Sustainability & Circular Economy in Construction

Webinar 1/3 by fors.earth GmbH for XRGREEN.CON

01.04.2026 I 10:00 – 11:30 a.m. I MS-Teams

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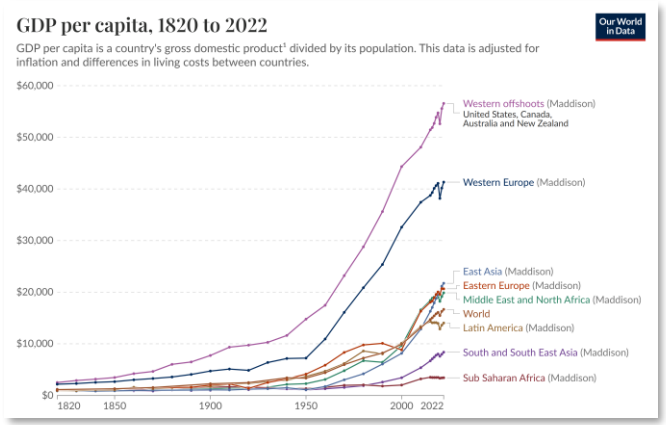
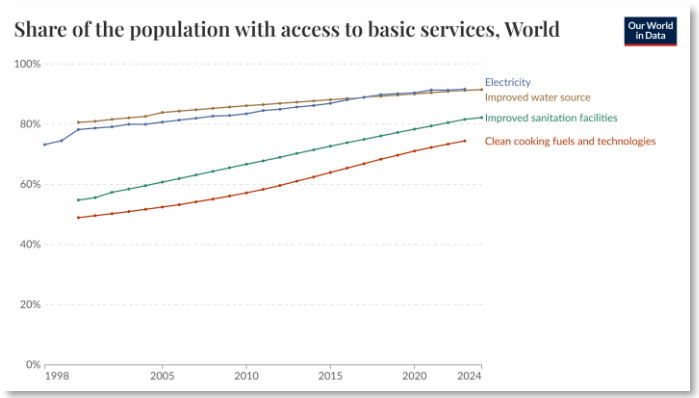
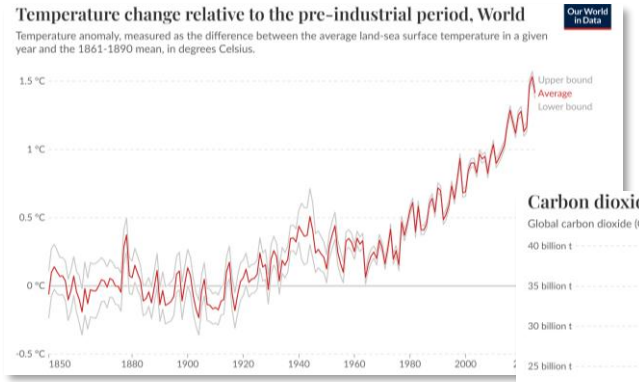
We have achieved a lot as humanity – but it came at a cost

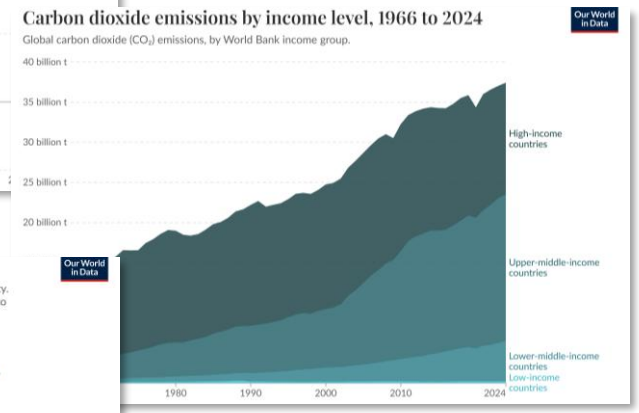
Over the years, there has been economic growth, technological progress and an improvement in living standards globally…

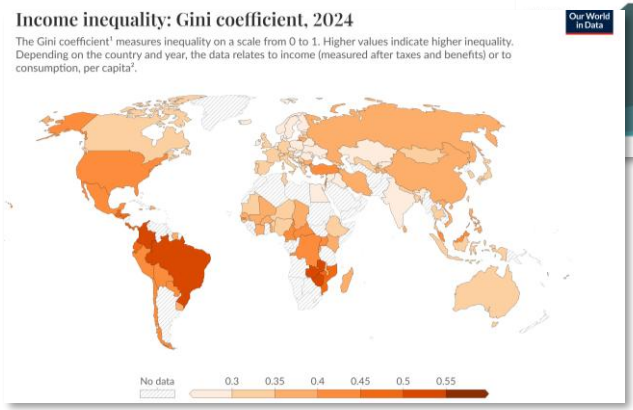




…at the same time, climate change is intensifying, resources are becoming increasingly scarce, and social inequalities remain

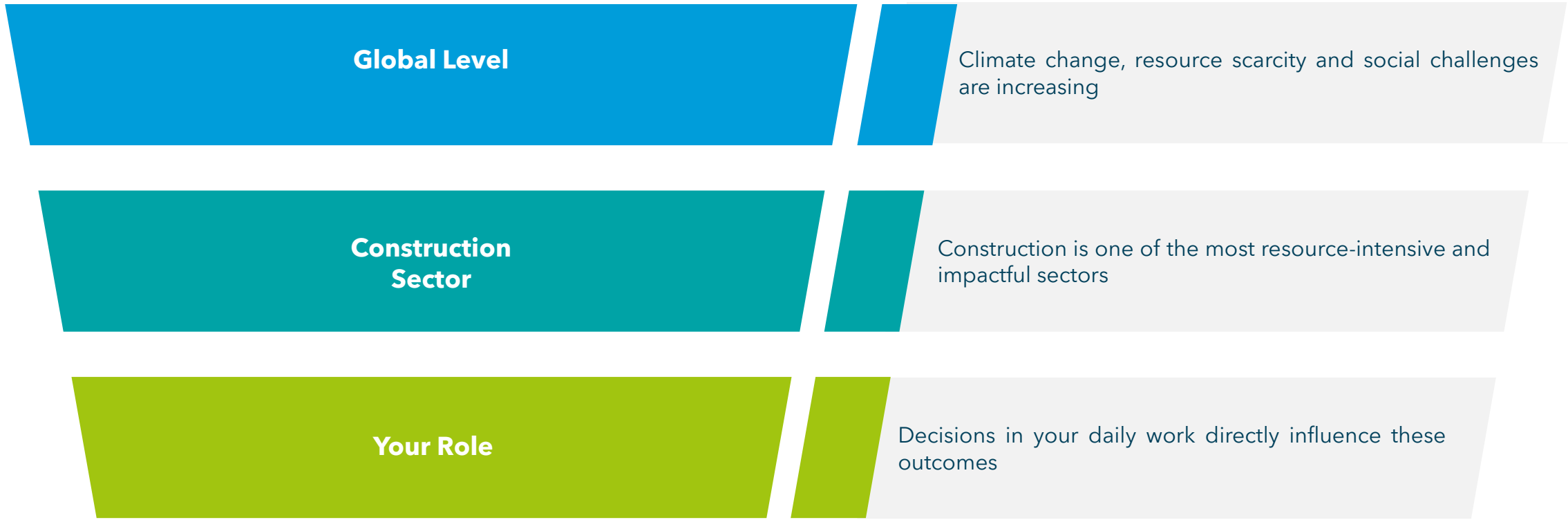






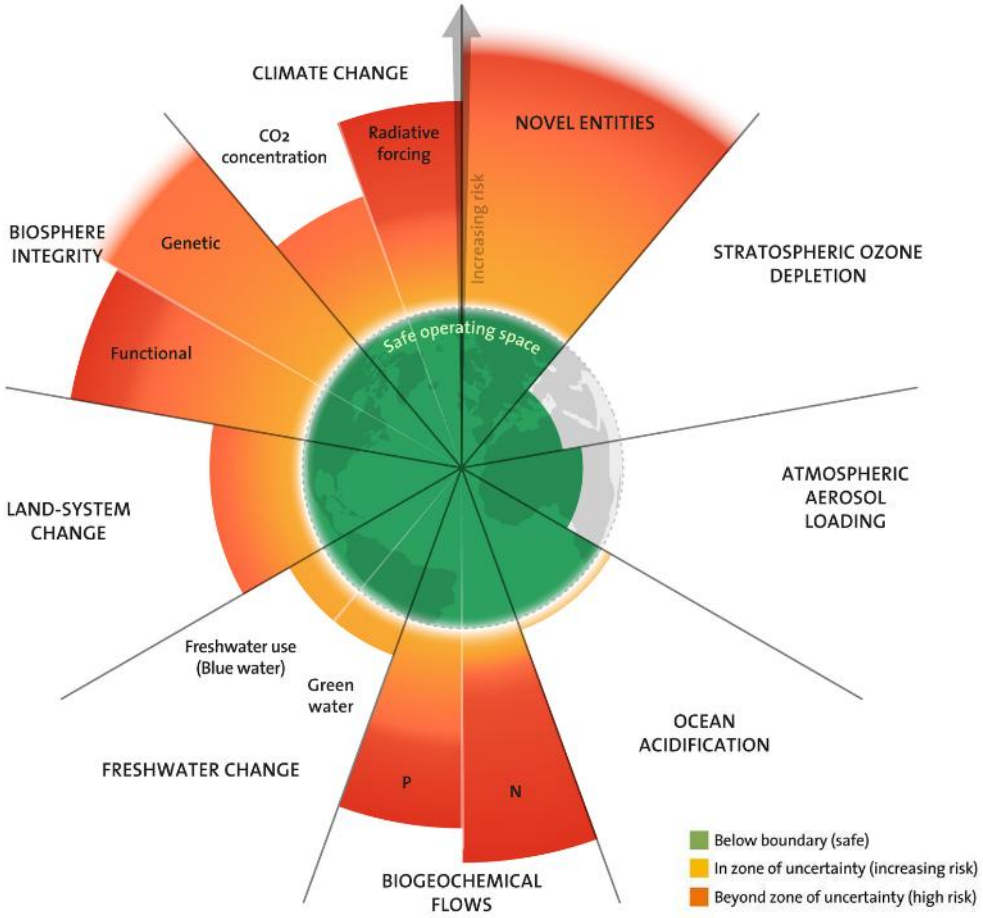
GDP per Capita: Data source: Bolt and van Zanden – Maddison Project Database 2023
Access to basic services: Data source: Data compiled from multiple sources by World Bank; World Health Organization (via World Bank);WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP), via World Bank (2026)
World Bank Poverty and Inequality Platform (2025) – with major processing by Our World in Data
Global Carbon Budget (2025) – with major processing by Our World in Data

Global challenges become real in the construction sector and in your daily decisions



We are operating within physical – non-negotiable – limits

Earth system processes define the limits within which human activity can safely operate



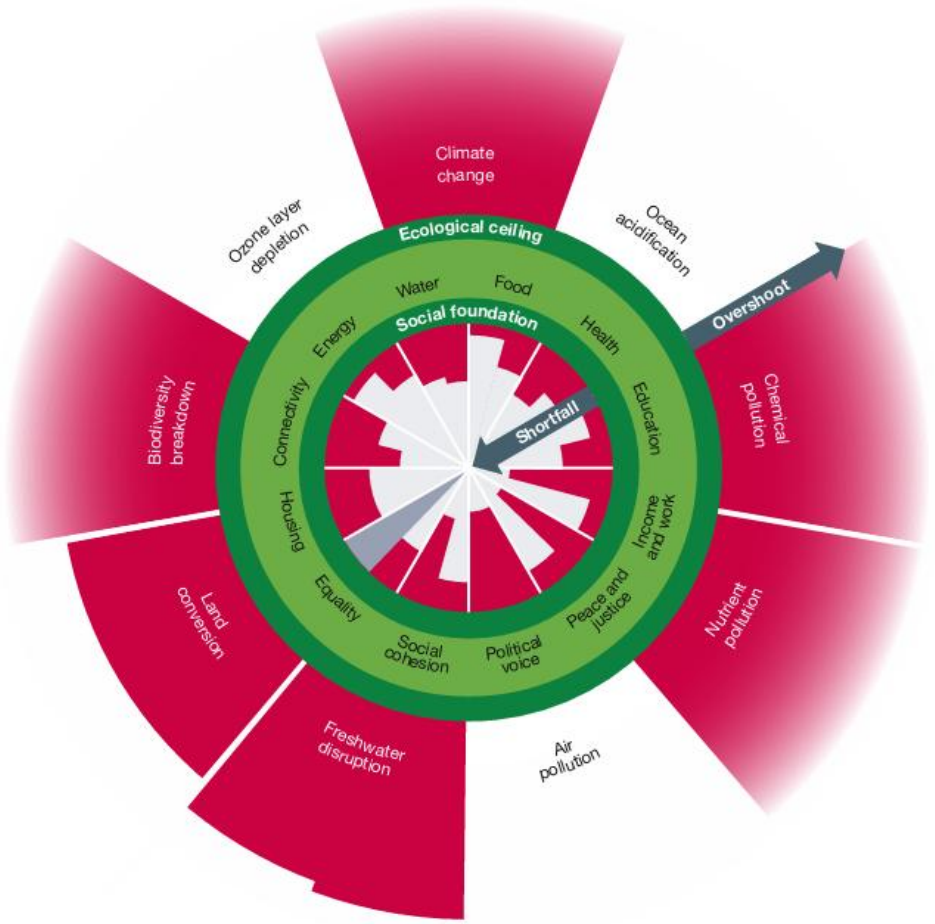
Society and the economy operates within these boundaries as well

The Doughnut Economy Model:

Inner ring (social foundation):
- Basic human needs like food, water, health, education, and equality
- Falling inside this ring means people are lacking essentials

Outer ring (planetary boundaries):
- Environmental limits like climate change, biodiversity, and pollution
- Going beyond this ring means we are damaging the Earth

The goal is to remain within the **"doughnut space"** between the two rings, ensuring that everyone's needs are met without placing excessive strain on the planet

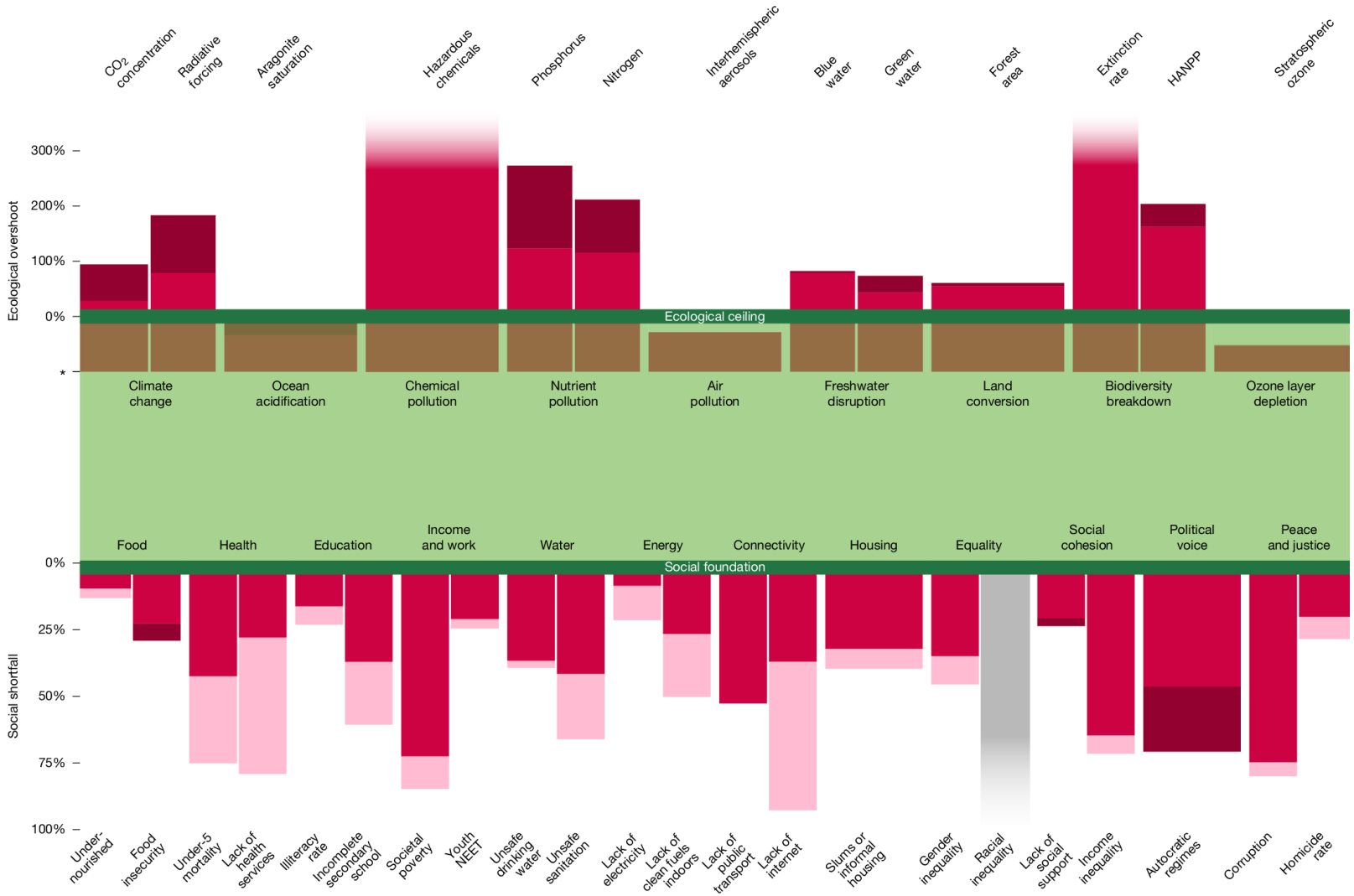


Doughnut of social and planetary boundaries monitors a world out of balance | Nature

Deep Dive (for private reading): The data behind the Doughnut (2000 vs. 2022)

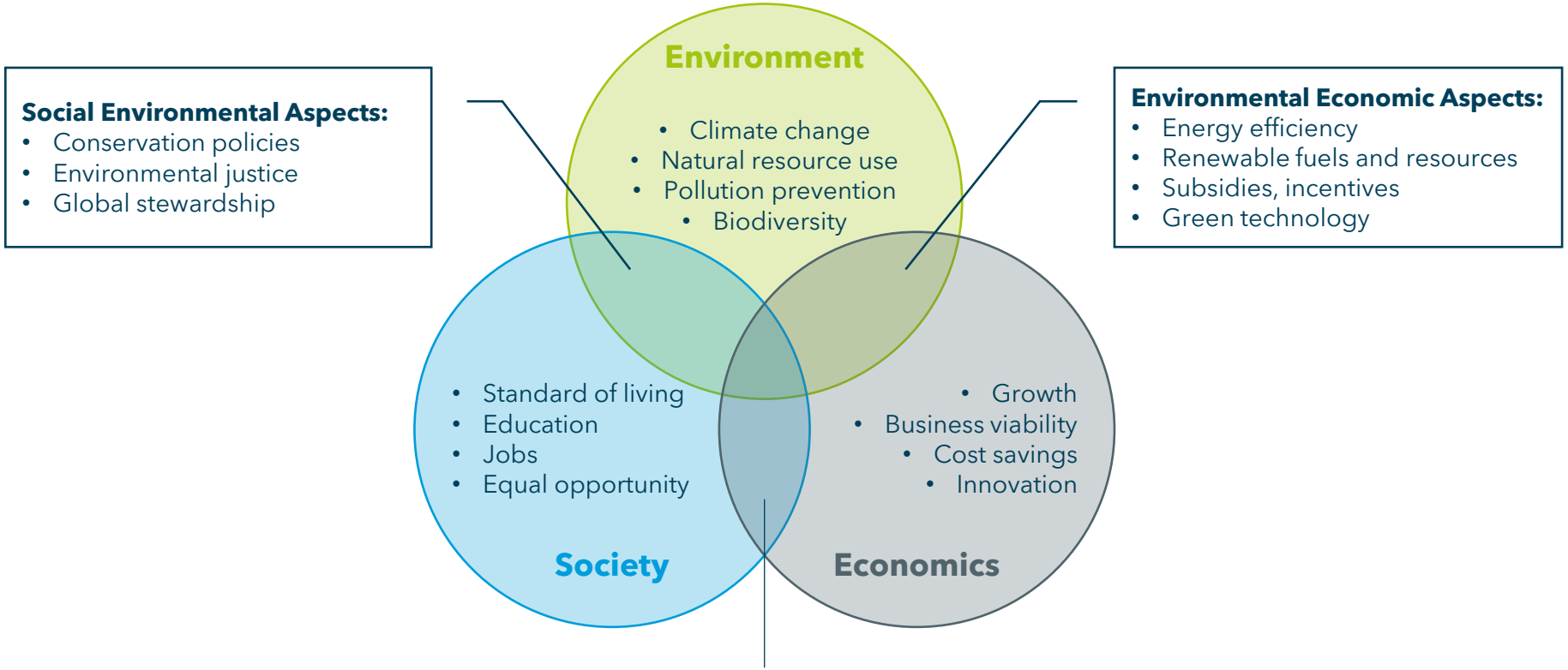
reduction in shortfall or overshoot

increase in shortfall



Doughnut of social and planetary boundaries monitors a world out of balance | Nature
Additional Resource: Country Trends - A Good Life For All Within Planetary Boundaries

Sustainability means meeting today's needs without compromising future generations



Brundtland-Report-1987-Our-Common-Future.pdf

Sustainability is increasingly shaped by a complex and evolving regulatory landscape

Sustainability is increasingly shaped by frameworks, regulation, standards and market expectations

Communications materials - United Nations Sustainable Development
European Green Deal Icon Vector Illustration Stock Vector (Royalty Free) 2181666391 | Shutterstock
CSRD Explained: A 2025 Guide to the Corporate Sustainability Reporting Directive changes | Leafr
Reporting Edition | Risk Management Partners
File:LEED Certified Gold.jpg - Wikimedia Commons
Certified Products - Cradle to Cradle Products Innovation Institute

World-GBC-WLC Roadmap V1.pdf
Investors Seek Greener Buildings - The New York Times
The Future Of Construction: Why Sustainability Is A Hot Topic
Green Architecture Hits a Growth Spurt - The New York Times
Property market faces green transition challenge
Transparency: A Strategic Tool for Mobilizing Climate Finance | UNFCCC

Regulation is not one rule – it is an interconnected system shaping construction

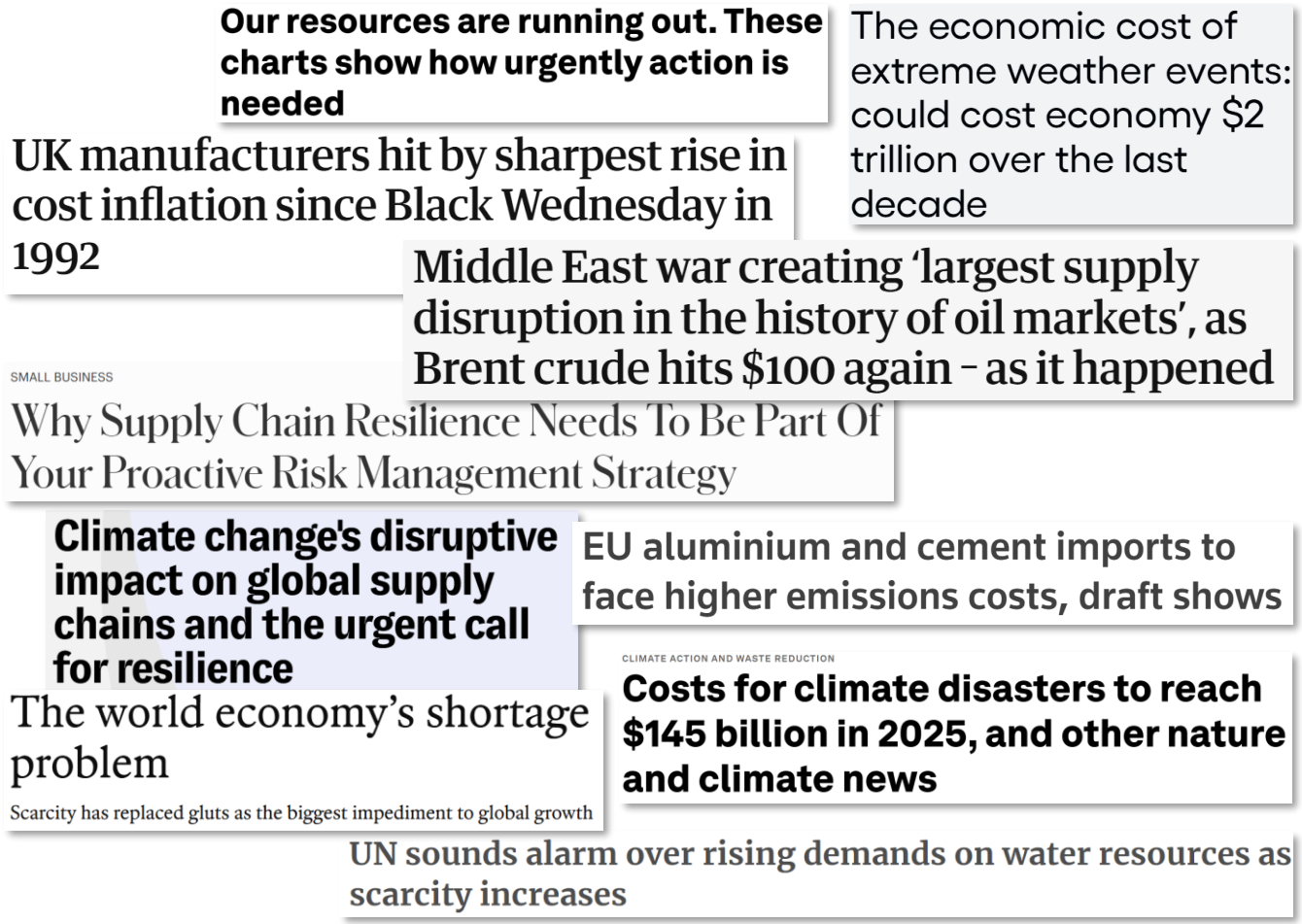
European regulation is not a single framework, but a system of interconnected policies and initiatives.
These frameworks jointly address multiple sustainability objectives – from climate and resources to circular economy and biodiversity.
For the construction sector, this means increasing complexity, but also clearer direction, especially via:

- **Circular Economy Action Plan** [COM/2020/98]
- **Waste Framework Directive (WFD)** [2008/98/EC]
- **Review of the Construction Products Regulation (CPR)** [COM/2022/144]
- **New European Bauhaus (NEB)** policy and funding initiative

Construction Products Europe - Let's build an efficient Europe
Policy brief on sustainable and circular construction | BUILD UP

Sustainability challenges translate directly into economic consequences

DRIVERS / EVENTS	EFFECTS	BUSINESS IMPACT
→ climate change	→ price volatility	→ cost increases
→ resource scarcity	→ supply chain disruption	→ risk exposure
→ geopolitical instability	→ new compliance requirements	→ changing competitive-ness
→ regulation		

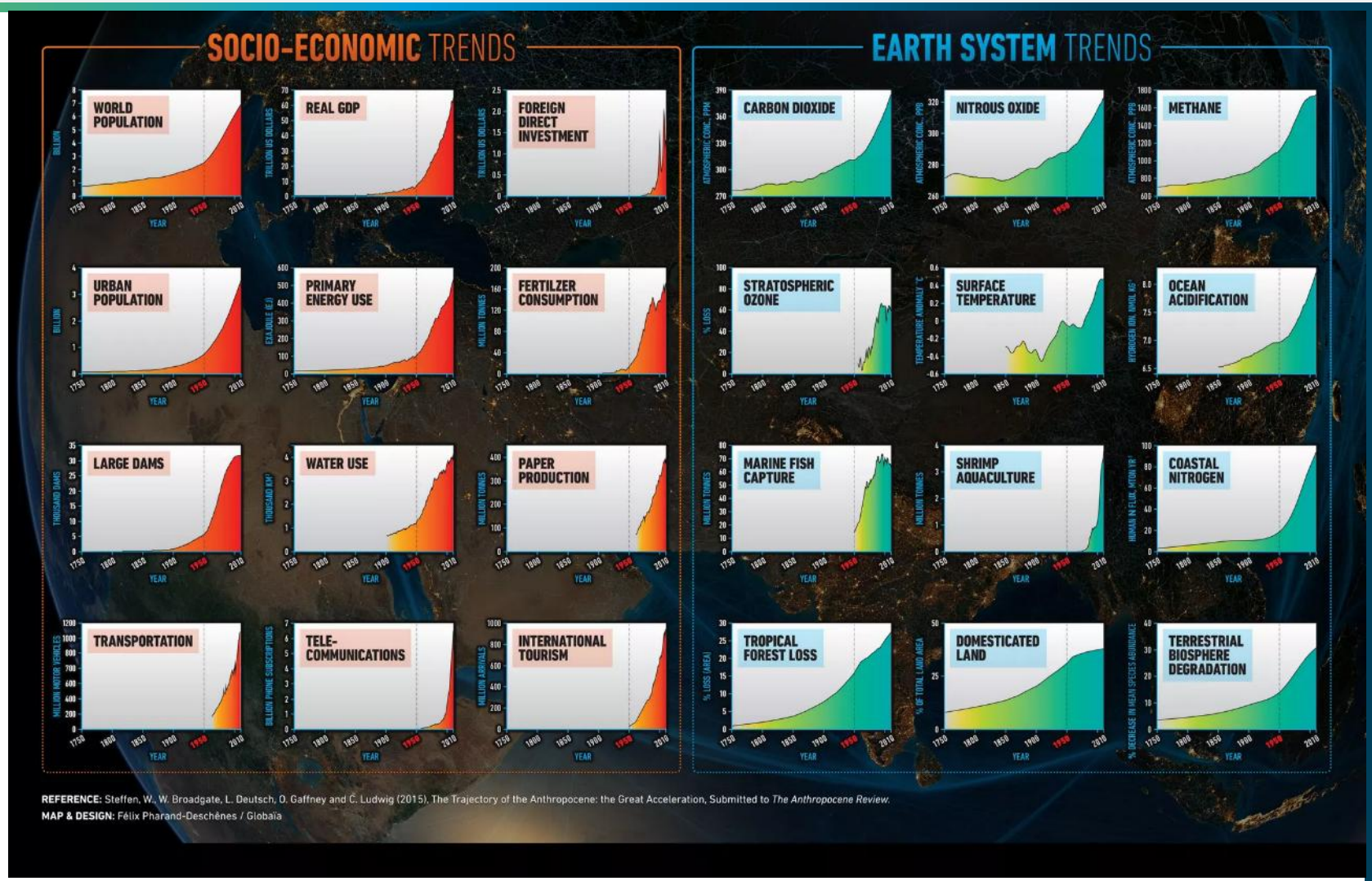


Supply Chain Resilience Should Be A Proactive Risk Management Strategy
The economic cost of extreme weather events: could cost economy $2 trillion over the last decade - ICC - International Chamber of Commerce
UK manufacturers hit by sharpest rise in cost inflation since Black Wednesday in 1992 | Manufacturing sector | The Guardian
Middle East war creating 'largest supply disruption in the history of oil markets', as Brent crude hits $100 again – as it happened | Business | The Guardian
Climate change's disruptive impact on global supply chains and the urgent call for resilience
Costs for climate disasters to reach $145 billion in 2025 | World Economic Forum
EU aluminium and cement imports to face higher emissions costs, draft shows | Reuters
The world economy's shortage problem
UN sounds alarm over rising demands on water resources as scarcity increases | UN News
Global sustainable resource consumption needed urgently, UN report says | World Economic Forum

These dynamics are accelerating and reshaping industries

Sustainability-related changes are not static – they are accelerating.

These forces **interact and reinforce each other**, resulting in **systemic** rather than isolated transformation.



Great Acceleration - IGBP

Construction is a major contributor to the problem – and a key part of the solution

FOOTPRINT: The construction sector accounts for…

- **50%** of total **energy consumption** in the EU
- **40%** of **greenhouse gas emissions** in the EU
- **52%** of the EU's **material footprint**
- **75%** of building stock in the EU is **energy inefficient**
- **16%** of Europeans **living in ageing, poor-quality housing**

HANDPRINT: The construction sector creates value such as…

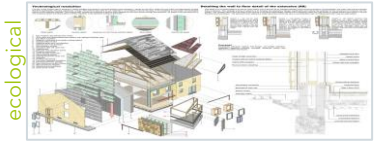
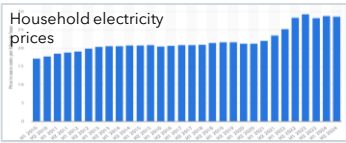
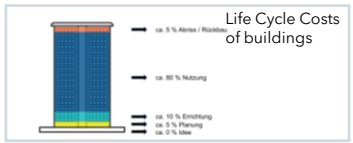
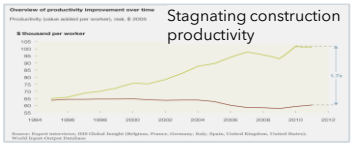
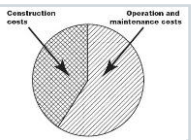
- **10%** of EU **GDP** is generated by construction
- **8%** of total EU **employment** depends on construction
- **50%** of total EU **investment** is related to construction
- **80%** of Europeans' **time** is **spent in buildings**

→ **Without construction, there is no infrastructure, no housing – and no functioning economy.**

Buildings and construction | In-depth topics | European Environment Agency (EEA)
Addressing the environmental and climate footprint of buildings - EEA Report 09/2024
FIEC - Statistical Report 2025
FIEC - Annual Report 2025
Level(s). What's in it for construction companies and contractors, manufacturers, asset managers, facilities managers, and occupants? - Publications Office of the EU
Analysis of Life-Cycle Greenhouse Gas Emissions of EU Buildings and Construction

What we build today determines impacts for decades

influence & time

DESIGN define	RESOURCE EXTRACTION supply	CONSTRUCTION implement	USE consume	RENOVATION improve	DECONSTRUCTION / END-OF-LIFE recover
Planning and defining how a building is designed, including materials, structure and performance	*Extraction and processing of raw materials such as minerals, metals and timber*	*On- & off-site building activities including assembly, logistics and execution*	*Operation and use of buildings over their lifetime*	*Maintenance, refurbishment and upgrading of existing buildings*	*Dismantling buildings and managing materials at the end of life*
Up to ~80-90% of lifecycle impacts are determined in design	**Significant impacts occur before construction even starts**	**Execution determines efficiency and waste intensity**	**The use phase often accounts for the largest share of lifecycle impacts**	**Critical lever given ageing EU building stock**	**Determines circularity vs. linear loss**
ecological: 			Breakdown of average building life cycle energy consumption 		
social: 			Household electricity prices 		
economical:  Life Cycle Costs of buildings	 Producer Price Index Building Material	 Stagnating construction productivity	Cost of operation and maintenance vs. construction cost 		

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Addressing the environmental and climate footprint of buildings - EEA Report 09/2024
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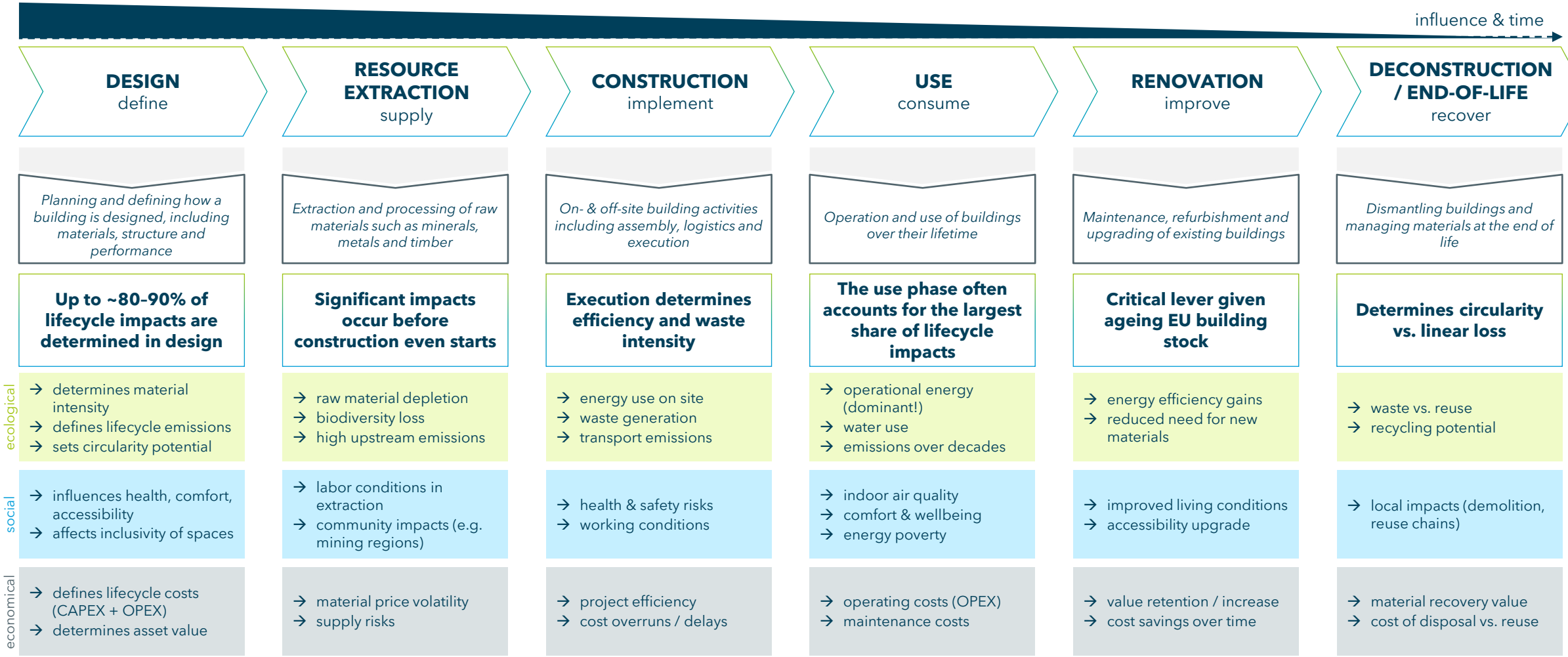
What we build today determines impacts for decades



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Circular economy is about keeping value in the system

The **three principles** for circularity are…

1

Design for circularity

- ✓ design for reuse, adaptability and disassembly
- ✓ avoid locking in linear systems
- ✓ design out waste & pollution

2

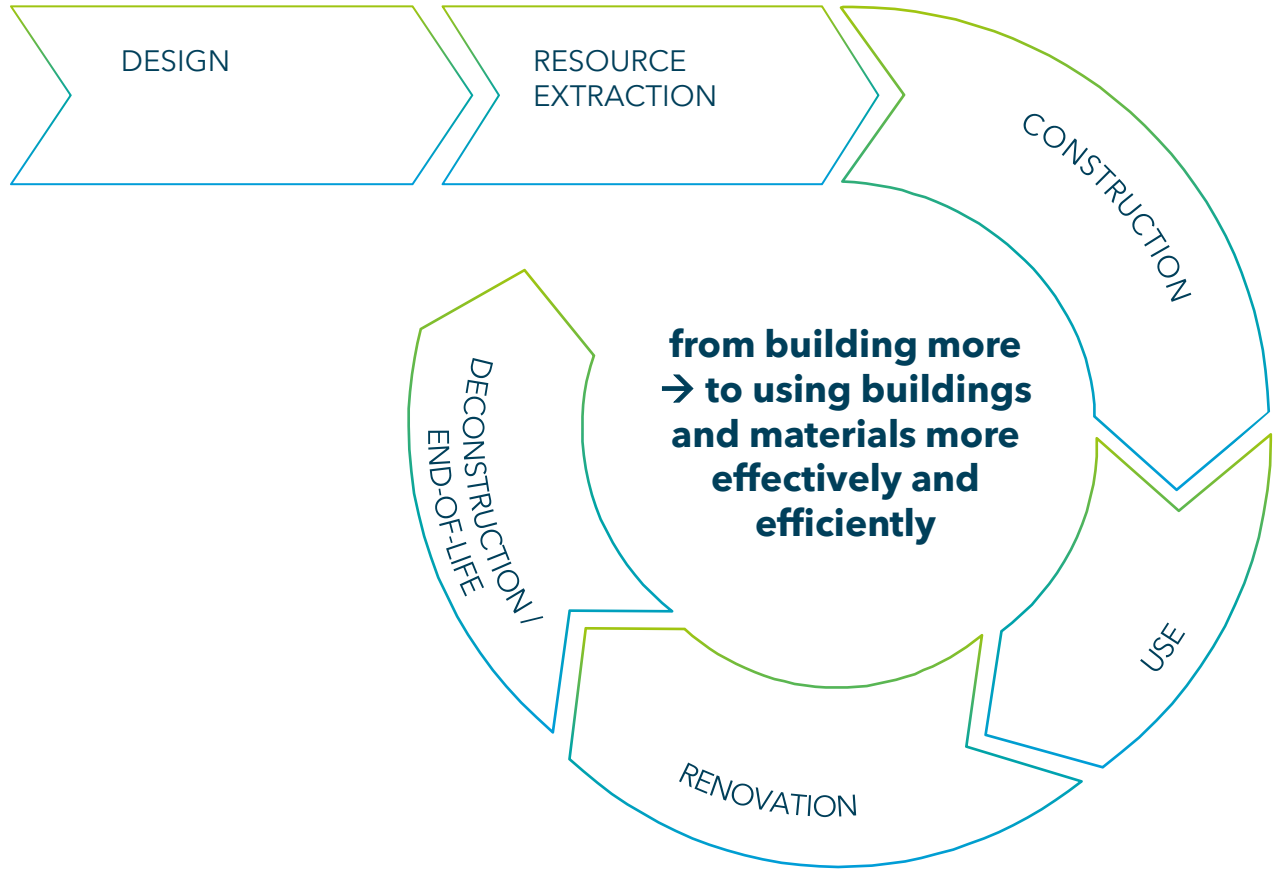
Keep materials and components in use

- ✓ reuse, repair, remanufacture
- ✓ extend building and component lifetimes

3

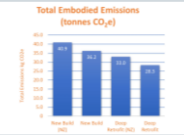
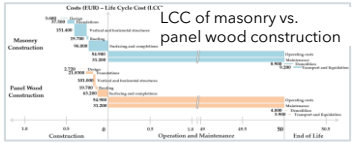
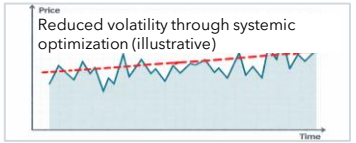
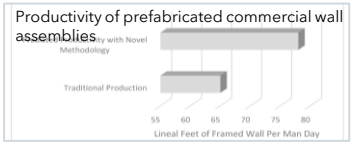
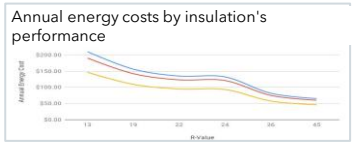
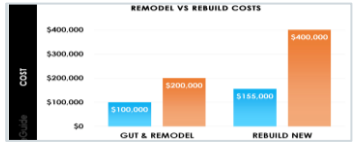
Regenerate natural systems

- ✓ reduce environmental degradation
- ✓ integrate nature-positive solutions



The circular economy in detail | Ellen MacArthur Foundation
https://circulareconomy.europa.eu/platform/sites/default/files/2025-03/Reading%20Guide%20on%20Circularity%20in%20the%20Built%20Environment%202025.pdf
Circular-Built-Environment-Playbook-Report_Final.pdf

Circular economy creates value at every stage – and connects them

	DESIGN define	**RESOURCE EXTRACTION** supply	**CONSTRUCTION** implement	**USE** consume	**RENOVATION** improve	**DECONSTRUCTION / END-OF-LIFE** recover
	✓ **design for disassembly and reuse** ✓ **modular and adaptable building concepts**	✓ **use secondary / recycled materials** ✓ **reduce reliance on virgin resources**	✓ **prefabrication and industrialised processes** ✓ **minimise construction waste**	✓ **operate buildings more efficiently** ✓ **enable shared use and more flexible utilisation**	✓ **upgrade buildings instead of rebuilding them** ✓ **extend building lifetime**	✓ **material recovery and reuse** ✓ **urban mining**
ecological					Embodied emissions of a new build vs. of a retrofit 	
social						
economical	LCC of masonry vs. panel wood construction 	Reduced volatility through systemic optimization (illustrative) 	Productivity of prefabricated commercial wall assemblies 	Annual energy costs by insulation's performance 		

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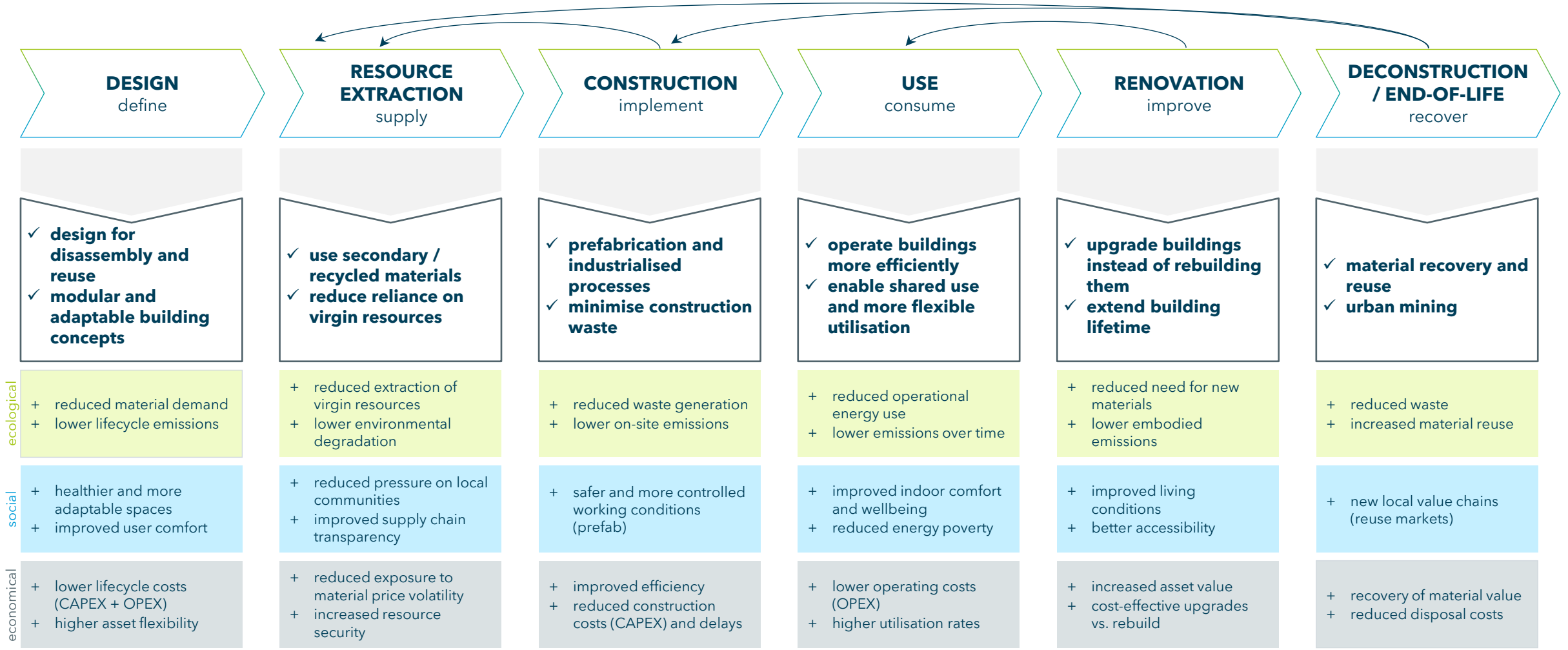
Circular economy creates value at every stage – and connects them



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Circular-Built-Environment-Playbook-Report_Final.pdf

Circular economy connects impacts, decisions and value across the lifecycle

What have we learned?

1. Impacts occur across the entire lifecycle
2. Most impacts are determined early – especially in design
3. The construction sector has both a large footprint and a powerful handprint

What this means:

→ Circular economy enables us to reduce negative impacts
→ and increase positive value at the same time

What this means for you:

→ You can influence outcomes – at your specific stage in the value chain
→ Small decisions can have long-term effects
→ Collaboration across roles and organisations is key

Looking ahead:

(towards Webinar 2)

✓ real-world case studies from the construction sector
✓ how circular strategies are applied in practice
✓ what this means for your daily work

Thank you for your interest!

Looking forward to seeing you in two weeks (April 14th).

Anton Breinbauer, Director

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for sustainable impact

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