile after its useful service life. In this sense, the value chain covers all stages in a product's life, from supply of raw materials through to disposal after use, and encompasses the activities linked to value creation such as business models, investments and regulation. At all stages in the value chain, and in the transport of intermediate and finished products between the value chain stages, raw

materials and energy are required and emissions to the environment are produced. In addition, the value chain is also comprised of the actors undertaking the activities and the stakeholders that can influence the activities. The value chain thus incorporates not only the physical processes, such as farms and factories, but also the business models and the way products are designed, promoted and offered to consumers” ^[34].

Adopting a value chain approach makes it possible to identify where the greatest opportunity for improvement lies, which actions should be promoted to take advantage of these opportunities, what enabling conditions are needed and which stakeholders should lead such actions ^[34]. Through its evidence basis and participatory process, this approach guides actors in a holistic manner towards desired environmental, sustainability and circularity outcomes. The value chain approach consists of three steps:

1. understanding the value chain and identifying key hotspots
2. consolidating existing action and identifying opportunities to address identified hotspots
3. defining a common agenda and prioritizing action to address identified gaps ^[34].

For a number of sectors and value chains, one or more of these steps should be undertaken. As section 3 of this brief shows, such an approach will provide the necessary information to understand the role of an organization or a business in relation to identified intervention points and/or common agendas.

Specific case studies for businesses across the world can be found in several online repositories, including: [UNEP's circularity platform](#), the Ellen MacArthur Foundation [repository](#), Circular London's [case studies](#), The Circulars' [insights](#) and Circle Economy's [Knowledge Hub](#).

3 A pathway for businesses to achieve circularity

Taking concrete actions towards circularity may seem overwhelming and complex. One approach is to break down long-term goals into short, *transformative sprints* that deliver results, show the benefits of change and motivate organizations. This approach first requires opportunities for businesses to carry out such sprints and to define their circularity pathway.

This section provides a framework and guidance for businesses to adapt this process.

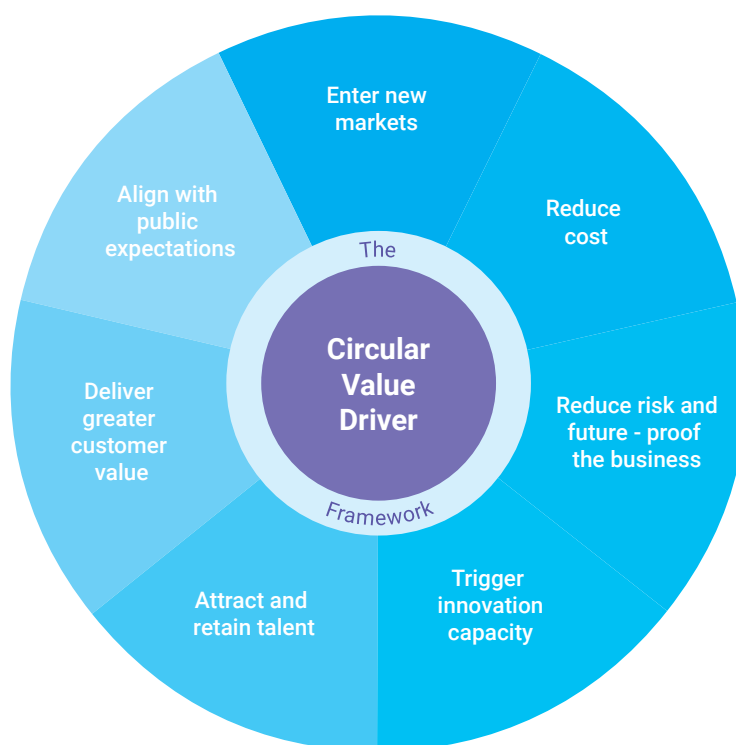
3.1 Building circularity into businesses

There are many ways to begin incorporating circularity into a business model. Several circular business model frameworks exist that include rich illustrations of practical examples, such as books and reports by Accenture [35], the Ellen MacArthur Foundation [36], the World Business Council for

Sustainable Development [37], the World Economic Forum [38] and UNEP [39]. **Figure 3** outlines a circular value driver framework developed by the Capital Equipment Coalition [40],¹ which illustrates the key drivers that businesses can consider when developing more circular models. These drivers are explored in more detail below.

Use the shift to a circular model to enter new markets or increase market share. Circular business models emphasize the need to maintain original product function for as long as possible. Reuse, refurbishment and remanufacturing extend a product's life cycle and can provide a viable alternative to new products for customers, potentially expanding existing customer relationships and leading to a wider range of new types of customers (those who are able to access the circular products and services). Circular business models can also expand markets by sparking innovation in the way that businesses meet customer demand, which can change how products

Figure 3: The circular value driver framework



¹ The Capital Equipment Coalition is a group of nine multinational companies that collaborate and exchange best practices. The framework is a PACE-affiliated project.

are designed. For example, “product-as-a-service” models (or product-service systems) can increase reliance on value retention processes ^[41], stimulate changes in product design to extend the life of key components or make manufacturers the product owner, rather than the product seller. Identifying which circular business model is most relevant for the business will create the context for new circular relationships with customers and suppliers.

Reduce cost. Shifting the focus to reusing products, components and materials through producer-managed closed-loop programmes can improve economic performance. Plotting out the current material and component flows within an existing business model shows where there are opportunities for materials and products to be reused and refurbished in instances where they may otherwise be wasted, and creates a benchmark for improvement. What was previously considered waste and a cost driver is now a valuable cost-saving resource.

Reduce risk and future-proof the business. Reducing the need for and the reliance on virgin materials and resources will lessen supplier dependency and reduce the risk of rising and volatile prices for materials used in products. Treating existing products and components as an alternate supply source can also lessen risks and the associated costs arising from value chain disruptions, though it may require changes in the development process of the product or service. Future-proofing the business model may result in shifting entirely to the use of refurbished, renewable or recycled materials. Ultimately, being prepared for future customer demand for circular products and services will increase the chances of winning business, especially as people seek out reliable and resilient products and services post-COVID-19. Risks to gender equality must also be considered and addressed as women play a vital role in managing biological resources. Increased gender equality could have wider benefits for economic and market development for businesses ^[42].

Trigger innovation. By specifically focusing on driving value through circular business models (for example, increased the lifespan and reuse of materials, repair and/or refurbishment opportunities and value retention) and identifying potential solutions, businesses can trigger creative new ideas on how to respond to key societal and market demands. This can spark organizational energy and creative opportunities for scaling up new circular solutions.

Attract and retain talent. A strong circular economy programme helps businesses to attract and retain talent, providing a sense of purpose for employees across roles and departments. It is helpful if a circular economy programme includes a gender-balanced workforce, ensuring that women are also well represented in decision-making and leadership roles. Research consistently shows that younger talent considers purpose-driven businesses with environmental sustainability initiatives to be more attractive places to work ^[43].

Deliver greater customer value. Circularity can build a strong and continuing relationship with customers. Solutions that extend product life cycles by providing repair, reuse and upgrade services help customers avoid disruptions and fulfil their needs while appealing to their desire for more affordable and environmentally sustainable consumption choices. Managing the customer relationship throughout a product’s full life cycle also builds trust, with shared know-how and strong take-back/recycling programmes offering greater security at the end of the product’s first useful life.

Align with public expectations. Businesses are facing increasing expectations from the public with respect to reducing their environmental impacts and promoting gender equality. Adopting environmentally sustainable circular economy strategies and practices provides a mechanism for reducing the use of virgin materials and increasing the use of renewable inputs. Such practices will reduce carbon emissions ^[44,45], biodiversity loss and pollution and increase a products’ sustainability over the long term, whether in the extraction of resources, production or use of products.

3.2 Case examples: the role of businesses in transitioning to a circular economy in different value chains

Transitioning to a fully circular economy within a generation will require urgent actions from all parts of society. Governments will need to provide direction and enabling conditions and consumers will need to make choices that encourage circularity. Meanwhile, businesses need to redesign their processes from the ground up to extend the useful life of their products, minimize the extraction of virgin resources and develop extended producer responsibility (EPR)

models that will maximize the value of their products over their lifetime. The following examples highlight what this might mean for food systems, electronics and construction.

3.2.1. Circularity in the food value chain

In the global food system, agriculture and food production generate 12 per cent of global greenhouse gas emissions^[30] and consume 21.3 billion tons^[27] of resources annually, while around one third of food produced globally is lost or wasted^[6]. Research also indicates that income, wealth and gender inequalities can translate into inequalities in future opportunities through unequal access to quality childhood nutrition^[6].

Redesigning food systems based on the principles of a circular economy can help address the global food waste challenge by making food value chains more environmentally sustainable and resource efficient^[46]. It can also result in more surplus food reaching those in need, helping to address problems of poor nutrition and inequitable access to food^[47].

Food products therefore appear to be good opportunities for applying circularity thinking, with food production and distribution businesses around the world already developing strategies to increase the circularity of their value chains. Improving food systems will also require investments in the circular economy that are resilient to future shocks that threaten food security^[48].

Understanding the food value chain

The global food value chain comprises the following stages:

1. the input industry (seeds, fertilizers, pesticides)
2. primary production (crops, livestock, fishing)
3. food processing and packaging (private food companies)
4. transport and logistics (trucks, shipping, air, refrigeration)
5. retail (supermarkets, markets)

6. food services (restaurants, cafes, takeaway, catering, cafeterias)
7. individual consumption (at home, away from home)
8. waste and disposal (landfill, recycling).

Businesses are key actors at most stages of the food value chain, ranging from farms to food processing companies to restaurants. Food companies, retail and food services are the most influential actors along the food value chain^[34]. The consolidation, vertical integration, market dynamics and shift from public to private governance of food systems has resulted in these actors (to a large degree) shaping both primary production and individual consumption. These businesses influence how food is produced, what type of food is produced and consumed and how much food is produced and consumed, which in turn influences the level of resource use and environmental impacts. Farms and fishing companies are also key actors along the food value chain, as most natural resource use and environmental impacts take place during primary production. However, the production practices of such actors depend heavily on interactions with actors upstream and downstream on the food value chain, which includes companies from whom producers purchase inputs and to whom they sell their produce.

The role of each type of business along the food value chain needs to be understood within the system in which it operates and in relation to key intervention points. Institutions that form and regulate food chains are also crucial in implementing the physical and regulatory infrastructure to influence food systems actors^[34]. Businesses' actions therefore form part of a holistic and common agenda for all actors along the value chain.

Shifting to a more circular food system

PACE^[31] and other collaborators have proposed steps to accelerate the transformation to a circular economy and to make it as impactful as possible. Drawing from these efforts, steps for businesses working in the food value chain include the following:

1. **Enable transitions to diets that consider planetary health.** In many countries around the world people are consuming unhealthy amounts of meat and calories^[49], with meals in restaurants possibly

containing more calories than the recommended guidance ^[50]. All businesses should take action to follow guidance and reduce their pack and portion sizes, along with relating the pricing of larger packs and portions compared with smaller versions. Businesses should also develop food products and dishes that have a better nutritional balance, contain more plant and less meat protein, and are a portion size more suited to a healthy diet. Optimizing portion sizes will also likely reduce food waste in the home and from hospitality and food service companies.

2. **Apply regenerative agricultural practices.** There is an opportunity for businesses and farmers to work together to change agricultural practices to those which improve soil health, reduce biodiversity loss and eliminate pollution. This will help improve carbon storage along with the water-holding capacity and nutrition of soils, thereby reducing the need for irrigation and fertilizer application. In the long term, such practices can reduce input costs, build new markets for nature-positive produce and improve long-term soil fertility.
3. **Increase the value of nature-positive food production for farmers.** Again, businesses can work with farmers to improve and derive value from more environmentally sustainable farming practices. This could include procuring food from regenerative sources and helping farmers derive value from the whole crop. It could also involve diverting any produce that does not meet the cosmetic standard for fresh sales towards being processed into high added value market products, such as chutneys, preserves and pre-prepared meals.
4. **Reduce food loss and waste by identifying hotspots.** Businesses can begin measuring and understanding food loss and waste within their own operations (including in transport and the cold chain) and within those of their suppliers and customers. This will help identify the best opportunities, i.e. “hotspots”, for reducing food loss and waste or finding added value markets for any surplus food (e.g. redistribute to those in need ^[51]). UNEP’S 2021 Food Waste Index Report suggests that consumer food waste is a priority in all countries, regardless of economic status ^[52].
5. **Consider where reducing food loss and waste impacts the SDGs agenda.** Tackling food waste should be considered as crucial for businesses

to deliver on several SDGs, including SDG 2 (zero hunger), SDG 3 (good health and well-being), SDG 12 (sustainable consumption and production), SDG 13 (climate action) and SDG 17 (partnerships for the goals). For example, redistributing surplus food helps increase food security for many and prevents food waste.

6. **Help consumers and other businesses reduce food loss and waste.** There is an opportunity for businesses to help consumers and other businesses reduce food waste in the home. Developing novel apps, innovative packaging solutions and low-cost measuring systems could be a huge market opportunity for businesses to help all citizens reduce the 570 Mt of food waste produced every year. ^[52] Companies are already helping with their customers around the world with clearer date labels, guidance on storage and resealable packs. Businesses could consider innovative pricing models to reduce food loss and waste and could install technology that repays savings made from reducing such waste ^[53]. Businesses could also identify new opportunities for co-products or from using the waste from other businesses as feedstock for new products such as making beer from wasted bread.
7. **Reframe food waste and by-products as valuable resources.** Businesses can identify lost and wasted food during production and processing and seek out opportunities to turn it into new products. Many businesses are already beginning to do this and databases of potential products, such as Refresh, exist that could help them make products from food that is currently lost or wasted.
8. **Facilitate the development of secondary markets.** Food waste can be converted into secondary products such as compost and digestate. The use of these can be limited by barriers including knowledge, cultures, infrastructure, lack of standards, legislation and finance.

Businesses can work with governments and nongovernmental organizations (NGOs) to set clear standards and develop knowledge on composting and the digestion of organic waste in their supply chains.
9. **Enable sanitary cycles for human waste.** Human waste can contain elements that are good for soil and plants. Microbes and bacteria can convert these elements into humus, which

provides nitrogen, phosphorus and potassium. However, human waste may also contain undesirable elements, including microplastics, pharmaceuticals, bacteria and disease-causing organisms, which could negatively impact ecosystem health. It is therefore important that appropriate pre-treatment (such as heat or anaerobic digestion) is used on human waste before it is applied on farmland. Businesses can invest in these opportunities and share knowledge across their supply chains.

10. Increase information accessibility and data utilization. To shift food value chains from overly intricate, inefficient and inequitable systems into resilient, regenerative ones first requires understanding the status quo ^[31]. Supply chains should be fully traceable and transparent so that everyone throughout the value chain, from farmers to consumers, can see where and how their food is grown and where it is consumed. WRAP has created food surplus and waste [measurement and reporting guidelines](#) for businesses and, together with the Institute of Grocery Distribution (IGD), developed the “target, measure, act” plan, which provides a structure to explore food waste issues within a company, while enabling businesses to work with their customers and suppliers to set realistic, measurable objectives based on their data availability. Businesses can use these tools to create systemic change.

3.2.2. Circularity in the electronics value chain

Electronic devices are now ubiquitous, with some estimates suggesting there were up to 50 billion Internet-connected devices around the world in 2020^[54]. The production, use and disposal of these goods produces more than 50 million tons of electronic waste (e-waste) annually. This rapidly growing waste stream is expected to produce 14 per cent of global greenhouse gas emissions by 2040 and grow to a total annual weight of 120 million tons by 2050. The raw materials in this waste have the potential to provide up to \$57 billion in value, but in 2019, only 17.4 per cent of e-waste was correctly recycled ^[55].

If electronic products are properly designed, produced, recovered, reused, refurbished, remanufactured and recycled as shown in Figure 4, the electronics industry can become almost fully circular. This

requires extending the lifetime of electronic products, shifting to more standardized designs (i.e. design for disassembly) that enable refurbishment and remanufacturing, ensuring that end-of-use products are collected and recycled at a high standard and ensuring that new products use more recycled and recyclable material^[33]. Consumers discard electronic products such as smartphones in the millions each year. Companies that manufacture ethical smartphones are finding new ways to maximize the value of resources used in phones.

In addition to improvements and the growth in recovery networks and designs for disassembly, refurbishment, remanufacturing and recycling infrastructure is needed in all countries where products are being used. There are also opportunities to extend the lifetime of electronic products with innovative business models that promote reuse or provide electronics as a service ^[56]. Greater reliance on cloud computing can further “dematerialize” electronic products and reduce the demand for new raw materials and by-products ^[57]. Collaborations between product designers, resource extractors, manufacturers, distributors, service providers, investors, consumers and recyclers can generate changes that prolong the life of electronics and ensure that they continue providing value at the end of their first useful life.

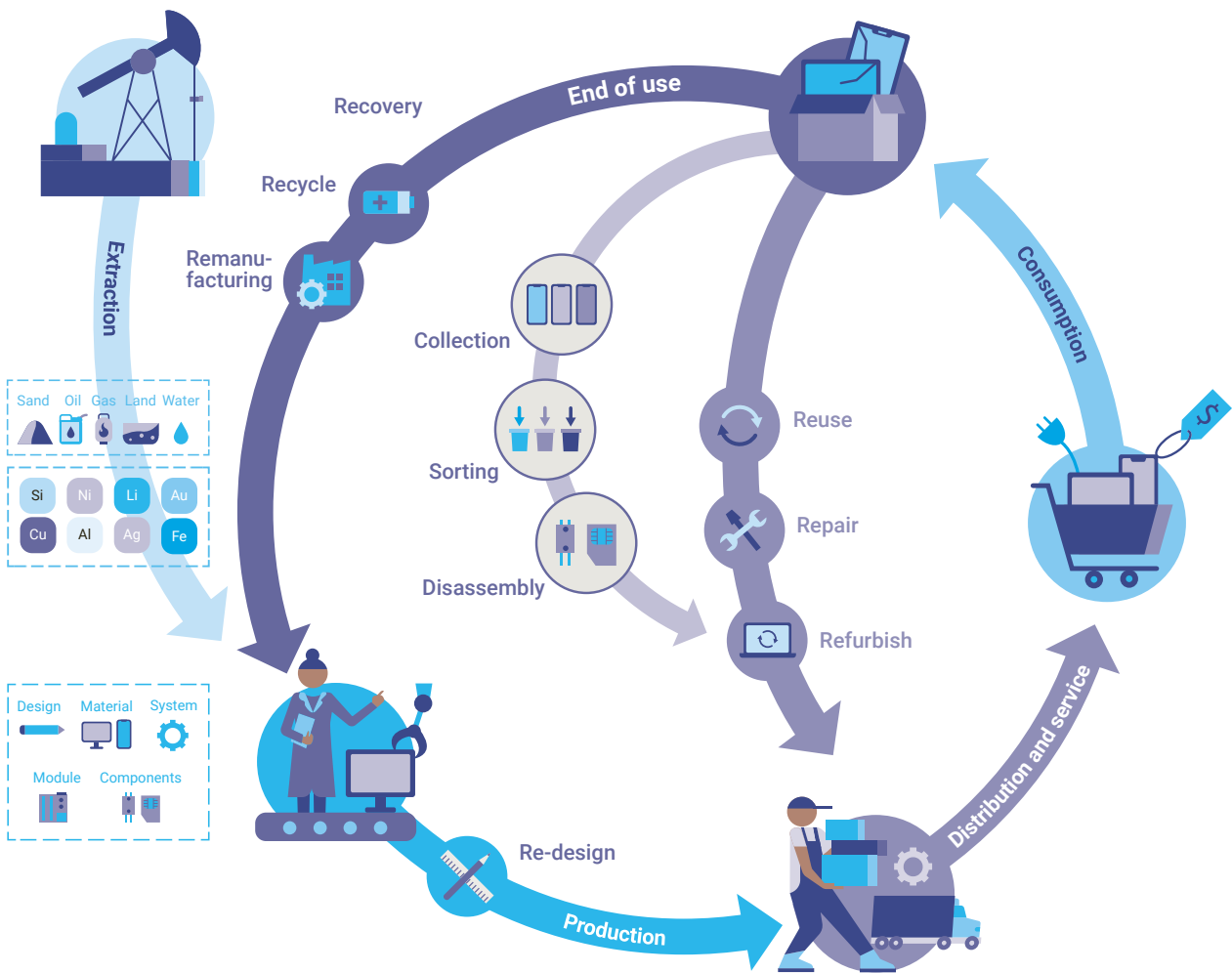
Understanding the electronics value chain

The global electronics value chain comprises the following stages:

1. raw material extraction (large mining companies and local small-scale artisanal miners)
2. manufacturing (design, materials process, components, modules and systems), researchers, innovators and financial institutes
3. distribution (service providers and logistics suppliers)
4. consumption (use and reuse)
5. end-of-use (collectors, formal and informal), recovery, sorting and disassembly, refurbishment, remanufacturing, recycling or disposal.

Businesses are key actors at all stages of the electronics value chain, ranging from raw material extraction and product manufacturing to e-waste

Figure 4: Circularity in electronics



collection and recycling, and therefore play a fundamental role in ensuring the shift to a circular and sustainable economy. Mining and refining companies (including artisanal miners and refiners) should reduce their environmental and social footprint by, for example, adhering to best practices and guiding principles that are developed by expert organizations. Product designers and producers should strive to create more durable products that are recyclable and/or easy and cost-effective to disassemble, remanufacture and repair. International brands should apply due diligence to their supply chains, eliminating informal mining where possible, recycling mining waste and ensuring appropriate labour and living standards for people employed across the entire value chain. Manufacturers, retailers and distributors should use distribution and sales networks to recover and collect e-waste and create incentives, take-back and buy-back schemes for end-of-life electronic products. Collection and recovery companies should ensure that all e-waste fractions are collected, irrespective of the

potential market value of its materials, and should also collaborate with informal waste collectors. Recyclers should treat e-waste fractions containing chemicals of concern in an environmentally responsible way to avoid hazardous emissions or discharges.

The trade of new and used products is also a key aspect to consider in the electronics value chain. EPR schemes must be established to ensure that electrical and electronics brands take responsibility for redesigning, refurbishing, remanufacturing, recycling and recovery needs in countries where manufacturing infrastructure is not available. In instances where EPR schemes are still not required or established, global electronics manufacturers should follow the principles and values of EPR laws in more advanced jurisdictions and take responsibility for their global value chains.

Collaboration between businesses and other stakeholders throughout the value chain is crucial for systemic change to happen in a coordinated way.

For example, national and subnational policies and international and regional conventions concerning the transboundary movement of hazardous waste are key to regulating e-waste trade activities. E-waste importers and exporters should ensure they comply with relevant regulations.

Transforming to a circular economy for electronics

Despite the massive global product sales networks of big electronics brands, there has been limited investment in infrastructure for handling the “end of use” of their products sold globally, especially in developing countries where manufacturing, remanufacturing and recycling and recovery capabilities do not exist.

PACE ^[33] and other initiatives have defined actions to help accelerate the transformation to a circular economy and to make it as impactful as possible. Drawing from these efforts, steps for electronics businesses include the following:

- 1. Incentivize and support product design for circularity.** Designing electronics products for longevity (making products durable, easy to upgrade or easy to repair), recyclability (easy to disassemble, with safe inputs) and with recycled material is the starting point for achieving all circular objectives. Too often circularity is not prioritized in the product development phase, as it can present new engineering challenges and be associated with higher costs and limited financial benefits for companies ^[58]. Brands are encouraged to design products that can be disassembled, taking into account the circular economy principles of redesign, product recovery, reuse, repair, refurbishment and remanufacturing, to ensure as much value as possible is retained at the product’s end of life. Producers are encouraged to transition to product-as-a-service business models.
- 2. Enable producers to increase their sourcing of recycled material.** Increasing the amount of recycled material in electronics manufacturing is essential for slowing down the demand for virgin materials in this growing industry. However, two issues are making it difficult for electronics manufacturers to increase their sourcing of secondary materials: first, secondary materials often cannot compete with virgin materials in terms of corporate social responsibility and legal

or quality assurance, due to a lack of transparency about the origin and content (contaminants, material grade, percentage of recycled content) of scrap material and a lack of certification processes; second, an unstable supply and lack of insight into supply forecasts discourage manufacturers from long-term sourcing decisions for recycled materials. Digital solutions, such as the Global Battery Alliance’s battery passport, can potentially increase the transparency and traceability of material flow in the electronics value chain ^[59].

- 3. Transform consumption modes to increase market demand for circular products and services.** Many businesses have ramped up their efforts in sustainable procurement and green information technology (IT) over the past decade. For example, the [Global Electronics Council](#) is supporting the integration of circularity criteria for electronics in sustainable procurement programmes, working with large-scale purchasers and manufacturers to develop a purchaser guide on circularity in IT procurement, as well as launching a global government call-to-action for sustainable procurement. These trends need to continue and increase in scale. For individual consumers and civil society to play an active role, businesses can participate in awareness-raising and information-sharing to influence consumption patterns and buying decisions.
- 4. Guide and support new business models for an environmental, financial and social triple-win.** New business models, including but not limited to product-as-a-service, may help extend the service life of a product or its components to match its technical life, through activities such as maintenance, upgrade, repair, refurbishment, remanufacturing and parts harvesting. These business models have the potential to internalize the economic benefits of designing for disassembly or longevity and also develop stronger customer relationships, as clear success stories have shown ^[35].
- 5. Encourage consumers to participate in bring-back schemes.** In the past decade, bring-back options for used electronics have increased and become more convenient, for example, via manufacturers’ rebuying programmes or take-back kiosks for smartphones (such as [ecoATM](#)) ^[60]. In Europe and other regions, producers and EPR organizations have a clear responsibility to

achieve collection and recovery targets regulated by the [Waste from Electrical and Electronic Equipment \(WEEE\) Directive](#). There are also inspiring examples from emerging markets and developing countries, where digital technology (such as an app managed by recyclers) is being used to facilitate hybrid bring-back and collection models that enable individuals to communicate when they have e-waste available for collection by informal collectors working in partnership with recyclers. Building on these positive examples, EPR organizations, manufacturers and recyclers need to build more targeted and innovative measures to encourage product bring-back.

6. **Set up effective product recovery and collection systems.** EPR is a common mechanism for financing end-of-use collection and recycling. Various projects are ongoing to extend the principle of producer responsibility to more countries. Some countries already have EPR legislation in place that is yet to be fully implemented. Public-private sector collaboration is key: governments, producers and producer responsibility organizations need to work together to develop collection mechanisms that suit the local context (for example, whether the collection is carried out by companies or the government). In areas where it may take time to fully deploy EPR schemes, other financing mechanisms should be used in the interim. Informal collectors can be highly effective and should be better integrated so that informally collected e-waste can enter formal recycling in a way that is safe and protects human rights ^[61].
7. **Enable efficiency and transparency in compliant and responsible transboundary movement.** The creation of more efficient reverse supply chains for environmentally sound management is needed, in compliance with the Basel Convention. For reverse logistics to play their role in a global circular economy, businesses, governments and Basel Convention competent authorities must work together to find pragmatic solutions that ensure protection from the potential hazards of e-waste mismanagement that comply with the Basel Convention, while also enabling responsible and efficient transboundary movement processes and exceeding the social and environmental outcomes currently achieved. This process can be enhanced by providing digital identification or other traceability mechanisms for each product.

8. **Strategically plan and install sorting, preprocessing and recycling operations.** Due to the increasing amount of e-waste, including domestic waste in developing countries, there is a need for more formal recovery and collection facilities globally. Furthermore, income from the growing recycling market should be distributed in a way that supports economic well-being in different locations. Sorting, preprocessing and recycling facilities are large capital investments that can be locked-in for decades, thus requiring economies of scale. Such facilities therefore need to be planned carefully with holistic considerations. Location, capacity and speciality are all important considerations.
9. **Increase incentives for investment in recovery, collection or recycling technologies and facilities.** In the current market, various factors are limiting the economic viability of recovery, collection or e-waste recycling, with incentives for investment in infrastructure and technological innovation, especially in sorting and preprocessing, significantly lacking. These factors include underdeveloped reverse logistics, increasing technical complexity, decreasing concentration of high-value materials and an unlevel field of competition. Nevertheless, some recyclers have been growing their businesses over the past few years, focusing on profitable areas such as precious metal recycling. In the area of preprocessing, high-precision dismantling, instead of shredding, can enable the recovery of more valuable materials, especially when products are designed for disassembly. To scale up recycling operations in general and increase investment in sorting and preprocessing technology in particular, economic incentives must be strengthened.
10. **Integrate and advance decent work in the transformation to a circular economy for electronics.** The electronics value chain is highly complex and involves various industry segments that are crucial for providing decent work, including virgin material mining, original design manufacturing, product recovery and e-waste collection and recycling. The transformation to a circular economy for electronics has the potential to facilitate the creation of environmentally sustainable businesses and more formal jobs.

Businesses have been joining efforts in committing to and auditing value chain partners' performance in the areas of labour, health and safety, the environment,

ethics and management systems, for example via the Responsible Business Alliance (RBA) or the Joint Audit Corporation (JAC) ^[33]. Such joint action of big brands and businesses is crucial for raising awareness and incorporating decent work in the shift to a circular economy. These efforts also increase the effectiveness of risk monitoring and avoid competitive pressure playing against individual efforts.

3.2.3. Circularity in the construction value chain

A focus on environmentally sustainable urban development is key to achieving a circular economy. Investments in city infrastructure are expected to grow exponentially in the coming decades as populations increase. For example, in South-East Asian cities, urban populations are expected to increase from 47 per cent in 2014 to 65 per cent in 2050 ^[62] catalysing a rapid rise of more than 200 smaller cities in the span of three decades (2015–2050). This implies a once-in-a-lifetime strategic opportunity to plan ahead for inclusive, environmentally sustainable, circular construction for future cities.

The construction of homes, offices, roads and other infrastructure annually consumes 38.3 billion tons of resources, including processed metals (such as steel) and minerals including sand, gravel and limestone ^[27]. This equates to around 40 per cent of total global annual resource use and 17 per cent ^[35] of global greenhouse gas emissions. The majority of these resources are fixed in buildings and roads for decades to come. Given these statistics, there is significant scope to reduce resource use throughout the construction value chain.

Understanding the construction value chain

The global construction value chain comprises the following stages:

1. financing (private investors, property developers, government stimulus, fiscal policy)
2. planning, design and commissioning (architects, urban planners, government authorities)
3. the production of construction materials (raw material extraction and processing, construction material production by manufacturers)

4. logistics (equipment, suppliers, wholesalers)
5. construction activities (construction companies, contractors, developers, architects)
6. the property market (property developers, banks and financial institutions, real estate brokers, buyers)
7. operations, maintenance and renovation (individuals, businesses, public facilities and service providers)
8. end-of-life (deconstruction, demolition, waste processing and disposal) ^[34].

Businesses are key actors at all stages of the construction value chain, and range from private investors to construction companies and real estate brokers. Investors and property developers, together with governments and financial institutions, are the most influential actors along the construction value chain. The key decisions made at the early stages of a construction project largely affect the movement along the rest of the value chain. Construction companies, mining companies and material manufacturers are also key actors along the construction value chain, as the majority of natural resource use and environmental impacts occur at the material production, construction and operations stages of the value chain, though these companies face several challenges and limitations in shifting to more environmentally sustainable practices. The construction value chain includes many other businesses, such as contractors, subcontractors, wholesalers, service providers, banks and real estate brokers, all of which should be involved in reducing natural resource use and the environmental impacts of the construction value chain.

The role of each type of business along the construction value chain needs to be understood within and across the entire value chain and in relation to possible key intervention points. For example, governments exert significant influence along the construction value chain, as regulators, planners and investors. Businesses will therefore need to consider their actions in relation to government actors and as part of a holistic and common agenda for all actors along the value chain.

Transitioning to a circular economy for construction

Unlike electronics and food, the definition of a common agenda for action along the construction value chain is currently under development, and an agreed pathway is therefore not yet available. Although this agenda for action is under development, it is possible to draw some insights from the value chain in terms of some of the key elements that should be considered when moving to a circular economy for construction. Notably, one of the main insights from an analysis of the construction value chain is that key decisions are made at the financing, planning and design stages. These decisions largely determine what type of construction is built and where, how much is being built, its design life and how it is built, thus affecting activity along the rest of the value chain ^[34].

Strategies for a circular economy in the construction sector should focus on designs that minimize material usage and focus on longevity, disassembly at end of first life and reuse and refurbishment potential, so that any change of use requires minimal resources.

- **Prioritize modular and flexible designs.** One aspect of a smart design is a modular and flexible approach, which enables buildings to be updated for new uses. Construction companies have an opportunity to develop novel building concepts that cater to the increasing demand for such modular construction.
- **Select regenerative, renewable and low carbon materials.** The choice of construction materials has a significant influence on the building's environmental impact and carbon footprint. The use of regenerative and renewable materials, such as bio-based alternatives to concrete, can provide opportunities to lower buildings' carbon footprints and help develop new construction methods with more flexible designs.
- **Promote novel production technologies.** As new (for example, low carbon) or reused materials become available, new technologies will likely be required to use these in the production of construction materials. Examples include 3D printers that can produce specific outputs using less materials and/or create less waste.
- **Explore digitalization opportunities.** The construction sector has witnessed an increasing trend towards digitalization, for example, through the use of design and construction simulation to optimize the construction process and allow the planning and logistics process to cause less waste. Additionally, systems such as material passports increase understanding of the type and quantity of materials used in buildings and can even include dismantling procedures so that their dismantling and reuse can be optimized at the end of their useful life.
- **Enable harvesting and decommissioning.** In the circular construction sector, the entire lifespan of a building should be taken into account and drive closer cooperation across different actors in the value chain. The costs and benefits of a longer lifespan should be divided fairly across the cooperating partners. The cost and time for each partner can be monitored during all design, build, finance, maintain, operate and demolish phases to enable the allocation of benefits.
- **Repurpose and refurbish existing buildings.** Vacant buildings have significant embedded material and energy costs. Buildings can be temporarily vacant for various reasons. For office owners and real estate companies this presents an opportunity for buildings to be redesigned so that they are more adaptable to new uses and can be optimized for other purposes. Major renovation projects show that solid business cases support refurbishing of existing buildings and housing which are attractive to new occupants.
- **Encourage advanced waste separation.** By separating construction and demolition waste, materials can be retrieved for high-value reuse. Hybrid waste management systems, which combine individual and central sorting methods, can lead to better business cases. Business opportunities may arise for companies that can offer processes and technologies to separate construction and demolition waste. New technologies, such as [SmartCrusher technology](#), make it possible to separate concrete into sand, gravel and cement, which increases the value of the individual materials due to higher-value recycling and reuse possibilities.
- **Foster better reuse.** When materials are better separated at the demolition site or a central facility, businesses can use these high-value residue streams for new purposes. Opportunities include the use of mineral fractions to create new high-

value construction materials that can replace virgin materials. No uncontaminated construction material should be discarded.

- **Create brokerages and marketplaces.** In the circular economy the task of matching the supply and demand of secondary materials may become onerous. Heterogenous waste flows need to be sorted, possibly stored and then matched with the demand. For businesses this presents opportunities to play a brokerage role, for example, through (online) marketplaces.
- **Use advanced logistics.** Brokerages and marketplaces alone may be insufficient and should be complemented by advanced logistics to collect and deliver materials where needed. Construction materials are usually provided in large volumes and require time-specific deliveries to optimize the construction process. More refined waste separation that produces smaller and more varied resource streams may require reverse logistics to supply different locations. Business opportunities exist to cater to these increased (reverse) logistics needs.

4 Conclusion

Circular models that extend a product's life or provide access to services (for example, mobility, entertainment) are likely to become increasingly attractive to many more people. A circular economic model can help increase profits by offering a way to deliver customer needs using less resources. It also presents the opportunity for achieving a "near-zero-waste" economy in 30 years' time, with a dramatically lower carbon pathway that allows businesses to "build forward better".

The analysis presented in this brief shows there is a need for businesses to act, rather than continuing to assume that old business models will remain profitable. Crucial to transforming the global economy towards full circularity is an understanding of how it can be achieved while still maintaining business value. This brief first examined the mass-value-carbon and value chain approaches, before considering sectors that have shown promise in transforming towards circularity. These included key opportunities within food systems, the electronics value chain and the construction value chain, though examples also exist within many other sectors. The examples included are not the only way that businesses can become more resource efficient and circular, but they do present solutions that have been used successfully.

Looking ahead, businesses must examine the key value drivers of extending product life and designing for disassembly, reuse and remanufacturing that can help identify pathways to move towards fully circular models. Entering new markets, reducing costs, future-proofing businesses, triggering innovation capacity and aligning with public expectations are all incentives in the transformation towards circularity. Businesses can begin this shift by engaging customers and suppliers in co-designing and testing circular solutions, and by working in an iterative way before considering a full move towards holistic and circular business models.

With this approach, businesses can use the circular economy as a new framework for driving change that brings benefits to them, their customers, their employees and their investors, while also preventing harm to the planet. Businesses can also choose to be gender smart by working with other stakeholders

such as governments to provide women and youth an opportunity to work in these new circular economy sectors ^[63]. It additionally offers a way of delivering value and greater well-being for more people and helps to address the critical environmental issues faced by all. Circularity also means greater collaboration and wider system-level thinking, where the right social, regulatory and digital infrastructure can expand the scope and speed of these transitions.

Arguably, the circular economy is not new ^[64]. Circular economy concepts are often embedded in the economic models of developing countries, as well as the traditions of previous generations and indigenous cultures – making more from what we have, valuing nature and precious resources and repairing and repurposing items to give them a new life ^[64]. Current environmental damage suggests that these values may need repurposing for the twenty-first century. Businesses are increasingly expected to adopt circular models, and to work more closely in partnerships across sectors and industries to build new and more circular value chains. New government policies on circularity are likely to aid this process, with the investor community expected to seek new models that deliver what citizens need with a dramatically lower environmental impact. Changing consumer demands are also likely to be an important driver of innovation and change. For example, the TV programme *Blue Planet II* seems to have impacted citizens' attitude towards plastic pollution, driving a significant shift towards phasing out single-use plastic products, increasing the use of recycled material in plastic products and stimulating the use of reusable products in everything from water, hot drinks and detergents worldwide ^[65].

In developing their strategies, businesses must consider the risks and costs of inaction. Continuing to provide products and services with high environmental impacts is unlikely to be welcomed by policymakers, financiers, regulators and citizens around the world, who are increasingly recognizing the impact of climate change, air and water pollution and biodiversity loss. Failing to recognize the risk of not:

- addressing the resource use and environmental impact of products,

- initiating a transition towards nature-positive approaches and net-zero carbon emissions, or,
- helping to build a near-zero-waste world

may therefore be riskier to businesses than taking action and innovating on these key issues ^[66]. Embracing the move to full circularity is one way that businesses can act to manage this risk now.

Overall, successful businesses of the future are likely to be those that deliver excellent value with minimal resource and environmental costs, while also moving rapidly towards nature-positive solutions and net-zero carbon emissions. Applying circularity principles can ultimately help achieve this goal. Incremental changes in the environmental impact of products and services will not deliver the net-zero-carbon, biodiverse, pollution-free world that many policymakers, investors

and citizens say they increasingly want and need. Transforming rapidly towards making products and offering services that do not pollute, are waste-free, help restore biodiversity and are zero carbon is a more commercially-successful strategy for all businesses, and one that businesses are increasingly showing is deliverable within a generation. This should be our collective target. It is time to make circularity the goal for all business.

References

A link to all of the references can be found [here](#).

Glossary

A link to the glossary can be found [here](#).