

PATHWAY // PRODUCTS & MATERIALS

**WE CAN
MAKE
THINGS,
BETTER**

**THIS PATHWAY IS ABOUT "THINGS":
THE GOODS PEOPLE USE TO FULFILL THEIR
NEEDS AND ASPIRATIONS, AND THE ASSETS
& MATERIALS BUSINESSES NEED TO
OPERATE AND GROW.**

It spans the entire product life cycle, from extraction and processing of raw materials to product manufacturing, distribution and sale, to end-of-life processing and recovery.



OUR 2050 VISION

FOR PRODUCTS & MATERIALS

**RESOURCE USE IS
OPTIMIZED TO MEET
SOCIETY'S NEEDS
WHILE ALLOWING
THE SYSTEMS THAT
PROVIDE RESOURCES
TO REGENERATE**

THE ECONOMY IS CIRCULAR

The circular economy principles of reduce, reuse, repair, refurbish and recycle have been embraced by individuals, businesses and governments. Goods and services are made universally available in a manner that neither exceeds the planet's capacity to renew resources nor pollutes the natural environment. New policies, business models, industrial ecosystems and diversified materials have arisen to support the circular economy, generating significant market value as well as a wealth of skills development and employment opportunities across both developed and emerging economies.

PRODUCTS ARE CIRCULAR BY DESIGN

Companies have designed out waste and made closed loops a reality across value chains. Virgin, non-renewable materials consumption has dramatically declined. Products are

developed without harmful substances and are designed to maximize utility whether through extensive reuse, repair or repurposing, before finally being recycled or biodegraded. Across all sectors, traceable, renewable and recycled materials are key inputs into manufacturing and re-manufacturing processes.

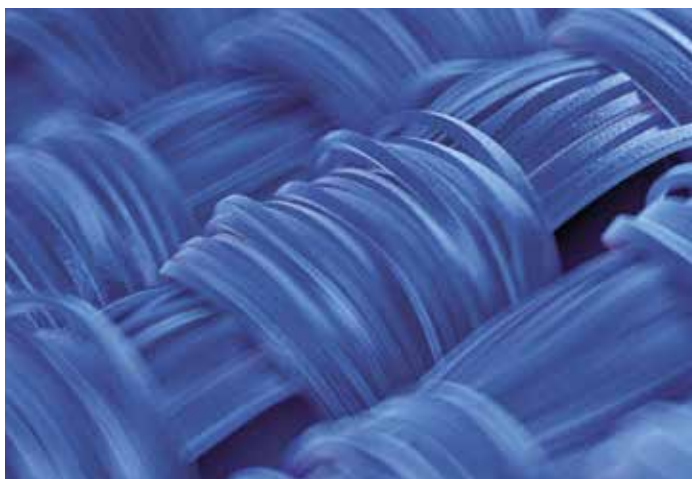
**PRODUCT LIFE CYCLES MAXIMIZE
VALUE AND PROTECT NATURE**

All materials are recognized as valuable resources and are carefully managed to ensure that their full economic potential is maximized before being returned safely to biological and technical cycles. An effective and consistent global recycling infrastructure ensures that all products can be efficiently collected and transformed back into valuable raw materials at the end of their life, without leaking into the natural environment. Historic waste has been cleaned up and natural environments restored wherever possible.

**THE CIRCULAR ECONOMY LEAVES
NO ONE BEHIND**

Sharing, service and product life extension business models have contributed to greatly improved access to essential products and materials at affordable prices all over the world. Companies take a people-centric approach to the integration of new business models and production technologies, ensuring that they engage with workers and communities, and empower them to benefit from emerging developments, while continued opportunities for livelihoods and entrepreneurship are available. Business and governments continually work to ensure that human rights are protected and respected and companies support the health, safety and wellbeing of workers everywhere.

KEY TRANSITIONS



CIRCULAR BUSINESS MODELS BECOME THE NORM, CREATING ECONOMIC, SOCIAL AND ENVIRONMENTAL OPPORTUNITIES

- Governments work with businesses and other stakeholders to develop regulatory structures that maximize long-term value. This is done through a combination of frameworks that encourage recycled and renewable materials, maximizing product lifespans and recycling. This creates a market that prefers secondary materials and only turns to non-renewable, primary materials when no alternatives are available, in turn, prompting the widespread normalization of circular models.
- Companies innovate and bring to scale new technologies and business models, creating substantial new markets that spring from and enhance the circular economy.
- Investment enables developing countries to make significant advances in digital and materials innovation, and to embed sustainable production and consumption at the heart of their economies.
- The emergence of a more circular and service-based economy creates a wide range of jobs across industrial sectors globally. Job losses that result from the circular transition are managed in an inclusive and responsible manner with workers being reskilled and upskilled accordingly.
- A thriving circular economy provides workers and businesses with greater opportunity to transition from the informal to the formal economy, while respecting workers' rights and ensuring lasting opportunities for income security, livelihoods and entrepreneurship.

A CIRCULAR BIOECONOMY PLAYS AN INCREASINGLY CENTRAL ROLE IN GLOBAL ECONOMIC ACTIVITY

- A circular bioeconomy plays an important role in reinforcing a circular, low-carbon economy, contributing to efforts to mitigate climate change while also providing materials to satisfy society's needs for food, feed products and energy.
- All industries (including construction, chemicals and textile sectors) seize opportunities to complement or substitute non-renewable and fossil-based materials with bio-based resources that are renewable and sustainably managed.
- Biological resources are recovered and reused wherever possible. At the point where these resources can no longer be reintroduced into the economy, they are safely returned to nature as nutrients.
- Wood and fiber products are sourced from healthy, working forests that also provide multiple benefits such as carbon storage, clean air and water, natural habitats and rural livelihoods.

GOODS AND SERVICES MEET THE NEEDS OF COMMUNITIES AROUND THE WORLD WHILE LEAVING NO ONE BEHIND

- Circular models of production along value chains ensure that the needs of a growing global population are met at the drastically lower rates of per capita primary resource use needed if our activities are to remain within planetary boundaries.
- Everyday products are made more accessible and affordable through resale, renting and service models, breaking down traditional barriers to ownership and allowing the shared use of idle assets. This allows people to improve their quality of life, sustainably.
- Businesses, governments and multi-stakeholder platforms work to ensure that human rights are protected and respected throughout global supply chains, collaborating to eradicate forced and child labor, modern slavery and human trafficking.
- The shift to a more circular economy and the widespread adoption of emerging business models and technologies occur in a people-centric fashion, ensuring that rights are respected and that workers are engaged and empowered to benefit from transformation.

MATERIAL COLLECTION AND RECOVERY IMPROVES EXPONENTIALLY

- Laws against pollution and waste in the environment, and taxes on landfills, become routinely and consistently enforced, strengthening the case for reuse, recycling and composting.
- The food, feed, natural materials and energy products that make up the bioeconomy are produced to be reintroduced into a circular system through cascading uses, reprocessing, and eventually composting and anaerobic digestion. These cycles are also designed to regenerate living systems, such as soil.
- Solutions such as take-back schemes and reverse logistics become business as usual. A range of stakeholders including manufacturers, retailers, government agencies and local municipalities support the collection of used products, materials and packaging, and their reintroduction into the manufacturing cycle. The volume of materials collected versus sold reaches near parity.
- Recycling is made easier for consumers. Consistent information on how to deal with different products and materials at the end-of-use is made universally available.
- Strong collaboration develops among end-of-use logistics and material processing firms. Processing and manufacturing companies work increasingly closely with recovery companies to secure competitive advantage through high-quality supply security and reduced production costs.

THE FLOW OF WASTE INTO THE ENVIRONMENT IS ENDED AND NATURE IS RESTORED

- Waste systems transform at national, regional and local levels. Cross-sector collaboration, investment and standardization drive enhanced stewardship of materials and products – such as plastics, electronics, textiles, construction materials, automotive components and household goods – at different stages of their life cycle and value chain.
- Innovations emerge that help to advance and bring to scale technologies that make recycling and recovering materials easier. Consistently designed infrastructure is established to collect, sort, manage and recycle household and municipal waste, especially in rapidly developing parts of the world. This significantly reduces and eventually ends the flow of waste into the natural environment.
- Products that contain plastics and other materials that cannot be collected and recycled are designed to completely biodegrade without harmful materials, as a last resort.
- Large-scale global clean-up efforts mobilize to remove plastic and other waste that has found its way into the environment. Waste that is collected from the environment re-enters the economy.

PEOPLE EMBRACE CONSUMPTION THAT IS CIRCULAR, REGENERATIVE AND SOCIALLY RESPONSIBLE

- Society reassesses its relationship with consumption. Responsible consumption and return behaviors are increasingly valued and rewarded through policy-driven incentives and pricing models.
- Consumer behavior shifts toward circular models of consumption as awareness grows of increasing resource scarcity and the environmental impacts of waste. Circular and sharing models become more available, affordable, practical and desirable across a broad range of products and services. Consumers come to value access more than ownership and increasingly accept repaired, refurbished and second-hand products.
- Business plays a significant role in educating and driving consumer appetite for circular economy products and responsible consumption patterns. Companies invest in innovation to make sustainable lifestyles possible, aspirational, affordable and accessible.
- Relevant information about the provenance and sustainability performance of products across supply chains becomes both widely available and comparable, enabling more sustainable purchasing decisions.
- Enhanced consumer awareness of the environmental impacts of packaging waste leakage informs behavior change, while business continually explores innovative sustainable packaging solutions.





TECHNOLOGY ADVANCES ARE DEPLOYED RESPONSIBLY AND DRIVE IMPROVED EFFICIENCY AND TRANSPARENCY ACROSS VALUE CHAINS

- Advances in robotics, artificial intelligence and machine learning make it possible for machines to work alongside humans, driving economic and resource efficiency gains and creating value at each stage of the manufacturing process.
- Technological advances make recycling, repair, remanufacturing and collection processes safer and more automated, leading to more efficient recycling yields and enabling recovery of previously unrecovered materials.
- Technology solutions also transform supply chain transparency. Materials, products and packaging are tracked across value chains using cloud-based, distributed ledgers and other digital technologies. These enable the monitoring and management of supply chain risks and potential adverse human rights impacts, promoting responsibility and resilience, and supporting the recycling and re-use of materials. Technology supports enhanced transparency and accountability for the environmental and social impact of products throughout their life cycles.

RELEVANT SDGs



- 6.3** By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.
- 6.4** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- 7.3** By 2030, double the global rate of improvement in energy efficiency.
- 8.4** Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead.
- 8.5** By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.
- 8.7** Take immediate and effective measures to eradicate forced labor, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labor, including recruitment and use of child soldiers, and by 2025 end child labor in all its forms.
- 8.8** Protect labor rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment.
- 9.4** By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally-sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
- 12.2** By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.3** By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.
- 12.4** By 2020, achieve the environmentally-sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.
- 12.5** By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.
- 12.8** By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.
- 13.1** Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
- 13.2** Integrate climate change measures into national policies, strategies and planning.
- 13.3** Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning
- 14.1** By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.
- 15.2** By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.
- 15.5** Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

PRODUCTS & MATERIALS

ACTION AREAS FOR BUSINESS 2020 – 2030

01

Develop new business models to ensure product life cycles are extended for as long as possible, prioritizing maintenance and refurbishment where appropriate.

02

Integrate circularity and next-life use into all aspects of business strategy from product design to go-to-market, after-sales service and end-of-life collection. Map and identify value chain gaps in capabilities related to closing circular loops, and work to address them internally and together with partners.

03

Invest in the innovation and adoption of sustainable and circular biological products that store carbon and substitute non-renewable and fossil-based materials, while also setting ambitious, science-informed goals that contribute to nature recovery.

04

Account for the true value of products and materials by factoring in natural, social and human capital costs. Update accounting principles to encourage longer life.

05

Establish consensus on and uptake of a common set of definitions and metrics to enhance decision-making, collaboration and disclosure of circular performance and linear risk.

06

Employ a people-centric approach to innovation, investing in the continual upskilling, reskilling and empowerment of workers in the face of emerging business models and new technologies.

07

Engage in positive advocacy with policymakers to create a playing field that ultimately favors secondary materials.

08

Develop and improve internal policies and systems for human rights due diligence as set out by the UN Guiding Principles on Business and Human Rights and **ensure human rights are respected** across all global value chains.

09

Drive collaborative efforts that cut across value chains to invest in improved local capacity and infrastructure for the collection and processing of materials necessary to support circular business models, particularly in developing countries.

10

Collaborate on campaigns to drive global consumer behavior change, targeting enhanced acceptance and preference for durability and serviceability as well as refurbished and recycled products while also making recycling as easy and convenient as possible.