

Die Stadt von morgen ist GRÜN

Cities

Alive

Green Building Envelope

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ARUP



„Cities need green
sizes S, M, L and XL
otherwise the human
ecosystem is incomplete.“

Gil Peñalosa, CEO „8-80 Cities“ quoted in
„Happy City“ by Charles Montgomery (2013)

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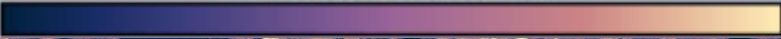
An aerial photograph of a wide, multi-lane road in a city, flanked by dense, mature green trees. The road stretches straight into the distance, leading towards a city skyline. In the background, various buildings are visible, including a prominent tower with a spherical observation deck. The sky is clear and blue.

Green Building Envelope
...Why bother?
...Why bother if we have large parks?
„...we have such a green City!“





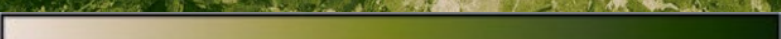
Temperature



Cold

Hot

Green Area



Low

High





12°C

hotter evening temperatures
in urban areas with a population
exceeding 1 million than
in surrounding areas

1.78 bn

People have inhaled
polluted air over the past
decade; this has led to
multiple diseases

6-10 dB(A)

reductions are feasible
in ambient noise levels

Global Contributors



Temperature difference from
city to surrounding areas

2°C

Air Quality Index Scale based
on US EPA Standard

34

BERLIN





Temperature difference from
city to surrounding areas

3°C

Air Quality Index Scale based
on US EPA Standard

31

LOS ANGELES



Temperature difference from
city to surrounding areas

12°C

Air Quality Index Scale based
on US EPA Standard

130

HONG KONG

An aerial night view of the Melbourne city skyline, showing numerous illuminated skyscrapers and residential areas. The city lights are reflected in the dark sky, and the surrounding landscape is visible in the distance.

Temperature difference from
city to surrounding areas

12°C

Air Quality Index Scale based
on US EPA Standard

20

MELBOURNE

An aerial photograph of London at sunset. The River Thames flows through the center, with the Big Ben clock tower on the left and the London Eye Ferris wheel on the right. The city skyline is visible in the background under a cloudy sky with warm, golden light.

Temperature difference from
city to surrounding areas

12°C

Air Quality Index Scale based
on US EPA Standard

67

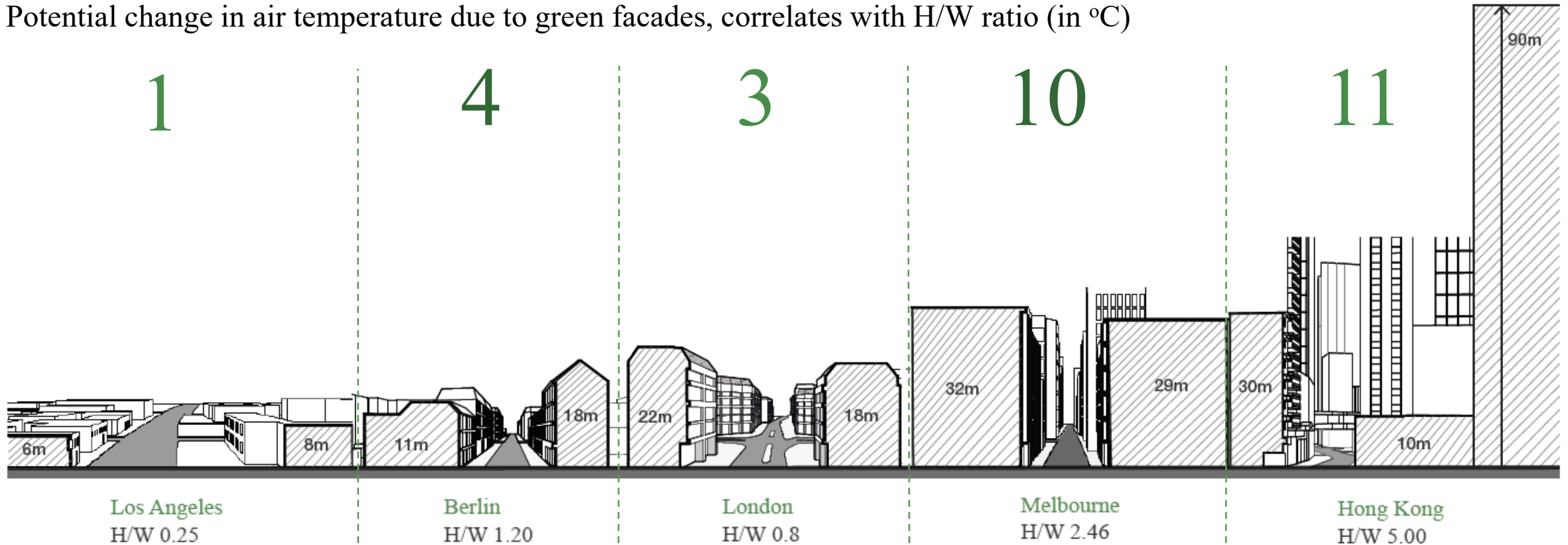
LONDON

Urban Heat Island

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Five Global Case Studies - Morphology

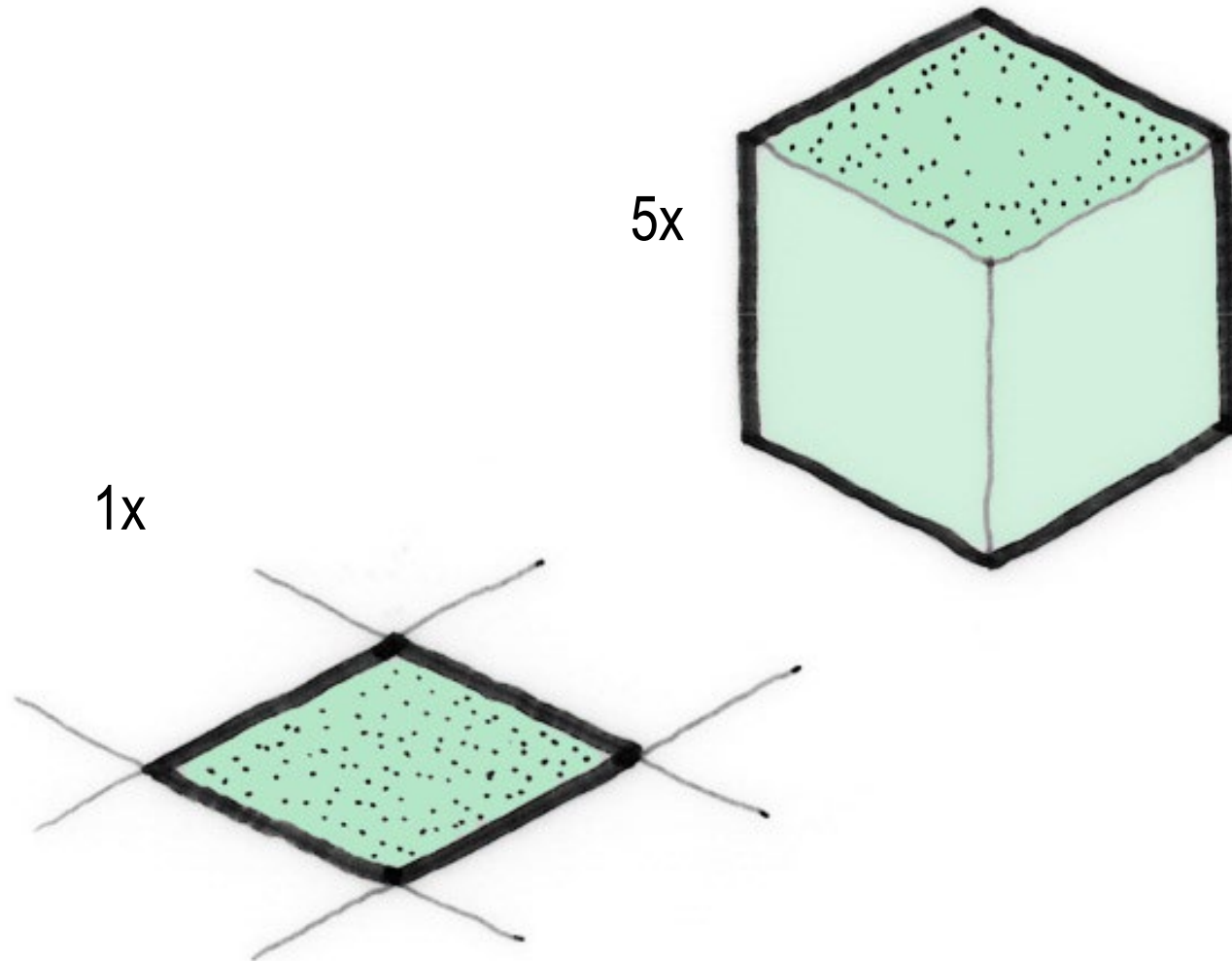
Potential change in air temperature due to green facades, correlates with H/W ratio (in °C)



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The Role of Buildings

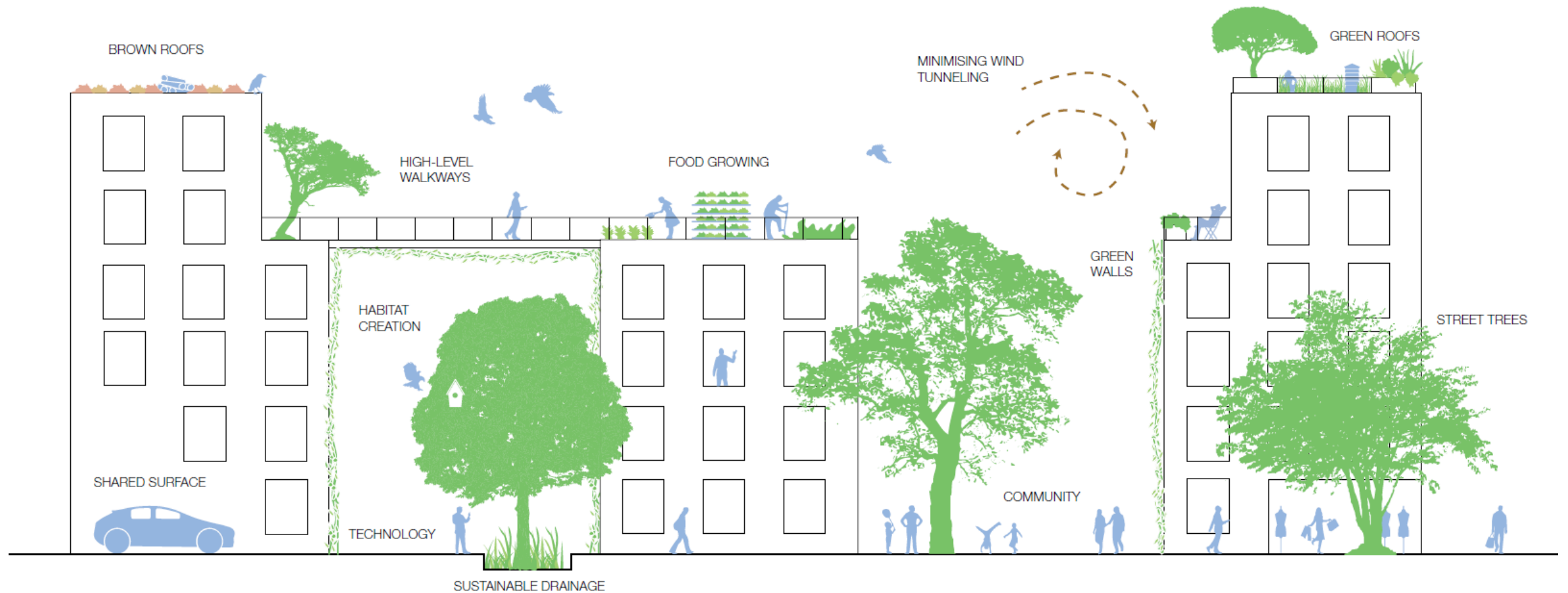
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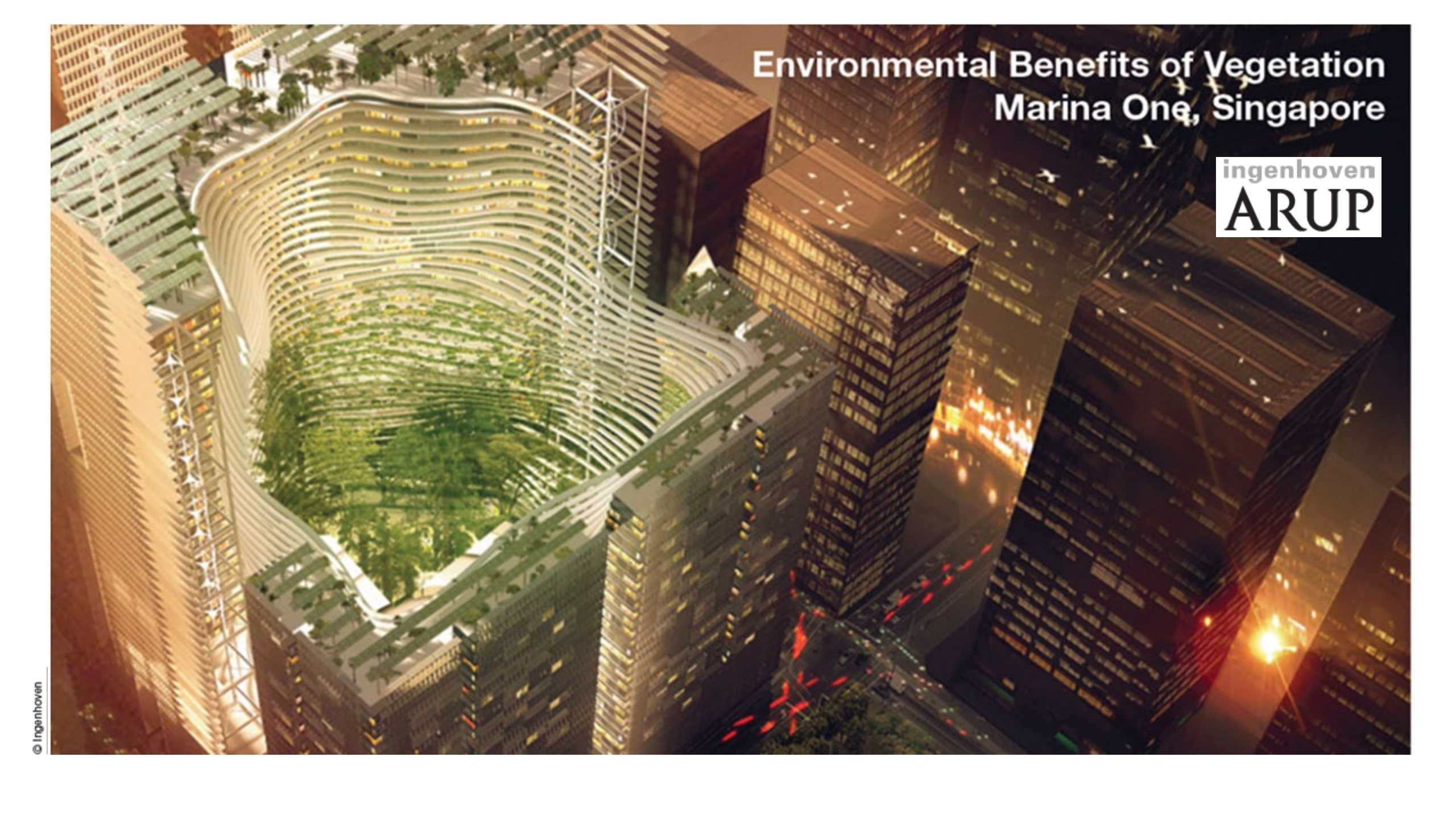
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Buildings as Green Infrastructure

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Environmental Benefits of Vegetation Marina One, Singapore

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Greenery at Marina One is an environmental sponge

CO₂ absorbed

equivalent to 400 - 450 long haul flights
(Criterion 3)



10 - 12 X
CO₂ reduction
compared to greenfield site
(Criterion 4)

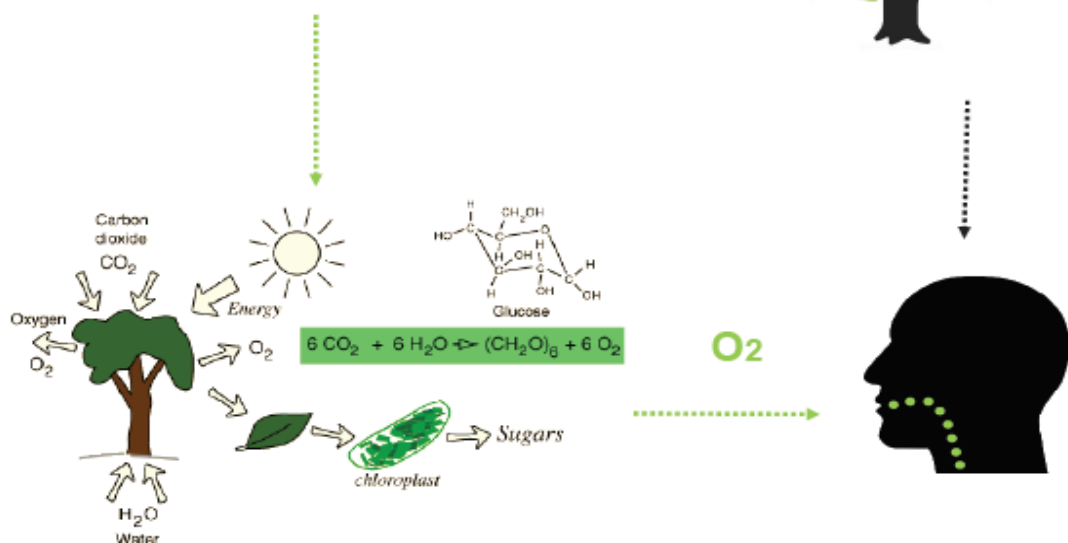
10 - 15% reduction in storm water runoff

5 - 7%

energy savings

for ventilation cooling demand
(Criterion 5)

Planting cleans the air of harmful pollutants (e.g. ozone, NO_x) [1]



O₂ production
for 500 - 600 people/day
(Criterion 3)





Vertical Meadow

Vertical Meadow (formerly known as Living Wall Lite) is an innovative and cost effective living wall system for temporary applications such as construction site scaffolding and hoardings.

It has been developed by Arup in partnership with Green Fortune, a living wall provider with a track record of over 300 living walls across Europe.

Plants and flowers are grown from seed in-situ on a temporary mat that is easily fixed to any scaffolding or hoarding. Within two or three weeks the first shoots start to appear, before growing into a verdant vertical meadow - turning any unsightly hoarding or scaffolding into something remarkable.

This is the future of temporary works, improving our cities by increasing natural capital.

Left: Vertical Meadow installation North Audley Street, London for Grosvenor Estates



Endorsed by





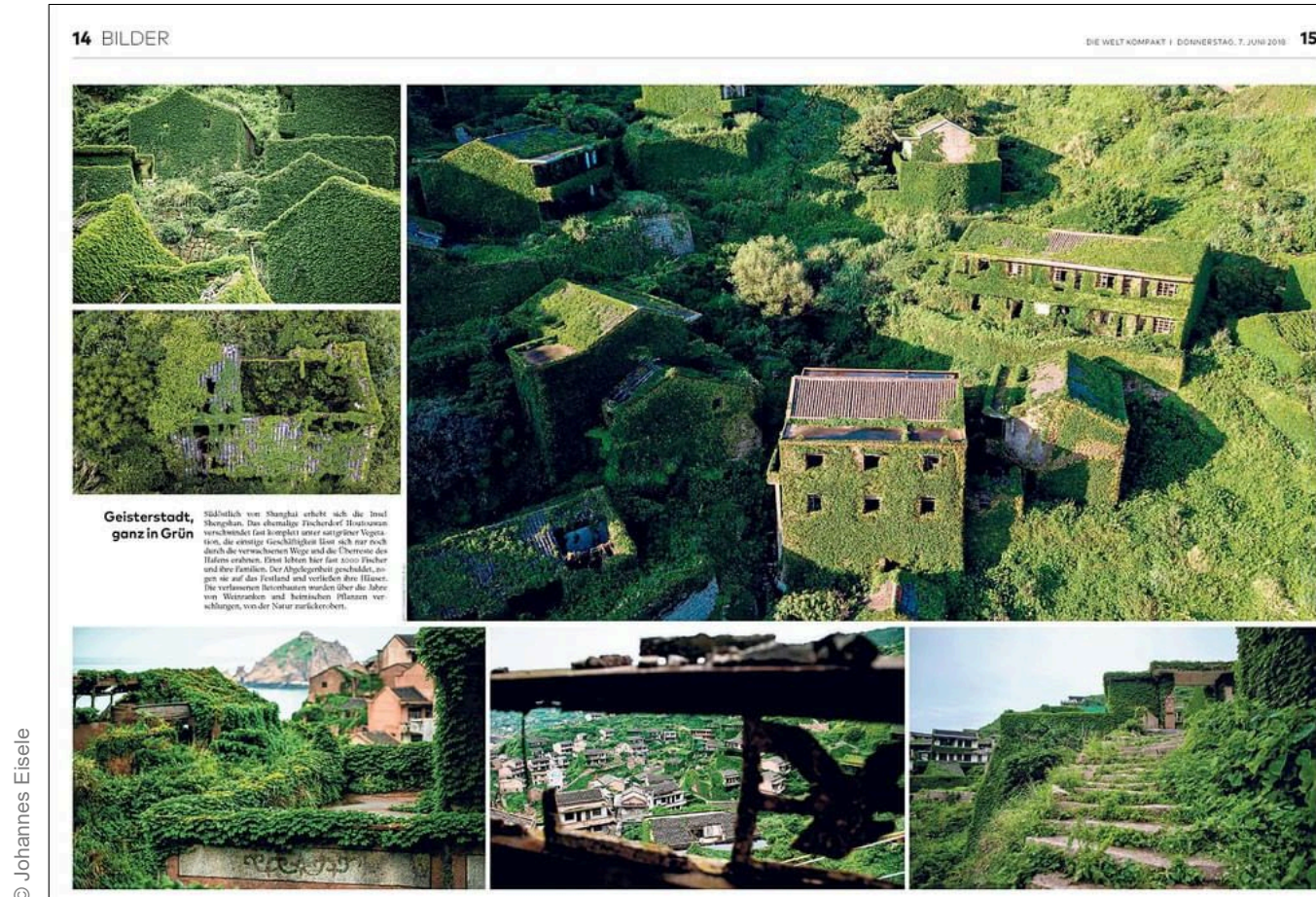
CROWN & ANCHOR

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Green Building Envelope

Abandoned City of “Houtouwan”, Shengshan Insel, South of Shanghai



Source: <https://www.instagram.com/p/Bjt7ydlq8D/>







Industrial environments and sites







Natürliche jahreszeitliche

Adaptivität

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From Green Algae to Solar Leave

...making summer sun available for winter use

BIQ-Haus

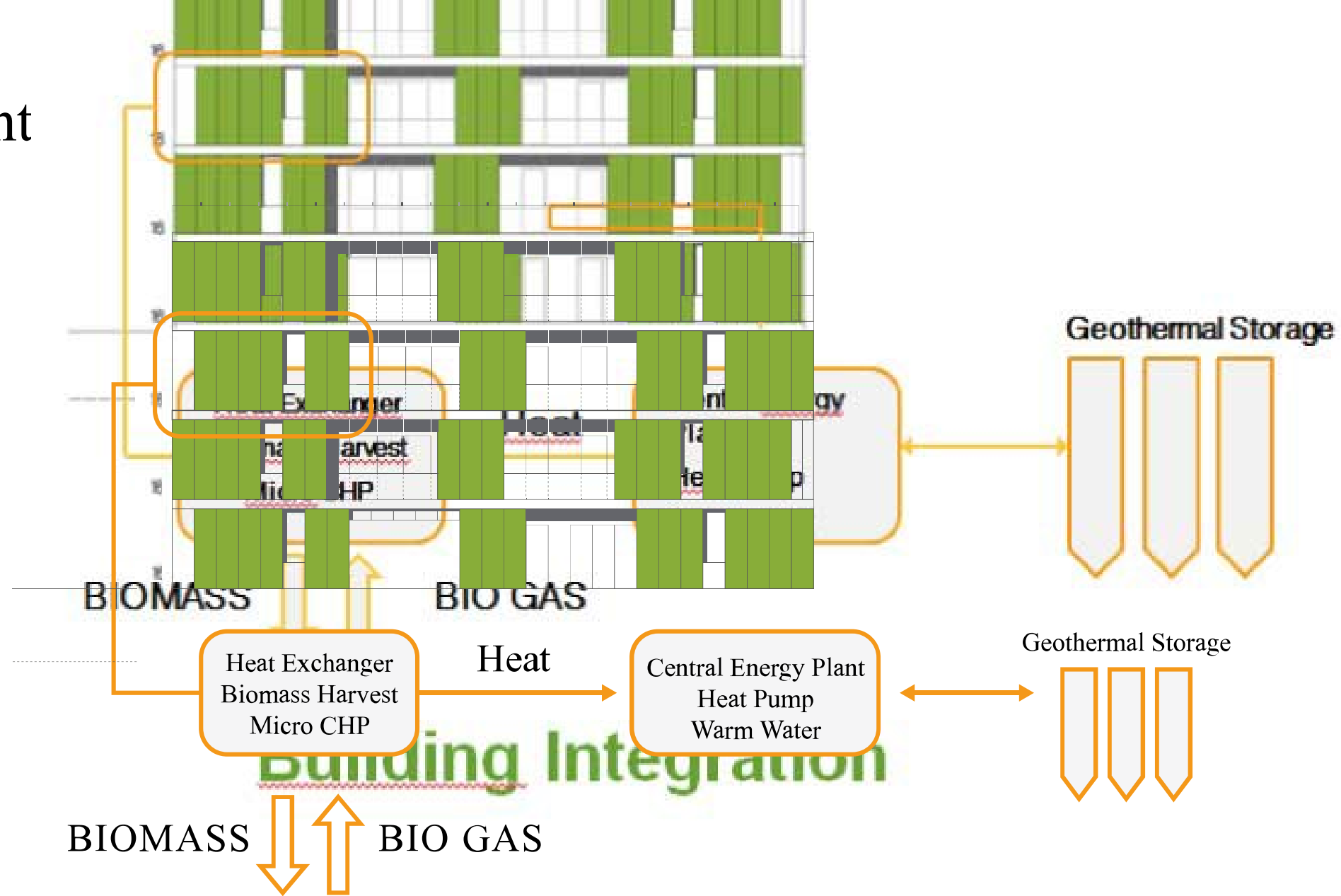
Hamburg, Germany

With SSC, Colt International & Splitterwerk Architekten

*[Not just avoiding heat gain
but harvesting energy]*



Building Int





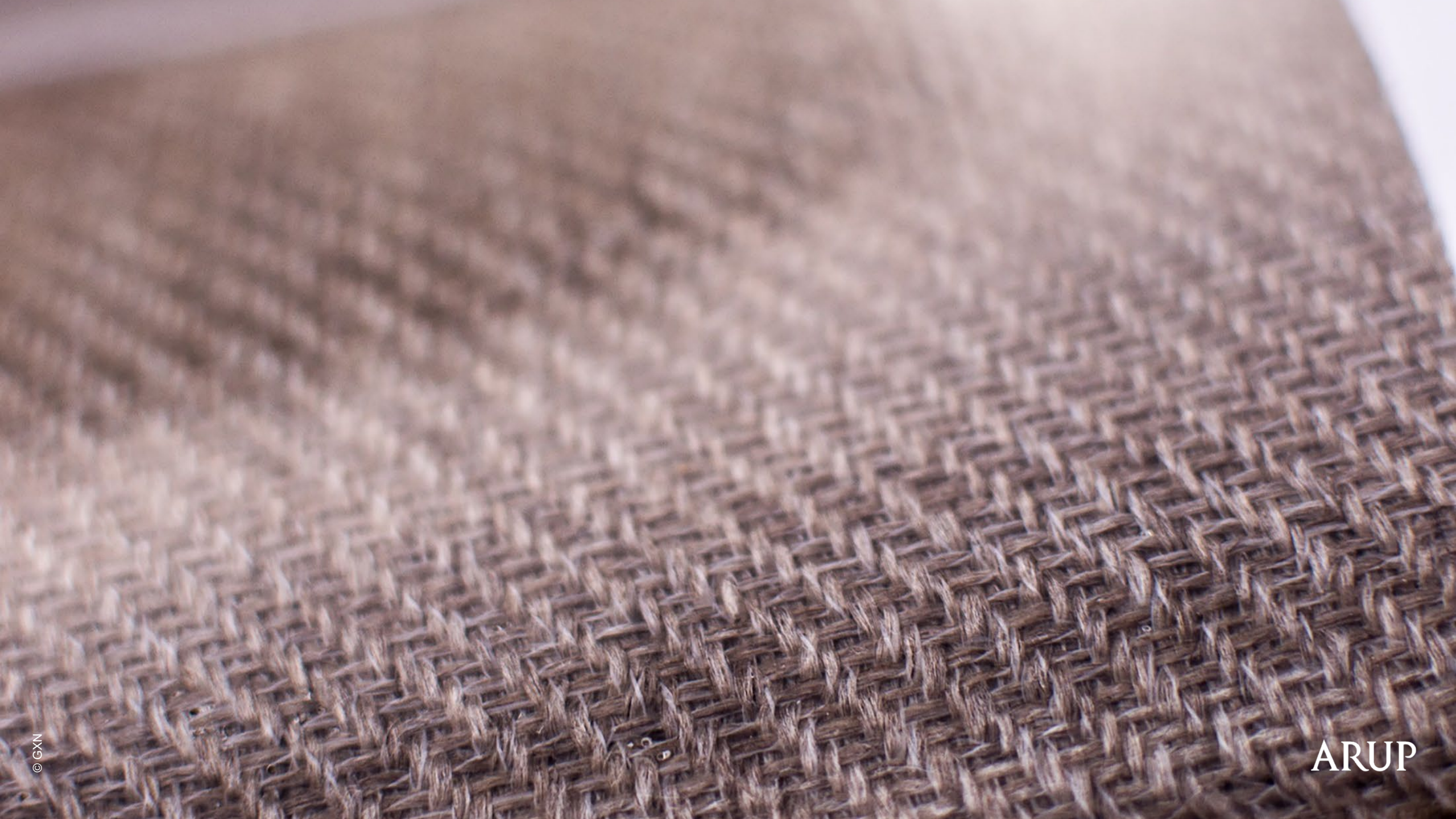
© Arup

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BioBuilt

Bio-degradable Facades

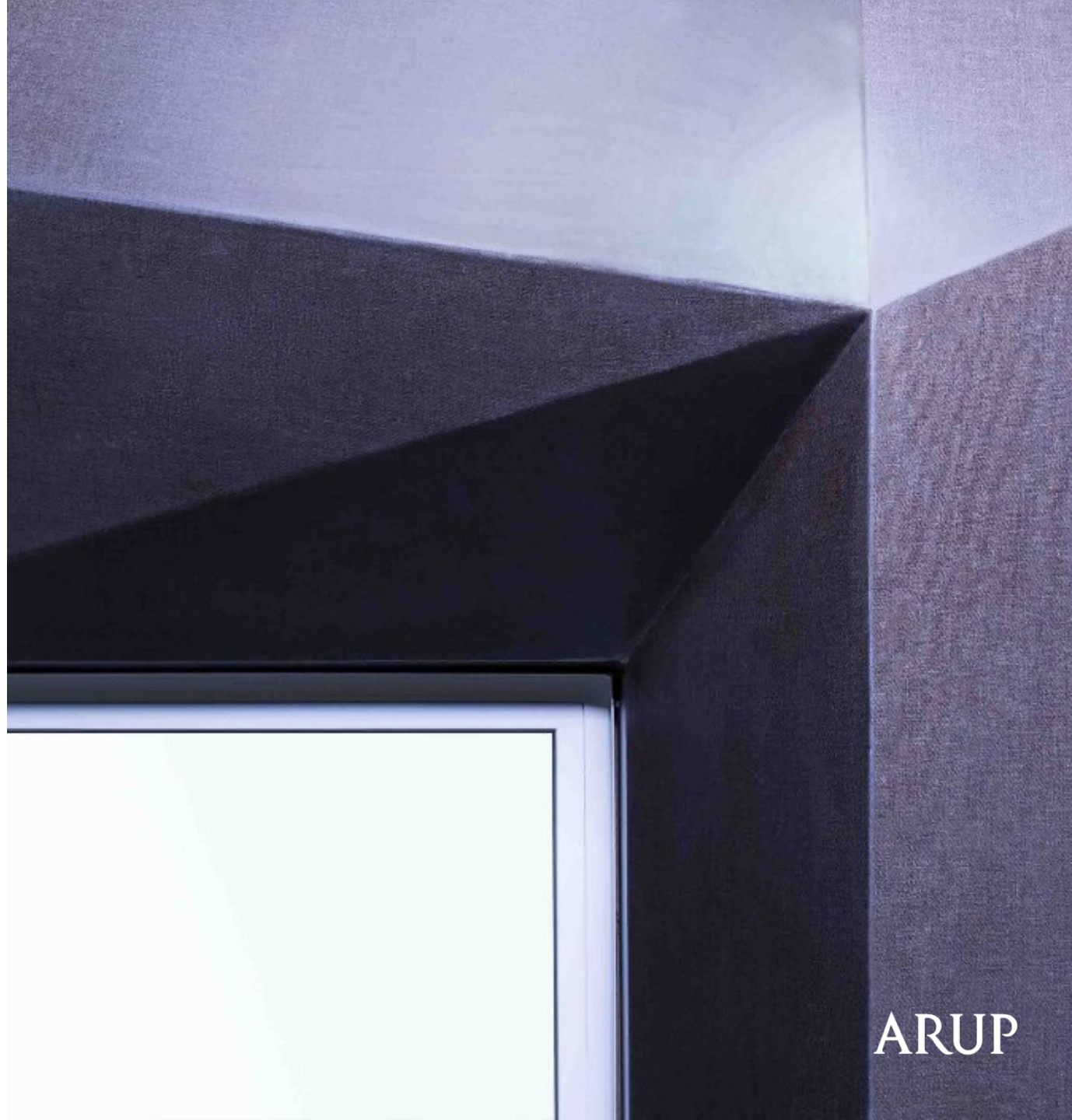






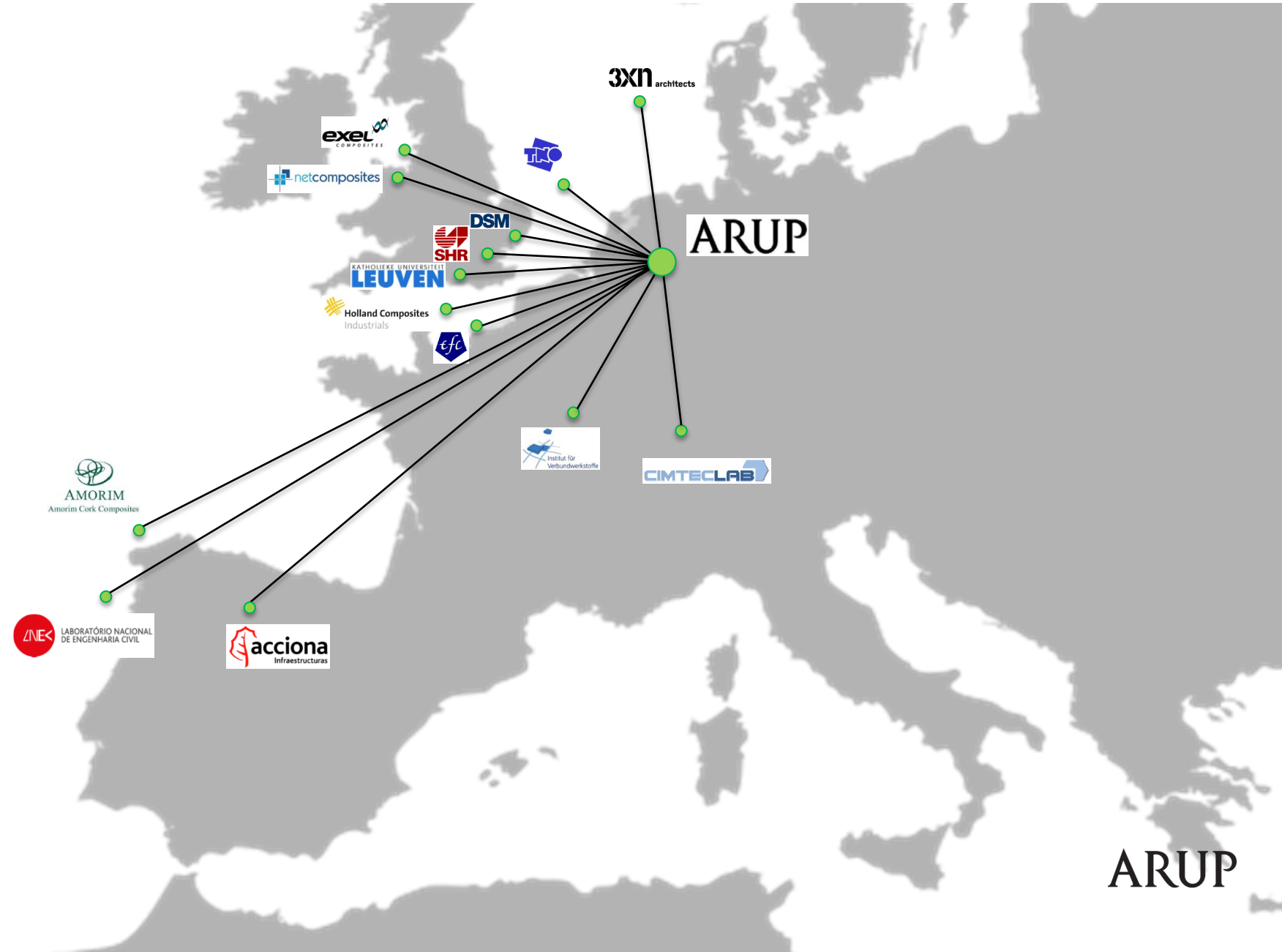
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BioBuild

- F7-EU funded project
- International consortium
- 15 Partners
- 7.5 M € overall budget



BioBuild

Berlin, Germany

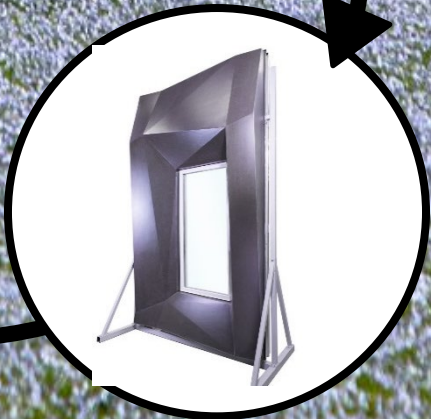
*[Bio degradable façade components
for a cradle to cradle design]*



TAKE



MAKE



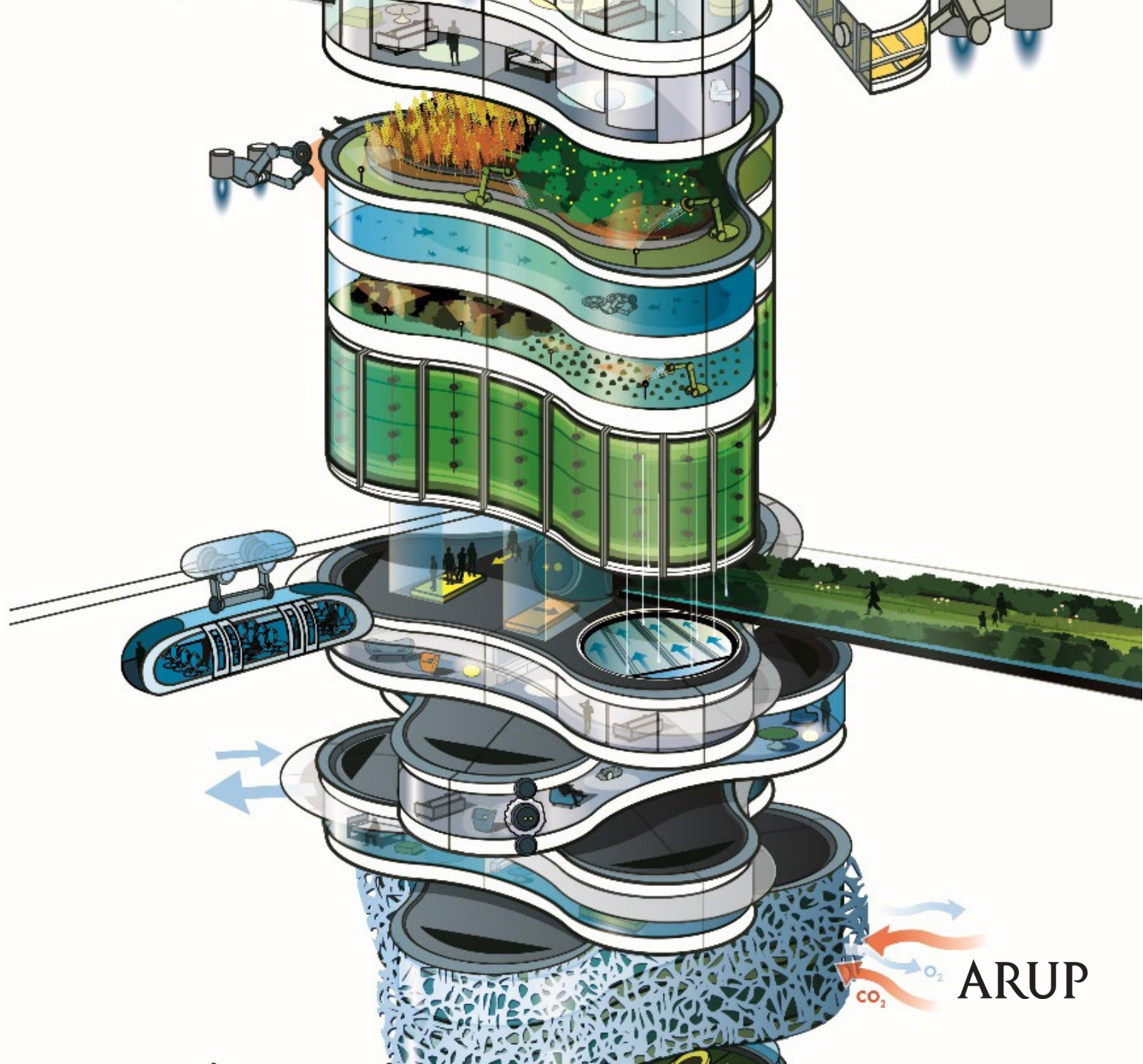
REGENERATE



20??

[Future in inspirational integration due to integration of many sustainable design aspects]

Sustainability driving better Envelope Design



D A M DEUTSCHES
ARCHITEKTURMUSEUM

2020

AUSSTELLUNGEN \ EXHIBITIONS
SEPTEMBER — DEZEMBER SEPTEMBER — DECEMBER



EINFACH
GRÜN

CALL FOR PROJECTS!



FÜR GUTES
KLIMA IN
DER STADT

2020

AUSSTELLUNGEN \ EXHIBITIONS
SEPTEMBER — DEZEMBER SEPTEMBER — DECEMBER



#EINFACH_GRÜN

AUSSTELLUNG

Jan-Juni 2021 ²¹

Dass Parks und Gärten GRÜN sind, davon gehen wir aus. GRÜN erobert immer mehr die Architektur der Städte: Wo kurzem noch das graue Kiesdach und die Betonfassade die S reflektierten, wuchern Kräuter, ganze Baumlandschaften und Hängepflanzen. Wo vor Jahren der weiße Hausgiebel strahlte, rankt der wilde Wein und in den Höfen wetteifern Gemüse und Rankgewächse um jeden Sonnenstrahl.

Wo genau sind diese grünen Inseln, die dem klimatischen Verhältnis von Architektur, Bewohnern und Nutzern so prägnant zuträglich und von den Straßen oft wenig einsehbar sind? Wer sind die Initiatoren, wie haben sie es angestellt und wozu dienen die grünen Dächer und Fassaden?

Schickt uns Eure GRÜNen Taten!

EINFACH-GRÜEN.JETZT



Die Stadt von morgen ist GRÜN !

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Arup Fellow

