CleanMed
Creating Healing Environments

Europe
2020
ONLINE

Green Building Certification

by Sylvie Meunier, *A*rdism

24th of Nov. 2020

What is a Green Building Rating System?

= method of

assessing,
rating,
and certifying

the **sustainability** of buildings.

Photo: Ardism

Why Use a Green Building Rating System?

- Achieve sustainability goals
- Comprehensive tools
- Create cost-efficient buildings
- Make buildings healthier & increase patient discharge rate
- Compliance to ESG criteria for green financing
- Recognition and marketing
- Increase in capital cost
- Accountability

Photo: Ardism

Green Building Rating Systems

Green Building Rating Systems

BREEAM®

LIVING BUILDING CHALLENGE℠

Green Building Rating Systems

Varied building types,
Refurbishment or new construction

= COMPREHENSIVE TOOLS

BREEAM®

U.S. GREEN BUILDING COUNCIL
LEED
USGBC

LIVING BUILDING CHALLENGE℠

+

INTERNATIONAL WELL BUILDING INSTITUTE

= HEALTH & WELL-BEING SPECIFIC

Green Building Rating Systems

BREEAM®

= Building Research Establishment Environmental Assessment Methodology

- Since 1990
- BRE (UK)
- >550.000 certified buildings
- >50 countries
- Certification process: licensed assessor collects data

= Leadership in Energy and Environmental Design

- Since 1998
- USGBC & GBCI – non-profit
- >84.000 certified buildings
- 82 countries
- Certification process: data collected by design team

LIVING BUILDING CHALLENGE℠

= Living Building Challenge

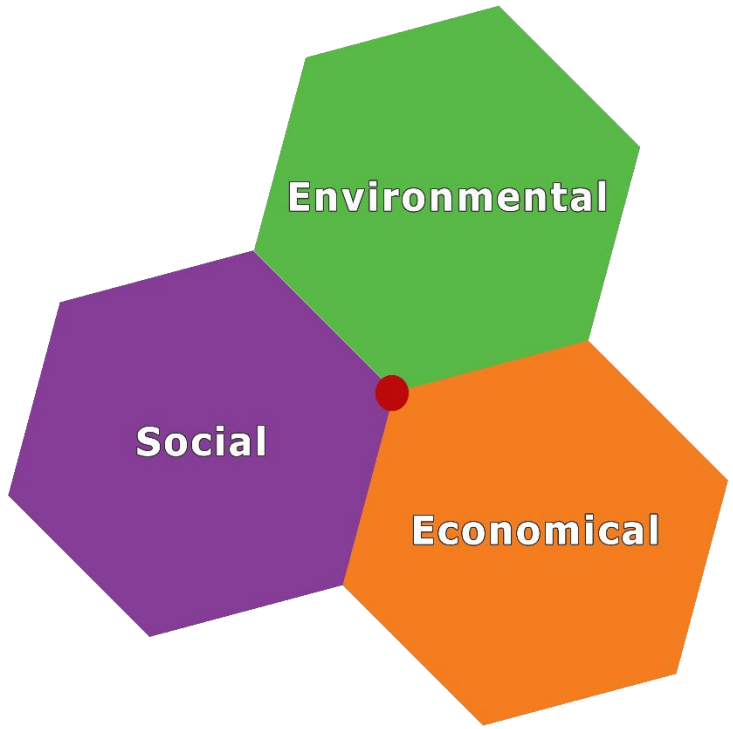
- Since 2006
- Living Future Institute – non-profit
- >136 certified buildings
- > 34 countries (regsitered)
- Certification process: data collected by design team after 12 months occupancy, based on actual consumption,

Green Building Rating Systems

= WELL Building Standard

- Since 2014
- International WELL Building Institute & GBCI
- >340 certified buildings
- >67 countries
- Certification process: after 1 month occupancy, based on actual performance, data collected by design team
- Crosswalks with LEED, BREEAM & LBC

Measuring Sustainability

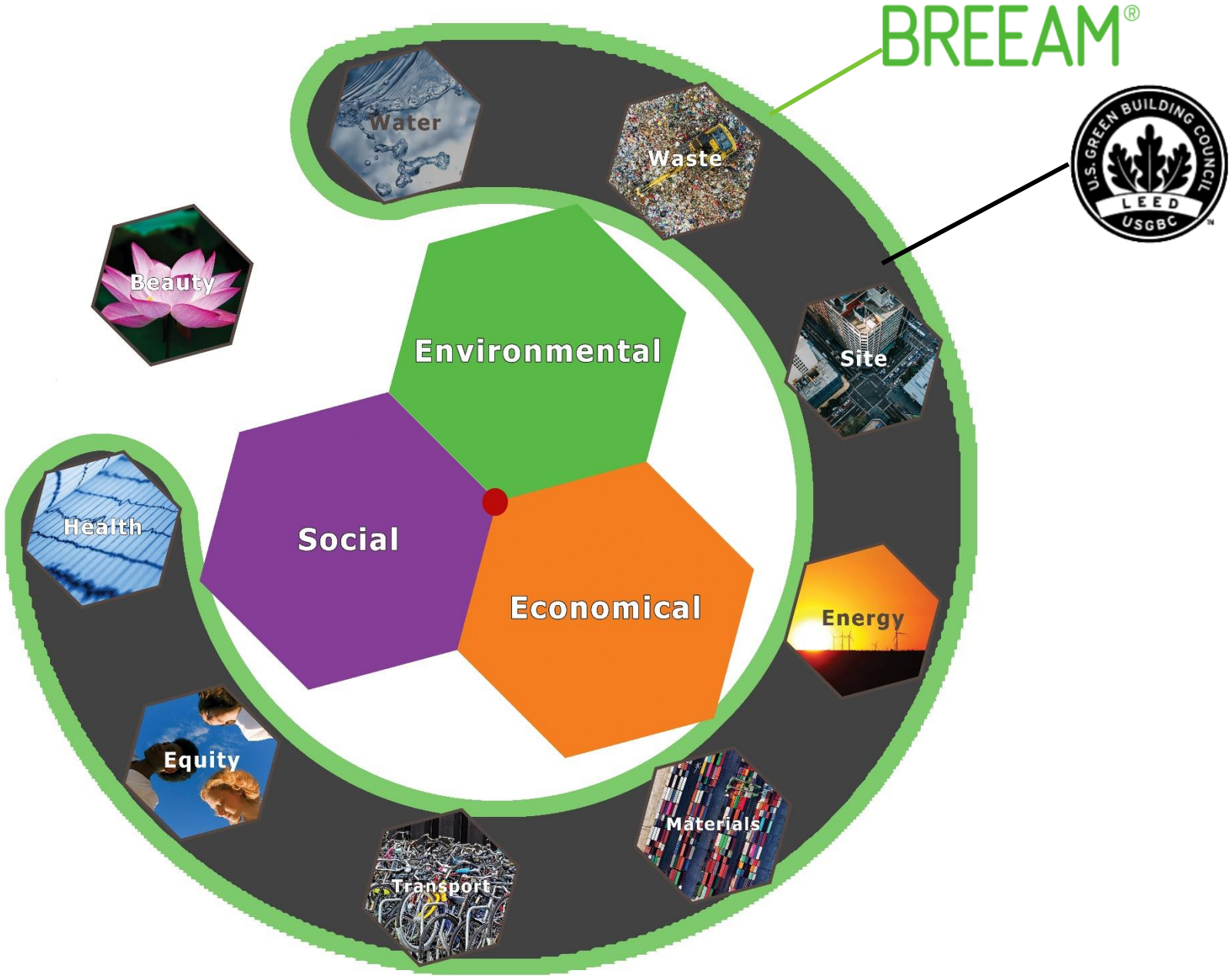


Measuring Sustainability

Measuring Sustainability

INTERNATIONAL
WELL
BUILDING
INSTITUTE

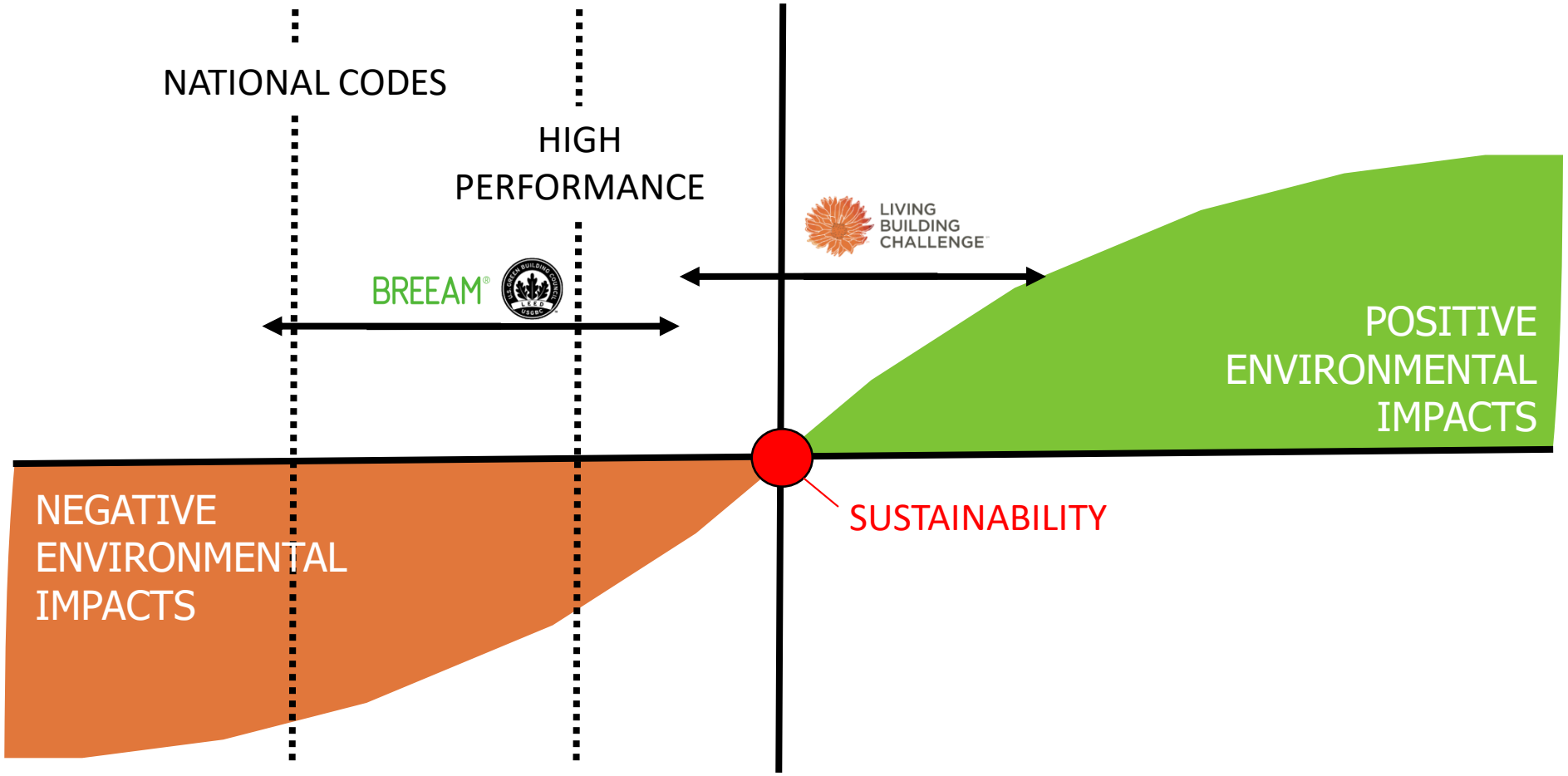
Measuring Sustainability



Measuring Sustainability

LIVING BUILDING CHALLENGE℠

Measuring Sustainability



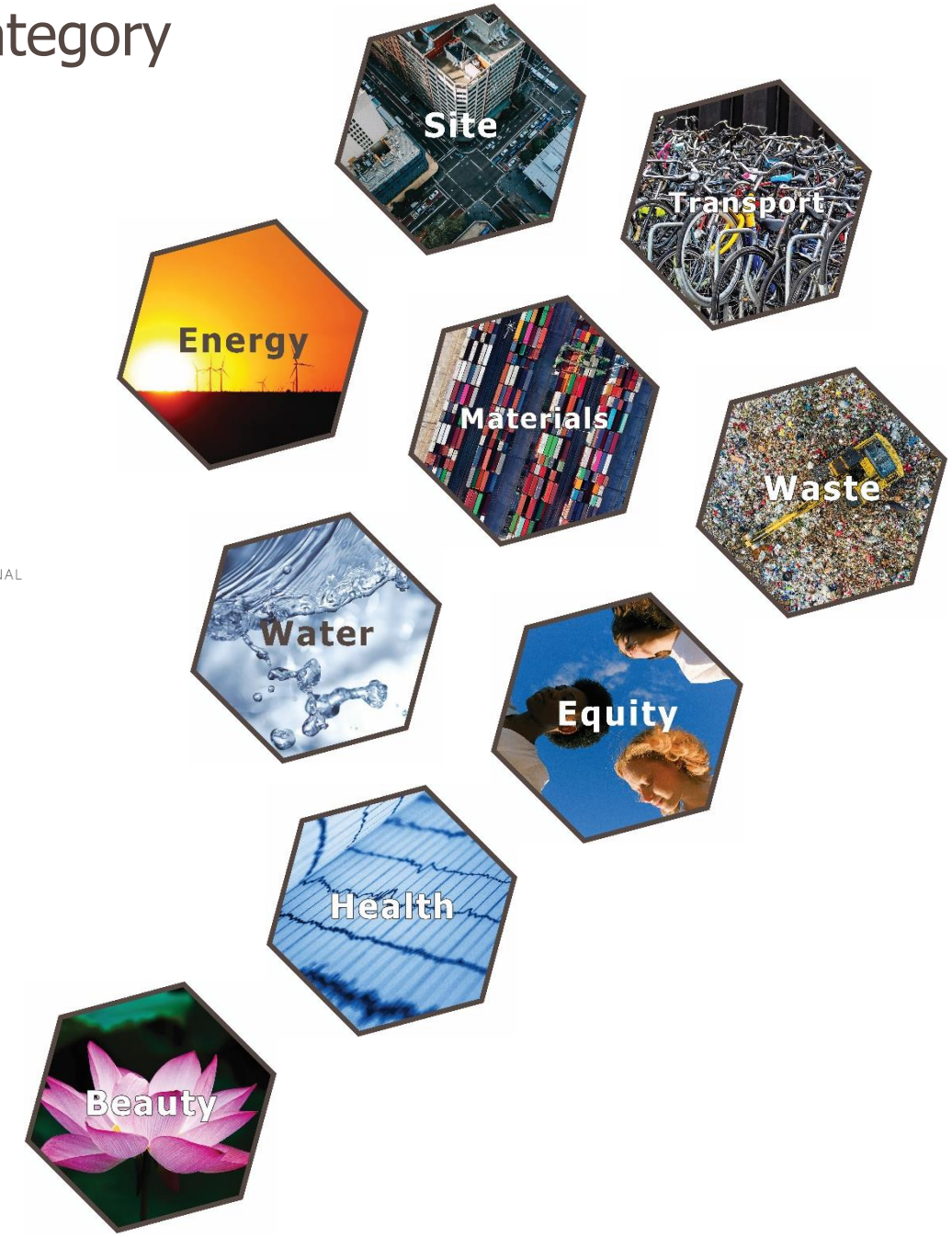
Strategies per Category

BREEAM®

LEED

LIVING BUILDING CHALLENGE

INTERNATIONAL WELL BUILDING INSTITUTE



- Brownfield remediatation
- Protect sensitive land / natural habitats
- Access to public transportation
- High density building
- Privilege neighbourhood with diversity of use

- Travel assessment
- Avoid flood-risk, natural hazard risk areas

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM®

INTERNATIONAL WELL BUILDING INSTITUTE

Site Selection

- Connection to nature – places of respite
- Heat island reduction
- Manage rainwater
- Design for resilience
- Prevent pollution/long-term impact from construction activities

- Light pollution reduction
- Noise pollution reduction
- Alarm Systems
- Enhance site ecology
- No petrochemical fertilizers or pesticides
- Promote urban agriculture

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM®

INTERNATIONAL WELL BUILDING INSTITUTE

Site Management

- Access to public transportation
- Promote bicycling, walking
- Promote electric vehicles and carpooling
- Limited car parking

- Survey occupants on fuel-based trips

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM®

INTERNATIONAL WELL BUILDING INSTITUTE

Transport

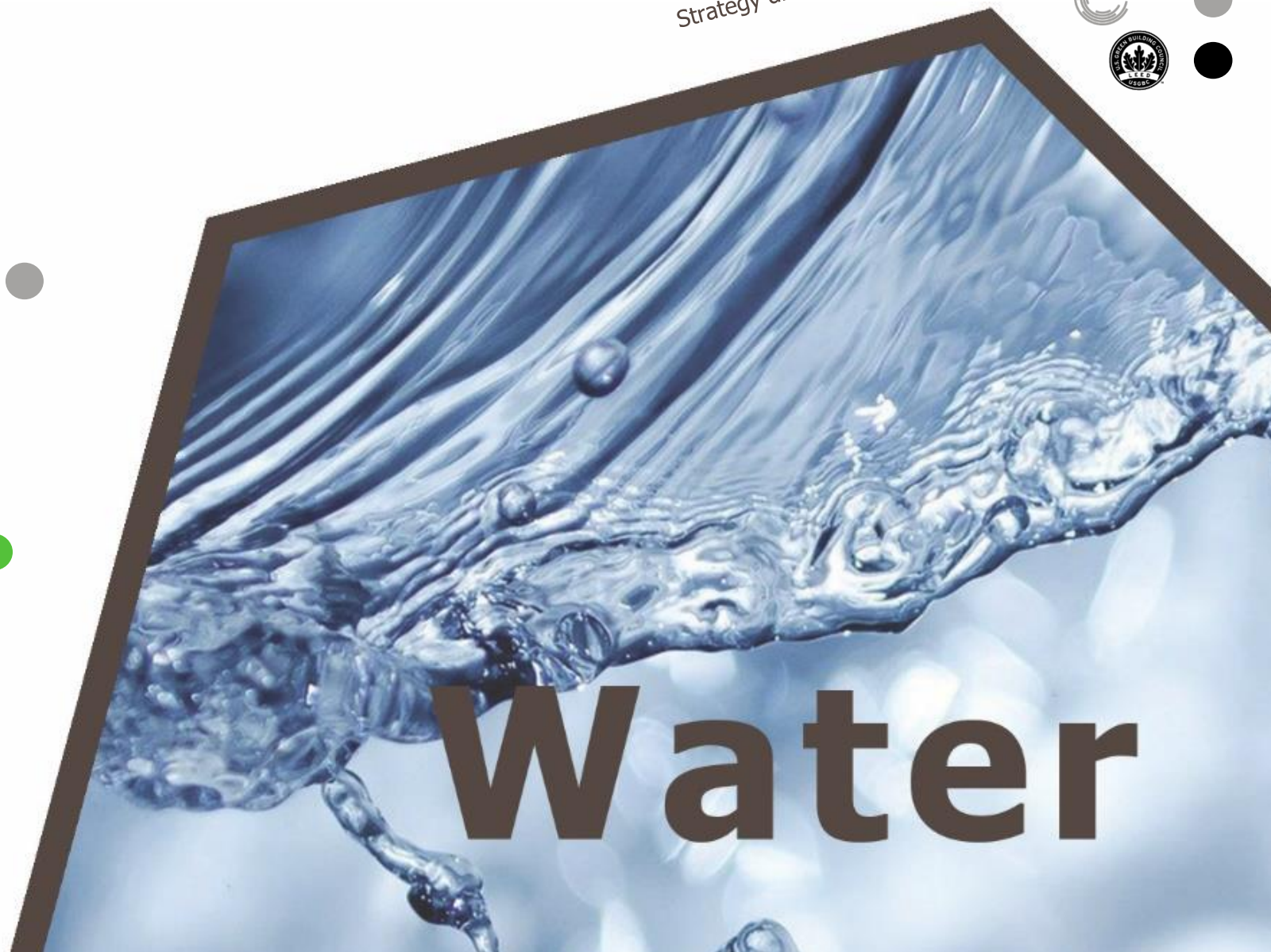
- Indoor water use reduction
  - Low-flow / low-flush fixtures
  - Water-efficient appliances
- Outdoor water use reduction
  - Efficient/no irrigation systems
  - Native adapted vegetation
- Water harvesting and reuse
- Water quality & prevention of water pollution
- Process water preservation and control
- Level metering, leakage prevention and detection systems

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE



- Optimize energy performance:
  - Bioclimatic architecture
  - Fabric performance
  - Air permeability
  - Efficient building services
  - Low-energy lighting
- Renewable energy
- No harmful refrigerants
- Level monitoring

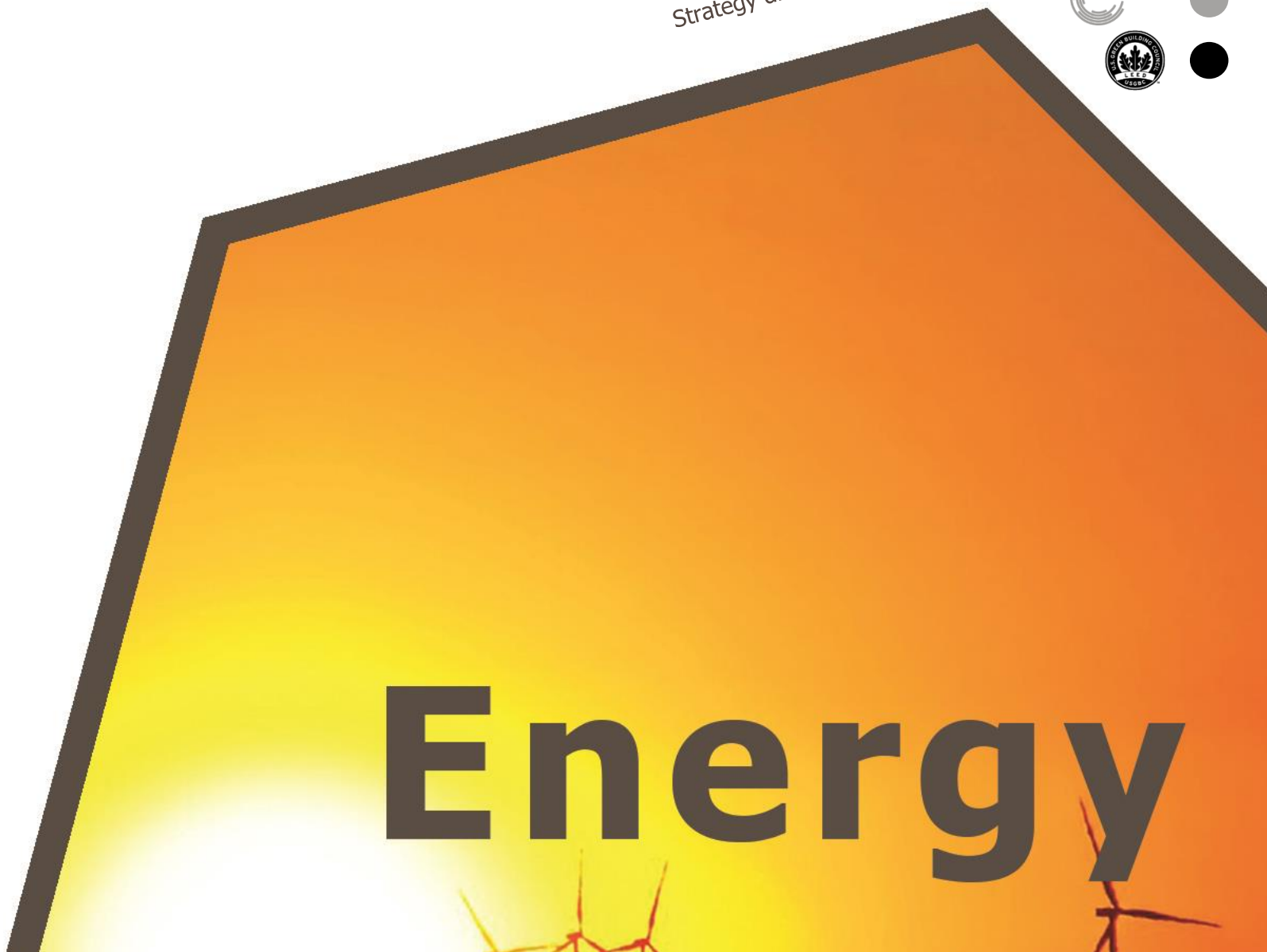
- Grid harmonization
- Offset embodied carbon emissions from construction
- Design for resilience: energy storage

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE



Case Study 1

Soppuka Welfare Centre

Finland

6,790 sqm

LEED v.4 NC Healthcare

since 2020

Owner: YIT

Arch.: Lukkaroinen Architects

Sustain. Consult.: GBP

MEP Eng.: Granlund Oulu

Constr. Man.: AINS

Photo courtesy: Lukkaroinen Architects

STRATEGIES

- Geothermal system for heating & cooling + district heating
- No refrigerants
- Energy-efficient luminaires
- Heat recovery in ventilation
- Remote monitoring system

Energy simulation

Reduction in energy consumption:
(from baseline)

85,9 % on heating

80,6 % on exterior lighting

60,0 % on service water heating

53,0 % on interior lighting

source: GBP

Photos courtesy: Lukkaroinen Architects

STRATEGIES

- Low flow faucets with aerators
- Low flow shower heads
- Low flush toilets & urinals
- Native and adapted plants species

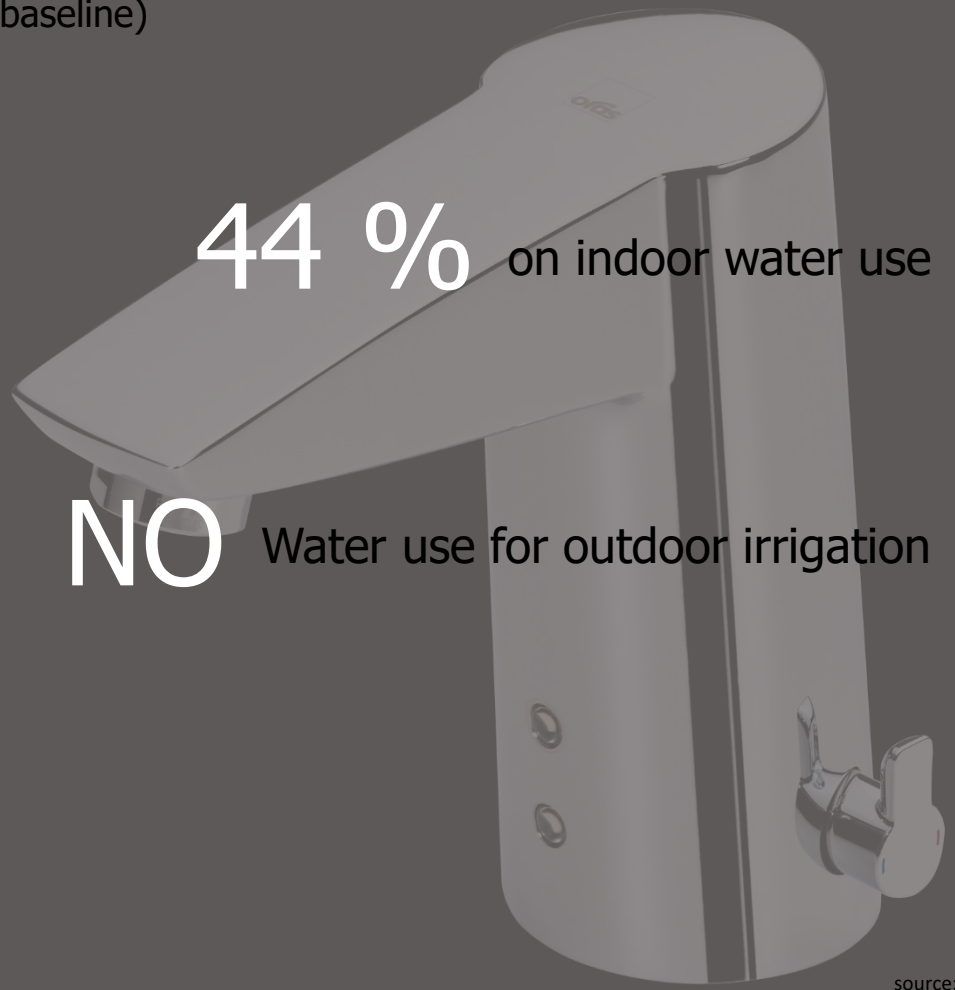
Photo courtesy: Lukkaroinen Architects

Water Use Reduction

Reduction in water consumption:
(from baseline)

44 % on indoor water use

NO Water use for outdoor irrigation



source: GBP

- Reduce: material efficiency
- Building life-cycle impact reduction : building re-use
- Product disclosure and optimisation:
  - Full life-cycle assessment
  - Materials/furniture re-use
  - Non-toxic components/ingredients
  - Labeled/certified responsible materials
  - Local materials
  - Reduced embodied carbon
- Design for flexibility/future
- Design for durability/resilience
- Containment of hazardous chemicals

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE

Materials

- Storage for recyclables
- Repurpose waste
- Divert construction waste

- Maintenance and repair program
- Re-usable, non-plastic kitchen ware

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM®

INTERNATIONAL WELL BUILDING INSTITUTE

Case Study 2

CoLab

USA

800 sqm

CERTIFIED PETAL

U.S. GREEN BUILDING COUNCIL LEED PLATINUM USGBC

LBC 3.1

LEED v.4 NC

since 2020, 2019

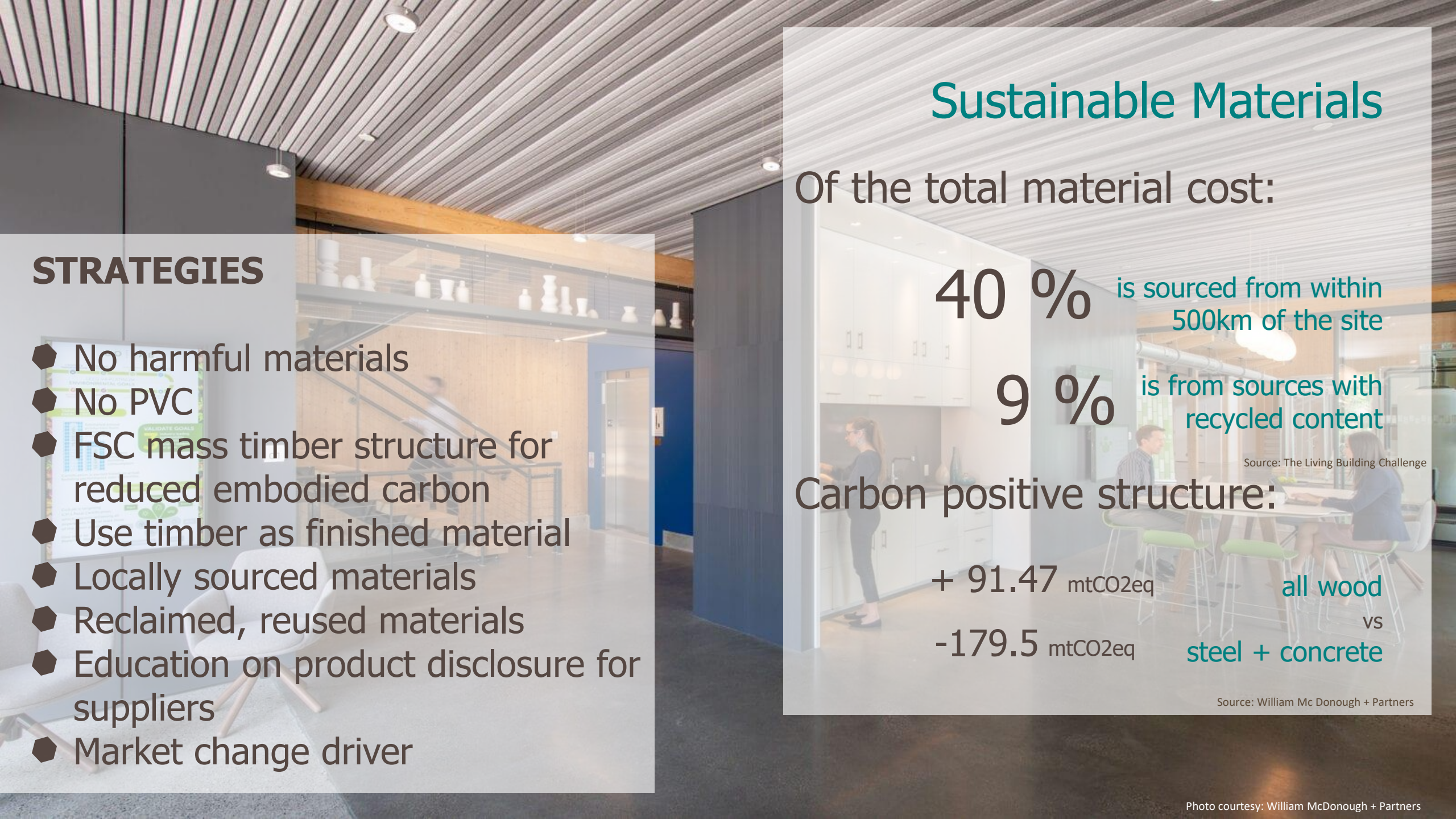
Owner: HITT Contracting

Arch.William McDonough + Partners

MEP Eng.: Staengl Engineering

Struct. Consult.: Simpson, Gumpertz & Heger

Photo courtesy: William McDonough + Partners



STRATEGIES

- No harmful materials
- No PVC
- FSC mass timber structure for reduced embodied carbon
- Use timber as finished material
- Locally sourced materials
- Reclaimed, reused materials
- Education on product disclosure for suppliers
- Market change driver

Sustainable Materials

Of the total material cost:

40 % is sourced from within 500km of the site

9 % is from sources with recycled content

Source: The Living Building Challenge

Carbon positive structure:

+ 91.47 mtCO2eq

-179.5 mtCO2eq

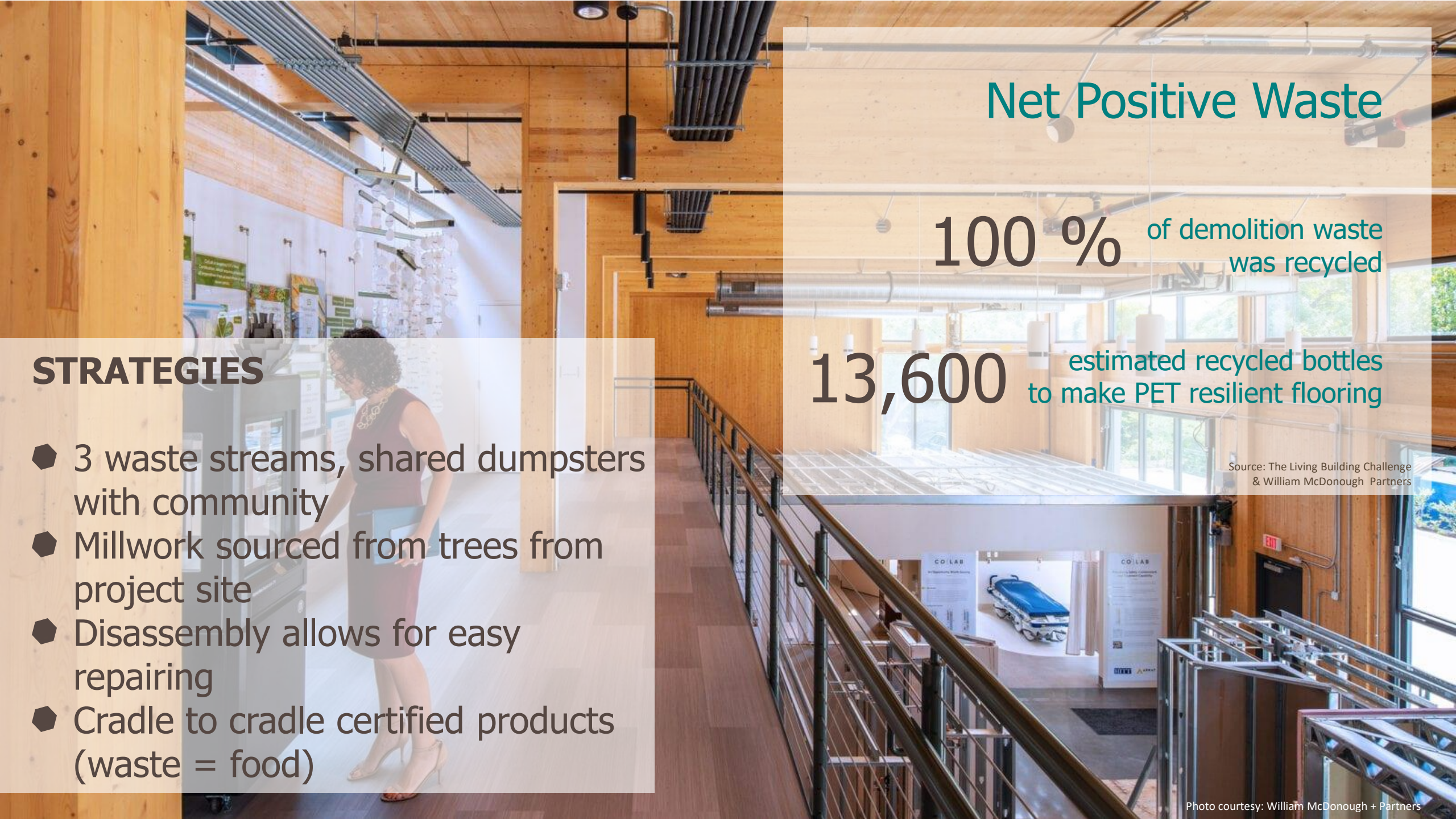
all wood

vs

steel + concrete

Source: William Mc Donough + Partners

Photo courtesy: William McDonough + Partners



Net Positive Waste

100 % of demolition waste was recycled

13,600 estimated recycled bottles to make PET resilient flooring

Source: The Living Building Challenge & William McDonough Partners

STRATEGIES

- 3 waste streams, shared dumpsters with community
- Millwork sourced from trees from project site
- Disassembly allows for easy repairing
- Cradle to cradle certified products (waste = food)

Photo courtesy: William McDonough + Partners

- Enhanced indoor air quality
  - Ventilation rate & filtering
  - CO_2, CO & NO_2 sensors
  - Low-emitting materials
  - No/low radon grade
  - Flush out after construction
  - Entryway systems
- Access to daylight
- Quality views
- Thermal comfort & control
- Adequate interior lighting
- Acoustic comfort
- Glare & flicker control
- Circadian light
- No smoking policy

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE

Health

- Hygiene support (bathroom and handwashing)

- Contact reduction for airborne contaminants
- Safe containment in laboratories
- Cleaning protocols & safe cleaning products
- Combustion minimization
- Separate exhaust for humidity/chemicals
- Humidity control, mold & moisture prevention
- UV air treatment
- Contact reduction for airborne contaminants
- No/low pollution of heating systems
- Prevention of air leakage in envelope
- Legionella risk management

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE

- Opportunities for body movement

- Quality potable drinking water
- Healthy food access & promotion
- Allow for mindful eating breaks
- Access to and promotion of physical activities
- Ergonomic / active workstations
- Variation of sensory experiences
- Mental health & well-being promotion programs
- Stress Management Plan
- Provide space for rest

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE

Case Study 3

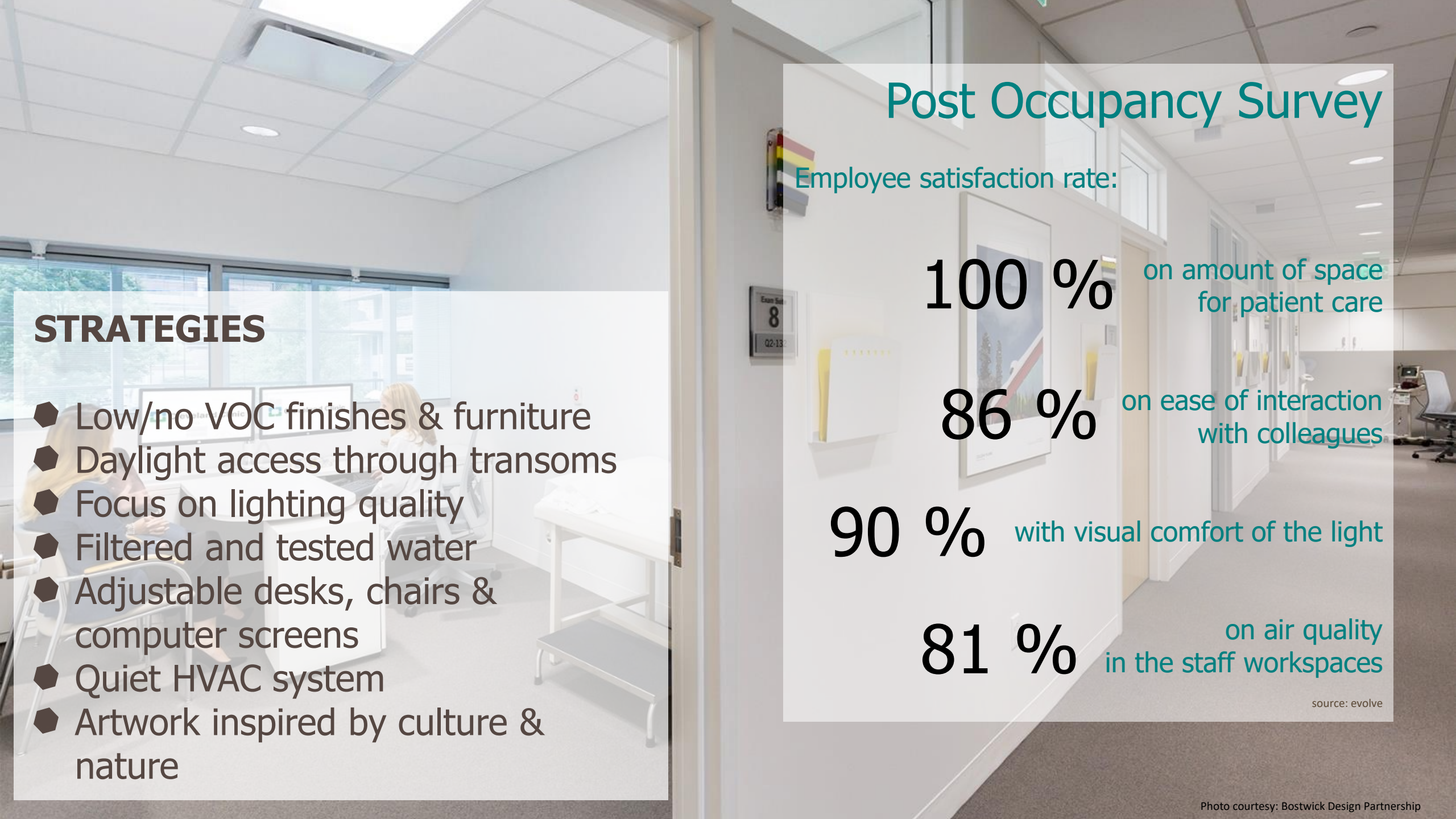
The Cleveland Clinic

Center for Functional Medicine
USA
1,580 sqm

WELL Building Standard
since 2018

Owner: Cleveland Clinic
Arch.: Bostwick Design Partnership
WELL Assessor: Evolve
MEP Eng.: Frederick, Frederick & Heller Engineers, Inc.

Photo courtesy: Bostwick Design Partnership



STRATEGIES

- Low/no VOC finishes & furniture
- Daylight access through transoms
- Focus on lighting quality
- Filtered and tested water
- Adjustable desks, chairs & computer screens
- Quiet HVAC system
- Artwork inspired by culture & nature

Post Occupancy Survey

Employee satisfaction rate:

100 % on amount of space for patient care

86 % on ease of interaction with colleagues

90 % with visual comfort of the light

81 % on air quality in the staff workspaces

source: evolve

Photo courtesy: Bostwick Design Partnership

- Site selection for equitable development
- Responsible and local sourcing of materials/food
- Inclusive / universal design

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE
BREEAM
INTERNATIONAL WELL BUILDING INSTITUTE
LEED

- Create fair, healthy, supportive environments for building users
- Provide places for gathering and community connection
- Encourage social equity within the project team
- Address needs and disparities within local community
- Keep good quality of air, sunlight for adjacent developments
- Keep free access to natural waterways

- Health benefits plans for occupants & community
- Donation to regional, community-based NGOs focused on equity

Strategy directly rewarded by:

LIVING BUILDING CHALLENGE

BREEAM

INTERNATIONAL WELL BUILDING INSTITUTE

- Involve JUST organizations in design and/or construction process
- Promote health-oriented mission
- Provide food for all – special diets
- Offer family support for employees
- Implement responsible labor practices
- Promote diversity and inclusion amongst staff

- Use of biophilic design principles:
  - Incorporate nature through environmental features, light and space, and natural shapes, patterns and forms.
  - Integrate public art intended for human delight, celebration of culture, spirit and place

Strategy directly rewarded by:

Case Study 4

Karuna Shechen Jharkhand Clinic

India
1,200 sqm

Owner: Karuna Shechen
Arch.: Ardism
Struct. Eng.: Sukhdev Mistri
Constr. Man.: Krishna Kumar Srivastava

Photo courtesy: Karuna Shechen

STRATEGIES

- Fair access to healthcare & vocational training for isolated populations
- Work opportunities for local community
- Envolvement of local community in the construction process
- Fair wages for construction workers
- Universal & inclusive design principles
- Local responsible sourcing of materials

Photo courtesy: Karuna Shechen

CONCLUSION

- Are we satisfied with the idea of merely reducing the negative environmental impacts of our buildings?
- Do we want to foresee a future in which beauty has not been a priority?
- Should we also do more to improve the health and well-being of all building occupants?

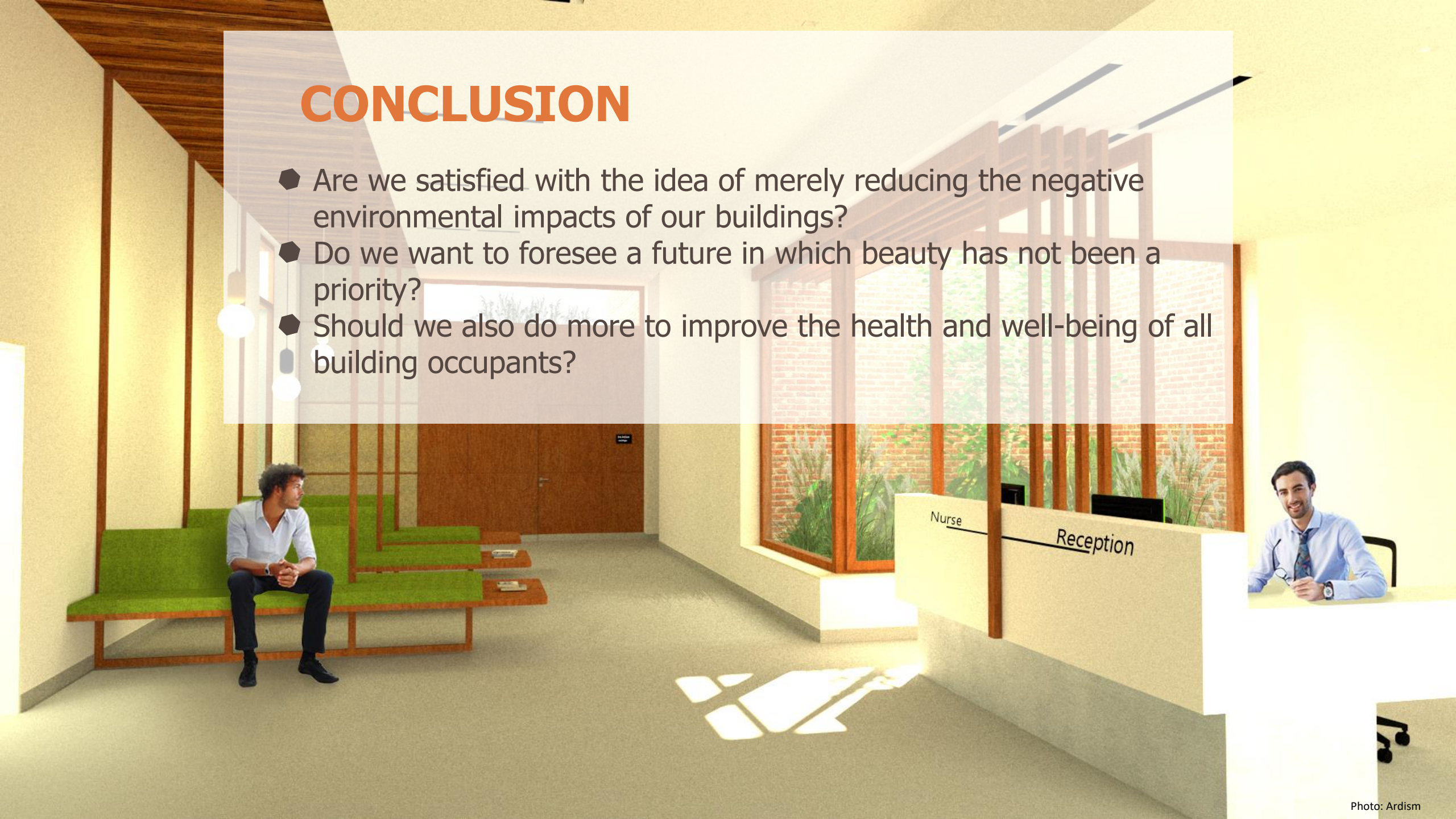


Photo: Ardism

THANK YOU!

Feel free to drop me a question:

sylvie.m@ardism.com

USEFUL LINKS:

Certification

- BREEAM: https://www.breeam.com/
- USGBC (LEED): https://www.usgbc.org/
- The Living Building Challenge: https://living-future.org/
- Well Building Institute: https://www.wellcertified.com/
- Cradle to Cradle: https://www.c2ccertified.org/

NGOs

- Hôpital Sans Frontières (hospital furniture and appliances donation from Benelux): https://www.hsf.be/
- Karuna Shechen (acces to health care, social services and education in India, Nepal & Tibet): https://karuna-shechen.org/

ARDISM

ARCHITECTURE / DESIGN / INTERIORS / SYLVIE MEUNIER