


Pioneering decarbonized urbanism

BIM Forum 2024, CPH

Signe Kongebro, Global Design Director, Urbanism
Henning Larsen

An aerial night photograph of a city, showing a dense network of streets and buildings illuminated by lights. A prominent river or canal winds through the city, reflecting the lights. The overall scene is dark, with the city lights providing the primary illumination.

**“Cities are where the
climate battle will largely
be won or lost”**

António Guterres
Secretary General of the United Nations

An aerial photograph of a city during a major flood. A multi-lane highway bridge spans across a wide river. The surrounding urban area, including residential houses and commercial buildings, is almost entirely submerged in floodwater. The water is a dark, murky grey, and only the roofs of buildings and the tops of trees are visible above the surface. The sky is overcast, contributing to a somber and desolate atmosphere. The text 'What is the role of urban design in an uncertain world?' is overlaid in the center of the image in a large, white, sans-serif font.

**What is the role of
urban design in an
uncertain world?**

**It is in urbanism
that we imagine
what we as a society
can become**



An illustration of an iceberg floating in the ocean. The tip of the iceberg is visible above the water line, while the much larger, submerged part is below. The water is represented by vertical blue stripes of varying shades. The sky is a light blue gradient.

Designing with the invisible

Lilac Tree

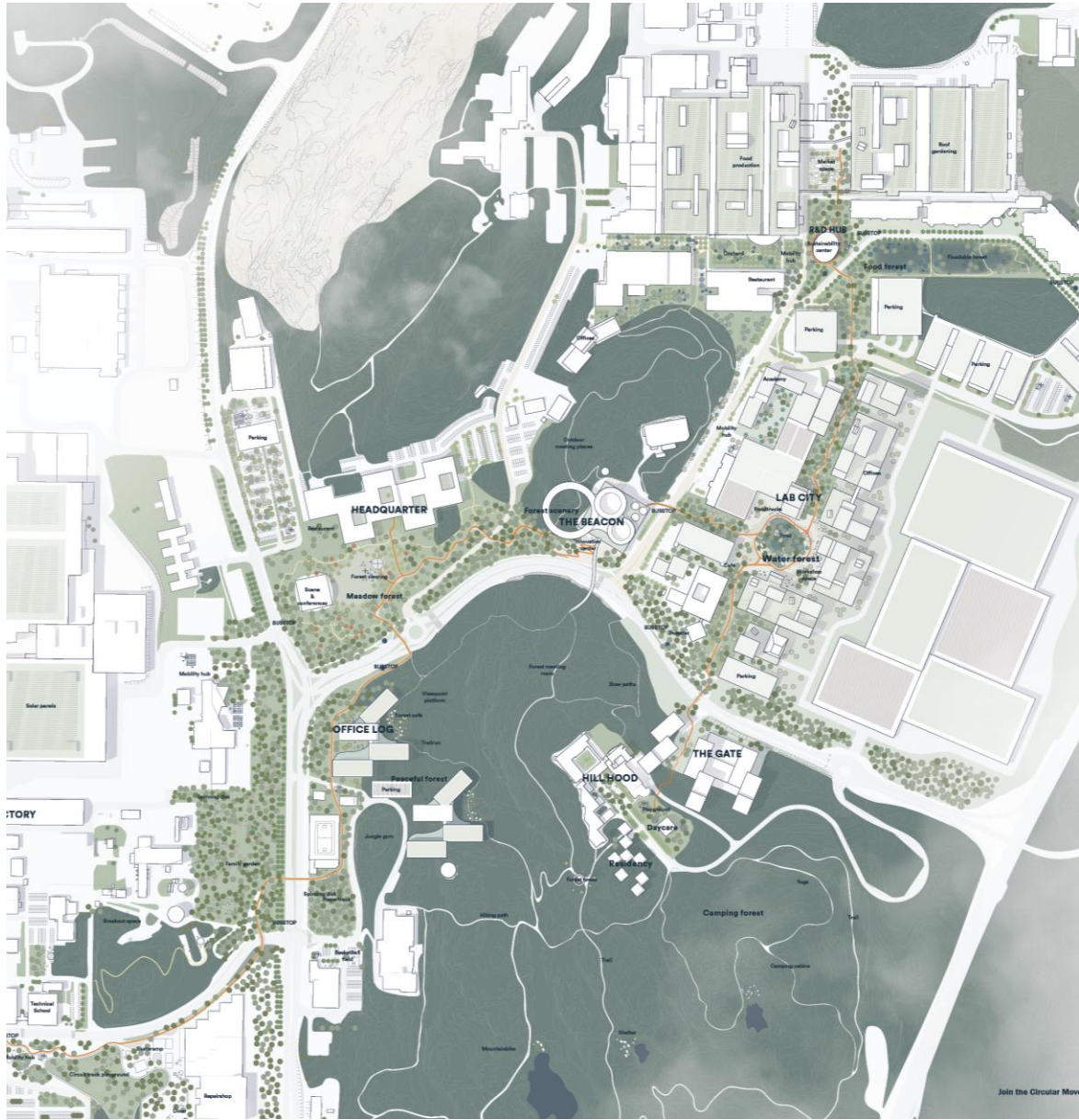


Oak Tree

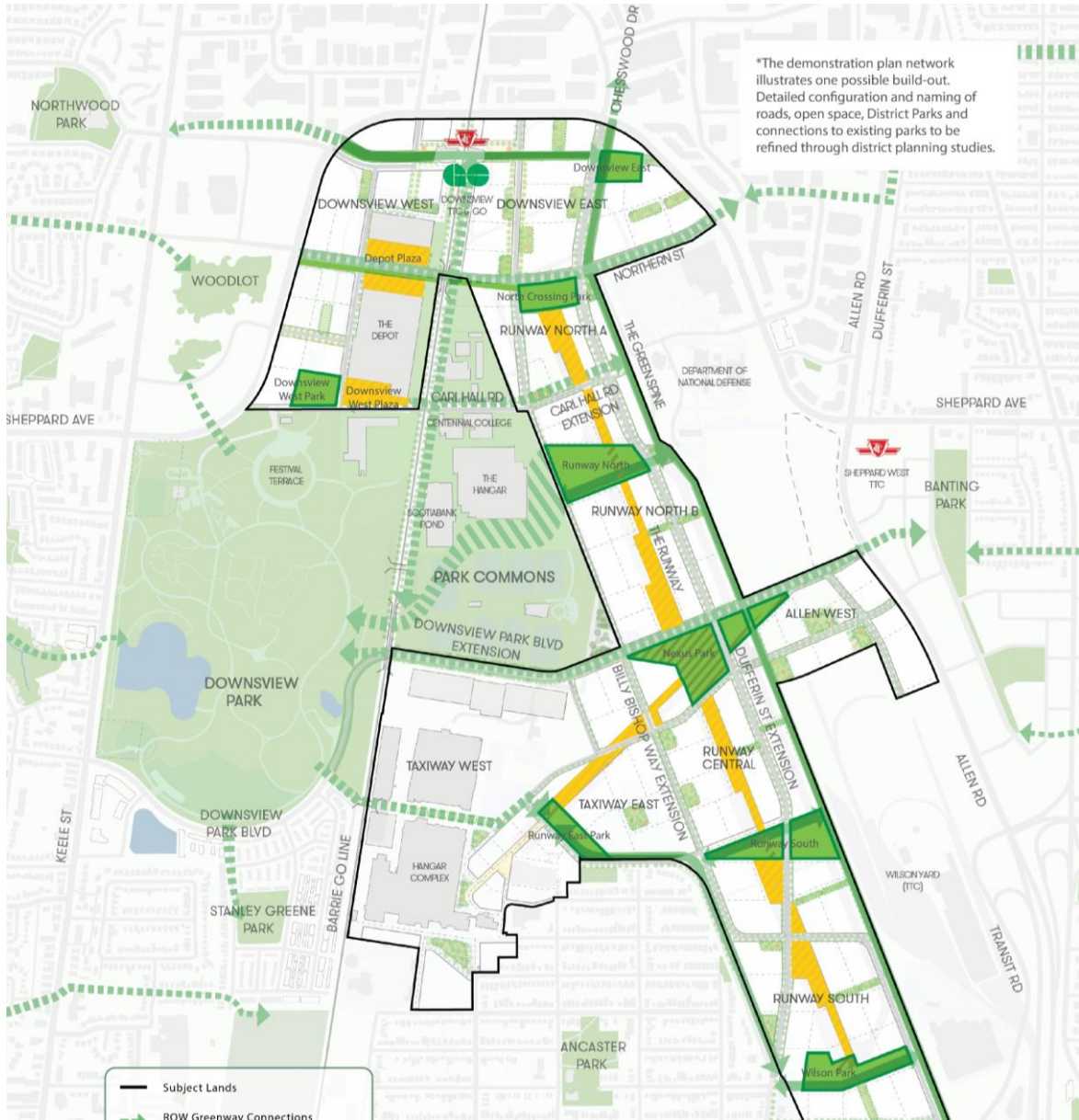


Designing with the invisible

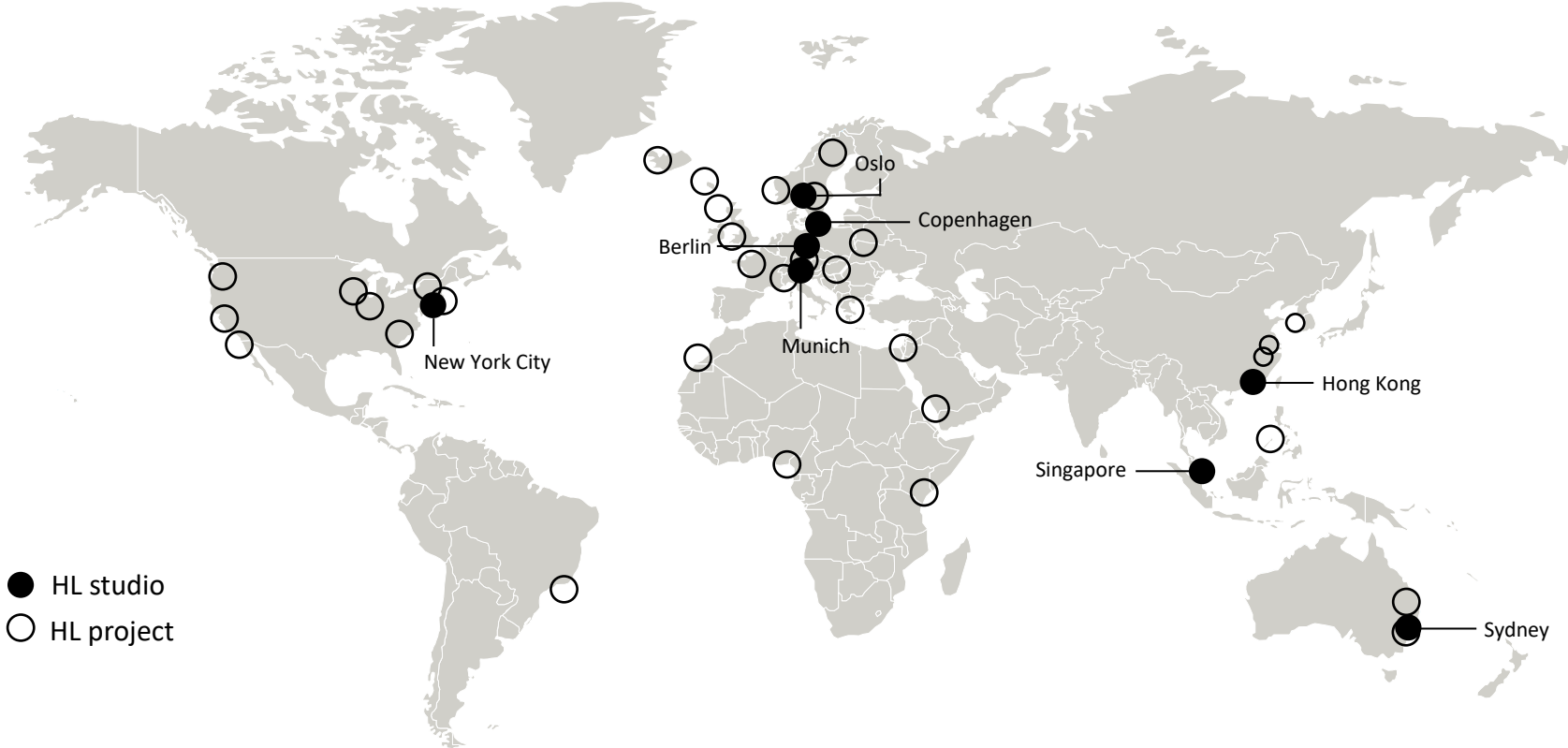
**We translate systems into
life-centric urban design
to create a desirable life
for all**







Global designers with local roots



1959

Founded by Danish architect, Henning Larsen

2019

European Architect of the Year, awarded by The European Centre & The Chicago Athenaeum

30+

Countries where we have completed and ongoing buildings and masterplans

Design studios

Copenhagen, New York City, Munich, Berlin, Oslo, Hong Kong, Sydney, Singapore

750+

Architects, Urbanists, Landscape Designers, Sustainability Specialists, Interior, Lighting, and Graphic Designers

Our backgrounds vary from architecture, landscape architecture, and urbanism, to communication, social and data science





Decarbonize
for net-zero



Resilient Societies
and Liveability



Resource
Management and
Circular Economy



Biodiversity and
ecosystem

How do we approach Sustainability ?

Partnerships
+
Collaboration

Goals
+
Strategy

Data
+
Innovation



Site

Context

WTC Memorial

Program Analysis

Civic Spaces in NYC

Learning from the Young Vic

Technology / Digital Media

Sustainability + daylight

Theaters

Positioning of Halls

Our design process is based on dialogue and collaboration



Henning Larsen

121.434 følgere

2md. • Redigeret •



The construction industry has an outsized impact on the environment but it also has enormous potential to be at the forefront of change.

... se mere

[Se oversættelse](#)



Kasper Kyndesen og 243 til

4 kommentarer • 9 genopslag



Henning Larsen

121.434 følgere

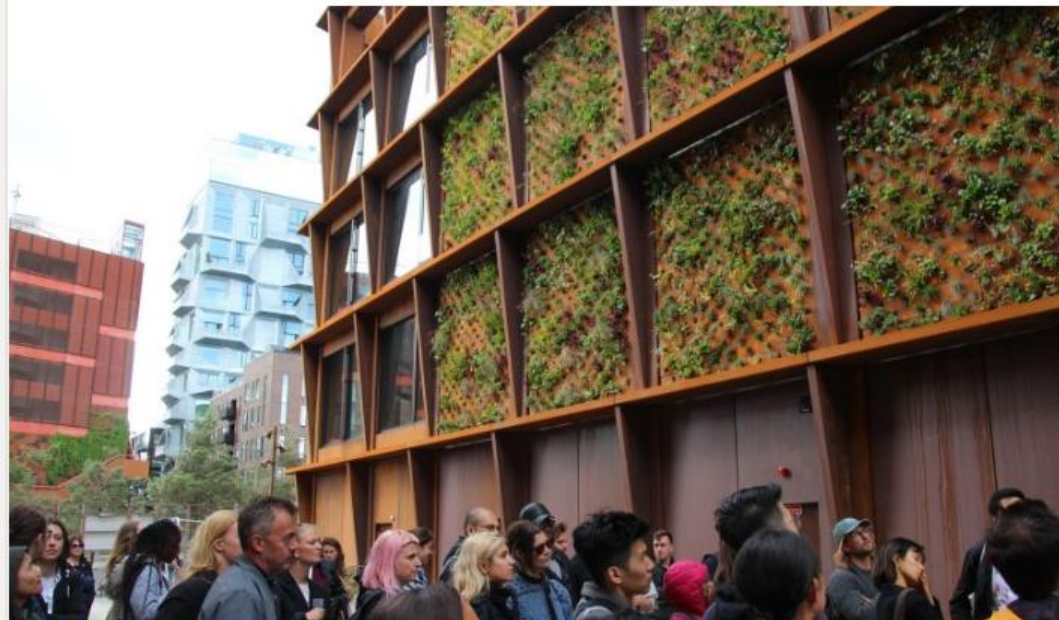
2md. • Redigeret •



On Monday, we sailed along Copenhagen's canals to Nordø, marking the perfect ending to the first day of [UIA World Congress of Architects CPH 2023](#).

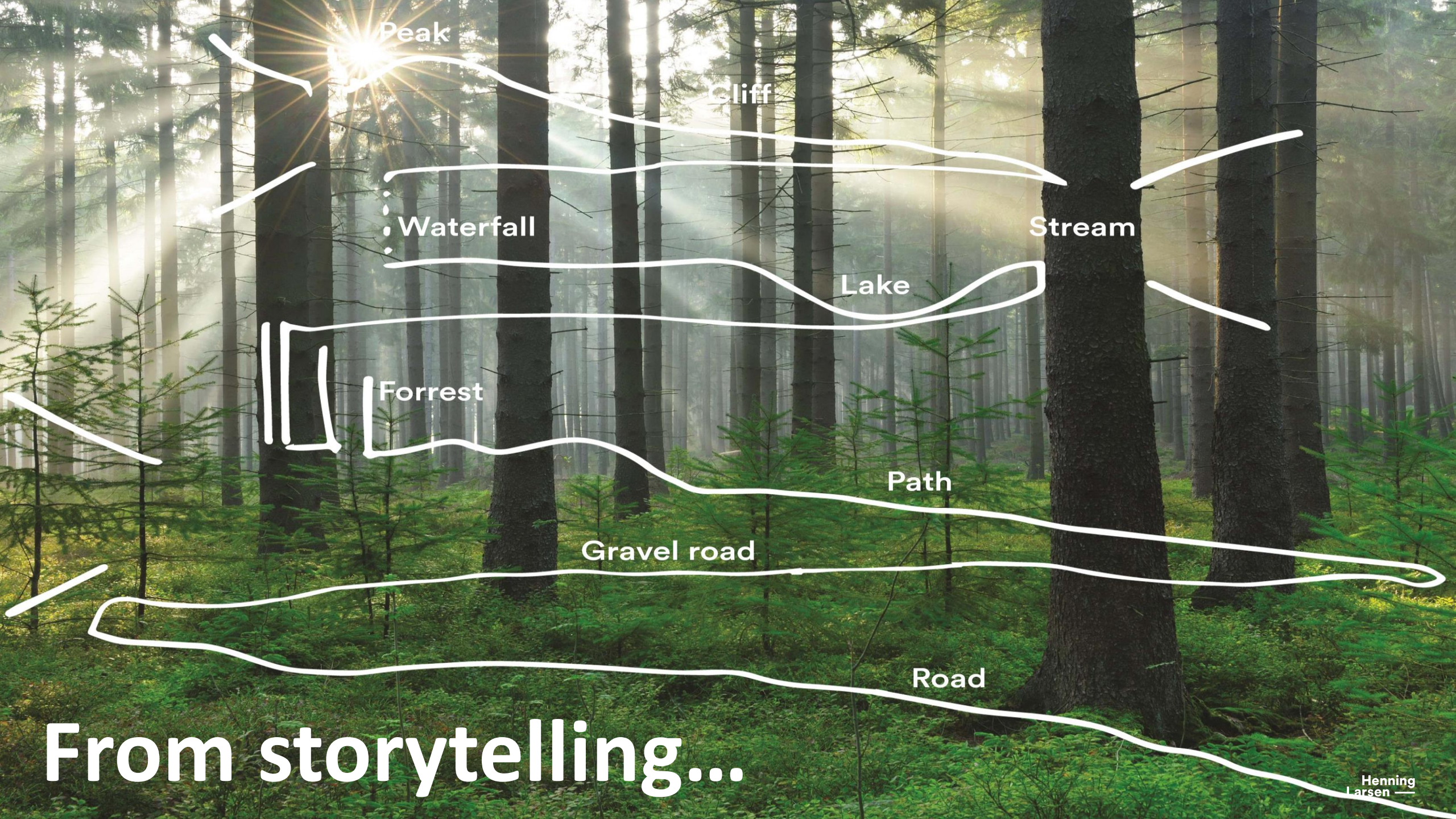
... se mere

[Se oversættelse](#)



Du og 413 til

2 kommentarer • 5 genopslag



Peak

Cliff

Waterfall

Stream

Lake

Forrest

Path

Gravel road

Road

From storytelling...



...to architectural experience



...from digital craftsmanship

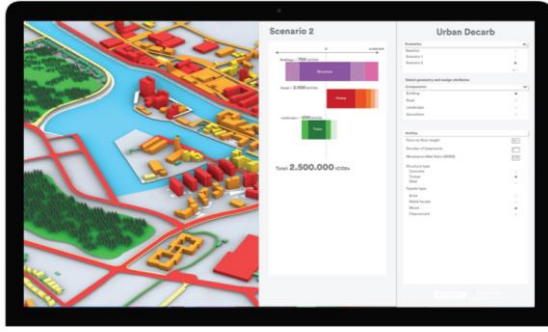


...through prototyping



...to “real” craftsmanship

Innovation for larger scale



Urban Decarb



GeoPlant



Green Scenario



Galago

1 to 1 prototyping (client & industry-driven innovation)



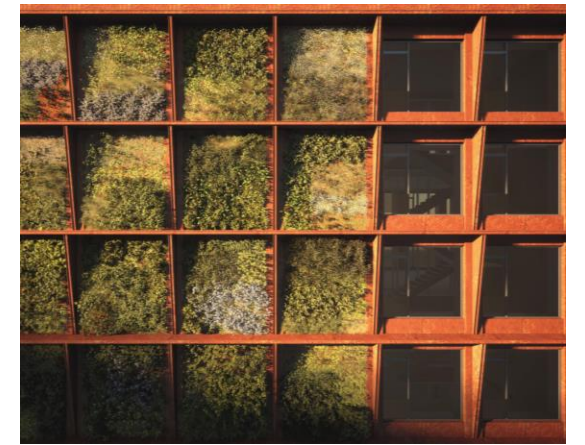
3Dprint, RowHouses



Straw school building, Felballe Friskole



Robotic Manufacturing, EarthShot



Nordø, Byggros

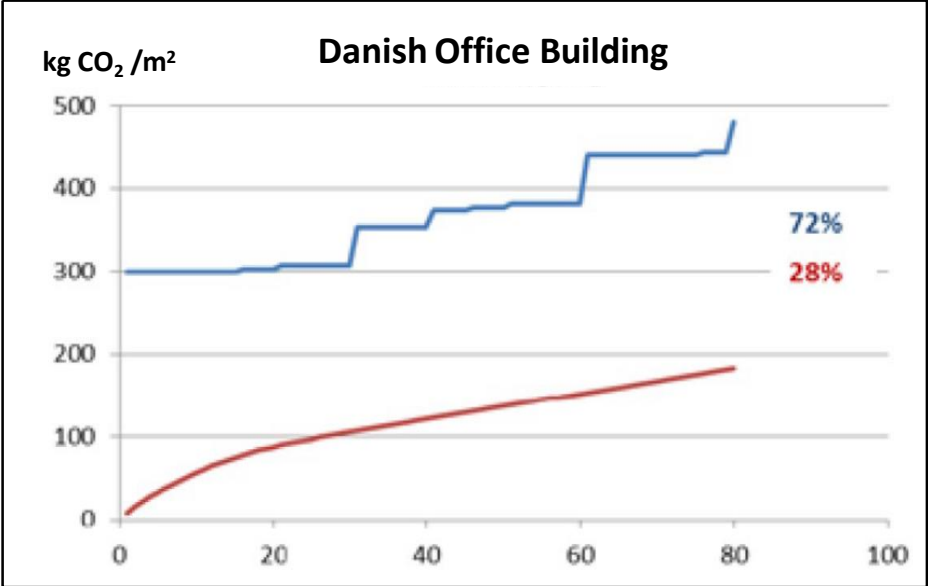
Scale matters

Why Biogene?

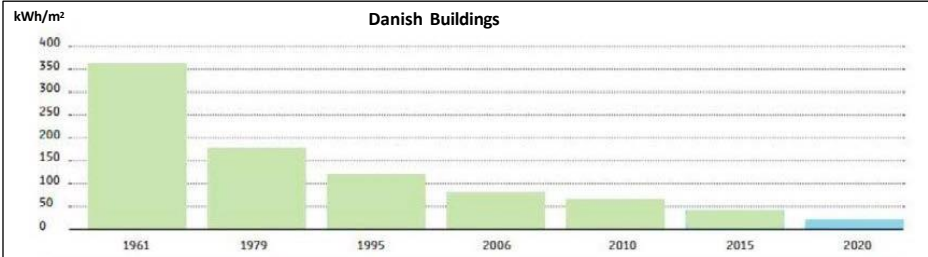
39%



Change of Paradigme



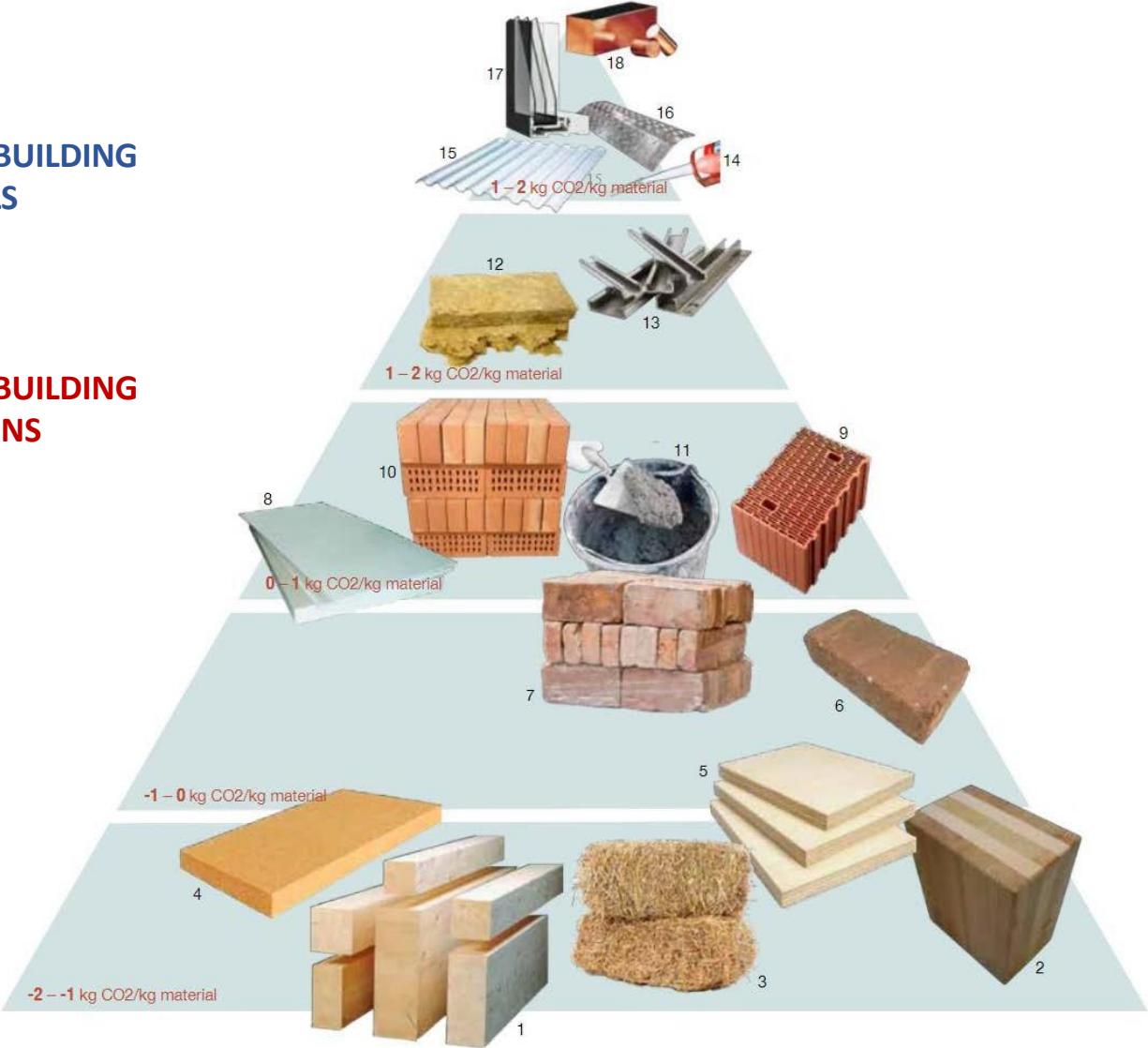
CARBON EMISSIONS



ENERGY USE

CO₂ from BUILDING MATERIALS

CO₂ from BUILDING OPERATIONS



From prototypes to the industrial and the realizable



From pilot to scale up

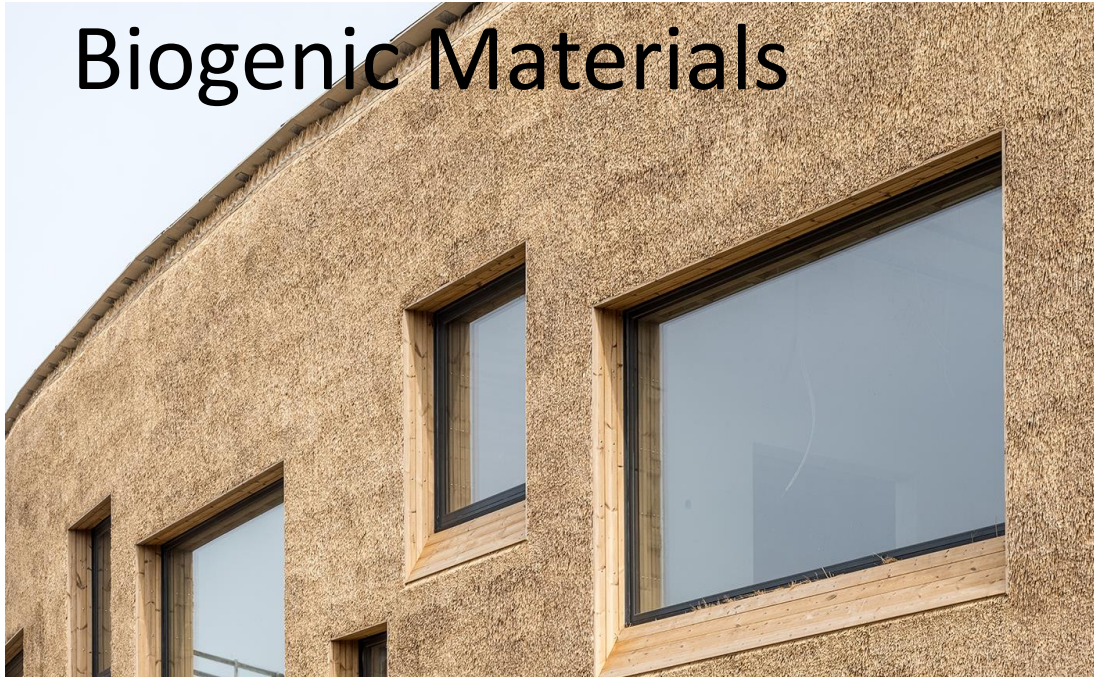


250 m²



160.000 m²

Biogenic Materials



Henning
Larsen —

april 2024

570.000 m²

H L [Henning Larsen](#)

121,434 følgere

1md. • 🔒

We are designing the world's largest wood city in Stockholm, Sweden.

Spanning 25 city blocks in the south of the capital, this monumental mass ... se mere

[Se oversættelse](#)



Anders Park og 2.429 til

28 kommentarer • 36 genopslag

H L [Henning Larsen](#)

155K followers

1yr • 🔒

Take a peek into the neighborhood of Fælledby.

The Fælledby model and exhibition are currently on display at UIA World Congress of Architects CPH 2023.

The project merges traditional Danish urban and rural typologies to create a hybrid residential area that balances city and nature.

Read more on the initiative here: <https://hnglr.sn/3NBWwSi>

#uia2023cph



422

3 comments • 10 reposts



In 2023 we configured
2000 tons of CO₂e/designer

Decarbonization through Urban DecarbTM

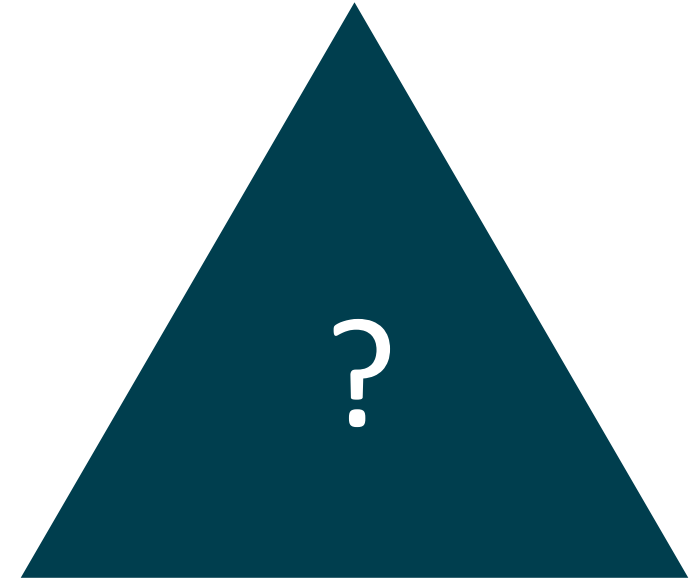
Ingredients for success



Food
Pyramid

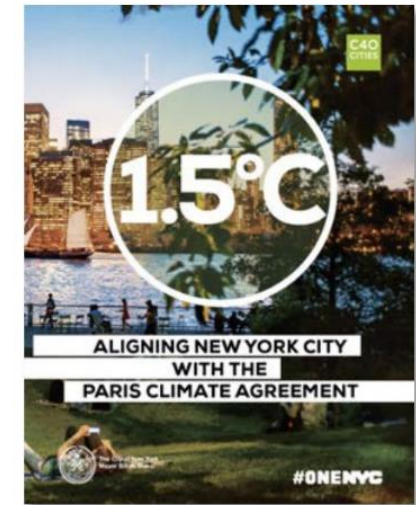
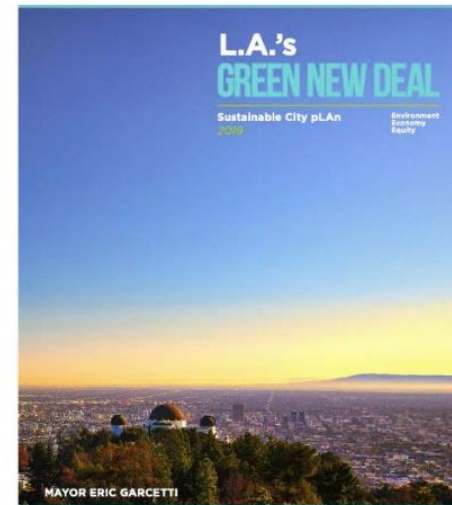
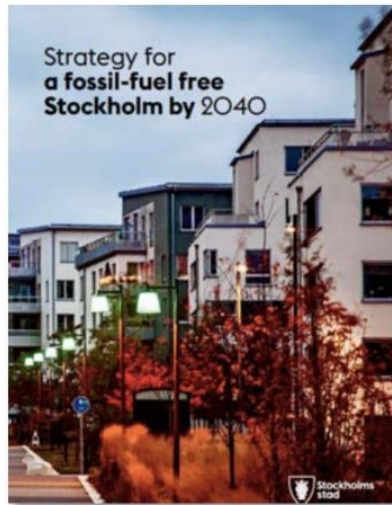
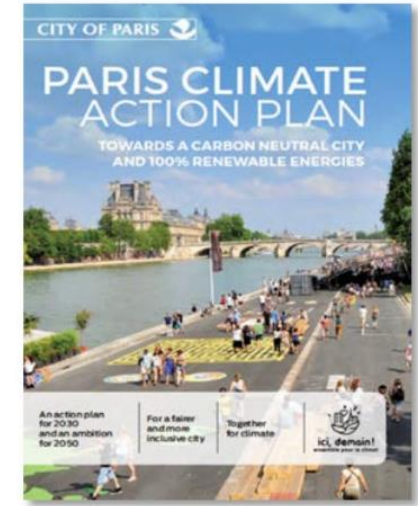
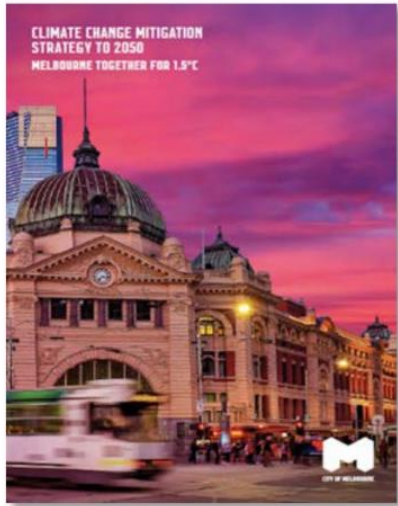


Material
Pyramid



Urbanism
Pyramid

More than 250 cities globally have formulated a climate ambition and plan





Buildings

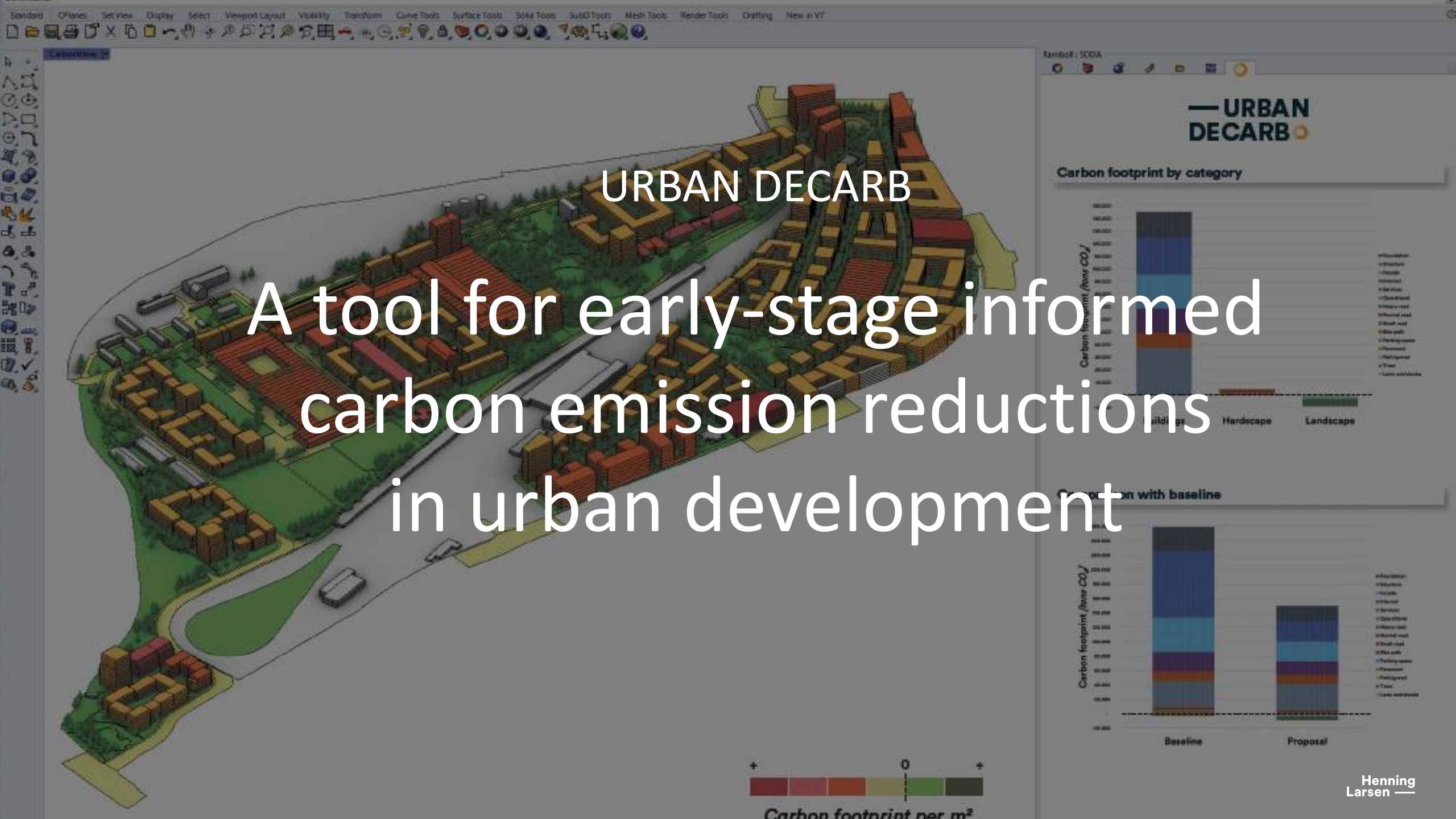
Mobility

Utilities

Roads

Landscape

Parking

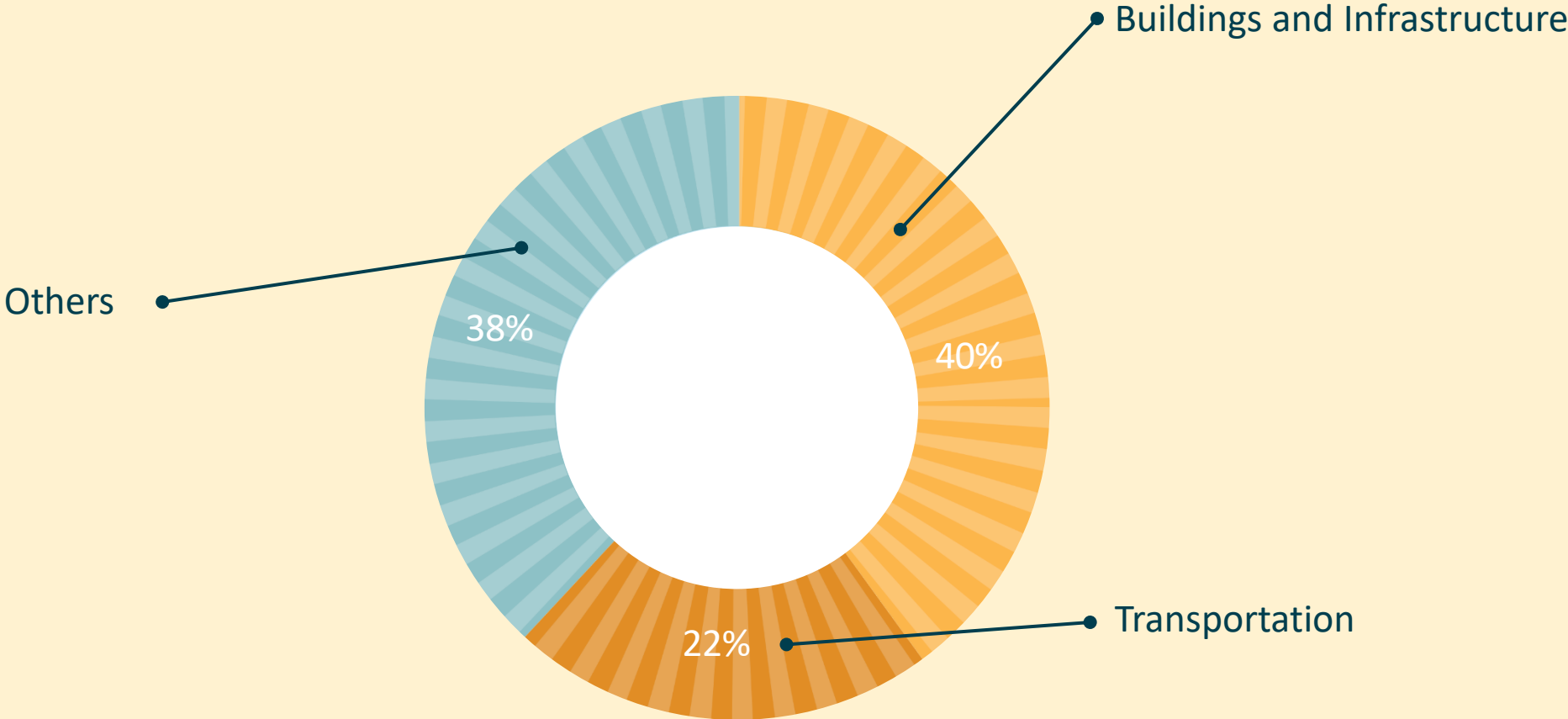


URBAN DECARB

A tool for early-stage informed carbon emission reductions in urban development

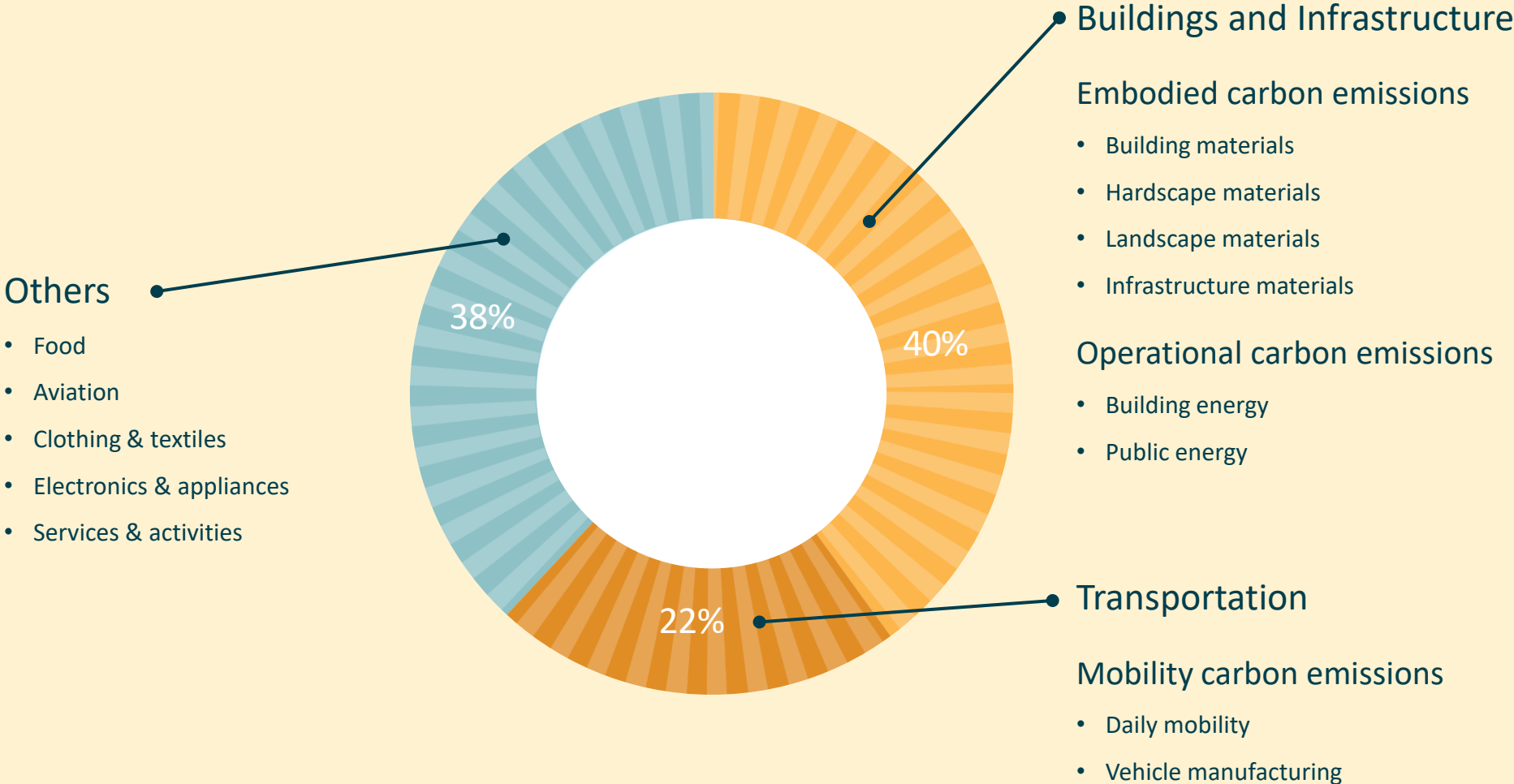


What are the most carbon intensive parts of urban areas?

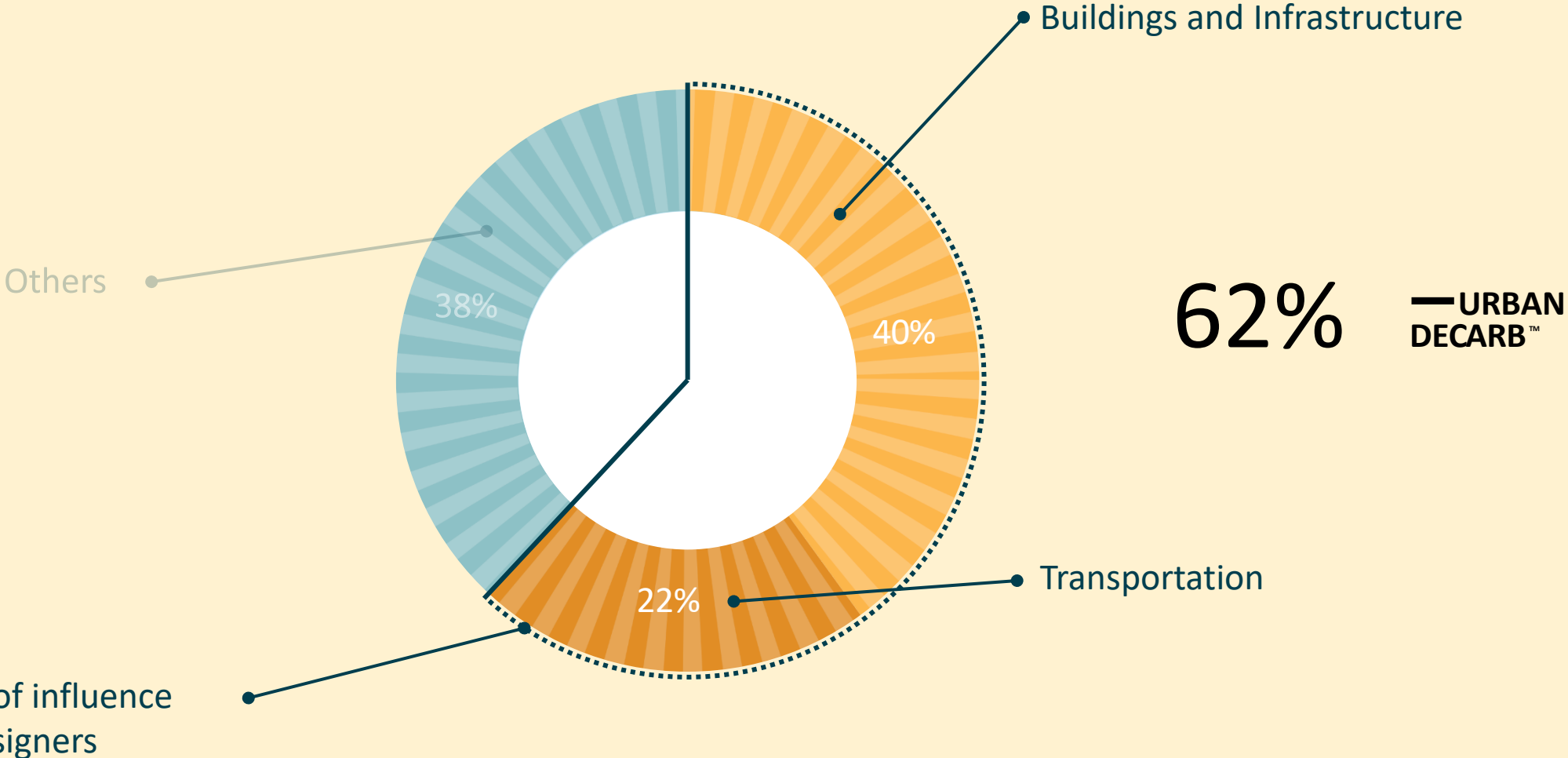


United Nations. Global Status Report for Buildings and Construction (2022)

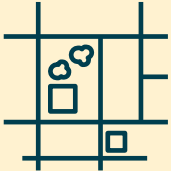
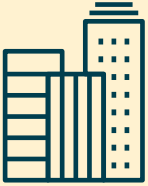
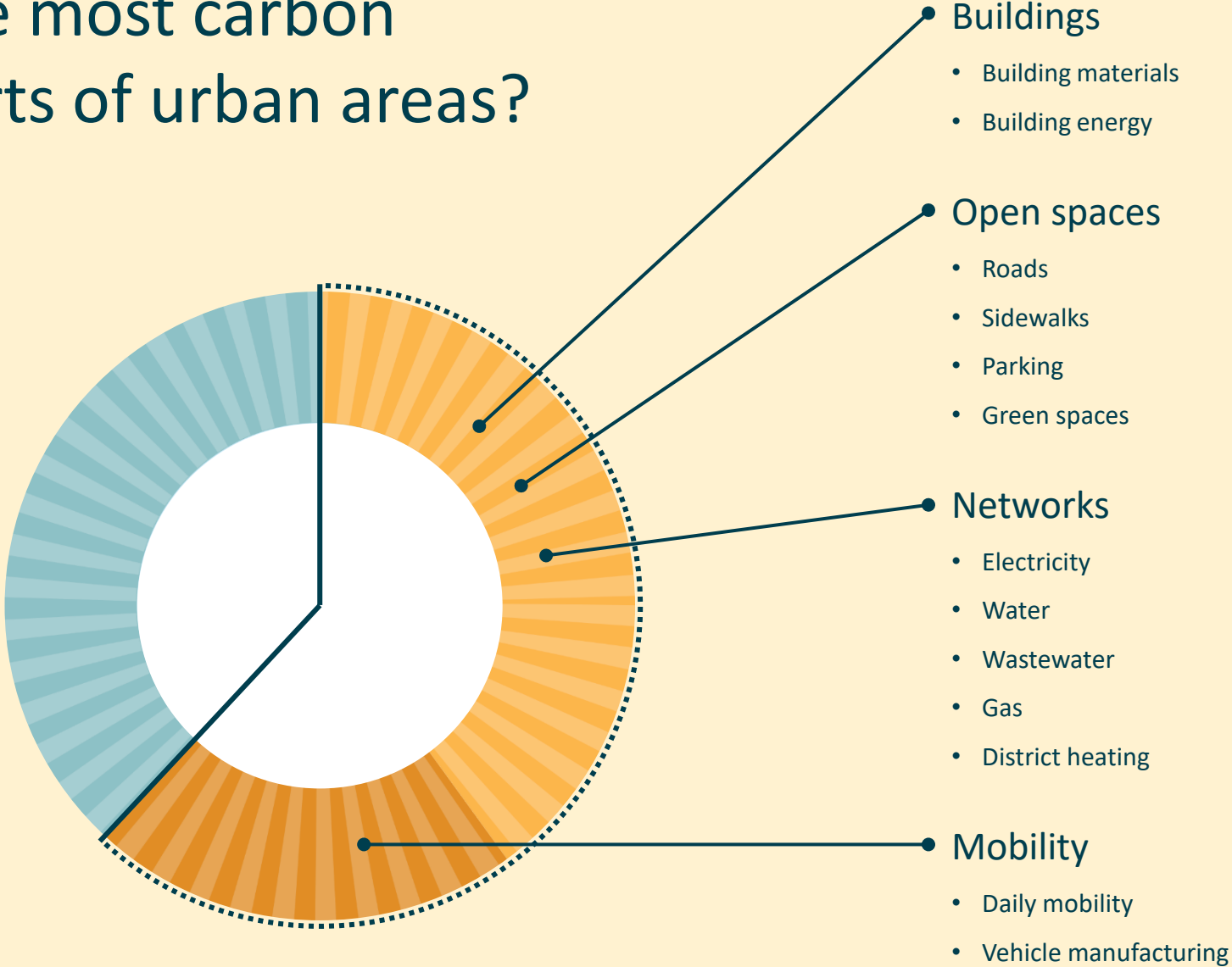
What are the most carbon intensive parts of urban areas?



What are the most carbon intensive parts of urban areas?

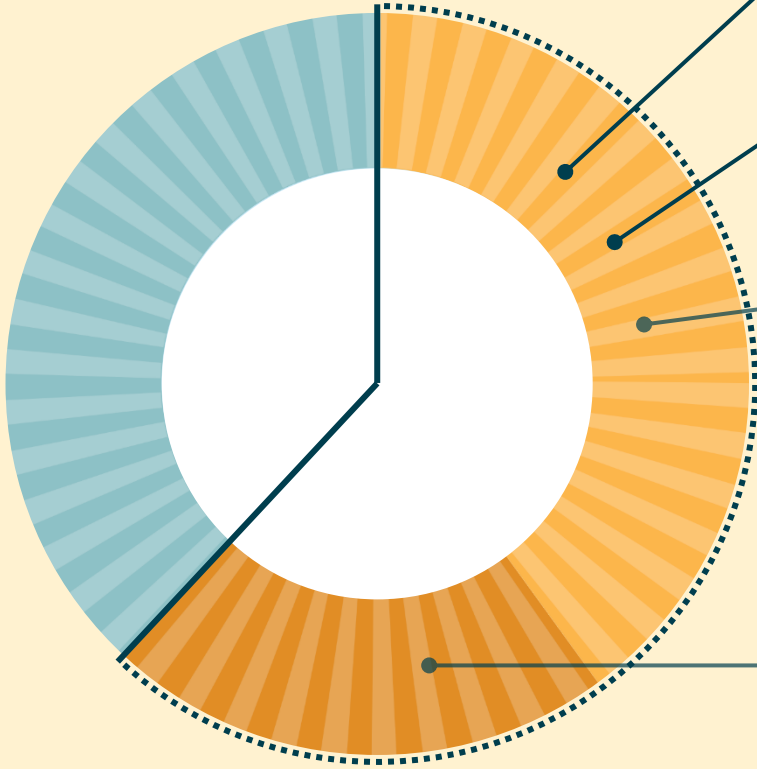


What are the most carbon intensive parts of urban areas?



Lotteau et al. Critical review of LCA for the built environment at the neighborhood scale (2015)

What are the most carbon intensive parts of urban areas?



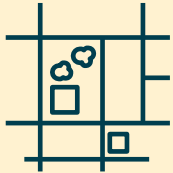
Buildings

- Building materials
- Building energy



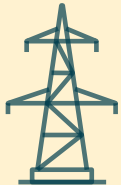
Open spaces

- Roads
- Sidewalks
- Parking
- Green spaces



Networks

- Electricity
- Water
- Wastewater
- Gas
- District heating



Mobility

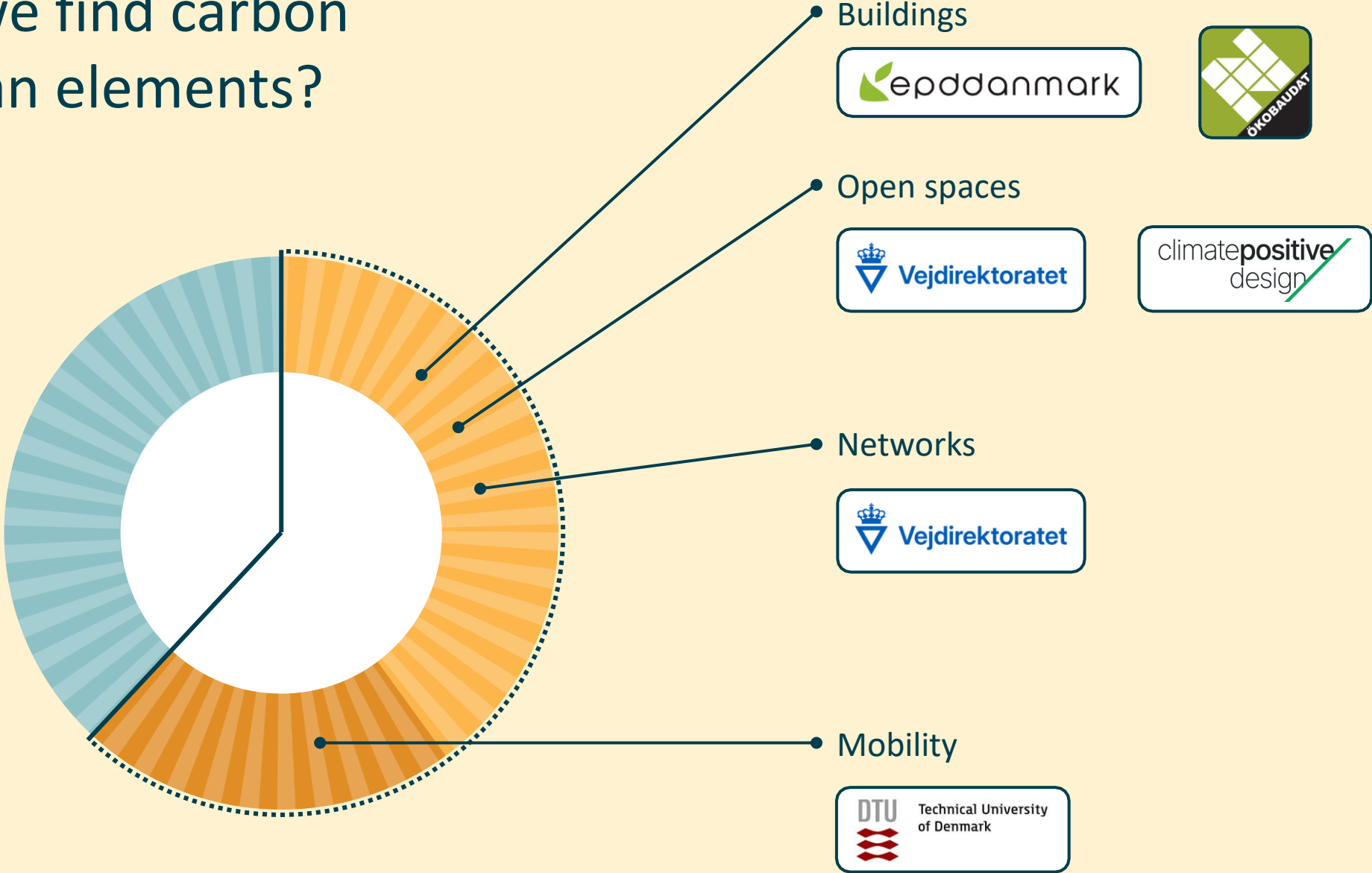
- Daily mobility
- Vehicle manufacturing



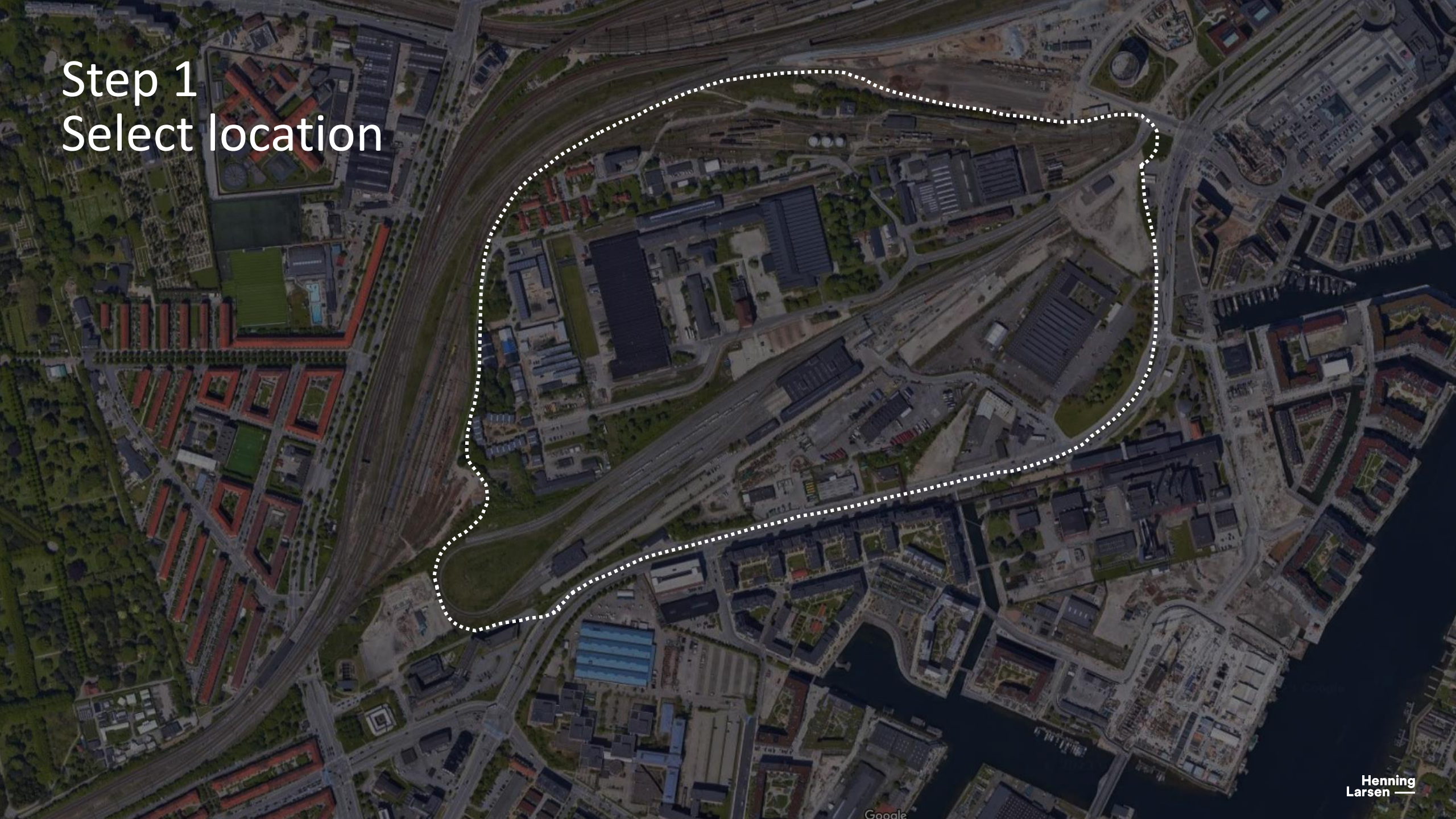
Implemented

In development

Where can we find carbon data for urban elements?



Step 1
Select location



Step 2

Create design scenario



-  Hardscapes
-  Greenery
-  Residential
-  Office/retail
-  Public institutions
-  Parking building
-  Transformed buildings
-  Untouched buildings and infrastructure

Step 3

Visualize the carbon data



Carbon footprint per m2

Step 4

Development of scenarios

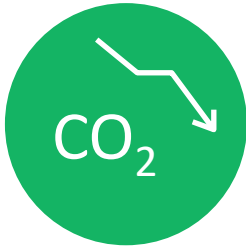
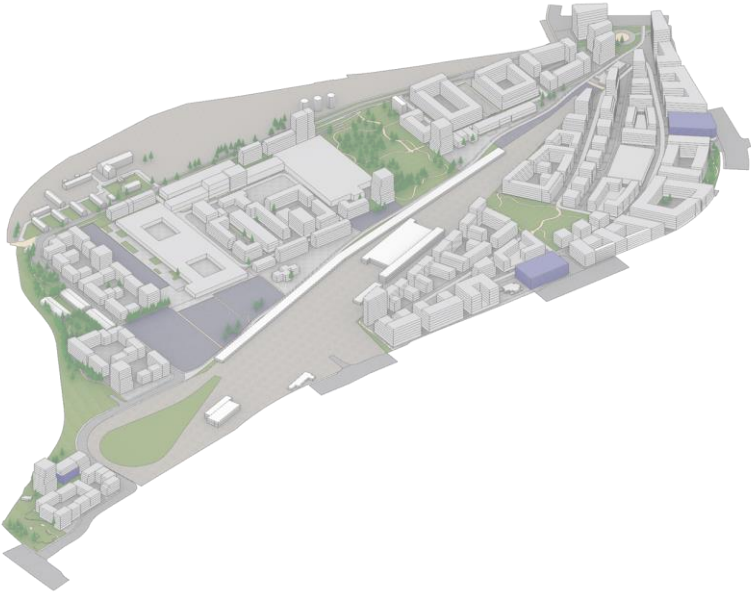
Baseline conventional design



Prioritize re-use
of existing buildings and use of
biogenic in
new-built



From grey to green:
adding additional
trees and nature



Potential:
Reduce 30-50% of carbon
in urban design scenarios

Henning
Larsen —

PlanCO2

A carbon calculation tool for urban planners



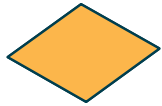
Middelfart
KOMMUNE

Henning
Larsen —

RAMBOLL



How can we design urban areas using carbon data?



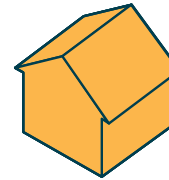
LOD 1
Brief



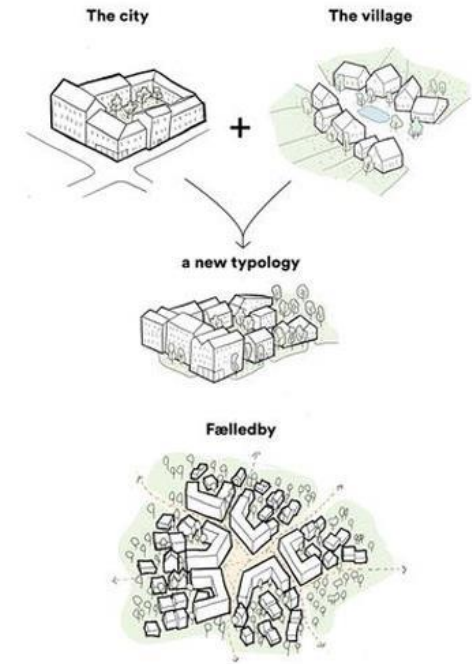
VEJLANDS KVARTER

LOKALPLAN 599,
KOMMUNEPLANTILLÆG NR. 4
OG MILJØRAPPORT

Borgerrepræsentationen har den 4. februar 2021 vedtaget lokalplan 599
Vejlands Kvarter, tillæg nr. 4 til Kommuneplan 2019 og miljørapport.
Planerne er bekendtgjort den 11. februar 2021.



LOD 2
Concept



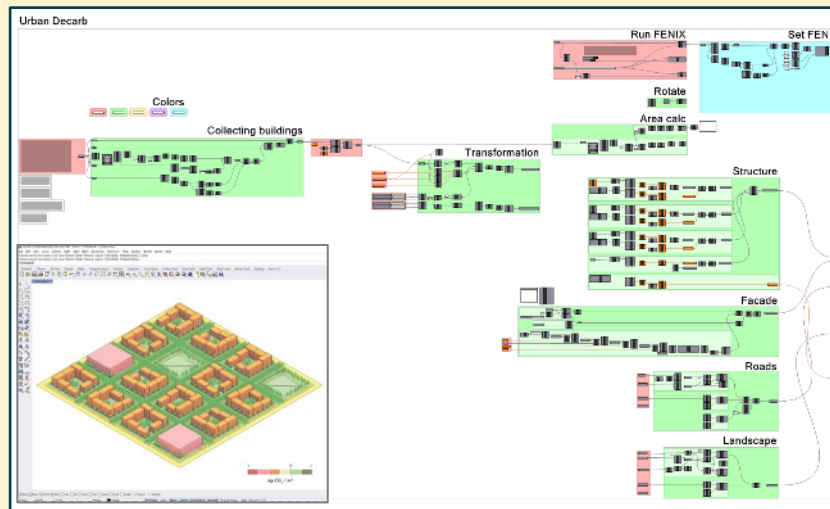
How can we design urban areas using carbon data?



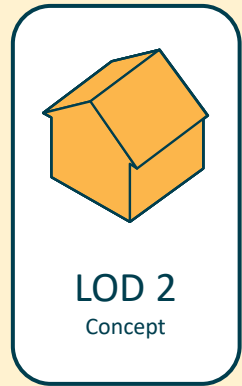
Urban Decarb

Users: Architects and urbanists

Software:



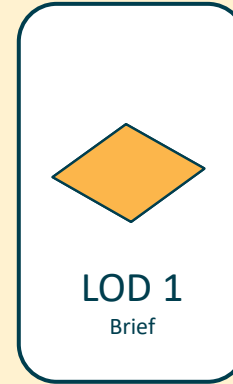
How can we design urban areas using carbon data?



Urban Decarb

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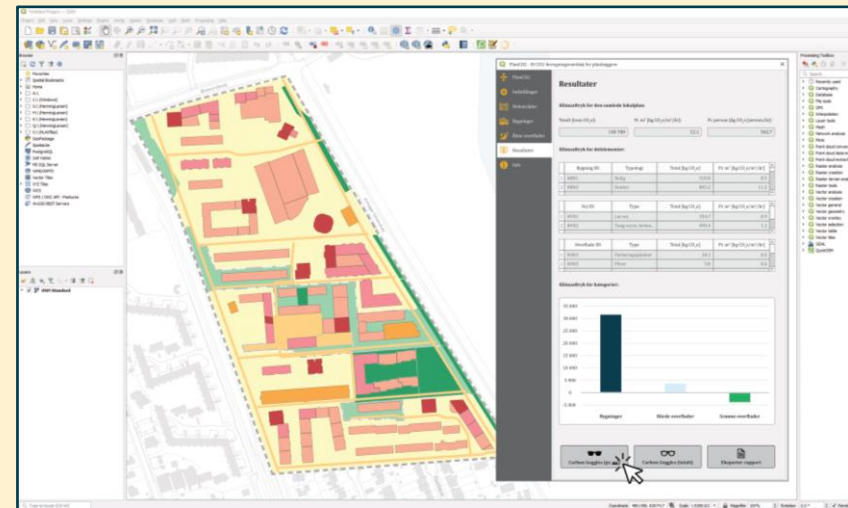
Software:



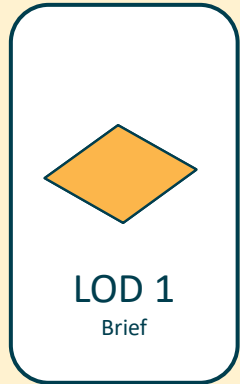
PlanCO2

Users: Municipal planners

Software:



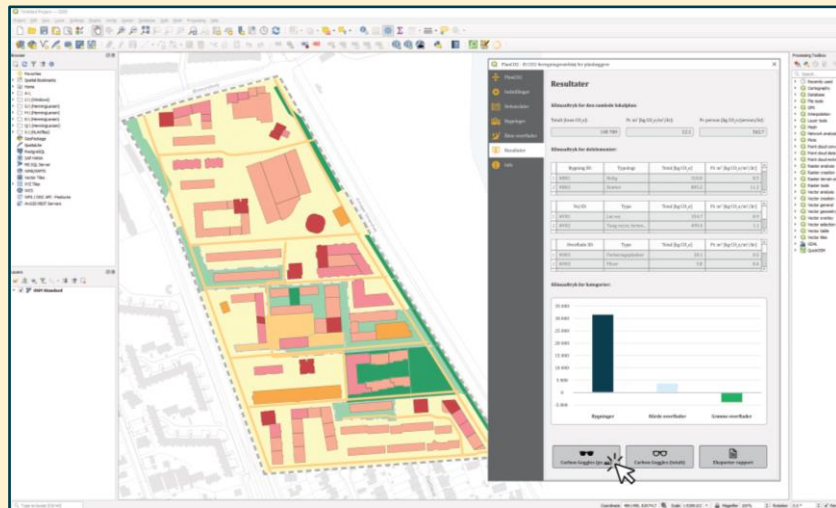
How can we design urban areas using carbon data?



PlanCO2

Users: Municipal planners

Software:



PLAN 22+

Plan22+ seeks to help develop knowledge and tools to support climate work in physical planning in Danish municipalities (open source)



Middelfart
KOMMUNE

Henning
Larsen

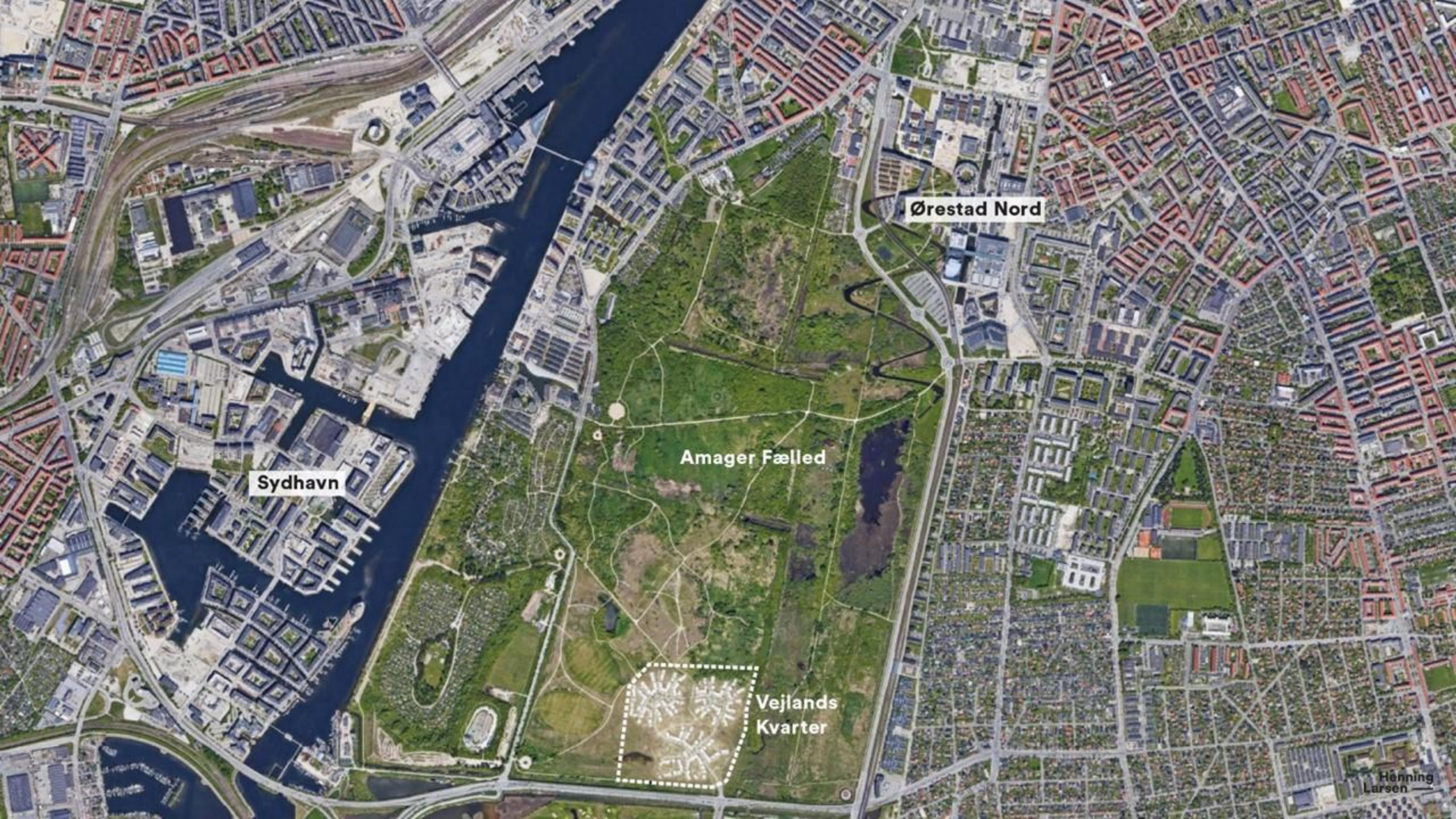
RAMBOLL



Making a pact with nature

Fælledby
Copenhagen, Denmark





Sydhavn

Amager Fælled

Vejlands
Kvarter

Ørestad Nord

Henning
Larsen

Habitats



Design with biodiversity

Build area = 60%

Increased biodiversity by:

+ 77% quality A habitats

+ 300 % more diversity in species

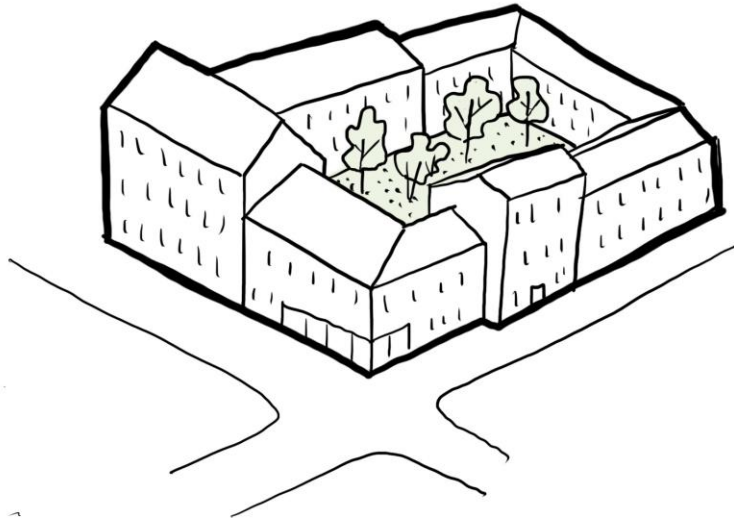
Compared with the unbuilt site





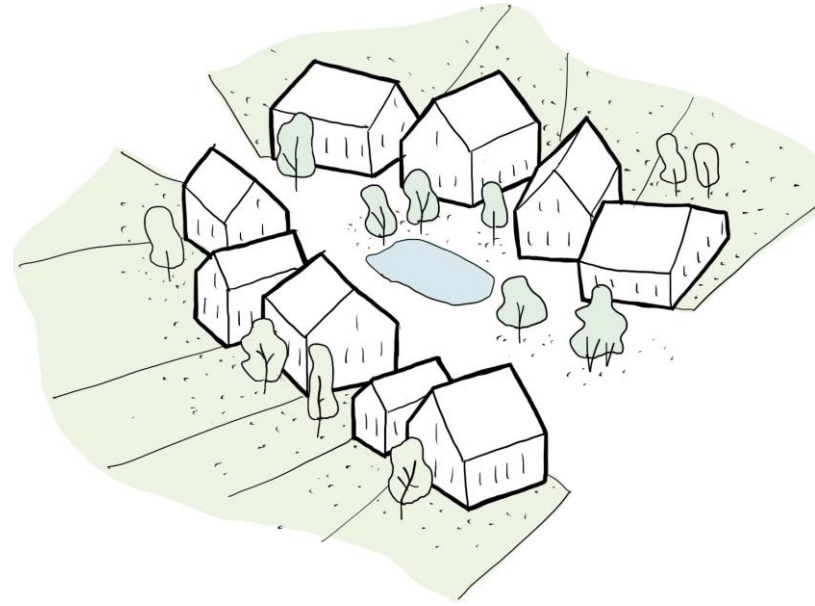
24 % have direct access to Fælledén
30 % have a view to Fælledén
100 % have a view to the green area
100 % have a balcony or terrace

City

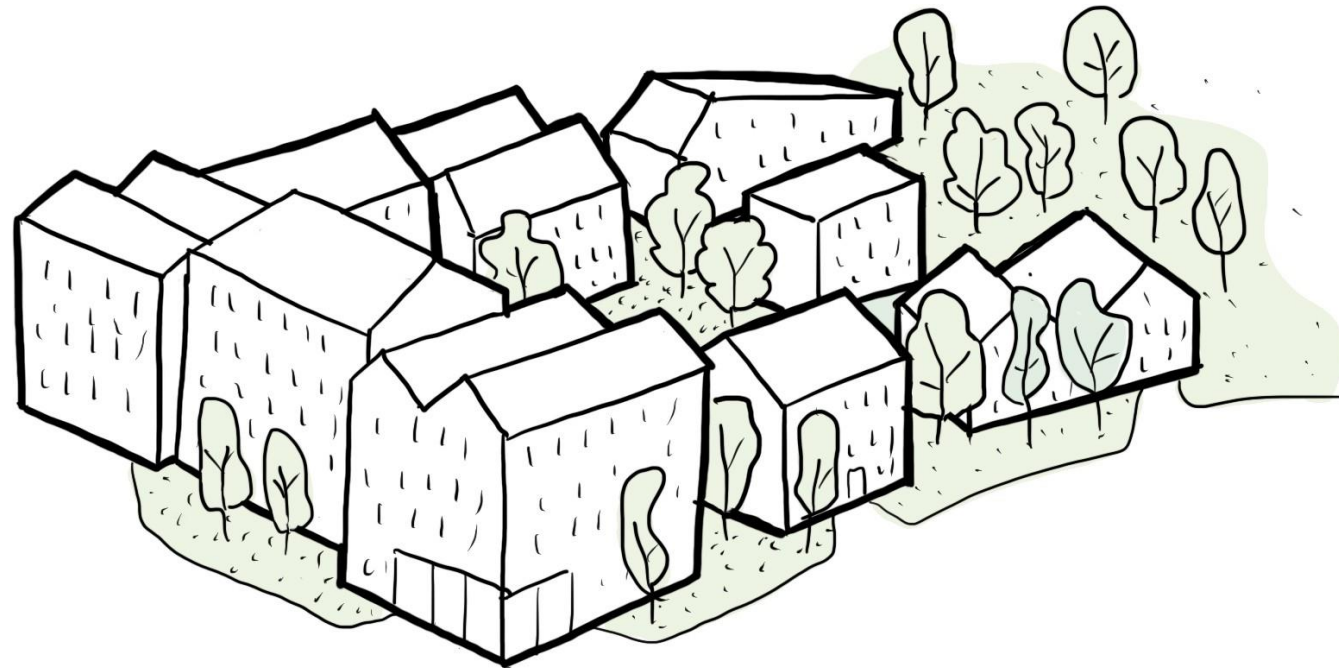


+

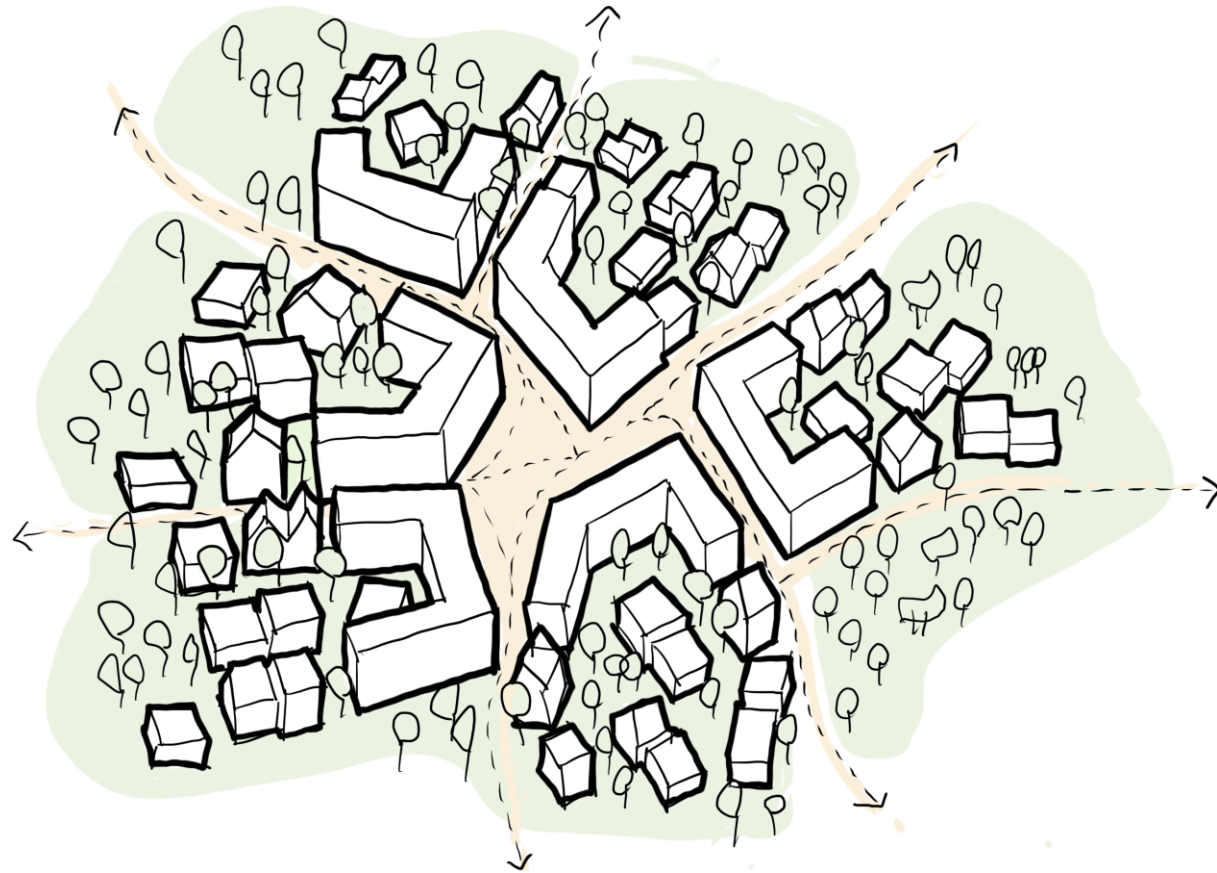
Village

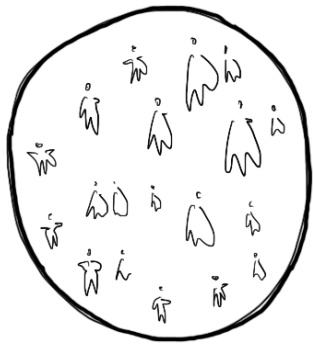


Combined typology

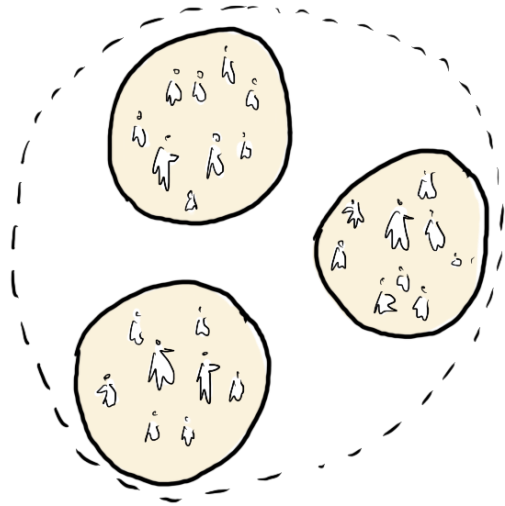


Fælledby

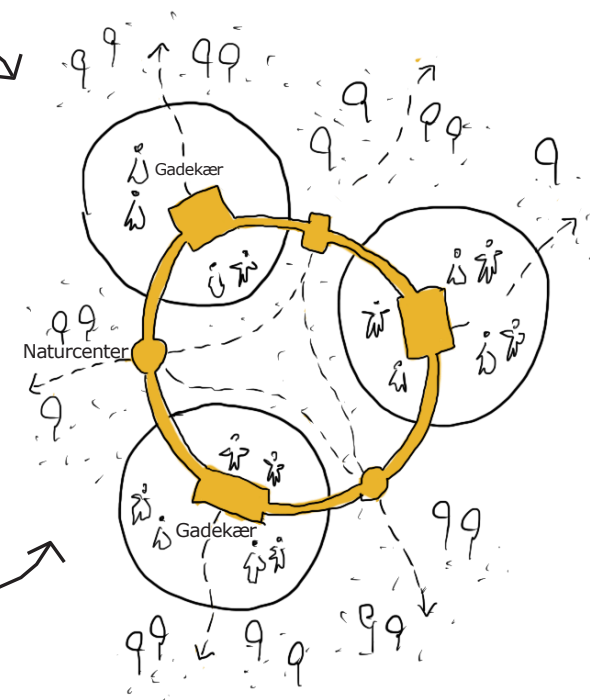
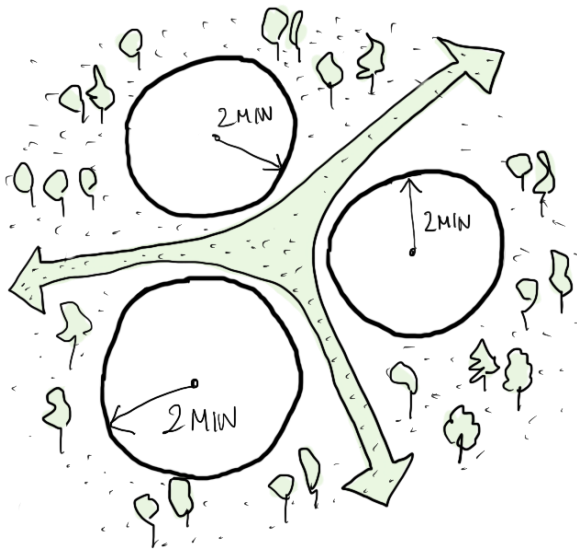
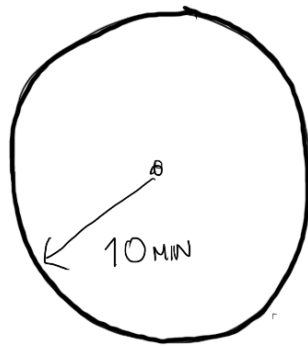




7000 inhabitants

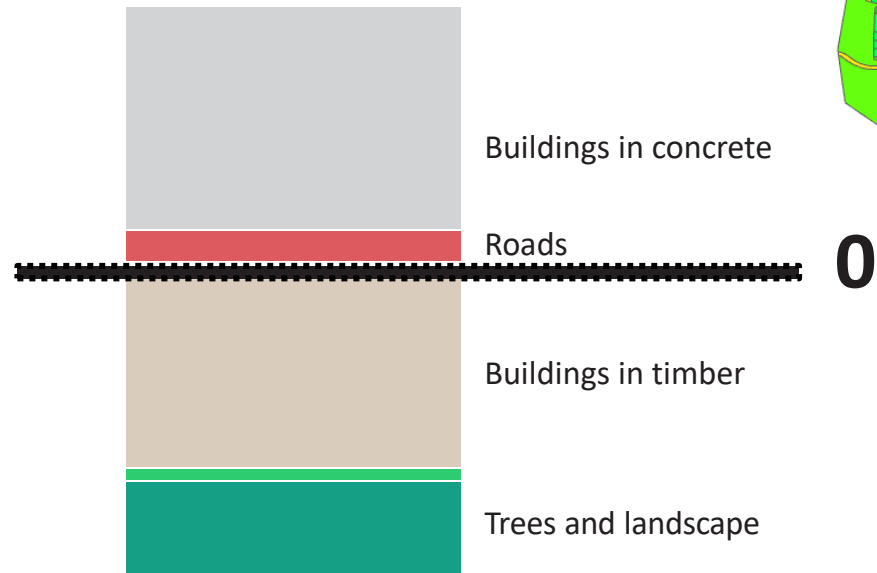


2300 inhabitants

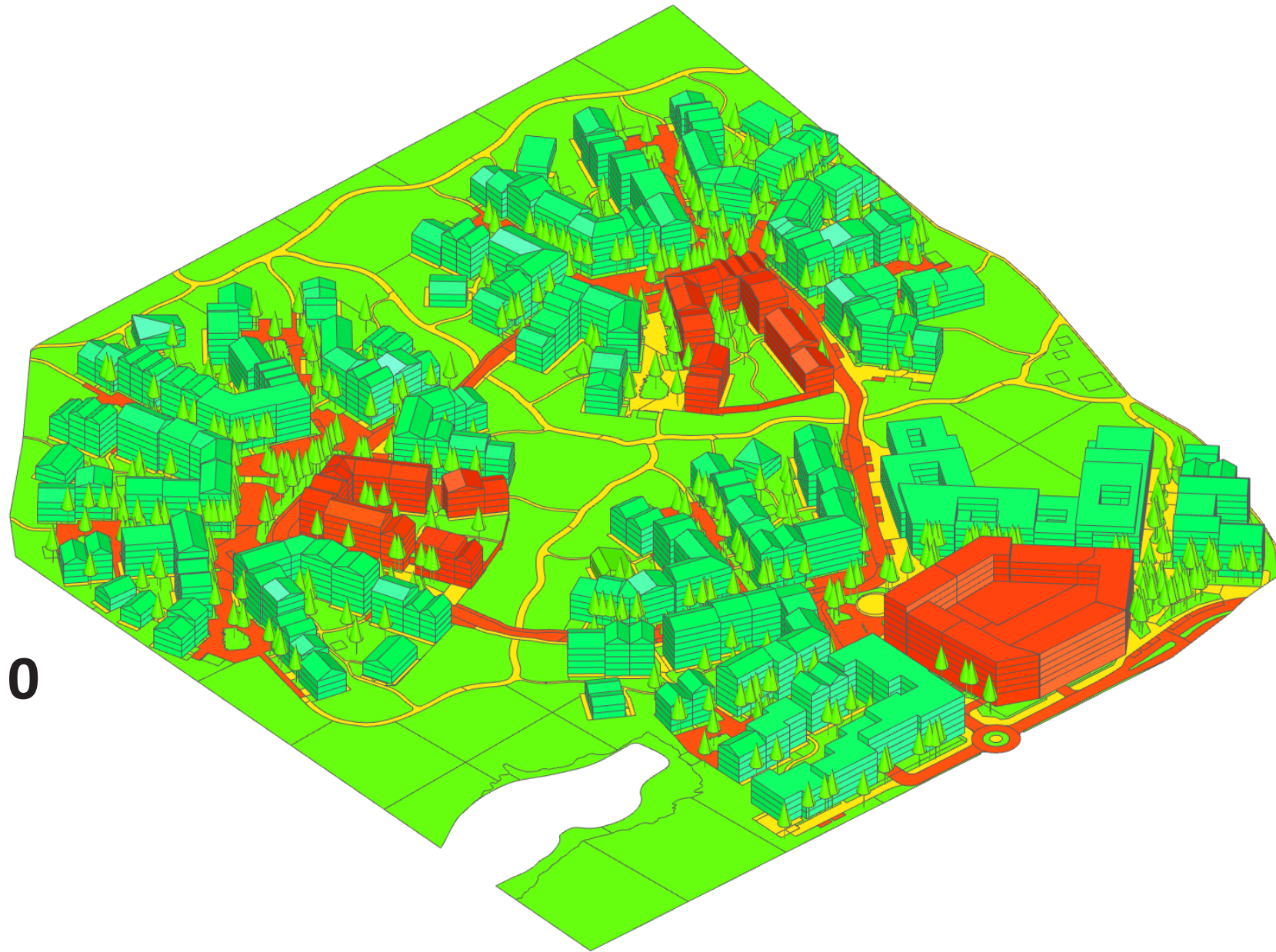


Carbon Googles

Reduces 62.800 tons of upfront carbon vs conventional

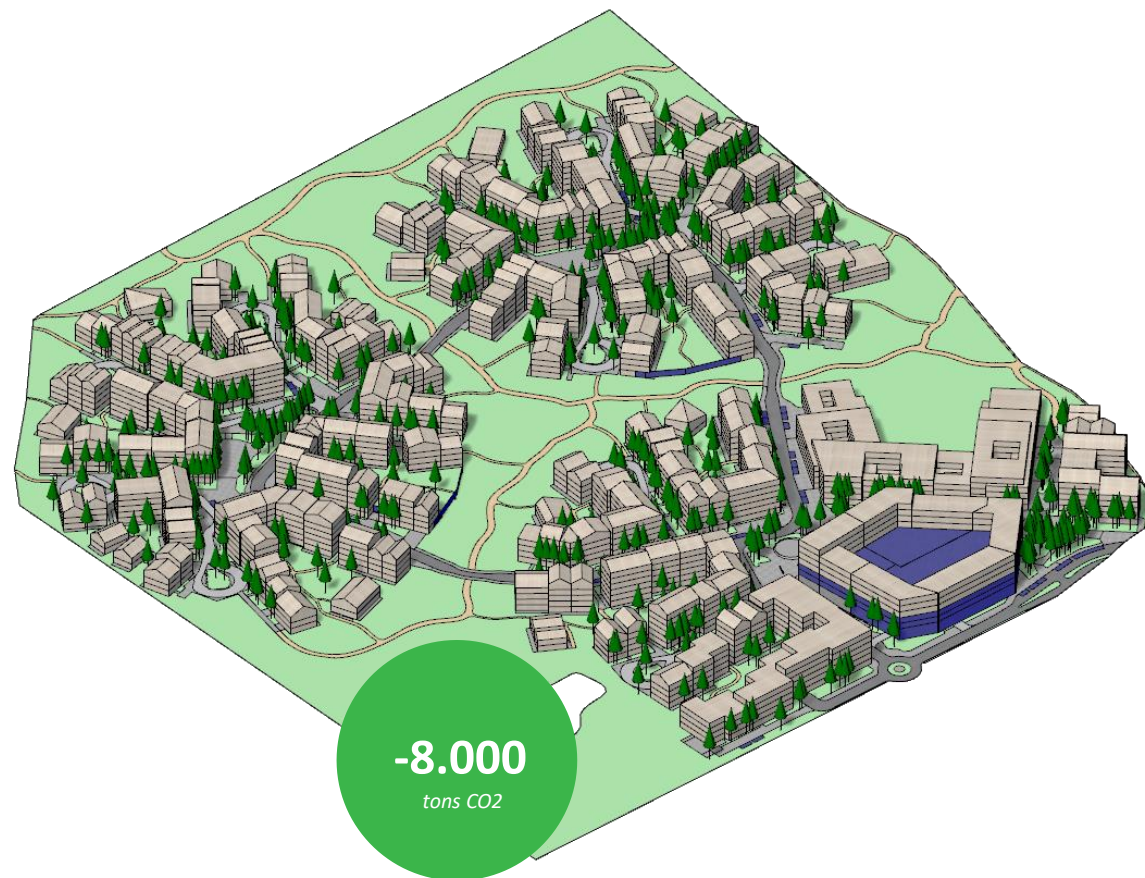
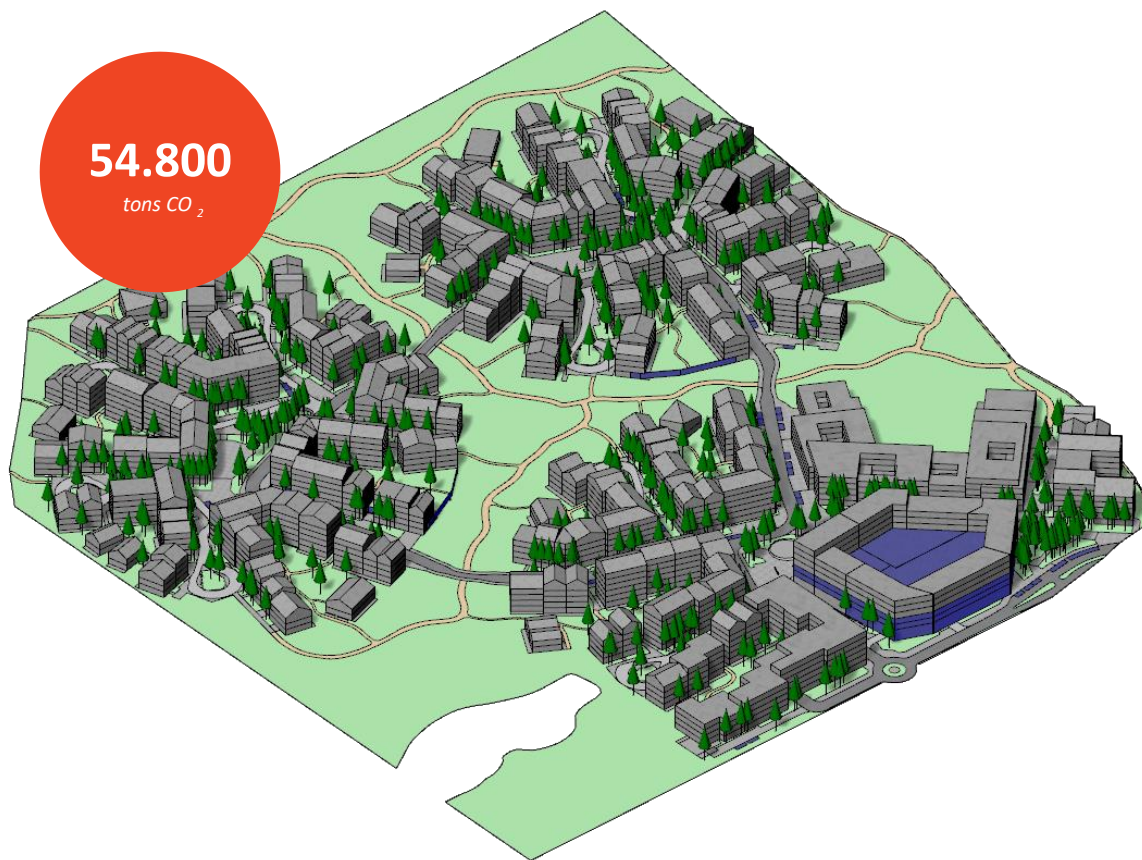


(A1-A3) 50 years



Conventional

- + CLT
- + Timber cladding
- + No burning after 50 years





VESTERBRO

Amagerbro

AMAGERBRO ØST

FASTE BATTERI

GAMLE BRYGGEN

HAVNESTAD

ØRESTAD NORD

SUNDHOLMSKVARTERET

AMAGER ØST

BAVNEHØJ

ENGHAVE BRYGGE

HOLMENE

BRYGGEN SYD

URBANPLANEN

SUNDBYØSTER

SYDHAVN

KØBENHAVN SV

Nokken

AMAGER VEST

VILLAKVARTERERNE

Scandic Sluseholmen

Vejlands Alle

Bistro Mig og Annie - Restaurant Ørestad

Royal Golf Center

Boulders København Sydhavn

Sydhavnstippen Naturpleje

Go Hotel City

Lergravsparken

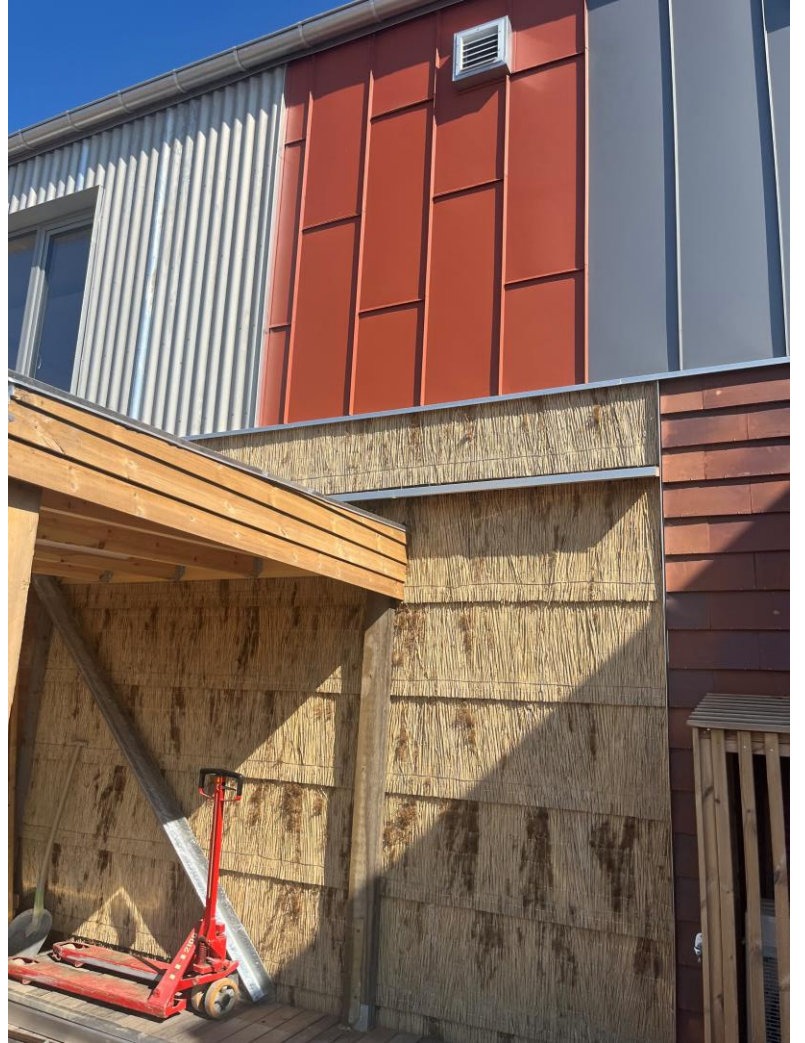
Amager Hospital

Sundbyøster

SUNDBYVESTER

Bygrænsen





Living together

Architizer

A+AWARDS

2020
WINNER



Thank you