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DIPARTIMENTO DI SCIENZE  
ECONOMICHE E AZIENDALI  
"MARCO FANNO"



**LMD** | Laboratorio  
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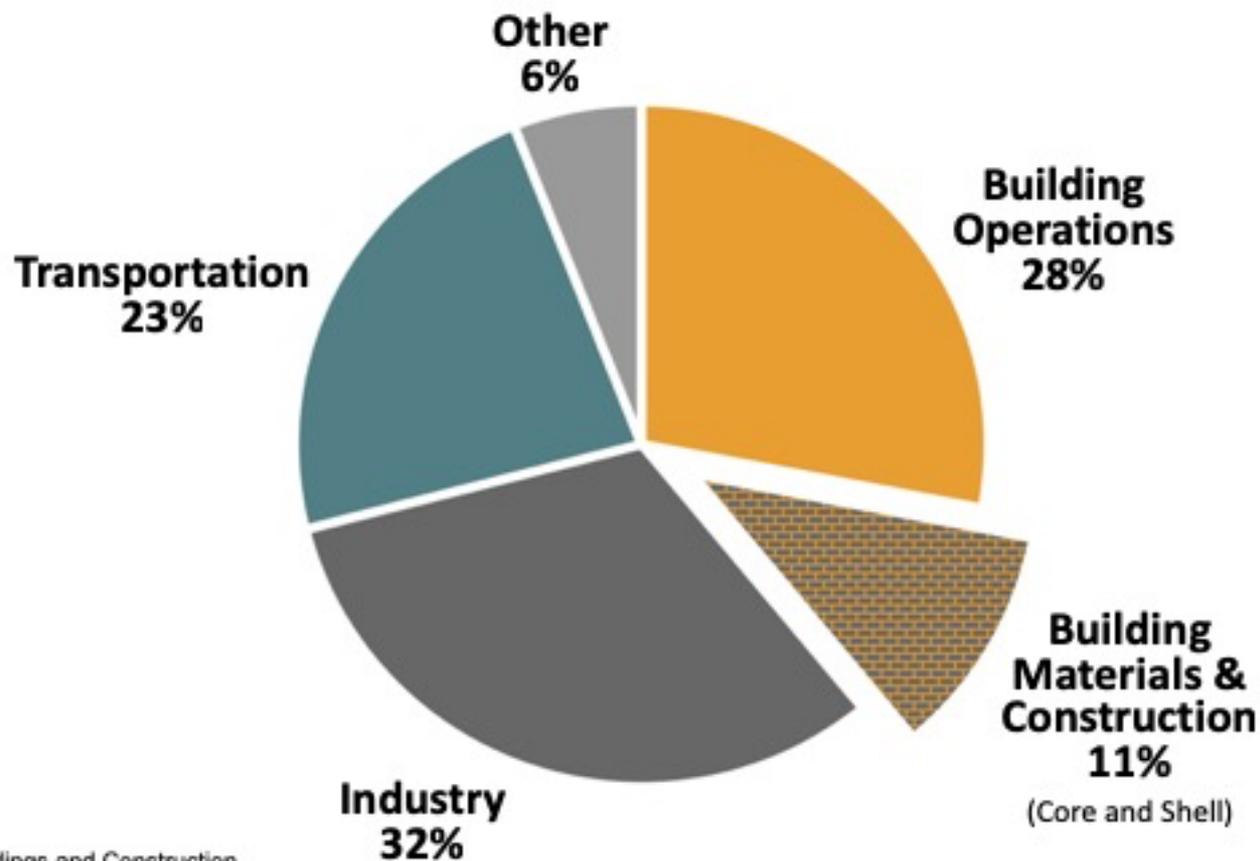
# The economic impact of sustainable building in modern economy

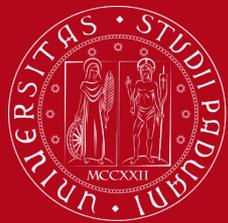
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**Sustainable Construction Sector Group**  
**Venice - February, 18th 2020**



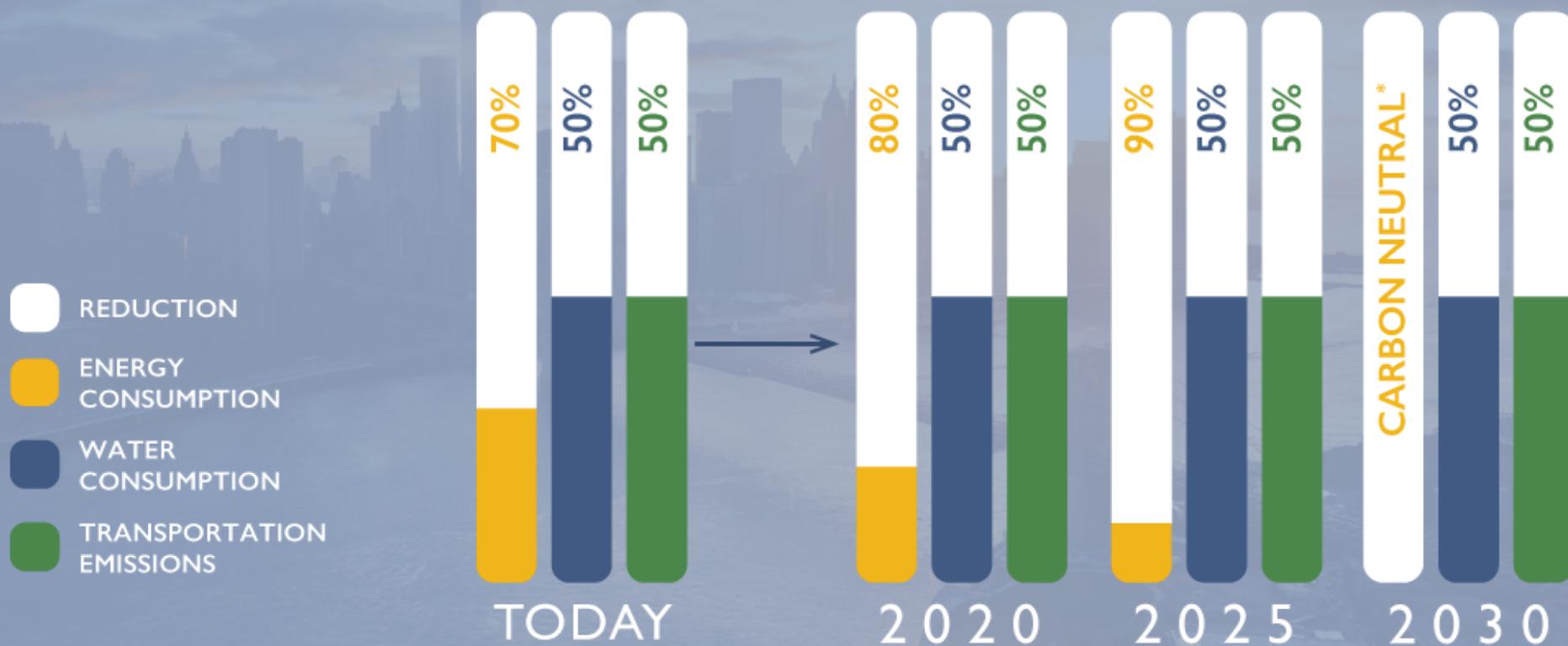
## Global CO<sub>2</sub> Emissions by Sector





# THE 2030 CHALLENGE FOR PLANNING

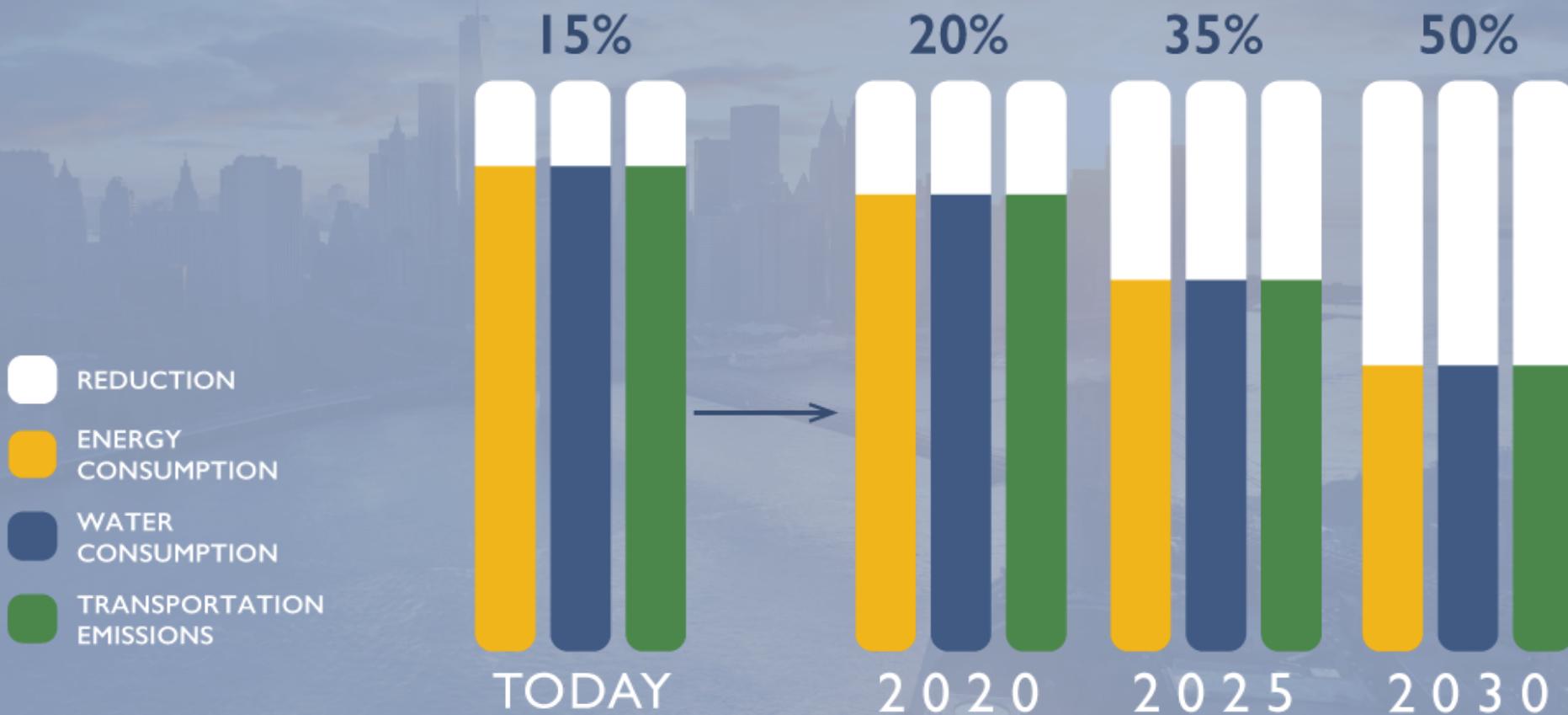
## NEW CONSTRUCTION & MAJOR RENOVATIONS





# THE 2030 CHALLENGE FOR PLANNING

## EXISTING BUILDINGS



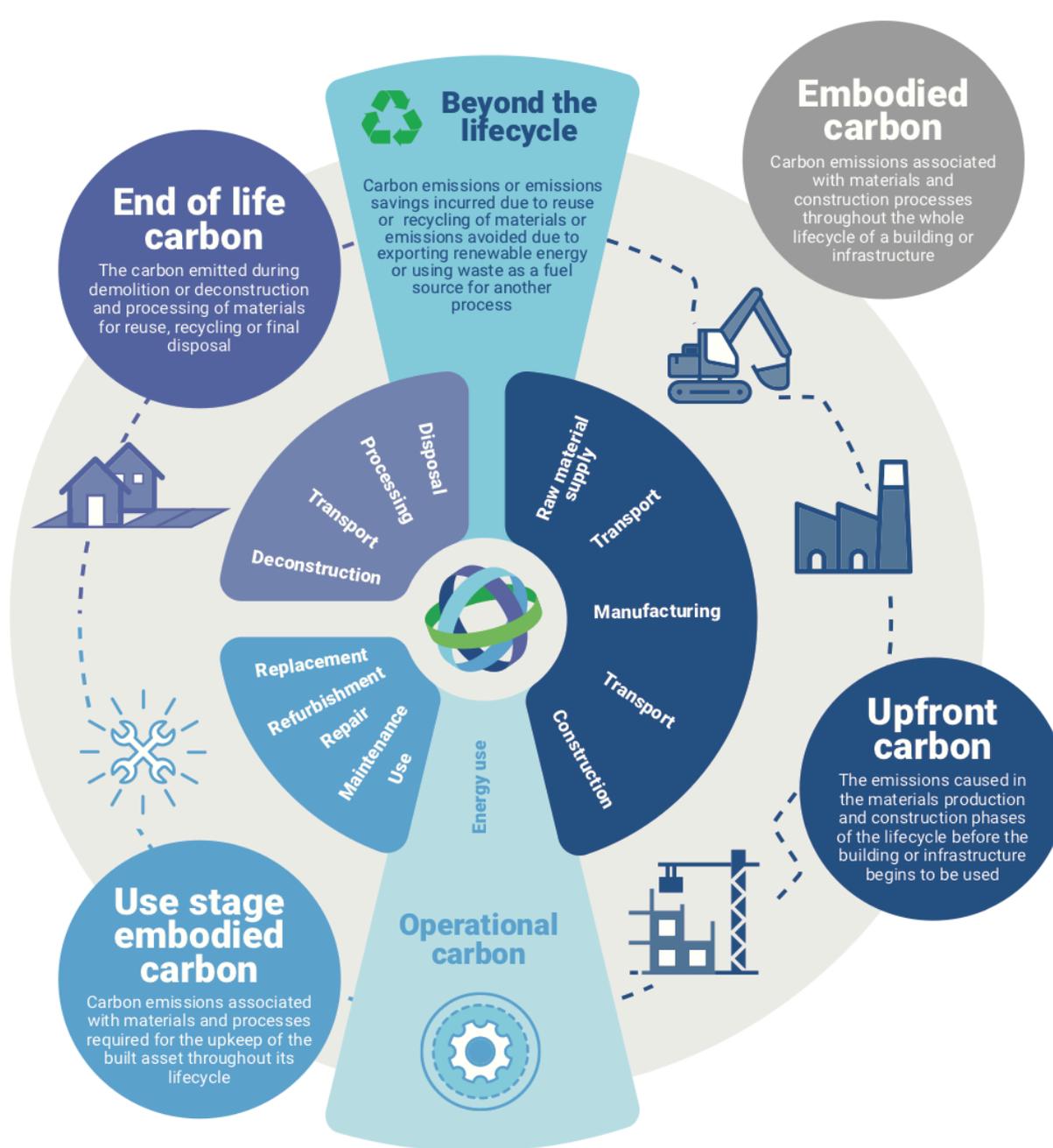
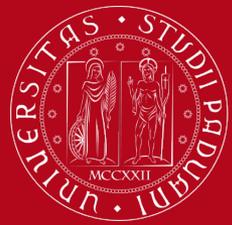
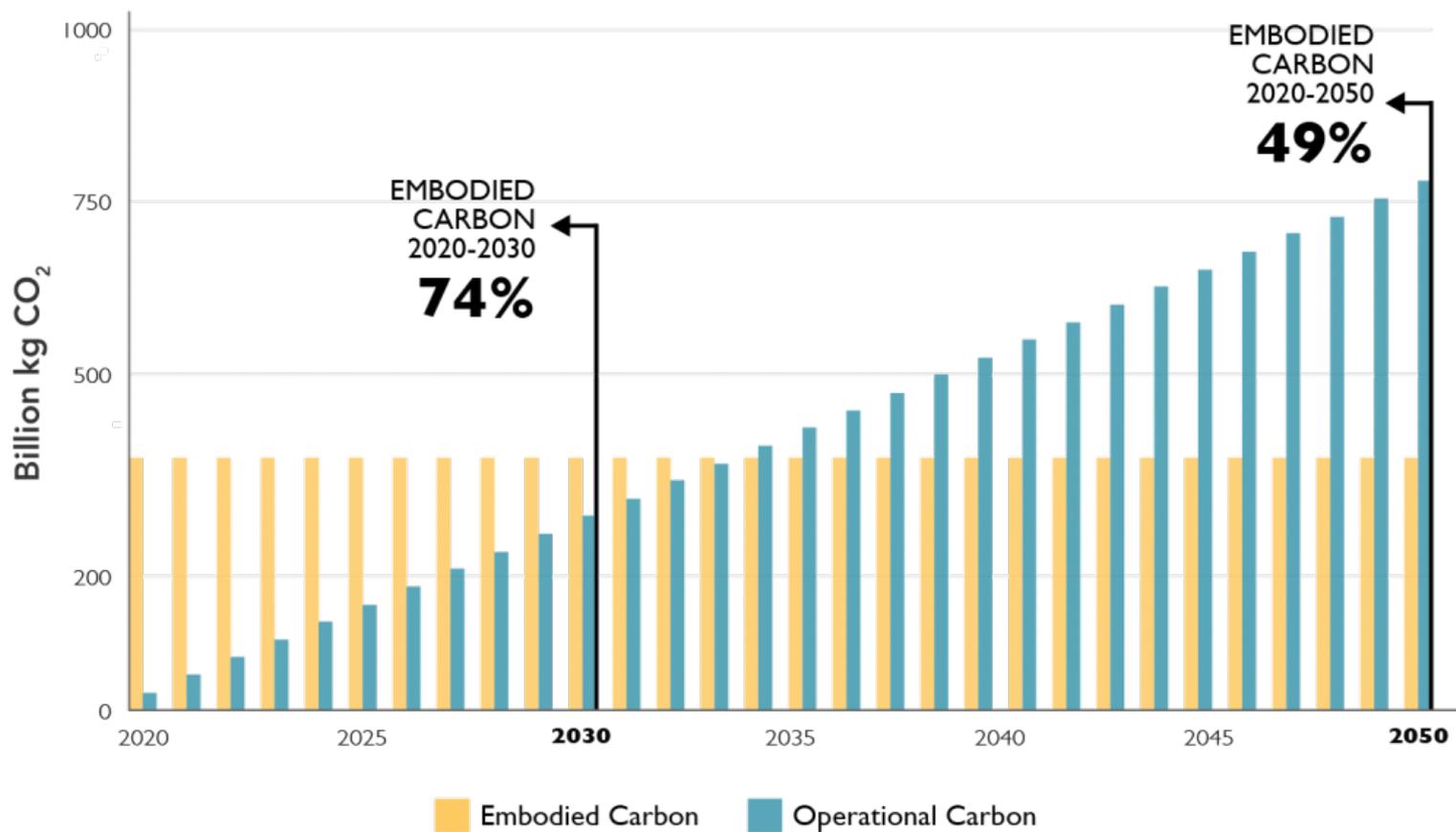


Figure 3: Project lifecycle showing both the scope of the definition and need for whole life consideration.



## Total Carbon Emissions of Global New Construction from 2020-2050 Business as Usual Projection



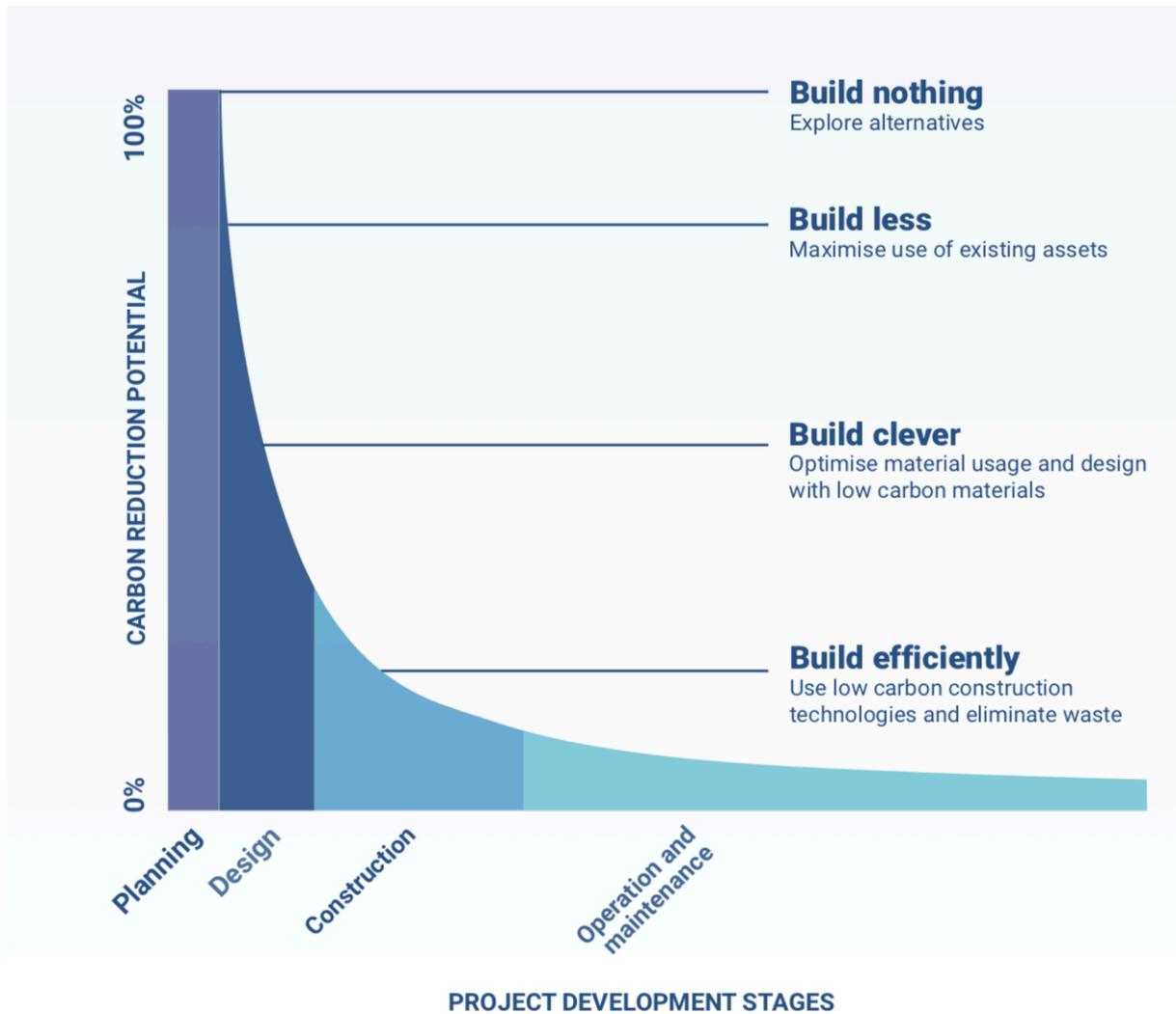


Figure 4: Opportunities to reduce embodied carbon from stage of design process.

Source: HM Treasury: Infrastructure Carbon Review, 2013



# SDGs and building





# Business Benefits Expected from Green Building Investments

## Business Benefits Expected From Green Building Investments

(Medians Reported in 2012, 2015 and 2018)

	New Green Building		
	2012	2015	2018
Decreased 12-Month Operating Costs	8%	9%	8%
Decreased 5-Year Operating Costs	15%	14%	14%
Increased Asset Value (According to Owners)	5%	7%	7%
Payback Time for Green Investments	8 Years	8 Years	7 Years

	Green Retrofit		
	2012	2015	2018
Decreased 12-Month Operating Costs	9%	9%	9%
Decreased 5-Year Operating Costs	13%	13%	13%
Increased Asset Value (According to Owners)	4%	7%	5%
Payback Time for Green Investments	7 Years	6 Years	6 Years



# Motivations to invest in green products

Promotes Improved Occupant Health and Well-Being



NA



Encourage Sustainable Business Practices



Increases Worker Productivity



Creates a Sense of Community



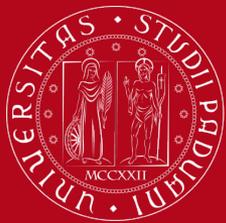
Supports the Domestic Economy





# Difficulties in investing in green building projects

- No real “insuperable” difficulties in investments (with respect to other difficulties)
- Relevancy of (higher) **cost factors is decreased** from 2012 to 2018 (from 76 to 49% interviewees)
- Main relevance assigned to **lack of supporting policies** (incentives), **market awareness and accessibility** (beyond high-end products)

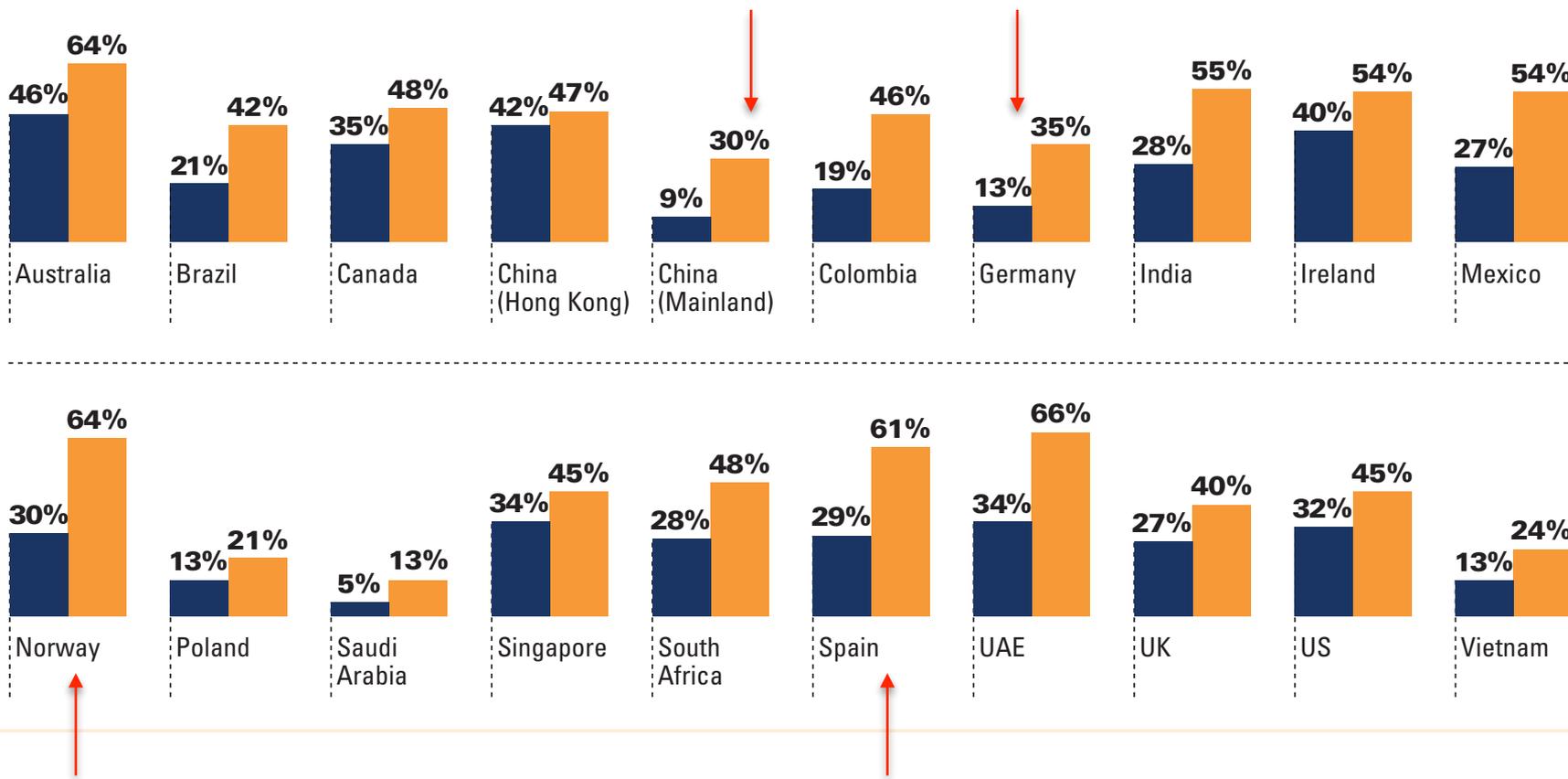


# Sustainable projects: an international comparison

## Percentage of Firms That Are Doing/Will Do More Than 60% Green Projects (2018 and Expected for 2021)

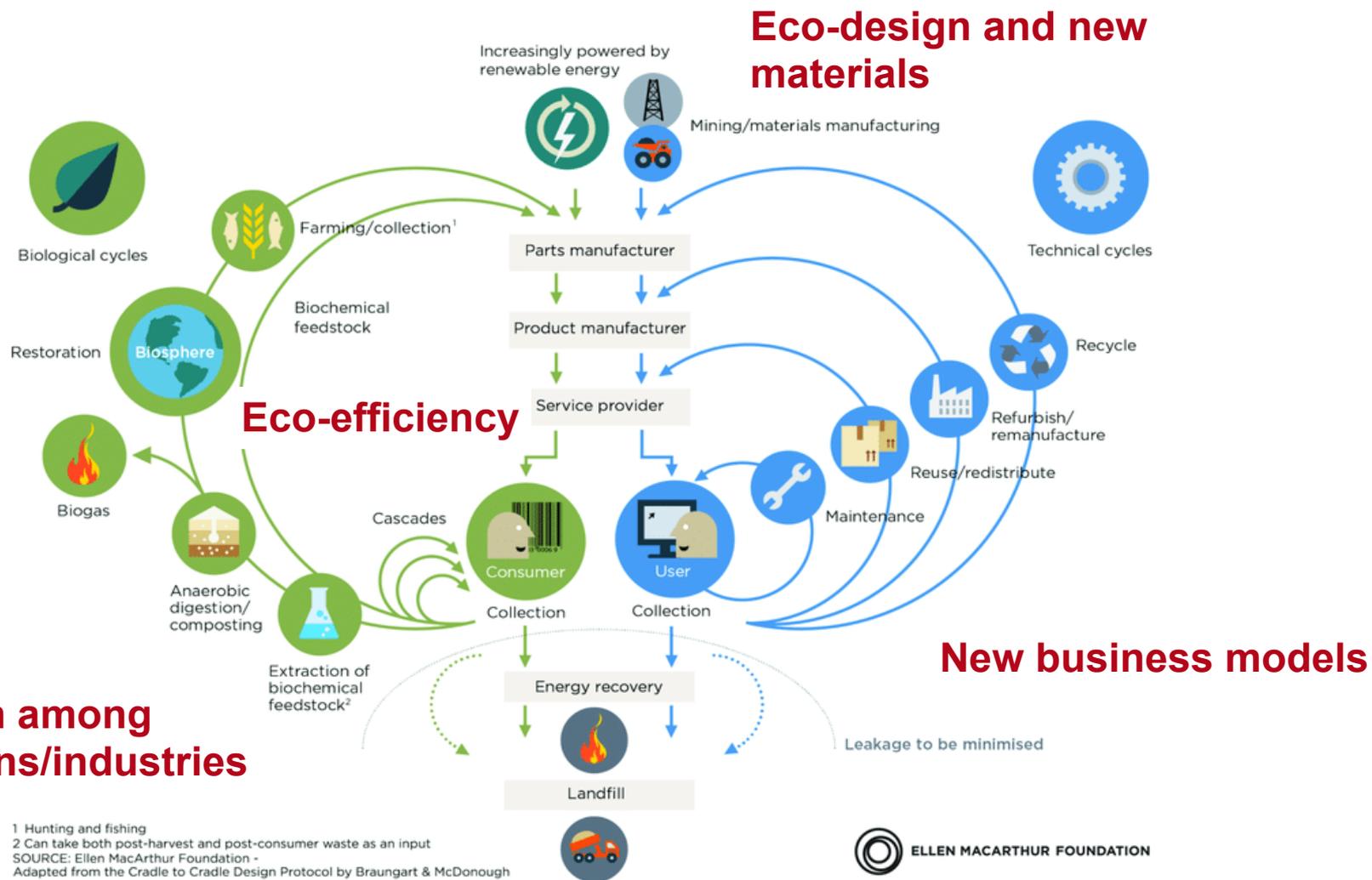
Dodge Data & Analytics, 2018

■ 2018 ■ 2021





# Circular economy=innovation

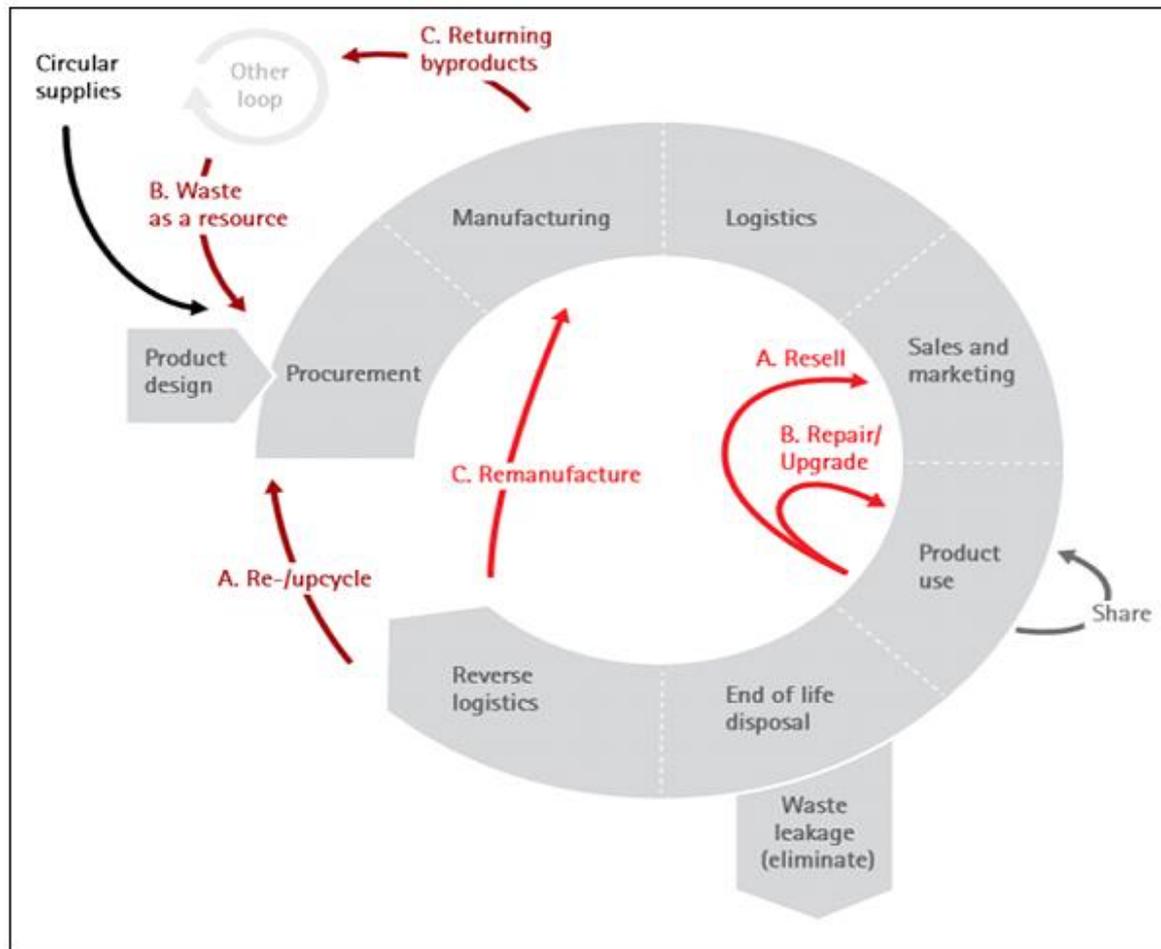


**Integration among  
value chains/industries**

1 Hunting and fishing  
2 Can take both post-harvest and post-consumer waste as an input  
SOURCE: Ellen MacArthur Foundation -  
Adapted from the Cradle to Cradle Design Protocol by Braungart & McDonough

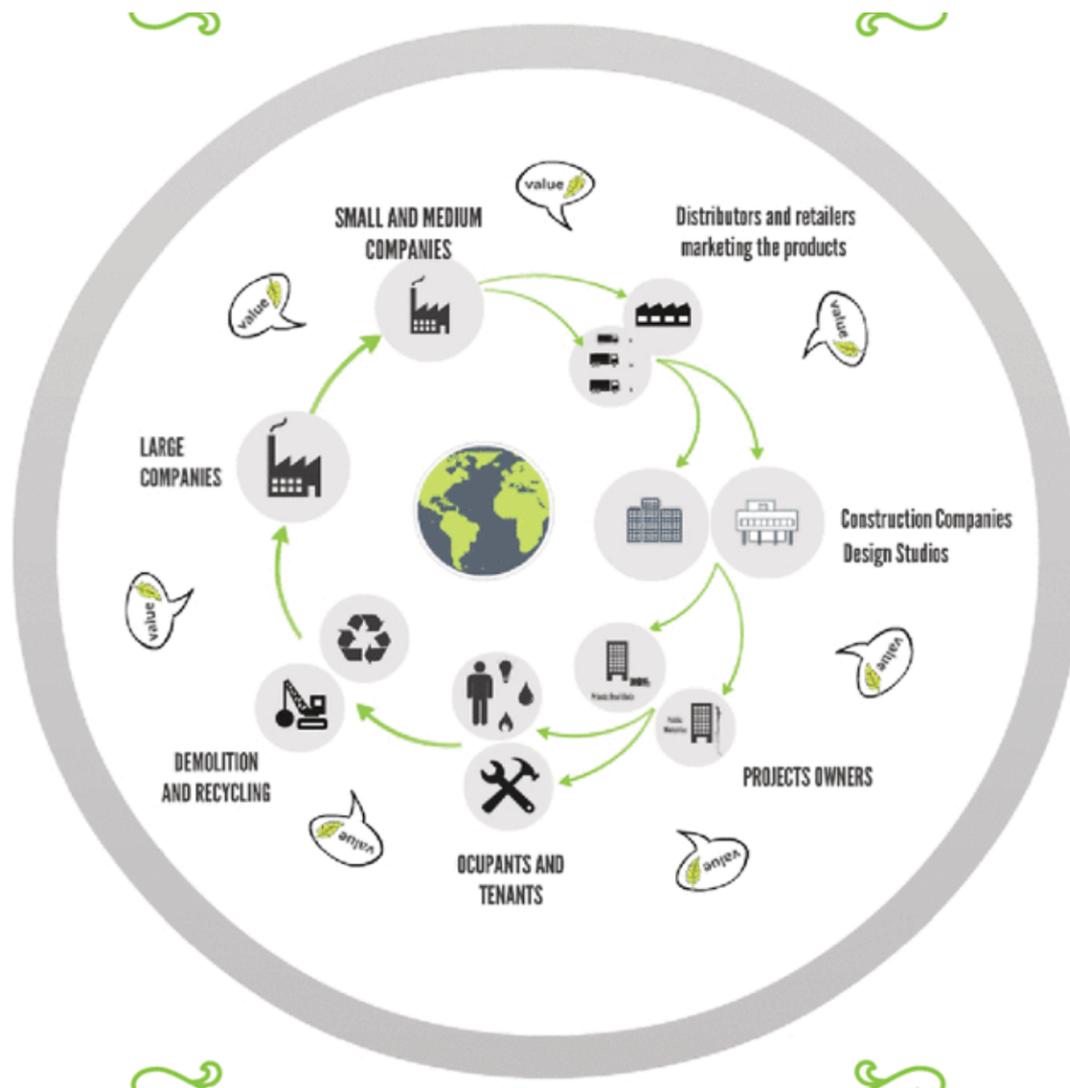


# Sustainable business models



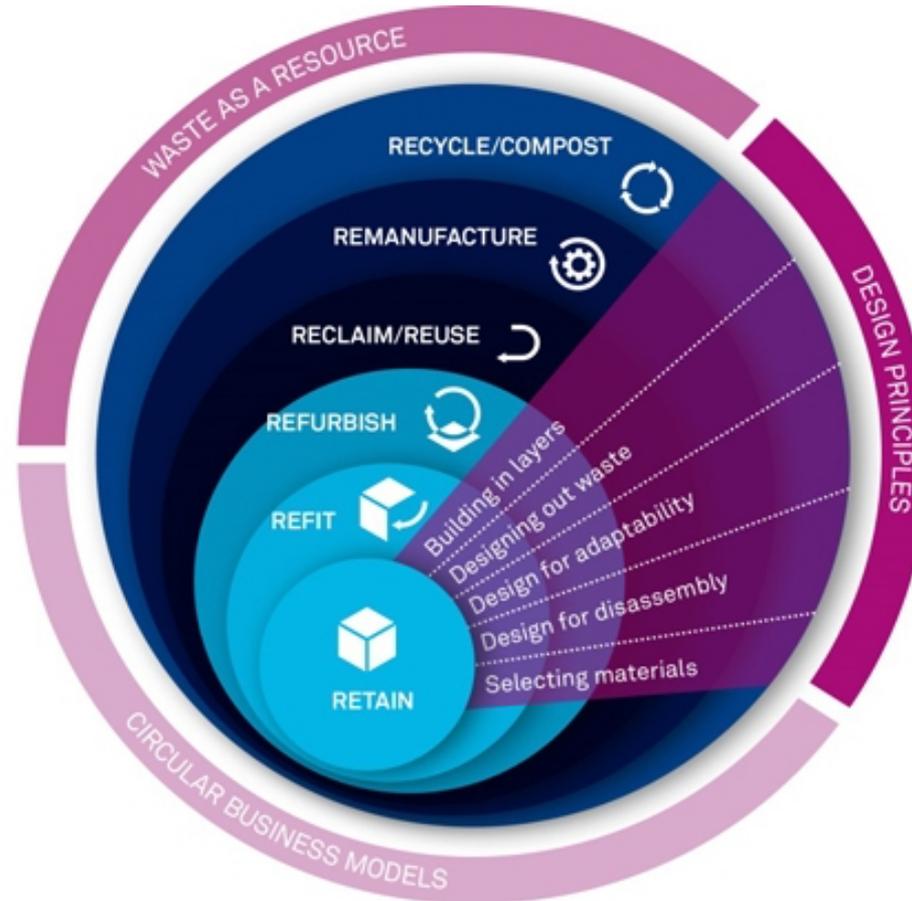
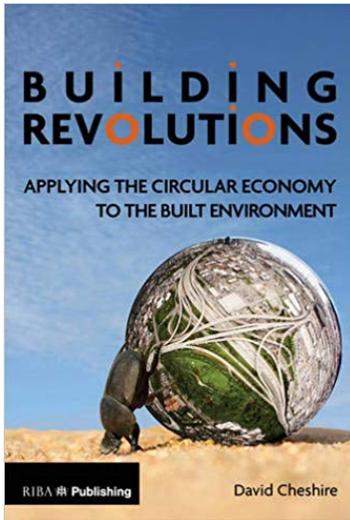


# “Building circular building value chain”

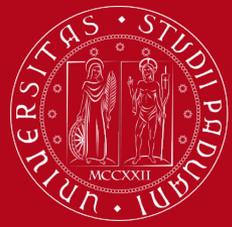




# Building and circular economy



Fonte: Building revolution



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# ICEhouse (Innovation for the Circular Economy house)



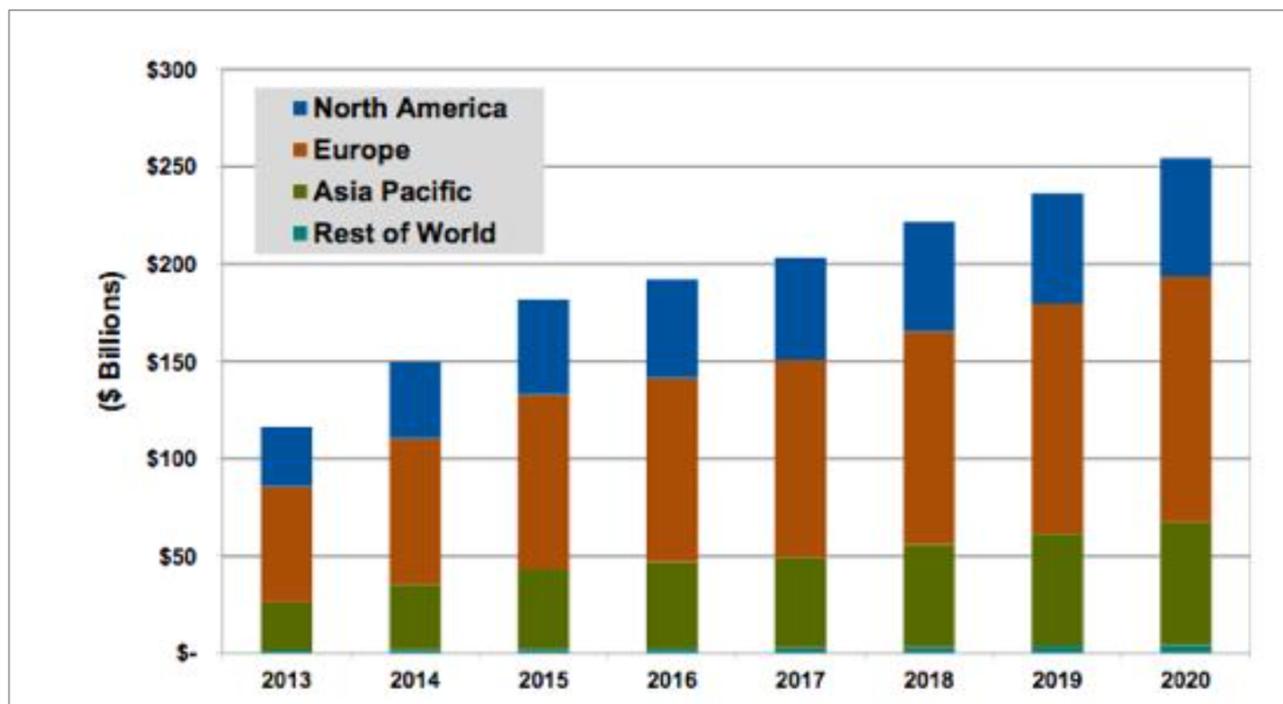


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# Circularity in building and business opportunities



**Figure 1: Market value of green construction materials by region, World Markets: 2013-2020**



Source: Navigant Research, 2013, *Materials in Green Buildings*



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# New materials



RAPPORTO DELL'OSSERVATORIO RECYCLE - LEGAMBIENTE

## 100 MATERIALI PER UNA NUOVA EDILIZIA



## Material ConneXion®

Material solutions at your fingertips.



LIBRARY + DATABASE

Find the materials you need  
to jumpstart your next  
project.



## The winners of Circular Construction Challenge

Three convincing and innovative ideas has been selected among the six finalists.



### From waste to biomaterial: Developing mycelium and waste-based materials for the building industry

Imagine a world where building no longer leaves a massive impact on



### GENTRÆ: Circular Alternative - Introducing reused building materials in large-scale retail sale

Every year an estimated 50,000 tons of timber used for temporary construction measures at building



### ReSkur: The next generations shed is build from previous generations building waste

Millions of tons of high quality building materials such as clay pantiles and wood rafters are

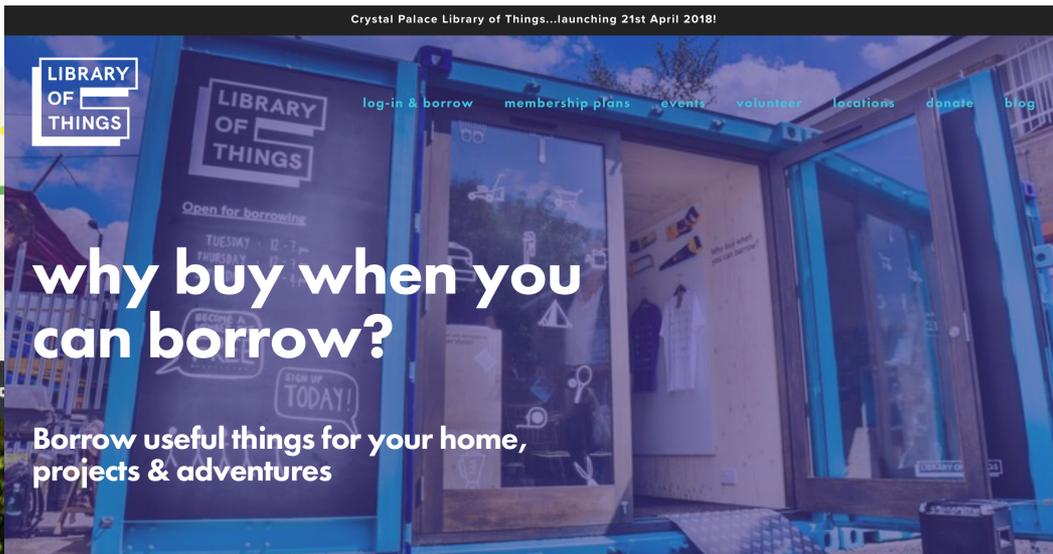


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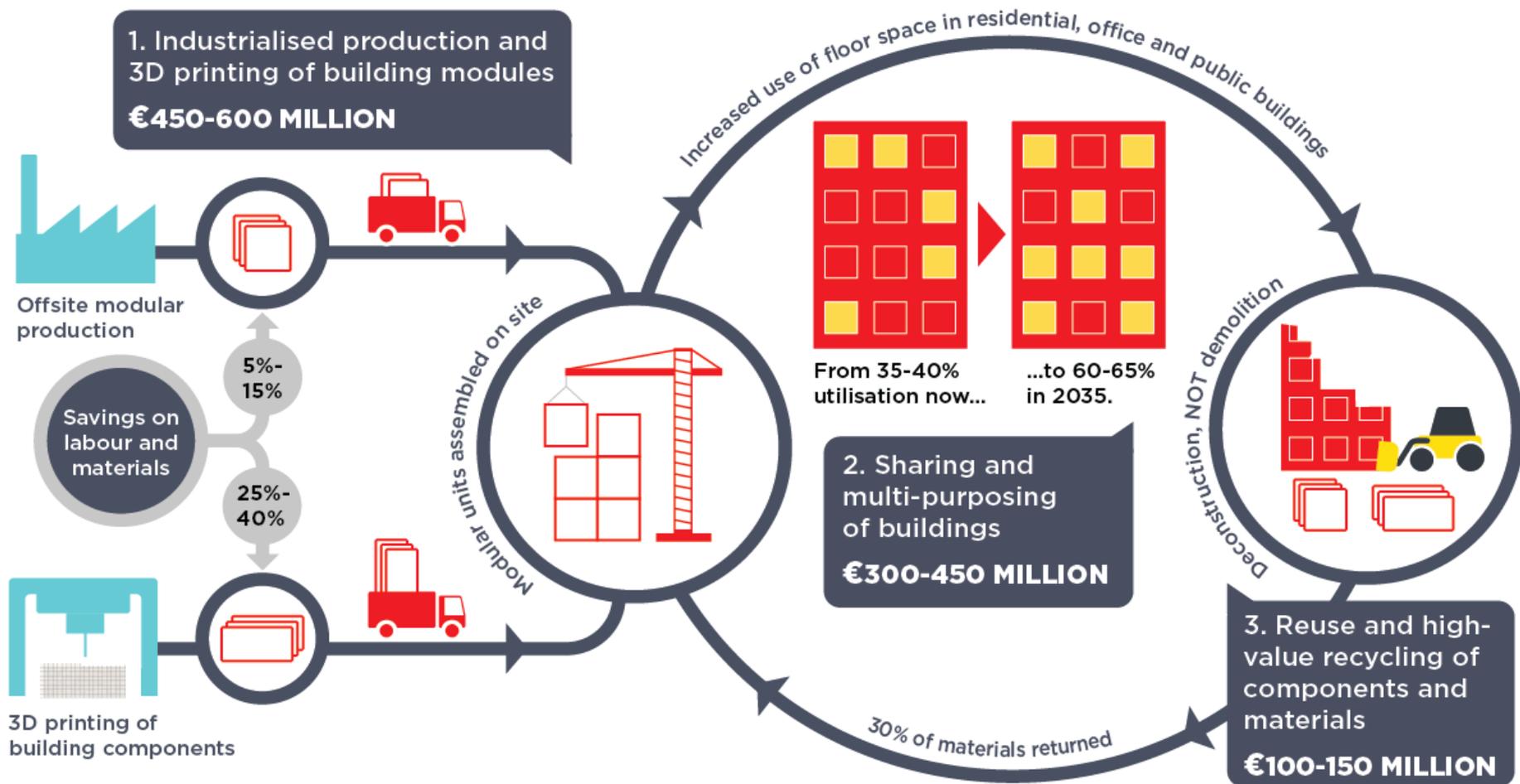
# New places (and business models)

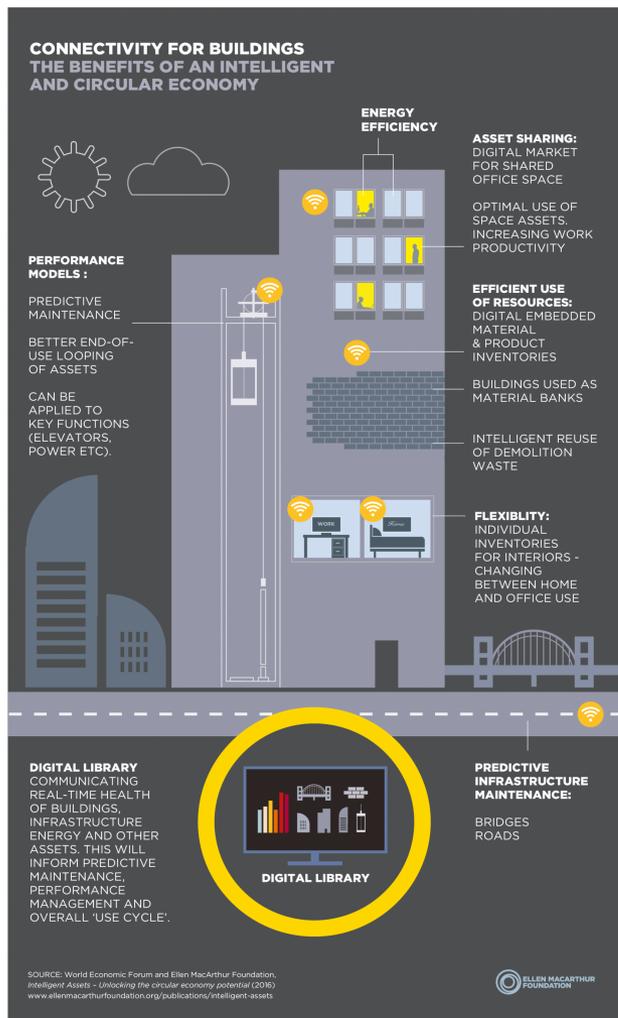


Home About Join What's On Co



## CONSTRUCTION & REAL ESTATE OPPORTUNITIES IN DENMARK





**380 Million Euros of turnover in 2018 (+52% on 2017)** related to devices and solutions focused on smart, connected home (source: Osservatorio IoT Polimi)

Fig 3.1

## Use Cases for Occupancy Analytics and In-Building Location Based Services

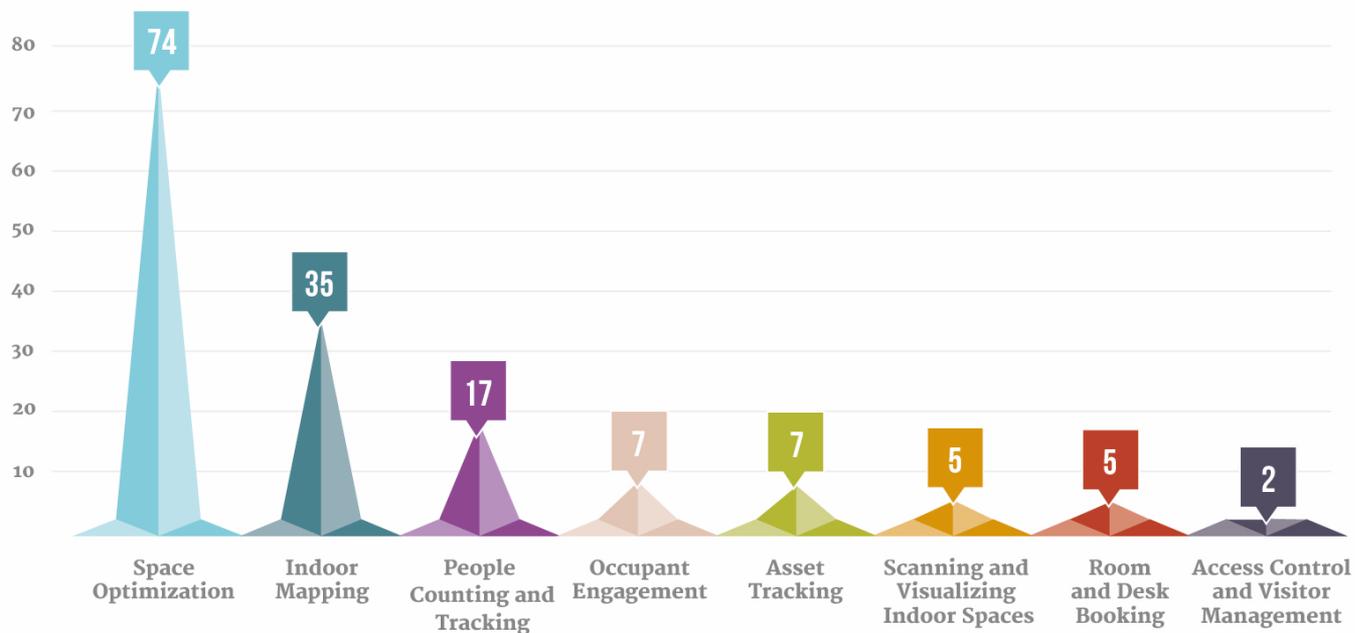


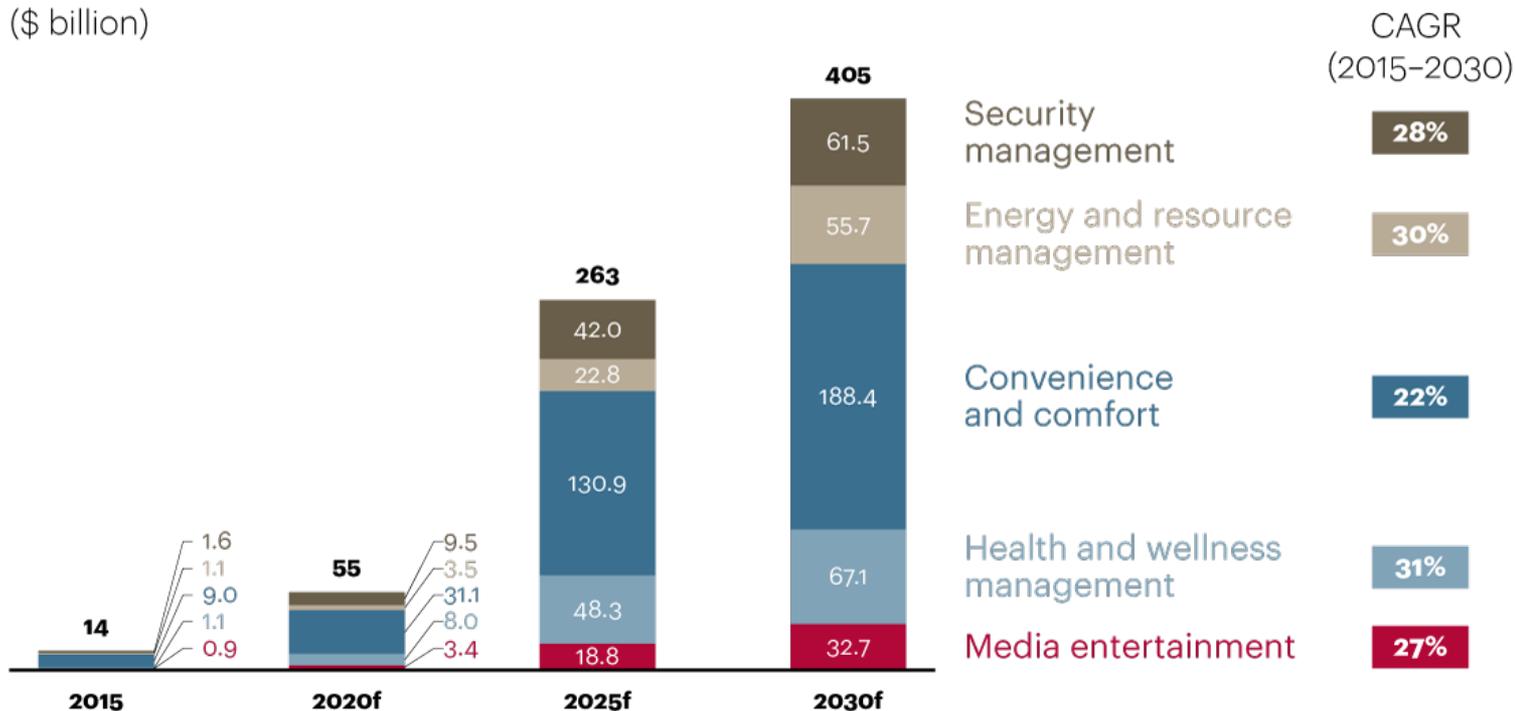


Figure 2

## Smart home market growth will explode after 2020

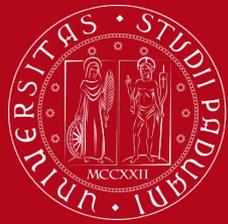
### Smart home market size by application category

(\$ billion)



Source: A.T. Kearney analysis





- **Eco-design as necessary condition**
- **Circularity in materials:** opportunities (and threats) in connecting market opportunities and *urban regeneration*
- **Digital innovation** (industry 4.0) as enabling factor towards new business models
- Open issues: **regulation, competences, partnership**



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