

CLIMATE
ACTION
WEBINAR

DESIGNING FOR ZERO NET
CARBON | ALL-ELECTRIC
AFFORDABLE HOUSING

AIA California



MODERATOR:

JAMIE STEINMETZ

LEED AP

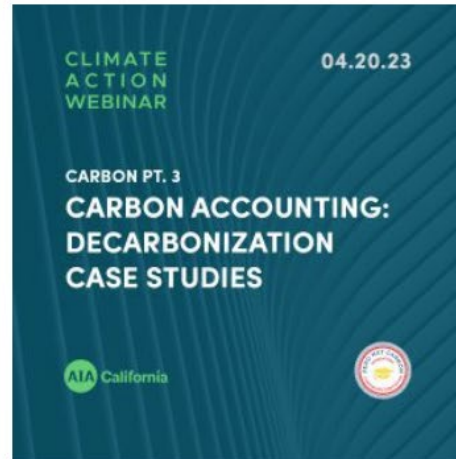
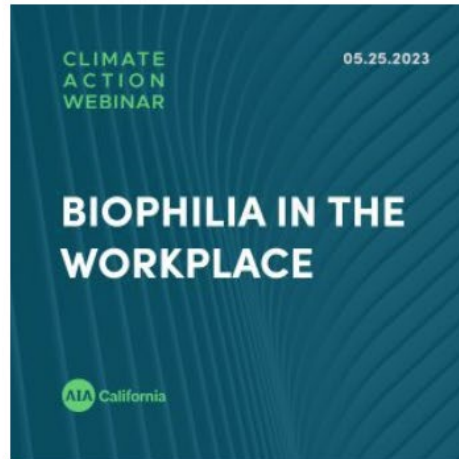
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Learning Objectives

Biophilia in the Workplace



Grasp the current state of economic trends and demands in the commercial building office market – and briefly describe how this will drive demands for design services in the coming years.



Discuss the experiential value of biophilia to building users, the economic value to building owners, and practical means of introducing elements of biophilia into and around workplaces.

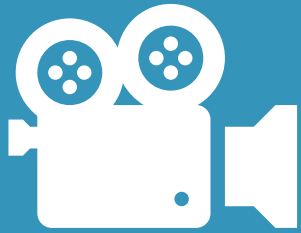


Summarize and list several opportunities for, and benefits and challenges of, incorporating urban farming techniques and technologies into buildings and project sites.



Name ways to integrate biophilic elements into environmental, social, and governance [ESG] goals and requirements, and how green building certification can benefit architecture clients.

Housekeeping Reminders



A recording of today's presentation will be made available on our website



Today's session qualifies for 1.5 AIA HSW/LU



Please use the Q&A function to ask questions for today's presenters



Cultivate a positive learning environment

SPEAKER



SIMON TURNER

LEED AP, WELL AP

FOUNDER, BUILDING COGNITION



SPEAKER



ORLANE PANET
COFOUNDER & CEO
MicroHabitat



SPEAKER



VICKI WORDEN

PRESIDENT & CEO

GREEN BUILDING INITIATIVE





The Business Landscape and the Science of Biophilia

THE CASE FOR PRODUCTIVITY IS NOW



SIMON TURNER

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- ▶ Email: simonturner@buildingcognition.com

Office Building Business Landscape

Demand

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graph TD; Demand[Demand] -- "- 40%" --> BV[Building Values]; BV -- "- 25%" --> REITs[Office REITs]; REITs -- "- 43%" --> REITs;
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Building Values

- 40%

Office REITs

- 25%

- 43%

Real Estate Trends

- Follow the Money
- Gradual Migration to the Suburbs:
 - Less expensive leases
 - Easier access by car
 - Online means less need for prestigious addresses
- Slow trend – Long lease terms
- Technology and Content will drive market
- What is the most dangerous competitor for high rise buildings?

Definition of Biophilia

A hypothetical human tendency to interact or be closely associated with other forms of life in nature
: a desire or tendency to commune with nature

92. Jennings V, Bamkole O. *The Relationship between Social Cohesion and Urban Green Space: An Avenue for Health Promotion*. *International Journal of Environmental Research and Public Health*. 2019;16(3):452.
93. Campbell LK, Svendsen ES, Sonti NF, Johnson ML. *A social assessment of urban parkland: Analyzing park use and meaning to inform management and resilience planning*. *Environmental Science & Policy*. 2016;62:34-44.
94. Ratcliffe E, Gatersleben B, Sowden PT, Korpela KM. *Understanding the Perceived Benefits of Nature for Creativity*. *The Journal of Creative Behavior*. 2021;n/a(n/a).
95. Rich DL. *Effects of Exposure to Nature and Plants on Cognition and Mood: A Cognitive Psychology Perspective*, Cornell University; 2007.
96. Bringslimark T, Hartig T, Patil GG. *Psychological Benefits of Indoor Plants in Workplaces: Putting Experimental Results into Context*. 2007;42(3):581.
97. Studente S, Seppala N, Sadowska N. *Facilitating creative thinking in the classroom: Investigating the effects of plants and the colour green on visual and verbal creativity*. *Thinking Skills and Creativity*. 2016;19:1-8.
98. Plambach T, Konijnendijk van den Bosch CC. *The impact of nature on creativity – A study among Danish creative professionals*. *Urban Forestry & Urban Greening*. 2015;14(2):255-263.
99. Van Rompay TJJ, Jol T. *Wild and free: Unpredictability and spaciousness as predictors of creative performance*. *Journal of Environmental Psychology*. 2016;48:140-148.
100. Leong LYC, Fischer R, McClure J. *Are nature lovers more innovative? The relationship between connectedness with nature and cognitive styles*. *Journal of Environmental Psychology*. 2014;40:57-63.
101. Altomonte S, Schiavon S. *Occupant satisfaction in LEED and non-LEED certified buildings*. *Building and Environment*. 2013;68:66-76.
102. Kato H, Too L, Rask A. *Occupier perceptions of green workplace environment: the Australian experience*. *Journal of Corporate Real Estate*. 2009;11(3):183-195.
103. Jostle. *Bridging the Engagement Gap: How leaders can get the levels of engagement they strive for*. In: Jostle Corporation; <https://intranet.jostle.me/bridging-the-engagement-gap>.
104. Loder A. *Greening the City: Exploring Health, Well-being, Green Roofs, and the Perception of Nature in the Workplace*. Toronto: Geography and the Centre for Environment, University of Toronto; 2011.
105. Joanne C, Chia-Ching W, Chun-Yen C. *Landscape Ecology*. 2022.
106. Carrus G, Scopelliti M, Laforteza R, et al. *Go greener, feel better? The positive effects of biodiversity on the well-being of individuals visiting urban and peri-urban green areas*. *Landscape and Urban Planning*. 2015;134(0):221-228.
107. Frumkin H, Bratman GN, Breslow SJ, et al. *Nature Contact and Human Health: A Research Agenda*. *Environmental health perspectives*. 2017;125(7):075001-075001.
108. Shanahan DF, Fuller RA, Bush R, Lin BB, Gaston KJ. *The Health Benefits of Urban Nature: How Much Do We Need?* *BioScience*. 2015;65(5):476-485.
109. Dean JH, Shanahan DF, Bush R, et al. *Is Nature Relatedness Associated with Better Mental and Physical Health?* *International Journal of Environmental Research and Public Health*. 2018;15(7):1371.
100. Malloy C. *Cities' Answer to Sprawl? Go Wild*. Bloomberg CityLab. CityLab Web site. <https://www.bloomberg.com/news/features/2021-10-22/urban-re-wilding-aids-biodiversity-climate-resilience>. Published 2021. Accessed Nov 4, 2021.
111. McKeough T. *Today's Must-Have Amenity? A little green space*. *New York Times*. <https://www.nytimes.com/2021/10/15/realestate/outdoor-space-nyc-apartments.html>. Published 2021. Accessed Dec 4, 2021.
112. Lenaerts A, Heyman S, De Decker A, et al. *Vitamin Nature: How Coronavirus Disease 2019 Has Highlighted Factors Contributing to the Frequency of Nature Visits in Flanders, Belgium*. *Frontiers in Public Health*. 2021;9.
113. Andreucci MB, Loder A, McGee B, Brajković J, Brown M. *Exploring Regenerative Co-benefits of Biophilic Design for People and the Environment*. In: Catalano C, Andreucci MB, Guarino R, Bretzel F, Leone M, Pasta S, eds. *Urban Services to Ecosystems : Green Infrastructure Benefits from the Landscape to the Urban Scale*. Cham: Springer International Publishing; 2021:391-412.
114. Richardson M, Butler CW. *Nature connectedness and biophilic design*. *Building Research & Information*. 2022;50(1-2):36-42.
115. Srinivasan N, Sachs N. *The Power of Sacred Places, 25 years of Science and Evidence-based Design of Healing Green Spaces: A Landscape Architect's Guide*. (2021) <https://naturesacred.org/new-report-the-power-of-sacred-places/>

Plenty of Science Behind Biophilia

Access to the Nature and the Workplace, IWBI, 2020

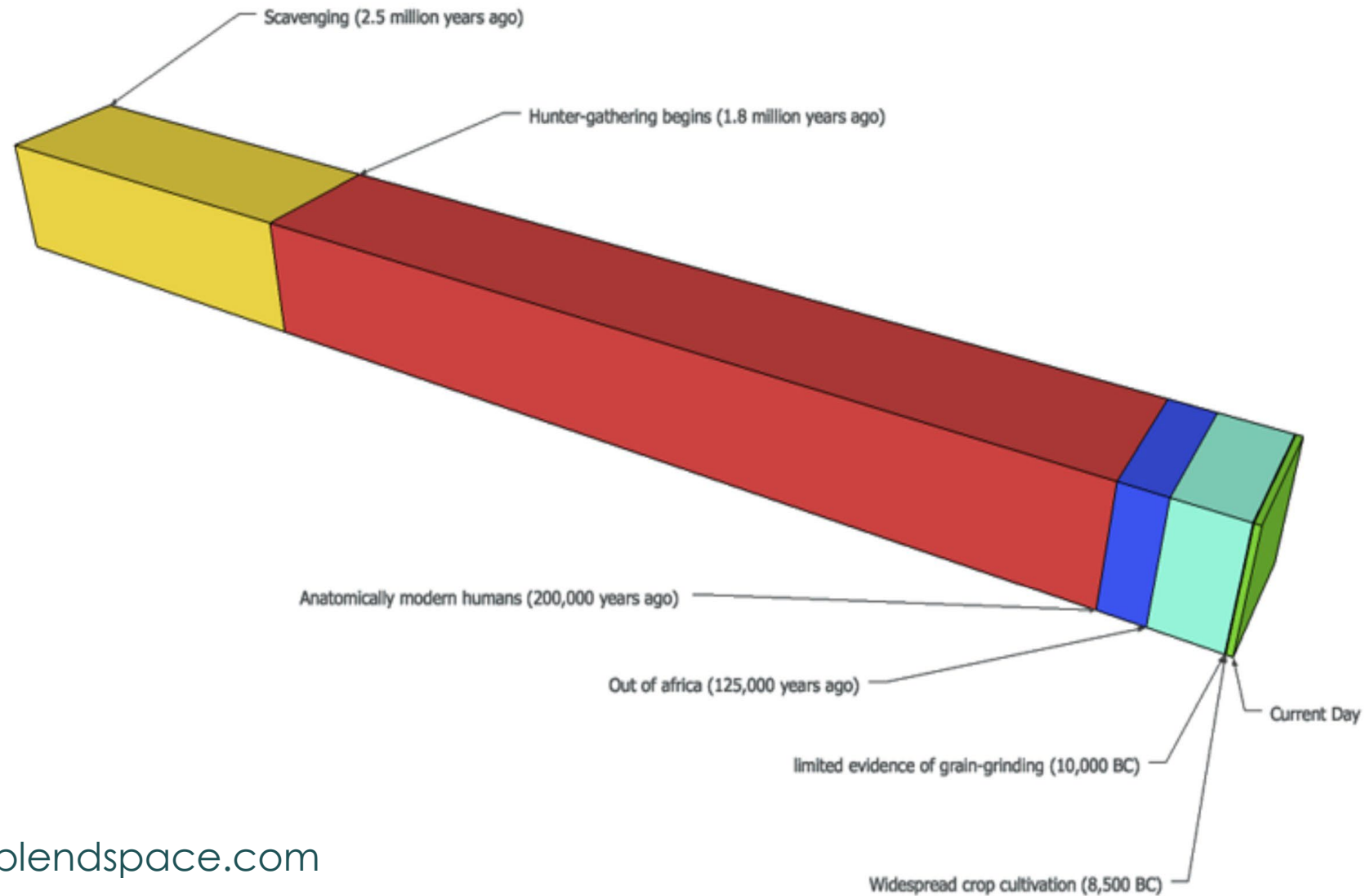
Documented Benefits

- Task Performance
- Stress Reduction
- Socialization
- Creativity



Access to the Nature and the Workplace, IWBI, 2020

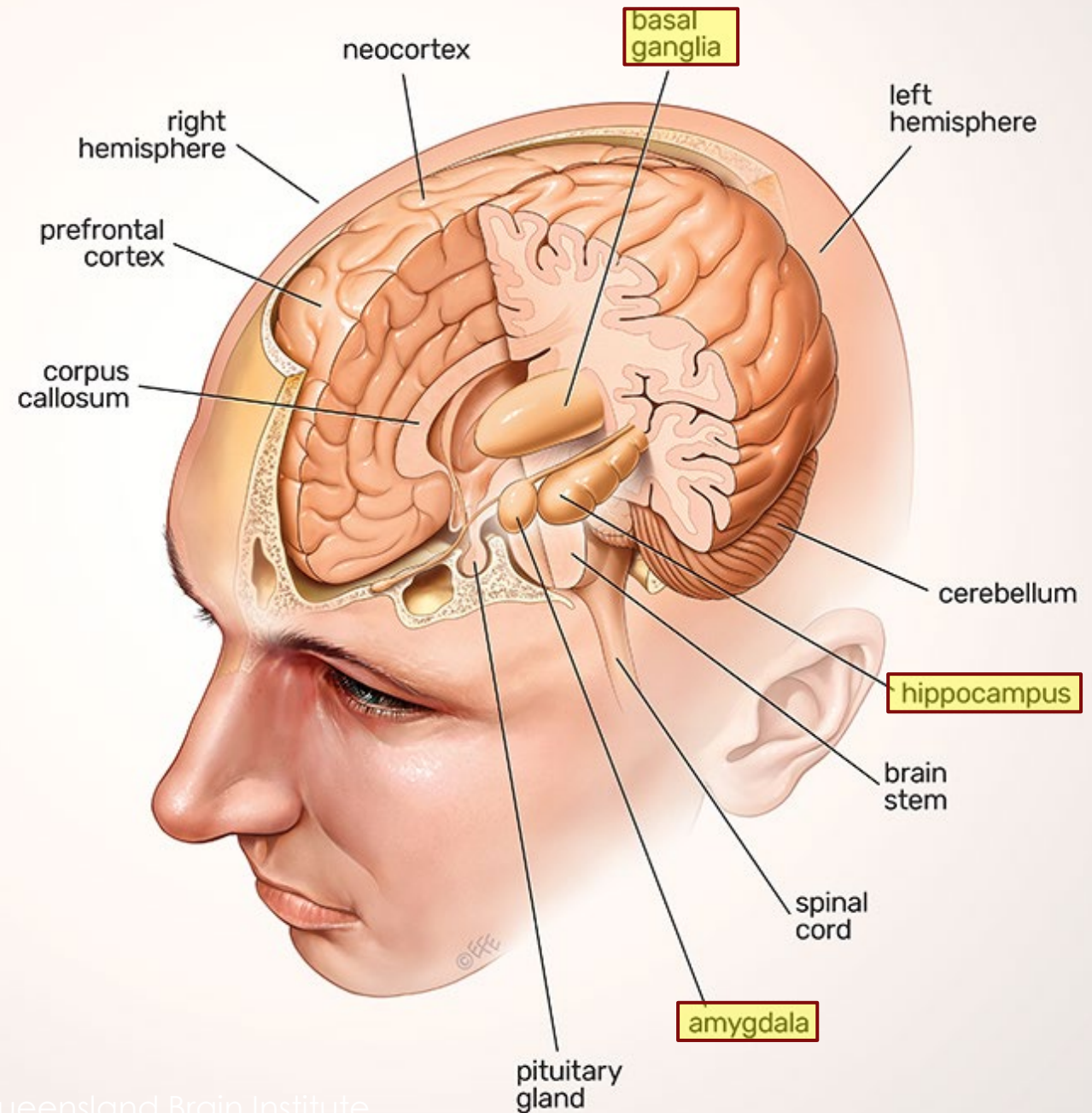
Biophilia – Mechanisms



Mechanisms



Kim TH, Jeong GW, Baek HS, Kim GW, Sundaram T, Kang HK. Human brain activation in response to visual stimulation with rural and urban scenery pictures: A functional magnetic resonance imaging study. *Sci Total Environ.* 2010; 408: 2600–2607. pmid:20299076



Do Plants Improve Indoor Air Quality?

Technically yes, but there are better reasons to deploy plants in the workplace

Conclusion

“Lean, it appears, is meaner than green, not only because it is less pleasant but also because it is less productive.”

The relative benefits of green versus lean office space: Three field experiments.
By Nieuwenhuis, Marlon, Knight, Craig, Postmes, Tom, Haslam, S. Alexander
Journal of Experimental Psychology: Applied, Vol 20(3), Sep 2014, 199-214



Orlane
Panet

#cultivatingchange



www.MicroHabitat.com

[@microhabitat.ca](https://www.instagram.com/microhabitat.ca)

MICROHABITAT

The Urban Farming Company

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Urban Farming in commercial real estate

PRESENTED BY COFOUNDER & CEO
ORLANE PANET





Cultivating Change

Building a healthier world

MicroHabitat's turnkey urban farming program is sustainability initiative that offers players in the residential and commercial real estate the possibility to have access to ultra-local and healthy food, grown and harvested directly on-site.

Through the integration of urban farming, we transform the urban environment by deploying eco-intensive farming projects that promote the adoption of a healthier lifestyle by creating a local and sustainable food system.

Our statistics in 2022



140
urban farms



26
food banks



20.5K
lbs donated



25.9K
funded meals



45.5K
lbs harvested

MicroHabitat is now running the largest private network of urban farms in the world

What is Urban Farming?

A sustainable method

Urban farming is the practice of growing food in urban and suburban areas using innovative techniques to transform underutilized spaces into edible landscape.



Urban farming offers a sustainable solution to the challenges of feeding urban populations and promoting environmental sustainability, community development, and healthy food access.



In urban areas, space is limited and land is scarce. Urban agriculture is a simple way to make use of unutilized spaces with greener, healthier roofs transformed into efficient production areas for growing plants, herbs and vegetables.



Different types of urban farming



Outdoor

Aimed at optimizing outdoor unused spaces, this type of production.



Types of outdoor production:

- With pots (The MicroHabitat method)
- With planters
- With a greenroof



Indoor

Either as a way to beautify an indoor space or by taking over a space for a commercial production, indoor farming can have many forms



Types of Indoor production:

- Amenity - Indoor furniture
- Commercial vertical farming
- Using soil, hydroponic or aeroponic

Importance of urban farming

Benefits



01

Climate change adaptation

Urban farms provide a way to adapt our urban settings and create more resilient environments

02

Improved food security and quality

A local source of food that is less vulnerable to disruptions in the supply chain, so it can improve the food security of communities.

03

Reduced environmental impact

Urban farms help reduce heat islands, flooding risks and greenhouse gases on top of reducing food miles

04

Health benefits

Provides green spaces in urban areas which creates opportunities for physical activity, fresh air and relieve stress by making us spend time in nature.

Health benefits of urban farming

Incorporating urban farming can have multiple positive effects on human health and performance

PHYSICAL AND MENTAL HEALTH

- Reduces stress, increase feeling of well-being which lead to better performance



BETTER NUTRITION

- Accessible fresh food encourage healthy eating habits. Home-grown/heirloom produce have been proven to have more nutrition



MORE SOCIAL CONNECTIONS

- Provides opportunities for social interaction and community building, which can improve social connections and overall well-being.



Urban farming and asset classes

Examples

Office, industrial and retail

Locations :

Indoor or outdoor, on roofs, patios or ground level

Goals :

- Experience for the occupants
- Biophilia and well-being
- Attract and retain customers and talents
- Alignment with ESG and certifications
- Increase back-to-office/appeal
- Differentiating factor
- Team building

Institutional

Types of institutions :

Senior living, youth services, hospitals, rehabilitation centres, schools, special needs programs, prisons, governmental agencies

Goals :

- Biophilia and well-being
- Social reintegration
- Food literacy and healthy lifestyle
- Alignment with ESG and certifications
- Rehabilitation and quicker recovery

Residential

Types of assets :

Multifamily, condominium and apartment

Goals :

- Answer the rising demand for locally-grown food and natural environments
- Community building and bonding
- Food literacy and healthy lifestyle
- Alignment with ESG and certifications
- Demand for common spaces and activities for all ages.

Benefits of urban farming in commercial real estate



Increased property value

Urban farming can make commercial properties more attractive to potential buyers or tenants and command higher prices



Improved sustainability

Urban farming can help commercial properties achieve greater sustainability by reducing their carbon footprint and increasing local food production



Diversification of income streams

Urban farming can provide commercial property owners with an additional source of income through the sale of locally grown produce or other agricultural products



Community engagement

Urban farming can help commercial properties build stronger relationships with their surrounding communities and enhance their reputation

Urban Farming: Challenges

Challenges



Maintenance Cost

Just like any garden, urban farms require constant maintenance. This can result in an increase in operating costs which will reduce the net income of the property.



Zoning Restrictions

Some areas may have restrictions that will limit urban farming projects. If the owner is unable to obtain an approval, the project could be unfeasible.



Lacking fiscal incentives

For now, not many tax or fiscal incentives are available to stakeholders interested in taking part of this green movement.

Urban Farming: Challenges

Solutions

MAINTENANCE COST

- Use low-maintenance & drought-resistant plants and automated systems
- Integrate services that yield benefits for the occupants to increase perceived value and gain in property value

ZONING RESTRICTIONS

- Work with local officials to advocate zoning changes or waivers
- Collaborate with a community organization

LACKING FISCAL INCENTIVES

- Establish communication channels with municipal, governmental and other agencies
- Invest in data analysis to quantify better urban farming benefits



Results of Urban Farming Initiatives

StuyTown



The company

StuyTown, is a large post-World War II private residential development on the east side of the New York City borough of Manhattan. They have created a unique community that gives the comfort and joys of suburbia while living in this big city.



Mission

With a major focus on sustainability, StuyTown has an ongoing commitment to green living, including making it easy for residents to do their part in protecting the environment.

Results of Urban Farming Initiatives

StuyTown



Healthier Environment health and wellness

MicroHabitat installed 250 pots in Stuytown to create healthier and thriving community spaces, with benefits such as reducing heat islands, preserving biodiversity, enhancing food system resilience, supporting local communities, and increasing property values.



Associations +500 meals

A donation of meals is provided to children through our partnership with Share Our Strength's No Kid Hungry® campaign with the mission to eradicate food insecurity and give youth access to healthy food.



Community 2 500 pounds/year

2 500 Pounds of vegetables, edible flowers and herbs were donated. Some of the produce is destined to neighbors in need from the greater community thanks to local food bank Vision Urbana. Other produce goes to Stuytown, for elderly and disabled residents needing assistance.

Cultivating Change: Urban Farming in Commercial Real Estate



Global CBRE Survey Finds Environmental and Social Features Have an Impact on Perceived Building Value and Transactions

The survey reveals how companies' intensified focus on environmental, social and governance (ESG) goals is driving their real estate decisions and strategies

February 28, 2023 08:00 AM Eastern Standard Time

DALLAS--([BUSINESS WIRE](#))--Companies are favoring environmental, social and corporate-governance (ESG) factors more heavily in their decisions on which buildings to lease or buy, with many prioritizing green-building certifications and features that reduce energy consumption or generate renewable energy, according to a [new global survey](#) from [CBRE](#).

Released today, the survey examines responses collected in Fall 2022 from more than 500 commercial real estate professionals worldwide. Overall, more than two thirds of respondents said their companies' focus on ESG intensified in 2022 and that their primary ESG consideration for their real estate is to reduce energy consumption and carbon emissions.

Environmental features drive building appeal and transactions.

As companies face rising energy costs and government regulations, they're willing to pay a premium for spaces with features like on-site renewable energy generation (58%) or smart technology to monitor and adjust energy use (53%) to help reduce energy consumption and carbon emissions.

In fact, 84% of respondents said they specifically look for energy-reducing features - and almost half would either seek a discount or walk away from a deal if a building lacked these.

Another big ESG influence is green-building certification, such as the Leadership in Energy and Environmental Design (LEED) rating system or several administered by the Green Building Council. Forty-five percent of respondents would pay a premium to lease or buy a certified building, and a third would either seek a discount from or outright reject a building that lacked

Certifications and urban farming recognition





Conclusion

Urban farming, biophilia and green certifications

Urban farming and biophilia are closely related. Urban farming is a type of biophilic design that aims to bring nature to the cities. It has many benefits such as:

- Increased access to fresh produce
- Improved access to fresh produce
- Reduced environmental impact
- Increases our health by bringing us closer to nature

Overall, urban farming is a good way to connect people with nature which is directly related to the purpose and benefits of integrating biophilic designs in cities which can also lead to recognitions and certifications

THANKS

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grow@microhabitat.ca



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SPEAKERS



VICKI WORDEN
PRESIDENT & CEO
GREEN BUILDING INITIATIVE





Biophilic Design & Green Globes Certification



Vicki L. Worden
President & CEO



The Green Building Initiative (GBI) is an international, nonprofit organization whose mission is **to reduce climate impacts by improving the built environment.**

Better buildings, together.

Delivering educational roadmaps through our certification and validation programs.



Sustainable, healthy, and resilient buildings for all.

Policy & Investors Driving Change in Focus



GBI's Green Globes Certification Supports ESG & Sustainability Goals

Program Features

- Interactive online questionnaire
- No “one size fits all” prerequisites rule buildings in, not out
- “Not Applicable” provisions keep teams focused
- Threshold for incremental recognition
- Multiple pathways provide options
- Third-party assessor & dedicated GBI support
- Meets jurisdictional requirement for certification
 - (i.e., including highest energy code requirement adopted locally, required by funding authority, or used within Green Globes; if higher than local code, highest code requirement prevails)



GREEN GLOBES EB 2023 & ESG + Climate Risk & Resilience

- 5% of total Green Globes points can be earned for Resilience
- Buildings earn points for environmental goals including CO₂e, reduction of waste, water, and energy, i.e.
 - Leases include monitoring of goals
- Earn points for DEI, CSR, and ESG policies/reports

1.3.2 SOCIAL & GOVERNANCE	
1.3.2.1 Ownership/stakeholders engage in social and governance best practices.	1 point
1.3.2.2 The organization issues a CSR (Corporate Social Responsibility) or ESG (Environmental, Social, Governance) report on an annual or regular basis.	1 point
1.3.2.3 The CSR or ESG report is publicly available.	1 point
1.3.2.4 The report aligns with an industry standard for disclosures and includes a materiality and climate <i>risk</i> or <i>resilience</i> assessment.	1 point

1.2.1 RISK ASSESSMENT & FACILITY ADAPTATION	
<p>1.2.1.1 A multi-hazard <i>risk assessment</i> has been completed for the building and location that includes as a minimum the following <i>risks</i> or hazards as applicable:</p> <p>1.2.1.1.1 Floods (coastal storm surge, tidal, pluvial/<i>stormwater</i>, or fluvial/riverine)</p> <p>1.2.1.1.2 Seismic events (earthquake, vulcanism, and/or resulting tsunami)</p> <p>1.2.1.1.3 Landslides and avalanches</p> <p>1.2.1.1.4 Severe weather (wind, tornado, hail, lightning, snow, ice-storm, drought, or severe heat or cold)</p> <p>1.2.1.1.5 Wildfires</p> <p>1.2.1.1.6 Man-made <i>risks</i> (explosion, terrorist act, or poison release)</p> <p>1.2.1.1.7 Health issues (e.g., pandemic, or sanitation issue in the aftermath of a disaster)</p> <p>1.2.1.1.8 Infrastructure disruptions (loss of energy, water, sanitation, transportation, or communications service)</p> <p>1.2.1.1.9 Changes to geology and/or groundwater conditions that affect or disrupt infrastructure and/or facility function</p>	3 points
<p>1.2.1.2 A <i>risk assessment</i> has been completed for 1.2.1.1 for each associated <i>risk</i> or hazard.</p>	Maximum = 4 points <ul style="list-style-type: none"> • One point is earned for in 1.2.1.1 for a maximum
<p>1.2.1.3 The assessment evaluates building functional requirements and prioritizes accordingly for future facility resiliency modifications.</p>	3 points

Green Globes Proposed Revision v. 2023

Green Globes for New Construction 2023

- Points are awarded for landscaping consisting of vegetated, native, and pollinator plants.
- Points are awarded for the inclusion of onsite chicken coops, aquaponics, rooftop gardens, food forests, and greenhouses.
- Points are awarded for optimum daylighting and task areas with clear outdoor views.

Green Globes for Existing Buildings 2023

- Points are awarded for the site re-establishing natural habitats.
- Points are awarded for a comprehensive site plan that includes access to walking trails, bike paths, and outdoor respite/community spaces.
- Points are awarded for optimum daylighting and task areas with clear outdoor views.

6.1.1 PERFORMANCE & GREEN DESIGN GOALS

6.1.1.1 Performance and green design goals (qualitative AND/OR quantitative) are established in collaboration with the owner in writing and are regularly assessed from *pre-design* through to completion of construction and occupancy for the following listed items:

- Site design;
- Environmentally responsible construction activities;
- Biophilia and occupant enrichment;
- Water conservation, efficiency, *alternate water sources*, and *reuse*;
- *Building envelope* and moisture control;
- Energy efficiency;
- Materials including:
 - Efficiency;
 - Environmentally preferable products; and
 - Storage of hazardous materials;
- Indoor environment including:
 - Acoustic comfort;
 - Thermal comfort;
 - Lighting;
 - Air quality; and
- *Building resilience*.



Green Globes Partial or Fully Vegetated Rooftops



- Roofs with vegetation absorb rainwater and keep buildings cooler than exposed asphalt would
- Lower cooling loads
- High SRI and shading mitigate heat island effect

Photo courtesy of Mackenzie

Green Globes Landscaping Bainbridge Island Fire Dept.



Photo courtesy of Mackenzie

- Site performance
 - Incorporating healthy landscaping
 - Saving mature trees
 - Drought tolerant, native, non-invasive

Two Green Globes Certified Young Living HQ Utah



- 3.6 acres of demonstration gardens, teaching and research, community amenity
- Incorporates nature into design, center courtyard with skylights and waterfall with reflecting pool and recirculated water

Maryland Environmental Services Headquarters

Millersville, MD



- *Rooftop gardens, edible landscape(s), food forest, community garden onsite.*
- *Is 25% of the vegetated area dedicated to pollinator-friendly plantings or an apiary?*
- *Chicken coop, aquaponics farm, AND/OR greenhouse installed*



Bringing Green Globes Net Zero Carbon to our Growing Client Base

GBI's Green Globes® certified space is growing and includes Class A office, multifamily, industrial, life sciences, data centers ... and more!



50%-89% + reduction



90%+ reduction

Live Chat - www.thegbi.org ♦ email info@thegbi.org

