

Practice with Purpose: How to Radically Redesign the Practice of Architecture

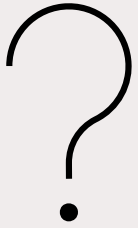
SPEAKERS:

WILLIAM LEDDY, FAIA
PRINCIPAL
LMS ARCHITECTS

RYAN JANG, AIA
PRINCIPAL
LMS ARCHITECTS



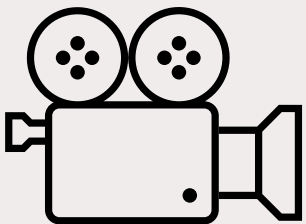
Cultivate a positive learning environment



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



This session qualifies for 1 AIA LU – AIA CA will submit for you



A recording of this presentation will be made available on our website soon

LEARNING OBJECTIVES



Understand why we should redesign the practice of architecture to help address some of the biggest challenges of our time.



Learn from real-world case studies that Practice with Purpose is both achievable and economically sustainable.



Identify the practical benefits of Mission-Driven Design for recruitment, retention, and marketing your practice.



Discover the multiple benefits of public advocacy that promotes resilient, equitable communities.

AIA
Continuing
Education
Provider

Attendees will earn 1 AIA LU for attending this presentation live.
AIA CA will submit you for AIA credit within 10 days of the presentation.

PRESENTERS

William Leddy, FAIA

Principal

LMS ARCHITECTS

Ryan Jang, AIA, LEED AP

Principal

LMS ARCHITECTS



THANK YOU!

William Leddy, FAIA | Leddy Maytum Stacy Architects

Ryan Jang, AIA | Leddy Maytum Stacy Architects



Practice with Purpose

How to Radically Redesign the Practice of Architecture

William Leddy, FAIA, AIA CA VP Climate Action

Ryan Jang, AIA, LEED AP

02.28.2023





BLACK LIVES MATTER



THEN: 1960's



NOW: Still protesting....









A combined ecological / societal emergency



What can one person do?

**Architects and designers are
uniquely equipped to
address this emergency**

**We have powerful tools,
abundant imagination,
and important work to do**

**But first, we must
transform our design culture
and change architectural practice**

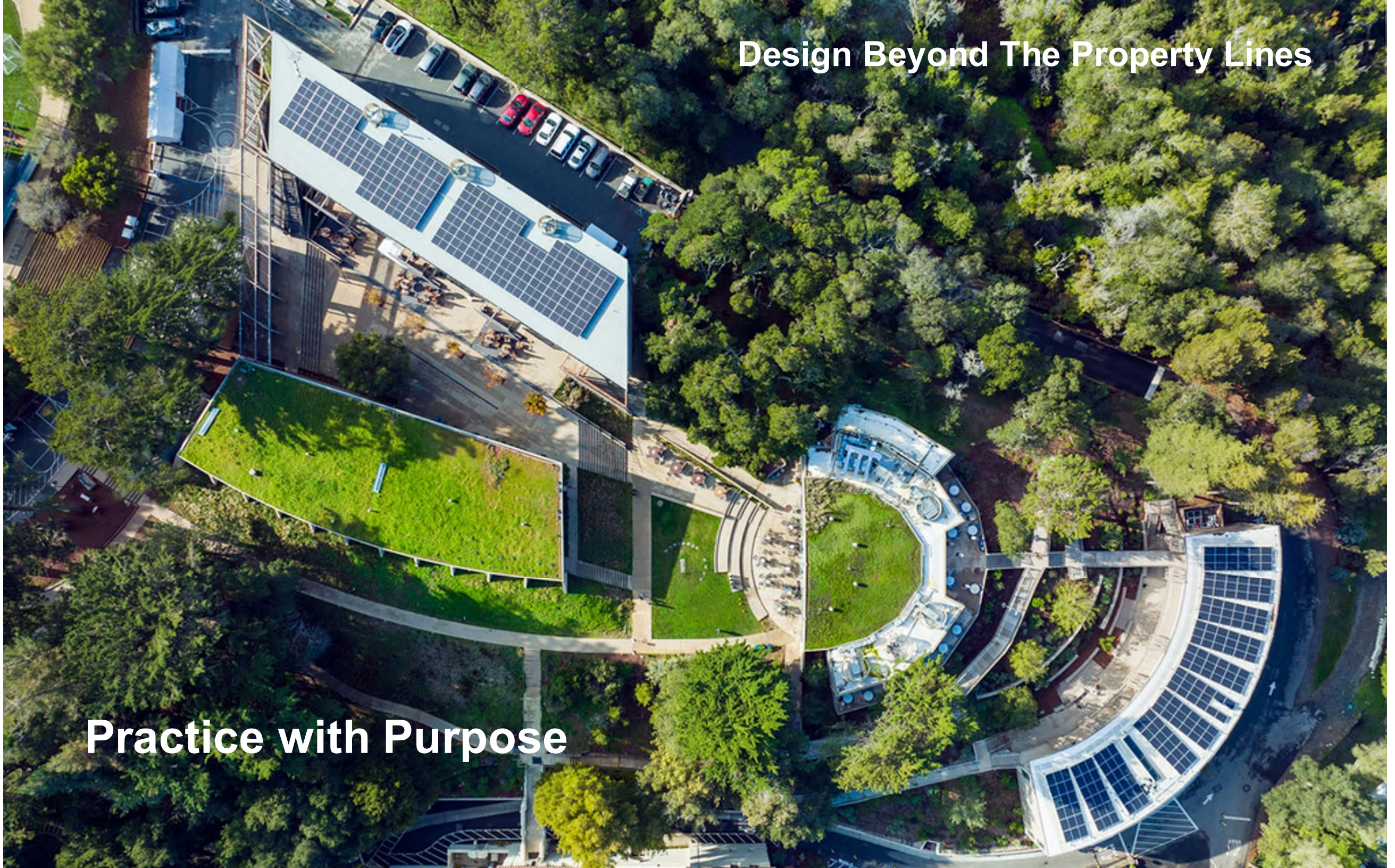
Redefine Design Excellence

Architecture isn't excellent unless it models an inclusive, zero-carbon future



Design Beyond The Property Lines

Practice with Purpose



- 1. Climate Action**
- 2. Equity**
- 3. Habitation**
- 4. Education**
- 5. Adaptation**

CLIMATE ACTION

DESIGNING A
ZERO-CARBON
FUTURE

Time is Running Out

The world is quickly depleting its 1.5°C carbon budget

1.5°C scenario



6 ½ YEARS TO GO

Carbon Clock

Mercator Research Institute
on Global Commons and
Climate Change (MCC)



www.mcc-berlin.net

The Climate Emergency

Climate destabilization is accelerating

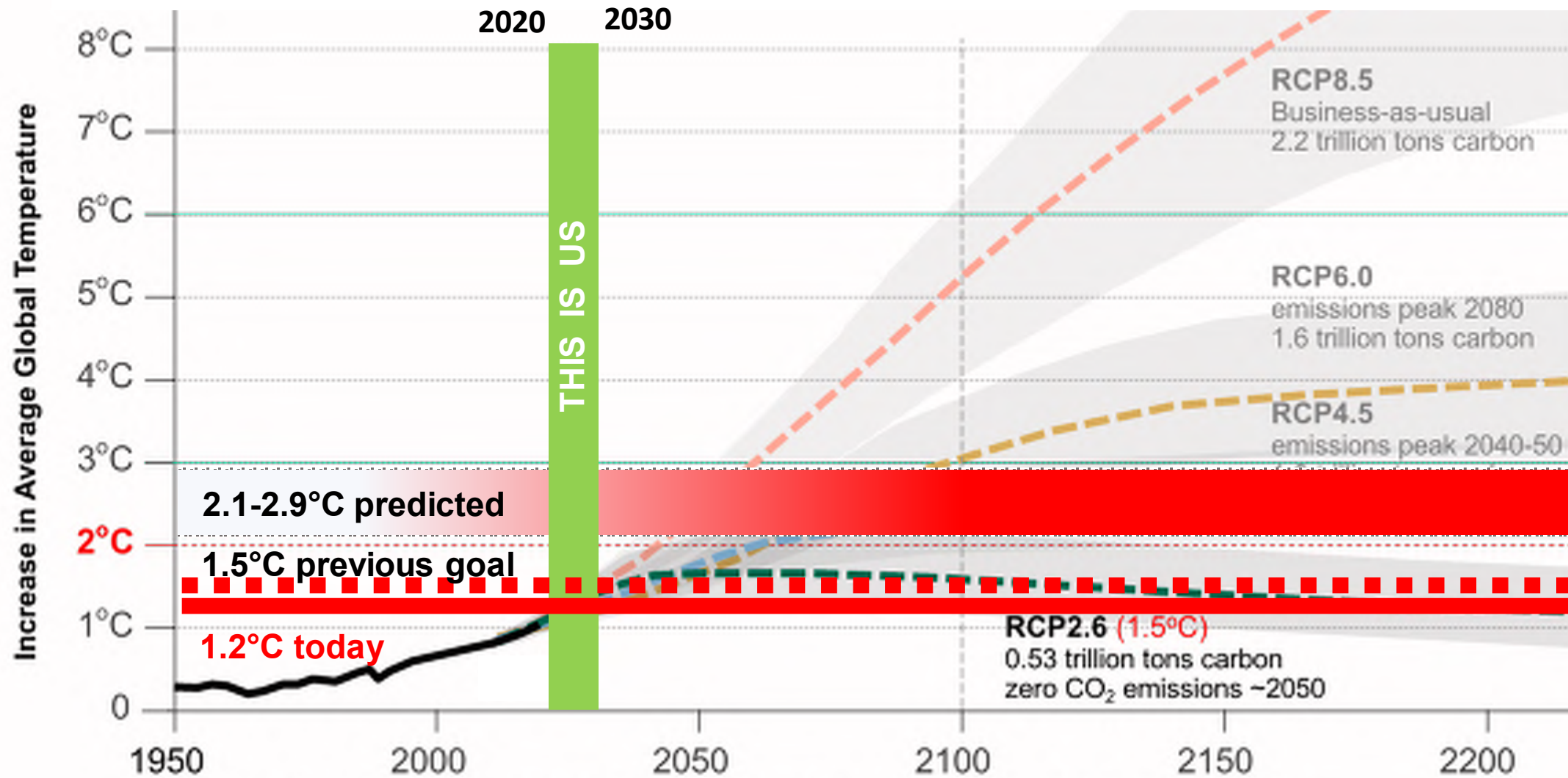


World still way off track on goal to keep global warming below dangerous threshold, UN says - Wed October 26, 2022

The United Nations reports that global warming will rise to between 2.1 and 2.9 degrees Celsius based on the world's current climate pledges



Agency with Urgency!



Global Temperature Projections for various RCP Scenarios

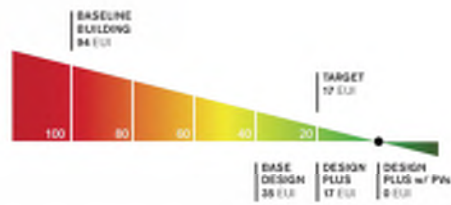
Source: Architecture 2030; Adapted from IPCC Fifth Assessment Report, 2013
Representative Concentration Pathways (RCP), temperature projections for SRES scenarios and the RCPs.



Office-wide Project EUI Tracking

Tracking Progress Across Our Portfolio

Organic Food Company

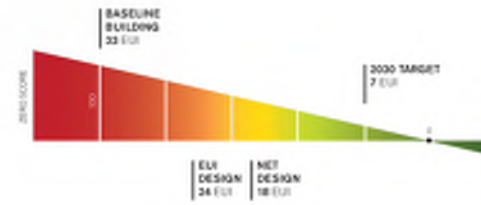


EUI Design Goal <small>before renewables</small>	Net Design Goal <small>with renewables</small>	Electric Energy
17.0 kBtu/sf/yr	0.0 kBtu/sf/yr	100%

LMS^A



Edwin M. Lee Apartments



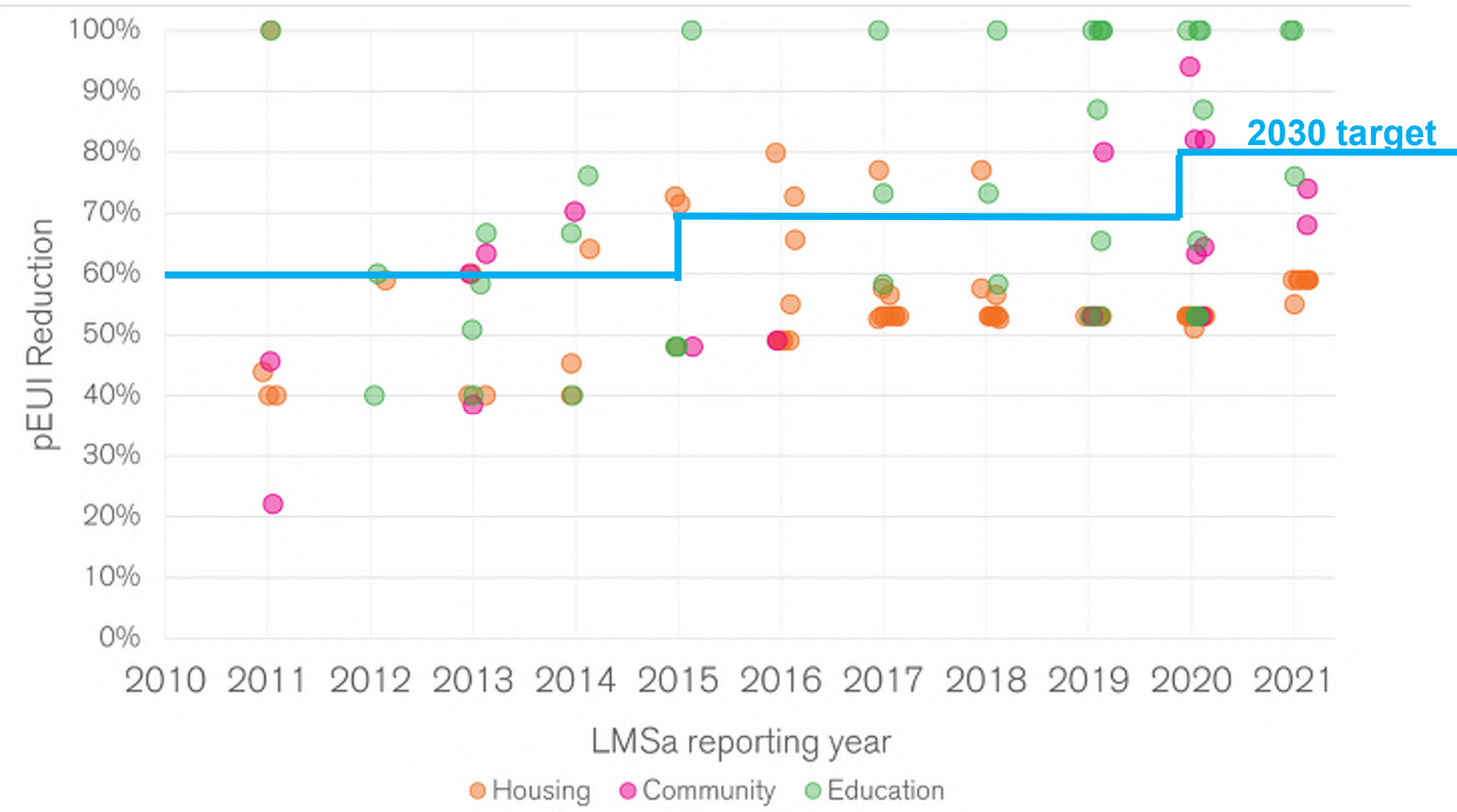
EUI Design Goal <small>before renewables</small>	Net Design Goal <small>with renewables</small>	Electric Energy
24.0 kBtu/sf/yr	18.0 kBtu/sf/yr	71%

LMS^A



AIA 2030 Commitment

Measure What We Value

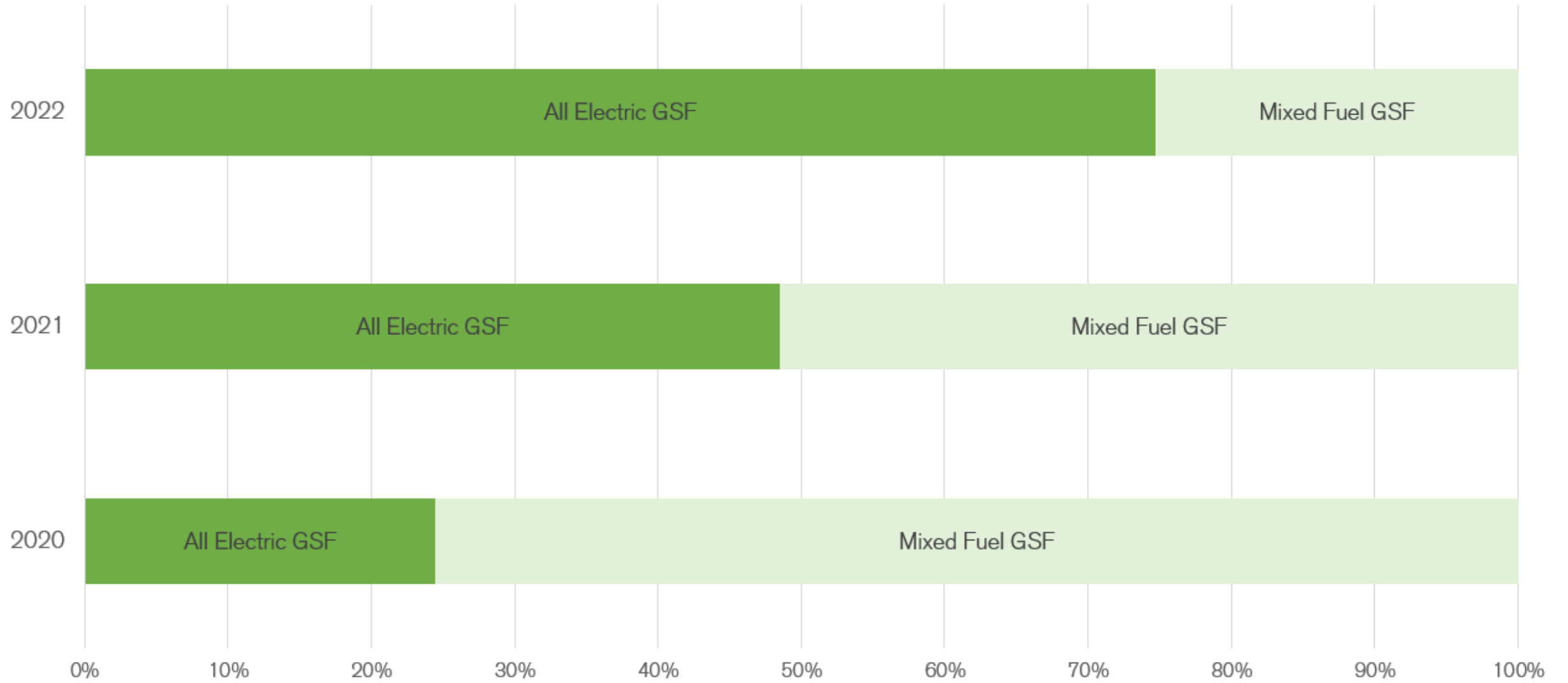


LMSA^A Projects by Market Sector

<https://www.aia.org/resources/202041-the-2030-commitment>

Going All-Electric

Lead the transition



Embodied Carbon

Early design analysis



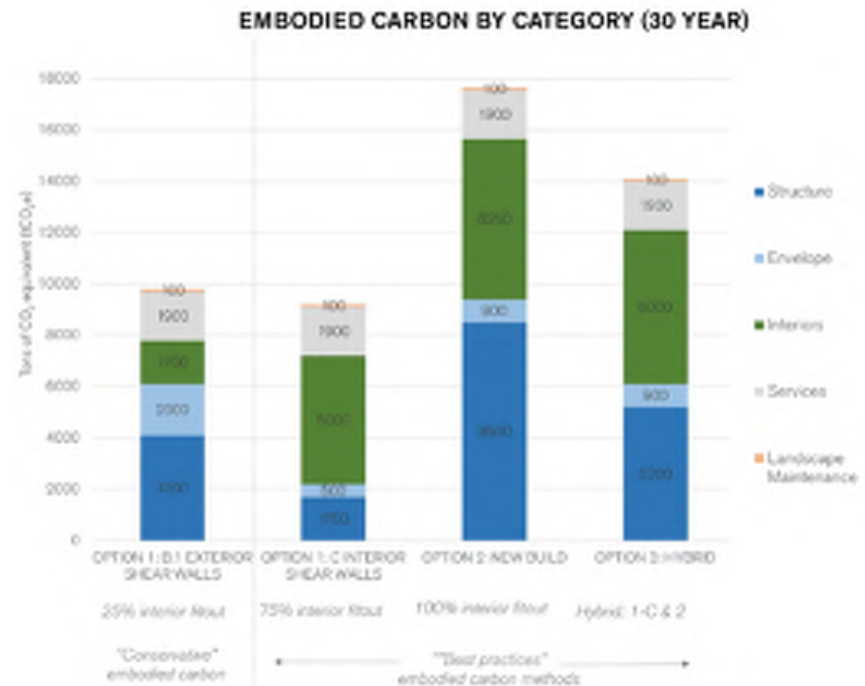
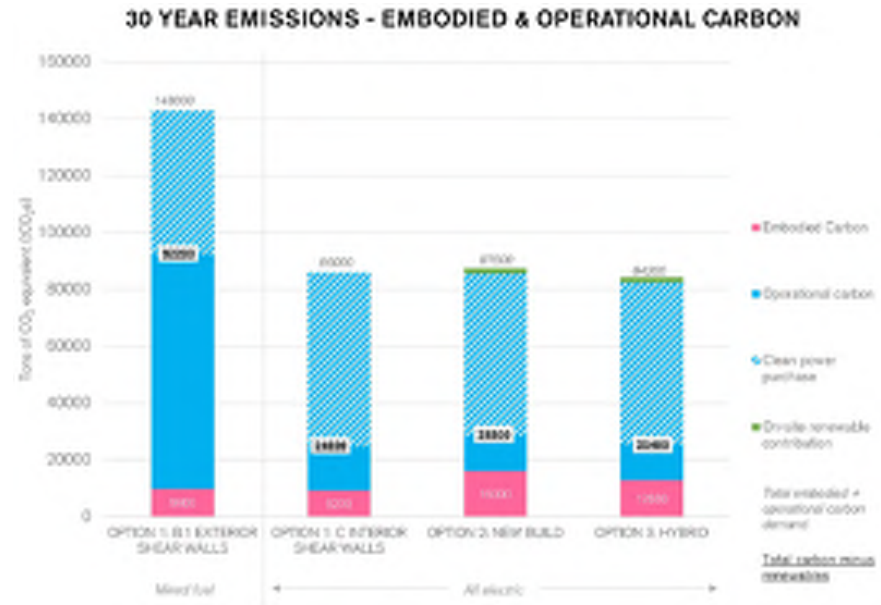
Option A: Retrofit Existing Building



Option B: Replace Existing Building



Option C: Hybrid, Partial Replacement



Project Based Research

Advance best practices through your work

Zero Net Energy Pilot Project (PGE)



Sweetwater Spectrum Community
Sonoma, CA

Low Carbon Concrete Case Study (BAAQMD)



Berkeley Way BRIDGE Affordable &
BFHP Hope Center
Berkeley , CA

Mass Timber Grant (CA Govt. Ops Agency)



Sunnydale Community Center &
Herz Recreation Center
San Francisco, CA

Jacobs Institute for Design Innovation

Modeling living and learning in a post-carbon future

Energy Reduction: 94%
EUI: 7.4 kBtu/sf/yr





12.4
kWh/sqft/yr



ENERGY USE INTENSITY

94%



ENERGY REDUCTION

58%



RENEWABLE ENERGY

84%



DAYLIGHTING

84%



NATURAL VENTILATION

+30%



DEDICATED OUTDOOR AIR

50%



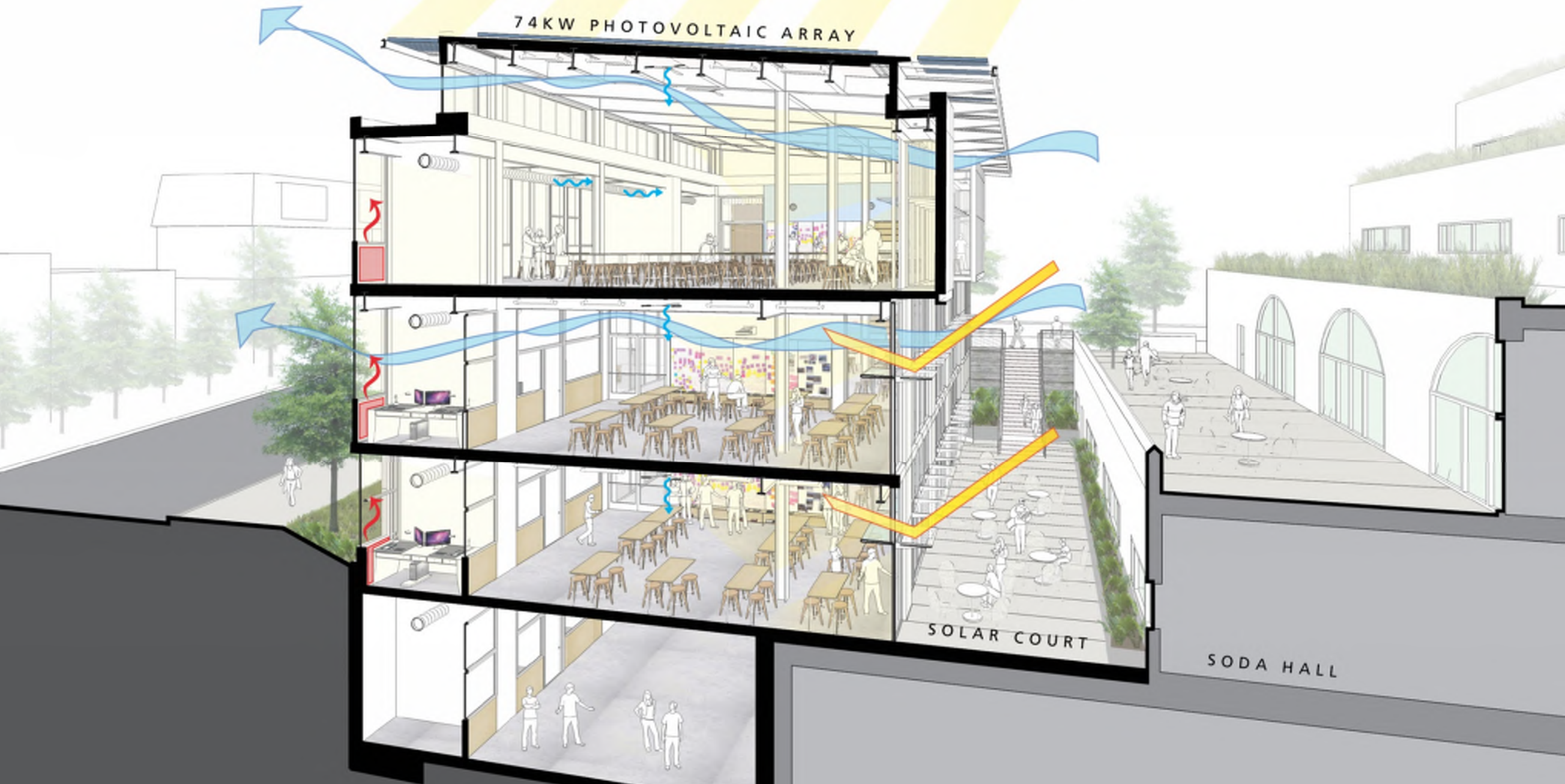
WATER CONSERVATION

100%



STORMWATER BIO FILTRATION

74KW PHOTOVOLTAIC ARRAY



SOLAR COURT

SODA HALL

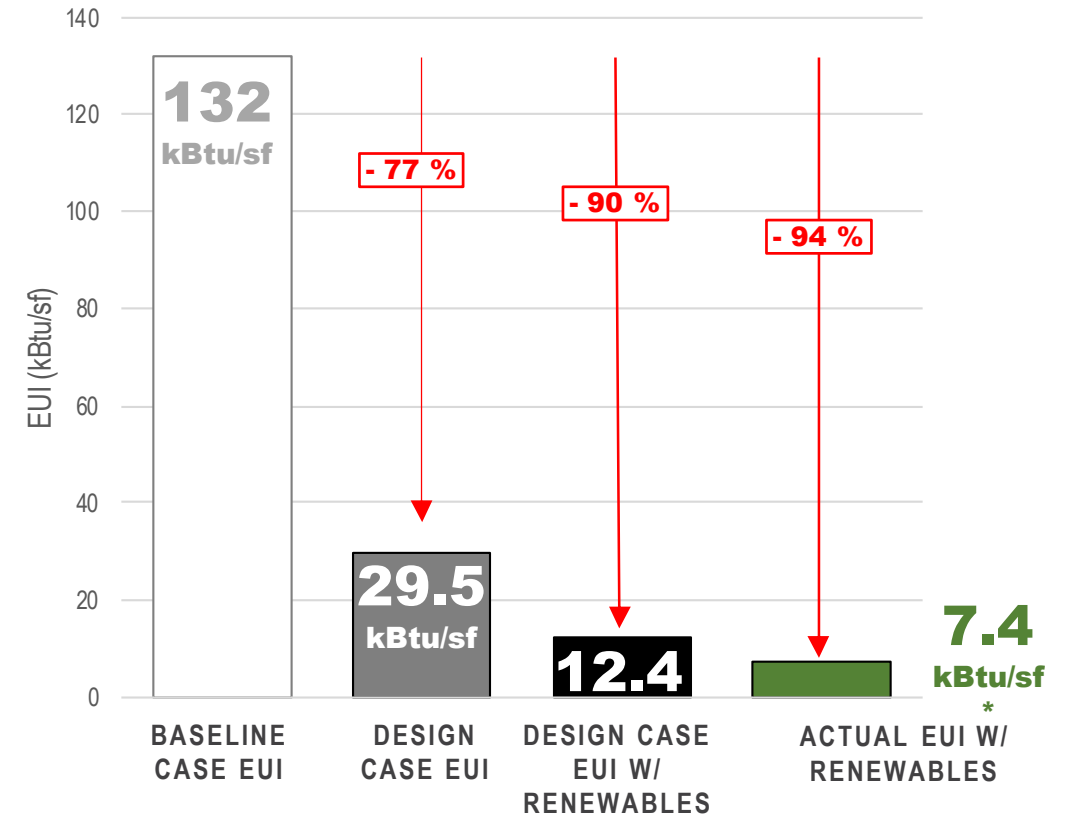
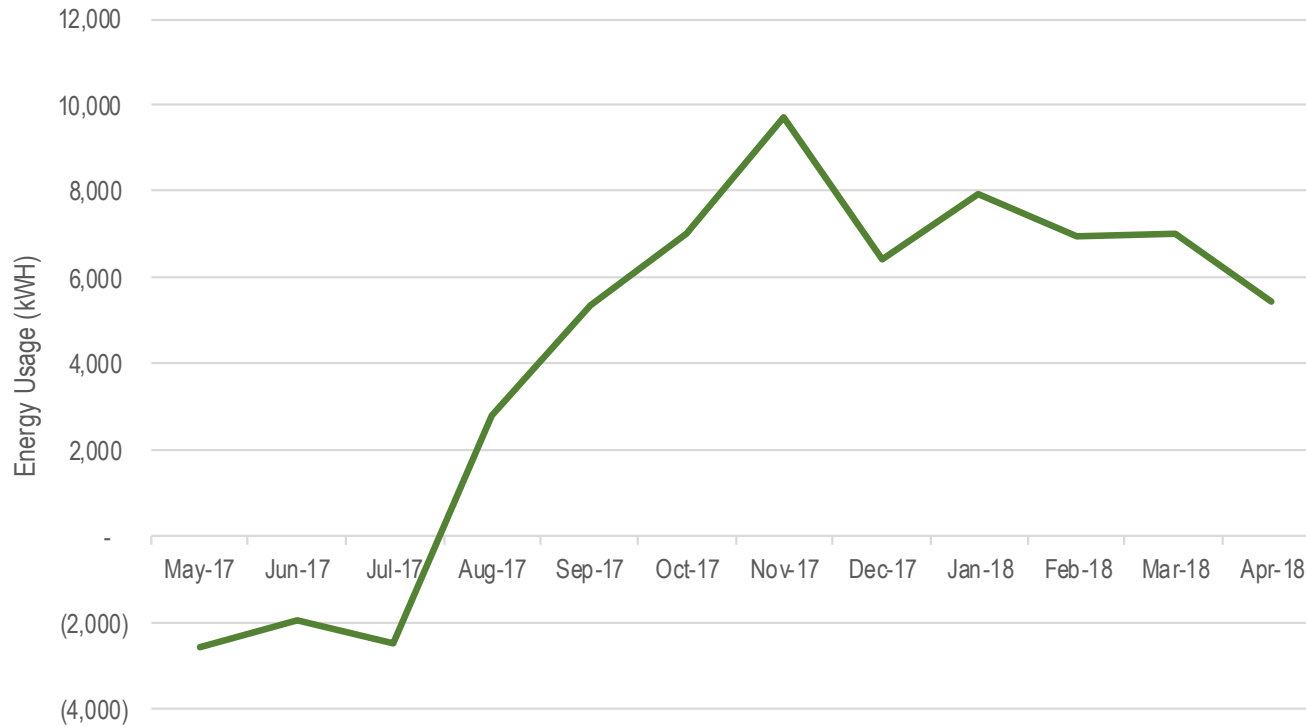




Post Occupancy Study

Actual Performance Beyond Design Case

NET ELECTRICITY USE: May 2017-April 2018
UC Berkeley Jacobs Hall



Energy data c/o Bruce Chamberlain & Raul Abesamis,
UC Berkeley Facility Services / Campus Energy

* Includes modeled values for central plant usage (not submetered)



EQUITY

ARCHITECTURE
IS FOR
EVERYONE

Diverse Voices

Fostering broad design perspectives



Design Dialogue

Meaningful community engagement



Full Cycle Engagement

A Continuous Feedback Loop



Early design

Student & stakeholder surveys, programming and spatial feedback



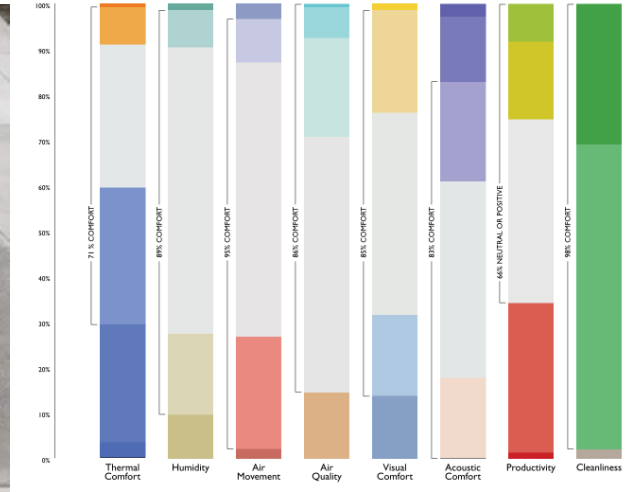
Design documents

Material selection, chemical sensitivity feedback, VR & daylight simulations



Construction phase

Mock-ups for texture testing

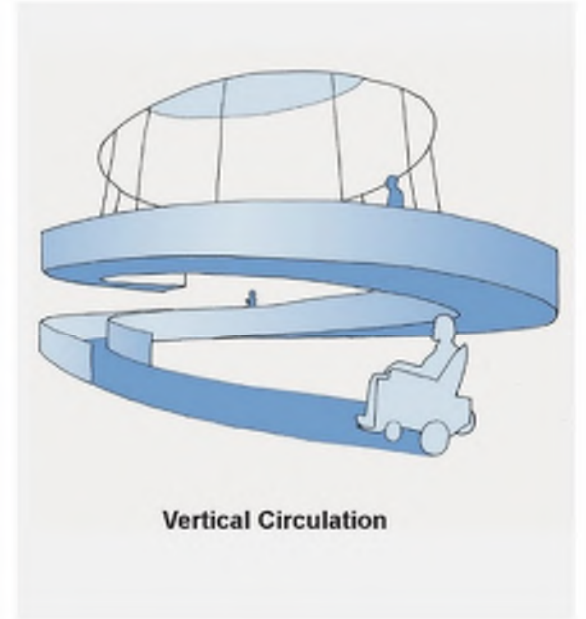
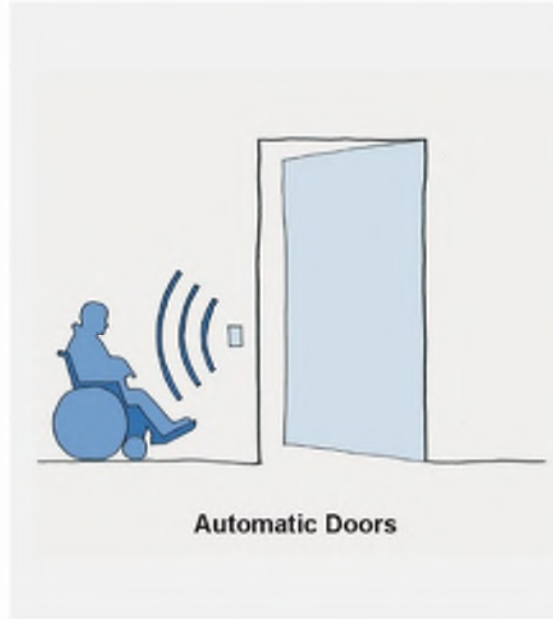


Post Occupancy

Comfort and satisfaction surveys for fine tuning solutions

Universal Design

Welcoming everyone



Empathic Design

Understanding diverse experiences



Arrival

Communicating Inclusivity



Arrival

Communicating Inclusivity



Sweetwater Spectrum

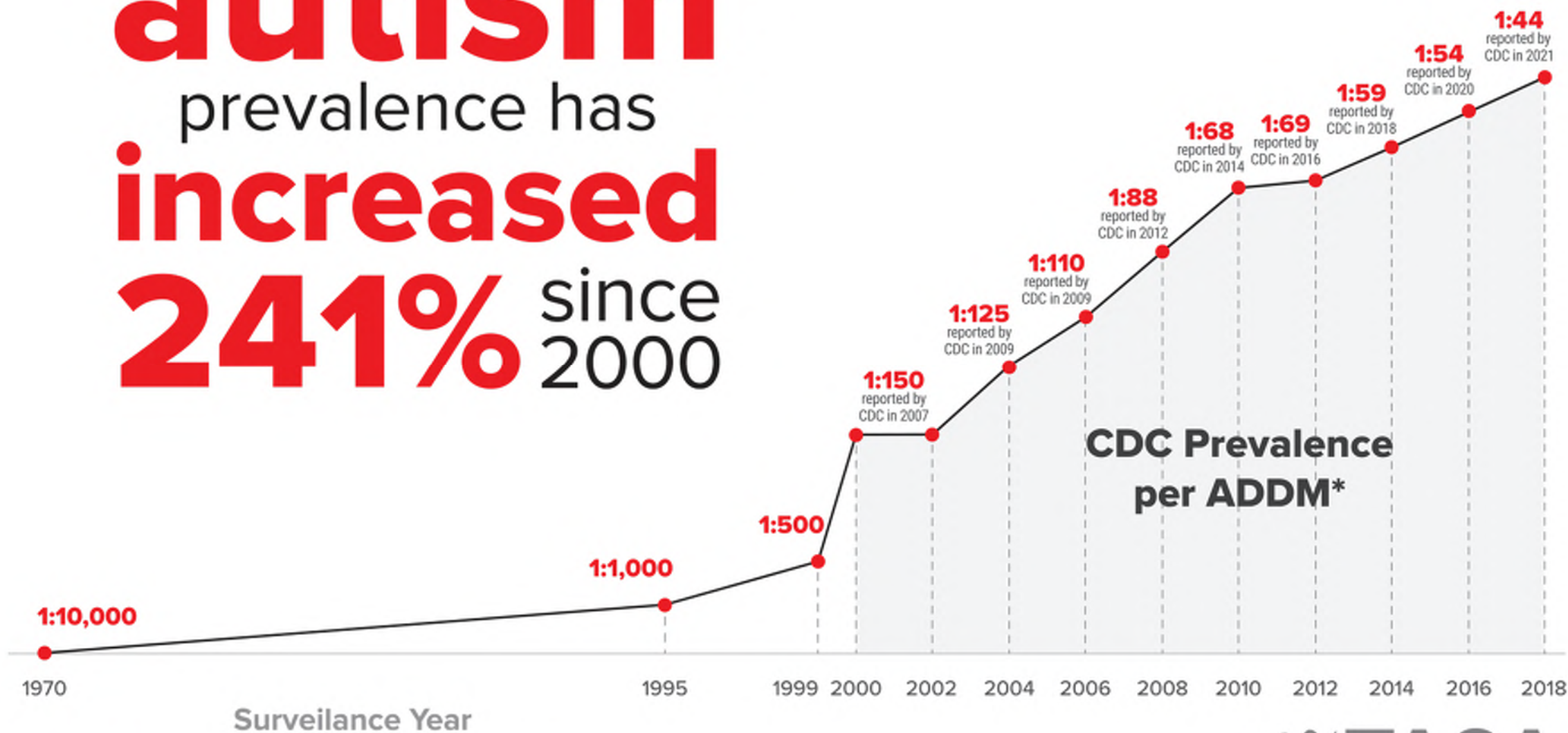
A new model for housing adults on the autism spectrum

Energy Reduction: 88%

EUI: 6 kBtu/sf/yr

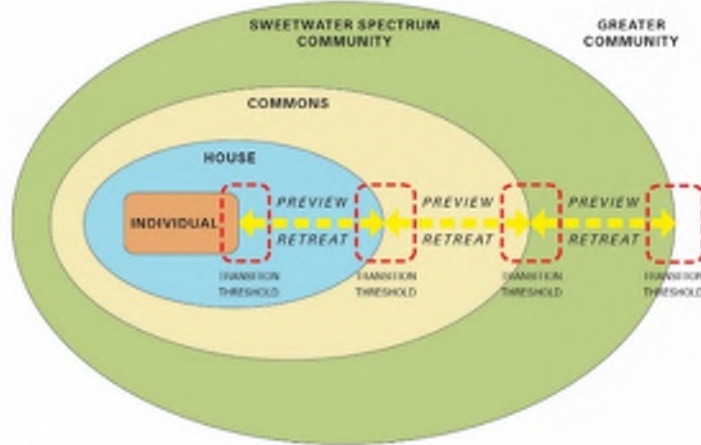


autism
prevalence has
increased
241% since
2000



*ADDMM (Autism and Development Disabilities Monitoring Network)

Design for Adults on the Autism Spectrum

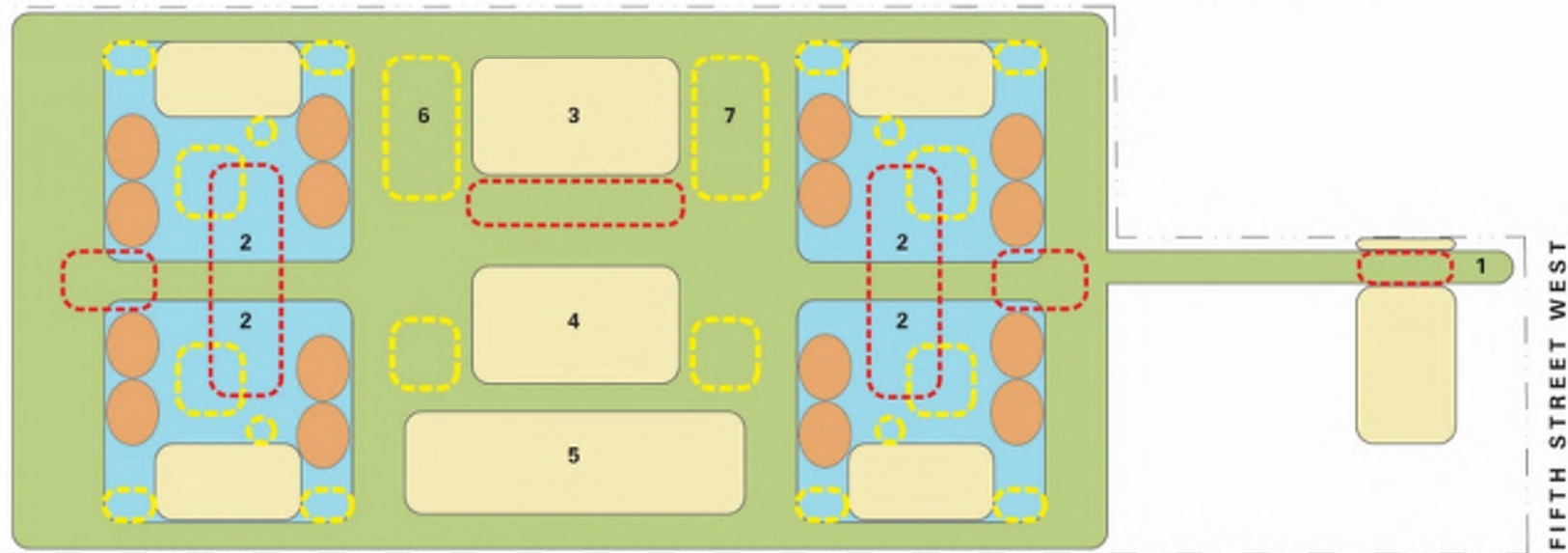


CONCEPT DIAGRAM



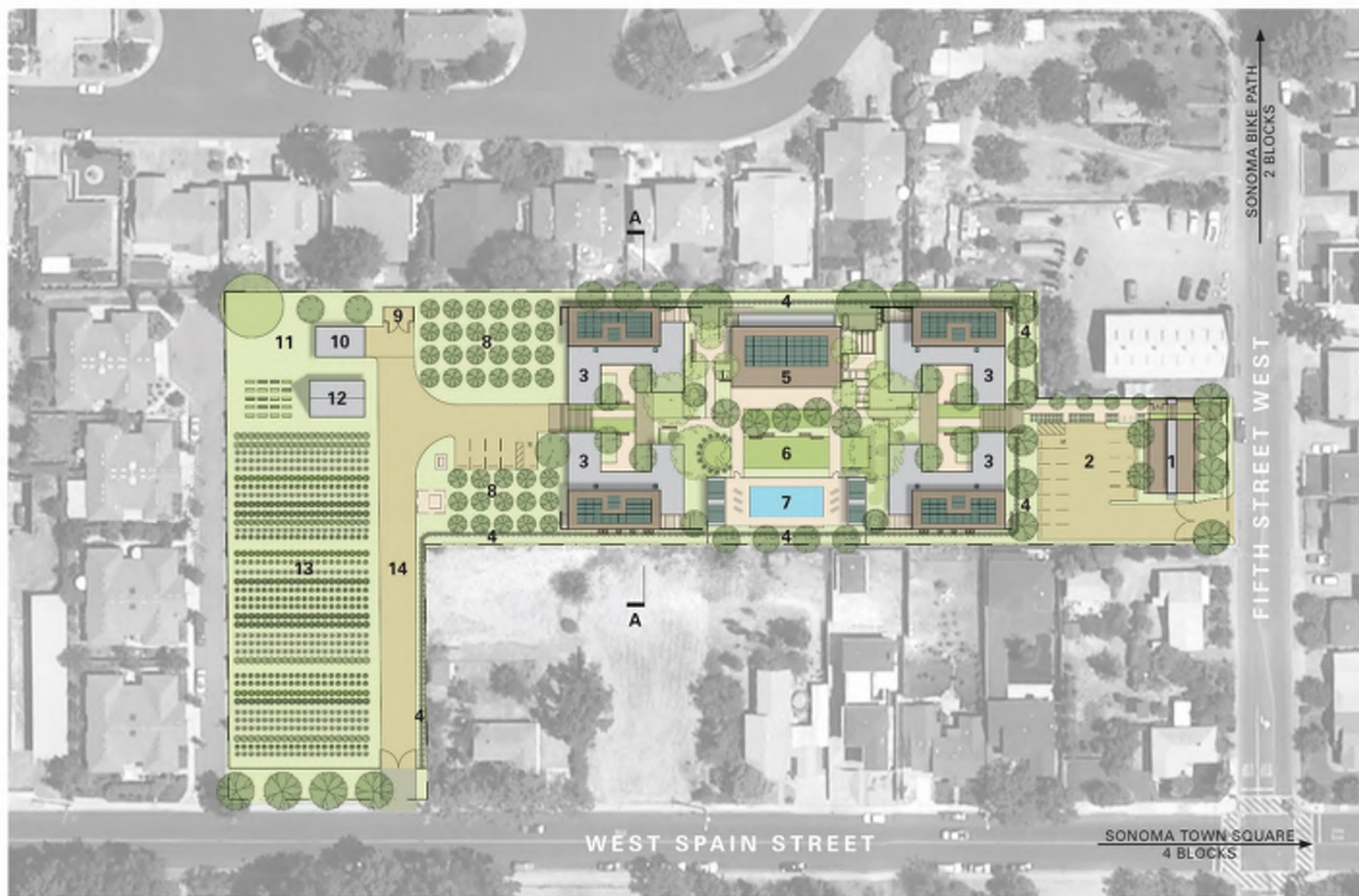
DESIGN GUIDELINES

IMAGES COURTESY OF ARIZONA STATE UNIVERSITY STARDUST CENTER PUBLICATION:
ADVANCING FULL SPECTRUM HOUSING - DESIGNING FOR ADULTS WITH AUTISM SPECTRUM DISORDER



PLAN DIAGRAM

1 ENTRY 2 HOUSE 3 COMMUNITY CENTER 4 THE COMMONS: PLAZA & LAWN 5 THERAPY POOL & SPAS 6 ACTIVITY GARDEN 7 HAMMOCK GARDEN



SITE PLAN

1 WELCOME BUILDING 2 PARKING 3 HOUSE 4 STORMWATER TREATMENT BIO-SWALE 5 COMMUNITY CENTER 6 THE COMMONS: PLAZA & LAWN
 7 THERAPY POOL & SPAS 8 ORCHARD 9 TRASH 10 STORAGE BUILDING 11 IRRIGATION WELL 12 GREENHOUSE 13 ORGANIC FARM 14 FIRE ACCESS ROAD



SUSTAINABILITY DIAGRAM

1 ORGANIC FARM 2 IRRIGATION WELL 3 COOL ROOF 4 NATURAL VENTILATION 5 DAYLIGHTING 6 DROUGHT TOLERANT PLANTS
 7 SOLAR HOT WATER PANELS 8 SOLAR PV PANELS 9 STORMWATER FILTRATION BIO-SWALE 10 SUN CONTROL 11 RADIANT FLOOR SYSTEM
 12 POOL SOLAR PANELS 13 HIGH PERFORMANCE WINDOWS 14 SOLAR TUBE SKYLIGHTS 15 HIGH R-VALUE EXTERIOR WALLS & ROOF 16 PERMEABLE PAVING











HABITATION

HOUSING
THE
UNHOUSED

Housing the Unhoused

Dignified housing is a human right

Figure 1

People Experiencing Homelessness in California

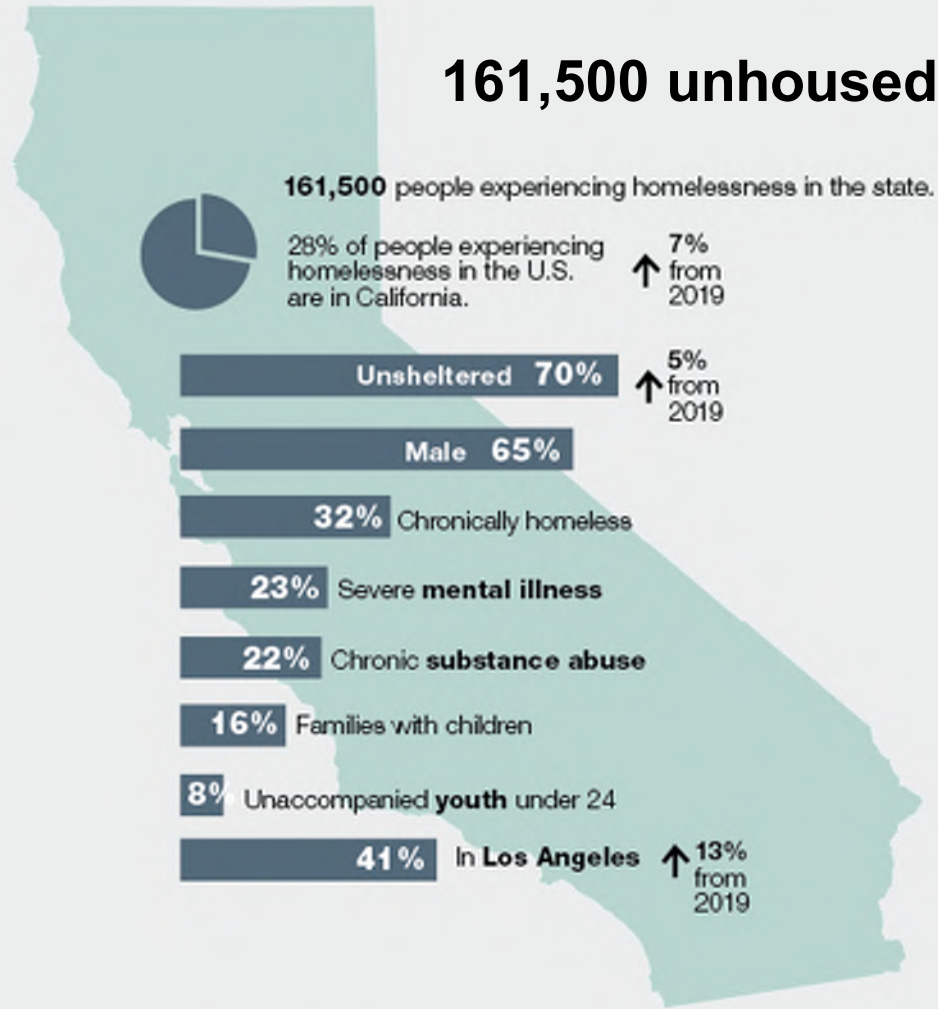


Figure based on the U.S. Department of Housing and Urban Development's (HUD's) January 2020 point-in-time homelessness count, before the onset of the coronavirus disease 2019. Recently, HUD released incomplete point-in-time data for 2021. The data reflected a count of sheltered people experiencing homelessness. Challenges associated with the COVID-19 pandemic means national data on unsheltered people experiencing homelessness will not be available for 2021.

Figure 2

Recent Trends in People Experiencing Homelessness



Figure based on the U.S. Department of Housing and Urban Development's point-in-time homelessness counts.

Edwin M. Lee Apartments

Veterans and families joined in resilience

Energy Reduction: 77%
EUI: 18.2 kBtu/sf/yr



POSTTRAUMATIC UNDERSTANDING

THE CONNECTIONS BETWEEN POSTTRAUMATIC STRESS AND ENVIRONMENTAL DESIGN



Rev. 12 September 2014

Credit: Perkins + Will

Design attributes

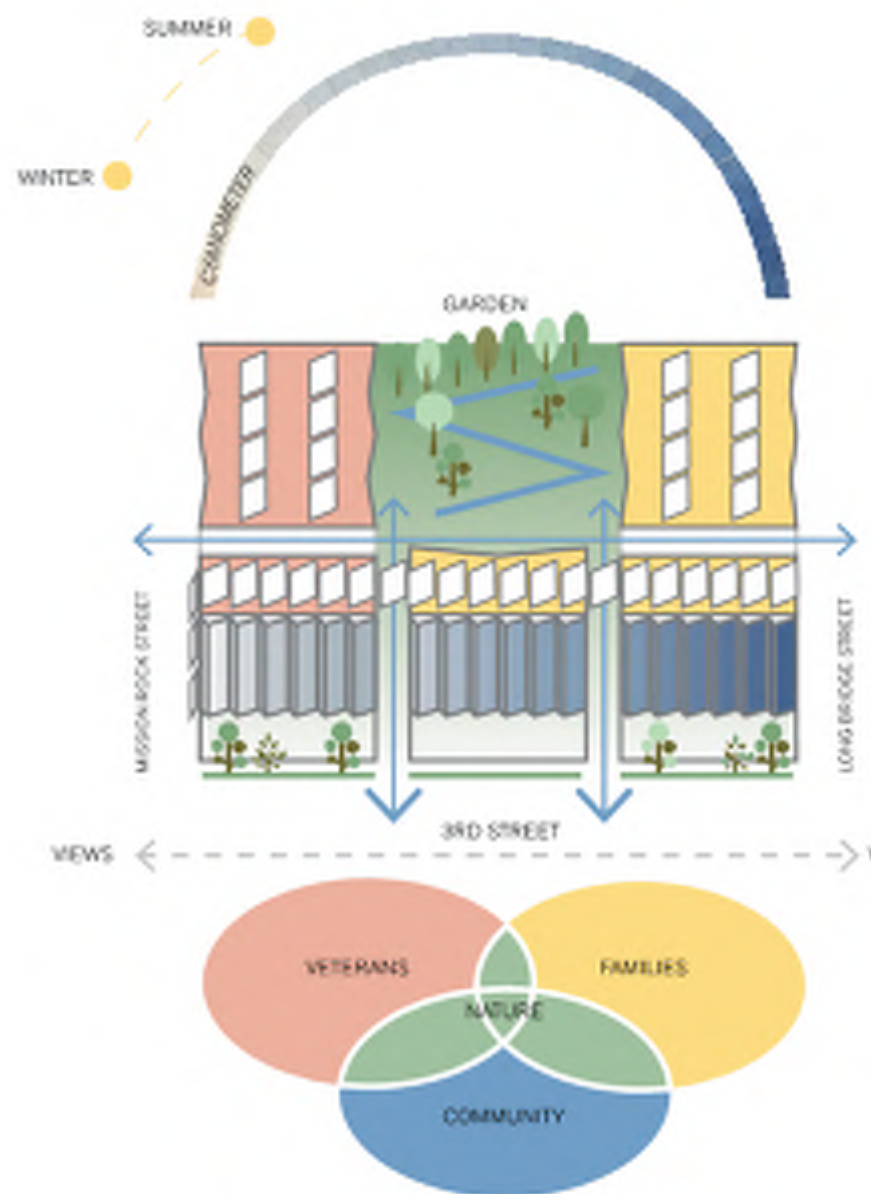
- Visual transparency
- Calming transitions
- Visible spatial order
- Garden access
- Views to nature
- Social privacy

Design Concept

Communities Integrated Through Nature

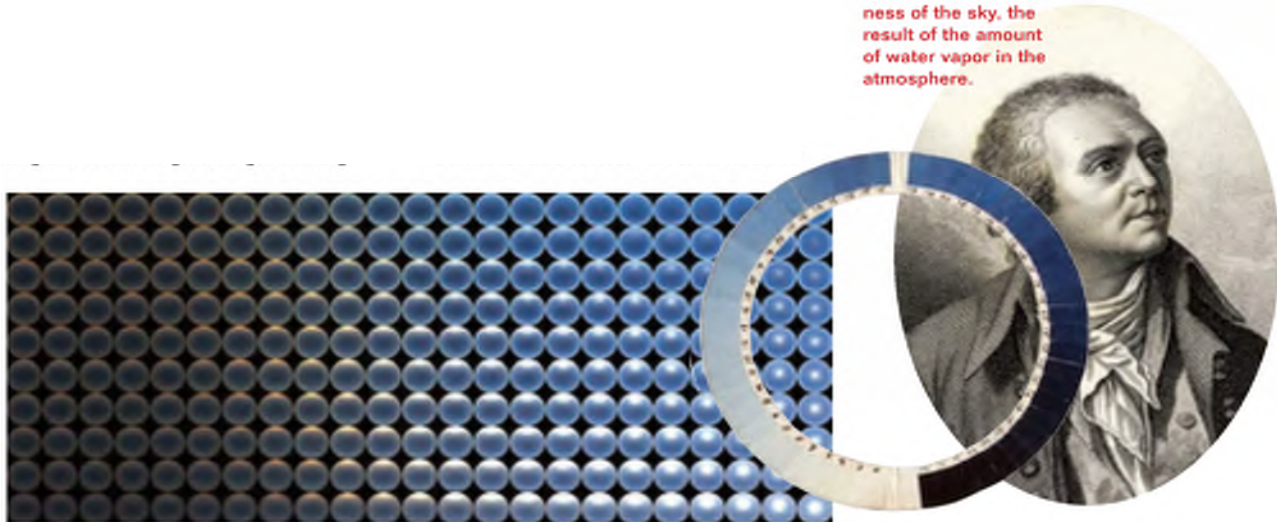


Aerial view of the Mission Bay Neighborhood from Third Street





▼
**HORACE
BÉNÉDICT DE
SAUSSURE** and
his cyanometer, an
eighteenth-century
instrument designed
to measure the blue-
ness of the sky, the
result of the amount
of water vapor in the
atmosphere.



Sustainable Design Strategies



DESIGN FOR EQUITABLE COMMUNITIES

- EQ1. Generous ramp design for veterans, strollers, and multigenerational communities
- EQ2. Integrated elements for children to play
- EQ3. Community garden area for residents
- EQ4. Community kitchen for broader Mission Bay/SF community
- EQ5. Transit-oriented (Muni)
- EQ6. Bike parking & bike network
- EQ7. Pedestrian community: Walk score 91
- EQ8. Electric car charging stations
- EQ9. Gender neutral restrooms in common areas

DESIGN FOR ECONOMY

- EM1. Prefabricated framing minimizes waste
- EM2. Durable finishes reduce maintenance
- EM3. Passive design allows low-cost operation
- EM4. Amenities and support services available for low income residents

DESIGN FOR WELLNESS

- WE1. Generous courtyard offers opportunities for respite, healing, and play
- WE2. Units and corridors offer views and daylight from all cardinal directions
- WE3. Continuous filtered ventilation provided to each unit
- WE4. Heating controls and natural ventilation options allow for thermal comfort
- WE5. Biophilic finishes, green roofs, horizon views, and indoor-outdoor connections enhance a connection to nature
- WE6. Common areas feature art inspired by nature & community from local artisans

DESIGN FOR ECOLOGY

- EG1. Post industrial landscape restored with native habitat
- EG2. Dark sky compliant light fixtures
- EG3. Designed to bird safe standards
- EG4. High-reflectance paving for heat island mitigation

DESIGN FOR ENERGY

- EN1. Orientation strategies reduce loads
- EN2. High performance building enclosure and windows reduce thermal energy loss
- EN3. Exterior sunshades reduce heat gain from south facing windows
- EN4. LED lighting and Energy Star rated appliances used throughout the building
- EN5. Ceiling fans in common areas reduce cooling demand
- EN6. Roof top solar photovoltaic panel system generates electricity for all common areas
- EN7. Solar thermal panels reduce domestic hot water heating energy needs

DESIGN FOR RESOURCES

- RE1. 70% cement replacement in concrete
- RE2. Rapidly renewable bamboo plywood used in common area woodwork and corridors
- RE3. Granite curbs and cobbles found on-site re-used in landscape design
- RE4. Ground floor concrete slab polished and sealed to provide durable floor with minimal material use

DESIGN FOR DISCOVERY

- DI1. PV energy generation monitoring and energy disclosure ordinances allow for post-occupancy energy evaluation
- DI2. Future post occupancy surveys and thermal studies to be completed after first year of building use

DESIGN FOR WATER

- WA1. Low-flow water fixtures
- WA2. Drip irrigation w/ smart sensors at green roofs & courtyard
- WA3. 100% stormwater managed on-site in bioswale planters

DESIGN FOR CHANGE

- CH1. Mission Bay soil settlement is mitigated with "hinge slab" entrances and ramps, allowing accessible access
- CH2. On-site renewable energy reduces demand on an increasingly strained energy grid
- CH3. Common areas are designed to be flexible and accommodate multiple uses over time
- CH4. Certain common areas include option for mechanical cooling in peak heat events
- CH5. Building is "purple pipe" plumbed to integrate future municipal recycled water system







EDUCATION

TWENTY-FIRST-
CENTURY
SCHOOLS

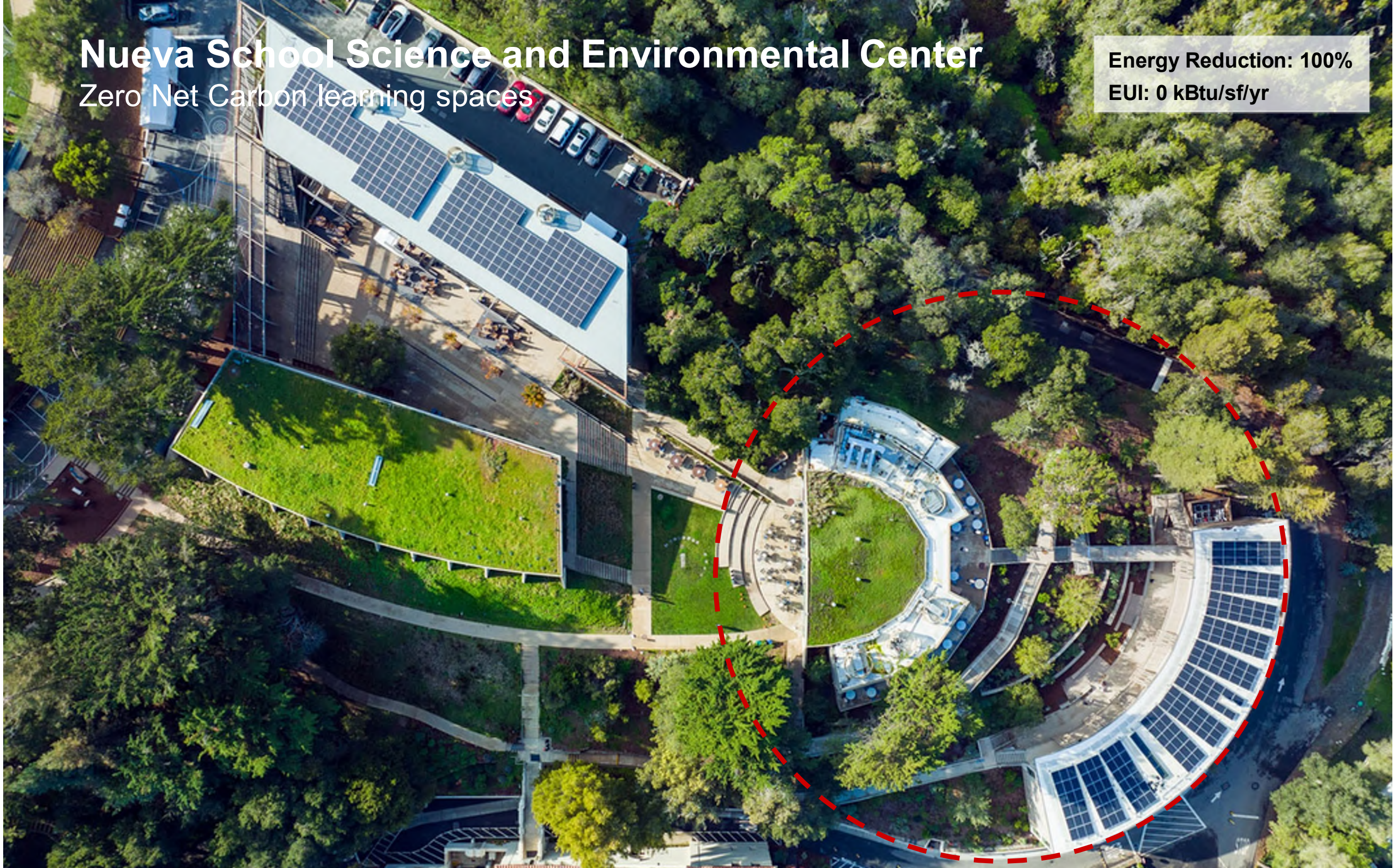
Schools as a model for a low-carbon future



Nueva School Science and Environmental Center

Zero Net Carbon learning spaces

Energy Reduction: 100%
EUI: 0 kBtu/sf/yr







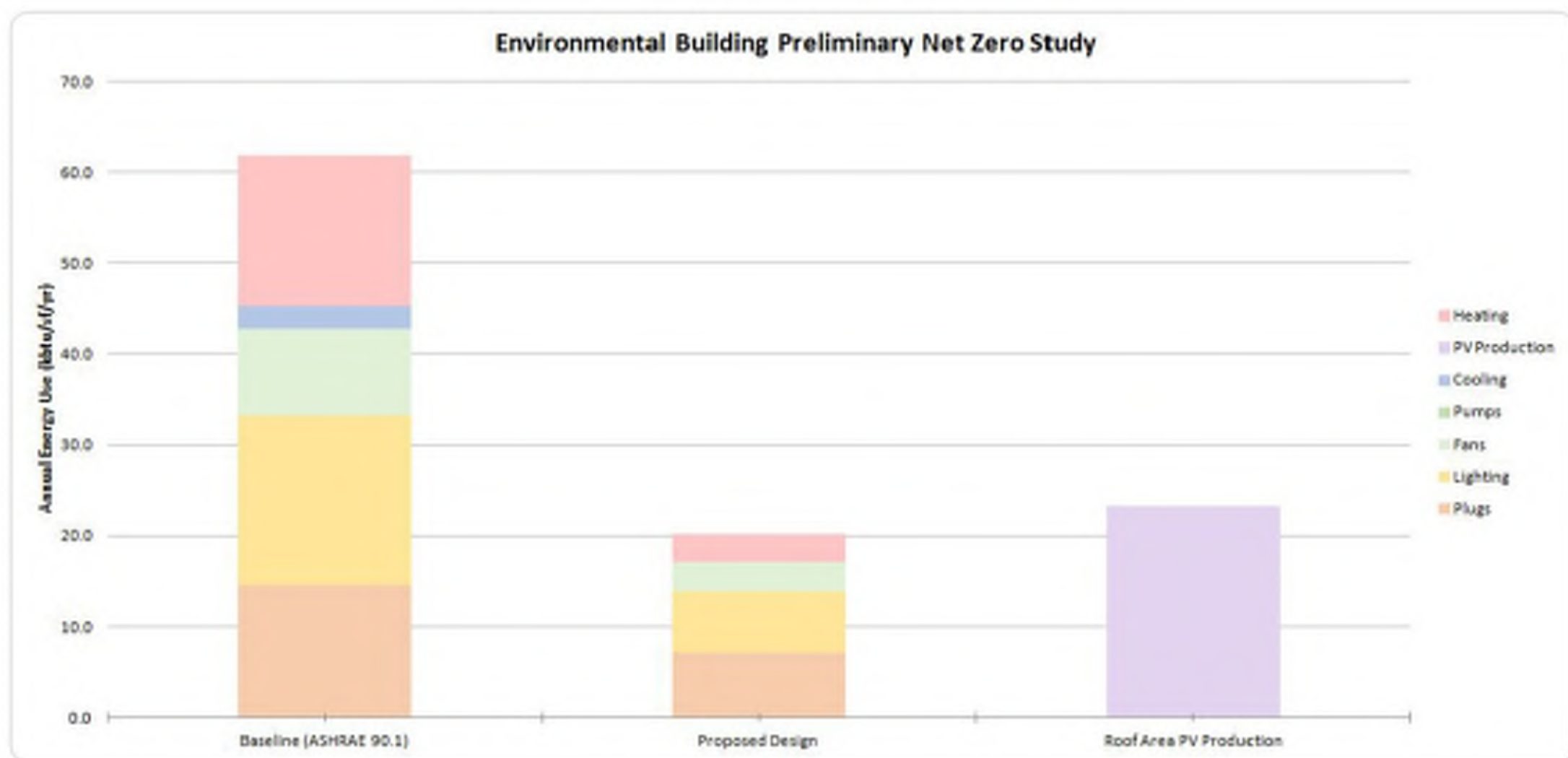
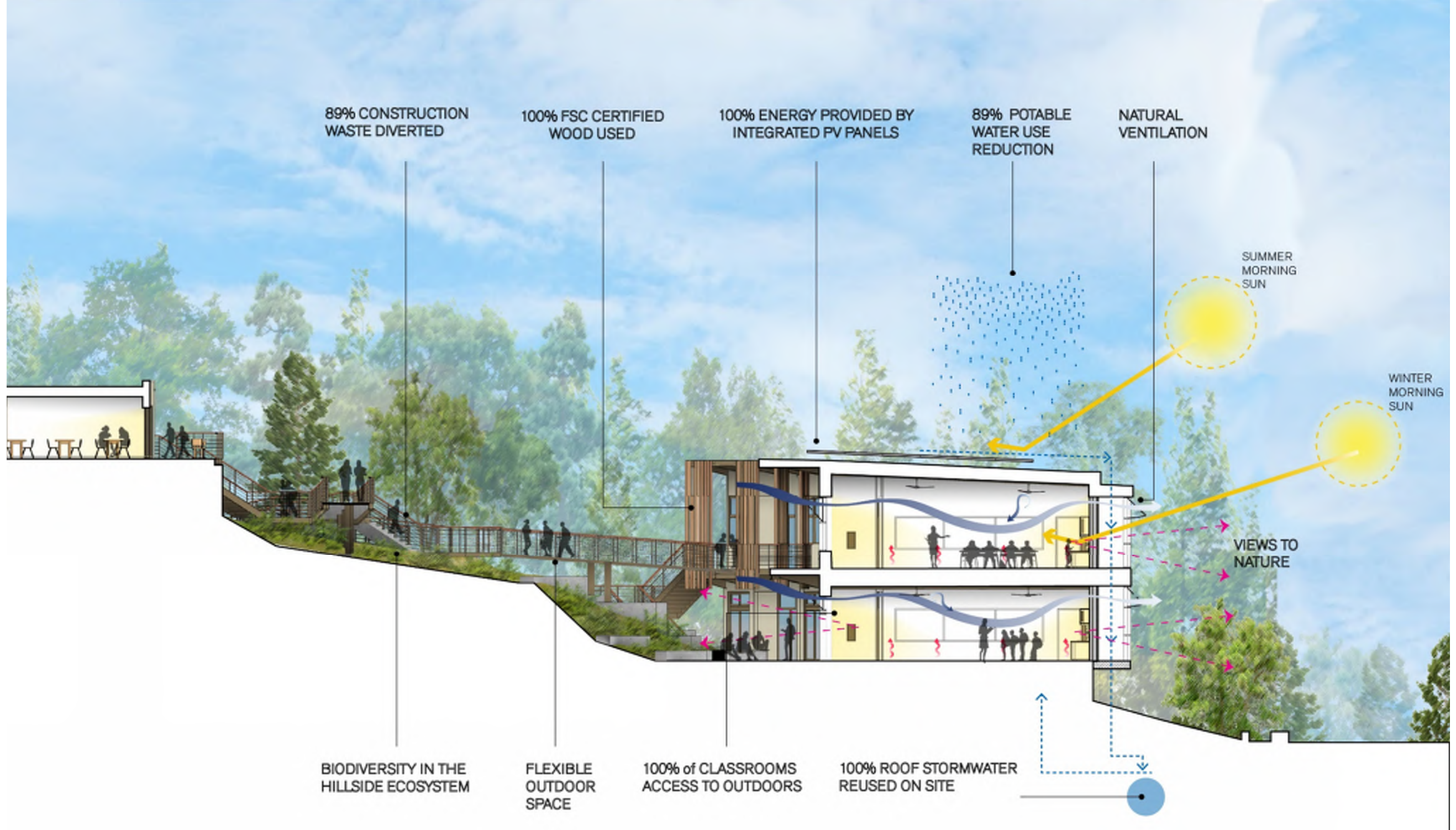


Figure 2: Annual Energy Use Intensity (kbtu/sf) comparison between Environment Science Building Design and ASHRAE Baseline



89% CONSTRUCTION WASTE DIVERTED

100% FSC CERTIFIED WOOD USED

100% ENERGY PROVIDED BY INTEGRATED PV PANELS

89% POTABLE WATER USE REDUCTION

NATURAL VENTILATION

SUMMER MORNING SUN

WINTER MORNING SUN

VIEWS TO NATURE

BIODIVERSITY IN THE HILLSIDE ECOSYSTEM

FLEXIBLE OUTDOOR SPACE

100% of CLASSROOMS ACCESS TO OUTDOORS

100% ROOF STORMWATER REUSED ON SITE





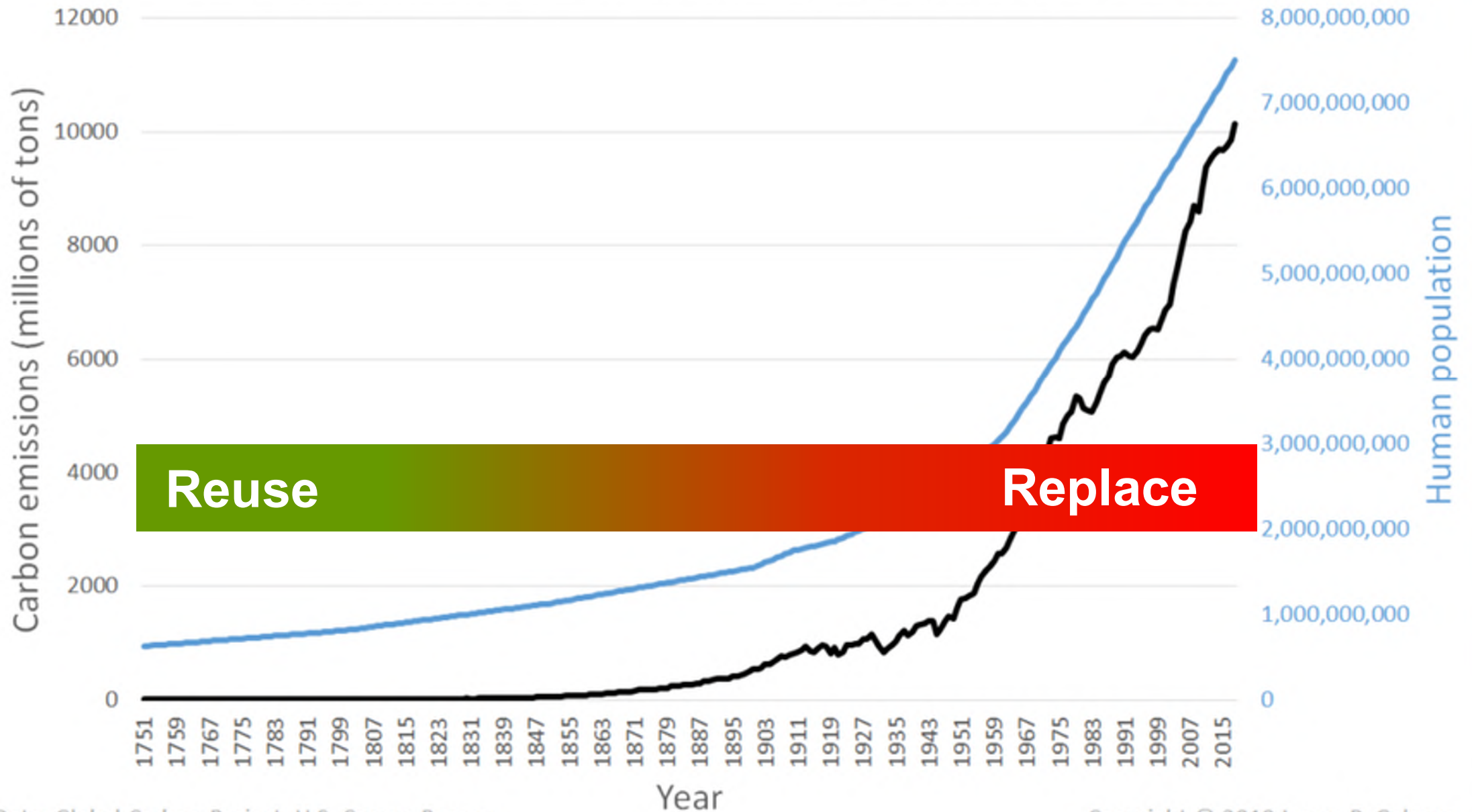


ADAPTATION

ADAPTIVE
REUSE
IN A CLIMATE-
POSITIVE
WORLD



Carbon emissions and human population, 1751-2018

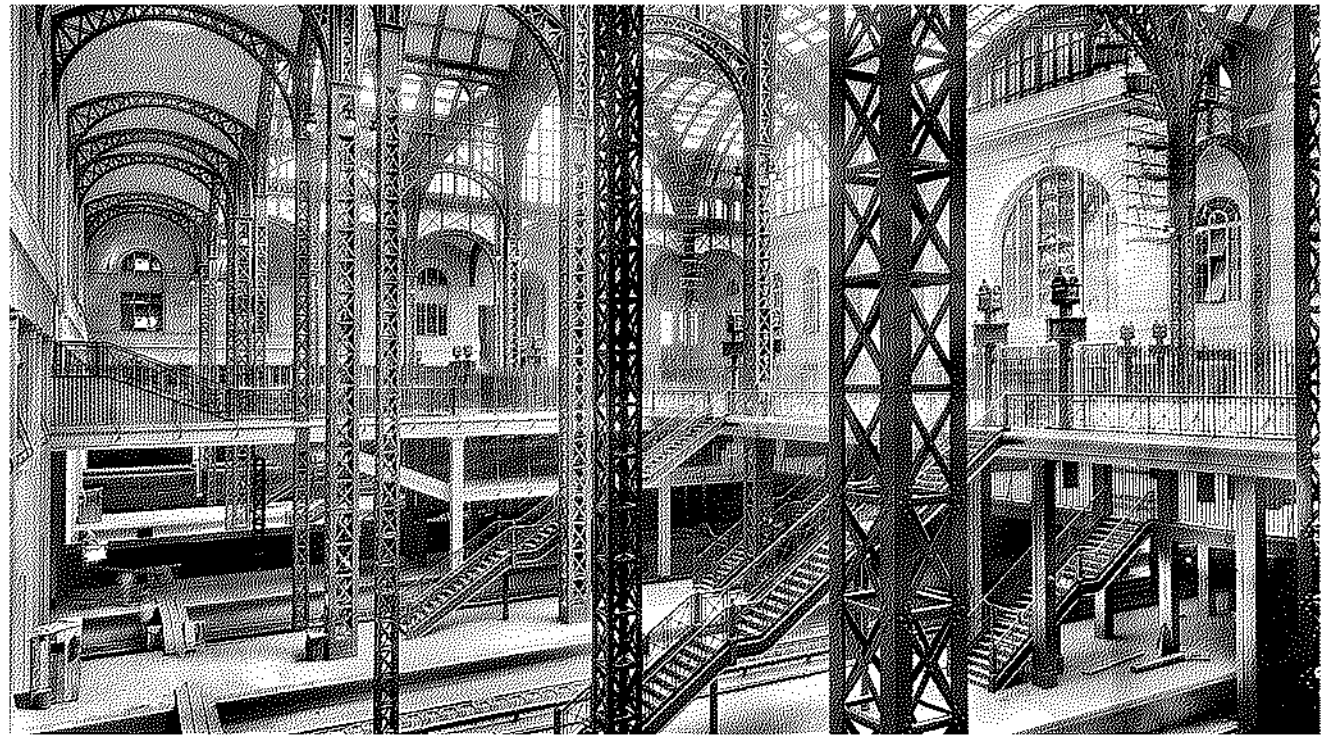


Data: Global Carbon Project, U.S. Census Bureau

Copyright © 2019 James P. Galasyn

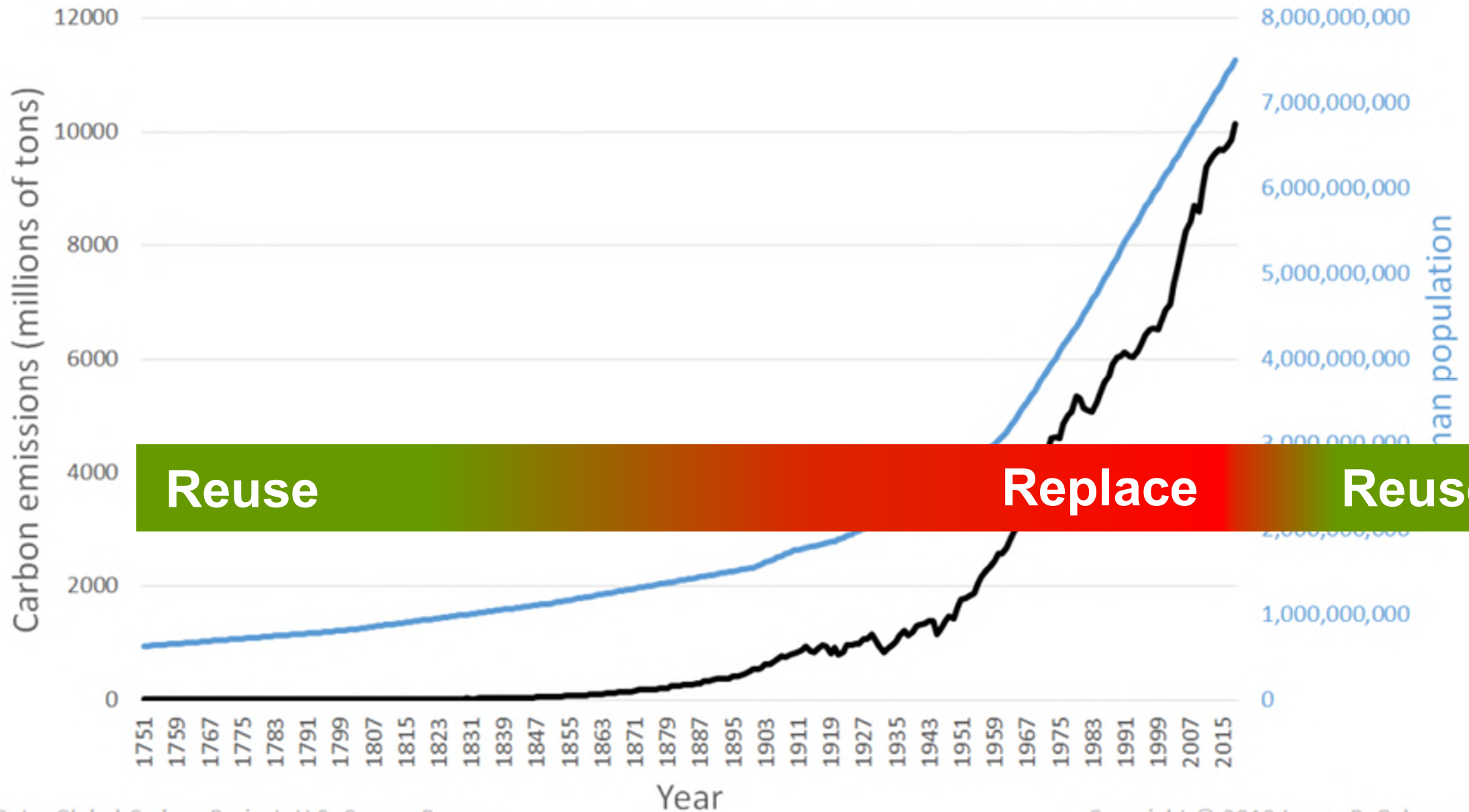


Pruitt-Igoe, St. Louis
1955-1972 (17 yrs)



Penn Station, New York,
1910-1963 (53 yrs)

Carbon emissions and human population, 1751-2018

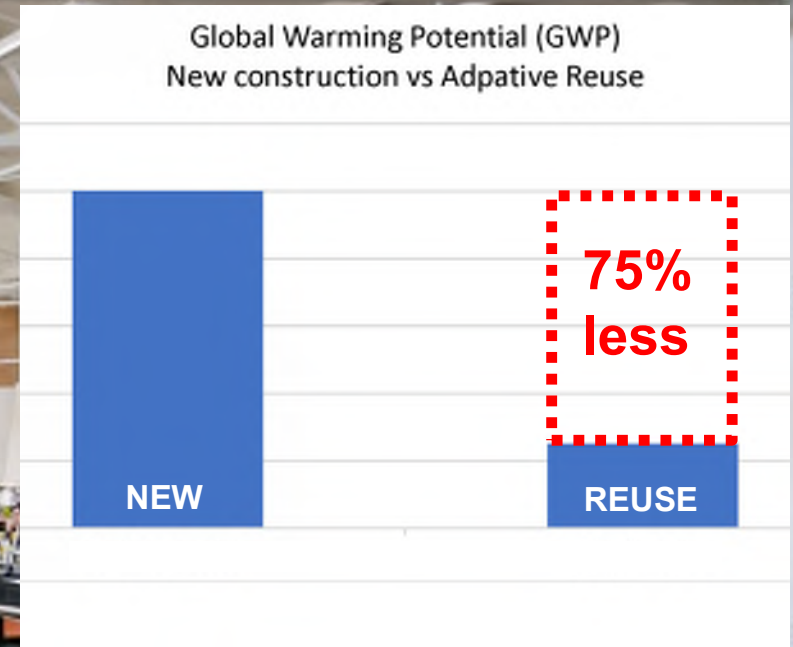


Data: Global Carbon Project, U.S. Census Bureau

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Life Cycle Impact Assessment: New Construction vs Adaptive Reuse

Case Study: Ortlieb's Bottling House, Philadelphia
Kieran Timberlake

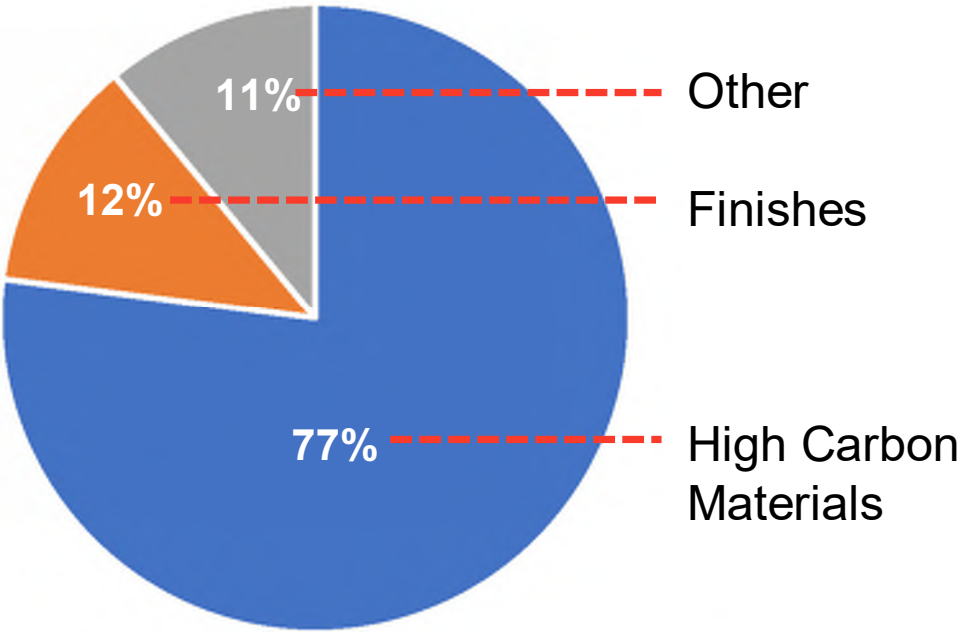


Source: Building & Environment: Comparative Whole Building Life Cycle Assessment of Renovation and New Construction (Hasik et al) June 2019

Life Cycle Impact Assessment: New Construction vs Adaptive Reuse

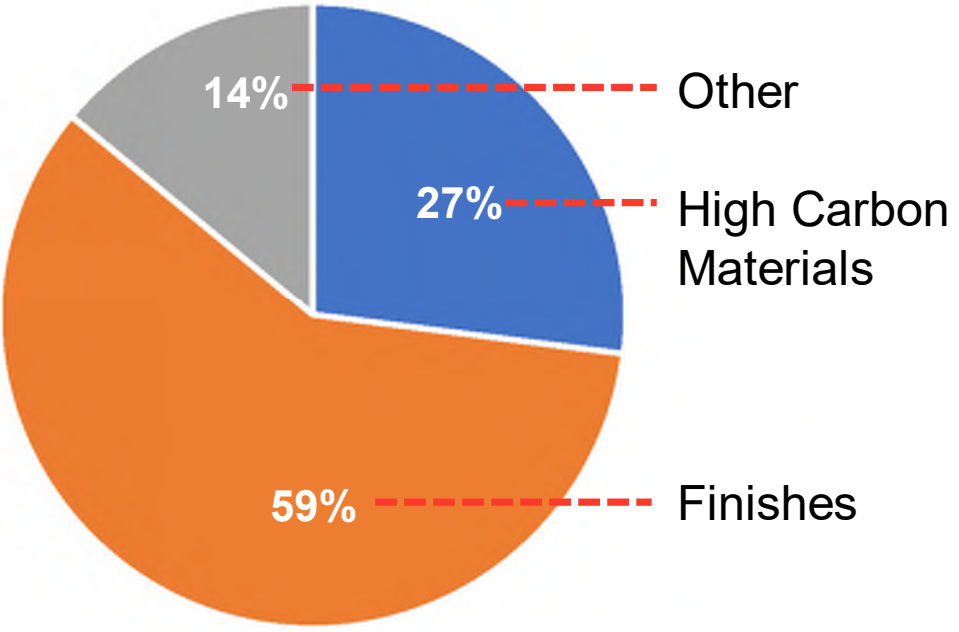
Case Study: Ortlieb's Bottling House, Philadelphia – Kieran Timberlake

Life Cycle Impact Assessment - New Construction



■ Concrete / Masonry / Metals ■ Finishes ■ Openings, wood, insulation

Life Cycle Impact Assessment - Adaptive Reuse



■ New Concrete / Masonry / Metals ■ Finishes ■ Openings, wood, insulation

Source: Building & Environment: Comparative Whole Building Life Cycle Assessment of Renovation and New Construction (Hasik et al) June 2019



“Where the choice is between demolishing to build new or retaining an existing structure, the default approach should be to retain and retrofit”

RetroFirst

Launched by AJ: Sept 2019

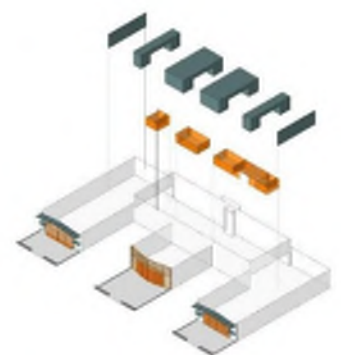
Signatory firms : >250 including 11 Sterling Award winners

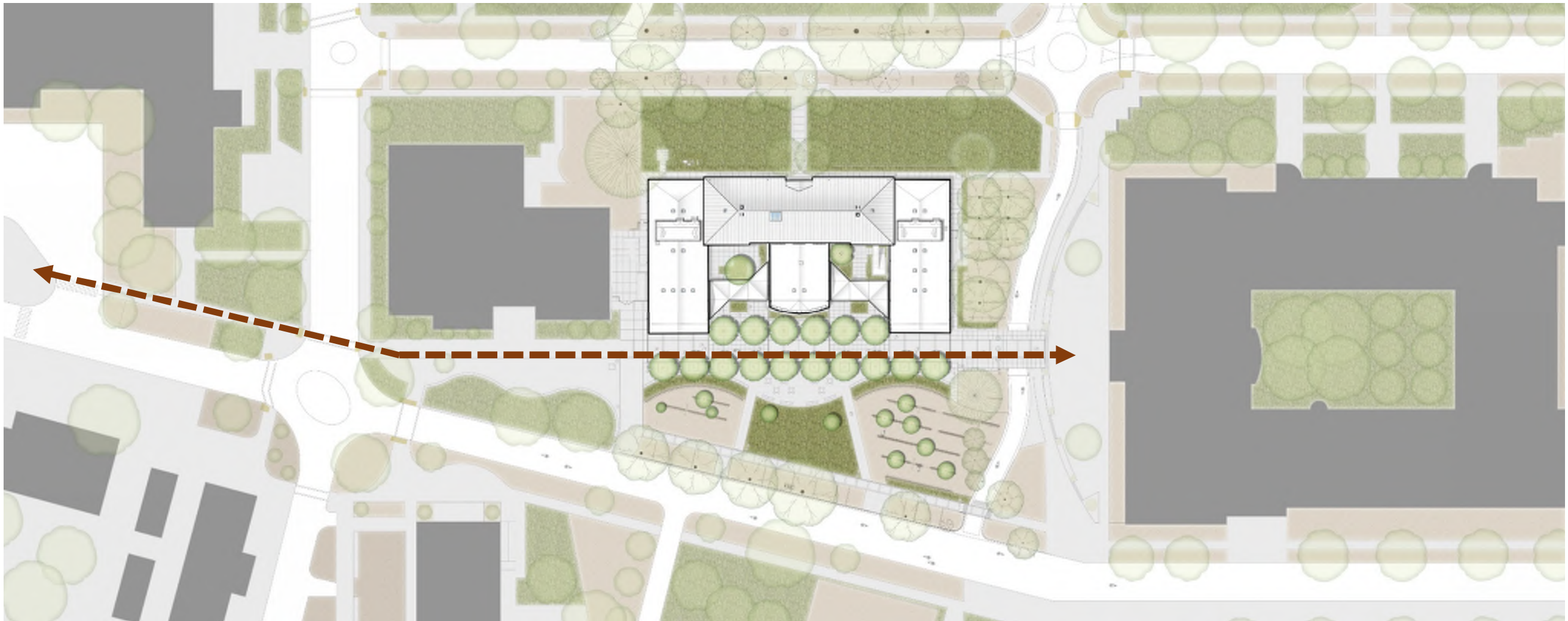
UC Davis Walker Hall

Adaptive reuse a 100 year-old structure

Energy Reduction: 80%
EUI: 26.4 kBtu/sf/yr
Embodied CO² Reduction: 57%











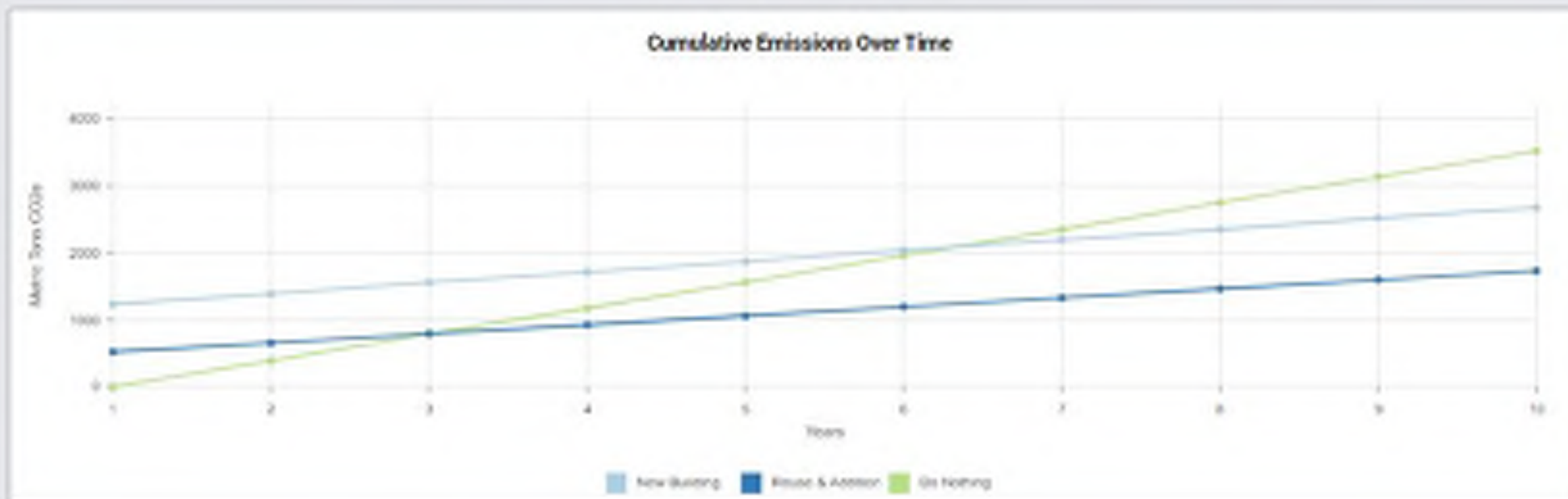
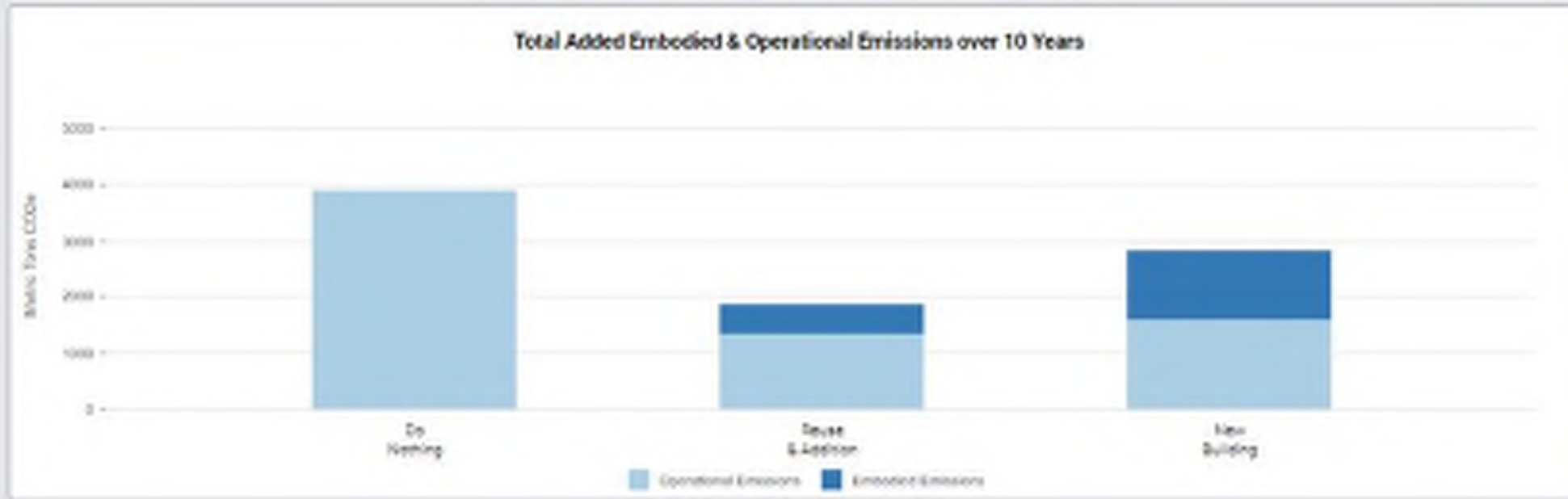
WALKER HALL 1310

GRADUATE CENTER



Embodied Carbon Analysis – The CARE Tool

57% reduction in embodied carbon compared to all-new construction



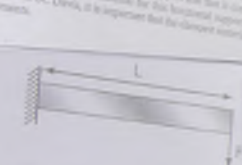




material and process for the horizontal support, you have been tasked with selecting the appropriate material. The seats of these chairs are mounted on a horizontal support arm that is connected to the concrete cover using bottom rods at UC Davis, it is important that the diameter of the support arm is large enough to meet the design requirements.

For this problem, you can treat the support arm as a beam that is fixed to the end of a rod (45 cm) and horizontal distance (1.5 m) and, while the distance can vary to support the load, the support arm must be able to sustain the weight of a student, 300 lb or 140 kg, without any plastic deformation. You should not include any safety factors in your calculations.

You may find the following information useful:





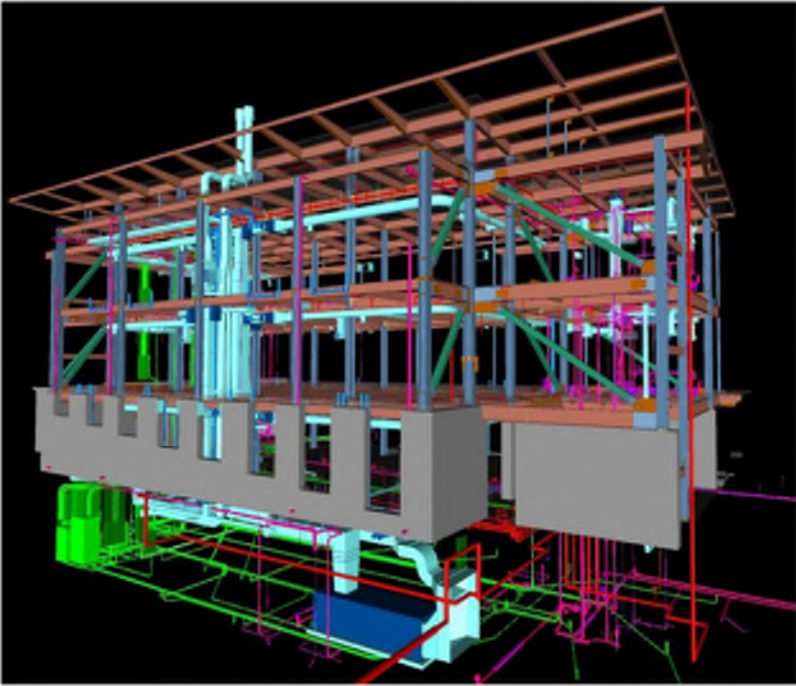


TAKE ACTION

DESIGN A PRACTICE WITH PURPOSE



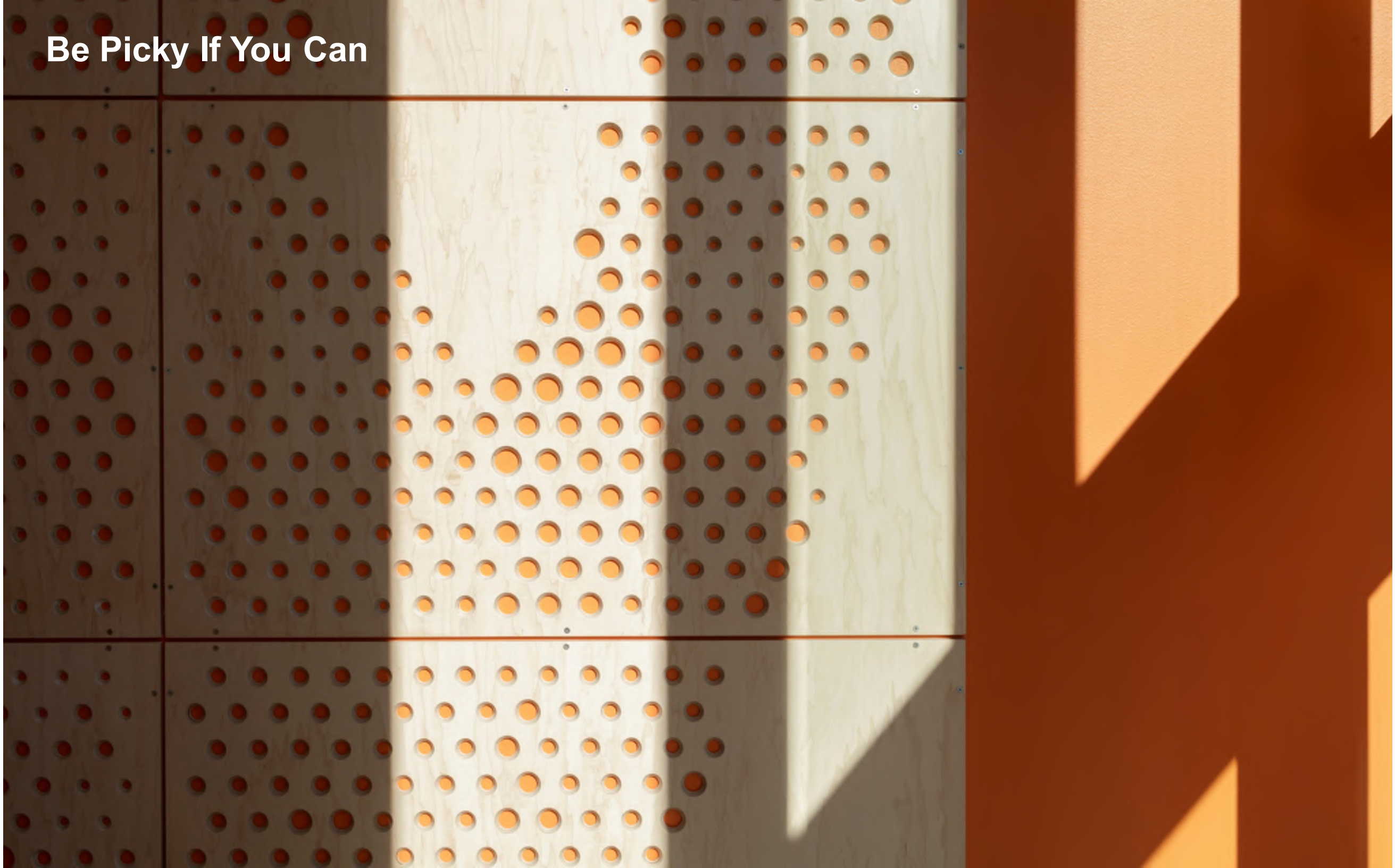
Communicate Your Values



Attract Mission-Driven Projects



Be Picky If You Can



Surf the Bottom Half of the Wave

A high-angle photograph of a surfer riding a massive, curling wave. The surfer is positioned in the lower half of the wave's face, riding the bottom half. The wave is a deep, vibrant blue, and the crest is breaking into white, frothy foam. The sky is a clear, bright blue. The overall scene is dynamic and powerful, capturing the essence of surfing.

**YOU CAN'T STOP THE WAVES
BUT YOU CAN LEARN TO SURF**

Practice Diversity



Right-Size Your Practice



Advance Best Practices

Sign on to the AIA 2030 Commitment / Use the AIA Framework for Design Excellence



MEASURE 1
DESIGN FOR INTEGRATION



MEASURE 6
DESIGN FOR ENERGY



MEASURE 2
DESIGN FOR COMMUNITY



MEASURE 7
DESIGN FOR WELLNESS



MEASURE 3
DESIGN FOR ECOLOGY



MEASURE 8
DESIGN FOR RESOURCES



MEASURE 4
DESIGN FOR WATER



MEASURE 9
DESIGN FOR CHANGE



MEASURE 5
DESIGN FOR ECONOMY



MEASURE 10
DESIGN FOR DISCOVERY

Advocate for Change

Become a Citizen Architect



AB 1010 is the first state law passed in the nation that requires architects to take Zero Net Carbon Design Continuing Education classes to obtain or renew their license to practice.

8.31.2022

Adaptive Reuse,
Efficient by Default:
Projects with
Embedded
Energy
Efficiency



A Architects Advocate
Action on Climate Change

As architects dedicated to healthy and livable communities, and guided by scientific consensus and reason, we Advocate for action on Climate Change.

ACTION #12

**BECOME A
CITIZEN
ARCHITECT!**

THINK GLOBAL, ACT LOCAL!

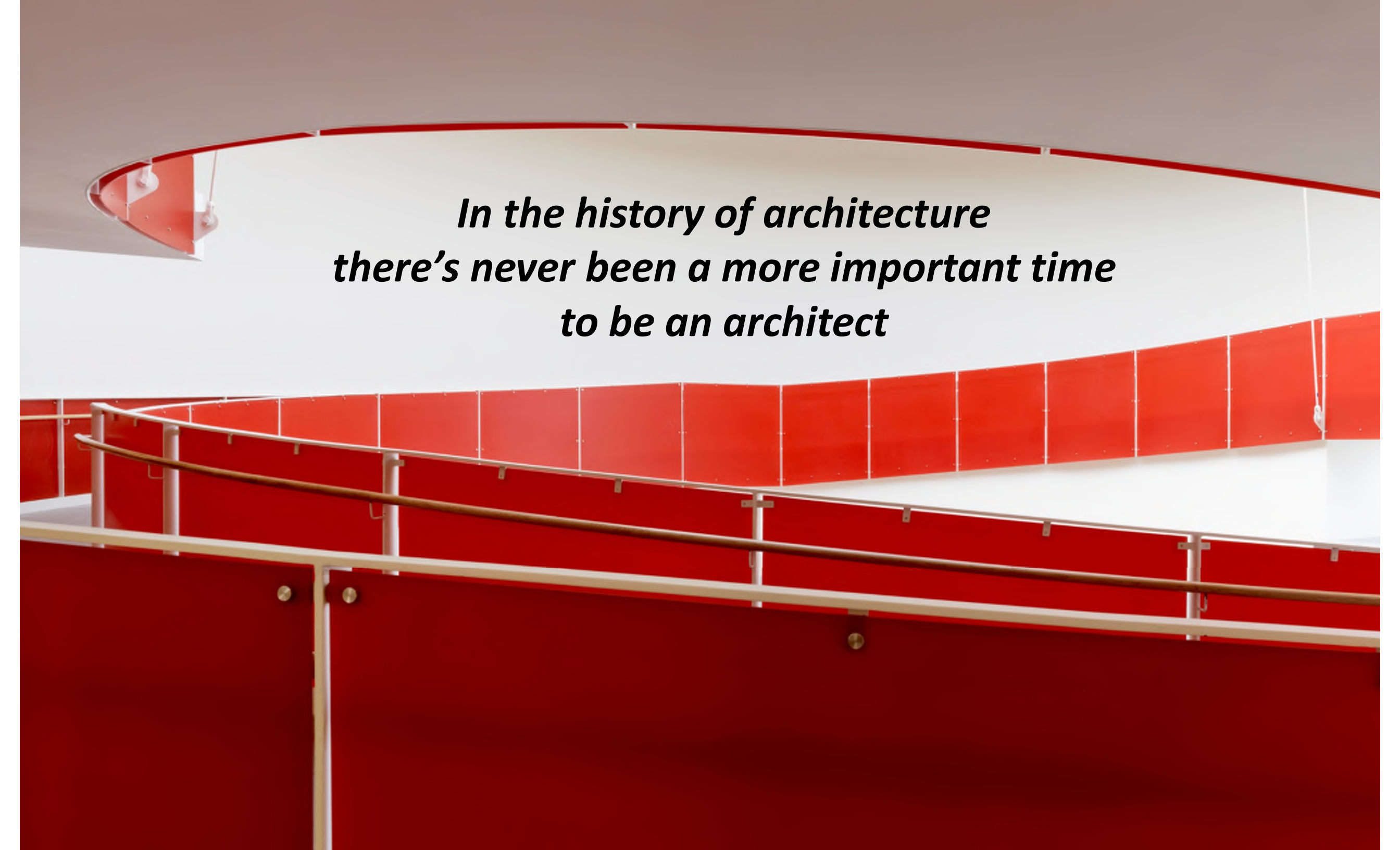
We can't afford business as usual

**It's no longer enough to meet our clients'
programs and budgets on schedule,
as difficult as that might be**

**It's no longer enough to view architecture as
an isolated work of experiential sculpture,
as fascinating as that might be**

**We must become innovative agents of change,
providing vision and skill to lead our communities
toward a just, climate-positive future for all**

**No project is too small.
We all have a role to play.**



***In the history of architecture
there's never been a more important time
to be an architect***