



MICRO-CREDENTIAL

CIRCULAR ECONOMY FOR LAND AND WASTE MANAGEMENT

2.- Principles and Models of Circular Economy

Core CE principles (design out waste, keep value, regenerate nature)

CELWS-W02-V01

What is The Liner Economy?



Plastic Packaging Losses

A 2023 study by Goretti Arnaste estimates **\$80–120 billion** lost every single year in plastic packaging alone — value destroyed before it ever reaches a second life.

The Scale of Global Waste

Under the prevailing take-make-dispose model, the global economy discards **1.3 billion tons** of material annually. These are resources extracted, processed, and simply thrown away — a catastrophic inefficiency the planet can no longer absorb.

The numbers are staggering — and the opportunity to act has never been clearer. Continuing on the linear path carries costs measured in trillions of dollars and gigatons of carbon.

\$1T

Annual Savings Potential

The Ellen MacArthur Foundation projects **\$1 trillion per year** in savings if circular economic loops are adopted globally across key sectors.

48%

GHG Emission Reduction

A **48% reduction** in global greenhouse gas emissions is projected by 2030 through circular economy adoption — the single largest lever available to industry.

The circular economy is not just an environmental imperative — it is the defining economic opportunity of the next decade. Early movers stand to capture extraordinary value.

\$4.5 Trillion Market Opportunity

Accenture's Handbook on Circular Economy estimates a **\$4.5 trillion global market opportunity by 2030**, driven by new business models, services, and material innovations.

76 Gigatons CO₂ Avoided

Under the Global Circularity Protocol (WTO 2025), circular strategies could avoid **76 gigatons of CO₂** over 25 years — equivalent to shutting down the entire global economy for over a year.

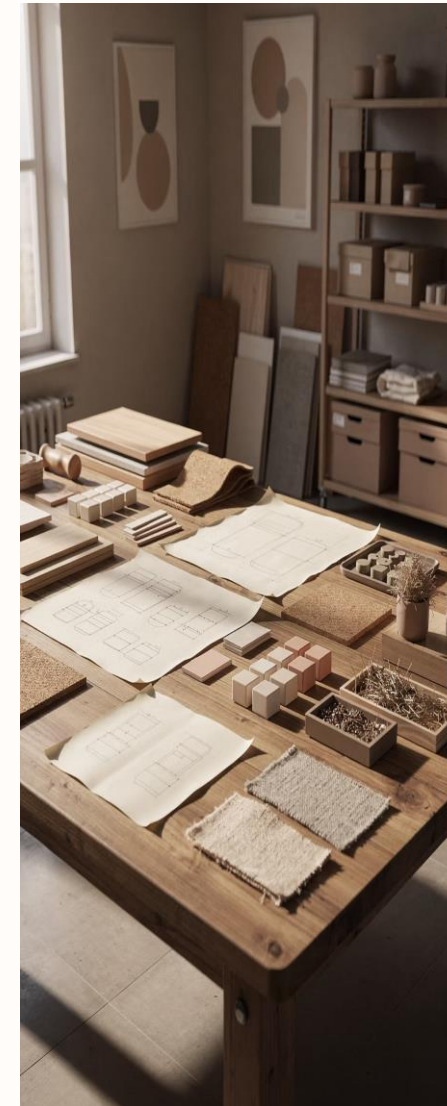
The first principle of the circular economy demands a fundamental rethinking of how products are conceived. Rather than managing waste at end-of-life, circular design **eliminates waste at the source** — before a product is ever manufactured.

Waste-Free from the Outset

The Ellen MacArthur Foundation defines this as creating products and systems that generate **no waste by design** — every material is intentionally chosen for its second life.

Clean Material Palettes

Eliminating toxic additives and specifying **recyclable-by-design** materials ensures products can safely re-enter biological or technical cycles at end of use.



IKEA's 2024 Design Playbook

IKEA has embedded circular design principles into every new product development process, making sustainability a non-negotiable design constraint rather than an afterthought.

- Mandatory **design-for-disassembly checklist** applied to every new SKU before production approval
- Material palette strictly limited to **10 recyclable fibers** or certified **bio-based polymers**
- Ambitious **zero-waste target for 2027** across all product lines globally



Design Out Waste

Every component visible.

Every material traceable.

Every part recoverable. This is what circular design looks like in practice — a product architecture built for endless reuse, not the landfill.



The second principle maximizes the value already embedded in products and materials. Rather than extracting once and discarding, the circular economy prioritizes keeping resources in active use for as long as possible through the **4 Rs**.

- 1 **Reuse**
Direct redistribution of functional products
- 2 **Repair**
Restoring items to full working condition
- 3 **Remanufacture**
Rebuilding to original performance spec
- 4 **Recycle**
Recovering raw materials for new production

Implementing the 4 Rs can extend average product lifespan from **2 years to 10 years** — a 5× multiplier on the value of every unit produced.



IKEA has operationalized all four Rs at scale, demonstrating that a global retailer with millions of SKUs can embed circularity into its core business model — not just as a pilot, but as standard practice.



Reuse: Buy-Back

1.2 million items reclaimed through IKEA's Buy-Back second-hand marketplace in 2024 alone.



Recycling: Closed-Loop Polyester

Old textiles feed a closed-loop polyester stream, directly supplying new IKEA product lines.



Remanufacturing: Reclaimed Wood

Reclaimed timber is re-engineered into new flat-packs, saving **30% of raw timber** consumption.



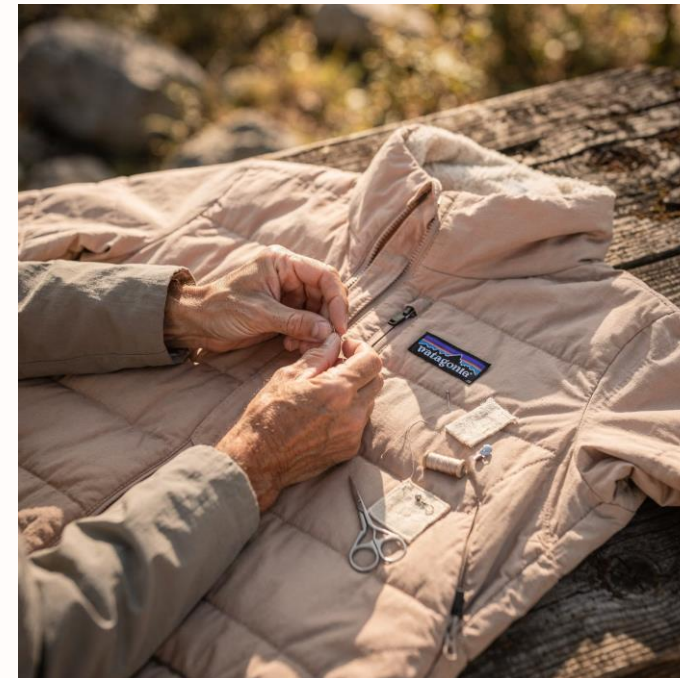
Refurbishment: Refresh Station

In-store "Refresh Stations" restore **250,000 furniture pieces** annually to near-new condition.

Patagonia's Worn Wear Program

Patagonia has turned repair into a brand-defining movement, proving that keeping products in use is not a sacrifice — it's a competitive advantage that deepens customer loyalty and drives revenue.

- In 2023, **\$100 million worth** of repaired jackets and gear were kept out of landfill
- A **repair-for-life guarantee** has become a core brand promise, not a cost center
- The program boosts measured brand loyalty by **22%** among participating customers



Value Capture: \$4.5 Trillion by 2030

The circular economy's \$4.5 trillion opportunity is not concentrated in a single sector — it flows from three distinct value streams, each unlocked by a different circular strategy. According to Accenture, companies that move first in these streams will capture disproportionate returns.



\$2.1 Trillion

Product-as-a-Service Models — shifting from ownership to performance contracts, keeping manufacturers accountable for longevity.



\$1.3 Trillion

Material-Recovery Enterprises — businesses that collect, sort, and reprocess secondary materials into high-value inputs.



\$1.1 Trillion

Regenerative-Design Innovators — companies embedding nature-positive design at the core of product development.

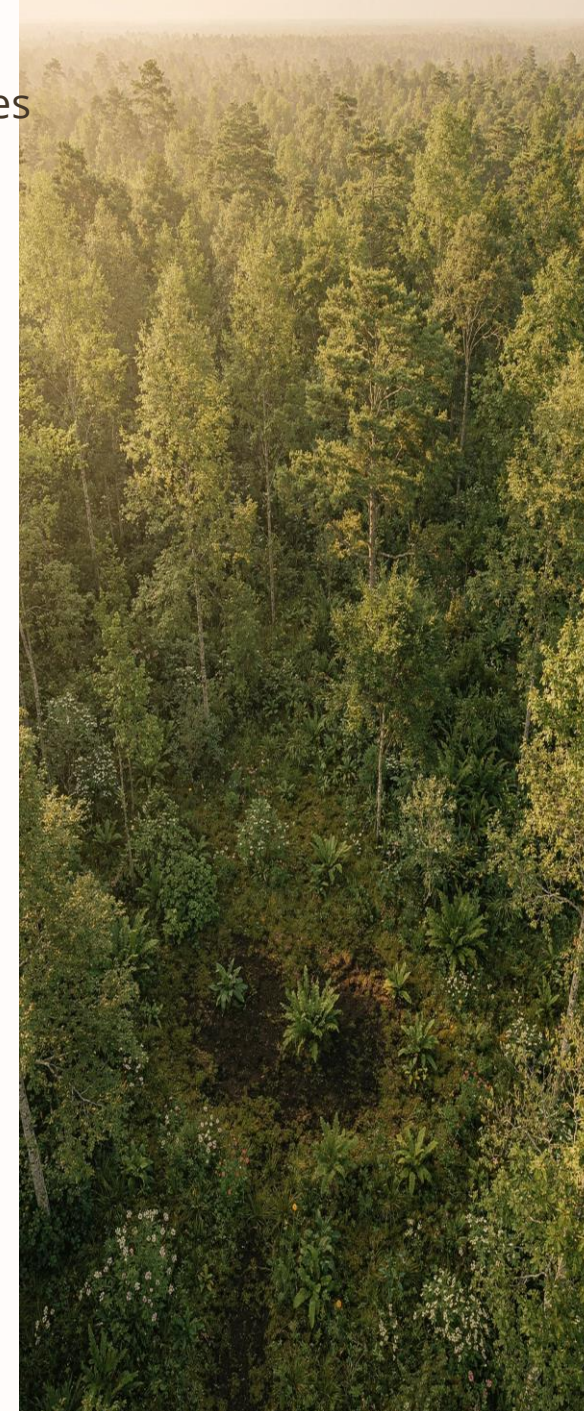
The third principle goes beyond sustainability — it is restorative. The circular economy does not merely aim to *do less harm*; it actively works to **return health to natural systems**, replenishing soils, oceans, and ecosystems that decades of extraction have depleted.

Return Biological Nutrients

Organic materials — food, textiles, wood — must be safely returned to soil, water, and air through composting, anaerobic digestion, or biodegradation, rebuilding the natural capital we depend on.

Shift to Renewable Resource Loops

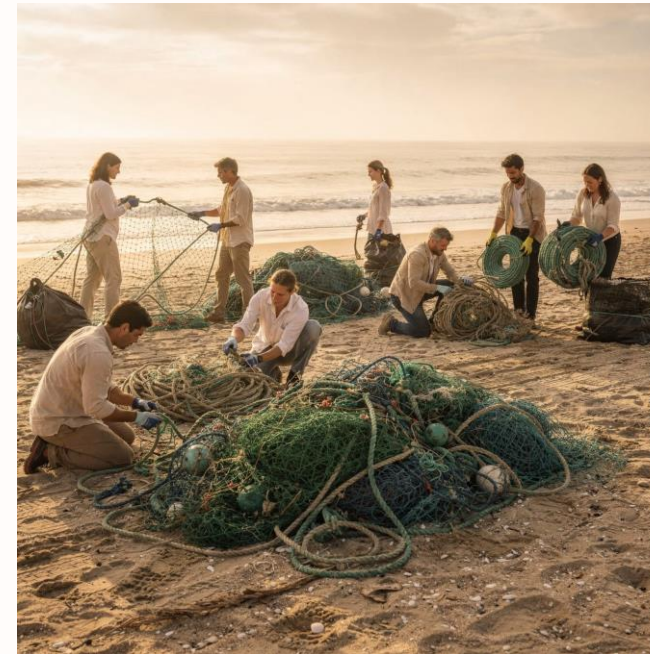
Replacing finite material inputs with **renewable, bio-based alternatives** closes the gap between what we take from nature and what nature can replenish.



Interface's Net-Works: Restoring Marine Ecosystems

Interface partnered with coastal fishing communities to collect discarded nets — one of the ocean's most destructive pollutants — and transform them into high-performance carpet tiles.

- In 2024, **1.8 million kg** of discarded fishing nets were collected and upcycled
- Coastal biodiversity index rose **15%** in partner villages within three years
- Local fishermen earn income from waste collection, creating regenerative livelihoods



Global Impact Projection (WTO 2025)

The scale of what circular economy adoption could achieve for planetary health is almost beyond comprehension. The WTO's 2025 Global Circularity Protocol models two headline outcomes that frame the urgency of immediate action.

76GT

CO₂ Avoided

76 gigatons of CO₂ avoided — equivalent to **1.5× total global annual emissions**, achieved over 25 years of circular adoption.

120BT

Materials Saved

120 billion tons of material preserved from extraction — enough raw material to construct **30 million houses** worldwide.

Business Models that Deliver Value

Understanding the principles is the foundation. But the circular economy becomes real when companies redesign their **business models** to capture value from circularity — not despite it. Three proven models are leading the way.



Product-as-a-Service (PaaS)

PaaS flips the ownership model: manufacturers retain responsibility for their products throughout their entire lifecycle, creating a powerful financial incentive to build for longevity and recoverability.

- **Philips Lighting as a Service** expanded its European rollout in 2024, saving **3 million tonnes of CO₂** by maintaining and upgrading lighting systems rather than replacing them
- Revenue mix shifted to **30% recurring subscriptions**, delivering more predictable income for Philips and lower upfront costs for customers



Model 2 — Sharing Platforms

Sharing platforms extend the utilization rate of existing assets, reducing the need for new production. By enabling more people to access the same asset, they extract far more value from each unit manufactured.



Zipcar: Fewer Cars, Less Emissions

Zipcar's fleet grew **18% in 2023**, demonstrating surging demand for shared mobility. Each shared vehicle displaces multiple personal car purchases, cutting **2.4 million tonnes** of vehicle production emissions annually.



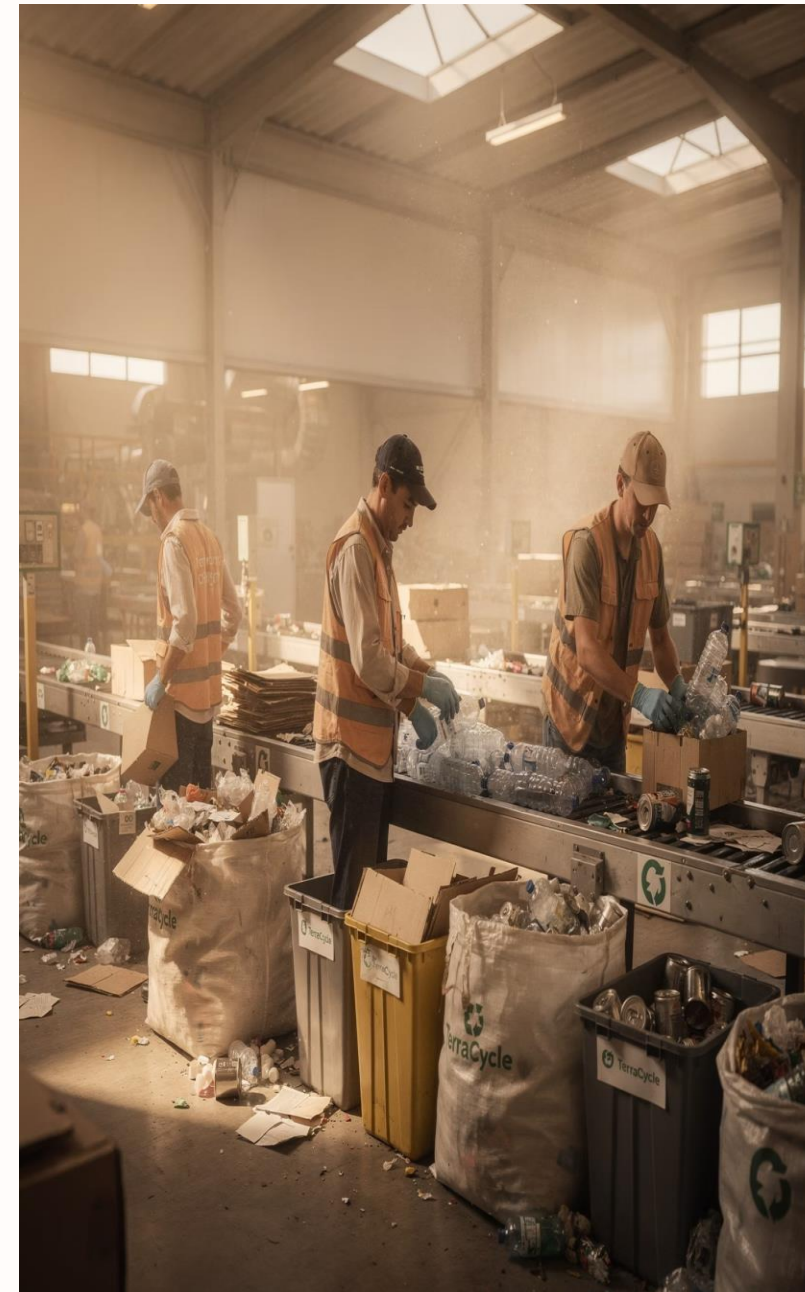
Airbnb Eco-Stay: Sustainability Drives Bookings

Airbnb's "Eco-Stay" certification badge drives **12% more bookings** for verified sustainable properties, proving that circular credentials translate directly into commercial advantage.

Resource Recovery & Upcycling

Recovering and upcycling waste streams transforms end-of-life materials into premium secondary inputs — creating entirely new revenue streams from what was previously discarded.

- **TerraCycle** processed **1.5 billion items** in 2024, generating **\$250 million** of secondary-material revenue from packaging, electronics, and personal care waste
- A closed-loop textile pilot with **Levi's** successfully reclaimed **10% of denim waste**, feeding it back into new garment production



Policy Levers Accelerating the Shift

Governments worldwide are deploying regulation and financial incentives to make circular economy adoption the path of least resistance for businesses of every size.

EU Circular Economy Action Plan 2024

The European Commission committed **€200 billion in funding** for circular SMEs, covering design innovation, material recovery infrastructure, and circular supply-chain partnerships across all 27 member states.

US Inflation Reduction Act 2023

A **30% tax credit** for remanufactured goods makes circular production economically competitive with virgin manufacturing for the first time, unlocking investment in US-based remanufacturing facilities.



Financial Engines: Circular Capital

Capital markets are increasingly recognizing circular economy investments as both low-risk and high-return. Institutional money is moving — and fast.

\$1.2T

Green Bonds Earmarked

The IEA's 2025 report identifies **\$1.2 trillion** in green bonds specifically allocated to circular economy infrastructure, materials, and service model transitions.

150

Startups Funded

Across materials science, digital traceability, product-as-a-service, and regenerative agriculture — the next generation of circular champions is being seeded now.

\$300M

EU Circular Innovation Fund

The EU's **Circular Innovation Fund**, launched in 2024, is backing **150 circular economy startups** with grants and equity investment to scale proven solutions.

5-Step Corporate Roadmap to Circularity

Moving from linear to circular does not require a wholesale reinvention overnight. This proven five-step roadmap gives any organization a structured path from baseline assessment to full-portfolio circularity.



1. Assess

Map all material flows and establish a **Material Circularity Indicator (MCI) baseline** to understand where value is currently leaking from the system.



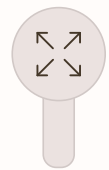
2. Redesign

Apply circular design principles — **disassembly, renewable inputs, clean material palettes** — to new and existing product lines.



3. Pilot

Test circular loops — buy-back, repair, PaaS — within **one contained product line** before scaling, learning and iterating rapidly.



4. Scale

Extend proven models **across the full portfolio** in partnership with supply-chain collaborators, amplifying impact and reducing unit costs.



5. Report

Publicly disclose circularity progress using the **Material Circularity Indicator**, building stakeholder trust and market credibility.

Know Where You Stand

Credible measurement and peer benchmarking are essential for any circular economy commitment. Two authoritative frameworks set the standard in 2025.

Circularity Gap Report Report 2025

The global average circularity score stands at just **8.6%** — meaning over 91% of materials used today are still wasted. This is both a warning and an enormous opportunity for first movers.

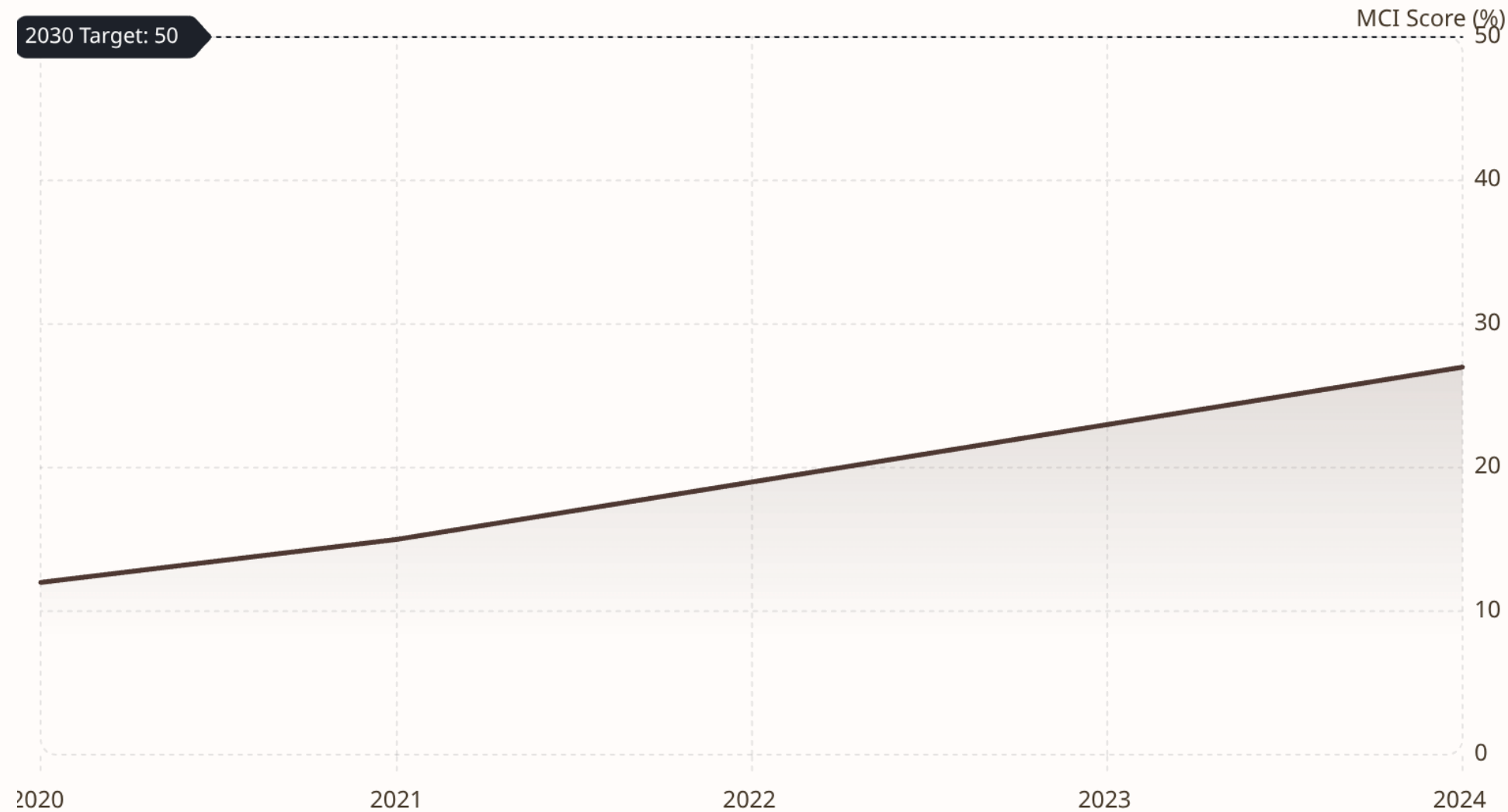
Ellen MacArthur CE100 CE100 Network

120 leading companies — from IKEA to Apple to Renault — are committed to net-zero circularity by 2030 under the CE100 framework, sharing knowledge, tools, and supplier networks.



Measuring Success: The Material Circularity Indicator

The MCI is the gold-standard metric for corporate circularity performance — providing a single, comparable score that tracks how much of a company's material flow is truly circular. Unilever's journey demonstrates what sustained commitment looks like.



Unilever's MCI rose from **12% in 2020 to 27% in 2024** following the "Loop Packaging" rollout — a 125% improvement in four years. Their **50% MCI target by 2030** is aligned with Science-Based Targets, setting a benchmark the entire consumer goods industry is watching closely.

Call to Action: The 2026 Circular Pledge

The window to act is open — but it will not stay open forever. The 2026 Circular Pledge gives every organization a concrete, time-bound commitment framework to enter the circular economy with confidence and accountability.

Commit

Adopt at least **one of the three core principles** — design out waste, keep value in use, or regenerate nature — as a formal corporate objective by **Q4 2026**.

Connect

Join the **Circular Economy Leaders Network** — over 500 member firms sharing tools, supplier contacts, and circular business model innovations to accelerate your transition.

Report

Publicly disclose your progress on the **Global Circularity Protocol dashboard**, making your commitments transparent and measurable to stakeholders, investors, and peers.

From Waste to Wealth: A Closing Vision

"Imagine a world where every product is a seed, not a landfill — where nature regenerates as fast as we consume."

The circular economy is not a distant dream. It is being built right now, product by product, business model by business model, policy by policy. The three principles — **design out waste**, **keep value flowing**, and **regenerate nature** — are our blueprint for an economy that works for both people and planet.

Let's design out waste, keep value flowing, and heal the planet together.

