



A LOCAL QUESTION WITH GLOBAL STAKES

THE CARBON COMPASS

4.º CONGRESO CAMACOL VERDE

MEDELLÍN · 14-15 · 2026





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CHIARA

Sustainability Specialist

— BI —

CPH
G



CHIARA

Sustainability Specialist



VICTOR-ANTOINE

LCA Specialist & Team Coordinator



IVÁN

Sustainability Specialist

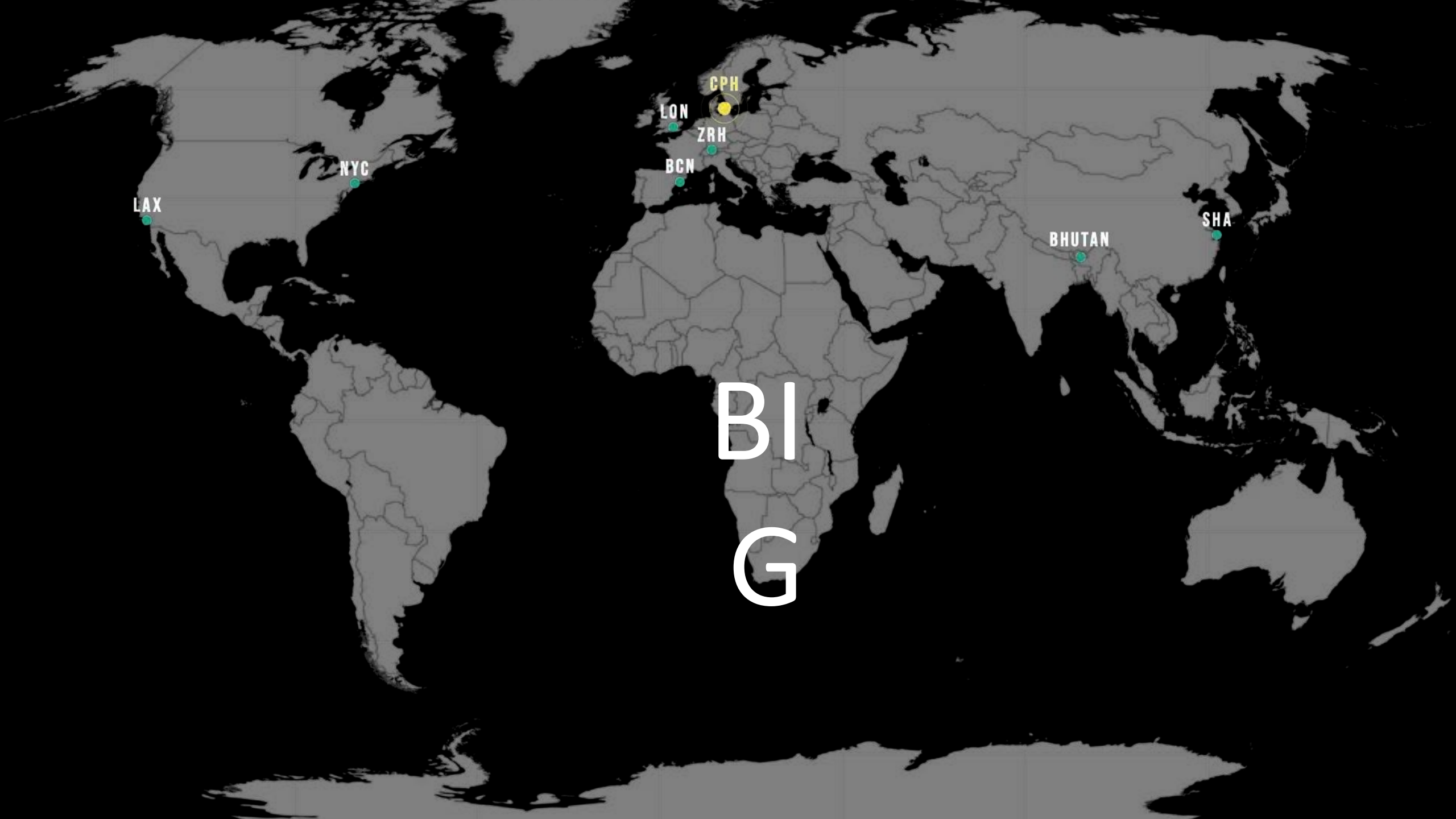


EVAN

Sustainability Specialist

BI
CPH

BI
NYC



LAX

NYC

LON

BCN

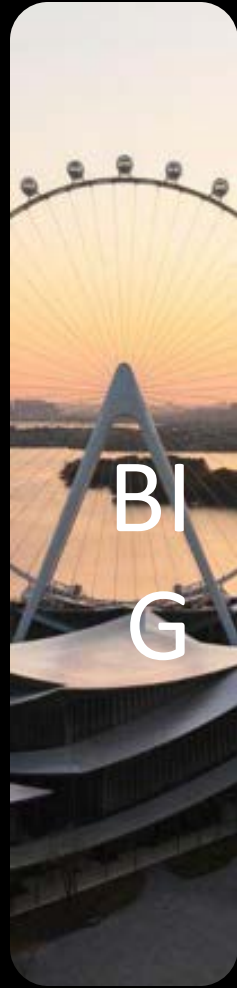
ZRH

CPH

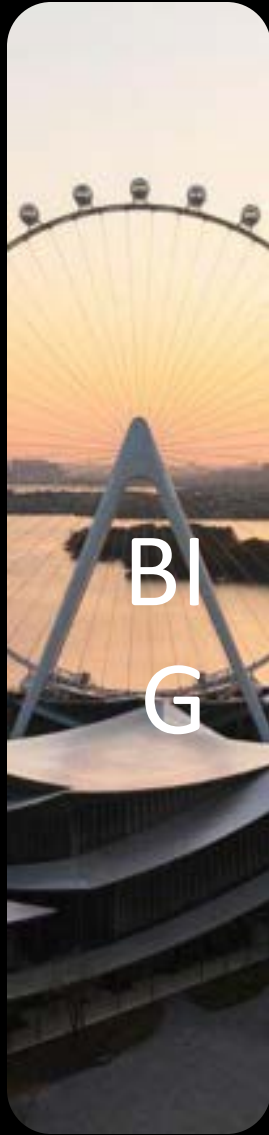
BHUTAN

SHA

BI
G

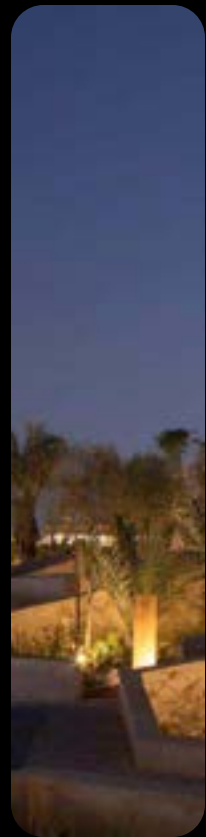


BIG







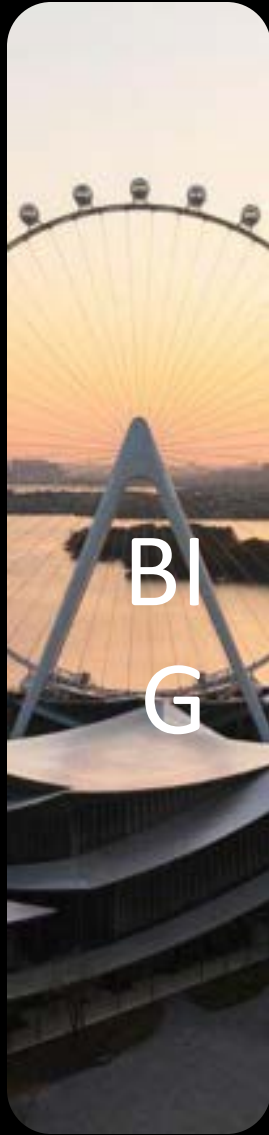


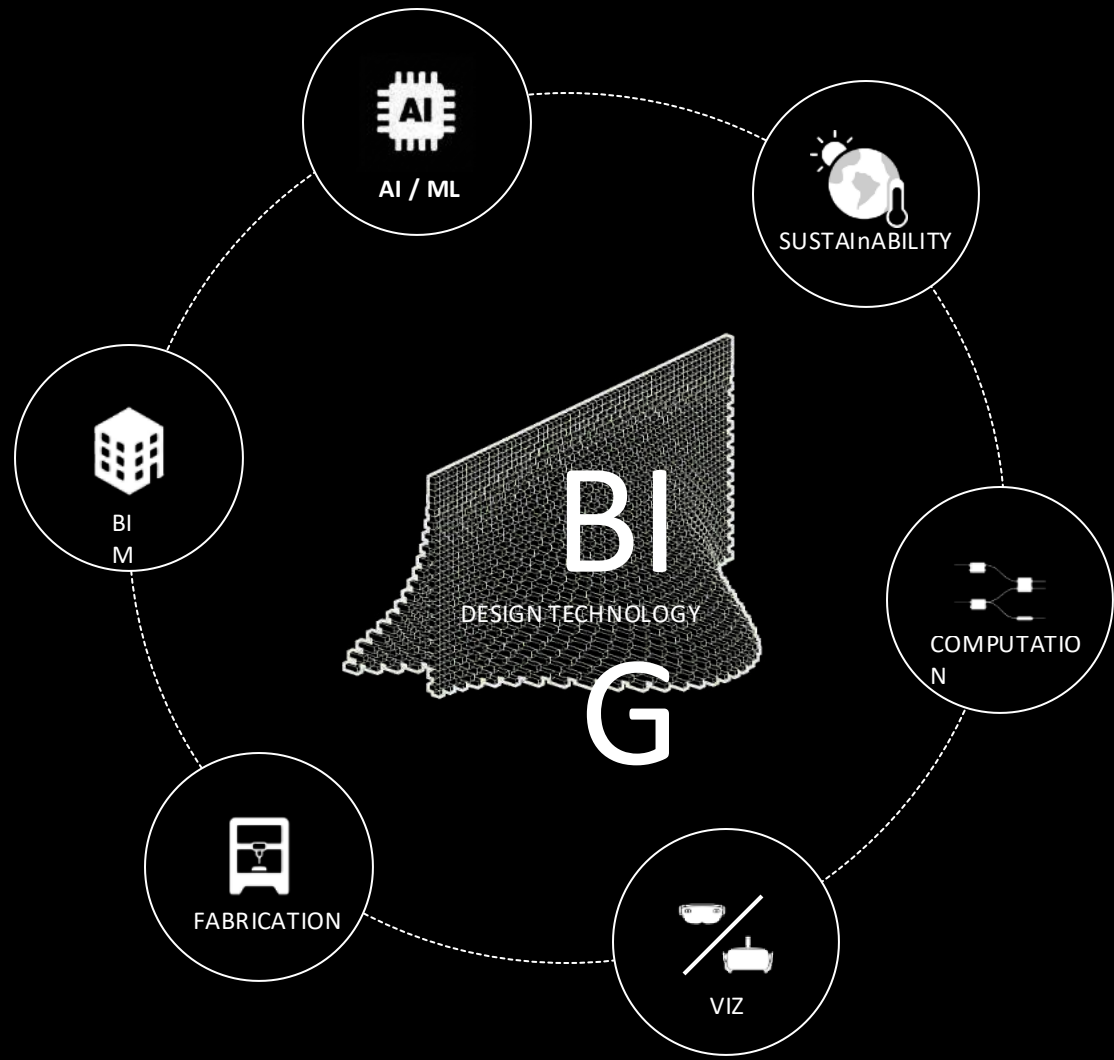


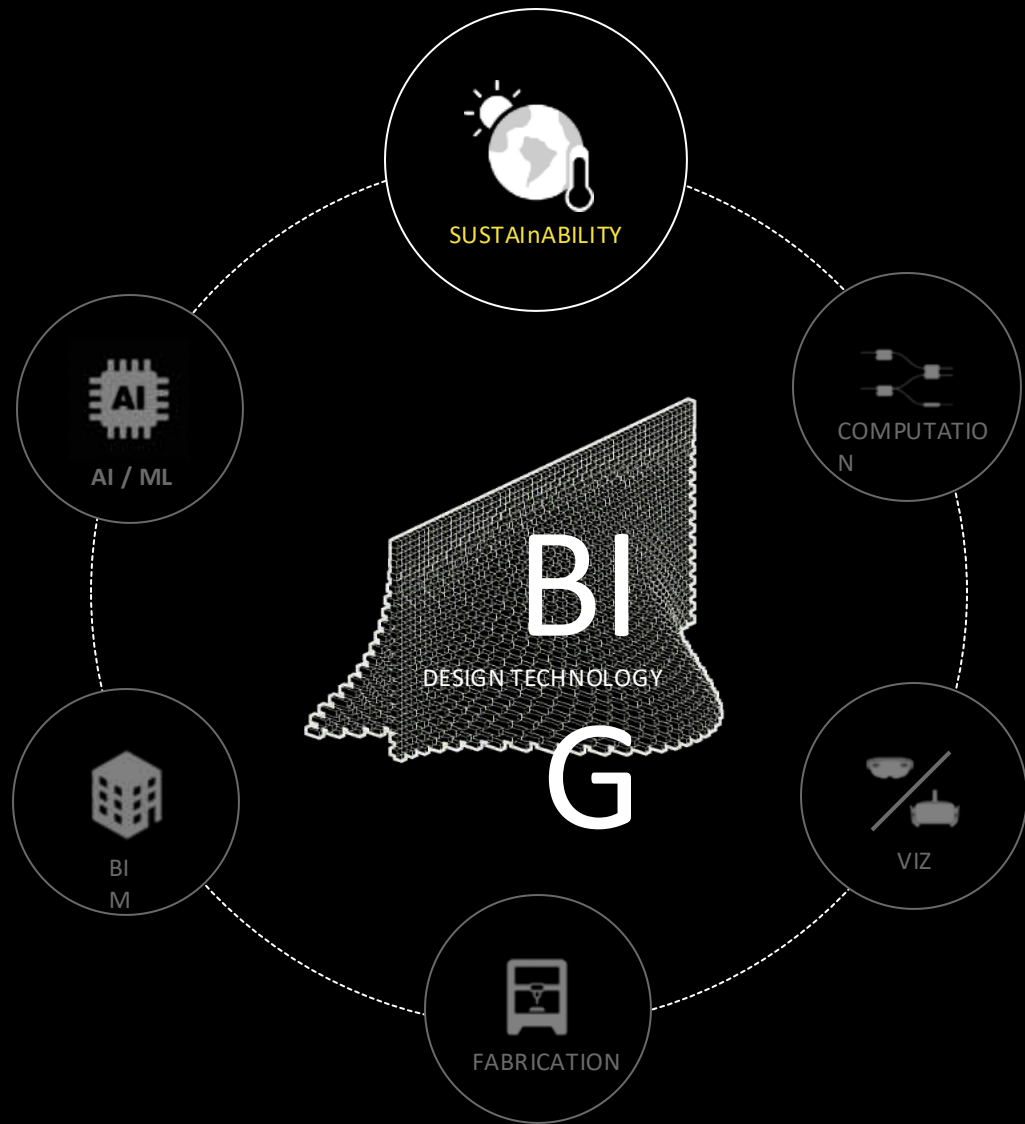
LANDSCAPE

UEA Pavilion









SUSTAINABILITY

COMPUTATION

VIZ

FABRICATION

AI / ML

BIM

BI
G

DESIGN TECHNOLOGY



BIG

SUSTAINABILITY

WIND

3-10 DAYS



DAYLIGHT

5-10 DAYS



REGULATION

3-5 DAYS



RADIATION

3-5 DAYS



SUN HOURS

3-5 DAYS



CLIMATE

3-5 DAYS



FACADE

5-10 DAYS



INDOOR

5-10 DAYS



NARRATIVE

5-10 DAYS



RENEWABLES

3-5 DAYS



SECTION & AXO

3-5 DAYS



BRIEF

3-5 DAYS



ENERGY

5-10 DAYS



VIEWS

3-5 DAYS



SHOEBOX

3-5 DAYS



OUTDOOR

3-5 DAYS



LCA

10-15 DAYS



R&D

TBD



BUILDUPS

5-10 DAYS



CERTIFICATION

5-10 DAYS




WIND
3-10 DAYS



DAYLIGHT
5-10 DAYS



REGULATION
3-5 DAYS



RADIATION
3-5 DAYS



SUN HOURS
3-5 DAYS



CLIMATE
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SECTION & AXO
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LCA
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R&D
TBD



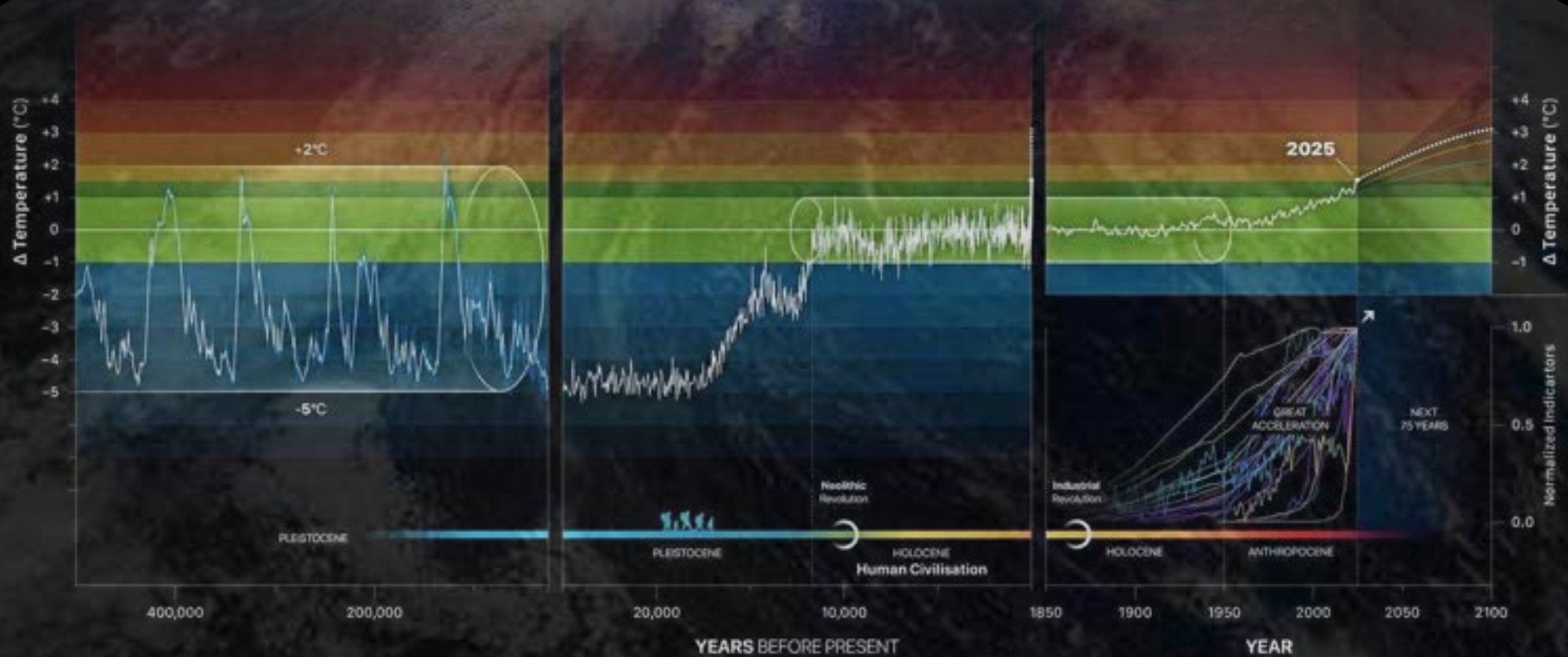
BUILDUPS
5-10 DAYS



CERTIFICATION
5-10 DAYS



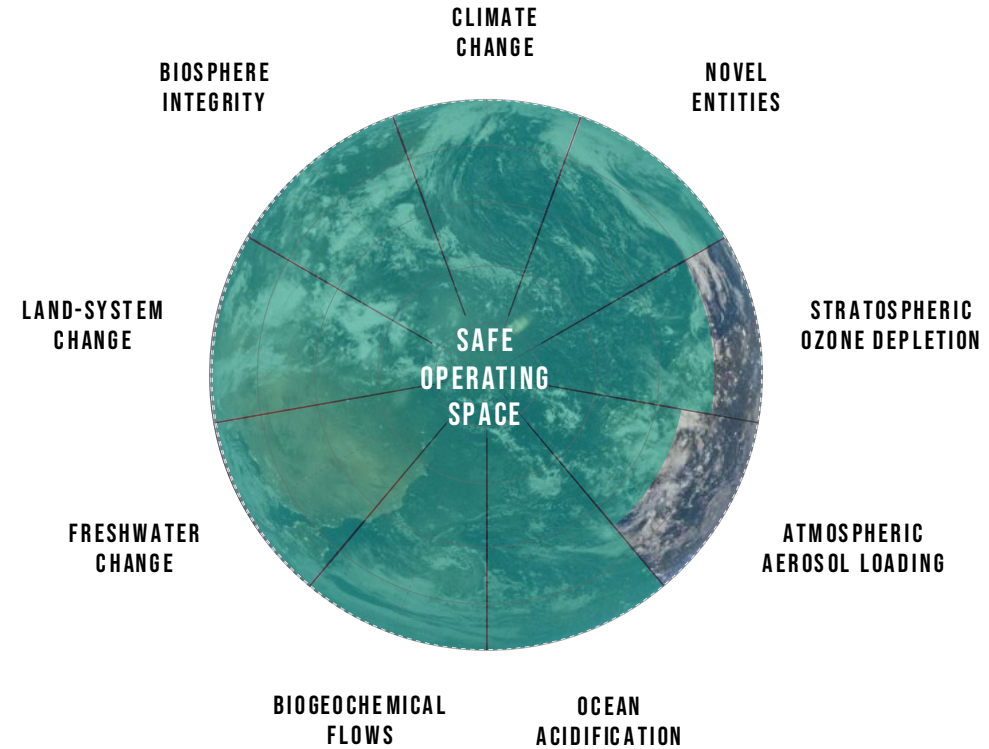
Humanity's Journey on Earth



ONE EARTH

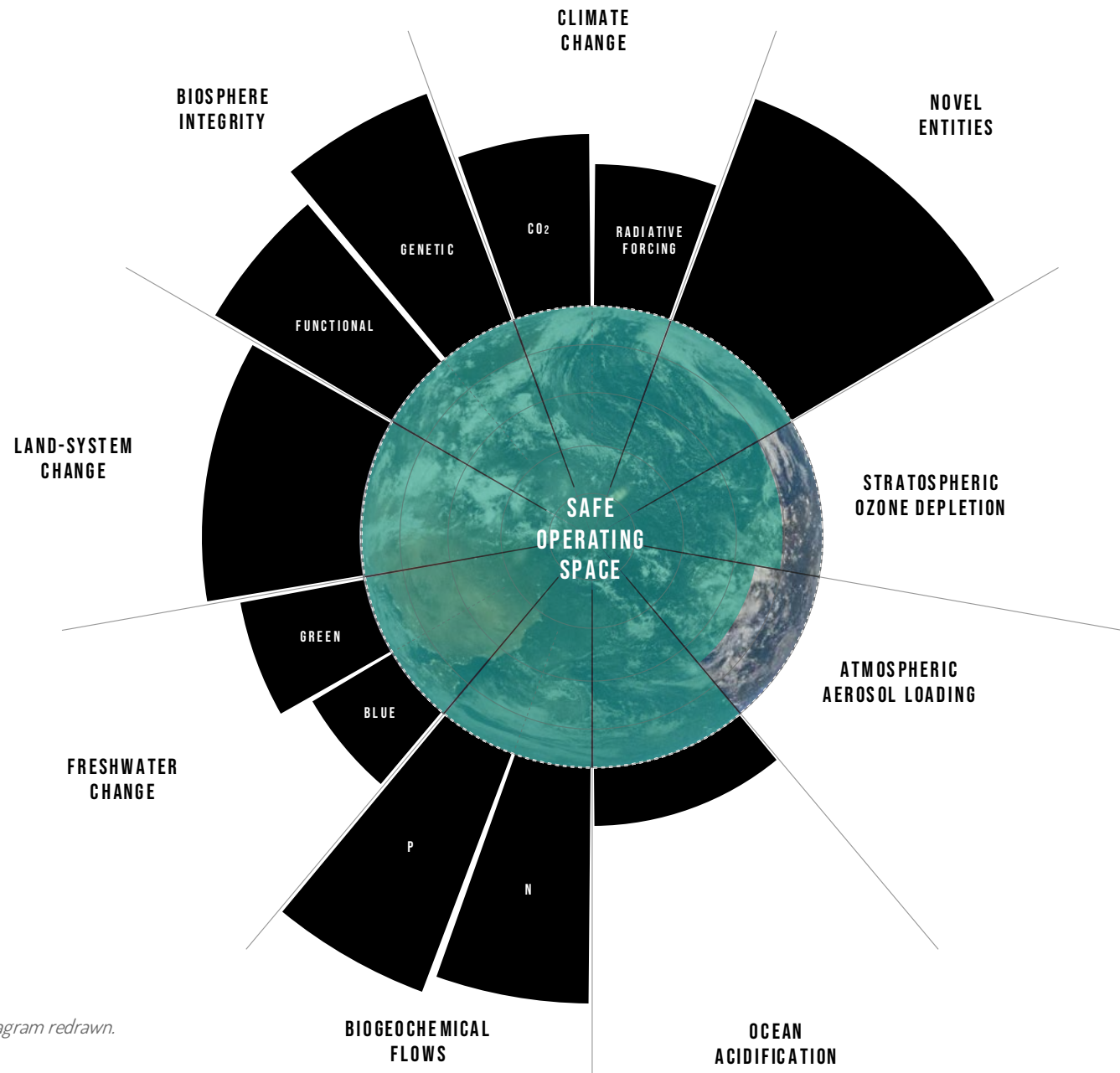


ONE EARTH NINE BOUNDARIES



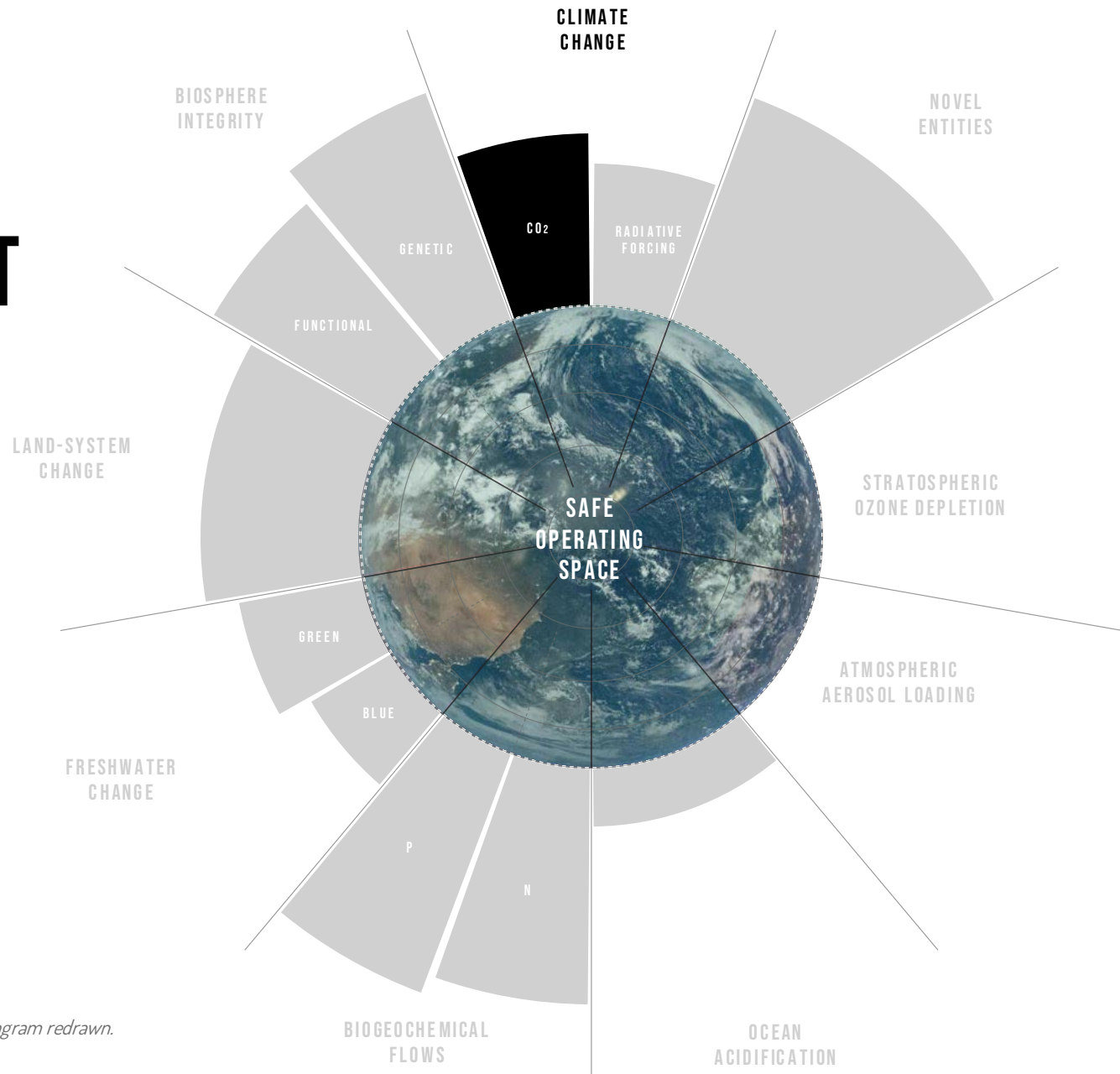
Source: Stockholm Resilience Centre – Rockström et al., planetary boundaries framework. Diagram redrawn.

ONE EARTH NINE BOUNDARIES SEVEN BREACHED



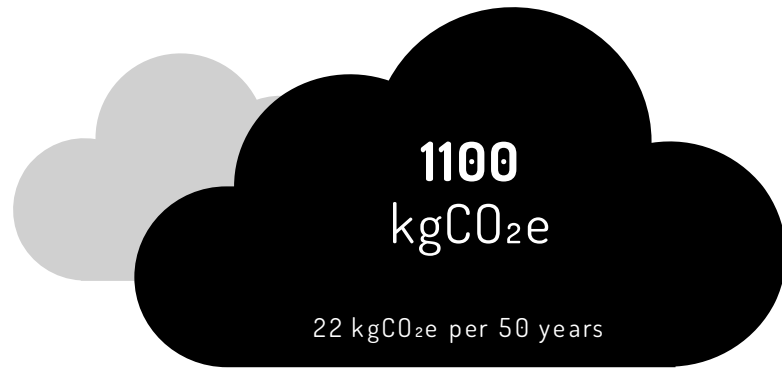
Source: Stockholm Resilience Centre — Rockström et al., planetary boundaries framework. Diagram redrawn.

ONE EARTH NINE BOUNDARIES CO₂ IS JUST ONE ASPECT

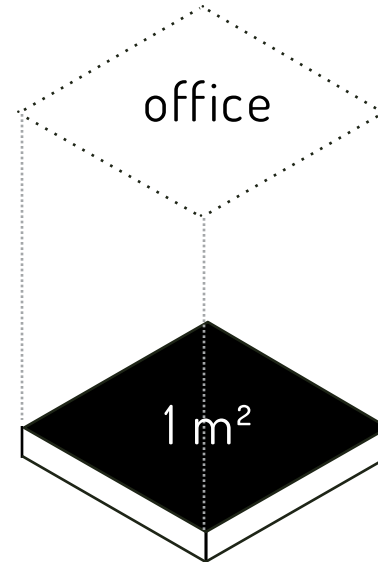


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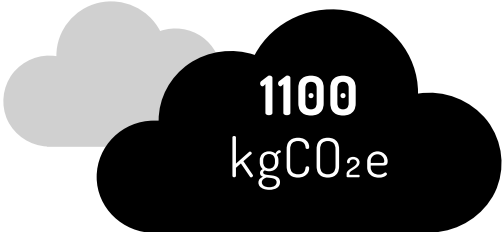
THE WEIGHT OF A SQUARE METER



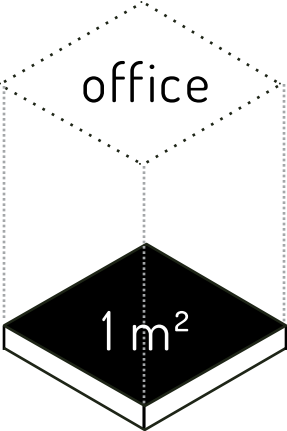
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ONE SQUARE METER ONE ROAD TRIP TO ARGENTINA



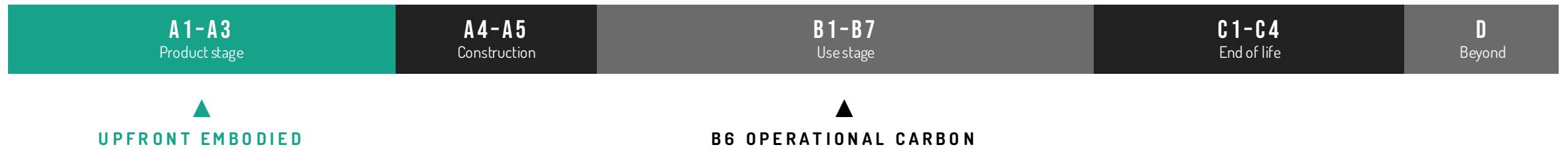
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THE FULL LIFE CYCLE



Source: lifecycle phases per EN 15978 (CEN, 2011). CBAM: EU Regulation 2023/956.

CONTEXT MATTERS

◀ PRIORITIZE EMBODIED CARBON

PRIORITIZE OPERATIONAL CARBON ▶

CLIMATE

TEMPERATE

EXTREME

GRID

RENEWABLE

FOSSIL FUELS

PROGRAM

HOUSING

DATA CENTER

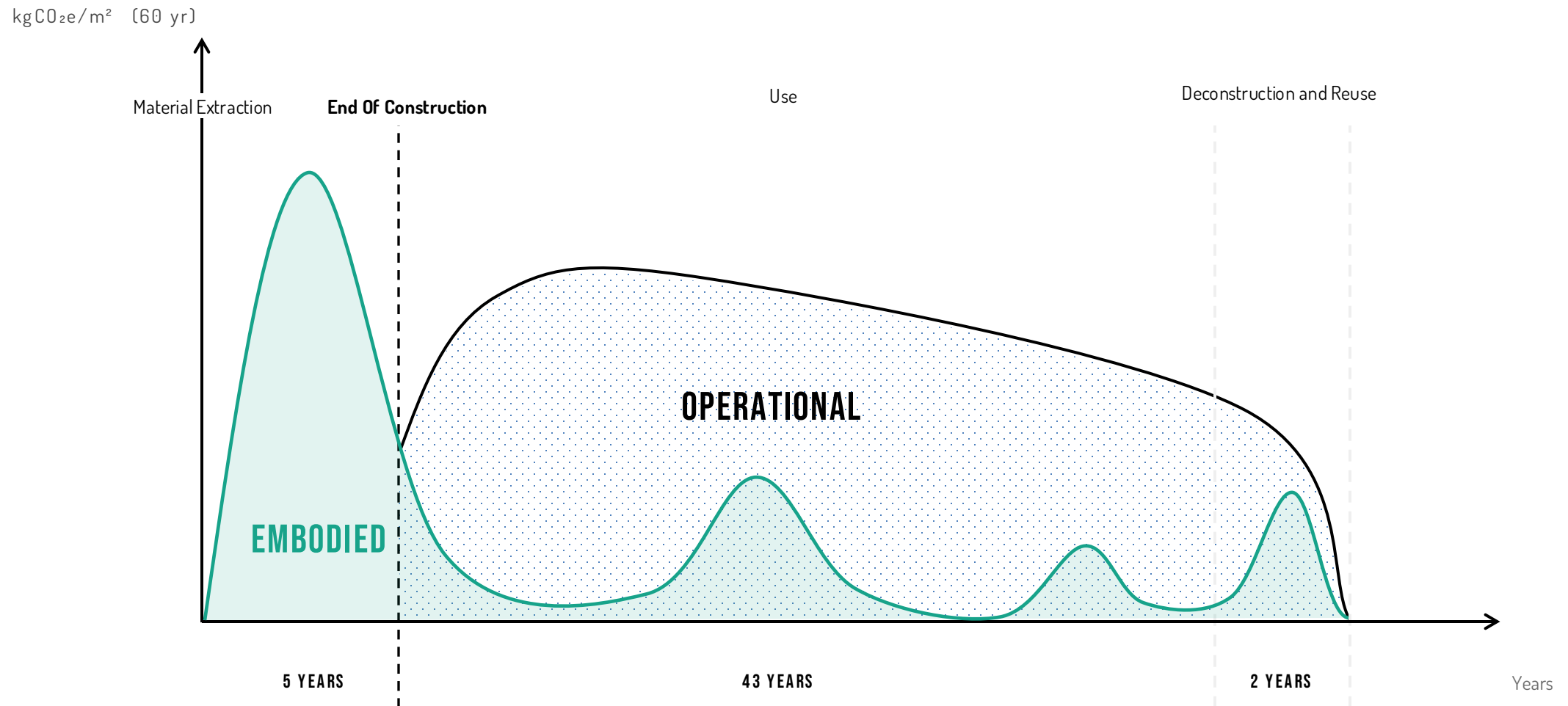
LIFESPAN

30 YEARS

100+ YEARS

THE CARBON THAT HAS ALREADY HAPPENED

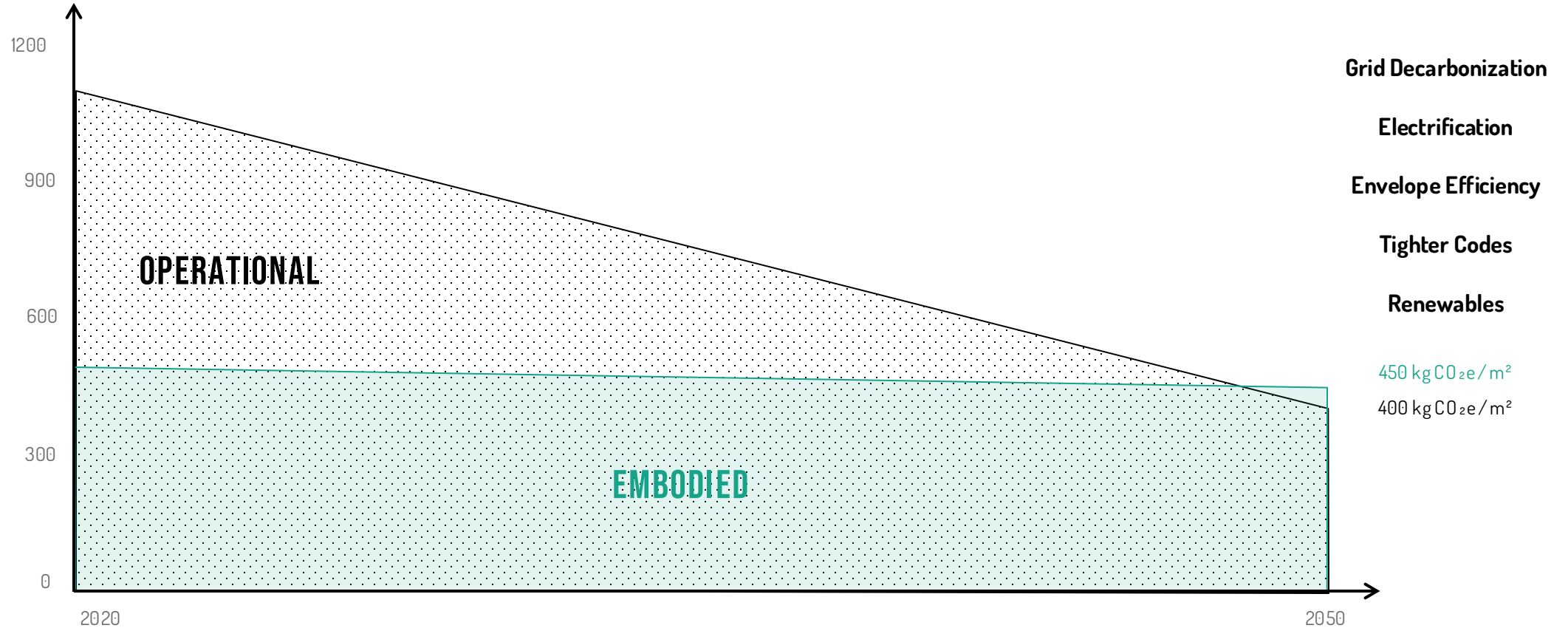
Example of carbon accrued in one building



A CHANGING BALANCE

Across the building stock, operational carbon falls as grid decarbonize.

kgCO_{2e}/m² (60 yr)



A CHANGING BALANCE **SOCIAL INFRASTRUCTURE**



DENMARK

MEASUREMENT BEFORE REGULATION



● 2010

○ 2018

DGNB VOLUNTARY





2010

2018

2022

ENVIRONMENTAL PRODUCT DECLARATION - EPD

2018

2022

2023

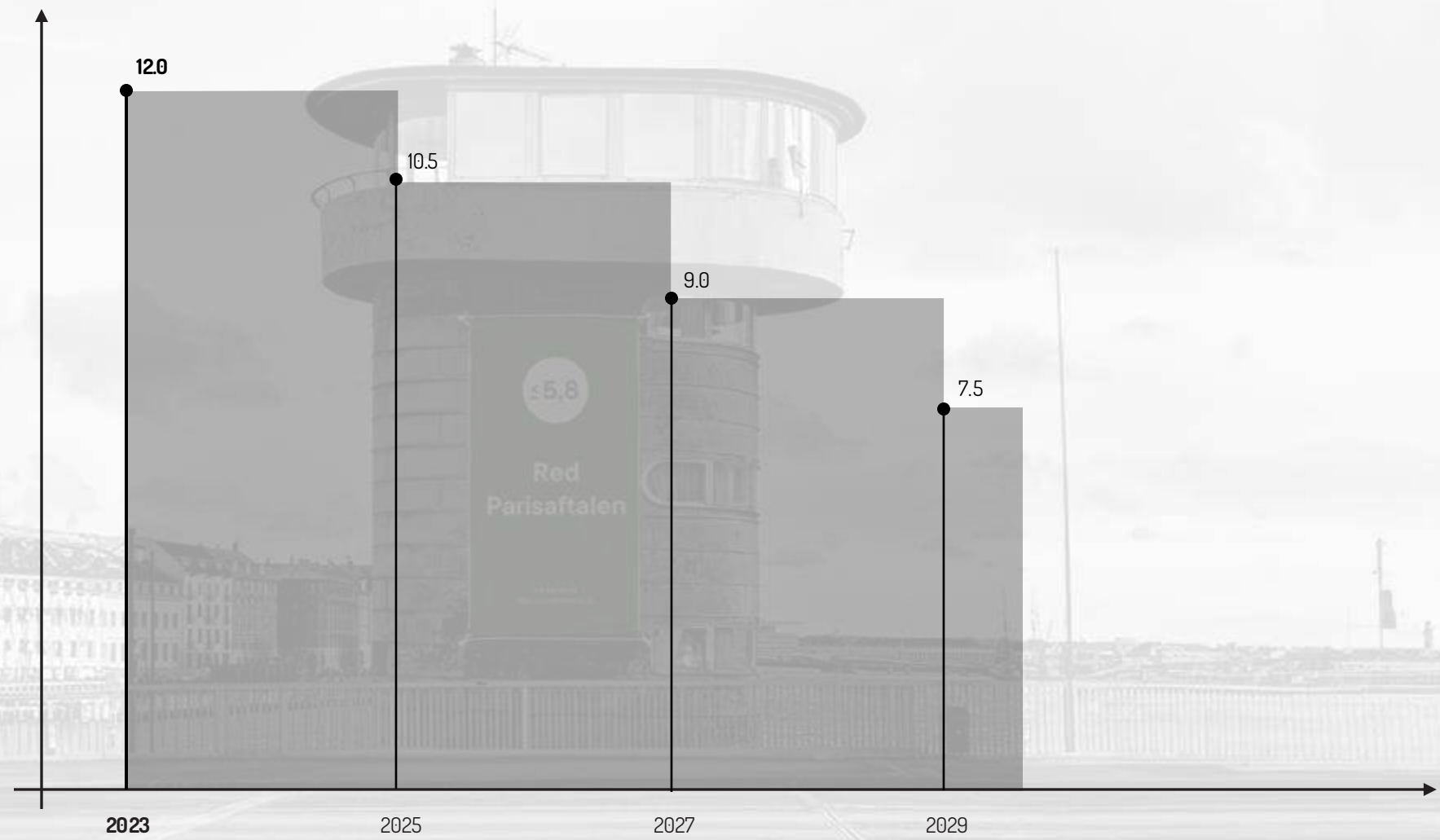


630 COMPANIES SIGNED THE REDUCTION ROADMAP.

Capital and supply chains followed.

2022

kgCO2e/m²/year



2023

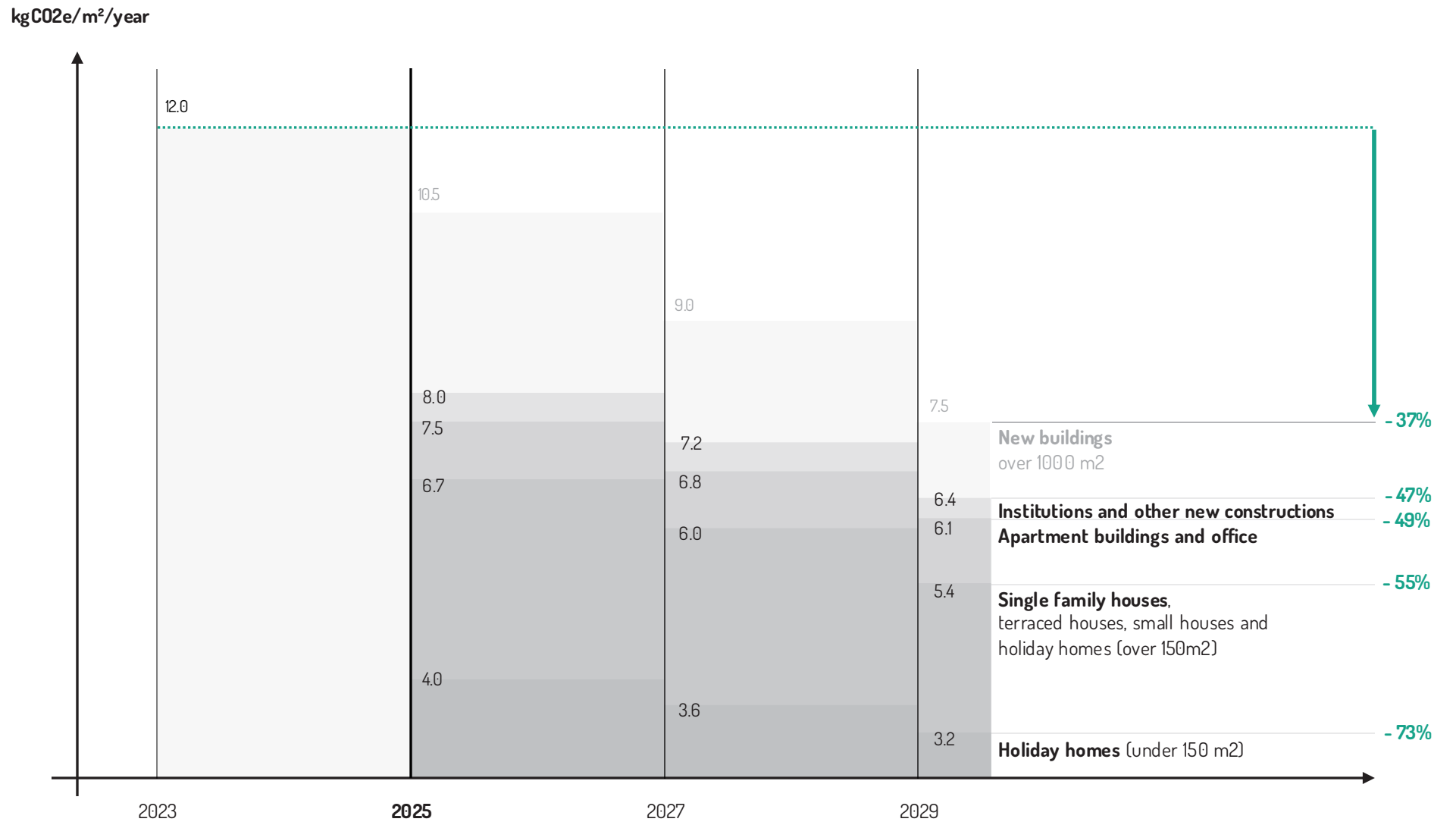
2025

12 kgCO2e/m²/year ESTABLISHED AS LEGAL LIMIT FOR NEW BUILD

2023

2025

2026



THE LIMIT GOT LOWER AND DIFFERENCIATED BY TYPOLOGIES

WHAT MEASUREMENT BUILT



LCA SOFTWARE
PENSION CAPITAL

Logistic Center West · Henning Larsen

LOW-CARBON MATERIALS
GREEN FINANCE

WHAT MEASUREMENT BUILT

LCA SOFTWARE

LCAbyg

BUILD / Aalborg University · launched 2015 · Danish state tool

Reduzer

Scandinavian-built · TEK17, Klimatdeklaration, FutureBuilt

Real Time LCA

Danish industry tool, integrated into design workflows

Tools built for the regulation, by the people writing it.

PENSION CAPITAL

ATP

DKK 200bn green investment target by 2030

PFA Pension

DKK 60bn portfolio · all DGNB Gold since 2019

PensionDanmark

All new offices DGNB-certified since 2012

Carbon disclosure became a financing condition.

Source: Danish Reduction Roadmap; ATP Green Bonds.

LOW-CARBON MATERIALS

EVIA, Sweden

Koljern concrete-free foundations, Foamglas (recycled glass) – 50-70% CO₂ reduction

EcoCocon Modules

Prefab straw-timber panels, 98% natural materials

FUTURECEM – Aalborg Portland

Reduced CO₂ cement alternative

Demand created by measurement created the supply.

GREEN FINANCE

Danish sovereign green bond

Inaugural issuance 2022

Nordic sustainable bond market

€48.6bn in 2022 (16% of all issuance)

Danske Bank Green Finance

€2.8bn green loans by 2021

New instruments. New flows. Real money.

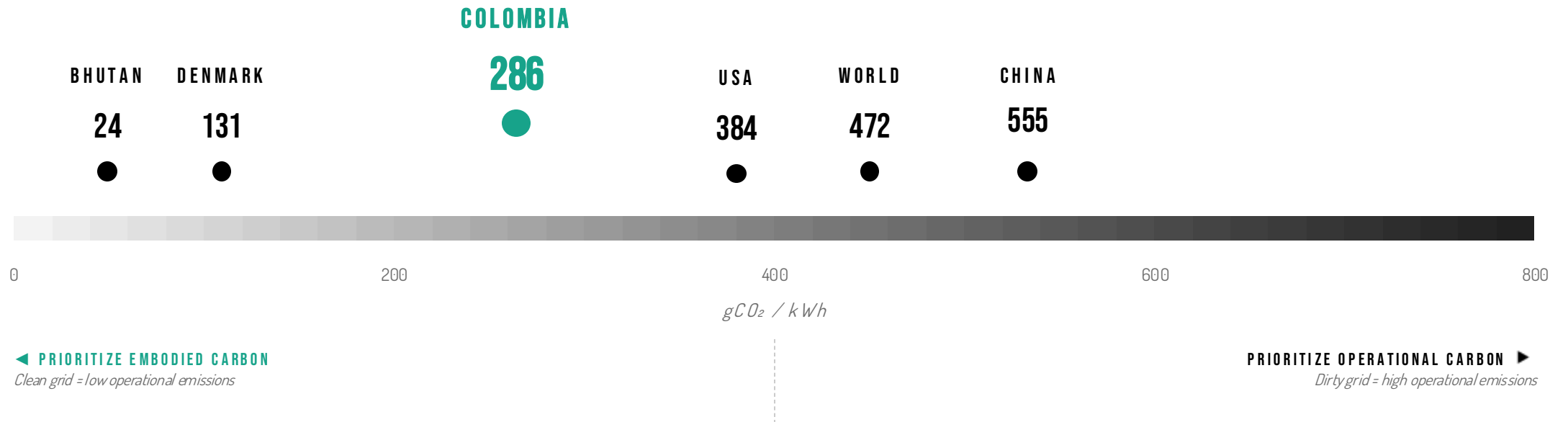


IN PRACTICE

THE CARBON COMPASS

THE GRID DETERMINES THE QUESTION

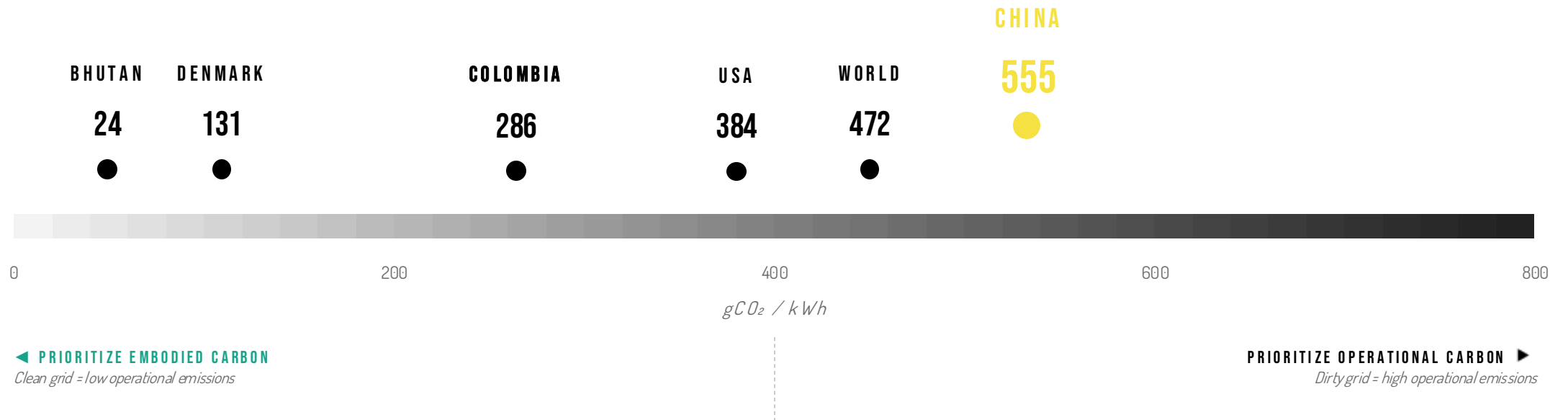
In buildings, the dominant operational energy load is electric — cooling in Colombia, heating in Denmark. The grid determines what that electricity costs in carbon.



Source: Our World in Data, "Lifecycle carbon intensity of electricity" (Ember + IPCC AR5 lifecycle factors), 2024.

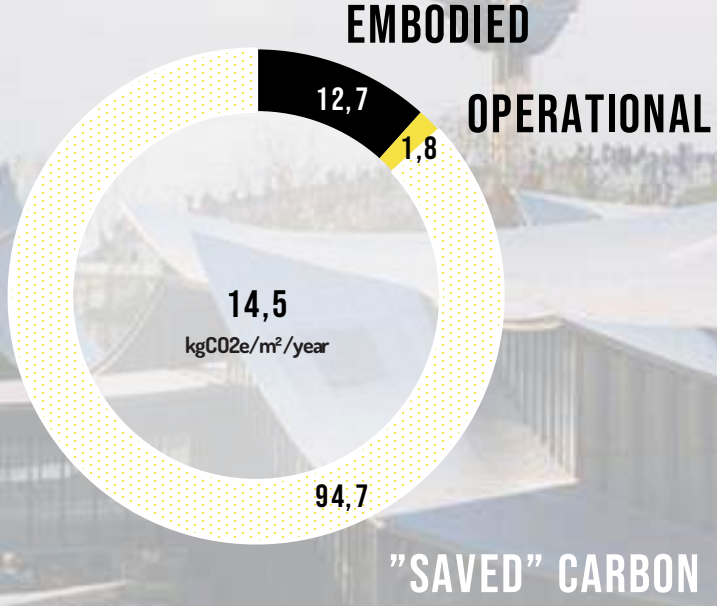
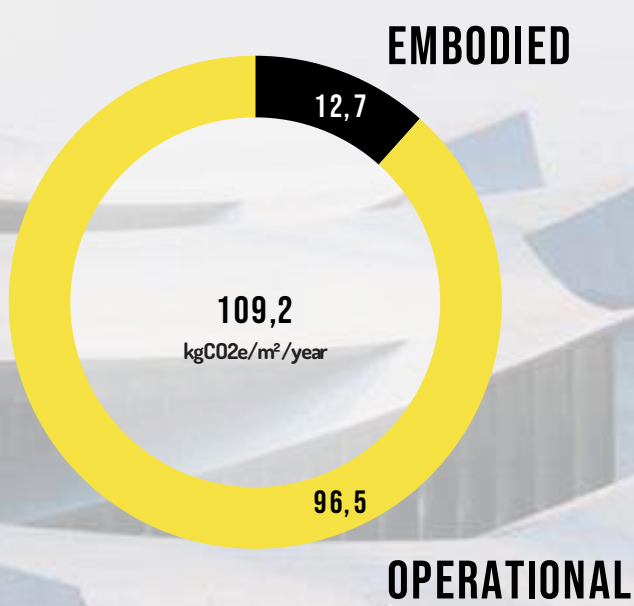
THE GRID DETERMINES THE QUESTION

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LOW VS HIGH CARBON GRID

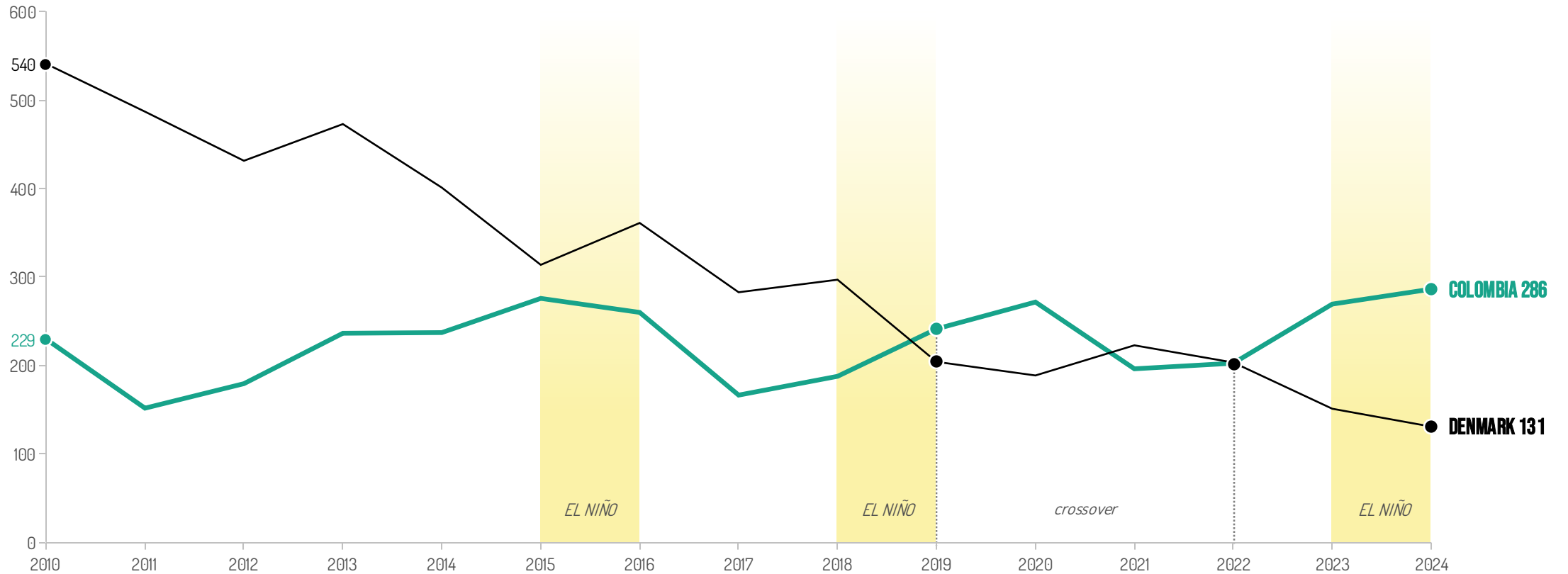


Numbers are not reflective of the latest design.

Suzhou China · Suzhou Museum of Contemporary Art · BIG

THE GRID IS NOT A FIXED NUMBER

gCO₂eq/kWh



Source: Our World in Data, "Lifecycle carbon intensity of electricity" (Ember + IPCC AR5 lifecycle factors).

SANKT LUKAS HOSPICE



CONTEXT MATTERS

◀ PRIORITIZE EMBODIED CARBON

PRIORITIZE OPERATIONAL CARBON ▶

CLIMATE

TEMPERATE

EXTREME

GRID

RENEWABLE

FOSSIL FUELS

PROGRAM

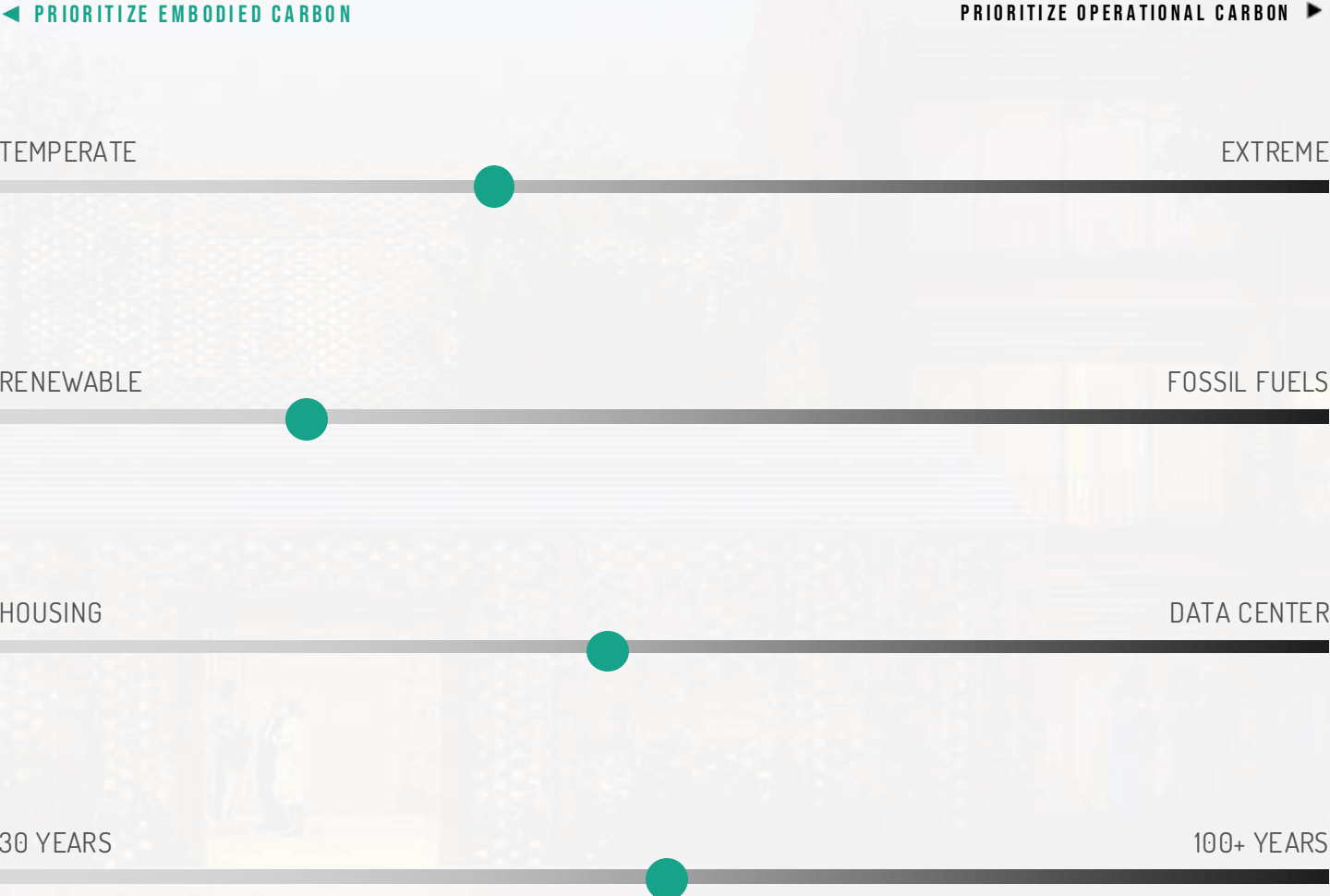
HOUSING

DATA CENTER

LIFESPAN

30 YEARS

100+ YEARS



REUSED MATERIALS



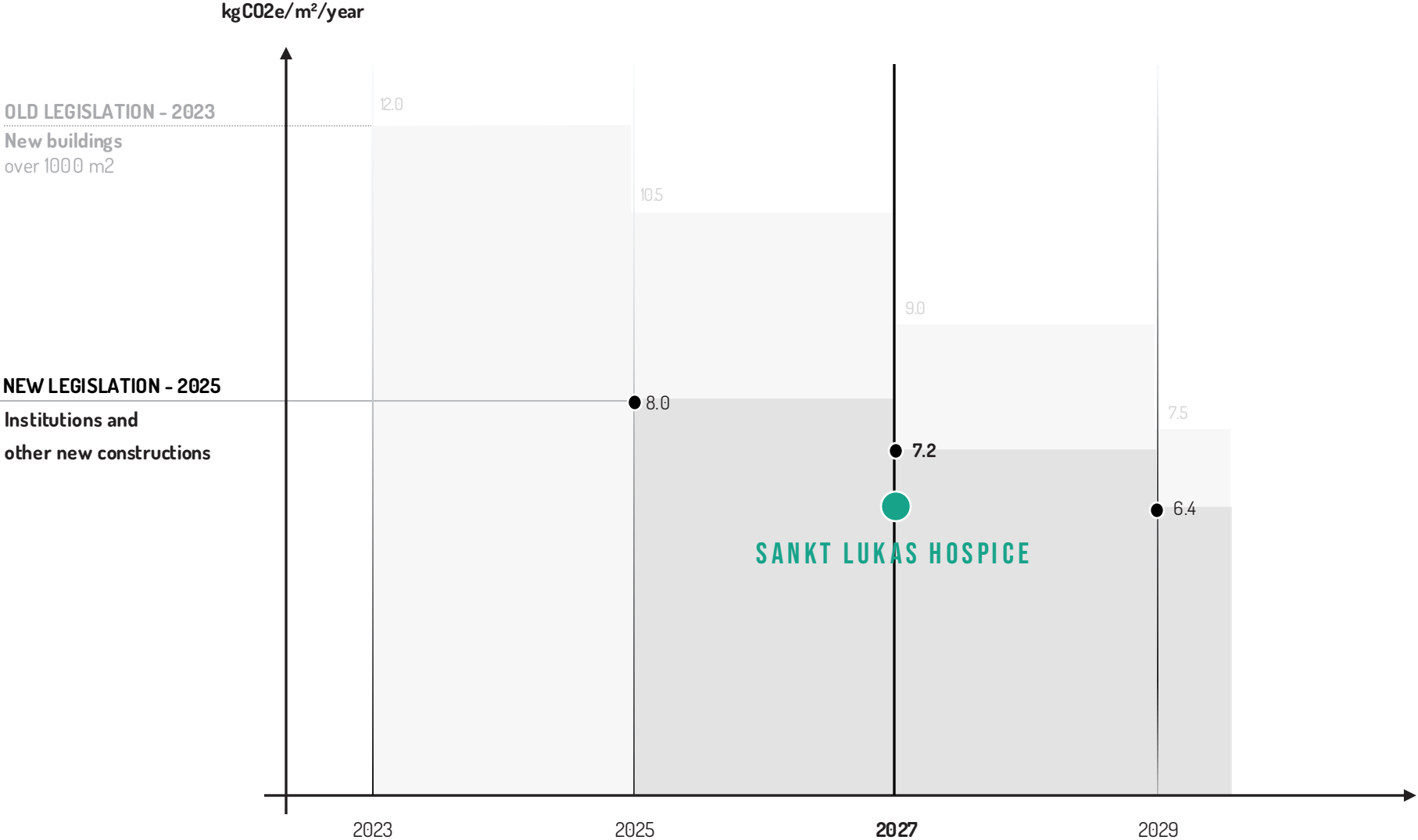
REUSED MATERIALS BIODIVERSITY

Copenhagen, Denmark · BIG

REUSED MATERIALS
BIODIVERSITY
BIOPHILIC



DESIGN FOR THE FUTURE



**SANKT LUKAS HOSPICE
LIFE CYCLE ASSESSMENT IN CONCEPT PHASE**

6.4

KG CO₂E / M² / YR

BR18 limit (2027): 7.2 · Reduction Roadmap target: 5.8

Clean grid. Temperate climate. Mature timber industry. The answer is clear because the context is clear.

LCA

17% Operational energy

3% Elevator

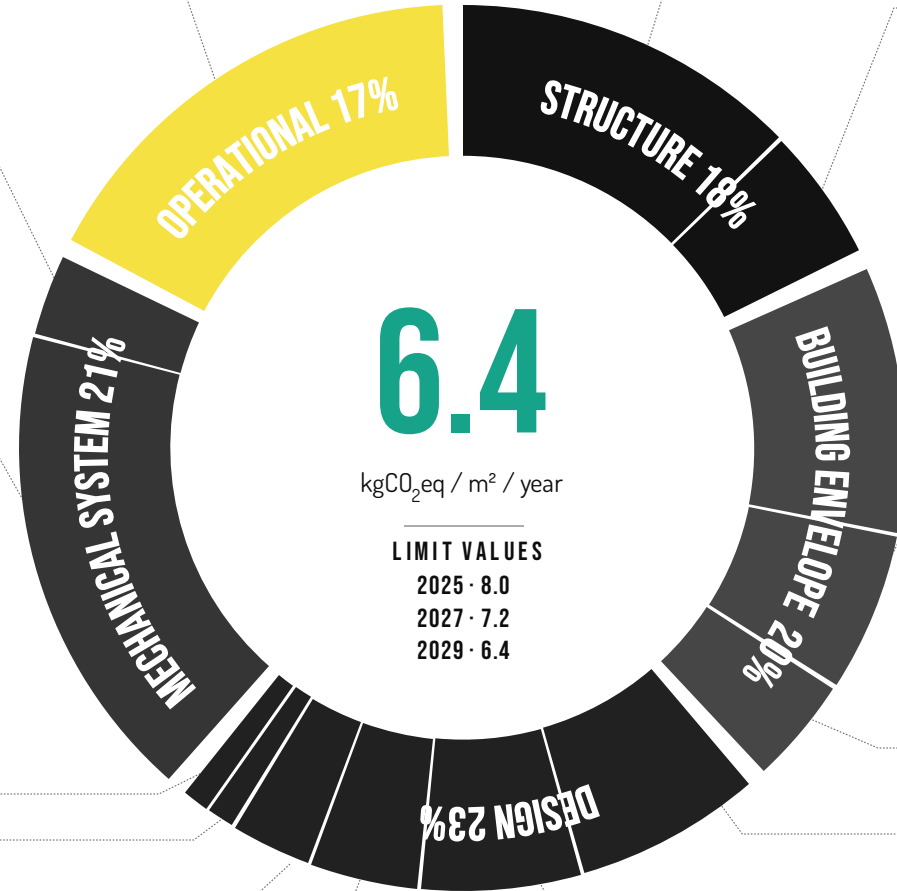
18% HVAC

1% Stairs and railings

1% Glass partition

3% Acoustic insulation

4% Roof tiles



6.4

kgCO₂eq / m² / year

LIMIT VALUES

2025 · 8.0

2027 · 7.2

2029 · 6.4

Concrete structure **13%**

Timber structure **5%**

Below-grade insulation **10%**

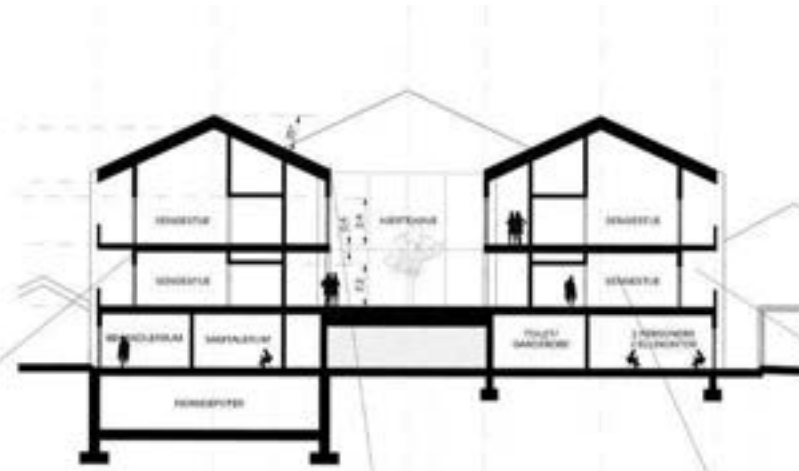
Windows **6%**

Above-grade insulation **4%**

Interior surfaces **7%**

Bricks **6%**

BIOGENIC RULE



Floor Slab
(385 mm)

Underfloor heating system: Novopan Klimagulv System
 Floor construction on joists
 Insulation
 Timber lamella mounted in acoustic dampening brackets
 Timber cladding



External Wall
(425 mm)

Clay panel: Clayboard heavy LEMIX D22
 Vapour barrier
 Wall construction of timber studs
 Mineral wool
 Particle board
 Wind barrier
 Mineral wool panel
 Yellow brick (reclaimed)



Roof
(625 mm)

Roof tile: Petersen Tegl Cover™, C71
 Tile battens
 Air gap
 Roof membrane
 Wood board: Steico Universal
 Rafter timber
 Cellulose insulation
 Vapour barrier
 Timber cladding



Load-bearing Internal Wall
(625 mm)

Clay panel: Clayboard heavy LEMIX D22
 CLT element
 Acoustic insulation / Service cavity
 CLT element
 Clay panel: Clayboard heavy LEMIX D22



Internal Wall
(145 to 195 mm)

Clay panel: Clayboard heavy LEMIX D22
 Wall construction of timber studs
 Acoustic insulation
 Clay panel: Clayboard heavy LEMIX D22

THE PLUS



CONTEXT MATTERS

CLIMATE

◀ PRIORITIZE EMBODIED CARBON

PRIORITIZE OPERATIONAL CARBON ▶

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RENEWABLE

FOSSIL FUELS

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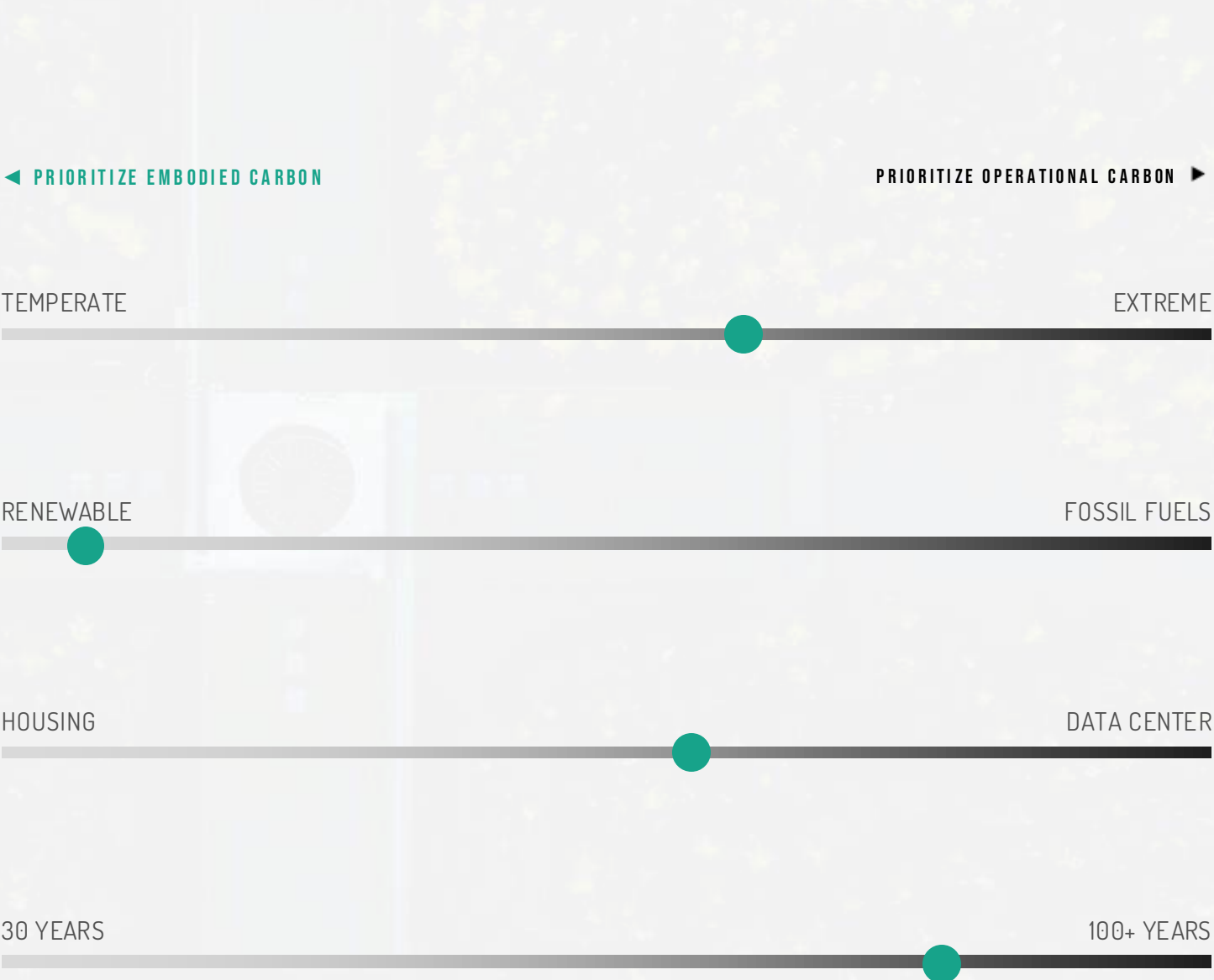
HOUSING

DATA CENTER

LIFESPAN

30 YEARS

100+ YEARS



RESPECTFUL



Magnor, Norway - EIG

**RESPECTFUL
EFFICIENT**

Magnor, Norway - BIG

RESPECTFUL EFFICIENT PRODUCTION

GELEPHU CITY



CONTEXT MATTERS

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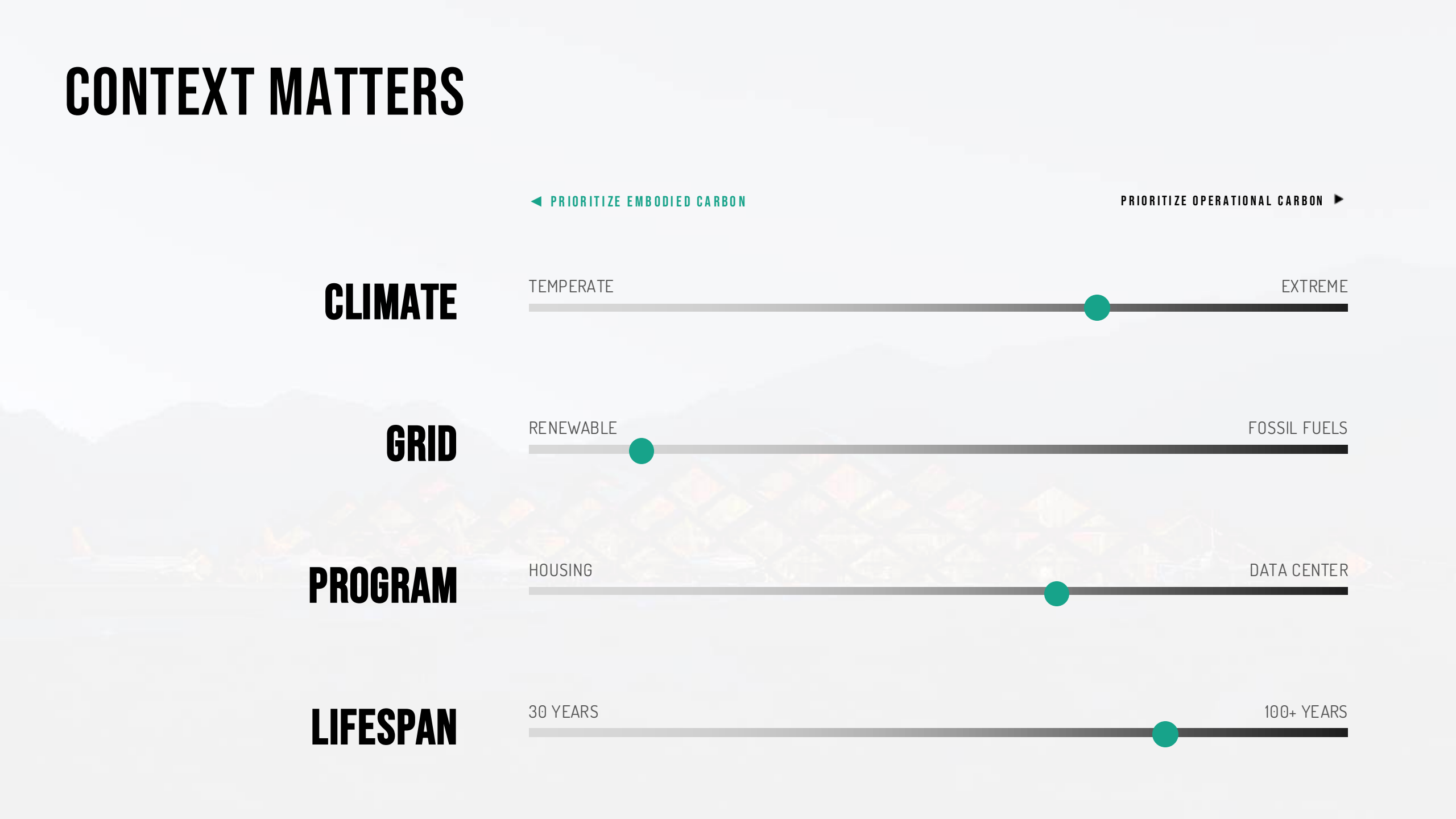
HOUSING

DATA CENTER

LIFESPAN

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100+ YEARS



MINDFULNESS



MINDFULNESS INCLUSIVE



MINDFULNESS
INCLUSIVENESS
VERNACULAR



GOOGLE BAY VIEW



CONTEXT MATTERS

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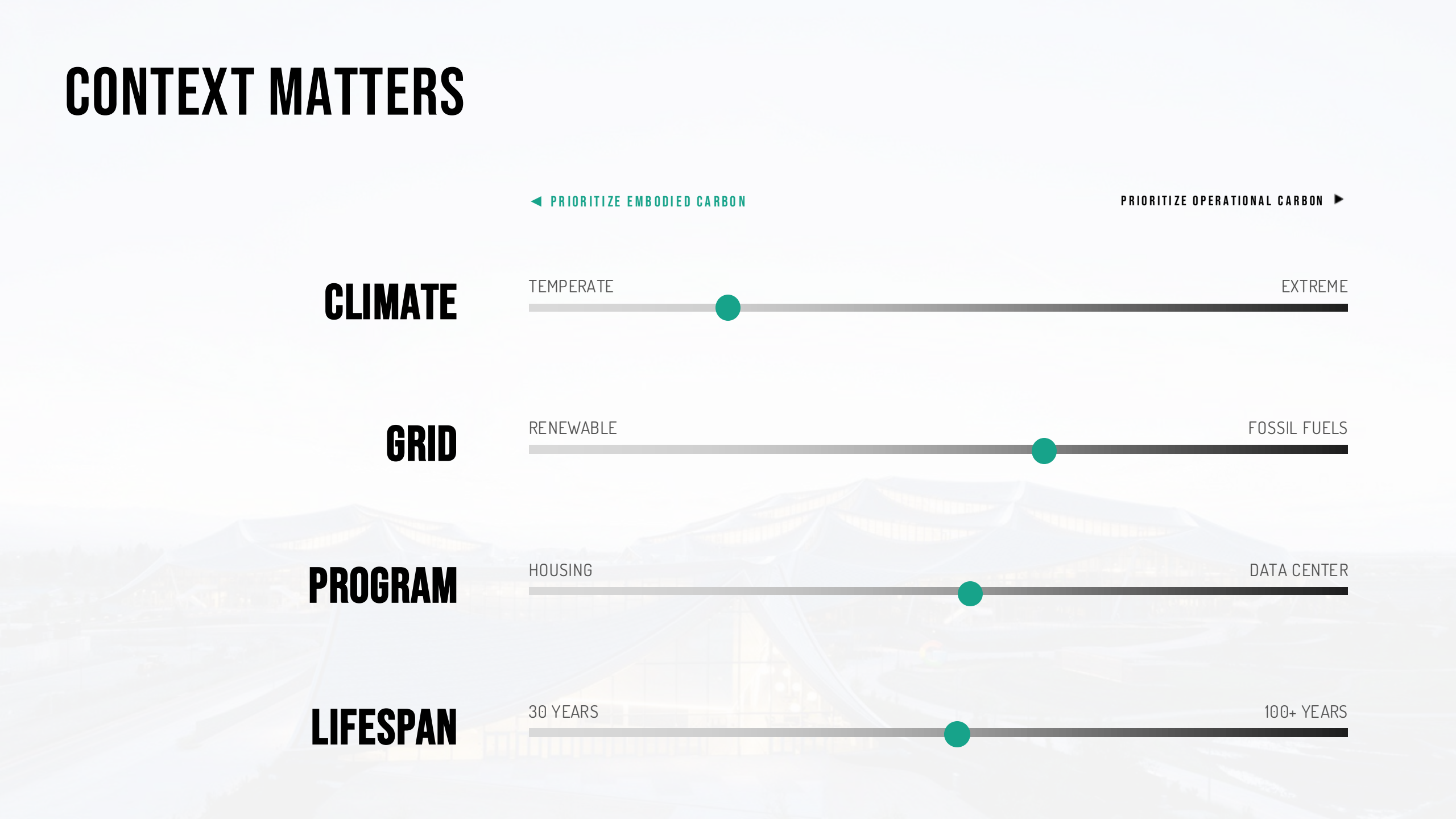
HOUSING

DATA CENTER

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LEED BD+C PLATINUM



Mountain View California, USA · BIG



**LEED BD+C PLATINUM
RENEWABLE**

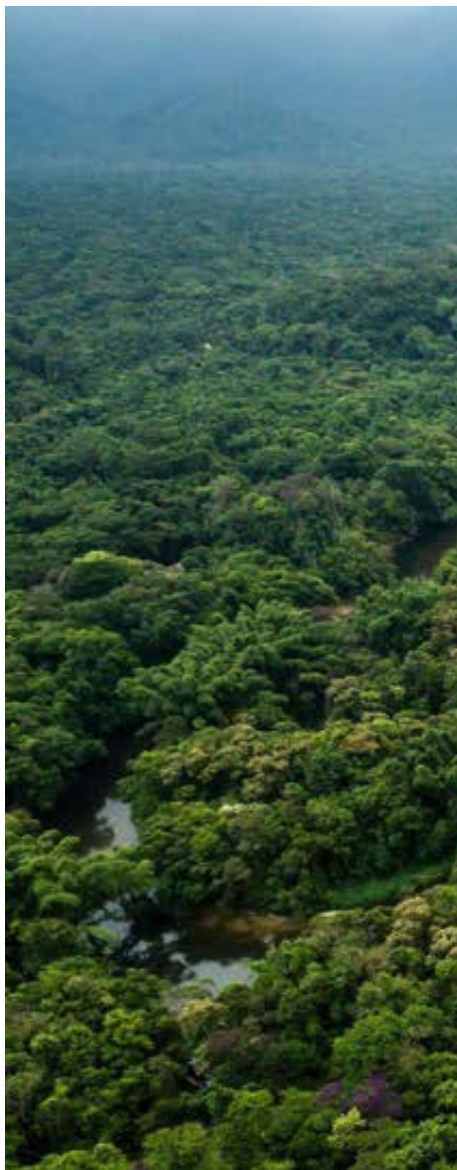
Mountain View California, USA - BIG

LEED BD+C PLATINUM
RENEWABLE
WELLBEING



An aerial photograph of a vast, dense tropical forest. The forest is a rich, vibrant green, with a river or stream winding through the lower portion of the image. In the background, there are rolling hills and mountains, some of which are shrouded in a light mist or haze, creating a sense of depth and scale. The overall atmosphere is serene and natural.

HOW DO YOU WANT TO USE YOUR COMPASS?



GRACIAS

4.º CONGRESO CAMACOL VERDE

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