ELLEN MACARTHUR FOUNDATION

Building prosperity

#EUCircularTalk 26 March

26/02/2025

Presented by
Nick Jeffries

In a nutshell

A circular built environment is…

“Doing more with less
Over longer periods…

\+ *Better material choices*
\+ *Nature at the core*

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Building Prosperity

Unlocking the potential
of a nature-positive,
circular economy for Europe

Key Message

A circular and nature-positive evolution of the built environment presents a significant economic opportunity which aligns business interests with environmental imperatives.

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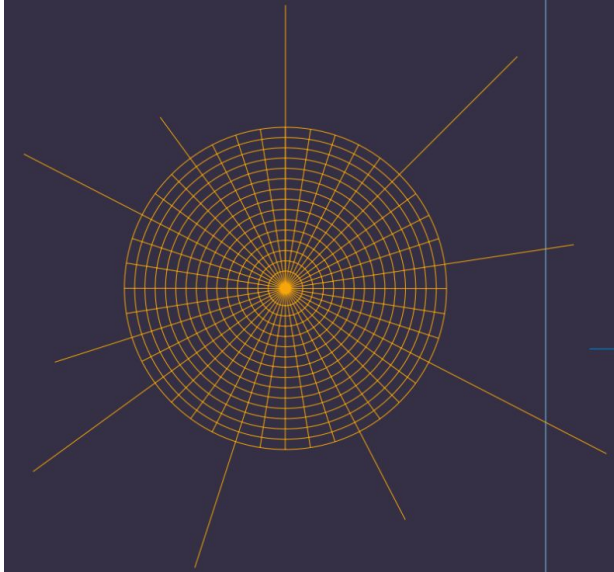
THE CIRCULAR ECONOMY HAS PROGRESSED AT PACE OVER THE LAST TEN YEARS AND IS BUILDING MOMENTUM



The circular economy is...

INVESTABLE

USD 334 billion
of investments have gone into Circular Economy solutions up to 2023 [A]

EUR 1.5 trillion
potential value of circular markets in the EU by 2040 [B]

HAPPENING NOW

USD 119 billion
Circular business models are growing up to ten times faster than the traditional fashion market, with the second-hand apparel market increasing by 24% from 2022-2023, reaching USD 119 billion [C]

USD 31.9 billion
The global regenerative agriculture market size was estimated at USD 10.3 billion in 2023 and is projected to reach USD 31.9 billion by 2031[D]

ABLE TO DELIVER WIDESPREAD BENEFITS

EUR 0.9 trillion
increase of annual benefits for the EU economy by 2030 [E]

-9.3 billion tonnes of CO_2e
Applying circular economy strategies in five key areas (cement, aluminium, steel, plastics, and food) can avoid almost half of the emissions from the production of goods in 2050[F]

A Ellen MacArthur Foundation
B Summa Equity
C ThredUp
D Insight Ace Analytics
E Ellen MacArthur Foundation
F Ellen MacArthur Foundation

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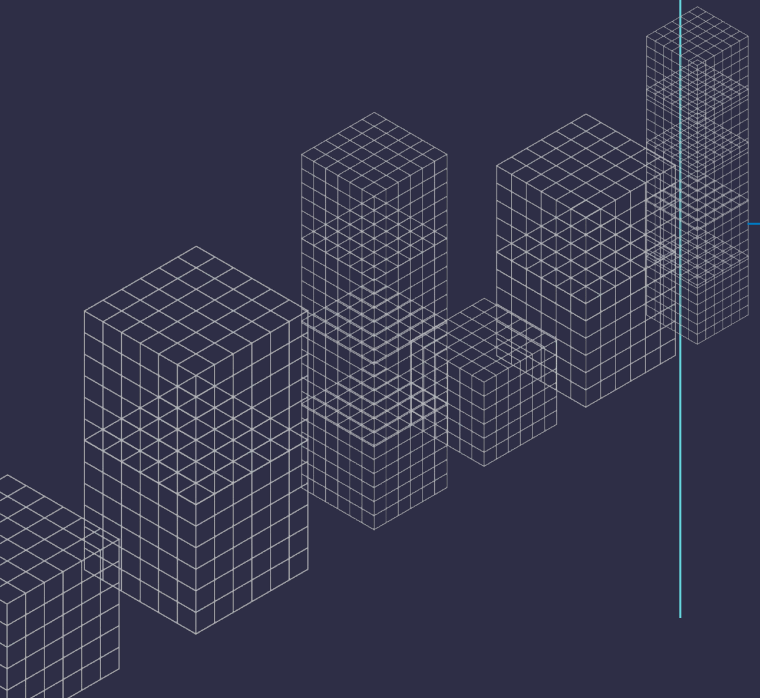
Europe's built environment requires a transformation to address its wasteful operating model



SCALE

25 million
people employed

10%
of EU GDP

IMPACT

35%
Of GHG emissions

1/3
of EU's material consumption

URGENCY TO ACT

30 million
existing buildings in need of renovation

32%
of European cities are highly vulnerable to climate risks

Leaders | A $25trn hit

Global warming is coming for your home

Who will pay for the damage?

3: Long-list of identified circular built environment strategies

System level	Buildings		Systems				
Scope	Retrofit/ repurpose buildings	Design better buildings	Improve urban systems	REVITALISE	MAXIMISE	OPTIMISE	Prioritised
Modular retrofit of underused (single-family) homes for higher/adaptable occupation	●	○	○	●	○	○	○
Repurpose underutilised dwellings (e.g. create highly attractive+affordable mixed-generational homes/neighbourhoods – motivating occupants of under-used homes to liberate them for families)	●	●	○	●	○	○	○
Revitalise or repurpose empty dwellings and commercial buildings (residential/non-residential) – usually with deep retrofit (mixed-use)	●	●	●	●	○	○	●
Build rooftop extensions on existing buildings	●	●	○	●	○	○	●
Build compact (mixed-use) multi-unit buildings (ideally around public transport connections, where greenfield building unavoidable) – smart designs, e.g. modular	●	●	●	●	○	○	●
Build on brownfield land with integrated regeneration using efficient designs (where housing need)	●	○	●	●	○	○	●
Build on infill sites, multi-unit	○	○	●	●	○	○	○
Build/upgrade active and public transport infrastructure	●	○	●	●	○	○	●
Over-compensate for any anavoidable new building with out-sized regional renaturing	○	○	●	●	○	○	○
Factories as forests, regenerative facilities	●	○	○	○	●	○	○
Enable mini-habitats: bee-friendly balcony flowers, bee homes, etc	●	●	○	○	●	○	○
Install (accessible) green roofs	●	○	○	○	●	○	●
Install green walls	○	●	○	○	●	○	○
Biomimicry solutions for e.g. heating/cooling	○	●	○	○	●	○	○
Renature/upgrade biodiversity of existing green spaces, e.g. lawns, parks	○	○	●	○	●	○	○
Create mini parks with trees and permeable pavements on underused urban space (e.g. parking space) and tree-lined streets	○	○	●	○	●	○	○
Build strategic wildlife corridors	○	○	●	○	●	○	○
Public/active transport connections to 'real' nature outside of city	○	○	●	○	●	○	○
Blue and green nature-based solutions e.g. riparian restoration (like in London – tributaries of the Thames), urban parks, and forests	○	○	●	○	●	○	●
Allotment and community gardens	○	○	●	○	●	○	●
Permeate sealed surfaces (e.g. removing tiles, permeable asphalt)	○	○	○	○	●	○	●
Repair/renovate for longer lifetime of buildings/products	●	○	○	○	○	●	○
Energy renovations, incl. insulation, heat pumps	●	○	○	○	○	●	●
Material-efficient, modular buildings (pre-fabricated) – incl. design of smaller-grid layouts to optimise structural material need	●	●	○	○	○	●	●
Use more (sustainably sourced) timber and bio-based materials (structural with pre-fabricated modules)	●	●	○	○	○	●	○
Use lower carbon concrete and steel (green cement/steel)	●	●	○	○	○	●	○
Low-carbon heating and cooling	●	●	○	○	○	●	○
Refuse furnishing/finishes where possible	○	●	○	○	○	●	○
Adopt passive design principles and adaptive comfort models (also in re-design)	○	●	○	○	○	●	○
Adopt less invasive design principles (e.g. raised foundations, vernacular principles)	○	●	○	○	○	●	○
Deconstruct and re-use blocks and modules	○	●	○	○	○	●	●
Use recycled materials	○	○	●	○	○	●	○
Rainwater harvesting	○	○	●	○	○	●	○
On-site/neighbourhood waste water recycling (e.g. nutrient recycling)	○	○	●	○	○	●	○
Building/neighbourhood organic waste/compost facilities	○	○	●	○	○	●	○
On-site waste sorting optimisation facilities	○	○	●	○	○	●	○
Energy-positive wastewater treatment plants	○	○	●	○	○	●	○
Build reneweable energy infrastructure	○	○	●	○	○	●	○
Digital building passports to facilitate buildings as material banks	○	○	●	○	○	●	●
New digital solutions for smart cities	●	●	●	○	○	●	○

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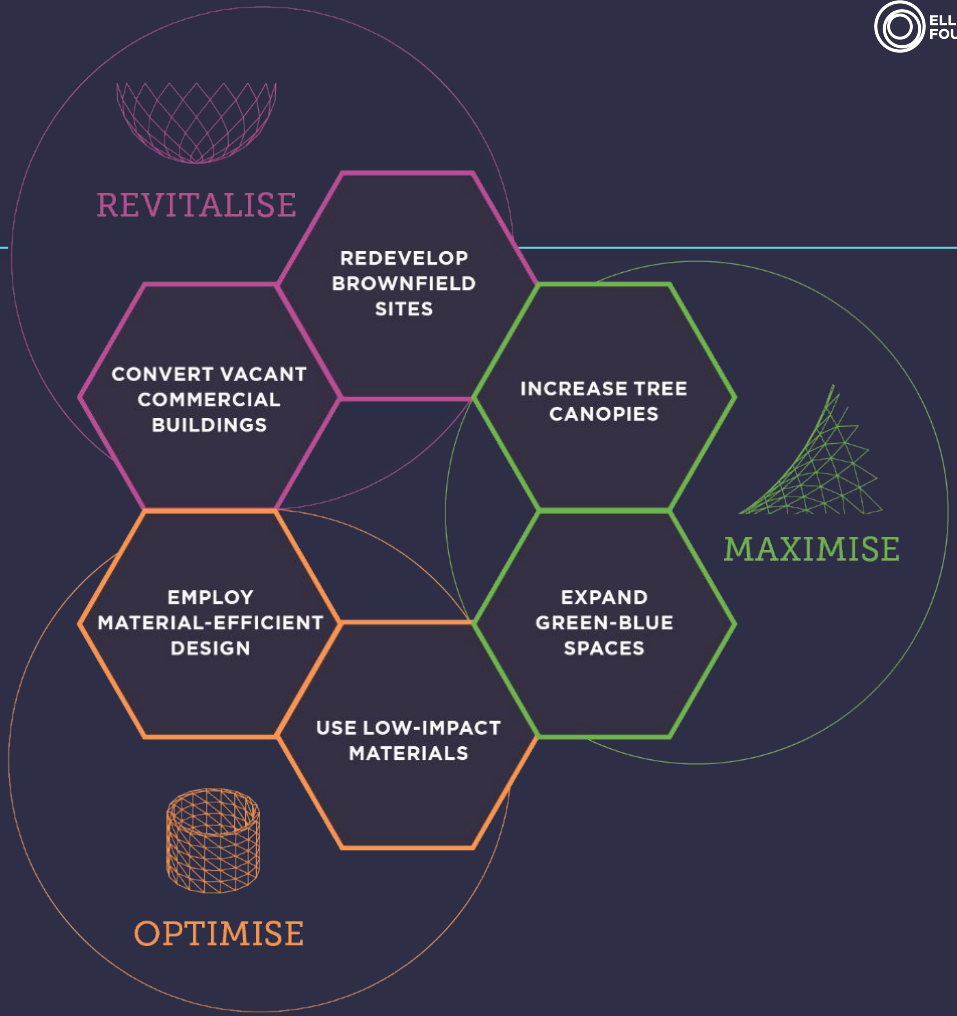
A nature-positive, circular built environment: three ambitions achieved through six strategies



Strategies in action across Europe

See examples of the strategies highlighted in this report in action. There are many real-world case studies to explore.

4: Key assumptions for the analysis

The key assumptions employed for the analysis reflect ambitious yet achievable goals which are based on existing practices in Europe, existing commitments, and peer-reviewed findings.

Summary tables

Table 2 - Scale and market context

	NATURE-POSITIVE, CIRCULAR STRATEGIES	
Metric	**Brownfield site redevelopment**	**Conversion of vacant commercial buildings**
Market size	3 million brownfield sites	25 bn m^2 real estate stock
Target segment	4% of available sites annually	8% of vacant office stock
Annual target	12,000 sites	1,020 sites
Annual area	120 million m^2	26 million m^2
Average site size	10,000 m^2	25,000 m^2
10-year target	1,680 million m^2	255 million m^2

- Conversion of brownfield area to number multi-family homes (MFH) units assumed to be in line with existing literature from the EU and USA, and case studies from industry
- Brownfield development allows for substituting demand that would otherwise be met with new single-family homes (SFH) on greenfield land, leading to further land sealing. For example, it was found that for every hectare of brownfield development, up to 4x of greenfield conversion could be avoided (Source: interview with industry expert)
- 50% of new development is MFH that has enough scale for management fees, which would not exist without brownfield

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System-wide benefits of a circular and nature-positive built environment, by 2035

EUR 575 billion

Potential annual revenue distributed across the built environment value chain

EUR 101 billion of revenue can be derived from revitalising urban land and assets

EUR 363 billion of revenue from optimising design and material sourcing

EUR 111 billion of revenue comes from maximising nature in cities

EUR 117 billion increase in annual revenue to city-centre shops, restaurants, bars, and cafés, driven by more vibrant and attractive cityscapes

EUR 22 billion of annual benefits to households and businesses from more efficient infrastructure networks and reductions in energy and water charges

EUR 632 billion of properties and business value safeguarded through maximising nature in cities and employing nature-based climate adaptation strategies

1°C - 3°C reduction in average urban peak temperatures in cities by increasing tree canopies and expanding green spaces

EUR 158 billion

Wider economic benefits realised annually for businesses, municipalities, and citizens

EUR 19 billion worth of benefits from improved health and productivity

Increased job creation potential

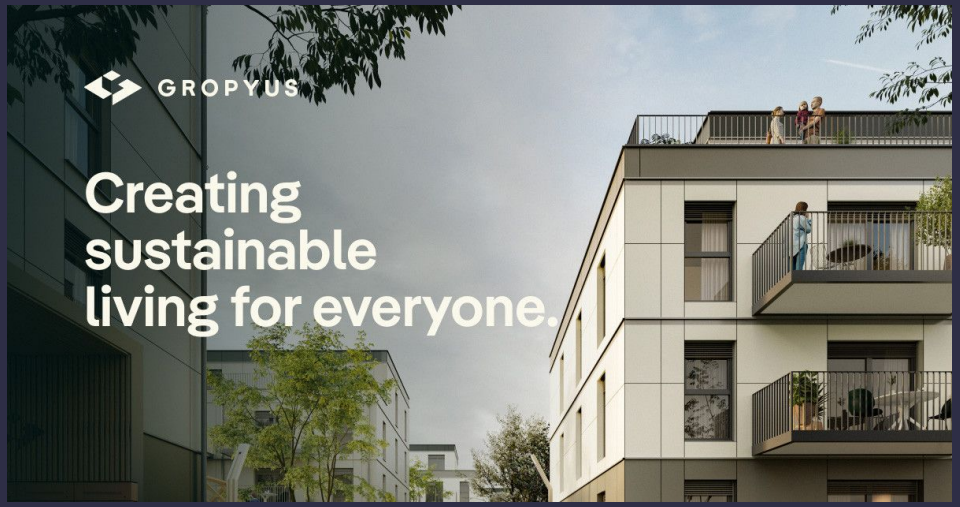
Properties adjacent to new green spaces and regenerated brownfield sites will benefit from improved liveability

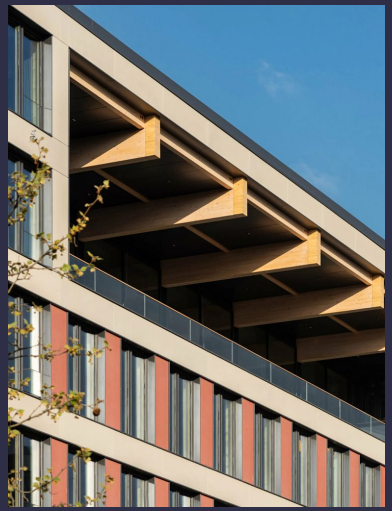
5% reduction in EU CO_2 emissions from lower demand for carbon-intensive building materials, more compact urban centres, and expansion of green space

16,000 km^2 of green space in Europe created or protected by applying six circular economy strategies

Nature, climate, and social benefits

BlokLok





CREE
GMBH

Hyperion
Robotics

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From barriers, to focus areas to calls to action

Barriers

A number of key market, policy and financial barriers hinder system-wide transformation in the built environment

- **Upfront costs** and difficulties monetising benefits impede investment
- A **fragmented value chain** with split incentives results in low demand for circular solutions
- **Complex planning policies** and a lack of relevant standards hinder progress
- **Insufficient awareness and expertise** among stakeholders about benefits and implementation strategies slows the scaling of solutions

Focus Areas

Action in five focus areas can overcome these barriers

- **Mobilise financial flows** to unlock circular economy opportunities at scale
- **Accelerate the uptake of digital enablers** to harness material, design, and construction innovation at scale
- **Establish an industry network** dedicated to collective leadership and fostering the emergence of circular economy ambassadors and practitioner
- **Leverage existing legal and policy frameworks** to enable the circular built environment to scale
- **Shift mindsets** by raising awareness of the economic, nature, and social benefits of systems-based solutions.

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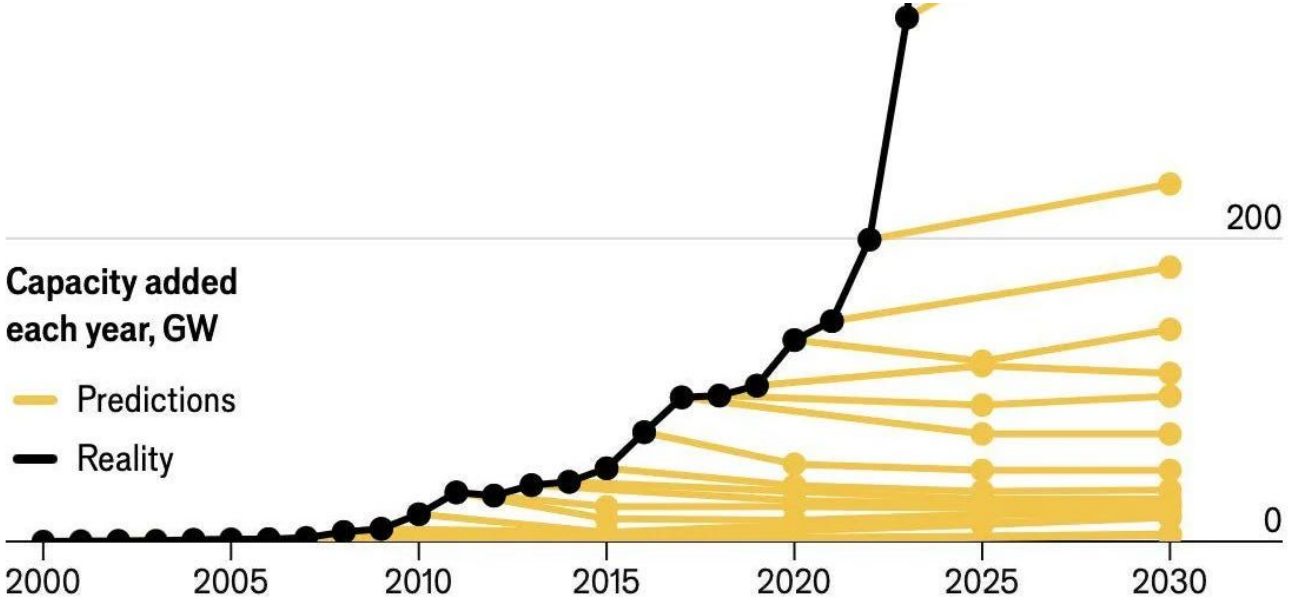
Calls to action

Key stakeholders can all play their role in scaling the transition to a circular and nature positive built environment.

Six key stakeholder groups can act now to advance a nature-positive, circular built environment

EU and national policymakers	City-level policymakers	Asset owners	Businesses and asset occupiers	Industry supply chain, designers, and contractors	Financial institutions and investors
Enablers and leaders		**Influencers and market builders**		**Practitioners**	**Catalysers**
1) Continue to encourage the broader application of well-designed economic instruments that will incentivise nature-positive construction projects in the long term. Mobilise finance 2) Ensure further interventions accelerate the transition by expanding the scope of targets within the existing policy framework beyond waste collection and recycling. Leverage policy 3) Invest public funds in research, development, and innovation for systemic solutions. Accelerate digital 4) Allocate funding to help cities and stakeholders develop innovative finance models to scale implementation. Mobilise finance 5) Leverage upcoming policy revisions to strengthen the circular economy in the built environment. Leverage policy	1) Ensure publicly funded construction projects set the standard for nature-positive outcomes. Mobilise finance 2) Embed nature-positive and circular criterion in city-owned land management. Leverage policy 3) Establish methods to streamline, fast-track, and simplify local planning processes for nature-positive initiatives. Leverage policy 4) Map urban ecosystems and tree canopies to help maximise nature in cities Leverage policy 5) Work with local industry to strengthen secondary material value chains. Establish networks	1) Complete a horizon scan of existing portfolios to seek sites with the greatest potential. Mobilise finance 2) Integrate circular principles into core business strategies. Shift mindsets 3) Play an active role in urban stewardship Leverage policy	1) Establish comprehensive company policies that champion circular leasing and construction practices. Leverage policy 2) Promote circular economy awareness. Shift mindsets 3) Optimise current building portfolios to reduce the need for new construction and advocate for more green spaces. Shift mindsets	1) Join or establish a coalition of practitioners within the built environment to overcome industry fragmentation and deliver collective circular economy services. Establish networks 2) Set new industry-wide standards and ambitious targets for circular procurement and purchasing. Leverage policy 3) Capture the quantitative benefits of circular economy practices and share them with other stakeholders. Establish networks	1) Embrace the general concepts of natural capital and biodiversity, and understand how they apply to the specific market conditions. Shift mindsets 2) Integrate circular economy strategies into investment decisions, adapting asset classes and funds to enable large-scale urban regeneration projects. Mobilise finance 3) Commit to investing in technological innovation and upskilling the current workforce to spur a critical mass of built environment value chain providers across the six strategies. Accelerate digital



Sources: IEA; Energy Institute; BloombergNEF