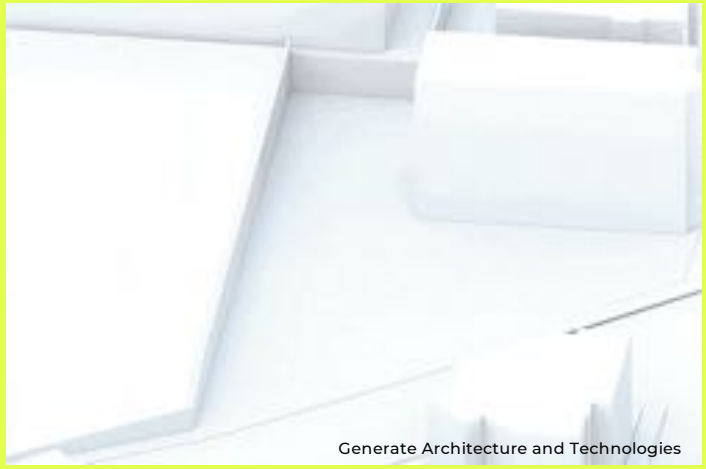
The Future of Work | Virtual Panel #7

How may we design an attractive workplace for people and planet in a city-edge location?

You’re in the right place!



Generate Architecture and Technologies

September 10, 2020 This panel will be starting soon.

better space; better people

The Future of Work | Virtual Panels

journey of structured discussions

1. Focus the mind on today's topic
2. Collective thinking: including Break Out session
3. Problem solving: key take-aways

better
space; better
people

This is not a solo act.

better space; better people

Welcome,

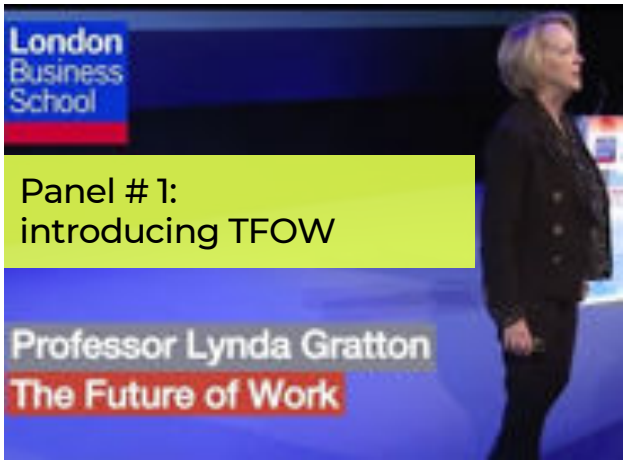
IWG International Workplace Group
kvadrat
SPACES.
vitra.
LENSVELT 1962
facilitylinQ
Hyphen
FRAME
ZZDP ARCHITECTEN
FUSE projects
CAIRN
THEBRAND-TAILORS
.DAY
UNIVERSITY OF CAMBRIDGE INSTITUTE FOR SUSTAINABILITY LEADERSHIP
FREDERIKS INTERIEURS

bs;bp values

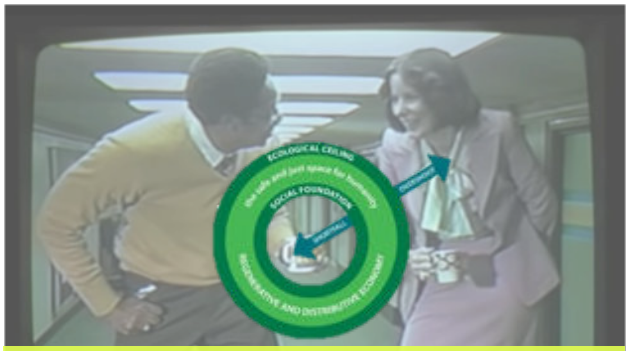
the design process
determines the outcome

better
space; better
people

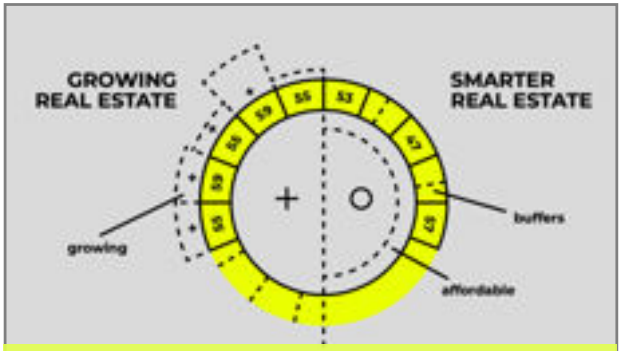
TFOW | VIRTUAL PANEL – 2020 JOURNEY PART 1



Panel # 1:
introducing TFOW



Panel # 2:
reimagening the workplace



Panel # 3:
real estate system + buffer space

APRIL

JULY

Panel # 4:
abandoned innercity locations

Panel # 5:
flexible multi-purpose workspace

Panel # 6:
vacant city-edge locations

better
space; better
people


How can we design an attractive workplace for people and planet in a vacant city-edge location?
The Future of Work | Virtual Panel #7

DESIGN WITH THE FULL LIFECYCLE IN MIND

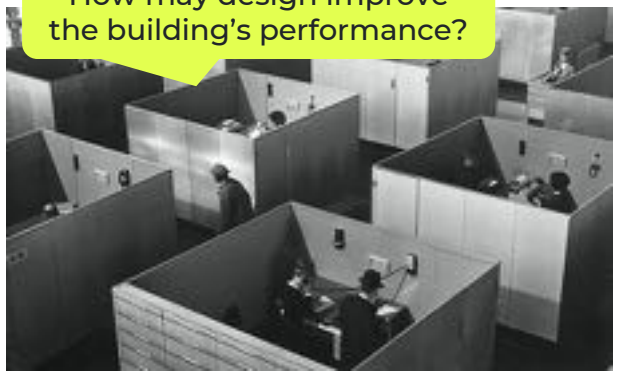
Construction Stage

Use Stage

End-of-Life Stage

Are materials recycled?

How may design improve the building's performance?



Are materials reusable?

Attractive buildings for people, planet and business require a holistic approach.

better space; better people

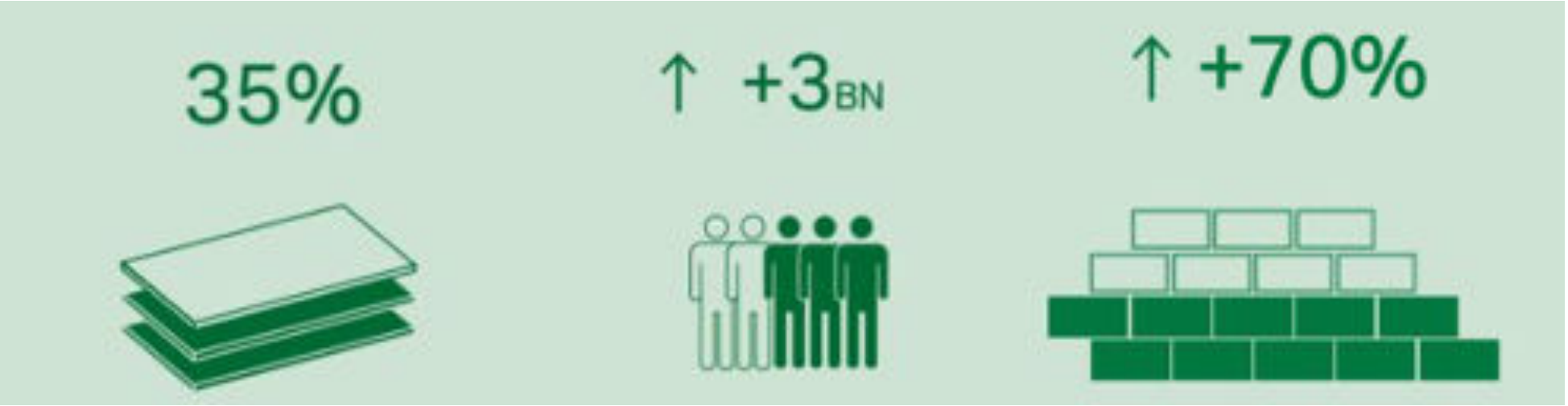
CREATE TO REGENERATE

better
space; better
people

Amsterdam aims to use 50% fewer primary raw materials by 2030 and become 100% circular by 2050 at the latest.

BUILT ENVIRONMENT UNDER PRESSURE

The world is already using 1.5 times its resources every year.



of total materials used by the construction industry

middle class growth in 2030

growth in demand for global construction in 10 years

ELLEN MACARTHUR FOUNDATION

Numbers from EMF, images from GXN

better space; better people

WHAT IS A CIRCULAR ECONOMY?

Do I need it all?

What is the environmental impact, once it is NOT used?

Think: what happens next with the materials that are used?

Was it recycled?

Can it be reused at maximum value?

ELLEN MACARTHUR FOUNDATION

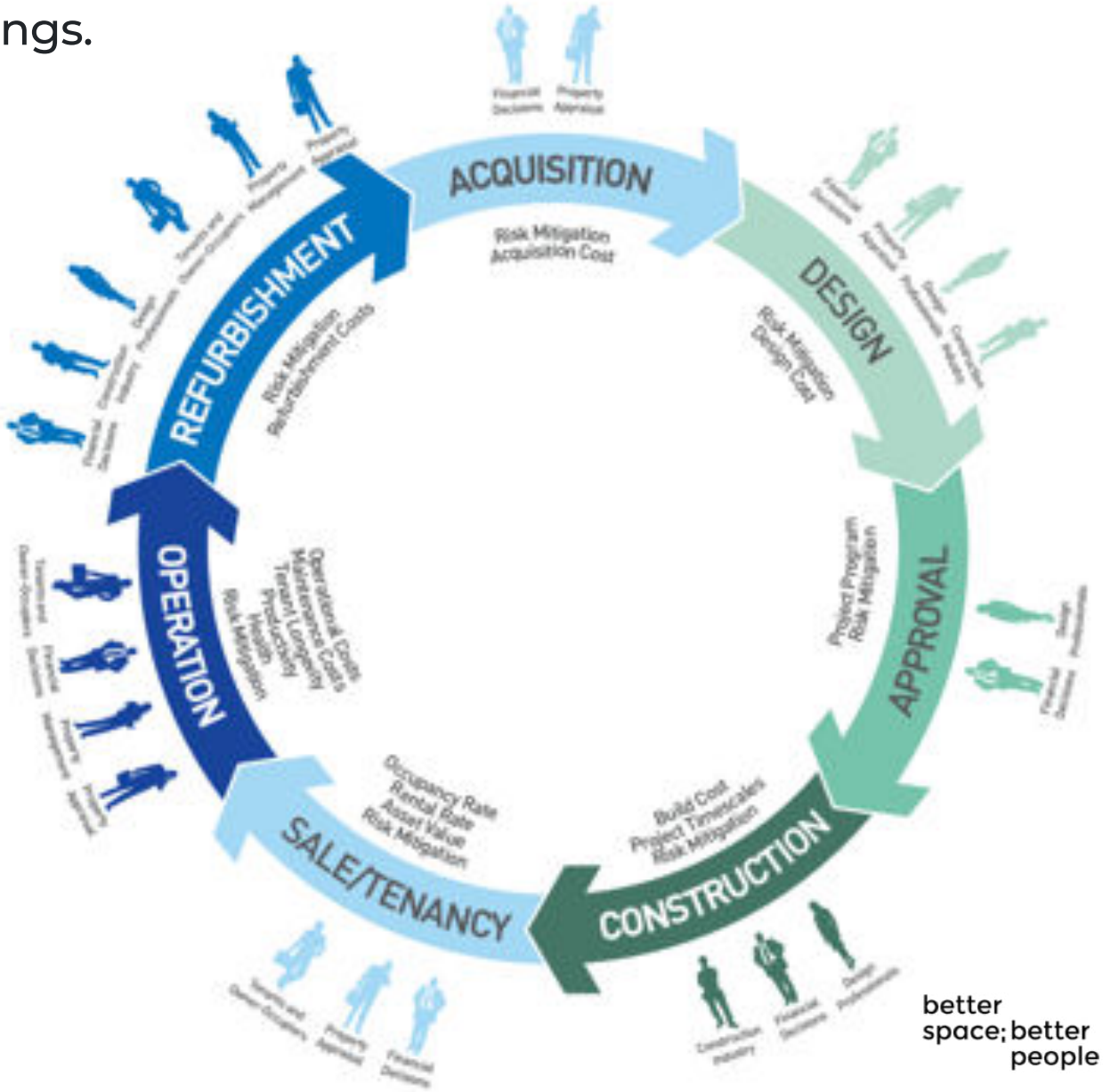
better space; better people

THE GREEN BUILDING COUNCIL

is advancing net-zero buildings.

COLLABORATION AT

THE CONCEPT STAGE



WORLD GREEN BUILDING COUNCIL

better space; better people

ADVANCING NET-ZERO BUILDINGS

UNDERSTANDING CARBON EMISSIONS

The key metric the industry uses for advancing green buildings.

** A green building reports annual carbon impacts as of total (tCO2e) and in terms of intensity (kgCO2e/m2)*

better space; better people

TO DATE, THE FOCUS HAS BEEN ON REDUCING OPERATIONAL EMISSIONS

Twenty years ago,

operational emissions

accounted for

94%

of buildings whole lifetime emissions.

better space; better people

DESIGN AT CONCEPT STAGE IS KEY ENABLER

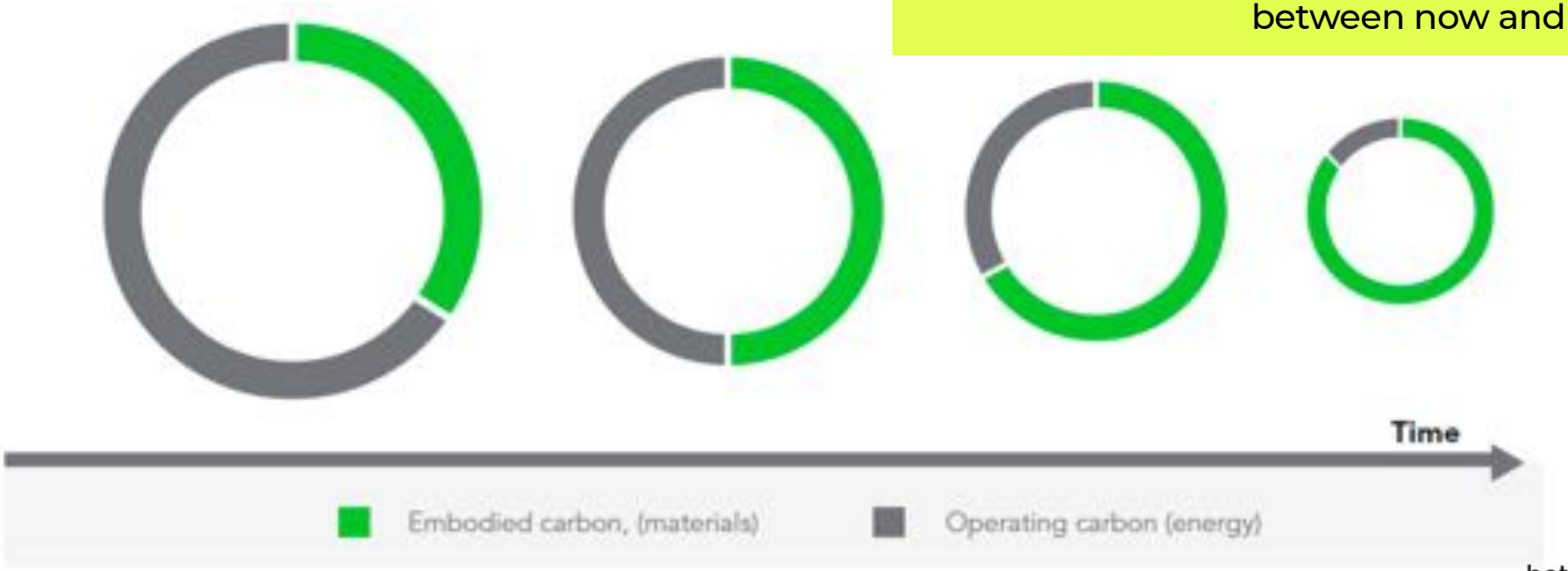
to reduce **embodied** carbon...

...which will be responsible for

almost half

of total new construction emissions

between now and 2050.



Current global buildings stock is **223B sqm**. This will rise to **415B sqm** in 2050.

better space; better people

5 STEPS TO ACHIEVING A NET-ZERO CARBON BUILDING

Today is about step 2 and 3.

1. Establish net-zero carbon scope

2. **Reduce construction impacts**

3. **Reduce operational energy use**

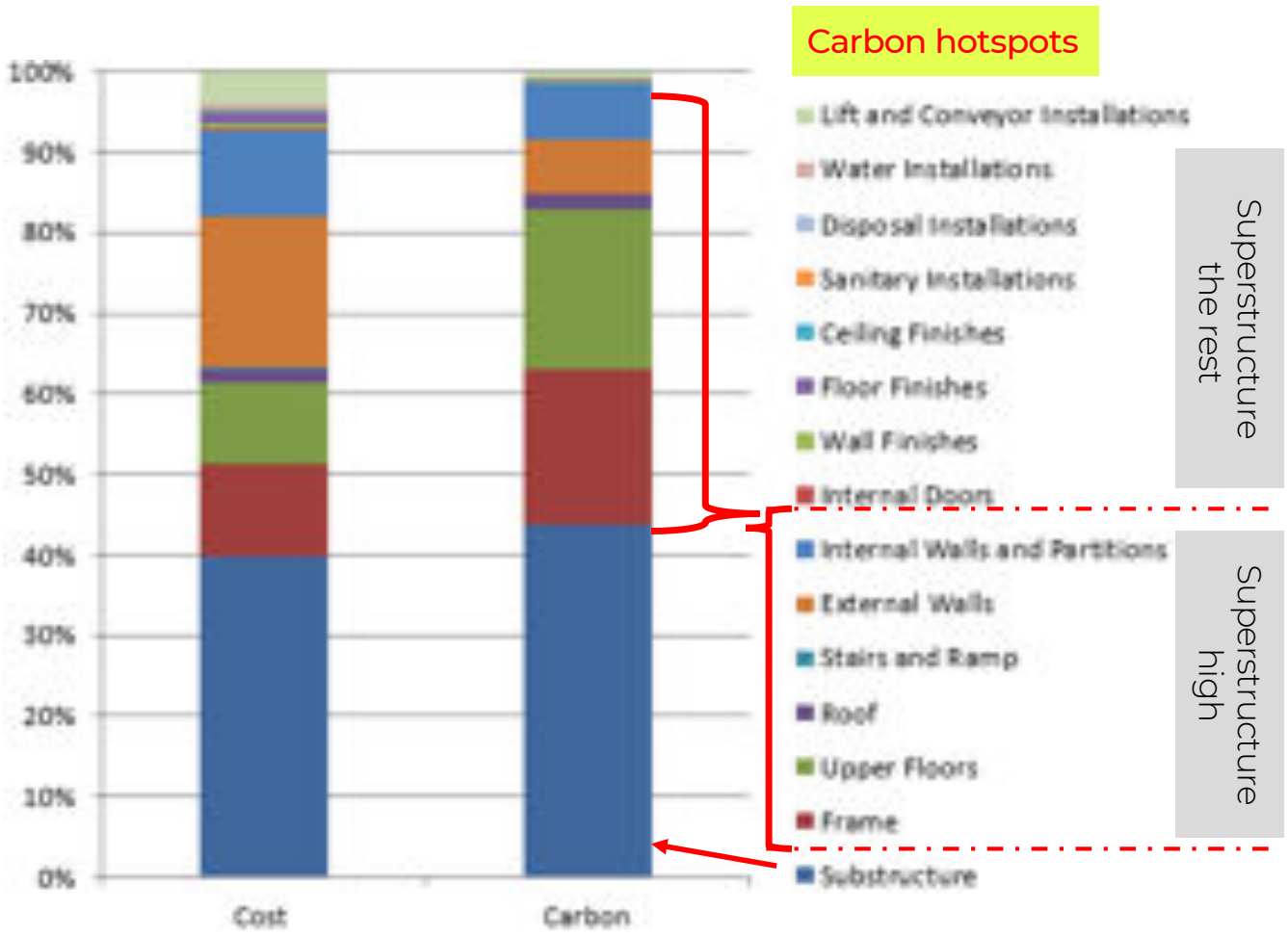
4. Increase renewable energy supply

5. Offset any remaining carbon

WORLD GREEN BUILDING COUNCIL

better space; better people

WHY IT MATTERS AT DESIGN STAGE!



Embodied carbon and cost profile
of case study office building, Victoria (2016)

Substructure and **superstructure** are **carbon hotspots** responsible for more than 80% of embodied carbon emissions.

better space; better people

Key drivers of carbon emission in a workplace project

We'll show you some examples for each stage.

KEY DRIVERS DURING CONSTRUCTION

- Production of materials
- Assembly on-site
- Transportation to and from site
- Reduce waste on-site
- Type of construction
- On-site trees/landscaping

Potential to reduce embodied carbon hotspots (80%).

better space; better people

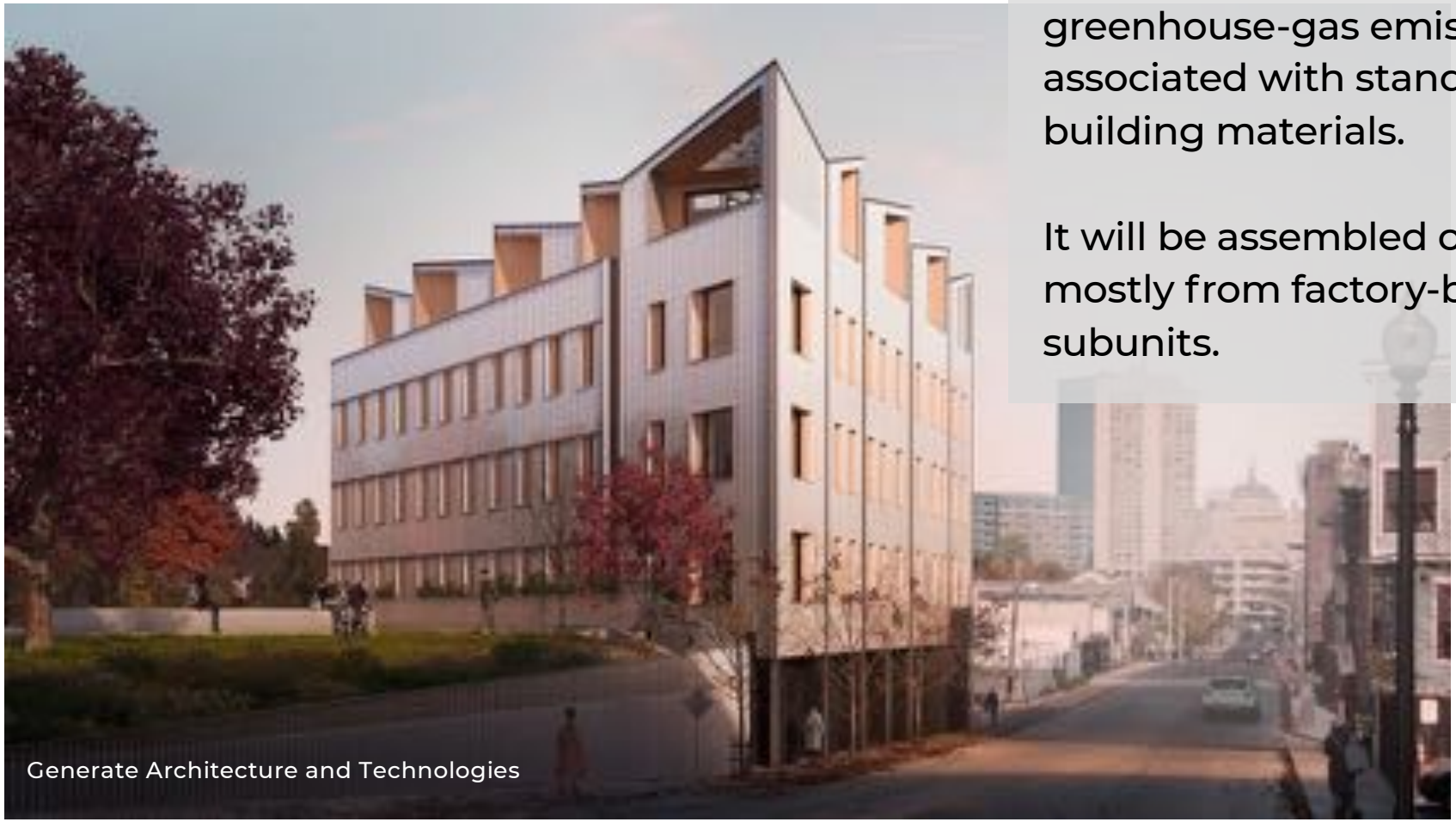
Cross-Laminated-Timber office, London

Boston carbon neutral apartment block (concept)

Type of production: CLT

Cross-laminated timber (CLT) eliminates most of the greenhouse-gas emissions associated with standard building materials.

It will be assembled on site mostly from factory-built subunits.



Generate Architecture and Technologies

Improve construction efficiency

better space; better people

Boston carbon neutral apartment block

MIT helped with the material analysis

- The steel-based building produces the most emissions
- The concrete version produces **8 % less** than that
- The mass-timber building produces **53 % less**.

This building's net carbon emissions will be essentially zero.

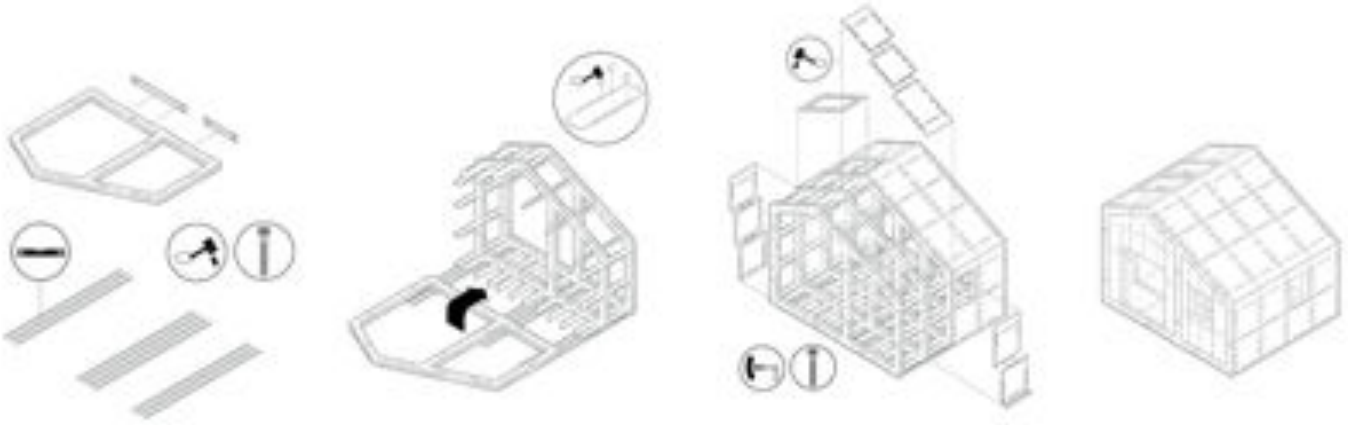
Even with energy used in felling, transporting, assembling, and finishing the structure.

Improve construction efficiency

better space; better people

The Gantry – kit of parts, wooden flatpack

Pre-fabricated office pods assembled in an existing building.



Improve construction efficiency

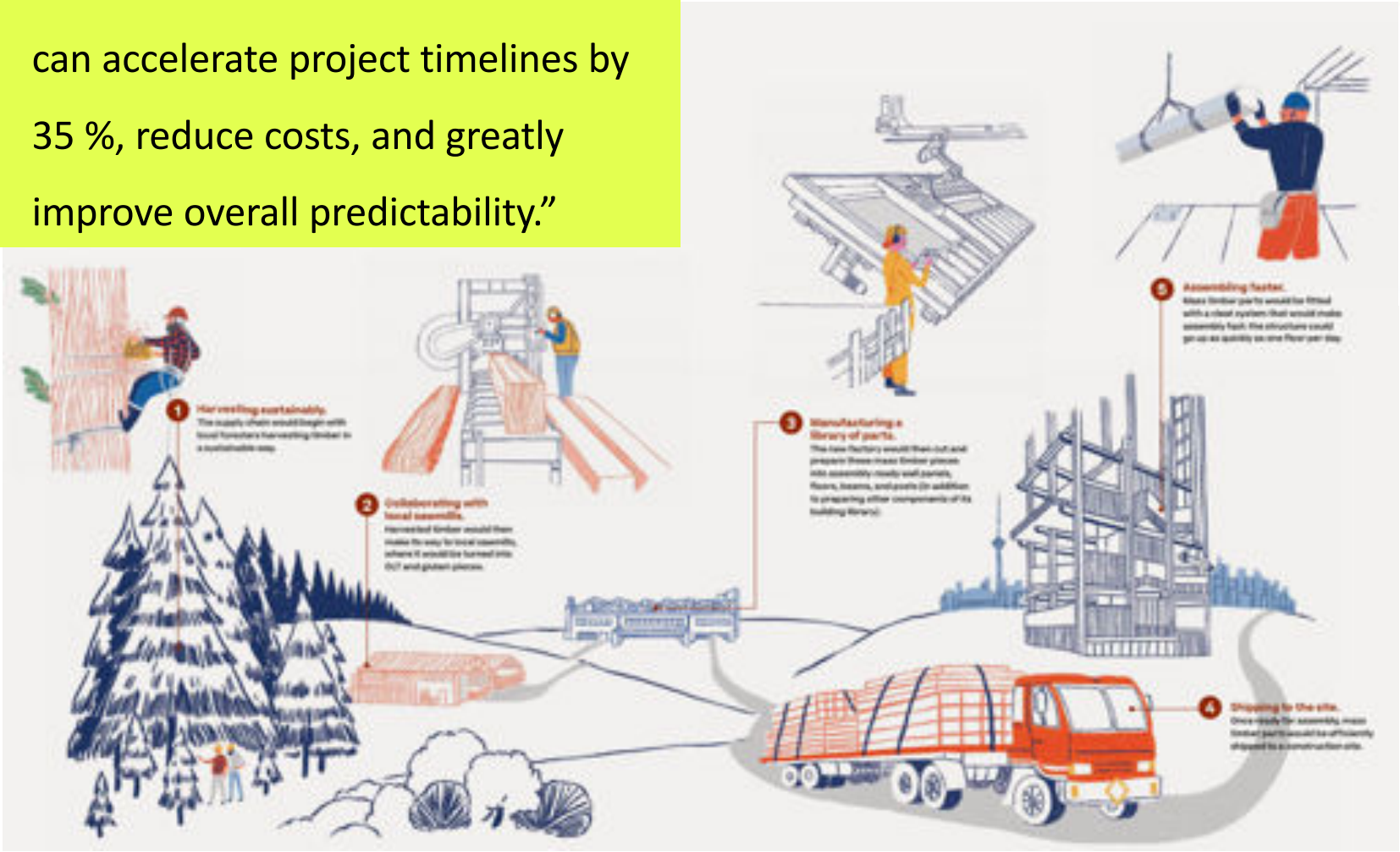
Hawkins\
Brown
Architecture 00

better
space; better
people

The Gantry – component construction off-site

Efficiency benefits in transportation, construction and dismantling

"Off-site mass timber construction can accelerate project timelines by 35 %, reduce costs, and greatly improve overall predictability."



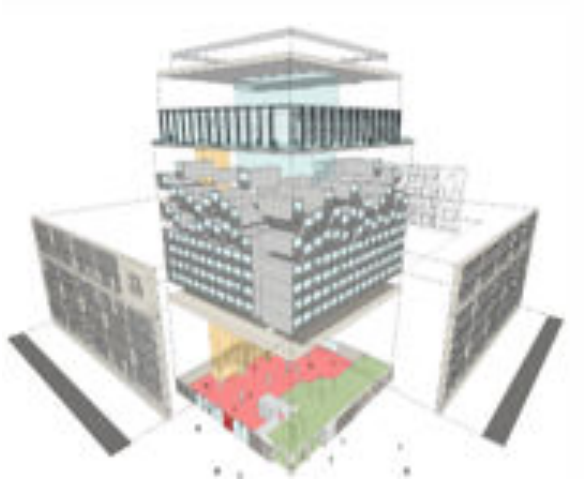
Example of dismantlable wood structure. (GXN)

Improve construction efficiency

better space; better people

CITIZEN M constructed of modular building blocks

First-time-right mission with shorter construction timelines.



Citizen M is the first and only hotel built entirely from prefab rooms.

68% lower embodied carbon compared to traditional hotel construction over a 60-year lifecycle.

Reduction of construction waste to just 2%.

(down from 10-20% for a traditionally built project)

Improve construction efficiency

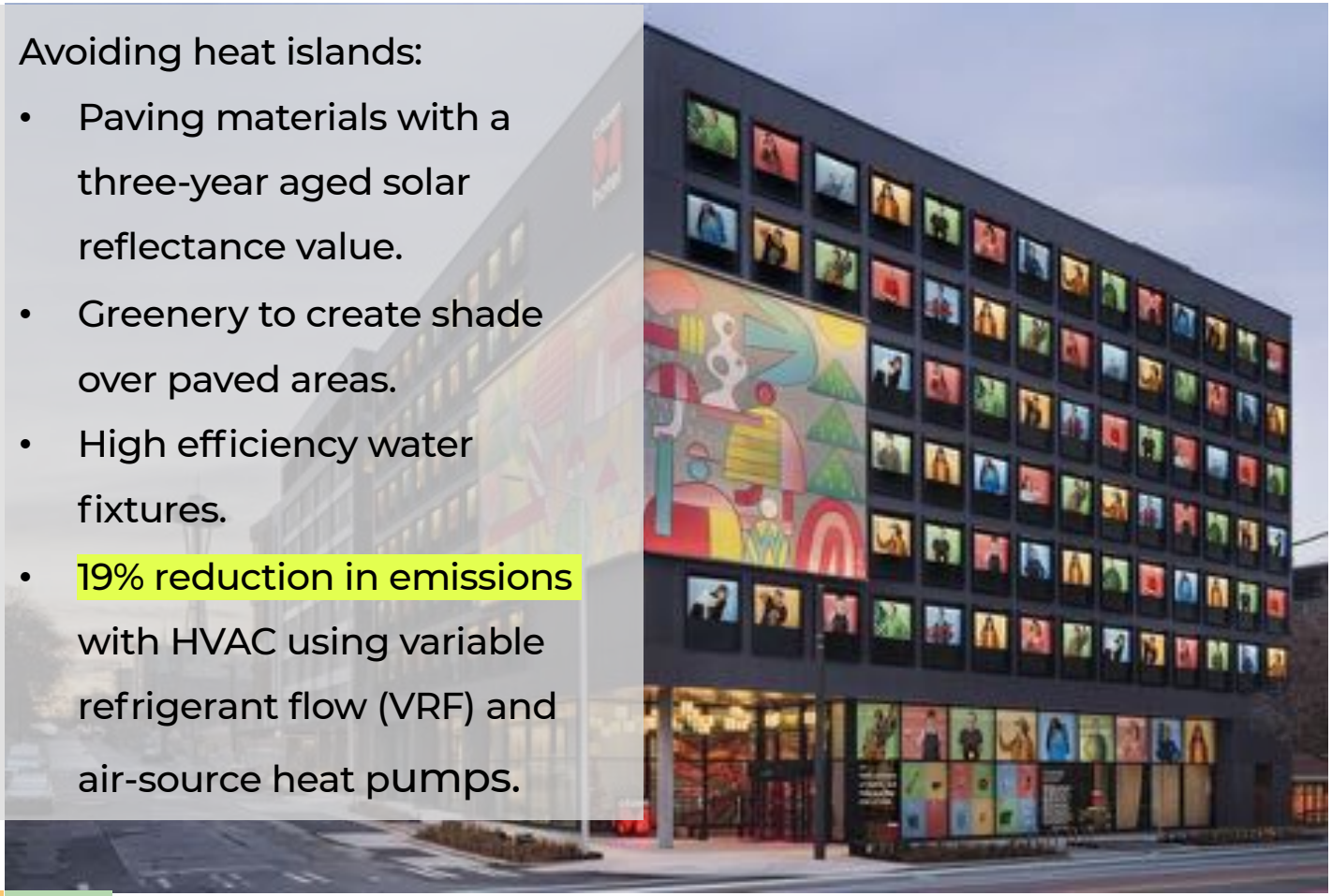
better space; better people

Modular building blocks

Citizen M Seattle and Boston achieved gold LEED certification

Avoiding heat islands:

- Paving materials with a three-year aged solar reflectance value.
- Greenery to create shade over paved areas.
- High efficiency water fixtures.
- 19% reduction in emissions with HVAC using variable refrigerant flow (VRF) and air-source heat pumps.



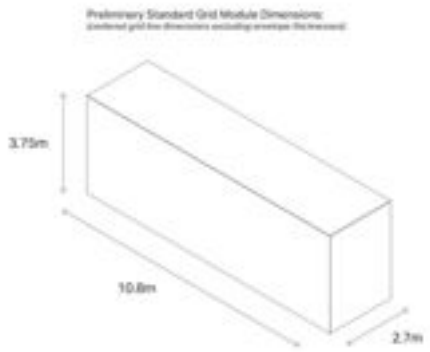
69% of hotels are LEED or BREEAM certified (+19% in 2020)

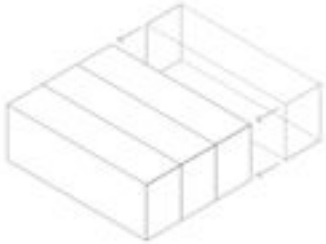
Improve construction efficiency

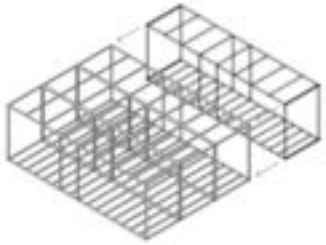
better space; better people

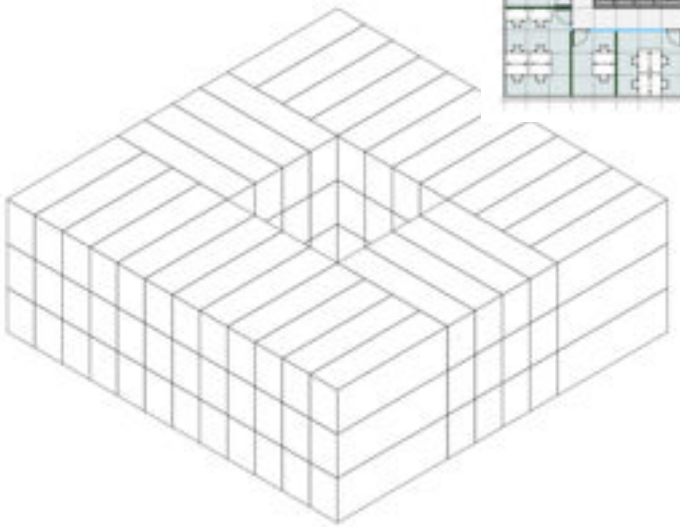
Imagine a workplace constructed of separable units

Building blocks that are fit-for-purpose and optimised in size.









Improve construction efficiency

better space; better people

KEY DRIVERS OF CARBON EMISSION IN THE USE STAGE

KEY DRIVERS DURING USE

- Design for good habits
- User access/ transportation
- Robustness of furniture
- Heating, cooling, insulation
- Carbon capture on site
- Reduce food waste/landfill

Tackling operational carbon is the most cost-effective and easy way to make significant carbon savings.

Embody operational performance

better space; better people

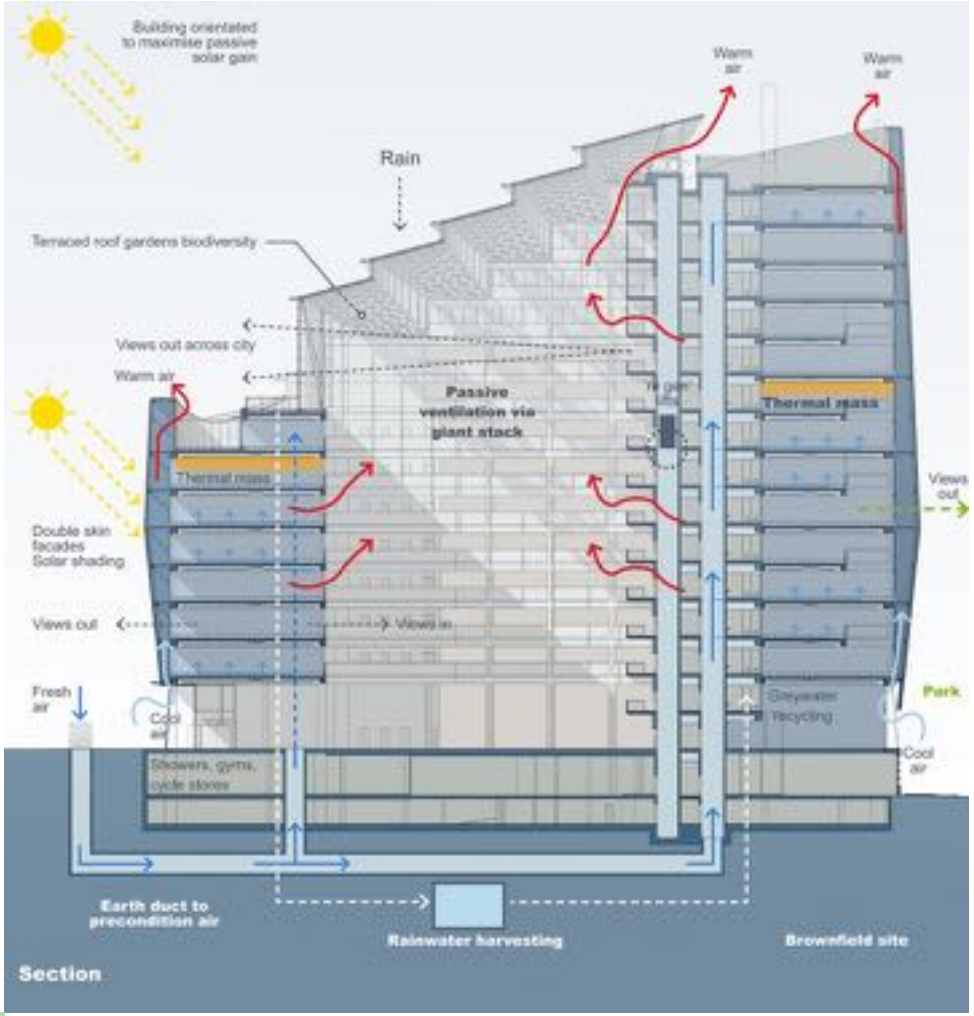
Users often override the efficiency of systems

How might design of buildings and interiors make it fun and convenient for people to produce less waste, and reduce energy consumption?

Nudging users to into better habits

1 angel square, Manchester

328,000 sq ft of high quality future-proof office space using 50% less energy.



Use less energy:

Double skin façade **minimises heating and cooling**, underground heat pumps provide free heating and cooling.

Future-proof:

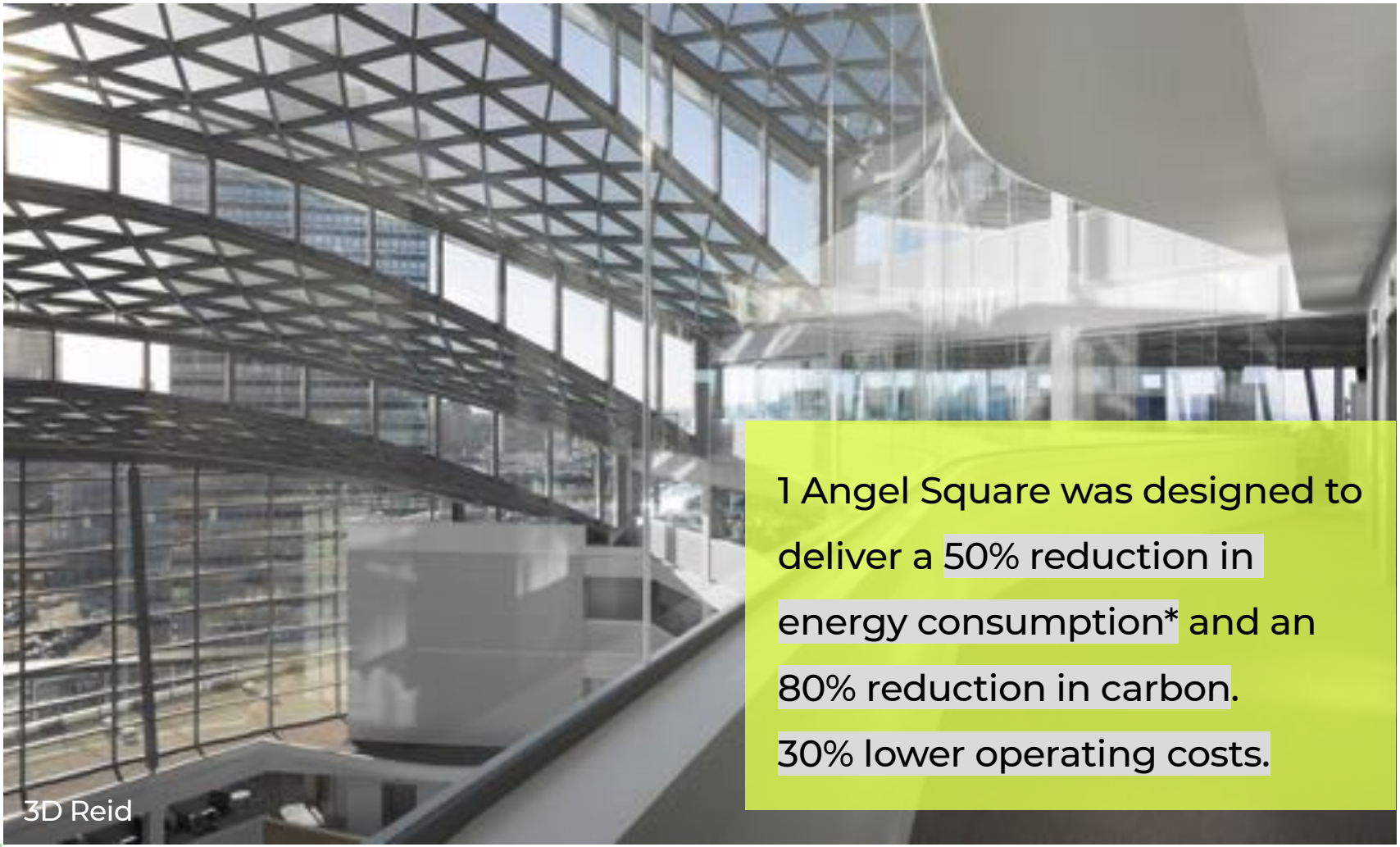
The structure and its mechanical & electrical systems allow occupiers to easily **reorganise and subdivide** space, so as needs change the **building stays relevant**.

Integrate operational performance

better space; better people

1 angel square, Manchester

Designed with operational performance in mind.



1 Angel Square was designed to deliver a 50% reduction in energy consumption* and an 80% reduction in carbon.

30% lower operating costs.

*compared to the owner's current Manchester complex

Integrate operational performance

better space; better people

The Crown Estate Head Office in central London

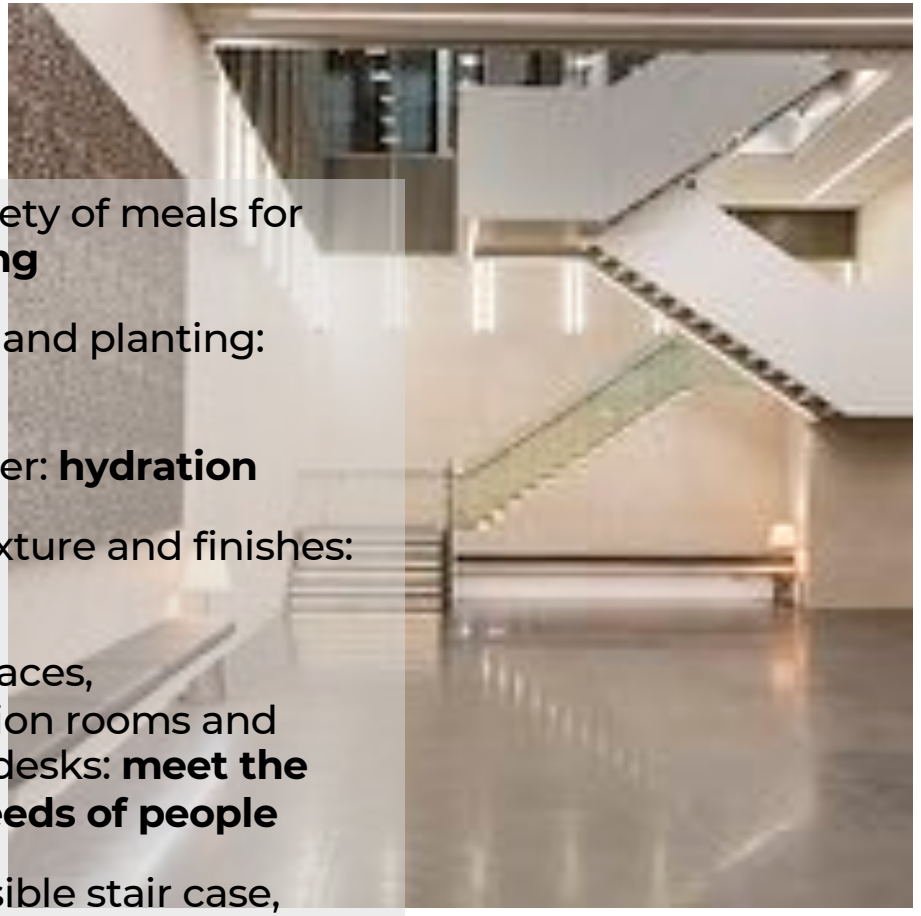
1st office in Europe with Platinum Well Building status

Integrate operational performance

better space; better people

The Crown Estate Head Office in central London

Wellbeing for people and planet.



- Healthy variety of meals for staff: **catering**
- Green walls and planting: **biophilia**
- Filtered water: **hydration**
- Furniture, fixture and finishes: **air quality**
- Different spaces, contemplation rooms and ergonomic desks: **meet the different needs of people**
- Fresh air, visible stair case, acoustics: **build features**
- Local amenities, local parks and public transport: **location of the building**

Integrate operational performance

better space; better people

Sellex 100/100 range

Reduce carbon impact of furniture in use.

The Sellex 100/100 range is made from material that is 100% recycled and 100% recyclable.

Integrate operational performance

better space; better people

Sellex 100/100 range

Procurement decisions during use stage.

The sled base frame is made of recycled steel and is combined with a 100% recycled and recyclable polypropylene shell.

Integrate operational performance

better space; better people

KEY DRIVERS OF CARBON EMISSION AT END-OF-LIFE

Design for disassembly to maintain the highest value of material when reused.

KEY DRIVERS END-OF-LIFE

- Demolition impact
- Reprocessing, cutting down
- Transport to recycle or waste management facility
- Extension of life (dismantle)

Reusability

better space; better people

Just the right amount of light to suit the building

Avoiding overcapacity.

In 2011, Thomas Rau did not want to purchase an expensive lighting infrastructure for his office

that he would eventually need to replace and dispose of

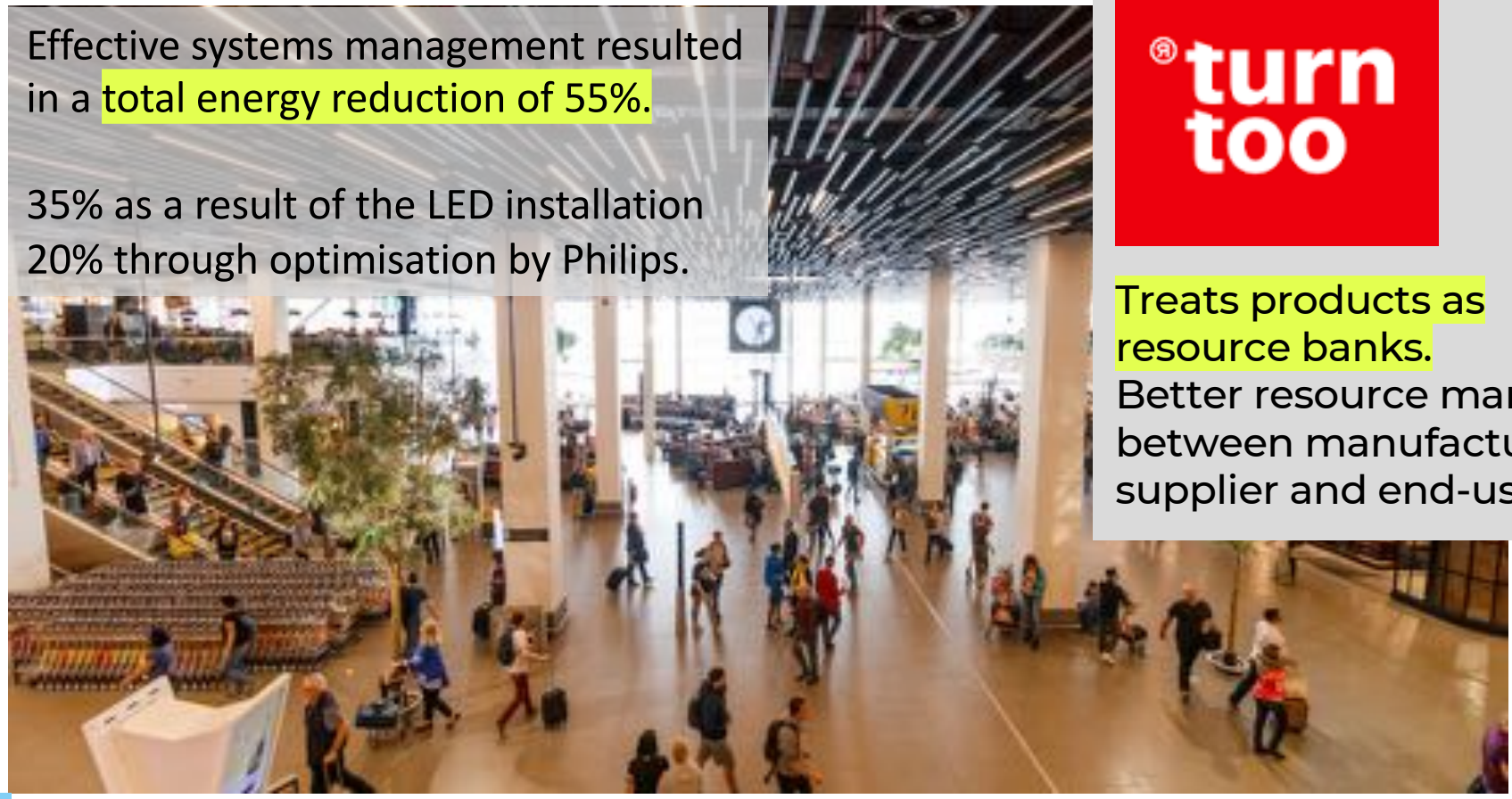
but rather light as a service, and just the right amount to suit the building.

Reusability

better space; better people

Making components available for future products

A performance model for manufacturers.



Effective systems management resulted in a total energy reduction of 55%.

35% as a result of the LED installation
20% through optimisation by Philips.

turn too

Treats products as resource banks.
Better resource management between manufacturer, supplier and end-user.

Reusability

better space; better people

Vitra global take-back program (back-dated)

Manufacturer guarantees that

Eames Fiberglass Chairs are

correctly recycled at end-of-life,

when the owner can’t.

Reusability

better space; better people

Vitra global take-back program

- Repaired & Resold
- Recycled into building material and new Polypropylene products.

Reusability

better space; better people

Ikea furniture lease model

Imagine business models that reintroduces products back into the market at a price customers will pay.

Now imagine the same idea for building components.

SERIOUS ABOUT CLIMATE CHANGE:
By 2030 IKEA plans to achieve a 70% reduced climate footprint per IKEA product and <40% share of raw materials in the carbon footprint of IKEA's products.

"When your leasing period is over, you hand it back and you might lease something else.

Instead of throwing those away, we refurbish them a little and we could sell them, prolonging the life cycle of the products."

Reusability

better space; better people

TRIAL FOR OFFICE FURNITURE

CUSTOMER

Furniture Rental Service

1. Design for longevity and reassembly
2. Build & prioritise a circular supply chain
3. Make rental more beneficial for customers

MANUFACTURER

Resale

Refurbishment

Upcycling

Recycling

Reusability

better space; better people

BUIKSLOTERHAM CIWOCO

A Circular Living & Working Complex designed to be future-proof: sustainable, adaptive and almost fully **dismountable**.

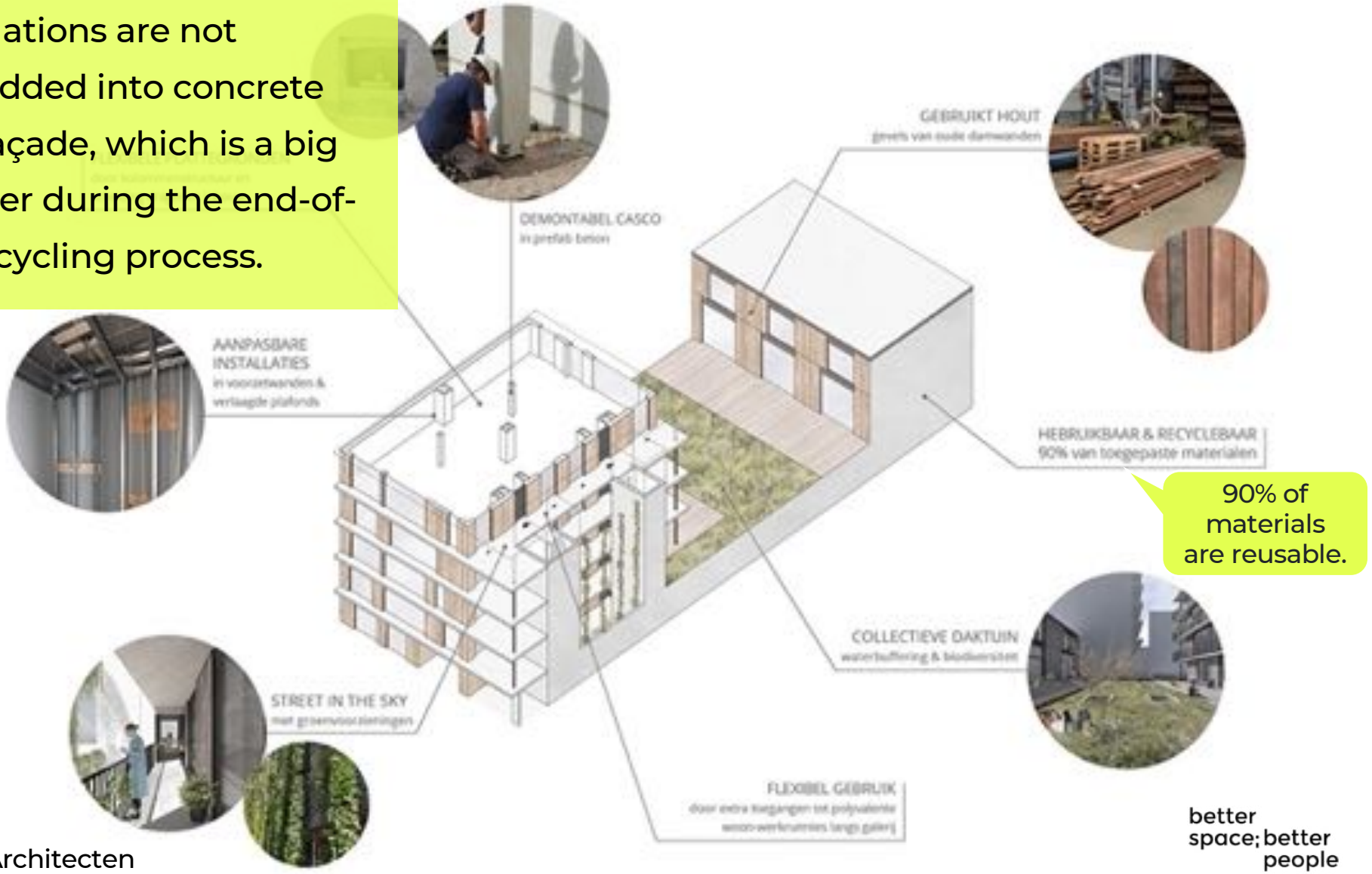
GAAGA Architecten

Reusability

better space; better people

BUIKSLOTERHAM CIWOCO

Installations are not embedded into concrete and façade, which is a big polluter during the end-of-life recycling process.



90% of materials are reusable.

Reusability

GAAGA Architecten

better space; better people

Triodos bank

Ticks all the boxes.

Changing rooms and showers encourage commuters to bike.

A green roof captures rainwater for flushing toilets.

Material passport to keep value at end-of-life stage.

Solar panels over the parking lot charge electric cars.

Reusability

RAU Architecten, Ex-Interiors

better space; better people

Triodos bank

Constructed using 165,312 screws. All components can be easily disassembled, unlike a steel building that would be welded together and girded in concrete.

"Today buildings are statically welded, glued and cast together. By designing for disassembly future buildings are flexible and function as material banks."

Reusability

better space; better people

BREAK OUT ROOM

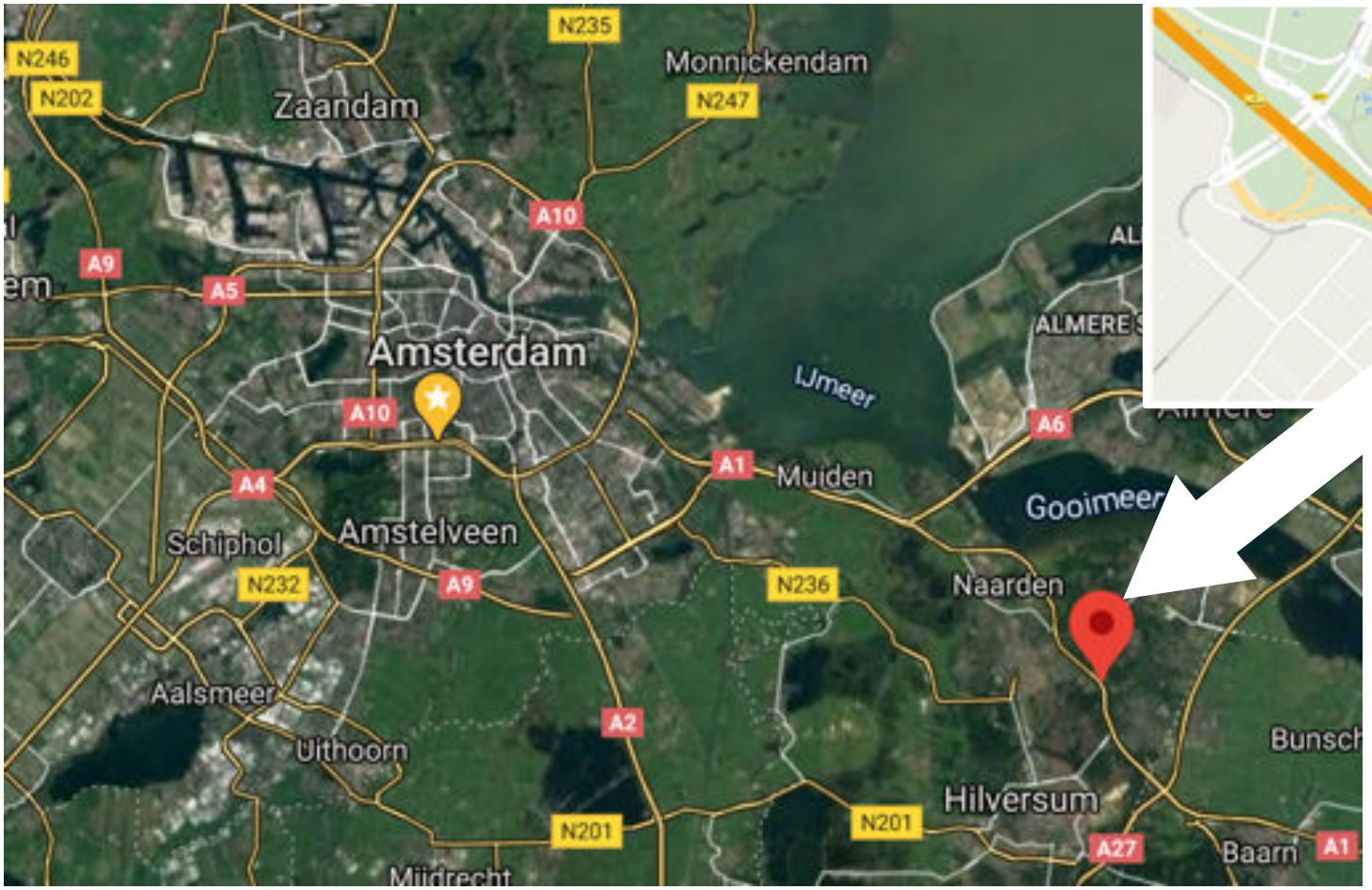
How can we design an attractive workplace for people and planet?

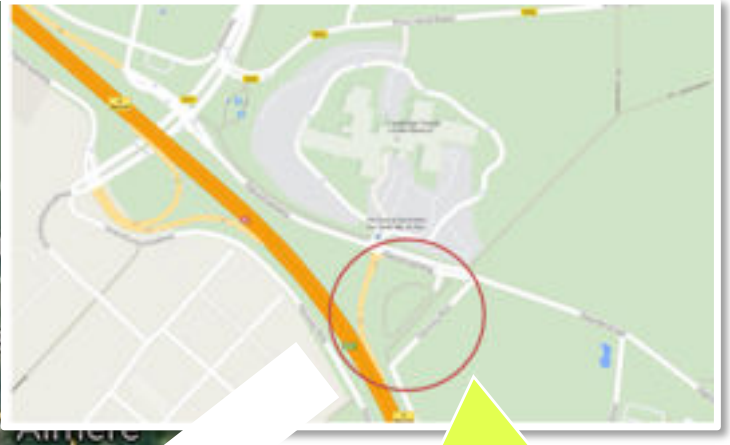
- 1500 sqm vacant site
- No surrounding development yet
- Former farmer’s field

better space; better people

IN A VACANT CITY-EDGE LOCATION

It could be on the edge of any metropolitan city
Amsterdam, Copenhagen, Paris, London (closer to suburbia, < 30 mins of the city)



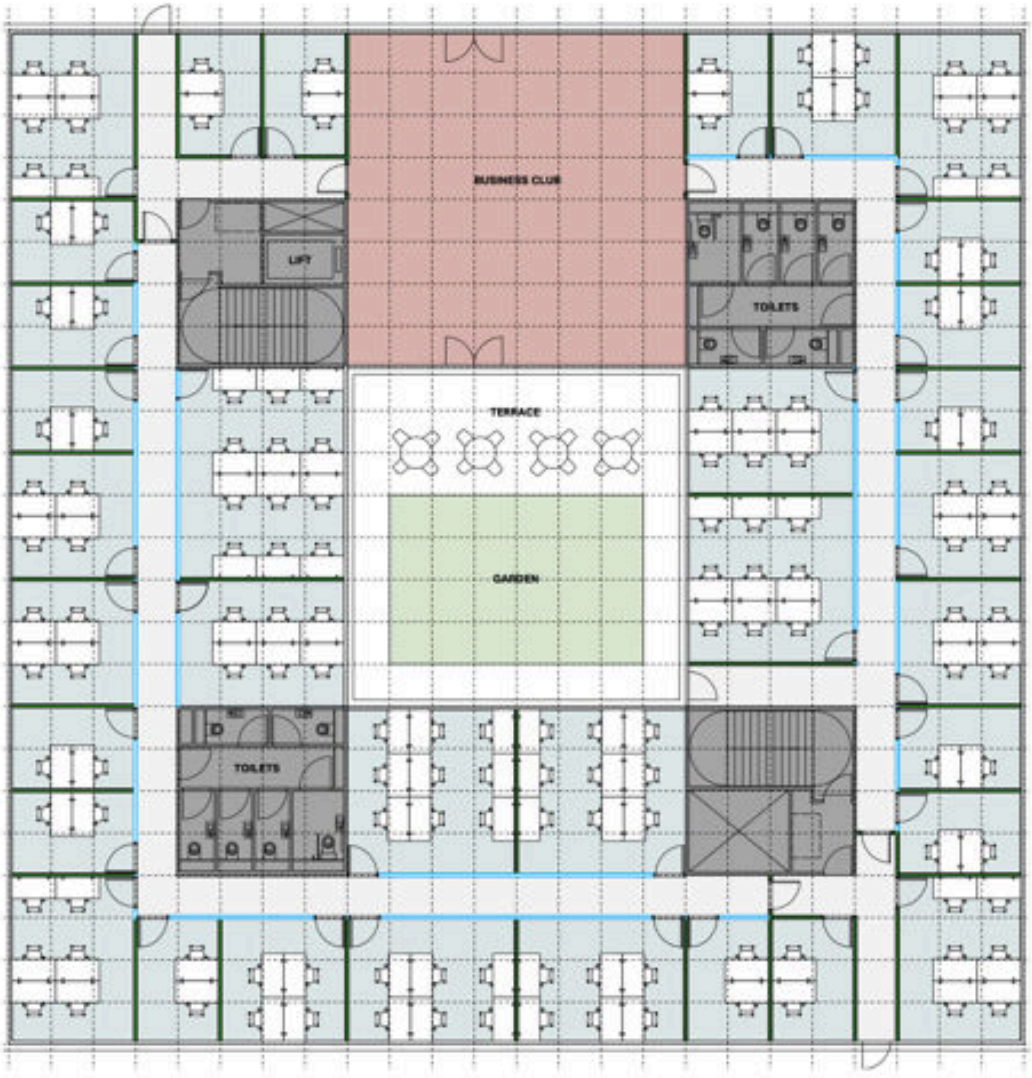


This location only has a bus stop and a view of the highway.

better space; better people

A CUBICAL WORKPLACE CONCEPT

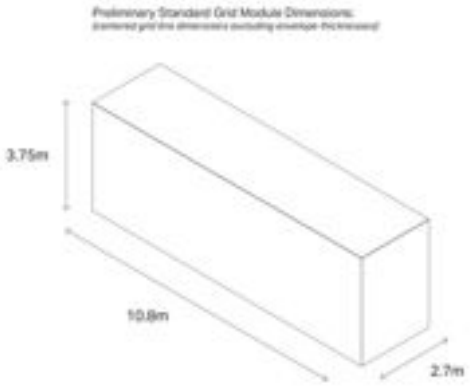
That could look like this, or in U-shape that integrates a garden and trees as a fixture.

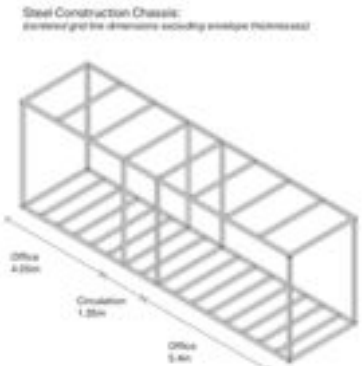


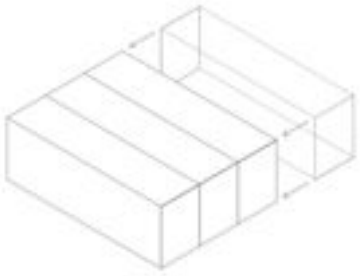
better
space; better
people

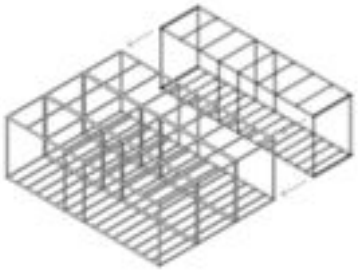
YOU MIGHT CONSIDER FLEXIBILITY

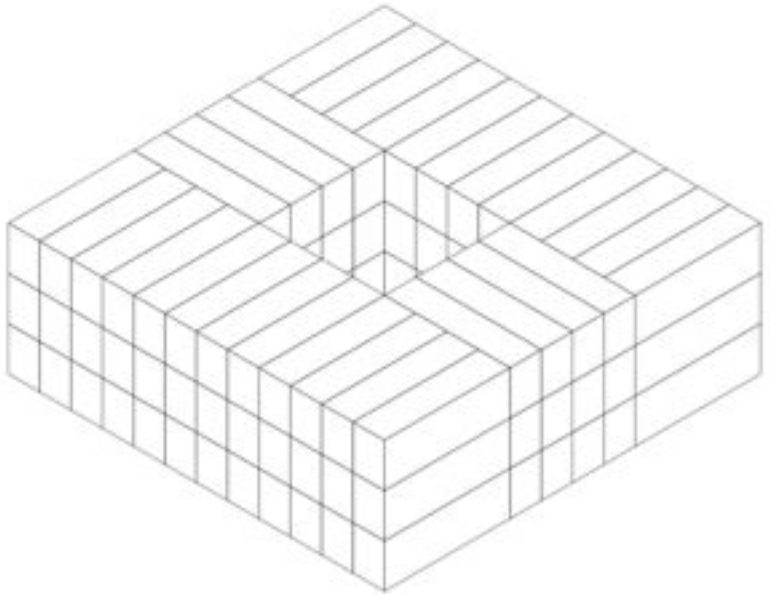
Modular, volumetric type of construction that can be taken apart for relocation or where spaces can be adapted as needs change.







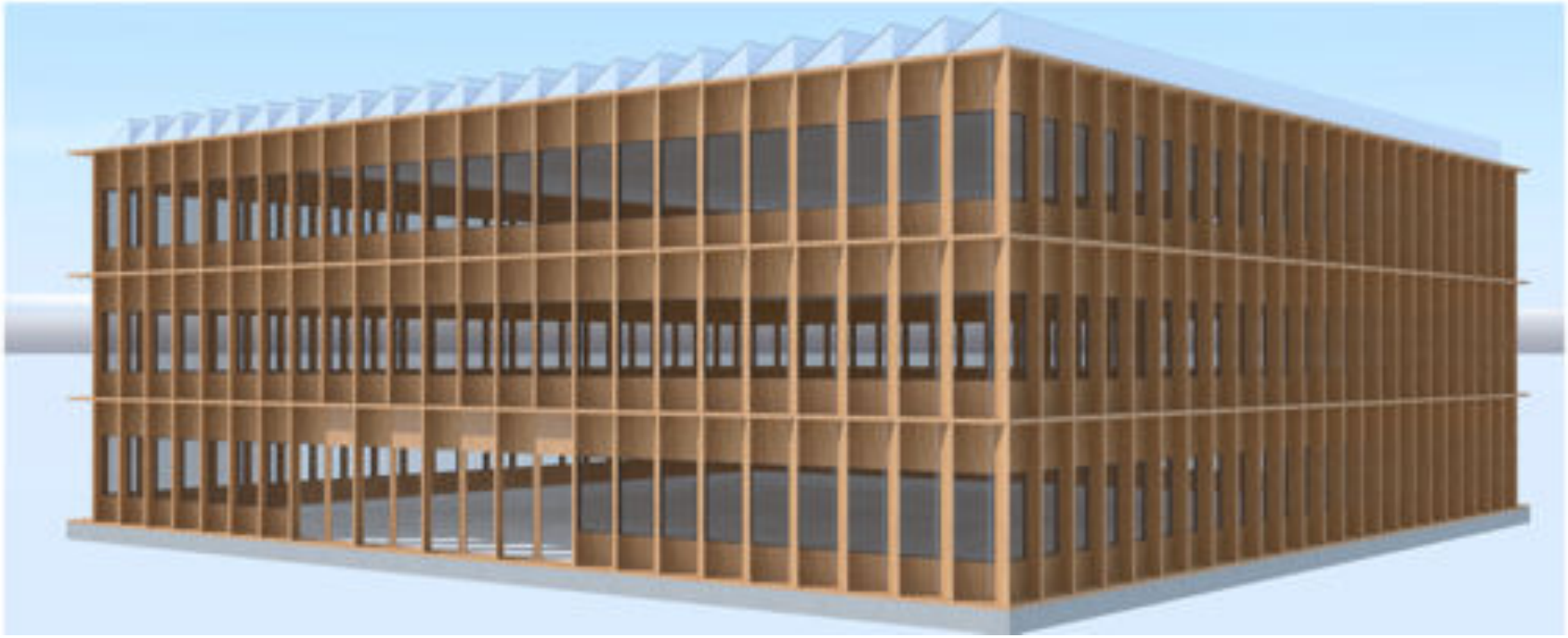




better space; better people

THE BUILDING COULD HAVE

A shading façade for better operational performance, renewable energy on the roof.



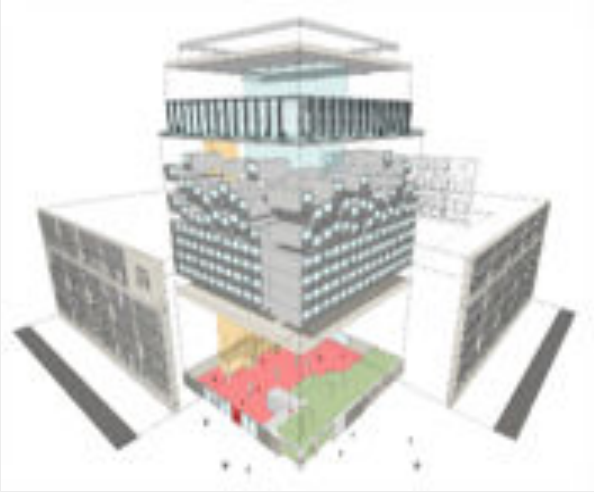
better
space; better
people

CHALLENGE 1 – CONSTRUCTION STAGE

How might you use a smarter type of construction to design a workplace that improves the circularity and attractiveness of the building? Be inspired by one of the cases below.

CITIZEN M

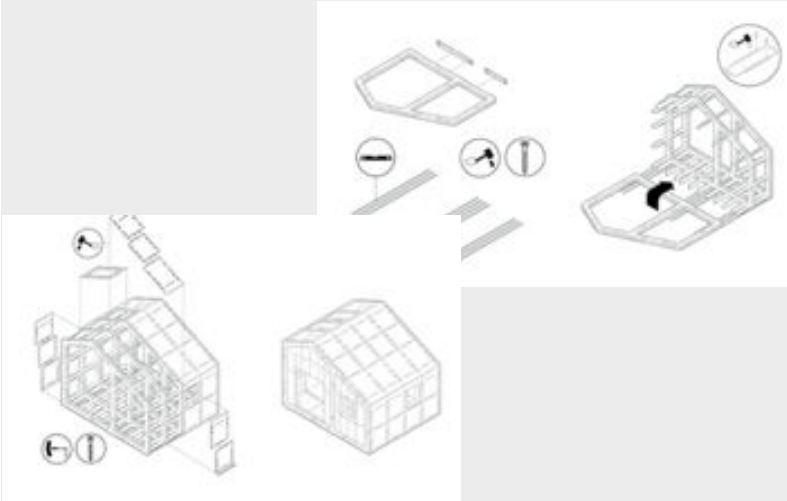
Modular units of bedrooms built off-site. All around the world hotels use the same construction type.



Volumetric workplace units made of steel and glass, built off-site, designed for relocation of units when demand changes.

THE GANTRY

CLT Kit-of-Parts prefabricated office pods, assembled on site, easy to rearranges during use stage.



Wooden (CLT) Kit of Parts prefab components (beams, floor/ceiling boards) designed for rearranging and dismantling.

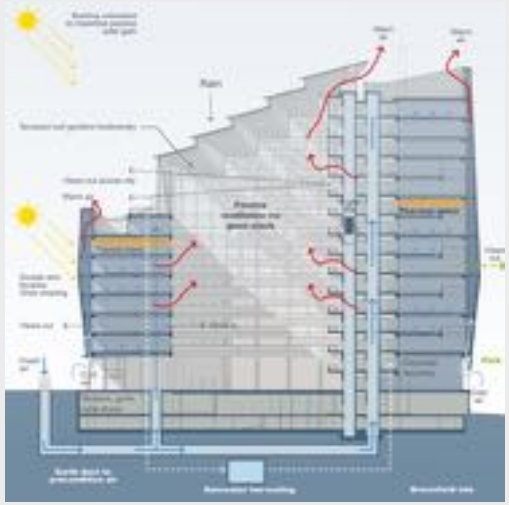
Improve construction efficiency

CHALLENGE 2 – USE STAGE

How might you design a workplace that helps the user be carbon-efficient, improving the circularity and attractiveness of the building and the wellbeing of people?

ANGEL

The double skin façade saves energy and heat pumps in the structure provide free heating and cooling.



Explore **operational performance built into the workplace structure** like shading façade, landscaping, trees, renewable energy, hvac.

CROWN ESTATE

The office received platinum WELL status by using design that promotes wellbeing, and behaviour that reduces waste.

Explore **operational performance** e.g. design harmony between workspace, people and nature. Live well, recycle more, waste less.

Integrate operational performance

CHALLENGE 3 – END-OF-LIFE STAGE

How might you design a workplace that dismantles easily so components can circulate back into the economy at their highest value? Be inspired by one of the cases below.

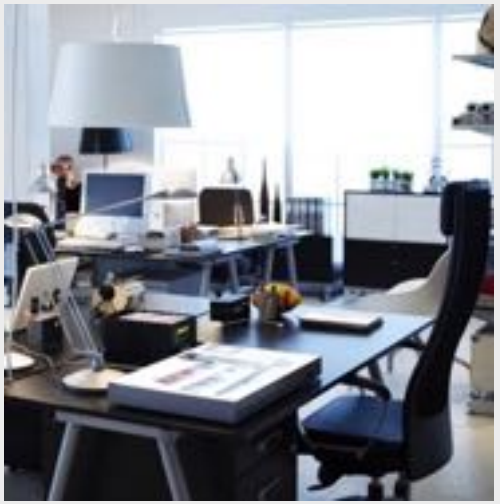
TRIODOS

This Triodos Bank was built with 165,312 screws and can be dismantled. A Material Passport ensures components get a 2nd life.

The structure is designed so it can be dismantled in components, retaining maximum value of material.

IKEA LEASE

Lease recycled and recyclable furniture, which you maintain well to extend the life and which IKEA refurbishes for you or (the next user).



Design products with supplier so they can be serviced for longevity, with replaceable components and a take-back program.

Reusability

TFOW | Virtual Panel #8

Thursday October 8,

13:00 – 14:30 CET

Or Seattle, or London or Rotterdam !

SPECIAL THANK YOU

UNIVERSITY OF CAMBRIDGE

MARINA BRADFORD

EVGENIYA LAZAREVA

VASCO MOREIRA RATO

BRUCE HAASE

CHLOE BULLOCK

better space; better people

better
space: better
people

www.bsbp.design