



GRUENE ERDE

breathing headquarters



Breathing Exercises for the Future

A Breathing Headquarter
by Plant-Based Systems Design

GRUENE ERDE

Breathing Headquarters

THE PURPOSE. 2030 NOW

Let's take a look at one possible future:
it is plant-based, petroleum-free, socially just and ecologically sound. Now, how can we bring all this together in building design?

Our design philosophy fits well with these principles – because we integrate human needs within the vibrant ecology of our living environment. With the GRUENE ERDE Breathing Headquarters project, given standards in terms of design, material consumption, energy consumption and the bioclimatic impact of large structures are subsequently questioned – and fundamentally redefined.

The company GRUENE ERDE accepted the challenge. As they specialize in the development and manufacturing of products in which ecological, sustainable thinking and action are fundamental – their specific consideration of socially just trade and material chains of exclusively renewable resources most resonates with global goals 2030.



THE IDEA.

plant-based breathing design

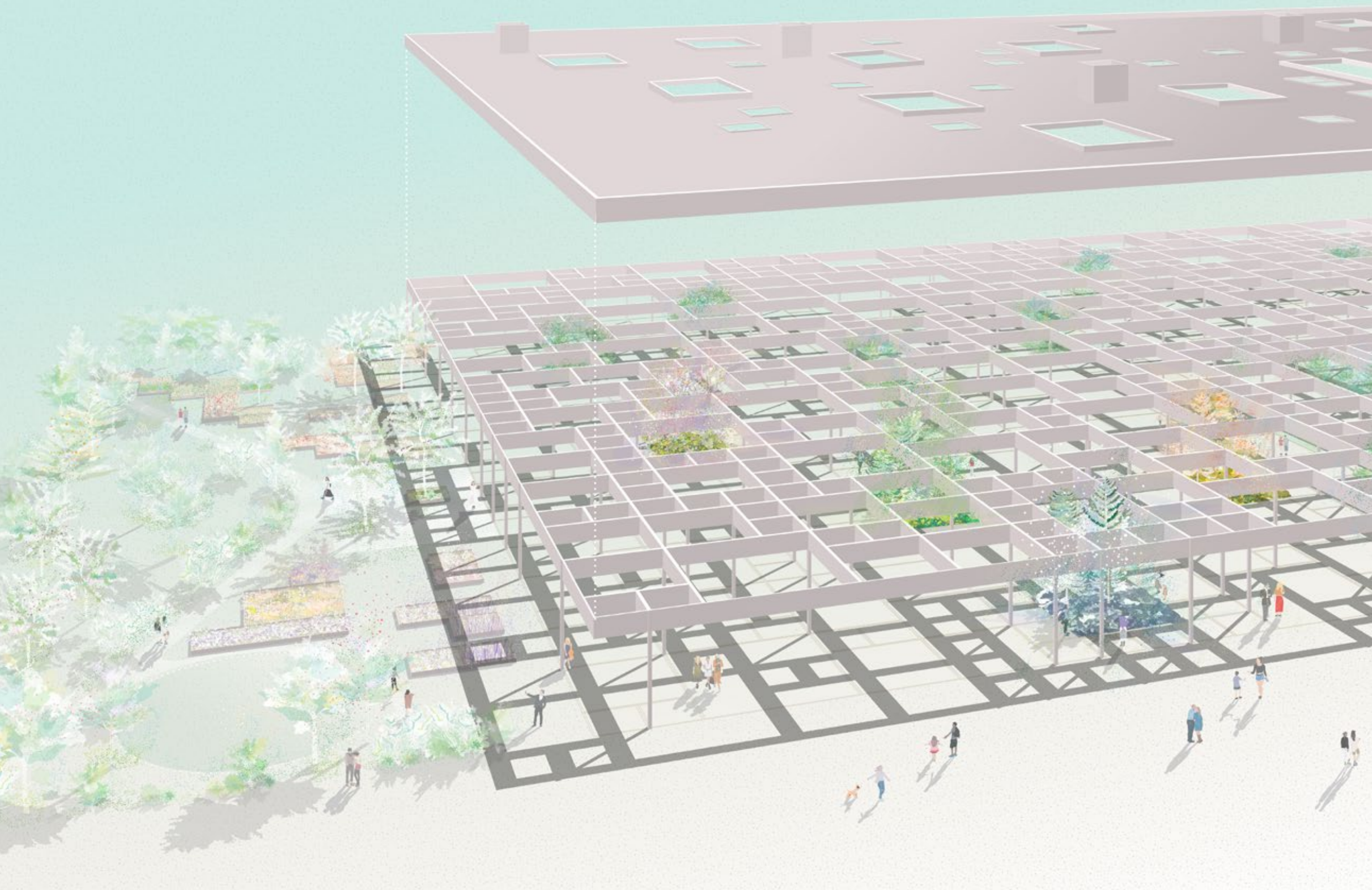
The 2030 Agenda for Sustainable Development presented by the United Nations is a call to revolutionize societal practice on our planet. It includes 17 goals and related topics such as water, energy, climate, urbanization, transport, science or technology. For us, these goals represent the basis of an inspiring global building practice.

We answer in designing an entire ecosystem. As a proof-of-concept for the UN goals 2030, we propose a plant-performative design approach that introduces biophilic breathing into buildings.

A systems design approach that is literally introducing breathing in oxygen, originating from its densely vegetated bioclimatic courtyards into architectural typology.

Augmented plant-performance provides fresh clean air and oxygen to breathe, while cooling all spaces and fully substituting conventional climate machines. A design that is 98.5% petroleum free and powered by renewable energy from 100% on-site resources. The end of air-conditioning as we know it and a beginning for a new kind of co-habitation on our planet Earth.





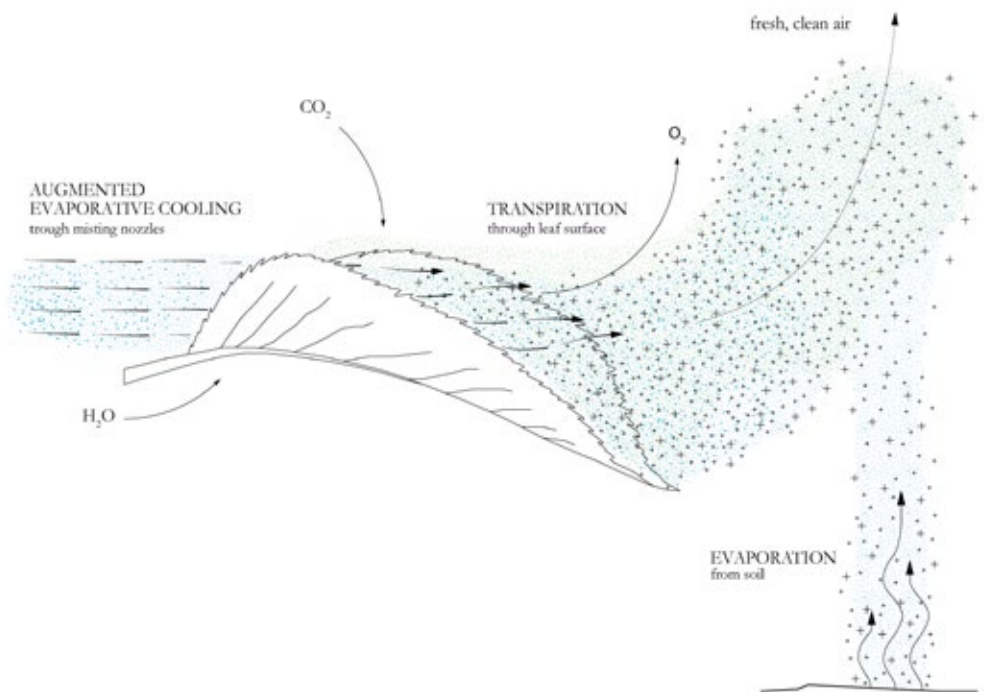
CONCEPT GRAPHIC INTERIOR LANDSCAPE:
The cassette roof-structure constructed of regional timber, defines with its roofscape individual "places" in the interior of the new GRUENE ERDE headquarters, rhythimized by thirteen performative plant courtyards.

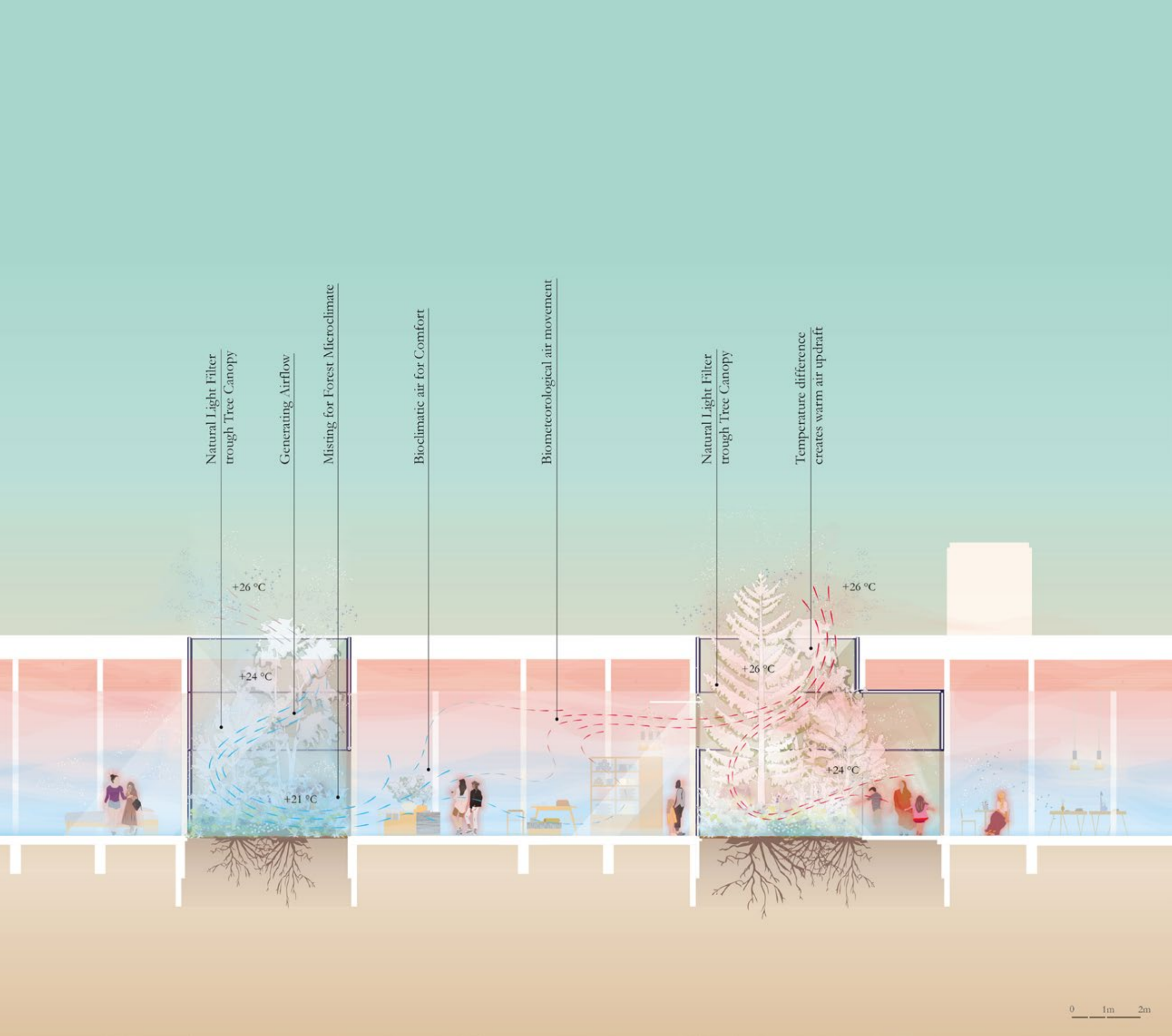
INNOVATING.

bioclimatic and sensual

As a world-premiere, at the GRUENE ERDE Breathing Headquarter “augmented climatic and atmospheric plant-performance” is applied on a large scale as a bioclimatic, ventilation and cooling concept.

This involves replacing extensive building services equipment with planting yards and their performance. They are creating individual microclimates, provide natural, living light and provide air and fresh oxygen for the entire building ventilation. An example of future bioclimatic architecture through systemic innovation.





HERBAL GARDEN
Providing organic herbs for bistro's menu and educational purposes

FURNITURE EXHIBITION

WORLD OF SLEEP

SOUTH FACADE CANOPY

PRODUCTION MANAGEMENT

LIVING, BREATHING COURTYARDS WITH OUTDOOR CLIMATE
Our plant performance brings the vitality of vegetation directly into play. Cooling takes place via augmented evapotranspiration of the plants themselves, with simultaneous oxygen production

ORGANIC MATERIAL STORAGE

WEST FACADE CANOPY

DELIVERY SERVICES

SMALL FURNITURE

BOOK CORNER

TROPICAL GREENHOUSE

VISITOR TOUR

TEXTILE PRODUCTION

TECHNICS

HERBAL CAFE



VISITOR ENTRANCE

ADMINISTRATION ENTRANCE

FRUIT ORCHARD

COSMETIC PRODUCTION

VEGETATIVE SHADING

HOME TEXTILES

VISITORS CLOAKROOM

PRODUCT PRESENTATION AREA

VEGETATIVE SHADING
Nonhuman protagonist providing microclimate for habitable space, reduced energy costs up to 80% and ecosystem performance

WEST FACADE PERGOLA

EAST FACADE CANOPY

BISTRO

FLAGSHIP STORE

ENTRANCE/RECEPTION

MANAGEMENT CENTRE

NEW PRODUCTS ROOM

WOODEN FRAME ROOF STRUCTURE
Parametrically optimized with an original algorithm, which negotiates the courtyard positions with structural, atmospheric and economical parameters

FOREST
Nonhuman commons that is providing microclimate through evapotranspiration, indigenous biodiversity as local food & micro-economy resource

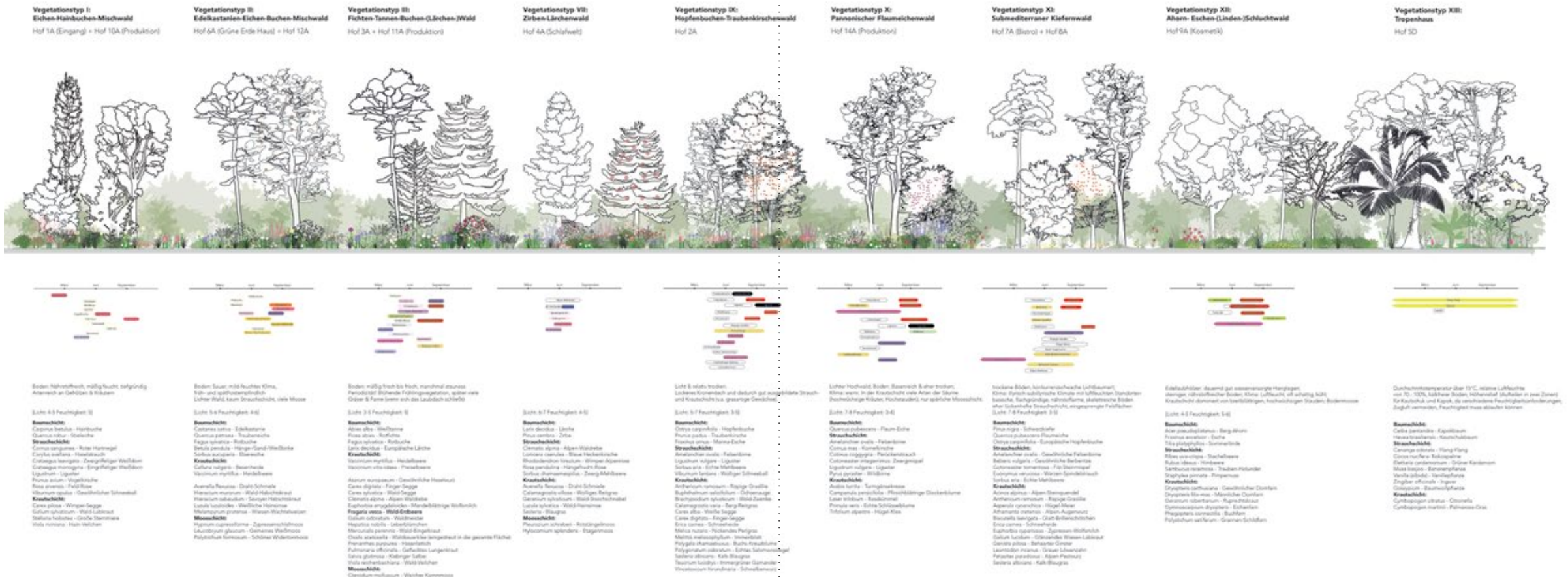
THE WORKING.

green innovation

Like inverted clearings in a forest, the interior landscape of the new GRUENE ERDE head-quarters is structured by thirteen patios, allowing daylight and oxygen to impact the way we sensually experience our daily working and living environment. Here, the augmented performance of individual forest-plant-communities of Austrian living forest ecotypes, are providing fresh clean air and oxygen to breathe. Augmented performance means to enhance the evaporative cooling properties of living plants – as evapotranspiration is a highly effective means to cool air naturally. The end of air conditioning as we know it and a beginning for a new kind of plant-based cohabitation on our planet Earth.



VIEW OF A BREATHING ATRIUM:
Supported by active fogging on hot days, the atria actually allow the building to organically breathe in and out, cooling all interior spaces – without the use of air conditioning.





“While walking into the building, you enter a landscape at the same time.”





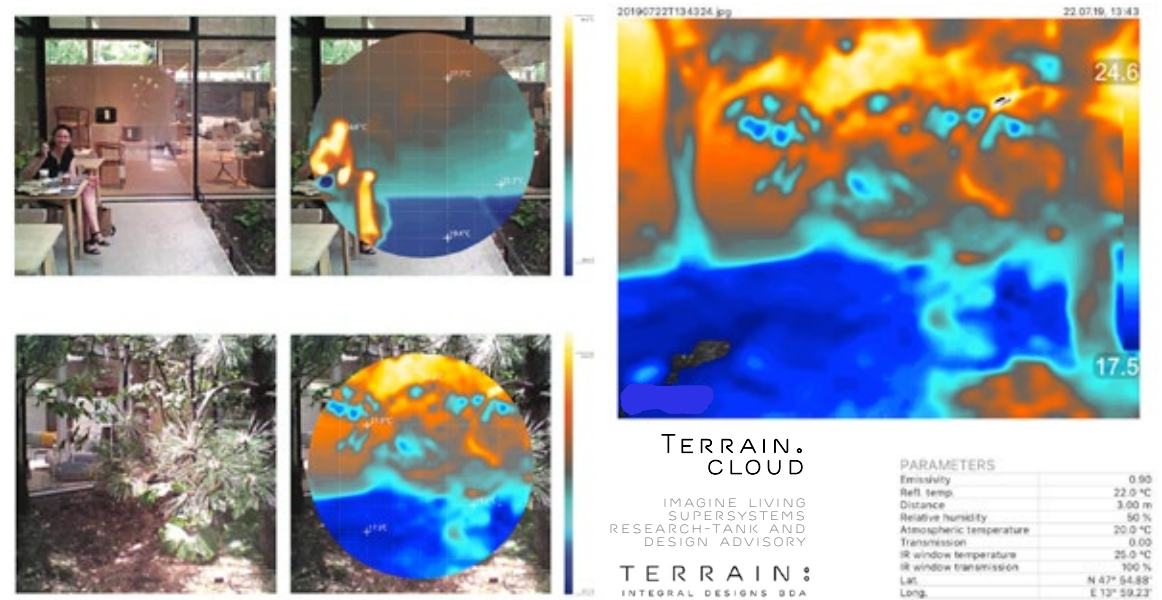
THE ECONOMY OF ECOLOGY.

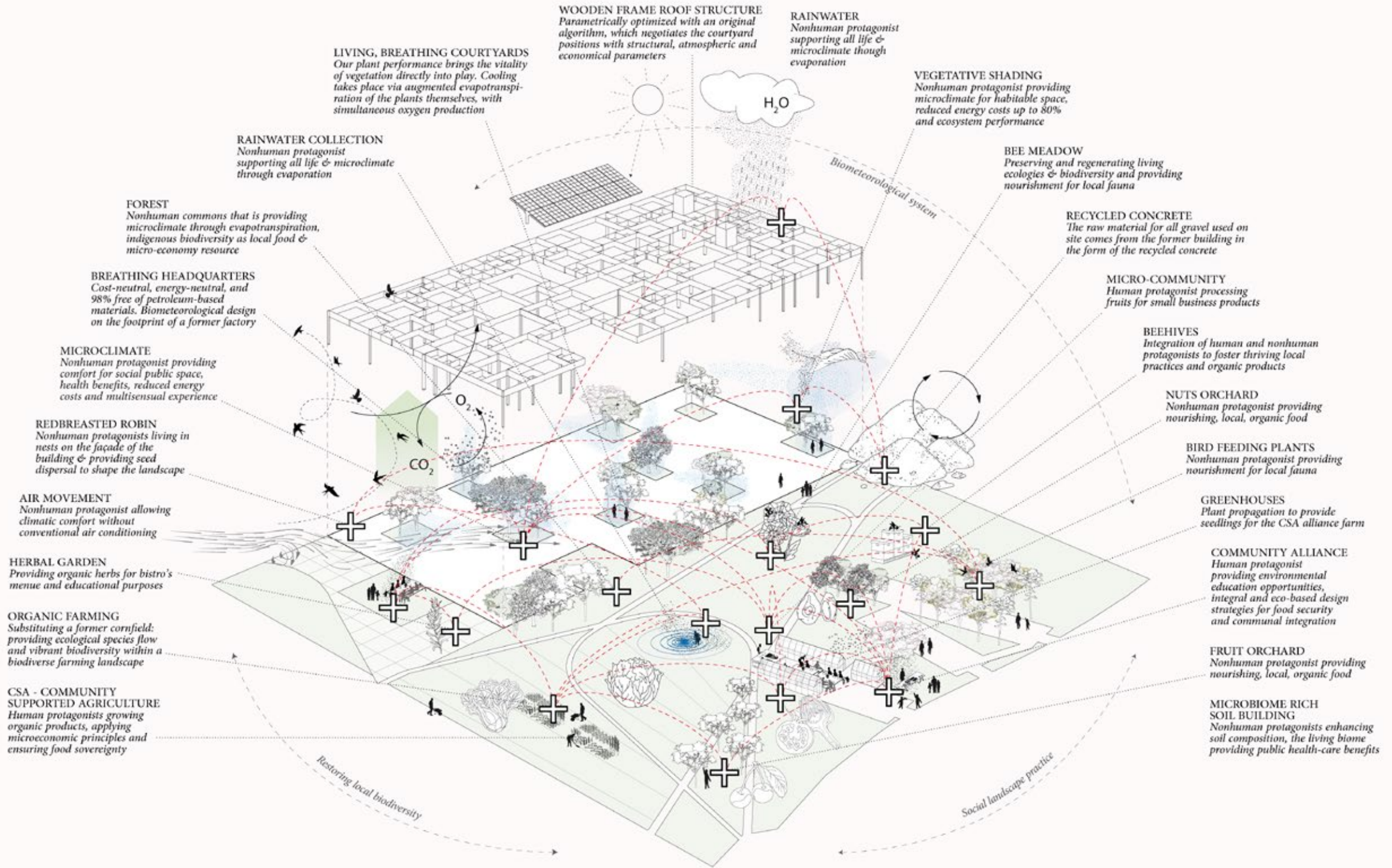
Energy independent, climate positive and cost-neutral

Does a climate-positive, energy neutral, carbon-free and biodiverse design generate additional concerns and costs?

The GRUENE ERDE Breathing Headquarter is the proof-of-concept for a carbon-neutral and cost-neutral building future! Excessive building infrastructure (and its construction budget) was substituted by sensing technology bound to augmented plant-performative cooling and breathing - a performative techno-natural system, that even promotes forest biodiversity. Through its 100% on-site generated solar-powered energy, climate and oxygen production, the headquarter is climate positive - providing a major sustainable factor for its entire life-span.

THERMAL INFRARED ANALYSIS OF A BREATHING ATRIUM:
The infrared images show best the performative cooling properties of the planted courtyards.





Breathing Headquarter

Performative More-than-human
Biophilic System

ACTIVE ECOLOGICAL LANDSCAPE.

It is crucial that our project approach does not end at the building facade. A large meadow in the Almtal valley welcomes visitors to the GRUENE ERDE headquarters with a diverse landscape of fruit trees and large native shrubs: 450 trees up to seven meters high and around 700 shrubs of exclusively native varieties have been planted on the former corn fields. According to the CSA principle of “community supported agriculture”, a company initiated farm it is run by the local initiative ‘Almgruen’. In two greenhouses, vegetables are grown for the company’s own bistro, and visitors can experience the germination and growth of the plantbased raw materials used for the GRUENE ERDE products. The surrounding orchards are planted with different old fruit varieties and are largely left in their natural state to allow insects and animals to overwinter.



THE LIVING LANDSCAPE:
Instead of creating a purely representative interstitial space, an organic agriculture farm, based on the CSA principle, with organic fruit and vegetable gardens, is now integrated directly in front of the GRUENE ERDE headquarters.





A PIECE OF HORIZON.

a sensual medium

Almost like a reflecting lake. A piece of horizon made of glass shingles determines the surprising first impression upon arrival at the GRUENE ERDE site. One is first occupied with sensually experiencing the organic aliveness of the grounds of the headquarter, as just the sky, trees and landscape are in front of one's eyes. Quite surprisingly, this main façade is then not a representative means. For this matter, the different angles of inclination of the glass shingles help to experience the liveliness of the natural setting, the wider landscape, its sky and clouds in changing weather and different light moods. One's own movement in front of the shingles makes the landscape most tangible. Robert Smithson's land art projects Ithaca Mirror Trail and Mirror Displacement were in a sense the inspiration for this translation. Turned into a façade, the reflecting mirror-facets do not form a pictorial continuum, but rather act as a medium with which we can experience the landscape on a level related to our senses.

THE OUTSIDE VIEW:
Almost like a reflecting lake. A stretch of horizon made of glass shingles determines the surprising, first impression upon arrival at the GRUENE ERDE site.





Mirror Displacement test arrangement:
Robert Smithson's land art projects 'Ithaca
Mirror Trail' and 'Mirror Displacement'
were the inspiration.



A LIVING WORK ENVIRONMENT.

How will the working staff relate to this building? And how will the visitors experience it? Our goal – as enrichment! The working atmosphere in the textile processing plant is most characterized by the daylight-flooded interior. Here, the time of day, the weather and the lighting mood become tangible for the workers at any moment. How does it feel to have living treescape right in front of your eyes while working? And what about the building materials that do not emit any harmful substances? The smiling faces of the employees speak for themselves. As sick leave drops to almost zero, it becomes obvious that the vibrant aliveness of this living interior “communicates” most positively.



MAKING AND BEING IN PRODUCTION:
The furniture upholstery, tailoring, mattress, pillow and natural cosmetics production, a show production, a store with furniture exhibition and sleep world, as well as a vegetarian-organic bistro – all under one roof. Production takes place in the same, natural environment of the planted courtyards.



CLOSING THOUGHT.

imagining a plant-based future

We are keen to inspire a larger audience with one possible future: it is plant-based, petroleum-free, socially just and ecologically sound. It is about living and connecting to fellow humans and to our alive environment — to rethink given standards in design, material use, energy usage and bioclimatic design of large structures.

We suggest one possible answer with this plant-based biophilic project, a proof-of-concept, that can inspire multiple projects to come. In times where clean and fresh air becomes most precious and healthy working conditions a prerequisite, it is an innovative design solution that will lead us into an ecologically sound future that our planet and all its life so urgently deserves.



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Breathing Headquarters

ENDORSEMENTS AND RECOGNITIONS.

“The current exceptional situation around the world offers an opportunity to pause and reconsider the values of our partly uninspired and inhumane construction production, [...]. How do we want to live in the future, how do we want to learn, how do we want to work? Like this, for example.”

Wojciech Czaja on the Breathing Headquarter im DER STANDARD May 2020

AWARDS

Zumtobel Group Award 2021 (Shortlisted Category “Buildings”)
DDC Competition “WAS IST GUT” (Winner Category “Raum”)
AIT-Award 2020 / Best in Interior and Architecture (Winner Category “Industrie/ Gewerbe”)
GREEN GOOD DESIGN AWARD 2020 (Winner Category “Green Architecture”)
DAM-Preis 2021 (Selected Category “Auslandsbauten”)
TRIGOS 2020 (Nominated Regional Category “Wertschaffung”)
Österreichischer Staatspreis für Design 2019 (Winner Category “Räumliche Gestaltung”)
Austrian Interior Design Award 2019 (Winner Category “Ladenbau”)
OÖ Holzbaupreis 2019 (Winner Category “Gewerbe”)
OÖ Landespreis f. Umwelt und Nachhaltigkeit 2019 (Winner Category “Betrieb”)

FACTS AND NUMBERS.

Implementation 2015 - 2020 phase 1
(phase 2 ongoing)

Numbers

Usable area of 12000 m² total. 13 plant-performative courtyards (20-30sqm) for natural light, clean air as well as natural air conditioning through cooled air and oxygen production. Plantings with 9 different native forest plant communities.

Social practice

On-site farm following the CSA principle of "community supported agriculture". Biological-vegetarian gastronomy from on-site vegetable and fruit production. Garden nature trail, hiking trails, bicycle rental. Production of sustainable products only. Regional employer with mainly Austrian value and material chains. Valueable and sensual space (educational value).

Funding and cost

Financed through crowdfunding participation model 2013. Cost-neutral to comparable "standard" industrial building through redistributing budget from standard ventilation building services to plant-performative breathing.

Material metabolism

98.5% Petroleum-free building materials. Building footprint is identical to the previously existing production building. Demolition concrete used for foundations and base of path surfaces. 100% 1900 m³ regionally sourced timber, and natural insulating materials. Timber frame construction with solid columns and load-bearing structure, glued laminated timber spruce for the supporting structure and roof element ribs, three-layer boards spruce for wall and roof element planking, facade silver fir, 507m³ virgin wool for facade insulation from D, CH, A. Photovoltaic system with system output 310,08 kWp. The energy use is 100% balanced. All rainwater is infiltrated to enable a balanced soil ecology in the vicinity of the site.





GRUENE ERDE

Breathing Headquarters

GENERAL PLANERS
ARCHITECTURAL DESIGN, DETAILED DESIGN
AND LANDSCAPE DESIGN

terrain:
integral designs BDA
Munich / Graz
Klaus K. Loenhardt, Katharina Hengel, Claudia Pittino, Clara
Hamann, Maria Fellingner, Kathi Zull, Zoe Yan Zou, Paul Frick,
Ondrej Hanuz

INTERIOR DESIGN
terrain: integral designs BDA Munich & archibrand Munich
Klaus K. Loenhardt, Daniel Hildmann

CONSTRUCTION DOCUMENTATION,
AND CONSTRUCTION MANAGEMENT
ARKADE GmbH Linz
Klaus Landerl, Gabriel Trinkl, Manfred Leitgeb

CLIMATE ENGINEERING
transsolar Munich
Wolfgang Kessling, Dietmar Geiselmann, Daniel Kiehlmann

CLIENT
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Jan Schünke, terrain: integral designs, Simon Oberhofer,
Grüne Erde

„In taking up the natural
performance of our breathing planet as our
instructive co-designer — we partner with
our living and vibrant world.”

2030 NOW
Green Innovation
Impact Design
Bioinspiration in design
Plant Performance
Petroleum Free Design
CO2 and Energy Neutral

terrain: integral designs BDA

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