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CEO GUIDE TO THE CIRCULAR ECONOMY

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The future of business is circular

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It's time to get into the circular mindset

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FOREWORD

The circular economy is a $4.5 trillion opportunity.[1]
It presents huge potential for global economic growth and will also accelerate society towards a sustainable future.

The concept of the circular economy isn't widely understood by business. Mobilizing this opportunity will remain a challenge until many more business leaders adopt a **"circular mindset."**

This is the biggest opportunity to transform production and consumption since the First Industrial Revolution 250 years ago. By unleashing circular innovation, we can boost the global economy's resilience, support people and communities around the world and help fulfill the Paris Agreement and the UN Sustainable Development Goals.

The circular economy is a new way of looking at the relationships between markets, customers and natural resources

It leverages innovative new business models and disruptive technologies to transform the linear economic model

By moving towards the circular economy, business can capture significant benefits, including:

- increased growth;
- innovation and competitive advantage;
- cost reduction;
- reduced energy consumption and CO_2 emissions;
- increased supply chain and resource security.

Strong and visionary CEO leadership is essential for implementing the circular economy and for reaching new levels of sustainable economic growth.

WHAT IS THE **CIRCULAR ECONOMY?**

Businesses are keen to take action, but aren't sure where or how to start. **This guide is a call to action that will help you get into a circular mindset.**

The circular economy moves away from the traditional "take-make-dispose" economic model to one that is regenerative by design. The goal is to retain as much value as possible from resources, products, parts and materials to create a system that allows for long life, optimal reuse, refurbishment, remanufacturing and recycling.[2]

The circular economy is a $4.5 trillion business opportunity

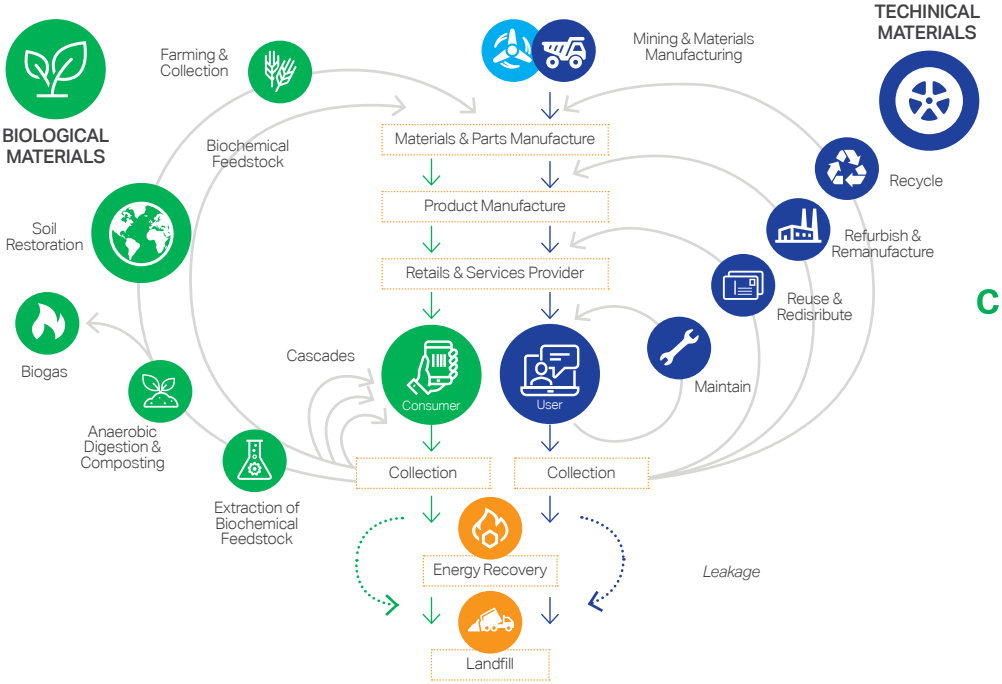
Companies who implement the circular economy concentrate on rethinking products and services using principles based on durability, renewability, reuse, repair, replacement, upgrades, refurbishment and reduced material use.

By applying these principles, companies can design out waste, increase resource productivity and decouple growth from natural resource consumption.

VEOLIA

Veolia, a global leader in optimized resource management, revolutionized its plastics strategy to guarantee the quality of recycled plastics to meet clients' specifications and to be comparable to virgin materials. Veolia implemented Liquisort© – an advanced sorting technology – for PP materials and a patented process to produce CleanPET©, high-quality free flowing recycled PET flakes that can be used to produce new bottles. Veolia establishes strong partnerships with companies to improve recyclability of products and utilization of secondary raw materials by coming in early in the design phase.

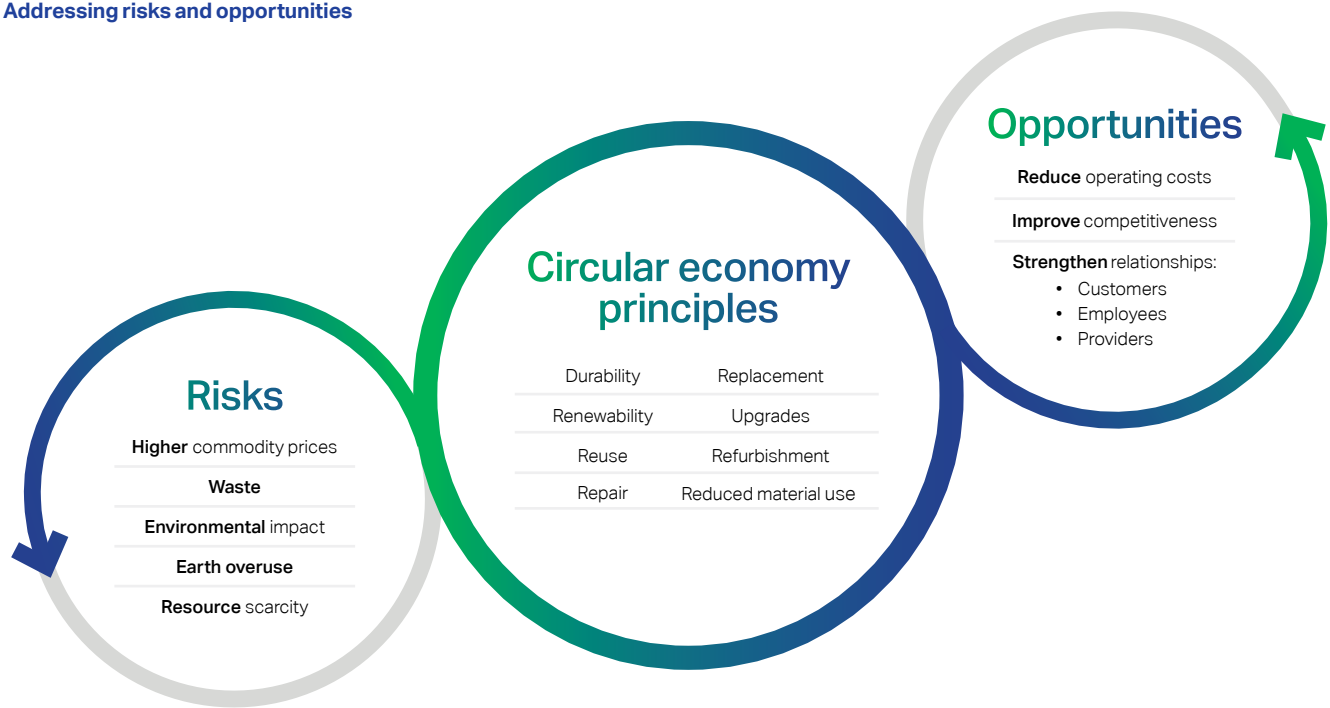
Figure 1:
Outline of the circular economy*



Transitioning to the circular economy will catalyze the most transformational economic, social and environmental changes since the First Industrial Revolution

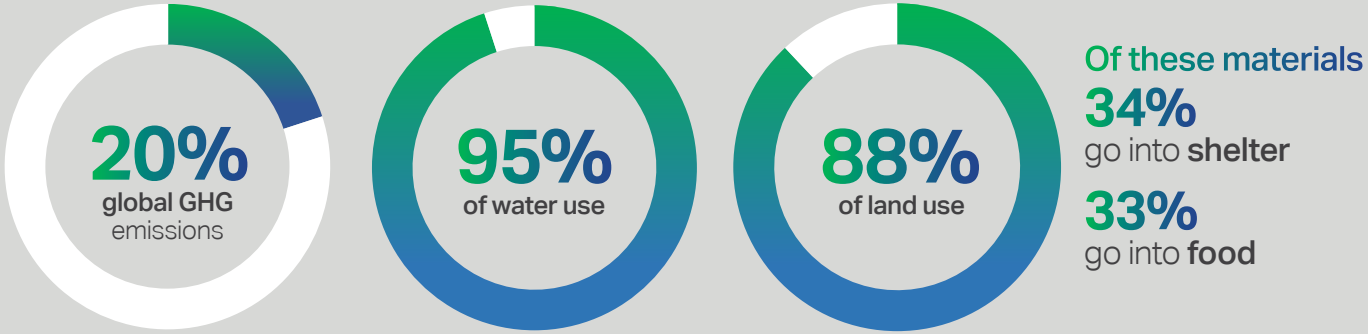
*Adapted from EMF https://www.ellenmacarthurfoundation.org/

Figure 2:
Addressing risks and opportunities



Eight materials are responsible for:

Steel, aluminium, plastic, cement, glass, wood, primary crops and cattle.



Of these materials

34%
go into **shelter**

33%
go into **food**

Implementing circular economy measures in these areas can help address climate change, water and land use challenges

Source: Circular economy: environmental benefits., Ecofys & WBCSD

WHY COMPANIES ARE MOVING TOWARDS THE CIRCULAR ECONOMY

Risk mitigation

Resource scarcity and fluctuating commodity prices

Population and economic growth drive resource demand and consumption.[4] Over the last 40 years, annual extraction of materials has more than tripled.[5]

As the population grows and more consumers enter the middle class, **the total demand for resources is expected to reach 130 billion tons by 2050, up from 50 billion in 2014. That's an overuse of the Earth's total capacity by more than 400%.**[6]

Even factoring in run-of-the-mill technological improvements and resource efficiency, we'll still be overusing around 40 billion tons of natural resources every year by 2050.[7]

Resource price volatility is the new normal

The scale and speed of demand growth, coupled with short-term but frequent price fluctuations, could lead to higher long-term prices and greater supply insecurity.

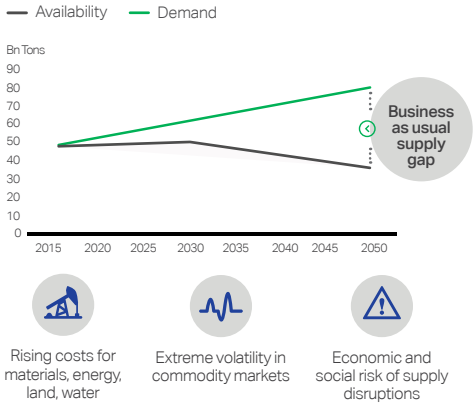
The risks of inaction are high

DANONE

Danone's ambition on packaging is to co-build the circular economy by creating a second-life for all plastics. To support this pledge, the Danone Ecosystem Fund is developing inclusive and sustainable business models: for instance, the Novo Ciclo Project is training waste pickers in Brazil and helps them set up waste management centers, as well as sale and resale cooperatives. At the same time, the project is allowing Danone Brazil to develop its rPET industry.

Solvay, a specialty chemical company, uses its Sustainable Portfolio Management tool to address social and environmental risks and opportunities across value chains and to steer its portfolio towards a circular economy. So far, 100% of Solvay's Group revenue is future-proofed because risks have been systematically identified, and 30% is delivering circular product solutions by moving towards increased durability, material efficiency and renewable inputs. These solutions also deliver better economic value to Solvay, and have higher growth- 9% year-on-year, instead of the 3% for "business as usual" solutions.

Figure 3:
The gap between sustainable resource availability and demand
Resource supply/demand imbalance 2015-2050



Source: Accenture Strategy, "Circular Advantage."

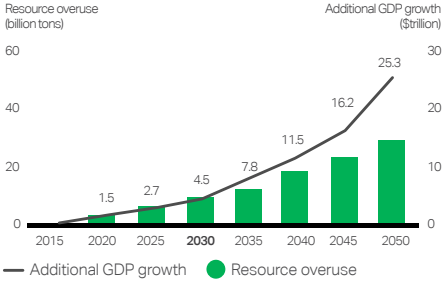
International Flavors & Fragrances Inc., a leading innovator of sensory experiences that move the world, integrated circular economy thinking into its sustainability strategy and vision to lead positive transformational changes toward a regenerative, healthy and abundant world. Driven by this new approach, they pioneered PuraVita™, a bio-based, degradable fragrance, manufactured with 100 % clean electricity, minimal waste and water, creating the world's first ever Cradle to Cradle Certified® fragrance. The principles learned are now being embedded in IFF's approach to its other products and processes.

Opportunities

GDP Growth

Transitioning to a circular economy can unlock global GDP growth of $4.5 trillion by 2030 and will enhance the resilience of global economies.

Figure 4:
More GDP with fewer resources



Source: *"Waste to Wealth,"* Accenture Strategy 2015

Policy readiness

Moving towards a circular economy can help companies get ahead of upcoming policy, regulation, pricing of externalities and potential shifts in taxation models.

Companies delivering economic and sustainability benefits through successful circular transformations serve as proof points for policy makers, and encourage them to make new policies that level the playing field.

Circular economy measures can help achieve the Paris Climate Agreement and the UN Sustainable Development Goals.

Unilever

Hundreds of billions of plastic sachets are thrown away globally every year. To tackle this problem, **Unilever** has developed a new technology, CreaSolv® Process, with the Fraunhofer Institute for Process Engineering and Packaging IVV and is inspired by an innovation used to recycle TV sets. During the process, the plastic is recovered from the sachet, and the plastic is then used to create new sachets for Unilever products - creating a full circular economy approach.

Business and societal benefits

Job creation: through circular principles, up to 500,000 additional jobs created in France alone.[8]

Reduced energy consumption: circular economy solutions could offer a 37% reduction in energy consumption in the EU.[9]

Reduced greenhouse gas emissions: in India, implementing circular solutions presents the opportunity to reduce emissions by about 40%.[10]

Increased resource security: sustainably managed forests ensure long-term availability of renewable resources for producing bio-based materials;

applying circular economy principles to water management can contribute to greatly reducing water stress in key regions.[11]

Innovation driver: the potential revenue of selected circular economy business models for automotive companies could more than double by 2030, growing by $400-600 billion.[12]

Adopting a "circular mindset" captures new economic opportunities to future-proof your business

storaenso

Stora Enso invested €32 million to transform its pulp-based **Sunila Mill** in Finland into the world's first integrated lignin extraction plant, which produces dry kraft lignin and uses it to directly fire its lime kilns in place of fossil-based fuels. Lignin has many potential uses, including replacing phenols used in adhesive resins for plywood and veneer applications. By utilizing more of the incoming wood, Stora Enso is improving resource efficiency and can generate a new revenue stream by selling lignin to external customers.

HOW CAN **COMPANIES GET STARTED?**

Accenture identified five business models and three technologies that will help you implement the circular economy.

FIVE BUSINESS MODELS:

CIRCULAR SUPPLIES: Use renewable energy and bio-based or fully recyclable inputs

RESOURCE RECOVERY: Recover useful resources out of materials, by-products or waste

PRODUCT LIFE-EXTENSION: Extend product lifecycles by repairing, upgrading and reselling, as well as through innovation and product design

SHARING PLATFORM: Connect product users to one another and encourage shared use, access or ownership to increase product use

PRODUCTS AS A SERVICE: Move away from product ownership and offer customers paid access to products, allowing companies to retain the benefits of circular resource productivity or ownership to increase product use

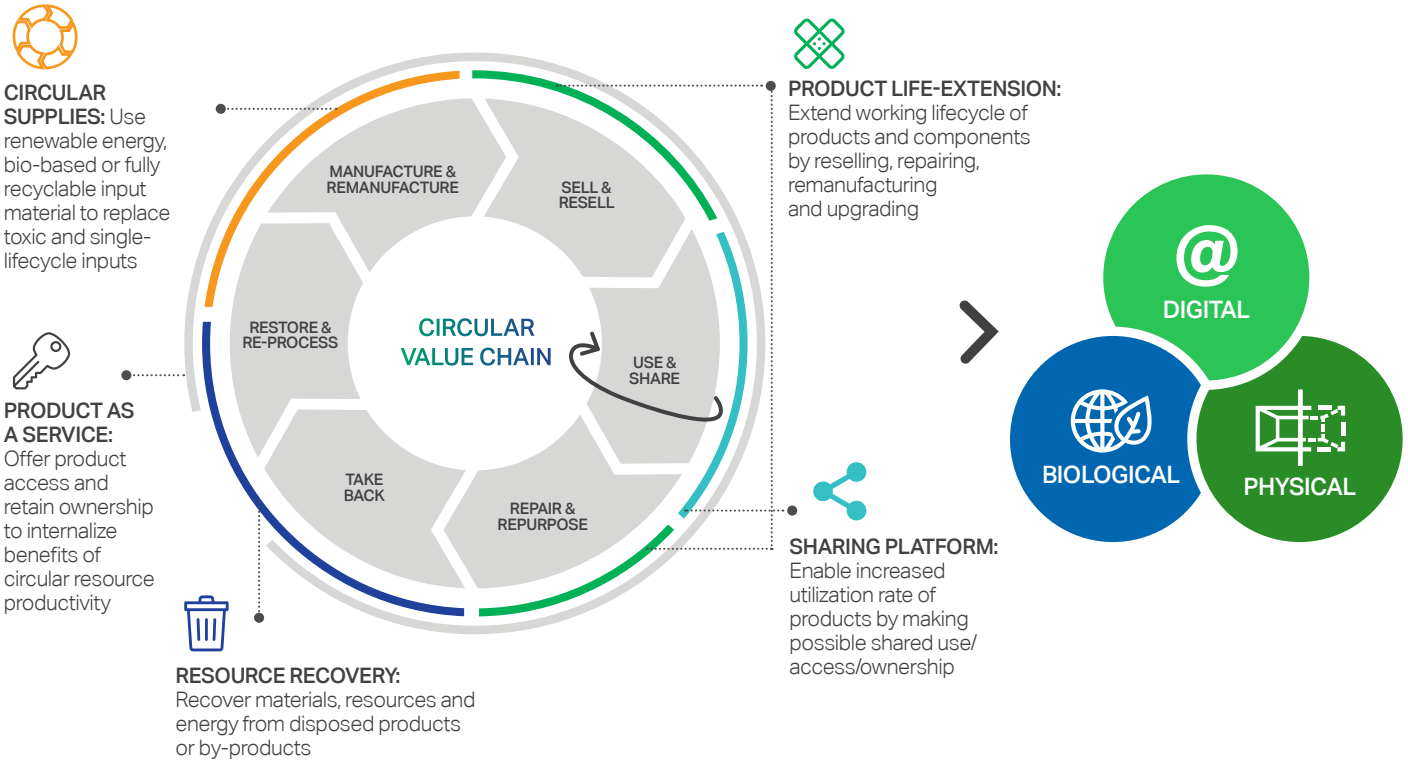
THREE DISRUPTIVE TECHNOLOGIES:

DIGITAL TECHNOLOGIES such as Internet of Things (IoT), big data, blockchain, and RFID help companies track resources and monitor utilization and waste capacity

PHYSICAL TECHNOLOGIES such as 3D printing, robotics, energy storage and harvesting, modular design technology and nanotechnology help companies reduce production and material costs and reduce environmental impact

BIOLOGICAL TECHNOLOGIES such as bio-energy, bio-based materials, biocatalysis, hydroponics and aeroponics help companies move away from fossil-based energy sources

Figure 5:
Five business models and three disruptive technologies



FIVE BUSINESS MODELS:

CIRCULAR SUPPLY CHAIN

BASF developed the innovative "biomass balance method," in which fossil resources in the current production Verbund are replaced by renewable resources such as bio-naphtha or biogas derived from organic waste or vegetable oils. In this process, renewable raw materials are used as feedstock at the very beginning of production in the Verbund, and allocated to the respective sales products using a novel certification method. The formulation and quality of the end products remain the same.

RESOURCE RECOVERY

DSM's new Niaga® technology gives carpet designers the freedom to make carpets fully recyclable. These carpets are made from a single material, or from two materials married together by a reversible glue. The technology uses 90% less energy and zero water during manufacturing, and allows full material recovery after use, without losing material quality. This helps reduce the amount of carpets that ends up in landfill, estimated at 1.8 billion kg per year in the U.S. alone. The DSM-Niaga technology can be applied to other products.

SHARING PLATFORM

In 2001, **Tata Steel** and the Steel Authority of India Ltd. established the joint venture Mjunction as an e-marketplace for by-products (e.g. secondary steel) and idle business assets. Buyers and sellers have price transparency, and what would be waste is now feedstock for companies, saving money while bringing environmental benefit. Mjunction has become the world's largest e-market for steel, is India's biggest e-commerce company with nearly 30 waste streams and volumes have increased from $13.8M in 2002 to $9.45B in 2016.

PHILIPS

PRODUCTS AS A SERVICE

Philips is transforming its business model to enable value-based healthcare, moving from selling equipment alone to a long-term solutions model to hospitals and other care providers. The new model enables care providers to reduce costs, share risks and access state-of-the-art solutions and service at a more predictable cost. By doing so, Philips delivers better customer value and shifts its innovation focus much closer to customers. By moving away from a purely transactional sales approach, Philips has achieved 50-90% material reuse (depending on the product) through its refurbishing activities, including its reuse of 940 tons of refurbished medical imaging equipment in 2016. Currently 9% of Philips total revenues (in 2016) are categorized as circular, and the aim is to reach 15% in 2020.

GROUPE RENAULT

PRODUCT LIFE-EXTENSION

Renault's leadership in European electric vehicle sales is based on circular economy principles and life-cycle thinking. The company extends and optimizes the life cycle of EV batteries by selling them as a service. Since the beginning of its EV offerings, Renault has promoted battery leasing, preferred by more than 90% of its customers. Renault has further extended the lifetime of its EV batteries by using them for stationary energy storage.

AkzoNobel

AkzoNobel, a leading paints and coatings company and major producer of specialty chemicals, is developing a new coating made from plant-based oils and recycled PET bottles. The technology – EvCote™ Water Barrier 3000 – allows restaurants, for example, to select more sustainable paper cups for serving cold drinks. By treating the cups with EvCote™, the paper fiber remains intact during recycling, which means the paper can be reused for other paper products.

enel

Enel, one of the world's largest energy utilities, is capturing circular opportunities not only through investment in new capacity from renewables, but also in the way it is managing old thermal plants. With its Futur-e project, Enel is managing 23 old thermal plants in Italy as a single portfolio, and upcycling economic activity on these sites to benefit local communities, stakeholders and preserve the environment.

CALL **TO ACTION**

Set a **circular vision**

Leadership can create the business imperatives, cultural changes and governance to promote the circular mindset, objectives and integrated goals/metrics.

Choose **your circular model**

Move beyond waste and recycling to leverage the full suite of circular business models. Use disruptive technologies to make the most of your circular transformation.

Work **in teams**

Achieving a circular transformation requires teamwork across functional areas (i.e. R&D, procurement, supply chain, manufacturing and marketing).

Start small and scale

To get started, start small and pilot innovative programs that could lead to long-term strategies. Celebrate successes, re-evaluate failures and work on scaling up.

Collaborate

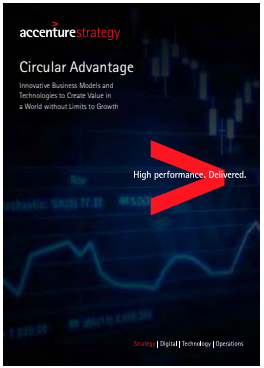
Join forces across value chains in forums like Factor10. Engage with other companies and stakeholders to remove barriers and work on solutions that will create growth while reducing impact.

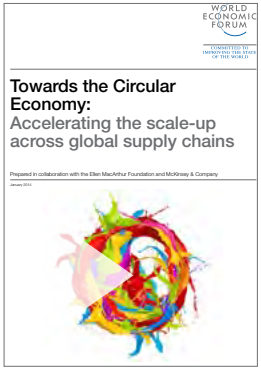
Track **progress**

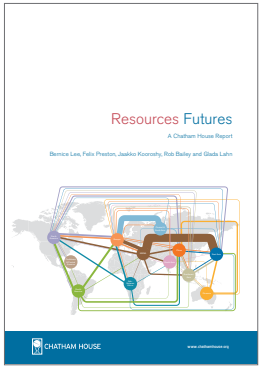
Use financial, environmental and social metrics to measure and track the impact circular innovation has on business.

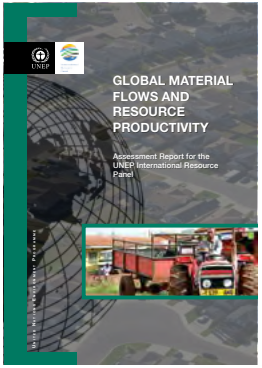
GET **INFORMED**

Read up on some of the latest circular economy research









ENDNOTES

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[2] Kenniskaarten: https://kenniskaarten.hetgroenebrein.nl/en/knowledge-map-circular-economy/definition-circular-economy/

[3] Research conducted by Ecofys with WBCSD to be released in 2017. Eight materials include steel, aluminium, plastic, cement, glass, wood, primary crops, and bovine cattle.

[4] Accenture analysis based on data from SERI and Dittrich, M. (2014). Global Material Flow Database. 2014 version and World Bank GDP data, http:// data.worldbank.org/

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Keep track of the latest tools and strategies for implementing the circular economy in your business.

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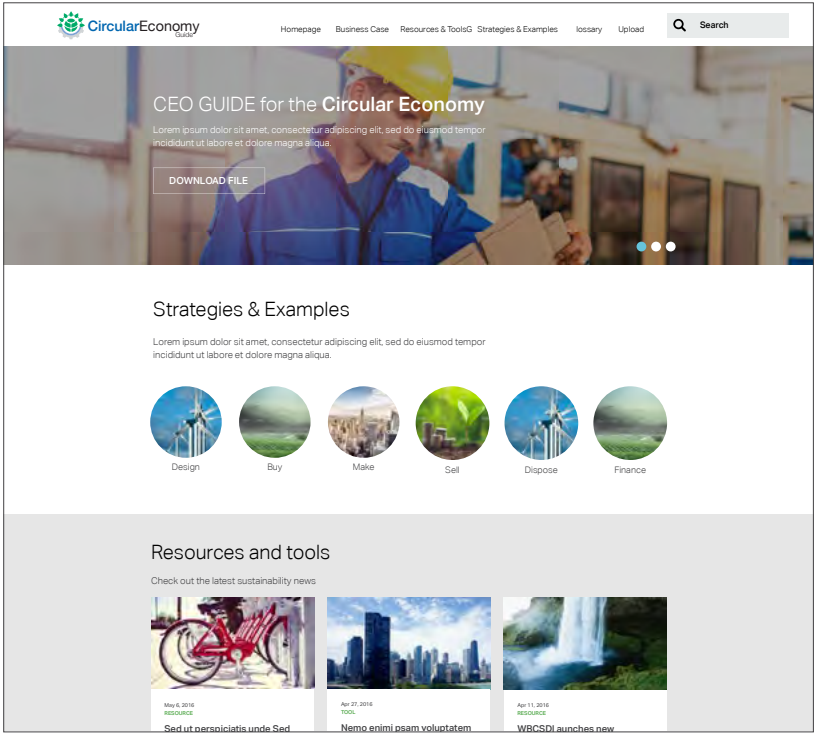

We must do more with less

Factor10 is WBCSD's circular economy program. It brings companies together to reinvent how business finds, uses and disposes of the resources and materials that make up global trade. It will bridge the gap between theory and practice to help companies identify and remove barriers and create scalable solutions.

By collaborating on solutions that go beyond business as usual, Factor10 will help deliver high-impact, large-scale results where resources are used wisely, processes create the greatest possible value and nothing is wasted.

It is the global business collaboration delivering innovative, scalable solutions for the circular economy.

Join **Factor**10

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