Confederation of Indian Industry

THEME PAPER

# Design for a Sustainable Future



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# Introduction

As the world confronts intertwined crises of climate change, inequality, and rapid technological disruption, design stands at a defining crossroads. The **25th CII Global Design Summit & Exposition** celebrates twenty-five years of Indian design leadership—marking a journey where creativity has evolved from form-making to future-shaping.

The 2025 theme, **"People, Planet, Purpose, Profitability,"** extends the idea of design beyond aesthetics or innovation. It recognises design as a force that can reimagine systems—bridging human aspirations with planetary boundaries and aligning economic progress with ethical intent. From inclusive mobility and regenerative materials to digital ethics and circular business models, design today offers a lens through which industries can both compete and contribute.

India's growing design ecosystem—spanning crafts to AI, policy to production—illustrates how sustainability and innovation can thrive together. The Confederation of Indian Industry (CII), through its Design Initiative, has continually championed this integration of creativity, technology, and responsibility. The Design Summit thus becomes more than a forum; it is a collective commitment to design that uplifts lives, restores ecosystems, and generates shared value.

This paper builds on that vision. It offers frameworks, case studies, and actionable insights to guide designers, businesses, and policymakers in aligning the 4Ps into practice. It invites readers to see design not only as a professional discipline but as a transformative mindset—one capable of shaping a regenerative economy and a more equitable world.

The future of design is not just to sustain, but to reimagine how we live, make, and grow—by design.



# Executive Summary

Most people want cleaner air, less waste, and products that last. Yet our everyday choices are shaped by what's easy, affordable, and readily available (packaging, product features, apps, and city layouts that nudge us towards more consumption). Design sits at the epicentre of these choices.

Design, at its essence, is the practice of shaping intent into impact. Every product we touch, every service we use, and every space we inhabit is the result of deliberate design decisions. Today, with climate crisis, social inequity, and economic uncertainty defining our era, those decisions carry immense weight. The theme of People, Planet, Purpose, Profitability reminds us that design is not merely about aesthetics or utility; it is about responsibility, regeneration, and resilience.

## Key Insight

*"Design has become the most powerful tool with which man shapes his tools and environments (and by extension, society and himself)."*

*Victor Papanek,*
*Designer and Educator*



# The Four Pillars

## People are at the heart of design

Human-centred design has long emphasised empathy and inclusion, but its scope now extends further: to the dignity of workers, the safety of consumers, and the wellbeing of communities. Design choices determine who benefits, who is excluded, and how equitably opportunities are shared. From accessible digital platforms to participatory urban planning, inclusive design ensures that progress leaves no one behind.

## The Planet is the largest stakeholder

Each material extracted, each system built, and each interface coded leaves an environmental trace. The design discipline is uniquely positioned to reverse this trajectory by embedding circularity, lifecycle thinking, and regeneration into creative practice. The shift from "less harm" to "net positive" design is already underway: designers are reimagining packaging as nutrient, products as services, and cities as ecosystems that give back more than they take.

## Purpose gives design its moral compass

In a world of accelerating technology and consumption, purpose anchors creativity in meaning. Purpose-driven design aligns innovation with ethics, ensuring that we create not just because we can, but because we should. It calls on designers to address systemic issues such as waste, inequity, and disconnection, transforming creativity into an act of stewardship.

## Profitability is sustainability's essential enabler

Design-led companies are demonstrating that circular, inclusive, and regenerative models can also be economically viable. Profi tability, when reframed through design, becomes not the extraction of value but its continuous renewal; profi t that sustains rather than depletes.

### Bottom Line

**When viewed together, People, Planet, Purpose, Profitability form a holistic compass for the next generation of design. Design is the very mechanism through which humanity can harmonise creativity with conscience, ambition with accountability, and progress with planetary health.**

# Numbers of Significance: The Scale of the Challenge

## The Climate Crisis

- **70%** of global greenhouse gas emissions come from just **100 fossil fuel** producers, highlighting how systemic change, not individual guilt, drives impact. (CDP Carbon Majors Report, 2017).
- The fashion industry is responsible for **10%** of global carbon emissions and **20%** of wastewater, yet **87%** of textiles end up in landfills or are incinerated. (UNEP, 2023).
- Animal agriculture contributes **14.5%** of global GHG emissions and uses **80%** of global farmland, whilst providing less than **20%** of total calories. (FAO, 2022).
- Data centres currently consume **2–3%** of global electricity and are projected to reach **6–8% by 2030**, driven by the increasing demand for AI and cloud computing. (IEA, 2024).
- The construction and building sector accounts for nearly **37%** of global $CO_2$ emissions, primarily due to materials such as cement and steel. (UNEP Global Status Report, 2022).

## The Waste Crisis

- By 2050, plastic waste in oceans could **outweigh fish** if current production and disposal trends continue. (Ellen MacArthur Foundation, 2016).
- Only **9%** of the world's materials are currently recycled or reused, meaning **91%** of global material flows are linear. (Circularity Gap Report, 2023).

- Approximately **2.3 billion** people worldwide still lack access to safe sanitation, whilst **one-third** of all food produced globally is wasted. (World Bank & FAO, 2023).

## The Equity Crisis

- Women and marginalised communities bear **80%** of the climate burden through displacement, health impacts, and resource scarcity. (UN Women, 2023).

- Unsafe design and poor urban planning contribute to **1.35 million road deaths** per year, **90%** of which occur in low- and middle-income countries. (WHO, 2022).

- **70%** of workers in global supply chains operate in the informal economy, often outside environmental and labour safeguards. (ILO, 2023).

## The Opportunity

- Transitioning to a circular economy could generate **$4.5 trillion** in new economic value by 2030 through design-led innovation. (Ellen MacArthur Foundation, 2020).

- Every **$1 invested** in sustainable design and resilience yields **$4–$7** in avoided losses and social benefits. (World Economic Forum, 2022).

- Companies with strong sustainability design practices outperform peers by up to **30%** in long-term profitability and innovation metrics. (McKinsey Design Index, 2021).

- The global green design and circular innovation market is projected to exceed **$8 trillion by 2030**, spanning materials, mobility, built environments, and digital services. (World Bank, 2024).



# Who is a Designer?

Traditionally, designers were associated with specific disciplines: graphic, industrial, fashion, interior, and so on. Today, the role has expanded dramatically. Designers now work across fields as diverse as policy, healthcare, technology, and sustainability. They are problem solvers, strategic thinkers, and a bridge between imagination and reality.

### Defining Design

"Everyone designs who devises courses of action aimed at changing existing situations into preferred ones."

— Herbert Simon, The Sciences of the Artificial (1969)

By that definition, design is a universal human capacity, and the designer is **anyone who consciously applies creativity and structure to make the world better.**

Designers occupy a uniquely powerful position in advancing sustainability. They change systems by starting with people, then scaling through structures. Their training, mindset, and methods equip them to translate complex global challenges into tangible, human-centred solutions. Five traits make them effective, and each has proof in practice.

## Empathy: Understanding Human and Planetary Needs

One of the most defining traits of designers is empathy. Design thinking begins by understanding human needs, emotions, and the contexts in which they exist. This empathetic approach aligns naturally with sustainability, which calls for sensitivity not only to users but also to communities, future generations, and even non-human life.

*"Design thinking is about meeting human needs in a technologically feasible and economically viable way."*
*— As Tim Brown, former CEO of IDEO*

### Case Study: IDEO's Clean Team

*Location: Ghana, Kenya, India*

**Challenge:** Millions of urban residents lacked access to safe sanitation, with traditional solutions being unaffordable or culturally inappropriate.

**Design Approach:** By deeply engaging with residents, designers co-created affordable, portable toilets and a collection system that fit within small urban homes. The design wasn't just about technology; it was about understanding dignity, habits, and aspirations.

**Impact:** Reduced open defecation whilst creating green jobs and improving public health across multiple communities.

# Holistic and Inclusive Thinking

Designers are trained to think **holistically and inclusively**, recognising that no problem exists in isolation. They consider the entire ecosystem of stakeholders (from producers and consumers to marginalised communities and ecosystems affected by design decisions). This mindset aligns with the principles of **just and equitable design.**

## Case Study: Medellín's Urban Transformation

*Location: Medellín, Colombia*

**Challenge:** Once one of the world's most dangerous cities, Medellín faced severe social inequality, with marginalised hillside communities cut off from city resources.

**Design Approach:** Designers, architects, and civic leaders introduced:
1. Metrocable: A cable car transit system connecting hillside communities to the city centre
2. Library Parks: Education and cultural centres in marginalised neighbourhoods

**Impact:** This systems approach addressed social equity, mobility, and environmental constraints simultaneously, transforming Medellín into a global model for socially sustainable urban design.

# Micro to Macro: Navigating Scale

Designers possess a distinctive ability to toggle between **micro-level attention to detail and macro-level systems thinking**. A sustainable solution requires both the precision of material selection and the foresight to understand global supply chains, energy flows, and lifecycle impacts.

## Case Study: Patagonia's Worn Wear

*Location: Global*

**Design Philosophy:** Every decision, from fabric selection to corporate campaigning, is part of an interconnected system that impacts both people and the planet.

**Micro-level Design:**
1. Materials and stitching optimised for repairability
2. Modular construction allows component replacement
3. Detailed repair guides published openly

**Macro-level Design:**
1. Supply chain ethics and transparency
2. Environmental activism and advocacy
3. Lifecycle analyses guide all material sourcing

**Impact:** Extended product life, reduced waste, and demonstrated that repair can be a business model, not just a cost centre.

# Frameworks and Methodologies

Designers rely on **frameworks and methodologies** that naturally lend themselves to sustainability. Tools such as the circular design framework (Ellen MacArthur Foundation) or cradle-to-cradle design (McDonough & Braungart) help designers assess environmental and social impacts early in the creative process.

## Case Study: Philips Lighting-as-a-Service

*Location: Europe and North America*

**Innovation:** Instead of selling light bulbs, Philips provides lighting solutions where the company retains ownership of materials and fixtures.

**Design Framework:** Grounded in lifecycle thinking and cradle-to-cradle principles
How It Works:
1. Customers pay for illumination (outcomes), not products
2. Philips maintains and upgrades fixtures
3. Materials recovered at end-of-life for remanufacturing

**Impact:** Reduced waste, encouraged durability, and ensured closed-loop material recovery whilst creating recurring revenue.

# Collaboration Across Disciplines

Design is **inherently collaborative**. Sustainability challenges (climate change, waste reduction, social justice) cannot be solved in silos. Designers act as facilitators between disciplines, translating diverse perspectives into cohesive solutions.

## Case Study: Ellen MacArthur Foundation's Jeans Redesign

*Location: 100+ brands, including Levi's, Gap, H&M*

**Challenge:** Denim production is highly resource-intensive and generates significant waste.

**Collaborative Design Process:**
1. Co-created common guidelines for durable, recyclable, non-toxic denim
2. Designers worked with suppliers and recyclers
3. Shared standards for safer dyes, removable hardware, and natural fi bres

**Impact:** Cross-industry effort demonstrated how shared design standards can transform an entire sector towards circularity, proving that collaboration multiplies impact.

## The Designer's Role

**Designers are systems translators, capable of envisioning and implementing sustainable futures. They are connectors who link creativity with practicality, aesthetics with ethics, and people with the planet. They are change agents who imagine what does not yet exist, question what is taken for granted, and design not just for today's users, but for tomorrow's world.**





# What "Sustainable" Really Means

## (and Why Designers Are Built for It)

In recent years, "sustainability" has become one of the most frequently used (and often misunderstood) terms in design, policy, and business discourse. At its core, true sustainability represents a balanced integration of three interdependent dimensions: environmental integrity, social equity, and economic resilience.

### The Brundtland Definition

**Sustainable development is that which "meets the needs of the present without compromising the ability of future generations to meet their own."**

— Brundtland Commission, 1987

# The Three Pillars of Sustainability

## Environmental Integrity

Sustainability entails reducing greenhouse gas emissions, minimising toxicity, and preserving biodiversity. The United Nations Environment Programme estimates that global material extraction has tripled since 1970, placing immense pressure on ecosystems. Addressing this calls for more than pollution control; it demands rethinking production systems to mimic natural cycles.

## Social Equity

A sustainable society ensures that progress benefi ts everyone, not just the affluent. Access to clean air, safe housing, and dignifi ed employment are essential indicators of a healthy and thriving society. The COVID-19 pandemic starkly exposed how unequal systems lack resilience, reinforcing that social wellbeing is inseparable from environmental stability.

## Economic Resilience

The World Economic Forum notes that extreme weather and resource scarcity now rank amongst the top global risks to economic stability. Hence, sustainability today involves designing economies that can endure shocks (whether from climate events, pandemics, or disrupted supply chains).

# Four Complementary Principles for Sustainable Design

Designers employ four complementary ideas or principles to approach sustainability.

## Circularity: Closing the Loop

**What it means:** Keeping materials and products in use for as long as possible through repair, reuse, and remanufacturing.

**The opportunity:** The Ellen MacArthur Foundation estimates that adopting circular models could unlock **$4.5 trillion** in economic benefits globally by 2030.

**Design approach:** Circular design reframes waste as a resource, prioritising durability, modularity, and material recovery.

## Lifecycle Thinking: Seeing the Whole Picture

**What it means:** Evaluating a product's impact from raw material extraction to end-of-life.

**Why it matters:** For instance, an electric vehicle may reduce tailpipe emissions but still rely on energy-intensive battery production.

**Design approach:** Lifecycle assessment (LCA) enables designers to identify hidden trade-offs and minimise total environmental impact.

## Regeneration: Going Beyond "Less Harm"

**What it means:** Aiming to restore and enhance ecosystems, not just minimise damage.

**Real-world example:** Regenerative agriculture rebuilds soil health and biodiversity whilst capturing carbon.

### Nature's Wisdom

"Nature's instruction manual is clear: life creates conditions conducive to life."

— Janine Benyus, Biomimicry Expert

## Resilience: Designing for Disruption

**What it means:** Ensuring that systems continue to operate effectively despite disruptions (whether from heatwaves, floods, or geopolitical crises).

**Design approach:** Incorporating diversity, redundancy, and adaptability (traits commonly found in natural ecosystems).

### Key Takeaway

Together, these principles (circularity, lifecycle thinking, regeneration, and resilience) form the backbone of sustainable design practice. Sustainability is not a static goal but an evolving ethic: one that challenges us to design and live within the limits of a thriving, interconnected Earth.



# Where Design has Leverage

Design holds immense power to shape not only how products look and function, but also how systems behave and evolve.

> "Design is the first signal of human intention."
> — William McDonough, Architect and Sustainability Pioneer

When that intention aligns with sustainability, design becomes a strategic lever for transformation, redirecting production, consumption, and governance towards long-term wellbeing.

## Products and Materials: Build to Last, Repair, and Reuse

Products are where design decisions have the most direct and visible impact. Every material, joint, and fastener determines a product's lifespan and recyclability.

**Design actions:** Choosing screws instead of adhesives, modular parts over monolithic assemblies, publishing repair guides, specifying safer materials with end-of-life pathways.

### Examples in Action

**Fairphone (Netherlands)**
Extends device life by allowing users to replace key components with basic tools, reducing e-waste by up to 30% compared to standard smartphones.

**Vitsoe's 606 Shelving (UK)**
Unchanged in design since 1960, demonstrating how timeless design and repairable construction sustain both utility and emotional durability.

**Bare Necessities (India)**
Eliminates plastic packaging, uses compostable materials, and designs containers meant for refilling or repurposing.

**MUJI (Japan)**
Employs minimalist, repairable design across decades, creating long-lived, modular furniture and appliances (an ethos of mottainai ("no waste")).

## Services and Business Models: Sell Outcomes, Not More Stuff

Sustainability flourishes when businesses profit from performance, not volume. Product-as-a-Service models create profit drivers from durability and maintenance.

## Examples in Action

**Interface's "Evergreen Lease" (Global)**
Leases carpet tiles instead of selling them, ensuring materials are recovered and remanufactured at end-of-life.

**Chakr Innovation (India)**
Captures particulate matter emissions from diesel generators and converts them into usable ink and paint (pollution-to-product model).

**UglyFood (Singapore)**
Delivers cosmetically imperfect but edible produce through subscription models, reducing waste through thoughtful UX and packaging.

# Digital and UX: Efficiency by Default and Ethical Nudges

Digital products have real physical footprints. Data transfer and processing consume energy.

**Design actions:** Optimising code, compressing media, designing effi cient user flows, setting eco-friendly defaults, and embedding timely prompts.

## Examples in Action

**Google Files App (India)**
Redesigned for low-bandwidth environments and energy efficiency, reducing digital footprint on affordable smartphones.

**Ola Electric App (India)**
Optimises routes, charging times, and energy use with a user experience that encourages eco-friendly travel behaviour.

**Gojek (Indonesia)**
Integrates carbon offset options and ride-pooling nudges directly into its interface, using behavioural design for sustainable mobility.

# Supply Chains: Make Ethics and Traceability Part of the Design Brief

A product's sustainability depends on invisible networks. Traceability systems, supplier codes of conduct, and logistics optimisation transform opaque systems into verifiable, circular loops.

## Examples in Action

**ReshaMandi (India)**
Utilises IoT and blockchain to establish a transparent silk supply chain, enhancing farmer income whilst ensuring traceability from cocoon to fabric.

**Nestlé Japan**
Adopted full material traceability for recyclable packaging, demonstrating how design-led data systems enable sustainability and accountability.

# Food Systems: Reduce Waste Through Design

Approximately **one-third of the global food supply** is wasted, often due to inadequate labelling, packaging, or storage.

## Examples in Action

**Too Good To Go (Europe)**
Connects consumers with unsold restaurant food, saving over 100 million meals annually through service design.

**Zomato & Swiggy (India)**
"Climate Conscious Delivery" and "No Cutlery" default show how UX tweaks shift user behaviour towards sustainability at scale.

**Phool.co (India)**
Repurposes temple flower waste into compostable packaging and incense, combining material innovation with social entrepreneurship.

**Coupang (South Korea)**
"Eco Bag" programme allows customers to return reusable delivery packaging, reducing single-use waste.

# Cities and Public Systems: Make Proximity and Transit the Easy Choice

Urban design determines whether the greener choice is realistic. The **15-minute city** model organises daily life so most needs are within a short walk, cycle, or transit hop.

## Examples in Action

**Ahmedabad's Janmarg (India)**
Bus Rapid Transit System exemplifies transit-oriented design tailored to Indian urban realities, reducing private car use and emissions whilst enhancing accessibility.

**Cheonggyecheon Restoration (Seoul)**
Replaced an elevated highway with a public green corridor, improving air quality and reconnecting citizens with nature (a model of regenerative urban design).

**Paris 15-Minute City (France)**
Paris's shift toward the 15-minute city model has reduced car traffic in central areas by over 40%, improving livability and access whilst demonstrating that proximity-based urban design can transform mobility patterns at scale.

# Energy and Water Systems: Design Usage, Not Just Hardware

Efficiency depends as much on user interaction as on technology. Energy-aware UX helps people save without sacrificing comfort.

## Examples in Action

**Nest Thermostats (Global)**
Use adaptive design to reduce household energy use by about 10–12% annually.

**SELCO Solar (India)**
SELCO Solar's modular, repairable systems tailored to low-income users and rural artisans have reached over half a million households, pairing design with social innovation.

**Miraikan Smart Homes (Japan)**
Demonstrate behavioural design for energy and water conservation using real-time feedback to shape user habits.

# Policy and Standards: Lock Good Design Into Rules

Right-to-Repair policies and Extended Producer Responsibility (EPR) laws reward circular design. Designers translate regulations into actionable specifications.

## Examples in Action

**India's ECBC & GRIHA**
Encourage design for passive cooling, material efficiency, and lifecycle impact assessment in construction.

**Singapore's Green Mark**
Sets measurable energy and water performance benchmarks that influence architects and developers across the region.

# Measurement and Transparency: Trace Impacts Across the Lifecycle

Without measurement, sustainability remains aspirational. Lifecycle Assessment (LCA) tools, material passports, and environmental product declarations make impacts visible.

## Examples in Action

**IKEA (Global)**
Publishes full product carbon footprints, helping customers and designers make informed choices.

**India Plastics Pact (CII & WWF)**
Applies lifecycle thinking to plastic packaging, setting measurable targets for recyclability and reuse.

**SCG Cement (Thailand)**
"Green Choice" label provides transparent environmental impact metrics, using data as design inputs, not just CSR metrics.



# Facing the Hard Truths:
## Without Losing Agency or Heart

Design for sustainability is often framed in optimistic terms. Yet optimism without realism risks becoming denial. To design responsibly, we must confront hard truths whilst believing in our collective capacity to change systems.

# Seeing the Real Challenges Clearly

## The greenwashing problem:

According to the European Commission (2021), over **53%** of green claims made by companies were found to be "vague, misleading, or unfounded." Examples include over-reliance on carbon offsets, fast-fashion 'recycling' programmes, and ambiguous 'biodegradable' plastics that fail to address the root causes.

## The scale mismatch:

The world's top **100 fossil fuel producers** are responsible for over **70%** of global emissions (CDP, 2017), whilst individuals are asked to recycle more or drive less, whose carbon footprints are minuscule.

## The hidden impacts:

Data centres and AI infrastructure now consume **2–3%** of global electricity, with projections suggesting this could double by 2030 (IEA, 2024).

### Critical Shift

**Design must move from moralising individual behaviour to intervening at systemic leverage points (the places where design can multiply impact). We must design policies, products, and infrastructures that make the sustainable choice the default, not the exception.**

# Transparency as Accountability

Designers can counter greenwashing by embracing:

- Open data and traceable materials
- Third-party standards (Cradle to Cradle, B-Corp, LEED)
- Digital product passports and material tracking

> "Transparency is not the end goal, but the beginning of accountability."
>
> — Kate Fletcher, Design Theorist

# Power Lies in Defaults and Standards

## Real leverage:

The rules that define what "normal" looks like.

## How it works:

When a municipality mandates circular materials in construction, or a digital platform enforces sustainable packaging for sellers, design decisions have a ripple effect across millions of interactions.

## Examples in action:

- India's Extended Producer Responsibility (EPR) in electronics and packaging
- Japan's Top Runner Programme for energy efficiency
- India's Public Procurement (Preference to Make in India) policy

# Restoring Agency Through Design

Good design restores agency by making sustainable action effortless:

- Appliances that default to energy-efficient modes
- Packaging that is genuinely recyclable within local systems
- Repairable products with modular parts

### The Role of Design

**Facing hard truths is not about despair. It's about redirecting agency from guilt to governance, from isolated choices to collective design power. The role of design is not to moralise, but to mobilise (to turn awareness into architecture, intention into infrastructure) so that people, planet, purpose, and profitability can finally coexist by design.**



# From Sustainability to Regeneration

For decades, sustainability guided our efforts towards doing less harm. Yet, as crises deepen, "less harm" is no longer enough.

## The Regenerative Question

**What if every product, service, or building made the world better, not just less bad?**

### The shift:

From minimising damage to actively healing ecosystems, restoring equity, and strengthening resilience.

### The approach:

Designing like an ecosystem, where waste becomes nutrient, diversity breeds resilience, and interdependence ensures longevity.

# Beyond Efficiency: Towards Positive Impact

Whilst sustainability focuses on efficiency (using fewer resources), regeneration is about abundance through reciprocity.

## Case Study: Gardens by the Bay (Singapore)

**Regenerative Design Elements:**

- "Supertrees" generate solar power
- Collect and recycle rainwater
- Naturally cool nearby spaces
- Support biodiversity

**Impact:**

Demonstrates how architecture can actively improve air quality, reduce heat, and support ecosystems whilst serving human needs.

## Case Study: Sikkim Organic Mission (India)

**Achievement:**

Entire state achieved 100% organic status in 2016

**Regenerative Outcomes:**

- Improved soil fertility and water quality
- Enhanced farmers' livelihoods
- Eliminated chemical inputs
- Restored biodiversity

**Impact:**

A living example of regeneration in agricultural practice, proving that restoration can be economically viable.

# Learning from Nature's Intelligence

Nature operates through closed loops. Biomimicry (learning from nature's strategies) is helping designers reimagine materials and systems.

## Case Study: Living Seawalls (Australia)

**Biomimetic Design:**
Mimics natural marine surfaces to regenerate coastal biodiversity

**Impact:**
Early studies show a **36% increase** in marine life along these designed sea-walls compared to flat concrete ones.

## Case Study: Aranya Natural (India)

**Regenerative Craft Model:**

- Works with natural dyes from local plants, roots, and minerals
- Closed-loop dyeing systems recycle water
- Compost leftover organic matter
- Empower artisans with dignified employment

**Impact:**
Restoring both ecosystems and traditional livelihoods through design.

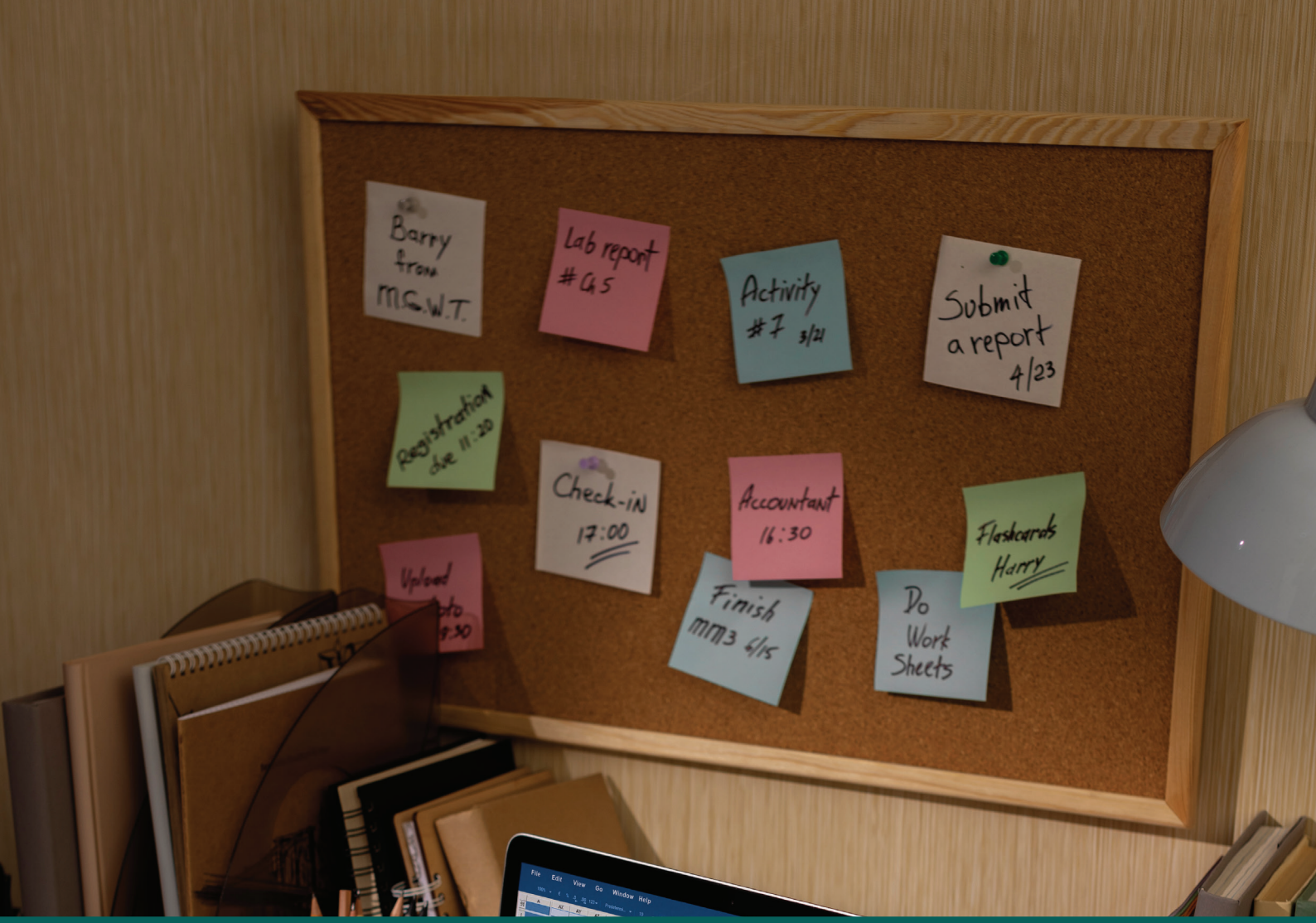
# The Economic Case for Regeneration

**$10.1 trillion** in annual business value and **395 million jobs** could be generated by 2030 through nature-positive design and regenerative business models. (WEF Future of Nature and Business Report)

Companies adopting regenerative practices across value chains could see a **15–25% increase** in long-term profitability, driven by resource efficiency, brand trust, and risk reduction. (BCG 2022)

## The Regenerative Invitation

**Sustainability asks us to sustain what exists. Regeneration challenges us to revive what has been lost. It invites designers to think beyond the lifecycle of products and to shape the lifecycles of ecosystems, communities, and economies. Through design, that shift (from restraint to renewal) can become the defining creative project of our century.**




# A Practical Checklist for Designers

Here's a basic list of things for you to consider during your next contribution towards a sustainable future. By no means is this checklist meant to be comprehensive, but it serves as the first stepping stone.



## 1. Core Product and Material Decisions

- **Durability and repairability:** Can this be opened, fixed, upgraded, and reassembled? Are spares, tools, and instructions available, affordable, and local by default?
- **Materials and toxicity:** Are inputs safe, certified, and known; is there recycled/recyclable content, and a documented end-of-life pathway in local systems?
- **Design for disassembly:** Are fasteners standardised, adhesives minimised, parts modular, and components labelled for recovery?
- **Emotional durability:** Will users want to keep and care for this, enjoying a timeless aesthetic, a high-quality feel, upgradability, and a sense of pride of ownership?
- **Packaging:** Can primary/secondary packaging be eliminated, right-sized, reused, composted, or returned within existing local infrastructure?

## 2. Energy, Water, and Resource Use

- **Efficiency by default:** Do factory, device, building, or app settings minimise energy and water without harming experience?
- **Passive first:** Can daylighting, ventilation, insulation, and thermal mass reduce mechanical loads before adding technology?
- **Operational feedback:** Are real-time prompts, dashboards, or cues provided to help users avoid waste without friction?
- **Maintenance design:** Are filters, seals, and wear parts easily accessible and replaceable to prevent leaks and inefficiency?

## 3. Information, Measurement, and Transparency

- **Lifecycle impacts:** Are scopes, boundaries, and trade-offs measured (LCA), tracked, and disclosed in plain, specific terms?
- **Claims and standards:** Are sustainability claims tied to credible third-party standards, test methods, and renewal cycles; avoid vague language?
- **Digital product passports:** Are origin, recyclate content, repair history, and take-back terms encoded and accessible?
- **Material passports and labelling:** Are components marked for sorting and safe processing at end-of-life?

## 4. Behaviour and Experience Design

- **Sustainable defaults:** Are the greener choices pre-selected or one-click, with wasteful options requiring conscious override?

- **Nudges, not nags:** Are timely cues (pool rides, no cutlery, refi ll reminders) embedded at the decision moment?
- **Accessibility and inclusion:** Are designs usable and affordable for diverse users, so sustainability is not exclusionary?
- **Lean interfaces:** Are pages, models, and media optimised (compression, caching, fewer calls) to lower compute and transfer?
- **User journeys:** Are flows designed to reduce unnecessary steps, downloads, and retries that drive resource use?

## 5. End-of-Life, Circular Loops, and Service Models

- **Take-back plan:** Who collects, where, and how often? Are fees, packaging, and logistics defined in contracts?
- **Reuse and remanufacture:** Can parts be graded, refurbished, and reintroduced? Are warranties and quality standards set?
- **Product-as-a-service:** Can outcomes be sold (light, mobility) with the maker retaining ownership and maintenance?
- **Secondary markets:** Is resale, leasing, or donation designed into the experience and supported by policy and UX?

## 6. Supply Chains, Procurement, and Operations

- **Traceability:** Can suppliers provide evidence of material origin, labour practices, and recycled content? Are audits risk-based?
- **Localisation where sensible:** Can heavy, low-value flows be shortened? Are repairs and spares locally available?
- **Logistics efficiency:** Are loads right-sized, routes optimised, and packaging pooled or reusable?
- **Procurement specs:** Are repairability, non-toxicity, recyclability, and take-back embedded in briefs and contracts?

## 7. Built Environment and Cities

- **Site and fabric first:** Orient for sun/wind, reduce heat gain, and design envelopes that can be maintained and upgraded.
- **Materials and health:** Prioritise low-toxicity, reused/recycled content, and design out pollutants.
- **Mobility and proximity:** Make active travel and transit convenient; reduce parking dependency with mixed-use planning.
- **Operations plan:** Define cleaning, maintenance, and replacement intervals that preserve efficiency over time.

## 8. Food and Bio-Based Systems

- **Waste prevention:** Are menus, portions, labels, and storage designed to minimise spoilage and enable redistribution?
- **Reusables by design:** Are returnable containers made attractive, durable, and easy to track?
- **Information design:** Have clear use-by guidance, preparation tips, and storage cues to extend shelf life been provided?

## 9. People, Equity, and Governance

- **Worker dignity and safety:** Are labour conditions verified and improved through design choices and supplier engagement?
- **Community impact:** Have local stakeholders been involved? Are externalities understood and mitigated?
- **Policy alignment:** Do designs meet or exceed Right-to-Repair, EPR, energy codes, and public procurement criteria?
- **Design reviews:** Are sustainability checkpoints formalised at the concept, detail, and pre-launch stages, with sign-off and remediation plans?

## 10. Team Practices and Collaboration

- **Roles and RACI:** Are responsibilities for measurement, repair, take-back, and disclosure clearly assigned?
- **Checklists in workflows:** Are these checks embedded in templates, sprints, QA, and acceptance criteria?
- **Supplier co-design:** Are recyclers, repairers, and logistics partners included early to ensure practical circularity?
- **Learning loops:** Are incidents, returns, and field data feeding redesign and continuous improvement?

## 11. Economics and Viability

- **Total cost of ownership:** Do users save over the life cycle? Is repair cheaper than replacement? Are warranties aligned?
- **Incentives and pricing:** Are deposits, leases, or service fees structured to reward durability and reuse?
- **Risk management:** Are climate, regulatory, and supply risks identified and mitigated through design choices?
- **Business metrics:** Are circular revenue, recovery rates, repair turnaround, and utilisation tracked and reported?

# Sources


- Climate crisis: “70% of global GHG from 100 fossil producers” (Carbon Majors, 2017). https://cdn.cdp.net/cdp-production/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf
- Fashion sector impacts: carbon share and wastewater; fast-fashion context and figures summary. https://www.genevaenvironmentnetwork.org/resources/updates/sustainable-fashion/
- Livestock emissions share: FAO work (2017) and updated perspectives; range and uncertainty discussion. https://www.fao.org/family-farming/detail/en/c/1634679/ https://thebreakthrough.org/issues/food-agriculture-environment/livestock-dont-contribute-14-5-of-global-greenhouse-gas-emissions
- Data centres electricity today and outlook to 2030; AI-driven demand. https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai https://www.iea.org/reports/electricity-2024 https://www.iea.org/reports/energy-and-ai/executive-summary
- Buildings and construction emissions and energy demand; UNEP Global Status Report (2022–2024). https://www.unep.org/resources/publication/2022-global-status-report-buildings-and-construction https://www.unep.org/resources/report/global-status-report-buildings-and-construction
- Circularity gap: share of materials cycled globally (CGR 2023). https://www.circularity-gap.world/2023
- “More plastic than fish by 2050” projection (New Plastics Economy report press note). https://www.weforum.org/press/2016/01/more-plastic-than-fish-in-the-ocean-by-2050-report-offers-blueprint-for-change/
- EU greenwashing evidence: share of vague/misleading claims; Green Claims proposal. https://environment.ec.europa.eu/topics/circular-economy-topics/green-claims_en https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1692
- Road traffic deaths and burden (WHO facts and global status report). https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries
- Circular economy value creation: $4.5T potential (WEF). https://www.weforum.org/stories/2019/11/helping-the-circular-economy-become-a-reality/
- Nest thermostat energy savings (10–12% heat savings; white paper).

Climate crisis: “70% of global GHG from 100 fossil producers” (Carbon Majors, 2017). https://cdn.cdp.net/cdp-production/cms/reports/documents/000/002/327/original/Carbon-Majors-Report-2017.pdf

- Fashion sector impacts: carbon share and wastewater; fast-fashion context and figures summary. https://www.genevaenvironmentnetwork.org/resources/updates/sustainable-fashion/
- Livestock emissions share: FAO work (2017) and updated perspectives; range and uncertainty discussion. https://www.fao.org/family-farming/detail/en/c/1634679/ https://thebreakthrough.org/issues/food-agriculture-environment/livestock-dont-contribute-14-5-of-global-greenhouse-gas-emissions
- Data centres electricity today and outlook to 2030; AI-driven demand. https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai https://www.iea.org/reports/electricity-2024 https://www.iea.org/reports/energy-and-ai/executive-summary
- Buildings and construction emissions and energy demand; UNEP Global Status Report (2022–2024). https://www.unep.org/resources/publication/2022-global-status-report-buildings-and-construction https://www.unep.org/resources/report/global-status-report-buildings-and-construction
- Circularity gap: share of materials cycled globally (CGR 2023). https://www.circularity-gap.world/2023
- “More plastic than fish by 2050” projection (New Plastics Economy report press note). https://www.weforum.org/press/2016/01/more-plastic-than-fish-in-the-ocean-by-2050-report-offers-blueprint-for-change/
- EU greenwashing evidence: share of vague/misleading claims; Green Claims proposal. https://environment.ec.europa.eu/topics/circular-economy-topics/green-claims_en https://ec.europa.eu/commission/presscorner/detail/en/ip_23_1692
- Road traffic deaths and burden (WHO facts and global status report). https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries
- Circular economy value creation: $4.5T potential (WEF). https://www.weforum.org/stories/2019/11/helping-the-circular-economy-become-a-reality/
- Nest thermostat energy savings (10–12% heat savings; white paper). https://storage.googleapis.com/nest-public-downloads/press/documents/energy-savings-white-paper.pdf

# Resources

## Core books and reports

- Cradle to Cradle + The Upcycle (McDonough & Braungart): foundational principles, certification pathway, and design criteria for safe circular materials.
  https://c2ccertified.org
- New Plastics Economy (Ellen MacArthur Foundation): circular plastics vision, design actions, and systemic roadmap.
  https://www.ellenmacarthurfoundation.org/plastics
- Future of Nature and Business (World Economic Forum): nature-positive value and jobs; sector playbooks for regeneration.
  https://www.weforum.org/publications/the-future-of-nature-and-business/
- Circular economy opportunity (WEF): macro rationale and business model implications.
  https://www.weforum.org/stories/2019/11/helping-the-circular-economy-become-a-reality/
- Global Status Report for Buildings and Construction (UNEP, latest edition): sector emissions, policy status, solutions.
  https://www.unep.org/resources/report/global-status-report-buildings-and-construction
- Circularity Gap Report (Circle Economy, 2023/2025): global circularity metric, material flows, priority interventions.
  https://www.circularity-gap.world/
- She Ji: "Sustainability in the Future of Design Education" (Faludi et al., 2023): evidence-based curricula, tools, learning outcomes.
  https://www.sciencedirect.com/science/article/pii/S2405872623000369
- WBCSD "8 Business Cases for the Circular Economy": CEO-level rationales and measurable outcomes.
  https://www.cbd.int/business/case-studies/wbcsd-8-business-cases-for-the-circular-economy-en.pdf

## Frameworks and toolkits

- Ellen MacArthur Foundation: Circular design case studies and sector playbooks; foundational definitions and principles.
  https://www.ellenmacarthurfoundation.org/topics/circular-design/examples
- SVID Sustainability Guide: methods for lifecycle, materials, behaviour, and systems design; "Design for Sustainable Behaviour" strategy sets.
  https://sustainabilityguide.eu/methods/design-sustainable-behaviour/
- Circular Design Guide (IDEO + EMF): end-to-end methods, workshops, exercises.
  https://www.circulardesignguide.com
  https://guides.library.illinois.edu/c.php?g=347670&p=2344606
- ISO 14040/14044 (LCA), ISO 14067 (Product Carbon Footprint), GHG Protocol Product Standard: measurement and disclosure backbone.
  https://www.iso.org/standard/38498.html

https://www.iso.org/standard/71206.html
https://ghgprotocol.org/product-standard

- BS 8001 (Circular Economy) and ISO 20400 (Sustainable Procurement): organisational and procurement frameworks.
  https://www.iso.org/standard/63026.html
- EU Ecodesign for Sustainable Products Regulation (ESPR) + Digital Product Passport (DPP) resources: policy context and design implications.
  https://environment.ec.europa.eu/topics/circular-economy/ecodesign-sustainable-products_en
- Sustainable digital/product toolkits and calculators.
  https://www.smashingmagazine.com/2023/07/sustainable-design-toolkits-and-resources/

### Case libraries and examples

- EMF case study collections across sectors (built environment, food, plastics, fashion, finance) with replicable models.
  https://www.ellenmacarthurfoundation.org/topics/circular-economy-introduction/examples
- Government exemplars: GSA sustainable design policy, net-zero mandates, LEED Gold baseline, and results from high-performance buildings.
  https://www.gsa.gov/real-estate/design-and-construction/sustainability/sustainable-design
- Livework on service design for circular business models and behaviour adoption—grounded "how-to" for org change.
  https://liveworkstudio.com/insight/designing-for-sustainable-futures/
- IDEO.org Clean Team (sanitation service design, Ghana): dignity-centred service model, hardware + logistics ecosystem.
  https://www.ideo.org/project/clean-team
  https://www.designkit.org/case-studies/1.html
- Signify/Philips Light-as-a-Service (pay-per-lux): servitization, durability incentives, material recovery.
  https://www.circularx.eu/en/cases/40/signify-light-as-a-service
- Fairphone (repairability, e-waste neutrality, take-back): modular phones, recycling/repair programmes.
  https://www.fairphone.com/en/our-impact/
  https://www.fairphone.com/en/2021/10/25/recycling-program/
- Vitsœ 606 (longevity and repair): timeless modular system, spares, service, emotional durability.
  https://www.vitsoe.com/rw/606
- Too Good To Go (food waste service): marketplace design and measured impact.
  https://www.toogoodtogo.com/press/200-million
- Cities & mobility: Medellín Metrocable; Ahmedabad Janmarg BRT.
  https://use.metropolis.org/case-studies/medellins-metrocable
  https://backend.orbit.dtu.dk/ws/files/158818365/urbansci_02_00095.pdf
- Pollution-to-product: Chakr Innovation (diesel particulate to ink).
  https://www.unep.org/news-and-stories/story/turning-diesel-ink-india

### Behaviour change and UX

- Bhamra, Lilley & Tang: Design for Sustainable Behaviour—intervention strategies (eco-feedback, steer, spur, constraints).
  https://www.researchgate.net/publication/233620661_Design_for_Sustainable_Behaviour_Using_Products_to_Change_Consumer_Behaviour
- Designit behavioural design POV with EAST, BASIC, and Fogg models applied to sustainability and well-being.
  https://www.designit.com/stories/point-of-view/the-power-of-context
- Behavioural Insights Team EAST guide: practical defaults and prompts.
  https://www.bi.team/publications/eastmeasuring/
- COM-B model (capability, opportunity, motivation): diagnosing behaviour drivers.
  https://www.sciencedirect.com/science/article/pii/S2211335519301540
- Fogg Behavior Model: designing triggers and ability paths.
  https://www.behaviormodel.org/
- Sustainable Web Design: Website Carbon Calculator; performance = energy design.
  https://www.websitecarbon.com
  https://sustainablewebdesign.org/

### Regenerative design

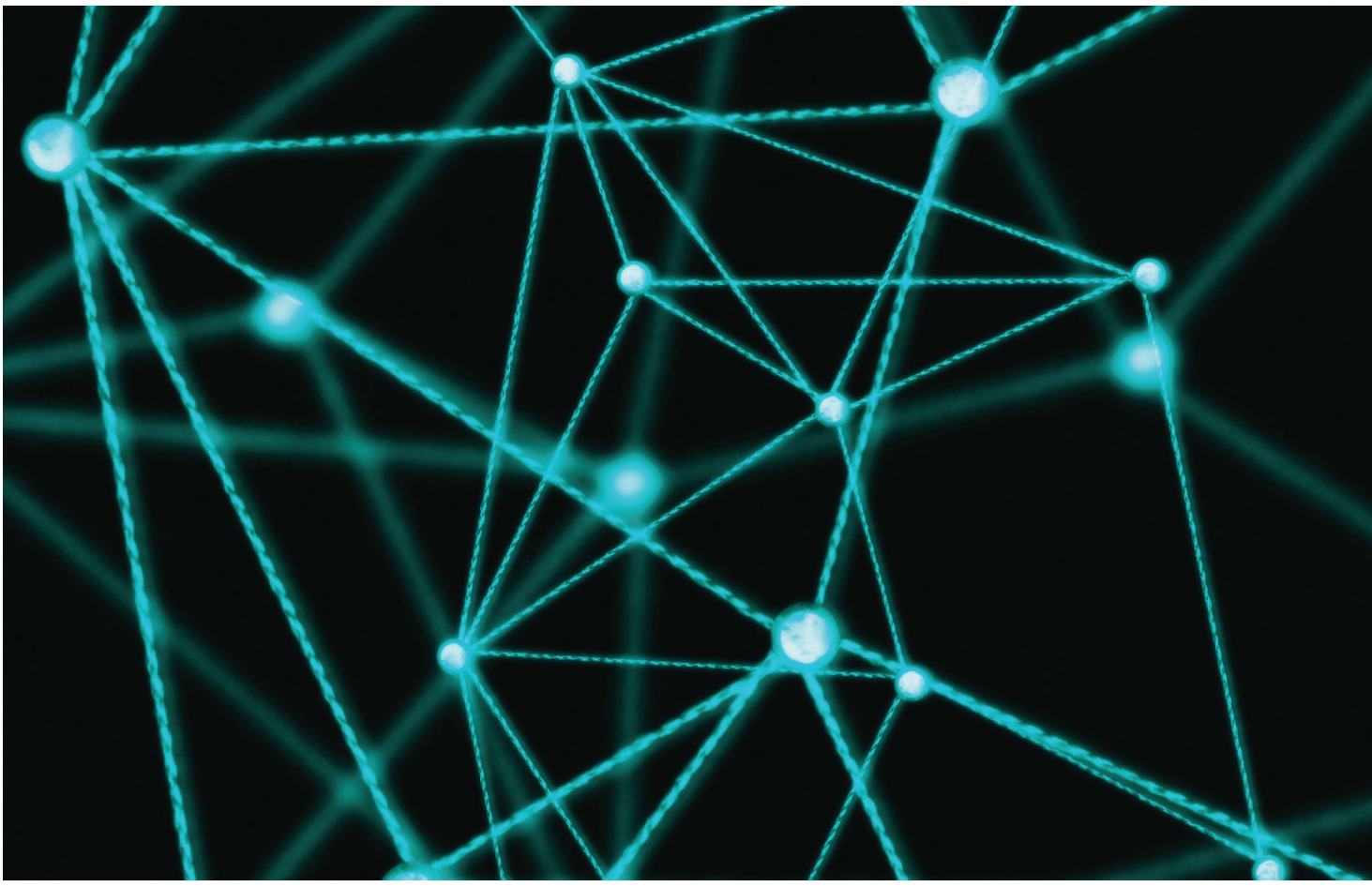
- AIA California: actionable steps architects can take now; policy hooks and project practices.
  https://aiacalifornia.org/news/what-you-can-do-now-regenerative-design/
- Wallpaper* feature surveying regenerative materials and indigenous practices (living root bridges, hempcrete, mycelium).
  https://www.wallpaper.com/design/regenerative-design-feature
- Biomimicry Institute: practice guides and case library for translating nature's strategies.
  https://biomimicry.org/resources/
- International Living Future Institute (ILFI): Net Positive/Regenerative frameworks (Living Building Challenge, Materials).
  https://living-future.org/
- World Economic Forum: nature-positive business roadmaps and sector transformations.
  https://www.weforum.org/centre-for-nature-and-climate/

### University and practitioner guides

- University of Illinois Sustainable Product Design LibGuide: succinct principles, LCA references, right-to-repair, servitization examples.
  https://guides.library.illinois.edu/c.php?g=347670&p=2344606
- Smashing Magazine roundup: sustainable web/UX methods, hosting directories, carbon calculators—useful for digital product scope.
  https://www.smashingmagazine.com/2023/07/sustainable-design-toolkits-and-resources/
- TU Delft Circular Design Lab: methods, courses, tools for circular product/service design.
  https://www.tudelft.nl/ide/research/research-labs/circular-design-lab
- Government exemplars: US GSA sustainable design policy; UK Government Buying Standards for sustainable procurement.
  https://www.gsa.gov/real-estate/design-and-construction/sustainability/sustainable-design
  https://www.gov.uk/government/collections/government-buying-standards-gbs
- Green Software Foundation: patterns and metrics for energy-efficient digital products.
  https://greensoftware.foundation/

LMNX (pronounced lemon-x) works at the intersection of design, social impact, and entrepreneurship on “things that matter.” It mentors and consults early-stage startups and entrepreneurs, experiments across a diversity of business ideas, partners with people and organizations committed to such initiatives, supports impact-led passion projects, engages deeply in growth and transformation assignments, and invests in startups working in this space.

LMNX understands that its decisions carry weight beyond financial returns, and aspires for its conversations and collaborations to strengthen communities, support meaningful causes, and catalyze lasting impact. LMNX was founded in 2024 by Dharmesh Mehta, a design generalist.



Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organisation, with around 9,700 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 365,000 enterprises from 318 national and regional sectoral industry bodies.

For 130 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with the Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness, and business opportunities for industry through a range of specialised services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Through its dedicated Centres of Excellence and Industry competitiveness initiatives, promotion of innovation and technology adoption, and partnerships for sustainability, CII plays a transformative part in shaping the future of the nation. Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes across diverse domains, including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

For 2025-26, CII has identified "Accelerating Competitiveness: Globalisation, Inclusivity, Sustainability, Trust" as its theme, prioritising five key pillars. During the year, CII will align its initiatives to drive strategic action aimed at enhancing India's competitiveness by promoting global engagement, inclusive growth, sustainable practices, and a foundation of trust.

With 70 offices, including 12 Centres of Excellence, in India, and 9 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with about 250 counterpart organisations in almost 100 countries, CII serves as a reference point for Indian industry and the international business community.

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